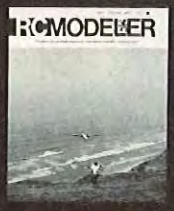
47783 JANUARY 1972 75¢

RC MODELER

THE WORLDS LEADING MAGAZINE FOR RADIO CONTROL ENTHUSIASTS

THIS MONTH

Spectacular Junkers J.U. 52 tri-motor for scale buffs by Jim R. Pyner is featured on page 18 of this months RCM.



THIS MONTHS COVER

Lloyd Sager launches his sailplane out over the Pacific from a slope in Southern California.
Ektachrome transparency by Dick Tichenor.

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VOLUME 9 NUMBER 1

JAN. 1972

VIEWPOINT

DON DEWEY

As we promised, several months back when we presented the 1971 R/C Modeler Magazine Reader Interest Survey form, we are presenting the results and analysis of that Survey. This report represents the largest scale and most successful survey ever taken in the radio control field. Many thousands of the two page Survey questionnaires were completed and returned by RCM readers - - - many accompanied by supplemental sheets of comments. Each of these, individually, was statistically computed by RCM employees assigned to this job full time until its completion. Individual questions and their answers were not only tabulated and totaled, but were cross tabulated by geographical area, by age grouping, and by income bracket so that a true picture could be obtained. Following these cross tabulations, each questionnaire was read, comment similarities noted, and an analysis prepared. The results of this 1971 Survey along with an evaluation of the results are the subject of this months Viewpoint.

As we stated when we presented the Survey form for your completion, its prime function was to guide the editors of R/C Modeler Magazine in the selection and presentation of material that you wanted to see in this, your publication. In addition, a complete in-depth analysis of this report has been forwarded to every manufacturer in the industry as an aid to them in planning their production for the coming two years. It is interesting to note that Surveys were received from every state in the United States as well as from Canada, Mexico, plus 25 foreign countries.

R/C MODELER MAGAZINE
1971 READER INTEREST SURVEY

READERSHIP PROFILE

OCCUPATION
- 27% Engineering, Technical
- 20% Business and Executive
- 18% Trade and General
- 16% Students
- 11% Professional (Doctor, Lawyer, Minister, etc.)
- 8% Military Service

INCOME BRACKETS

.8%	$40-49,000
.6%	35-39,000
1.5%	30-34,000
2.7%	25-29,000
7%	20-24,000
17%	15-19,000
38%	10-14,000
19%	6-9,000
4%	3-5,000
9%	0-2,000

AGE

12%	10-19
24%	20-29
31%	30-39
25%	40-49
7%	50-59
1%	60 and over
Average Age:	35.0 years

YEARS IN MODELING

16%	0-4
12.5%	5-9
14%	10-14
11.5%	15-19
13%	20-24
17%	25 and over

YEARS IN RADIO CONTROL

57%	0-4
22.5%	5-9
11.5%	10-14

A.M.A. MEMBERSHIP
52% currently belong to the A.M.A.

R/C CLUB MEMBERSHIP
53% belong to an organized R/C club

AMOUNT SPENT ON R/C EACH MONTH
(Excluding Radio Equipment)

48%	$10-24
36%	$25-49
11%	$50-74
2%	$75-99
3%	$100 plus

SOURCE OF PURCHASES
- Hobby Shop only 37%
- Mail Order only 5%
- Buy from both Hobby Shop and Mail order 58%

READERSHIP PROFILE ANALYSIS: The percentage breakdown of the occupational categories of R/C Modeler Magazine readers show that no one specific category of occupation has a clear majority, although the Engineering and Technical category still leads the occupational listing. It is interesting to note that the Engineering and Technical field dropped from a cumulative total of 32% of the readership on the 1969 Survey to the 27% shown on the current Reader Interest Survey. At the same time, the Business and Executive category showed an increase from 15% of the total on the 1969 report to its current 20% standing. The Trade and General category also showed a decline from 26% of the total in 1969 to 18% on this years report. A major gain was in the Student category which increased from 9% on the last survey to 16% in 1971. The Professional category showed no change, while readers with a Military occupation showed a gain from 7% to its current standing of 8%.

Thus, while a decline was evidenced in the Engineering and Technical as well as the Trade and General occupational categories, the Business and Executive, Student, and Military Service categories resulted in substantial increases. The average annual income reported by RCM readers is exceptionally high compared to the National average income which is less than half that of RCM readers. The majority of RCM readers are in the 10-14 thousand dollar a year annual income bracket with an average annual income of approximately $11,000.00 per year.

The average age of 35 years is an increase of 1.2 years from that reported on the Reader Interest Survey conducted by R/C Modeler Magazine two years ago. However, in the age category breakdown, a substantial increase of readers in the 10-19 and 20-29 year age brackets has been indicated. This figure, when combined with the fact that 57% of R/C Modeler Magazine readership indicated an experienced level in radio control of from 0-4 years indicates a rapidly growing number of new consumers, with those consumers in the median age group of 30-35. Again, we use the word "consumer", rather than "modeler", since the question concerning the years in modeling produced a rather undependable answer. Although the chart shows a wide range of experience in "modeling" a great majority of returns contain the comment that the individual had "built models as a boy some 18-20 years ago." This, then, to the reader, constituted that length of time in modeling. In reality, a reading summary of the individual surveys indicated that we had two distinct experience levels: (1) the long time modeler who had years of experience in other forms of aero modeling, and, (2) the non-modeler with less than 2 or 3 years in radio control. In point of fact, the surveys showed that 83% of those responding had built other models before entering into radio control, including control line, free flight, and plastic models. 28% of those responding had been involved in two or more phases of modeling prior to entering R/C. These facts, combined with the increase in income and drop in experience level from the last survey indicates once again a definite and increasing influx of consumers from the "non-modeling oriented" public. This fact is borne out by the volume of correspondence received each month from the adult non-modeler entering R/C for the first time. This years Reader Interest Survey also indicated that 67% of those responding had secondary hobbies including 3% who fly full size aircraft. With regard to membership in the Academy of Model Aeronautics and in individually organized R/C clubs, the percentile figures indicate that 52% of those responding currently hold AMA licenses while 53% belong to an organized R/C club.

The final point in the readership profile is the amount of money the individual consumer spends on his hobby of radio control each month – and where he purchases the supplies he uses in his hobby. The amount does not include major purchases, such as expensive kits, radio equipment, etc. In fact, a great number of individuals with whom we discussed the survey mentioned that they estimated the figure exceptionally low. It is interesting to note that 58% of our readers buy their supplies and materials from both hobby shop and mail order houses, while 37% purchase from hobby shops exclusively and the remaining 5% buy exclusively from mail order houses. The latter figures show a definite increase in influence on the consumer by the mail order houses while the hobby shops still retain a dominant position in the retail segment of our industry.

To Page 95

Letters

THE 'JUNIORS' TALK BACK

Dear Sir:

I have been reading the Letters column and it seems to me that everybody is heated up over G.F. Abbotts letter.

Okay, I'm 15 years old and love the hobby with every beat of my heart. Another guy said it was too difficult and has become too serious, and expensive.

Difficult; that depends on the person, some have a talent for it and some don't. Now me, I'm just in-between, just do my best and come out with a half sensible sailplane.

Today's kits range from simple neat ships to the scale kits and a lot inbetween. And with today's materials for covering it's greatly simplified.

Serious; what do they mean by serious? By how involved a person gets! Who's concern is that but the modeler? If he wants to fly F.F., sailplanes or pylon racers, it's up to him.

Expensive; the only one in the bunch that is true. The main problem is being able to buy R/C gear. Once you get past that hill it's pretty easy. I should know, I just got my gear after a few years of waiting and waiting to get a job being a newspaper boy. And I'm still waiting to get a plane up in the air successfully.

After spending over $200.00 on R/C flying like a lot of other people, you must love the sport or stay out of it!

And you find a group of people who love the sport as you do and a nice place to fly. And a dash of patience and a lot of money, you've got it made.

Yours truly,
Paul Lindstrom
1099 38th Sp. 70
Santa Cruz, California 95060

Dear Sir:

This is in response to Craig Covello's letter (Sept. '71) and others like him who complain of the high prices on R/C gear. BULL! If they were sincerely interested in R/C they would find some way to earn the money to get started. I, too, am 15 years old and have always had trouble finding ways to earn money, but when I wanted something I usually got it. In August I started my own hobby and

radio repair shop, and have almost doubled my original investment. I'm sure that if the people who write those letters would stop wasting their time writing letters, and found some way to earn money they would be in the air in a short time.

Yours truly,
Ralph V. Hunt
Middleboro, Mass.

If you still wonder where the 'Juniors' are, as do some magazine editors, look around. They're winning R/C contests, such as in Formula I and at the recent LSF Tournament. And, they don't like to be called 'Juniors', unless, of course, we're willing to refer to ourselves as 'Elders'. An RC'er is an RC'er, so let's forget the labels based simply on age.

HAMS, AND EGG ON OUR FACE

Dear Sir:

Being a long time Ham as well as an avid R/C flyer I read with interest the article by Edward F. Eggert, W1EGM on page 35 of the September issue. I am writing because of an error in the article. He states and I quote, "The actual test will have the code sent at this speed for 5 minutes, during which you only have to correctly copy 25 straight words without error." It is necessary to copy only five straight words without error or 25 letters or one minute of copy without error.

Mr. Eggert also makes the error of thinking there is not much activity on the upper end of the six meter band. There is considerable activity in some cities on the upper end by amateurs using FM equipment. There is also a AM net on 52.275 MHz. This is a national net.

I fly my planes on 6 meters and have no trouble with interference as there is very little 6 meter activity locally. My point is that anyone who is going to fly on six meters should find out what local activity there is on the band and then select frequencies to avoid it. By the way, I use 53.2 MHz.

Yours sincerely,
Roy A. Cartier
K4AC
Winchester, Virginia

Roy is correct and we've been caught in a typographical error that was not the fault of the author.

To Page 92

Feedback

RADIO CONTROL ACTIVITY AND NEWS BRIEFS

F.C.C. Expands RC Model Activity

Basics: Of the five 72-76 MHz frequencies previously reserved exclusively for model aircraft use, one has been opened to sharing with model car and boat use; additionally, two more frequencies have been made available for shared use by model aircraft cars and boats.

Background: In November of 1969 the FCC proposed the mutual sharing of five frequencies for all types of models. This proposal encountered so many objections, primarily from model aircraft users, that it issued a modified proposal in June of 1970. The modification proposed reserving three of the frequencies exclusively for model aircraft, plus two for non-aircraft, plus two more to be shared by all types of models.

The modified proposal was also considered unacceptable by model aircraft users and a second round of controversy resulted in a further modification of the FCC proposal, which now has been released as official, effective 15 November 1971.

Significance: Once again the Academy of Model Aeronautics has been instrumental in producing a reversal of governmental direction concerning radio control activities involving model operations. The FCC, in its report No. 7222 (Sept. 30, 1971) specifically refers to the arguments of the AMA pertaining to interference and safety problems which could have resulted from the previous proposals.

Although the latest FCC action takes one of the existing model aircraft-only frequencies and opens it to sharing with model cars and boats, it adds two new frequencies for shared use which previously had not been legally available. The net effect is an increase in the total frequencies available for model aircraft use. It should be noted that in many areas of the country where interference from car and boat operations is no problem the effect will be to provide for expanded activities.

Specifics: Frequencies reserved for model aircraft only: 72.08, 72.24, 72.40, 75.64.

Frequencies to be shared by all types of models: 72.16, 72.32, 72.96. The latter frequency (72.96) was previously for aircraft only.

Note: The latest FCC action does not affect 27 or 50-54 MHz bands. All frequencies previously available in these bands for model use continue as above.

A.M.A. Hot-Line

According to the *Swamp Static* from the Broward County RC Club, Plantation Florida, at the Nats Radio Control Contest Board Meeting, a system of progression through the classes was decided upon. At the first contest of the new year, each contestant declares his chosen class, which the CD then notes on his license. Contestants winning first, second and third place, earn 3, 2, and 1 point(s) respectively. This position score is then multiplied by the number of contestants in that event, which tends to level out the contest activity and population density variations throughout the country. A cumulative total of 50 points was set for promotion into the next higher class. A fifth place or better at the Nats will automatically advance a contestant to the next higher class.

New Class "B" Pattern tentatively approved by the board is: Takeoff, Touch and Go, 3 Axial Rolls, 3 Inside Loops, 4 Point Roll, Spin, Horizontal 8, Cuban 8, 3 Outside Loops, Traffic Pattern, Landing Perfection and Spot Landing. Time will be eight minutes.

Some other general items pertaining to Pattern were proposed and accepted tentatively, among which will be downgrading for a dead-stick landing to be eliminated, while all gear-up landings will be considered crash-landings. In addition, mufflers of some kind will be required on all pattern planes although Pylon is still exempt from this ruling.

World Championships Equipment Rundown

From the *Fliar* newsletter of the Forest City Flyers, London, Canada, comes the following tidbits on the Internats:

More flyers used Webras than any other engine (19); next was the HP .60 (15). In addition there were 8 Super Tigres, 7 Rossi's, 6 O.S. Max's, 3 Enyas, 1 Merco and 1 Meteor.

The most favored radio gear was Kraft and Simprop with 7 each, followed by 5 Skyleaders, 5 Pro-Lines, 3 Digi-Flys, 3 Micro-props, 3 Graupners, and 2 each of the following: Controlaire, Rowan, Orbit, CRC, and Robot. Also represented were one each of the Royal, Silvertone, Dirigent, Multiplex, Digitron, Radio Pilote, Prop Control, Degicon, Futaba, EK Pro, Nortrol, Heathkit, Telepilot, and one home built.

From this report most flyers at the World Championships agreed that the Rossi engine is the powerful mill on the market but that it has some as yet un-ironed bugs in the carburetor which are being remedied at present.

The HP .61F Report

The following is reprinted from the *Tri-Valley R/C News* the publication of the Tri-Valley RC Club of South Bend, Indiana.

A friend with a newly acquired HP-61, asked if I would "give it a try on my bird." Never turning down the opportunity of learning something from a new experience, I promptly accepted! I firmly bolted the engine in place and headed for the flying field.

Obviously this is not a Peter Chinn engine report as space does not permit (and I'm not Peter) however, I will briefly report my personal experiences and opinion on the appearance and performance of the HP-61.

Outwardly the engine has a well finished casting and is neat and trim in appearance. The machined cooling fins are not part of the crankcase casting; instead, they slip over the cylinder liner and are retained by a flange on the liner and the cylinder head. Four metric socket head bolts retain the cylinder head, fins and liner to the crankcase casting. Ball bearings support the crankshaft at each end. Crankcase volume is exceptionally small with fuel ports located front and back instead of the usual side location. The piston is ringed with a single ring.

The carb is similar to a Super Tigre mag carb in that the high speed needle adjust is located at the opposite end of the low speed needle. The idle screw needle was very sensitive-and difficult to adjust with the engine running. The muffler location adds much to this problem. The throttle barrel stop screw is retained with a lock nut. This arrangement is poor, causing one to use the trial and error method for optimum setting. No baffle is located

in the exhaust port, however, the throttle is very linear once properly adjusted. No tach readings were taken.

The muffler was designed as part of the engine and is very effective in reducing noise. Much quieter than the KO and Silence-Aire. The unique wire clamps furnished, snap on over the cylinder screw bosses and do an excellent job of retaining the muffler making assembly or removal very simple. In the event of a hard crash, the muffler would probably fly off.

To date the HP-61 has 3 hours of running time, is exceptionally easy to start, runs very smooth on a 11-7 balanced prop and has exceptional power on a 10% nitro mixture. It will stand my 6 lb. Ugly Stik on its tail for at least 6 or 7 hundred feet straight up!

With the exception of the sensitive low speed needle adjust and the poor stop screw arrangement, I found the performance of this engine outstanding in every respect. And incidently, my friend has just ordered another engine. The engine he gave me to try now belongs to me!

The HP-61F RC is sold by Nelson Model Products Inc., Chicago, Illinois, at a retail price of $64.95 (muffler included). HP engines are guaranteed for material, workmanship and the resulting performance for 6 months from the date of purchase. Manufactured in Austria the HP-61 will undoubtedly reflect a price increase as will all other imported engines.

If you are in the market for a new .60 don't overlook the HP-61. It may be what you're looking for – a real power house. – *Jerry Smith*

Did You Know That:

The clear backing from MonoKote makes a great protective cover for your plans rather than wax paper. Freezer wrap paper works very well also.

Hobbypoxy Quick-Fix Formula 4 can be used very effectively to plug a hole in a leaking fuel tank. These hints and kinks were reprinted from the *Palm Beach Aeronauts News*, Palm Beach, Florida.

Product Report on the Heath GDA-19-41 Servo

My first surprise upon ordering the new miniature servo was the fast service. Eleven days from mailing the order to delivery. Not only is the servo considerably smaller, the mailing package was so small I thought at first that the package contained some parts I had ordered.

After a quick inventory and a few minutes to update the assembly manual, I was ready to begin.

The P.C. board is not overly crowded and no more difficult to assemble than the old GDA-19-4 servos.

I completed this servo in two and one half hours including the usual interruptions. I am sure this time can be cut way down on the next one.

Although there are fewer electrical components to install, the postage stamp size of the P.C. board slows the assembly time down.

This is a completely new servo with many improvements. The length of this servo is about ¾" shorter than the old servo. The height is the same. A completely new gear system with a choice of rotary or linear outputs, the nylon case fits together better, and the wire bundle exits on the bottom making installation easier. The centering adjustment on the feed back control is an external adjustment which is really convenient.

The servo is in the usual Heathkit standard. Everything goes together like the book says. Plug it in and it 'hums' to life. And of course it is completely compatible with the older systems, as well as some of the other brand radios.

I understand that by the time you read this Heath will also have another smaller servo on the market. So if you want the 'servo size of the week' better wait another week before buying your system.

Reprinted from the McDonnell *Carrier Wave*.

Birds And Bee Facts

An Albatross has a gliding ratio 5 times more efficient than our present aircraft. It has a wing loading of 3.3 pounds per square foot, and has a glide ratio of 40.1. The only problem they have is taking off and landing, sound familiar? From the Western Ohio Radio Kontrol Society *Worksheet,* Dayton, Ohio.

Storing Your Model For The Winter

With cold weather just around the number three pylon, many fliers will be hanging up their gear. Here are a few hints from the *MARCS Sparks* Madison, Wisconsin, on how to prepare this year's plane for storage so that it will be ready to go at the first sign of spring.

1) Remove everything that's removable from the model. This includes all R/C gear, L.G., engine, tank, control horns, wing seating tape, etc. As you remove a part, clean it with rubbing alcohol, commercial plane cleaner, Windex, etc. The best cleaner for MonoKote seems to be dope thinner.

2) ENGINE: Depending on how much use the engine has had, a total tear-down may not be required. If the engine was running fine (no sagging, intermittent running, no power loss, etc.) then don't disassemble the whole mess. Merely pull the backplate (or front housing) and the glow plug. Flush the engine clean with Methanol or dope thinner and let dry. Flush out the ball bearings on a BB engine. If the piston head has a build up of burnt ephemera, pull it and clean with a wet SOS pad. Then reassemble and lubricate with 3-in-1 Oil or Hoppe's No. 9 gun cleaner. Brush all the crud out of the cylinder fins with a wire brush. Clean the spray bar. If the head has burnt-on castor oil, get some Sunbeam Metal Clean and follow the instructions for a beautifully refurbished finish. Put in a new glow plug and set the engine aside.

3) Completely disassemble and clean the tank and fuel filter. Replace all tubing. Passing the wire mesh filter element through a match flame will burn out all the minute particles.

4) Remove wheels from axles and wipe down the L.G. If necessary, remove tires from hubs and clean well. Check for fatigued or misshapen wire and replace, if necessary.

5) Put a full charge on the batteries. Check for fuel soaked foam around the receiver or batteries. If you've flown over 200 flights, you might want to either send it in to the factory for a check-up or do some maintenance on your own. Take the back off of the transmitter case and clean the whole box thoroughly, especially around the gimbles, on/off switch and trim tabs. Store in a clean cloth or in factory box.

6) Carefully clean every nook and cranny of the stripped fuselage, especially around the engine bearers, tank compartment, etc. Texize K-2R spot remover is great for getting oil out of balsa (several applications may be necessary). Repair any small cracks or flaws in the finish. Check all push rods against fatigue or distortion. When all is spic and span, install the R/C gear and install the tank and

To Page 65

engine clinic

By Clarence Lee

This month I would like to bring to your attention a new line of plastic spinners manufactured by Bob Siegelkoff under his trade name of C.B. Enterprises. Bob first entered the hobby business by manufacturing a mixture control carburetor used primarily on the pylon racers. He followed this up with a line of fully machined aluminum spinners and engine mounts. These are machined from bar stock. As those who have used C.B. Products know, they are first class and the best available. The same thing can be said for Bob's new line of plastic spinners. In fact these are the first plastic spinners that I have ever seen that I would use on one of my own airplanes. I have always preferred the aluminum type in the past. In the November 'Engine Clinic' we did a bit on fuel foaming and its causes. One major contributing cause being out of balance spinners particularly with the plastics. Most of your plastic spinners mount to the front face of the propeller and are in turn retained by the prop nut. This might be okay if the hub of your propellers were dead square, however, most of your propellers have a wedge shaped hub that tips the spinner which lets it wobble, resulting in extra vibration. If you doubt this, get hold of a pair of calipers sometime and check the thickness of the propeller hub on both sides. You might be surprised to find it as much as 1/32" thicker on one side than the other. Although few propellers are off this much, one will occasionally come along that is. On the other hand, few propellers are dead true, most running .010" to .015" thicker on one side than the other which is enough to tip the spinner and cause the resulting vibration. For this reason I have always recommended the metal spinners that utilize a backplate for mounting. But there are RC'ers with a nice red or yellow airplane who also want a nice red or yellow spinner to match so they purchase a plastic one from their friendly hobby dealer.

Now C.B. Products has made the colored plastic spinner available utilizing a machined aluminum backplate mounting; this means no tip, no wobble, and no spinner-induced vibration. The plastic spinners use the same type of backplate as the machined aluminum spinners, with the tongue and groove fit. Thus, no matter how hard you tighten down the spinner it will not jump over the edge of the backplate.

The spinners are molded from nylon and boiled to reduce casting stresses and increase their resiliency. They are available in 1½", 1¾", 2", 2¼", 2½", and 3½" sizes. The 3½" size being intended for the larger scale models such as the P-51, etc. The spinners have been run up to 25,000 rpm with no ill effects so they would be safe on the pylon racers. I would like to point out that a spinner is only as true as the mounting hole in the backplate. The spinners come with a pre-drilled hole. However, for some makes of engines, particularly the racing engines, it is necessary to enlarge the hole, as this is where extreme care should be taken not to end up with an off-center hole. Find a friend with a drillpress and do the job properly. Don't use that taper reamer you enlarge props with, a rat-tail file, broken screwdriver, or whatever.

The spinners are available through your local hobby shop. For dealers interested in the spinners, the sole distributor is Midwest Products, Co., 400 South Indiana St., Hobart, Indiana 46342. As of this writing, prices had not been set.

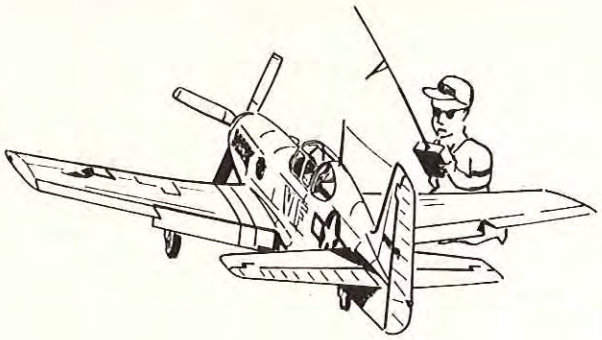
Dear Mr. Lee,

Could you explain, in your column, why wood props are preferred over nylon props for RC use. I am learning to fly and find it much more economical to rebalance the nylon props each time I touch a tip. Wood props would shatter under the same conditions.

Thank You,
Martin G. Rezmer
San Luis Obispo, Calif.

Wood propellers are more desirable both from a performance and safety factor. Nylon propellers, being flexible, allow the pitch of the blade to change, making them less efficient. Also, even though you balance a nylon propeller statically, the flexing of the blades will create an unbalanced condition while running (dynamic) resulting in more vibration. The wood propellers being stiffer, do not flex or change pitch. However, safety is the main reason for not using nylon propellers. First, nylon develops stresses during the molding process. The propeller should be boiled in water to relieve these stresses as mentioned in detail in several previous columns. However, how many modelers ever bother to do this. Close to none would be a pretty good estimate. Second, in cold weather the nylon has a tendency to stiffen. The colder the weather the stiffer the nylon. This stiffening does not increase the strength – it only makes the propeller more susceptible to breaking or throwing a blade. So, if you are using a nylon propeller on a

To Page 89



by DAVE PLATT
(Designer — Top Flite Models)

SCALE IN HAND...

Cockpit detail!

The very words seem almost enough to make the newcomer to scale modeling blanch. For the chap whom we'll call the "scale improver" – that is, the guy who's made a scale job or two and is looking for faster ways to do a better job (name of the game in scale), cockpit detail is probably his biggest hang-up. Even the experts are learning – so if you're new at this, don't feel left behind.

The cockpit of a scale model is certainly one of the most important parts; some might even say **the** most important part. Let's see what we have found out for sure, so we can at least have a sound basis for further improvements.

Before we get down to the actual intricacies of making the details themselves, it is necessary that we ensure a proper base from which to start. Building a cockpit is not simply a matter of sticking bits in everywhere. There are preparations to be made **while the model is being designed** which will turn an otherwise difficult and frustrating task into a straightforward, satisfying, and therefore enjoyable experience in model building.

First, a cockpit is a model in itself, and must be so regarded. When laying out the design of a new model, draw lines on the plan representing the outer limits of the cockpit area: the floor, front bulkhead, rear bulkhead and the sides. The "box" contained within these lines will be where our model of the cockpit goes and there can be no room for anything else. In most subjects this happens to come right where you'd like to put the receiver or some of the servos. Sometimes, indeed, it can be a real pain to relocate these essential goodies elsewhere, but there's simply no choice.

When we place the RC gear in the design we have only two essentials to satisfy: the item must be accessible for servicing or replacement, and its weight must not affect the Center of Gravity adversely. To solve the first problem, it may be necessary to give up traditional concepts of RC gear placement. For example, the battery or receiver, always mounted fairly forward in the fuselage, may have to go in the wing.

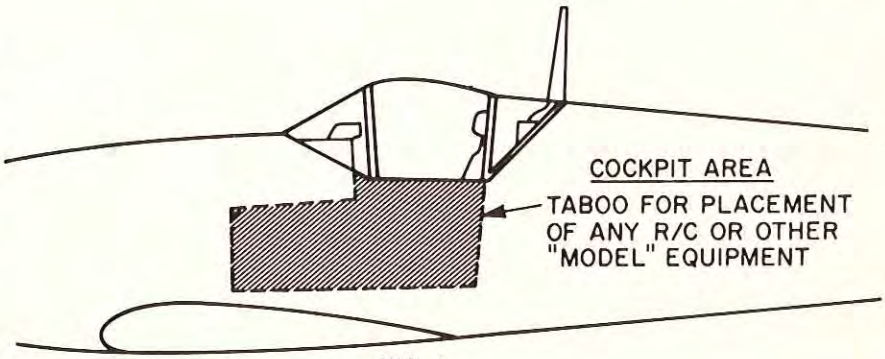


FIG. 1

From our experience, we'd say that placing any item **forward** of its usual place will lead to less trouble than if it is placed somewhere back of the cockpit. A scale model that turns out nose-heavy, as built, is almost unheard of.

One thing we usually do have in a scale fuselage is **width**. Remember, when you are planning gear placement, that the fuel tank does not have to be in the center of the ship. Mounting the tank off to one side will frequently solve many space problems. We even recall a case where one modeler solved one of these problems in a most ingenious way – lacking length between the rear of the engine and the cockpit front bulkhead for a 10 or 12 oz. tank, he put in **two** 6 oz. tanks, one on each side of the ship, and fed the engine from a Y-junction mounted between the tanks.

Summarizing all of this; **plan** your cockpit area, and solve unusual problems in unusual ways where need be.

Having ensured proper room for the cockpit, we now proceed to build the structure of the model. At a suitable stage of completion, make templates (thin card will do fine) of the walls, floor, front and rear of the cockpit. Place these all in the model, trimming the templates slightly, as necessary, until you can lay them all in position together inside the fuselage. What we're doing here is to find the precise shapes necessary to line the entire cockpit area.

In Fig. 2 we show a fairly typical-looking layout of card shapes. At this time we must make sure that each of these shapes can be fitted into position

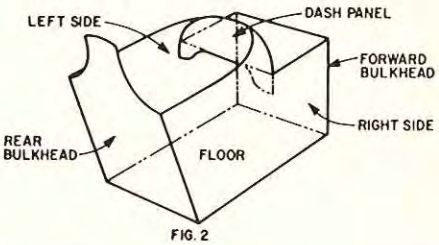


FIG. 2

through the cockpit opening. A reasonable amount of bending of the shapes is permissable to get them through, but if you have real difficulty with any of the shapes, cut the template in two sections and feed it through in pieces. Mark all of the templates with its location and put them aside until required.

★ ★ ★

To Page 86

KEN WILLARD

Well, the results have been tabulated. For the RCM Reader Interest Survey, I mean. Now, I don't know whether ole' Dauntless Don ("Dauntless do it unless it's an improvement!") plans to publish the results, other than in the report that goes to selected recipients – advertisers, etc. – *(Ed's note: See Viewpoint column for Reader Interest Survey results!)* but I'm sure the word will get around. Clarence Lee's Engine Clinic was most popular.

Yeah? Not with the sailplane enthusiasts, I'll betcha!

Guess you can see what bugs R/C enthusiasts the most . . . it's those pesky engines! But you gotta admit they certainly are getting better – and Clarence's constant attention to ways and means to improve their performance must be one of the reasons.

Recently I've been dividing my time between flying my sailplane, the "TopSailer", and my amphibian, the "Wavemaster", which I've been flying as a flying boat off-water.

While testing the Wavemasters waterborne performance, I've been doing a lot of taxiing at various speeds – slow, at displacement; intermediate, or 'maximum spray' speed (which you usually avoid), and high speed, 'on the step.' I have been amazed at the ability of the O.S. Max Gold Head .60, with O.S. Muffler to keep running at the maximum spray speed, when water is sprayed up into the propeller disc. Normally you would go through this transition speed in one to two seconds, yet I have purposely kept the Wavemaster at that speed for as long as 25 to 30 seconds (primarily to check the waterproofing of the wing cradle), and the engine has continued to turn away, at about one-quarter throttle, without missing a beat, even though you can hear the water slopping the propeller. And that's reliability!

Speaking of flying boats, it's interesting to note that the RCM survey shows an increasing interest in seaplane activity, as well as in R/C soaring. Now that makes me real happy, because those two phases of R/C flying are the ones that I've always enjoyed the most, beginning with the "Dreamboat" amphibian 'way back in 1953 (18 years ago – WOW!) Nearly every R/C fan goes through a period when he – or she (mustn't forget the ladies!) – gets pretty good at Sunday sport flying and starts looking for something new and different to tackle. And that's where seaplanes, and sailplanes, are picking up more popularity with each passing year. Although it's true that sailplanes are also picking up a host of newcomers to the sport of R/C flying in addition to converts from power flying.

Most of the converts from landplanes to seaplanes begin by experimenting with the addition of float gear to their model. Len Purdy has taken this aspect into consideration by developing his "Convert-A-Float" pontoon set-up for his ARF line. But a lot of guys like to try their own hand at it.

I recently received a letter from Tom Charlsworth, 'way out in Hamilton, New Zealand, that is an excellent example, and particularly interesting to me because he used a "Schoolmaster", one of my favorite designs. Here's what he says:

Dear Ken:

I thought you might be interested in my "Schoolmaster" conversion to floats, which, if I may, I have renamed "Wetmaster". This is my third "Schoolmaster", the previous two were fitted with S/C gear as per plan and trike U/C. All three have been powered by an O.S. .10.

Now that I have Multi (English Skyleader SL4) I decided to build another with three functions and two wheel U/C (to save weight). It was so nice to fly and very docile, not the bomb I had expected at all even with an all-up weight of 2¼ lbs.

As we have an abundance of lakes and rivers handy to home, I decided to try some floats. I must admit I didn't expect it to get off the water with only a .10, and now 2¾ lb. all-up. (500 mah pack and all).

Well, we took it to the local lake with our fingers crossed, cameras at the ready. After some taxiing trials which were O.K., I pointed her into the wind and fed the power. Surprise, Surprise, "Wetmaster" surged forward, was on the step in no time, and airborne in about 100'. The climb is good, but I find it stooges around very nicely on half-power. Landings are beautiful.

Details of the floats are as follows: Foam core, 1/16" balsa skinned;

To Page 83

CUNNINGHAM ON R/C

Just what is a "Sport type aircraft"? Or, for that matter, what is a "trainer type" R/C model? We have a pretty good idea just what comprises a pattern type model airplane - - - one that has won, or placed in a pattern type event. But, what is a sport type model? What is the ideal model for all fliers? What is the ideal model for all beginners?

Well, quite frankly, there really isn't any ideal type for everyone. Some fliers like a high, or shoulder wing type design, while others like a low wing airplane. Some prefer to fly .60 engines while others swear by a .10 fuel gulper. A growing group of fliers like to fly gliders, soaring about the sky on long slender wings, while others like to push a fire breathing monster around the pylons at a hundred and fifty miles an hour. Even in these specialized areas there is not one model for all fliers. So, the question comes back to "what is a sport type model?" It really can be a pattern type model, but perhaps it is a model that takes less time to build than its more complex pattern type brother. Maybe it's a model that looks more like a real aircraft than does the average stunt type aircraft. Or, perhaps it is a model that uses a smaller engine to get the job done rather than to use a super powered .60.

Over the years I have tried to design models that would be of interest to the majority of readers of RCM. None of these have been all out pattern machines, rather they have been for small to medium size engines, and of simple type construction.

Frankly, I like to fly all type of models, although I don't fly as often any more as I would like to. When I fly, generally I like to fly a .60 powered machine, because this is the type that is most often flown in this area, and this type of machine can put up with the wind that almost always blows in the middle of Texas.

But just what do you, the readers like to fly? I know that we just recently ran our semi-annual Readers Survey and asked this same question, and also, Ken Willard asked this same question about two years ago in his column, but now, I would like to have an expression of those of you who regularly read this column on your own preferences for an aircraft to build. Do you like to build kits, or do you like to build from magazine plans? Do you like foam wings, or built up type construction? Do you like powered flight, or silent flight? Do you like simple construction, or complex construction? Retract gears or fixed gears? What size engine, and what size airplane are you interested in? Do you have to hand launch for your flying, or takeoff and land from a paved field, or from a grass runway? Do you like a model that looks like a model airplane, or one that looks like a full scale aircraft when it is in the air? Do you like silk and dope covering, or plastic films? Do you paint with dope, enamel, epoxy, or hardware store paint? Is your radio set a 1970 or newer mini set, or is it an older, larger type of radio system? Do you like to fly in contests, pattern or fun fly, or do you just like to takeoff, bang around the sky, and get back to the ground again in one piece? Do you use home brew fuel, or commercial? The questions can be endless, but, I would like your help. I would like for you readers to take time out to jot me a short note on some of the above questions, and send them to me in care of the magazine. I won't be able to answer your letters, but I will tabulate the results and, from these answers, guide the thinking of future columns and future design projects. A good cross section of answers to these questions can give both Don and me a real insight into what type of models really interest the most fliers. One other question that comes to my mind is do you like balsa models or plastic? Come on, guys, push a pencil for a few minutes and let's have some letters.

Last month I took a swipe at 3M77 for foam wing usage, and the bad feelings still stand. This is an area that is certainly giving trouble to a lot of modelers. My good friend Johnnie Casburn, builder of the balsa ARF Fun Fly kits tells me that very soon he will be putting on the market the adhesive that his company uses in bonding the vinyl wing skins to their foam wing cores. Johnnie has had very good experience with his adhesive, with no separation of the core and skin. In fact, he has one test wing that has been skinned for over a year, and the glue bond is stronger now than when the skins were first applied. If you are interested in this adhesive, drop a line to Johnnie Casburn Model Engineering Co., 6508 Normandy Road, Fort Worth, Texas 76112.

Another interesting item to come to the surface for the modeling fraternity is produced by another good friend, Dr. Jerry Mrazek, of Mrazek Laboratories. This invention is called a SpeedTak. It is an electronic device designed to measure the speed of your model in the air. It will also measure the rpm of your engine. The purpose of this goodie is to allow you to properly match your engine, prop and fuel to give you the fastest turning engine in the air. This can be an invaluable aid both to the pylon racing pilot and the pattern pilot. This little black box measures the sound change of the aircraft in the air, and transmits this information to a scale that reads both speed and rpm. At this writing the SpeedTak will sell for $39.95. For further information write to Mrazek Laboratories, P.O. Box 12788, Fort Worth, Texas 76116.

For some time, old Uncle Don has been telling me that I should try one of the newest types of adhesives, and I have been putting off giving it a try. Several Sundays ago it was raining, a day not much good for anything but building and watching football on the tube. I had a kit that had been gathering dust for sometime, so I dragged it out and gave the new adhesive a try. It is a hot glue gun, and until you have tried one, you can't imagine how fast you can construct a model. I built the wing on an RCM wing jig, setting everything in place but the sheeting, and then going over all of the balsa joints with the glue gun. Zap, Wham, and it was done. I

To Page 87

Junkers

BY JIM R. PYNER

J.U. 52

Photos by Peter Tearal

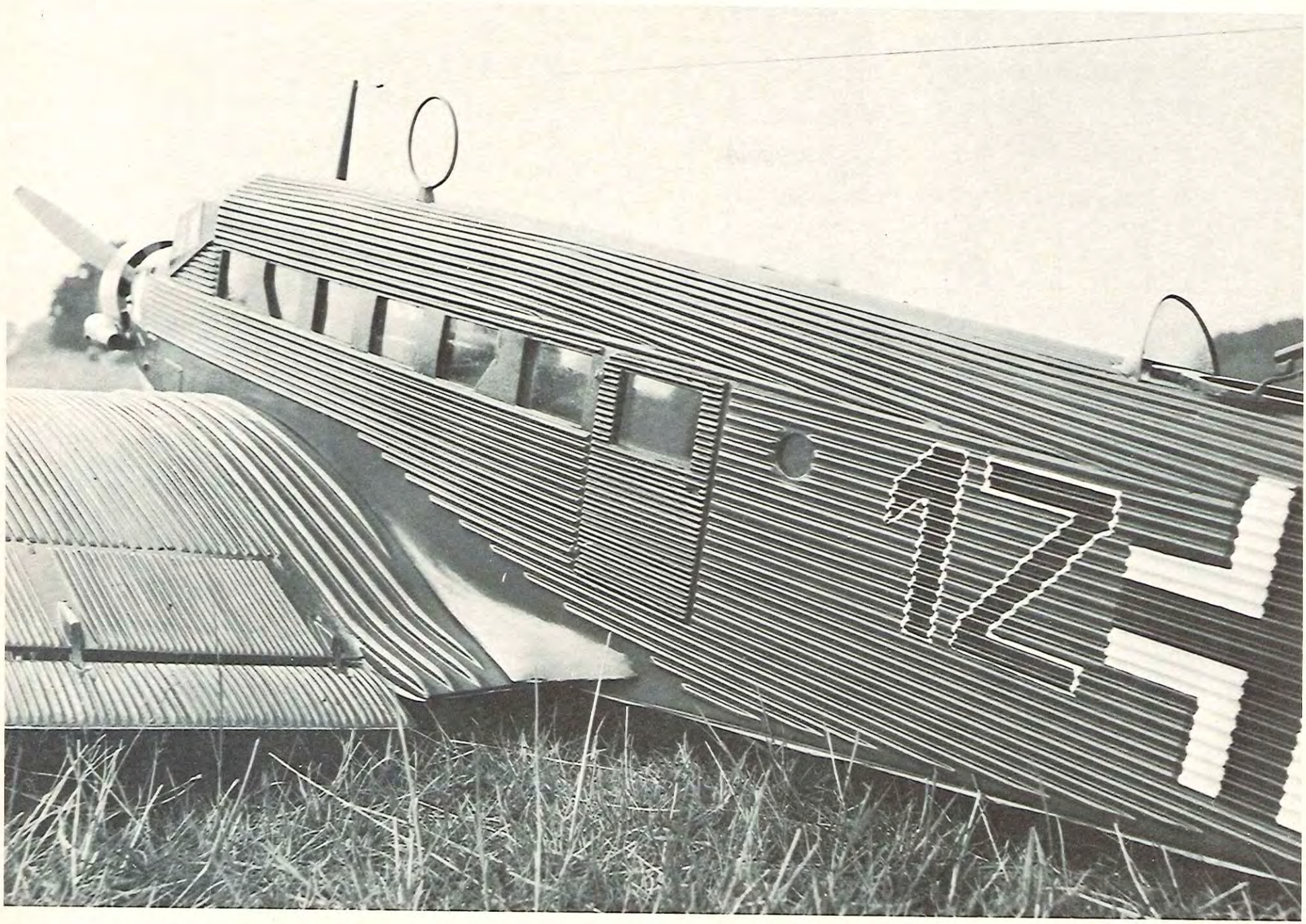
I first decided on the J.U. 52 as a modelling subject when, one evening, browsing through some old magazines in a friends house, I came across Ken McDonough's drawings in an old issue of Model Aircraft. It had enough bits on it to make it interesting as a model, and its ugliness lent it a bit of character.

There would be complications, I felt, with aileron and elevator hinging, corrugations, and I thought, the C. of G. But as I looked at the aeroplane it became obvious that the basic construction should be quite simple.

The prophets of gloom had a field day discussing the afore mentioned complications, but I am a firm believer in getting started. This way, by the time you reach the sticky bits one has so much time and effort involved, that one has to find a way around the problems. My worries, however, were unfounded since building the Junker was a piece of cake, almost like a Super 60. *(Ed's. Note: The Super 60 has been a popular high wing R/C Trainer in Great Britain for many years).* The finish, i.e. corrugations and markings were not difficult, but it was a time consuming business.

Now to work: I decided on a scale of 1" = 1'0", giving a span of just under 8 feet. This being a simple enlargement of six times that of the drawings to hand. Power would be a Merco .61 MK 111 in the nose, and the motors in the nacelles would be simple Cox .049's, with T.R. tanks which would make a nice off beat noise. This way if either wing engine quit I would not get any of the problems associated with these conditions. Wing engines could be larger, there being scale offsets to the nacelles, but the simple approach, I feel is sometimes the best.

Aileron and flap hinges could have given me some headaches on a built-up wing and I pondered on foam wing panels. The sudden overnight rise in the price of balsa sheet and the amount of the stuff I should have to use decided this one for me. Paul Smith of Wanstead had just acquired an amount of Foam Block and offered me the facilities of his front-room workshop. While my better half was doing her thing in the Bingo Hall one Saturday evening, Paul and I cut both panels in one hour. This time included making a hot wire cutter and 50% of the wing was completed. This, I hasten to add, was our first attempt at foam cutting and apart from a few wrinkles which were soon sanded out, was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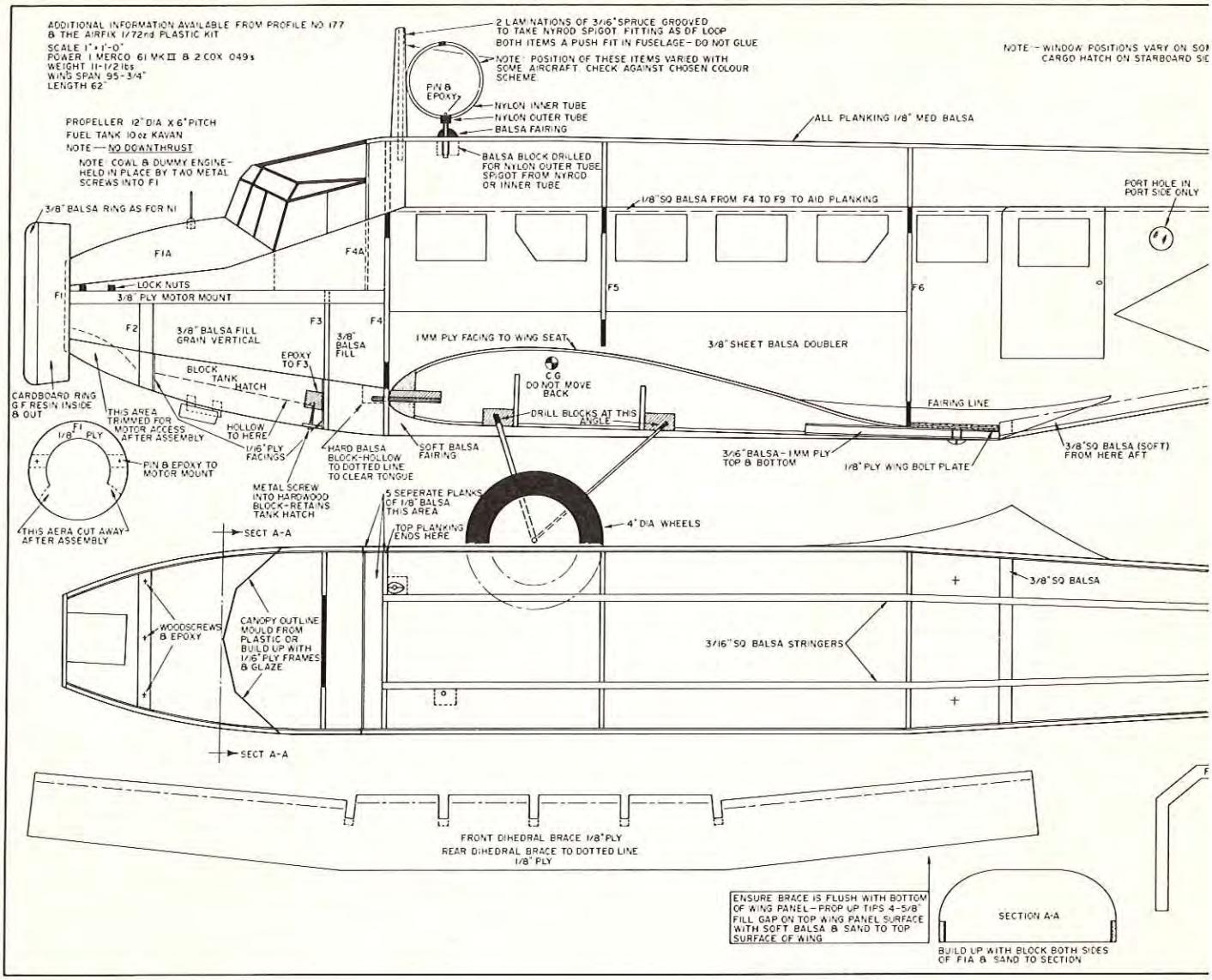


extremely successful. I felt, afterwards, that I should have put a little wash out in the tips owing to the lack of area – way out there, man – but this has since proved unnecessary.

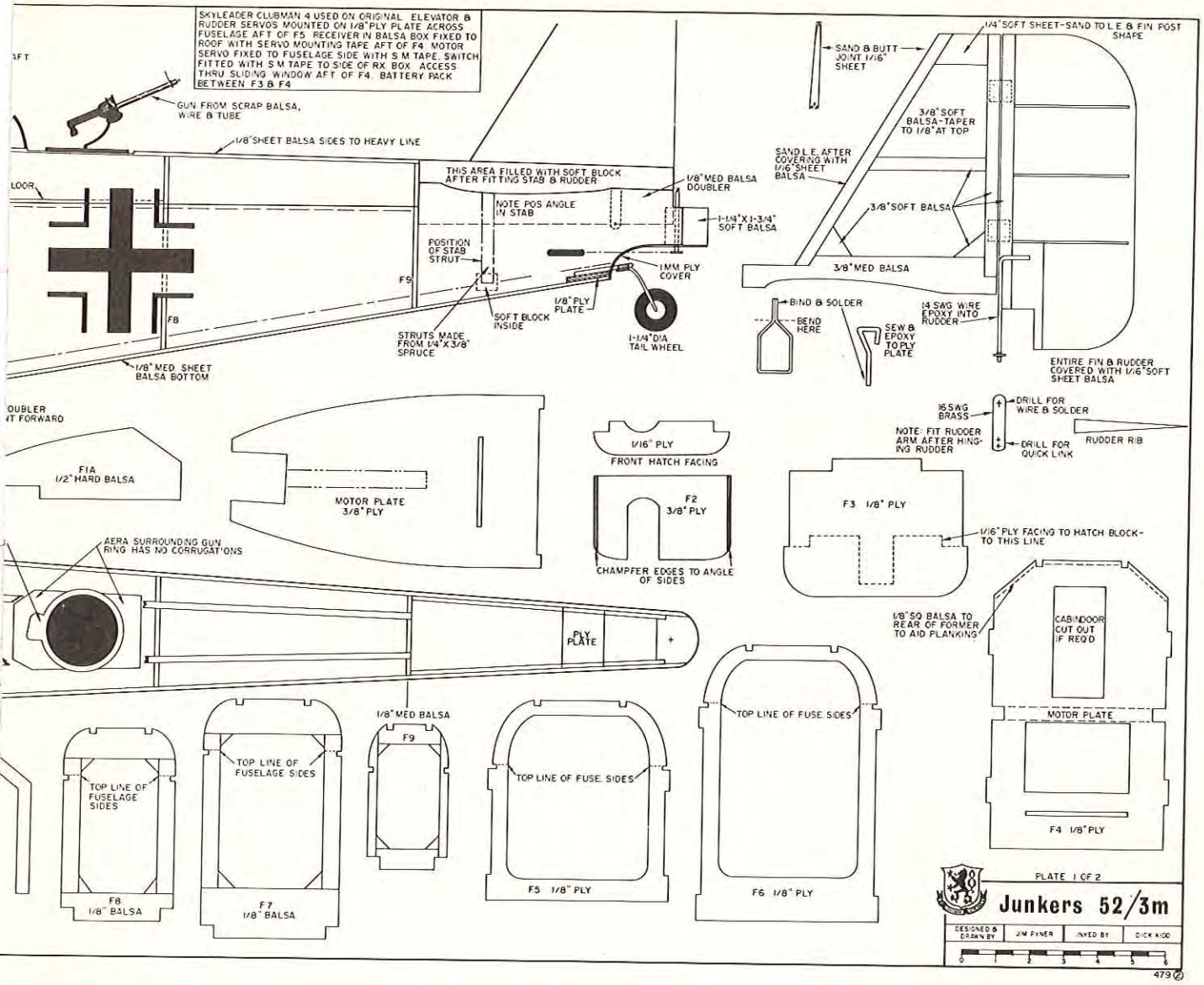
Steve Rose, of West Essex, who conducted the initial flight, reported that it would drop a wing if you shut down the power and applied too much up-elevation, but if you want stall turns and spins, you would not make a J.U. 52, so no worry there. A point worth making with the foam wing is that the hinge brackets are very simply epoxied into the T.E. and should one make a mistake in lining them up (I do it every time) one simply moves them around and packs out any hole existing around the area with scrap. None of this fiddling around one gets with lining things up to the T.E. of ribs. It doesn't happen to you, mate? It does to me! Every time!

The T.E. had a simple length of shaped T.E. sanded to confirm with the panels and the entire wing was covered with obechi veneer, but could be covered in one-sixteenth balsa if one feels like spending money. The centre section was conventional with ribs of 1/4" balsa plus 1/8" ply dihedral braces, covered with 3/32" sheet. Flaps are soft balsa sheet with ply dummy hinges epoxied into the L.E. and lined up with the flat bottom surface of the wing and stepped down 1/4" **below** the wing. Aileron hinges are made up of 16 SWG saddles, a pair of MM 16 SWG nylon retainers, threaded through 1/8" paxolin sheet and the lot is epoxied into the T.E. to line up with the flaps, control being with what appears to be never ending cables.

Elevator hinging is identical with the elevator stepped **above** the T/P T.E. The fuselage is constructed with medium 3/8" balsa sides with 1/32" ply doublers and simple rectangular formers with a curved top deck planked with 1/8" sheet. The nose area is block and helps bring the C of G where it should be and accepts a 10 oz. Kavan tank with ease.

Wing nacelles were made by the simple method of cutting the side elevation from 1/2" sheet with a cut-out to slide over the wing. This, in turn, is glued to the offset centre line of the nacelle to form a backbone, and soft block is added to both sides and carved to shape. A 1/8" ply front former was added, and to this a spacing block to accept the Cox .049. The reasoning here being that should the power be insufficient, one could remove the spacing blocks and still have enough room inside the cowlings for a larger engine using a radial engine mount. This, however, has proved unnecessary.

Now to the finishing. First of all, I acquired the Airfix plastic kit of the J.U. 52 as this gives one a good guide to the way the corrugated metal runs,



where it ends, etc., and how various grades were used in the construction. For example, the T.P. with Fin and Rudder appeared to be covered with a lighter grade of aluminum which means that the corrugations have to be smaller and closer to give the right effect. The same thing applied to the ailerons and flaps. That used on the wings seemed to be a little stouter, and on the fuselage it appears to be the heaviest, with the exception of the door which was more in keeping with the material used on the rudder. These are the conclusions I have come to after studying various photographs, profiles, and the Airfix kit. I may be wrong, but it looks right. Markings may be a problem to anyone contemplating one of these aeroplanes as it seems to me, in my ignorance, rather difficult to settle on one particular aircraft.

Where one would find an aeroplane which had been operating, for example, in North Africa and happily settle for this – one would find a picture of the same aircraft taken some days later in a different area where the fitters had been to work, fitting shutters to some of the side windows, or cheerfully hacking a cargo hatch in the starboard side, which puts the modeller back at square one. Unit markings and call signs seemed to change overnight, also. A friend of mine who makes the Luftwaffe a full time hobby tells me that our own intelligence service found it almost impossible to keep a close check on the Luftwaffe Transport System, and if they were wondering, "Brother, I am lost," one must remember that this aircraft was assembled in plants all over occupied Europe and I feel sure some differences must have been made, much as one finds with some of the W.W. I aircraft which went to different contractors.

I went through the usual ideas for reproducing the corrugated effect on the aircraft, corrugated cardboard, gouging tools, plastic, etc. No dice – cardboard was O.K. on a flat surface but not very successful on a curve, the fuselage top deck, for example. A tool to gouge out the grooves might have done the job, running with the grain, but would have made a sorry mess if one had to go cross grain. So I settled for the old standby, for which there is no substitute, balsa! The entire model was covered with lightweight tissue and received one coat of sanding sealer. I took a soft sheet of 1/8" balsa and gave it a coat of sanding sealer to one face. This I then stripped down into 1/8" strips with a straightedge and balsa knife. A balsa stripper would have been handy here. Come to think of it, any kind of stripper would be handy here. WHOOPEE!!!

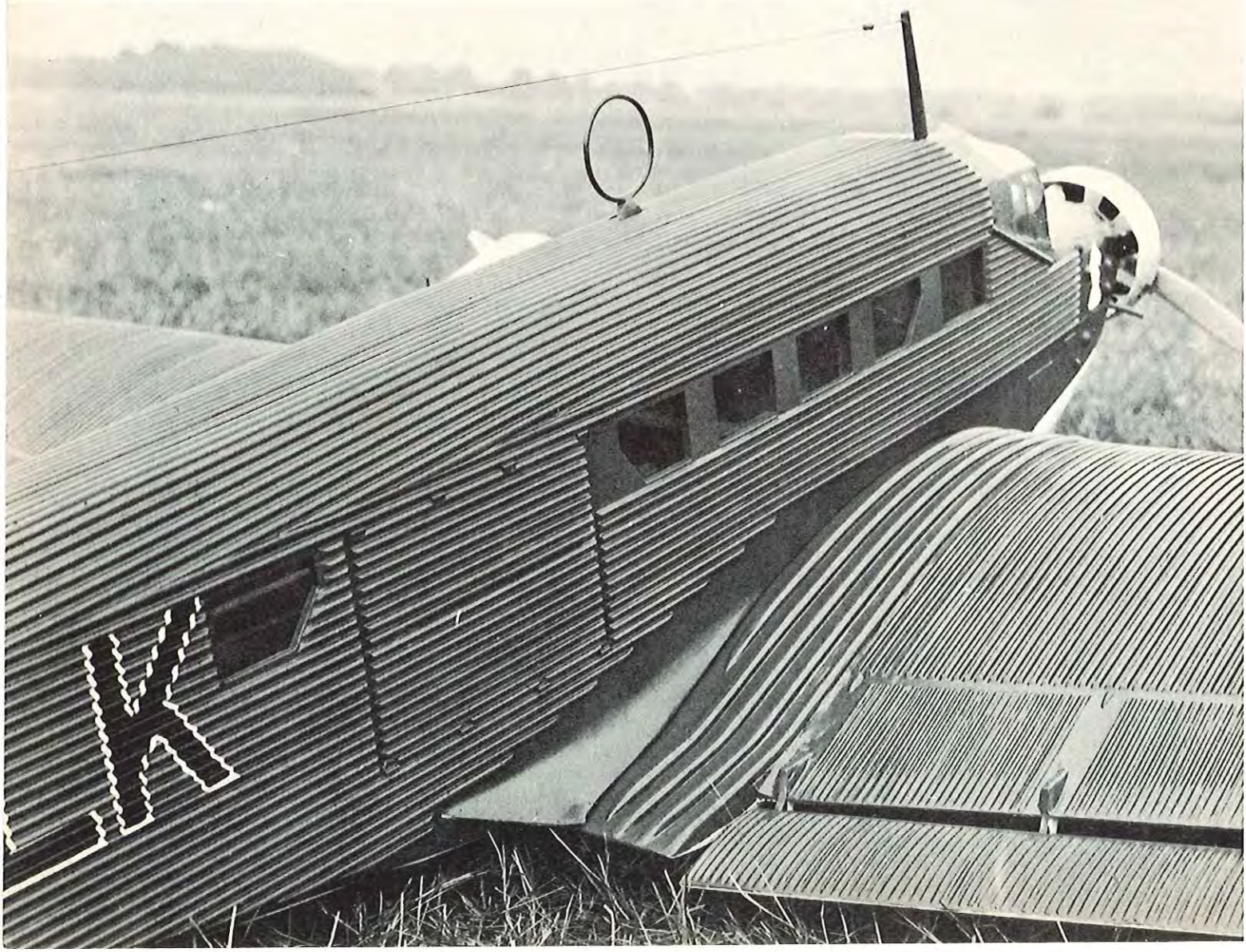
Having marked a centre line down the top of the fuselage, I then applied a coat of sealer to the fuselage approx-

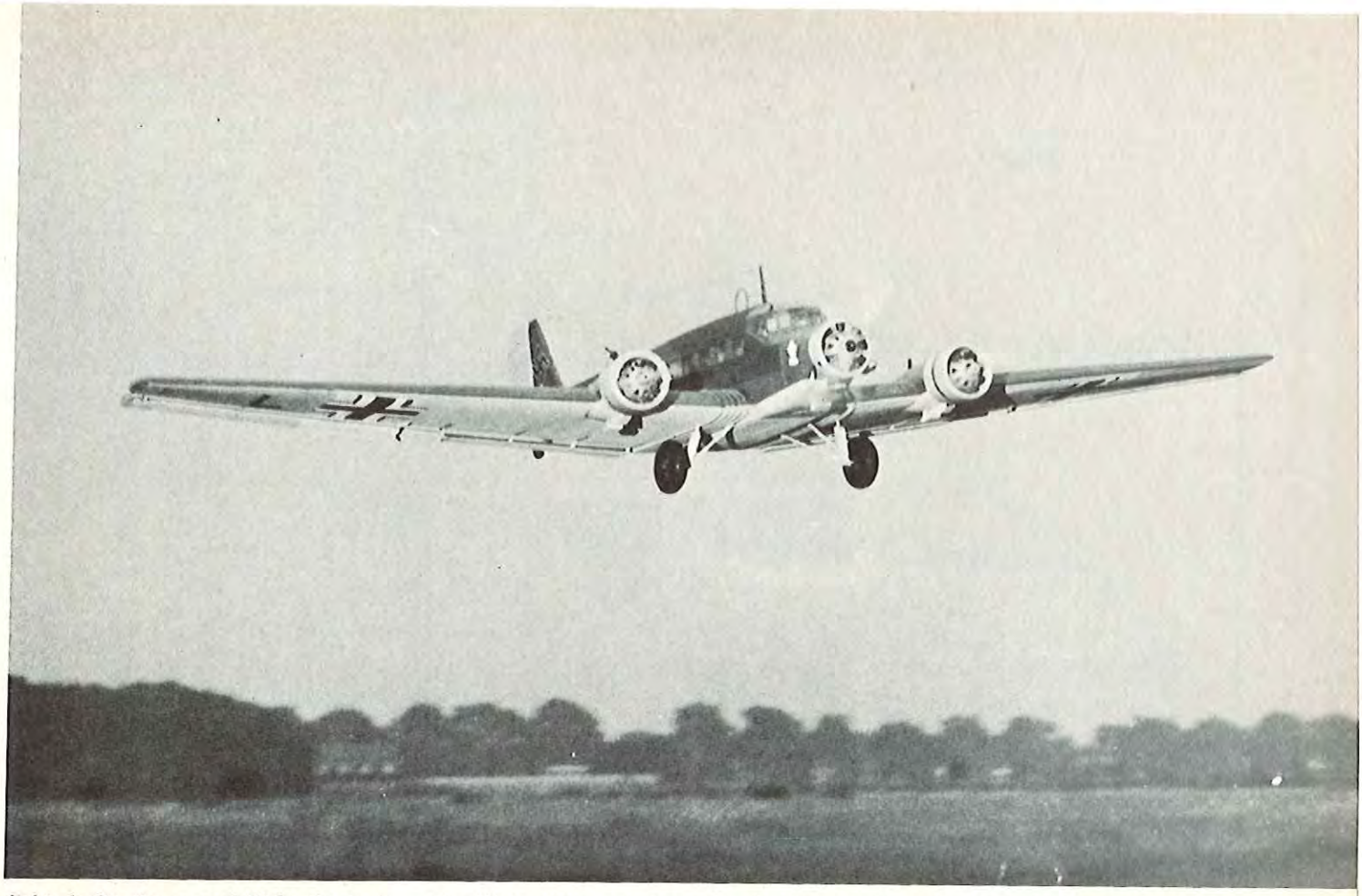
imately 1" wide and just laid the strips on it, using a piece of 1/8" sheet as a distance gauge, but this was not strictly necessary. The combination of two sealed surfaces, livened up with a fresh coat of sealer resulted in the strips welding into position with the occasional pin being used only on a few curves. Wings, the same procedure, using 3/32" sheet and the tail unit and control surfaces, using 1/16" sheet.

The sharp edges of the strips were rounded off by using a piece of 3/8" balsa strip with garnet paper fixed with evostick, *(Ed. note: Pliobond Contact Cement or equivalent)* to form a sanding block, cut into 6" lengths. The wings and tail unit, again, used smaller grades of wood for the sandings block. Then, this that had appeared to be a never ending job was finished, and the entire model was given two coats of sanding sealer followed by two coats of Kingston Diamond Eggshell thinned with celulose thinners. All insignia was hand painted as it was found virtually impossible to mask off any area over the corrugated strips. The scheme I have employed came from an old aviation magazine and depicts a J.U. 52 of the 2nd Staffel of I/KGZ bV.1, which was in Southern Greece in May 1941. This employed the green upper surfaces and blue undersurface with yellow cowlings and rudder. The cowlings were made from a mixture of balsa, cardboard, and glass fibre with the centres moulded in lightweight ulat and resin *(Ed. note: Fibreglass and resin)* inside half of an old plastic ball. The dummy engines could be improved upon, but they look okay when viewed from a distance of 3½ miles.

After what seemed to be quite a long time, the beast was ready to fly, although still waiting for dummy exhausts to be fitted, since I had an invitation to the U.S.A.F. base at Lakenheath and the use of the runway. The servicemen there have their own model club and we had invited various clubs in the locality for a fly-for-fun meeting. Their hospitality and organization were first class and their efforts made it a superb day for us all. A great bunch of boys, not forgetting the girls who looked after the hot dogs and beer and the kids who cleared the entire flying area of any trash in a very short time.

Conditions were good for the first flight of the Junkers and, with the use of a runway, how can you lose? I had more confidence in the model and the Skyleader Clubman than I had in myself so I gave the TX to Steve Rose who, I feel, is a superb flyer. All three motors running, slightly offbeat, and away went Iron Annie. Down the runway, tail up and she flew! Steve reported that she needed a little down trim and slight right aileron trim, otherwise she flew herself. The view of the underside as she passed overhead was quite realistic and banked turns with the windows against a bright sky were beautiful. After awhile, Steve settled into an approach on the runway and she floated in like a bird and rolled to a stop in front of the crowd. A moment of silence, and then the applause. Steve and I were de-





lighted. On the second flight the tank hatch detached itself from the fuselage and descended to land on the grass and the tank was seen to be hanging below the aircraft, supported with the fuel tubing with the engine still running. Steve decided to land her, and once again all was O.K. apart from a ruptured tank which had swung onto the propellor area.

A kindly soul lent me another tank and a third flight was made and on this occasion, Steve got quite carried away and had to make a dead stick approach and landing . . . once again all was O.K. That ended our flying on that occasion and we departed the base very happy men. Since that occasion the Junkers has completed some three hours flying and the TX has been passed around to all and sundry in the West Essex Club. My ten year old daughter, Janet, flies it better than myself, would you believe? Incidentally, if you are there, Dave Platt, it has even flown on Wanstead Flats!

Anyway, for you fellows who are looking for a steady flying model that looks like an aeroplane, this is the one. There is a lot of it – but the basic construction is simple. Do not be put off by a foam wing. Take a look at the taper and imagine a built up wing a'twisting and a'warping. The amount of effort you put into the finish depends on the builder – one could use corrugated cardboard and save time and perhaps a little weight. Speaking of weight, the beast weighed in at 11½ lbs., but as she flies I feel sure that it would carry another pound with ease.

Paratroops, airborne supplies? . . . please yourself. And now, go thou and do likewise. The crowd will love you.

AUF WEIDERSEHN!!!!!

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BUILDING SEQUENCE

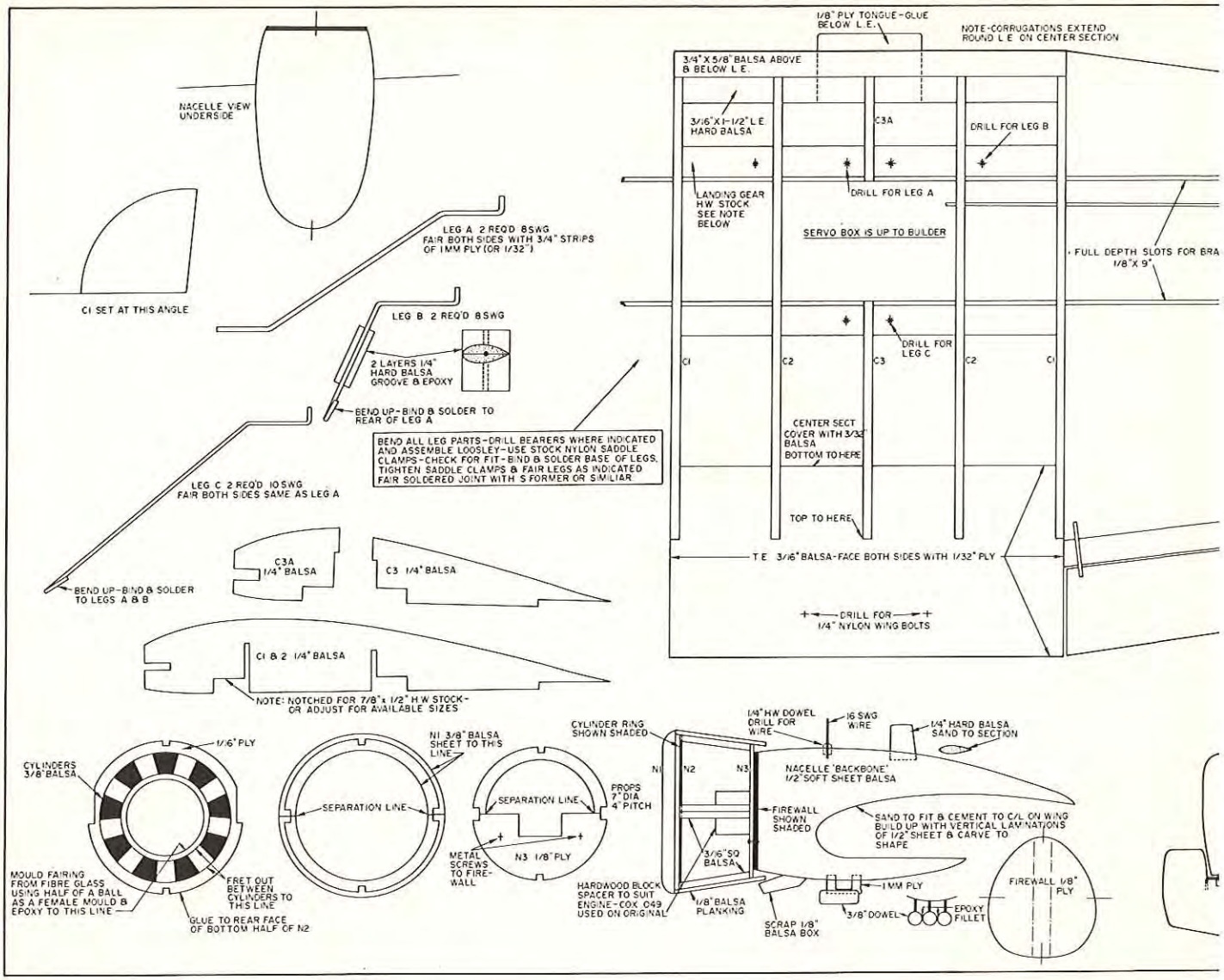
First study your Profile No. 177, plastic kit, or additional reference material to determine which particular aircraft you intend to model, paying particular interest to the glazing on the starboard side. Are you building a model of an aircraft which had loading doors AFT of the T.E. of the wing? If so, you will have to delete the windows in this area. Having decided this we can commence.

Cut two fuselage 1mm (1/32") ply doublers and, using a new blade in your knife, cut out all windows and former notches. The porthole on the port side is best cut with a fine blade in the fretsaw.

Join 1/8" medium weight balsa sheet to form a large enough sheet for cutting the basic fuselage sides. Now cut basic fuselage sides to shape, noting that this includes the tailplane seat – but do not remove windows and former notches yet. Now glue the ply doublers inside the fuselage sides – these will be handed, i.e. left and right. Use contact adhesive here if you think you can get them together – in line – the first time. It is an awful waste of good wood, if you 'drop a clanger', as we say here in England. Using a pointed blade in your knife, you can now remove the windows and former notches from the inside face, using the edge of the ply cutouts as a guide for a good, clean cut.

The hard work comes next. Cut out all fuselage ply formers. Note that although F. 4 is specified as 1/8" ply it could be 3/16" or 1/4" ply if you prefer a little beef in this area. Any extra weight forward of the C. of G. may pay a bonus later on. Mark the position of the 3/8" ply motor plate on the inside face of the ply doublers. Glue a strip of 1/8" x 1/8" balsa along the top inside edge of the fuselage side, grooving slightly to sit flush on the doubler. Also the 3/8" x 3/8" balsa where indicated inside the rear fuselage sides.

Now join the fuselage sides with F.



4, F.5, and F. 6, ensuring that everything is square. While this is drying, make up all rear formers from medium weight sheet. Next, add the 3/8" sheet balsa doublers inside the fuselage, forming a good wing seat, and draw the rear end of the fuselage sides together with the tail block, drilled out for the rudder fixing. Care is needed here to ensure that no twist creeps into the fuselage. Now, glue in all balsa formers – F.7, F.8, F.9, and the two 3/16" x 3/16" medium weight balsa stringers.

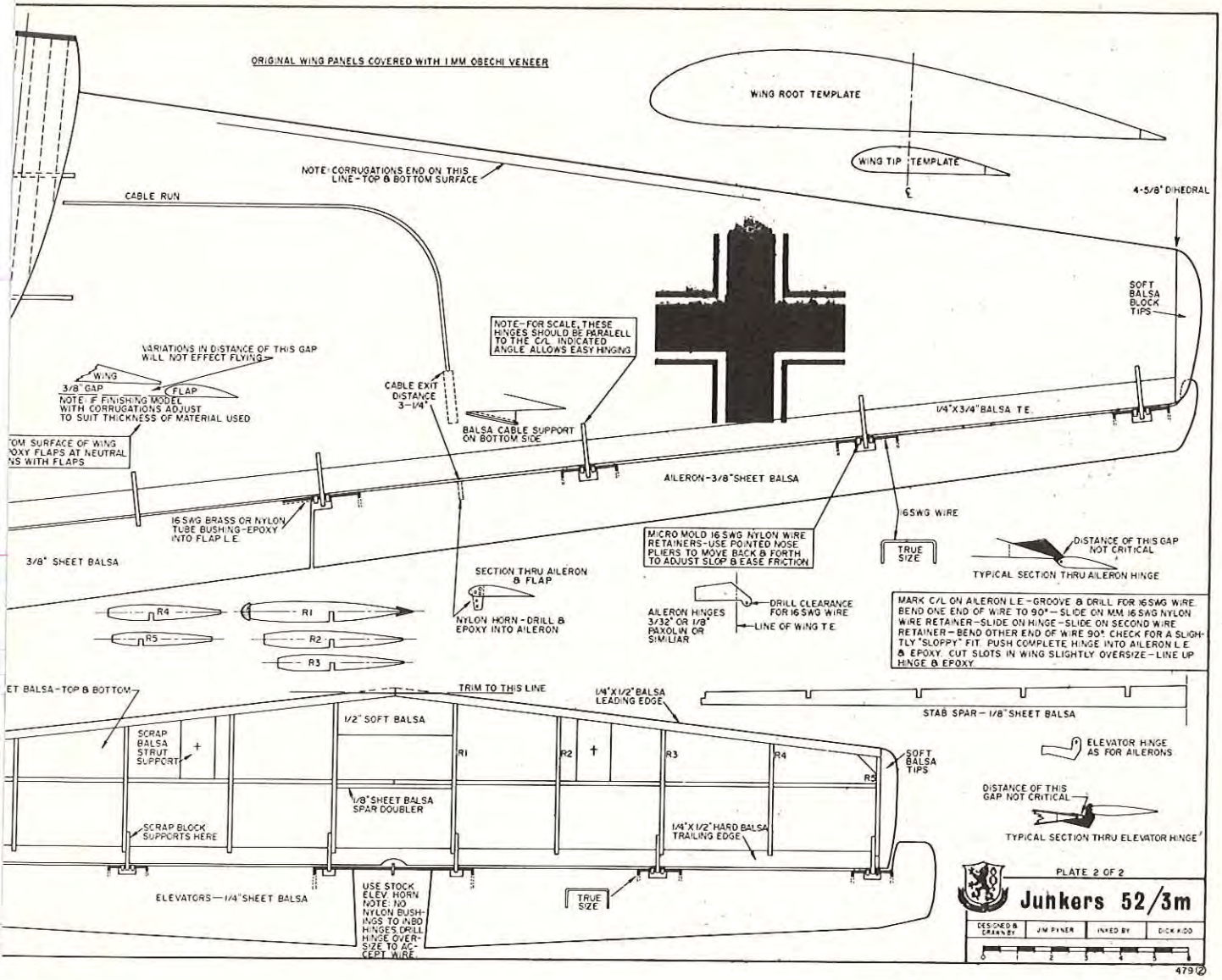
Chamfer the edges of F.2 and fit the motor mounting plate to the fuselage sides. Note the 3° – 4° right thrust. When satisfied that all will fit, drill the engine bolt holes and mount the engine using lock nuts on top. Epoxy around the nuts. They will be lost from the sight of man from here on out!!!

Decide on the motor servo cable run position and drill holes in F.2 and F.3. The cable will pass through the cutout in F.4. Now for the hard part. Using a slow drying epoxy, coat the edges of the motor mount and draw the nose together around it using suitable clamps at the front end. I used pieces of 1/8" ply with a cutout of the correct width, and place them top and bottom. Epoxy F.3 in position, keeping the motor plate level. Follow up with F.2 and back away, leaving this assembly to dry overnight. When dry, drill and screw through the motor plate into F.2 as an extra reinforcement and add F.1; pin and epoxy to the motor mount. The 3/8" balsa doublers below the motor mount are fitted next with the grain vertical. These will need to be grooved with the razor saw doubler to follow the contours of the fuselage sides. The area inside the tank bay will receive a coat of fibreglass resin when completed, so there will be no loss of strength.

No doubler is fitted below the motor mount between F.1 and F.2. Most of this area will be trimmed away on completion to clear the motor and will receive fibreglass cloth and resin to the inside. F.1A is now glued to the centre line of the motor plate and balsa sheet or block built up either side. Now, add hard block to the bottom between F.4 and F.3, hollowing out to clear the wing tongue. Follow up with the tank hatch block spot cement with 1/16" ply facings and go to work on the nose section with razor plane and sanding block. This will be the hardest part of the job out of the way. A change of scenery does everyone good, so switch your attention to the tail end.

A fixed tail wheel is shown on the plan – I used a castering tail wheel but, as the tail comes up so quickly, it is not strictly necessary. However, fit a steerable wheel if you cannot live without it.

Build the tailplane next. Nothing



particular here. Just standard multi practice. The elevators are cut from 1/4" firm sheet, joined with a stock elevator rod and horn. Study the hinge detail on the plan. Cut the hinges from paxolin or similar plastic and drill for 16 SWG wire. Drill two oversize to accept the thicker wire of the elevator joiner. Mark a centre line on the L.E. of the elevator, drill and groove for the hinges.

Make up and assemble the hinges as shown on the plan. The nylon retainers are a tight fit on the wire and are to stop any sideway movement, the surfaces hinging only on the wire passing through the plastic "hinge."

Epoxy the wire hinge pins into the L.E. of the elevator – lining up the two elevator halves and allow to dry. Cut slots in the tailplane T.E. and sheeting and epoxy the plastic parts into position. Eyeball the assembly to ensure that the elevator is horizontal with the T.E. and approximately 3/16" **above** the T.E. and approximately 1/16" – 1/8" **behind** the T.E. These measurements are not critical . . . if it looks right – it is right!! Now, add the tail doubler to the rear fuselage and mount the tailplane, noting that this is set at a positive angle.

The floor below the dorsal gun position is now fitted and the fuselage turtledeck planked with 1/8" medium balsa to stiffen the whole shebang.

The fin and rudder are made next. Use soft wood here to keep weight down and hinge with mylar strip. Pass the wire which carries the rudder horn through the tail block – line up and glue the fin to the centre line of the tailplane and add soft block around the fin base to follow the contour of the fuselage.

CENTRE SECTION

Points to note: Dihedral braces are full depth with the bottom 3/32" sheet butting to the brace as opposed to lapping on. The wide 3/16" balsa T.E. is faced with 1mm Ply and has proved quite strong enough for normal use. End ribs are set at the angle shown to allow the wing panels 4-5/8" dihedral at the point shown. Note that the **top** of the brace is **below** the top surface of the wing panel – this eliminates the embarrassment of sanding hard ply to conform with the top surface of a soft foam wing should one make a bad cut. Any gap can be filled with soft sheet and sanded. Otherwise standard building practice is followed.

WING

Cut from foam using the wing templates after marking a centre line on the block and lining up the centre line as shown on the ribs, the flat bottom of the templates going to the flat lower surface of the block. Cut a 3/4" wide strip from the T.E. and white glue the 3/4" x 1/4" balsa T.E. in place. Cut slots for the braces. On the original model, I joined the panels

to the c/s at this stage – grooved for the aileron run – and covered the panels with 1mm Obechi Veneer. The only problem I encountered was that my work shed is 8' – 3" long and 6' – 6" high – so I was a little crowded for movement. However, no problem should arise if your wife lets you use the house. The centre section joint was covered by one layer of surface mat cloth and fibreglass resin, this being hidden later by the corrugation. At this stage a centre line for the nacelles should be marked on the wing using the wing/center section joint as a 'straightedge'. Soft tip blocks complete the basic wing.

FLAPS

Non working? No need to, Mate! This aeroplane takes off with a short run and floats on the landing approach. The flap 'hinges' can be cut from ply and epoxied into position after planing and sanding to the flaps section.

AILERONS

Cut from firm 3/8.. sheet balsa, mark a centre line along the L.E. Plane and sand to section. Cut notches for the hinge clearance. Cut plastic hinge parts with a fretsaw and drill for 16 SWG wire, **slightly** 'sloppy.' Follow instructions on the plan and make up your hinges. Drill and groove the L.E. on the marked centre line and epoxy the hinges in place, taking care to keep the epoxy glue off the wire hinge as it passes through the plastic part.

Cut slots in the T.E. and foam of the wing. Note here that in scale, these slots should be parallel to the wing joint at right angles to the wing centre line. The angle shown allows a nice easy hinge movement and was used on the original. Now comes the beauty of a foam wing. Should you have anything out of line, the slots can be widened and filled with scrap on completion. Now, epoxy the flaps in position, using scrap balsa as a temporary distance gauge, under the bottom of the wing to step the flap down as shown on the plan. Slide the ailerons in position, eyeball to line up with the flap and epoxy well. Epoxy a tube in the L.E. of the flap to take the inboard aileron hinge pin. Fit a tapered piece of balsa under the wing to support the cable outlet, then line up the aileron horn and epoxy into the aileron.

NACELLES

Decide on your choice of engine and tank. The original uses .049 Cox Babe Bees with a 30cc control line metal tank feeding through a hole drilled in the Babe Bee tank. If using a separate tank, mark positions of feed and vents on the firewall and drill. Cut a nacelle backbone from 1/2" sheet balsa and glue to the ready marked centre line on the wing. No need here for a 'micrometer' fit, just get the thing level. Feed the tank pipes through the firewall, check for fit (it may be necessary to scoop out the L.E. a little to line up the tank) and glue the firewall to the face of the backbone, again, keeping square. Now build up on both sides of the 'backbone' with balsa sheet, gluing well to the rear of the firewall and around the tanks. Use a sharp knife and sandpaper to shape. Note that the underside is a

different contour.

COWLS

Build up with balsa as shown on the plan. Fix the lower half to the firewall with two metal screws (mind that tank). If you use a dummy engine, build up with 1/16" ply scrap balsa, and a moulded fibreglass fairing as described on the plan. Note that this fairing has holes fretted out and also allows access to the metal fixing screws. The clever Joes can go one better and fabricate the entire cowl from fibreglass and it would probably make a better job. Check against your engine and, if necessary, epoxy distance blocks to the firewall to bring the engine forward to allow the prop to clear. If using the wooden cowls, use fibreglass resin inside to give a little beef and fuel protection. The fuselage cowl is a simple balsa ring cut from 3/8" sheet as for N.I. with a simple card wrapping at the rear, coated with resin. Make up a dummy engine and epoxy two spacing blocks to the rear. Drill and screw the latter to F.1.

LANDING GEAR

Form the wire parts, then drill angled holes in the landing gear blocks and assemble loosely, using stock saddle clamps for fixing. Check sweep back and angles and, when satisfied, bind and solder the base joint. Fair with balsa and ply after adding the fuselage fairing block. Fair the soldered joint with S. Former (it looks prettier – my soldered joints are lousy) and retain the wheels with collets.

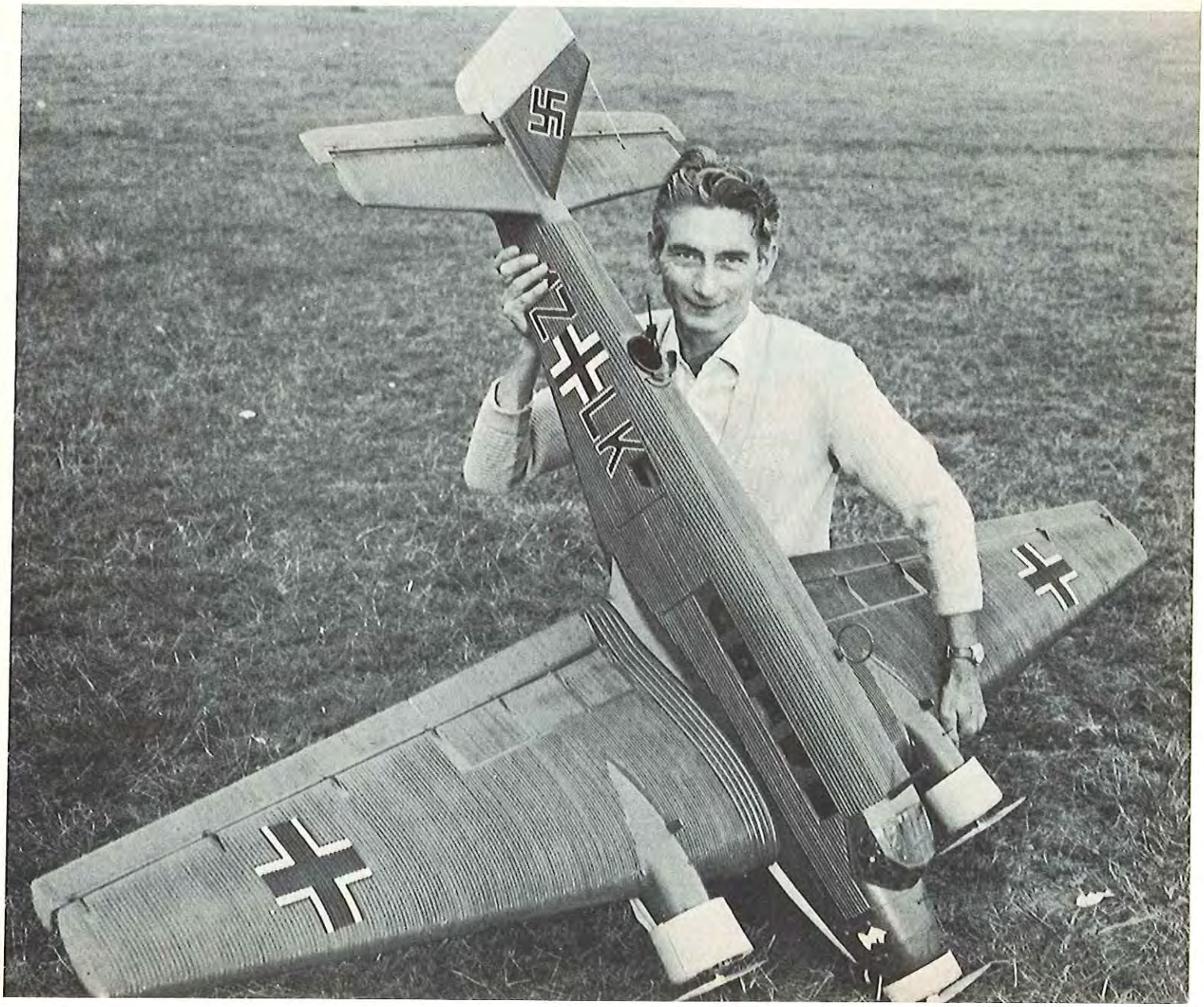
Finally, (if you haven't already done it), add the 1 mm ply facings to the wing seat – line up the centre section and drill for wing bolts. Make up the elevator and rudder pushrods with an adjustable Q-Link at the elevator servo end. Sheet the bottom of the fuselage, rounding off the corners slightly. Add the 1 mm ply cover to the bottom of the rear fuselage, slotted for the tailwheel and drilled for the rudder arm. OOPS!! Have you remembered the small block supports for the tail plane struts? Wing fairings are from soft block and will just about complete the basic structure.

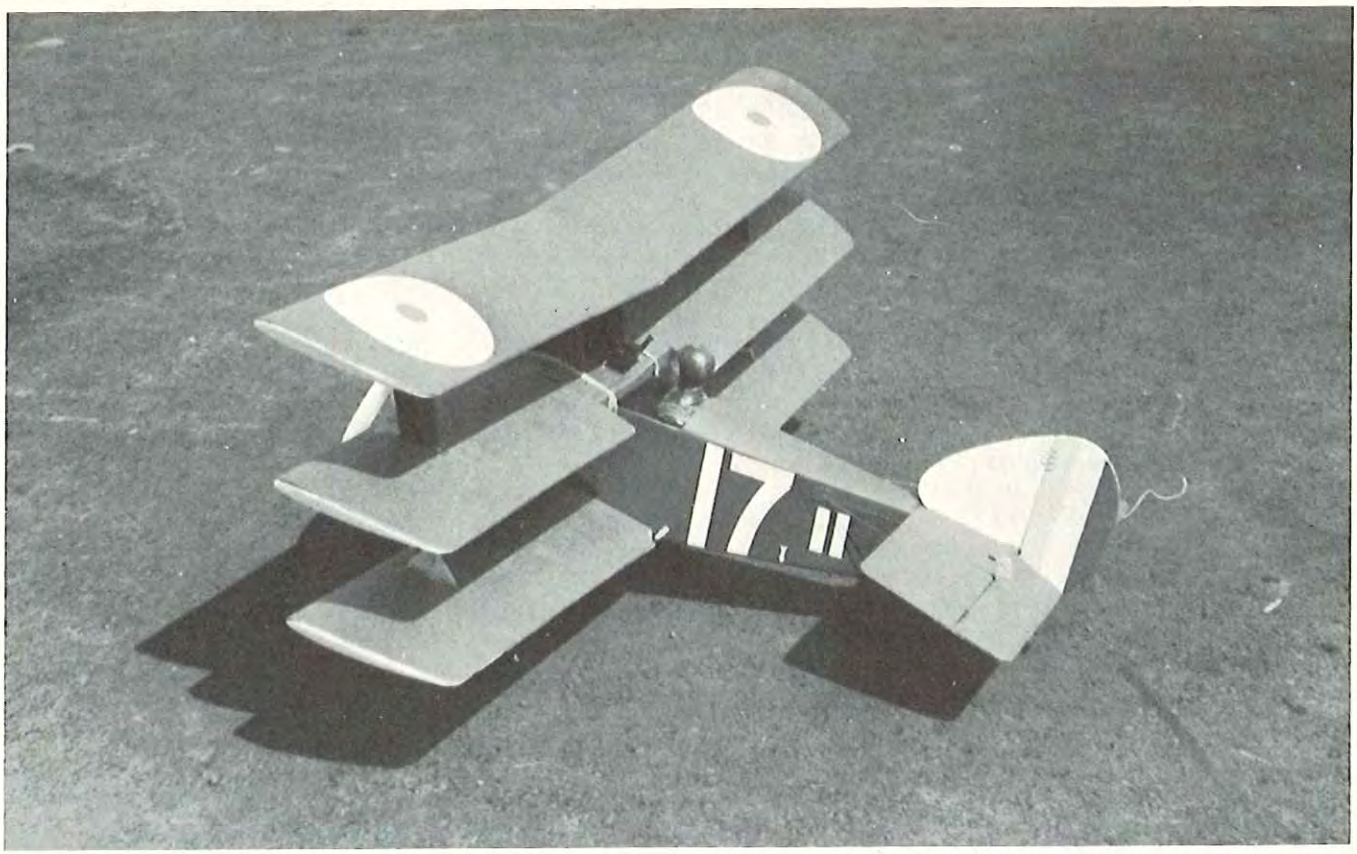
FINISHING

Sand everything!! and apply one coat of sanding sealer. Sand again and fill any dents with your favourite filler. I use Alabastine or Pollyfilla. Sand the filler and touch in with sealer. Cover the entire model with lightweight tissue and apply another coat of sealer. Now, the easy way out is corrugated paper doped on. The original model was done the hard way, but if I made another I think I would do it the easy way. But for those among you who want it – here's the hard way.

Take a sheet of 1/8" soft balsa and apply a coat of sanding sealer to one

To Page 82





The author's .15 powered Sopwith tripe looks almost like a caricature of the famous WW I aircraft. In the air, it's one of the finest sport models we've ever had the pleasure of flying.

SOPWITH TRIPLANE

A SEMI-SCALE .15 POWERED MODEL THAT IS AS DOCILE AS A TRAINER AT LOW THROTTLE, YET FULLY AEROBATIC AT FULL POWER. BY FRED REESE.

I have wanted to build a Sopwith Triplane for a long time but the thought of building three wings for only one airplane had put me off. Then Ace RC came to the rescue with their constant chord, 35 inch foam wings. What could be easier? I have been flying foam winged Rumplestadts for about a year now with excellent results. They can really take a beating and they repair easily. With all this experience, scale three-views, and three foam wings I began to draw the plans.

What I ended up with is not scale. It is a caricature that resembles the

Sopwith Triplane. It is still very attractive and a real crowd pleaser with very scale-like performance. The airplane literally flies itself and is extremely stable. It will return to level flight with hands off the controls from practically any attitude. At low throttle it is as docile as any trainer, yet with full power it is very aerobatic.

I spent a very sleepless night before the first flight worrying about the short nose and just about everything else but I needn't have. Except for the addition of some down trim, everything was perfect. It lifted off easily in about twenty feet, and climbed stead-

ily, so I began to try out the responses. Rudder response was good. The elevator was a bit sensitive but I found myself using it very little. I would recommend that newer modelers use the inside hole on the elevator servo output wheel. The stall proved to be just a gentle mush – the nose dropped a little and the airplane continued on its way. Slow flight was fantastic! The airplane would hover at zero ground speed when headed into the wind with no tendency to fall off on a wing or snap roll.

The gentle stall characteristic is because of the different angles of attack of each of the three wings. The top wing, which is the most foreward, has the most positive incidence and stalls first. The center wing stalls next and lastly the bottom wing. I must add that you have to try very hard to make all three wings stall because as the top wing stalls the airplane becomes nose heavy in relationship to the wings still flying so the nose drops naturally and flying speed increases until the top wing is no longer in a stalled condition.

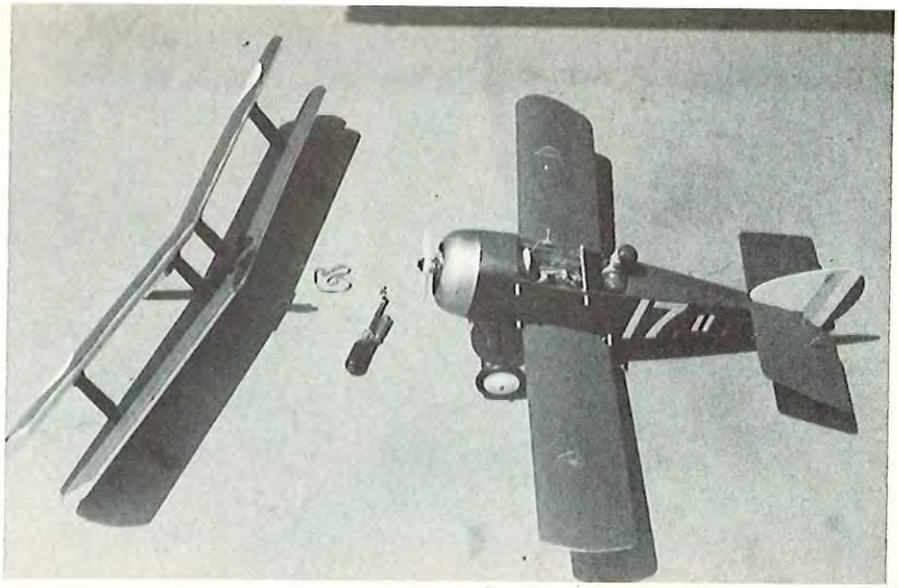
I have flown the triplane many times since that first flight and it continues to be a pleasant escape from those roaring .60's. Low, slow passes with the wings gently rocking prove that it is not necessary to go fast to have fun.

Ideally, the triplane should have a three channel radio and a throttled .15 engine for power. However, the little triplane flies very well with rudder control only. So if you have a single channel or one of the new two channel radios you can join the fun with something a bit different from the usual high wing monoplane.

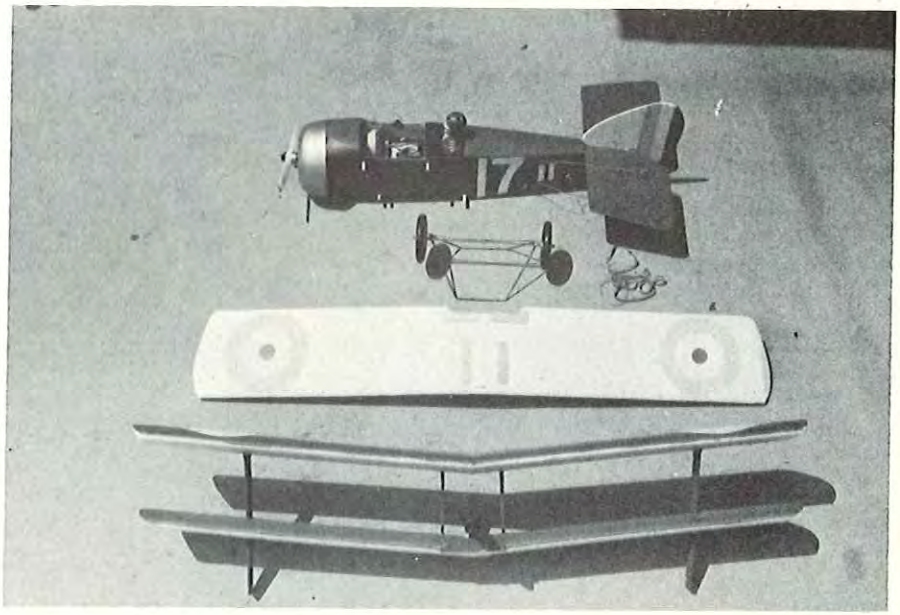
If you have read this far, build it! Right now order the full size plans from RCM and three sets of the Ace constant chord wings. While you are waiting, gather up all of the balsa, plywood and dowels, paint, wheels, etc., that you will need. Paint the pilot and assemble the Williams Bros. 2" scale Vickers gun.

CONSTRUCTION

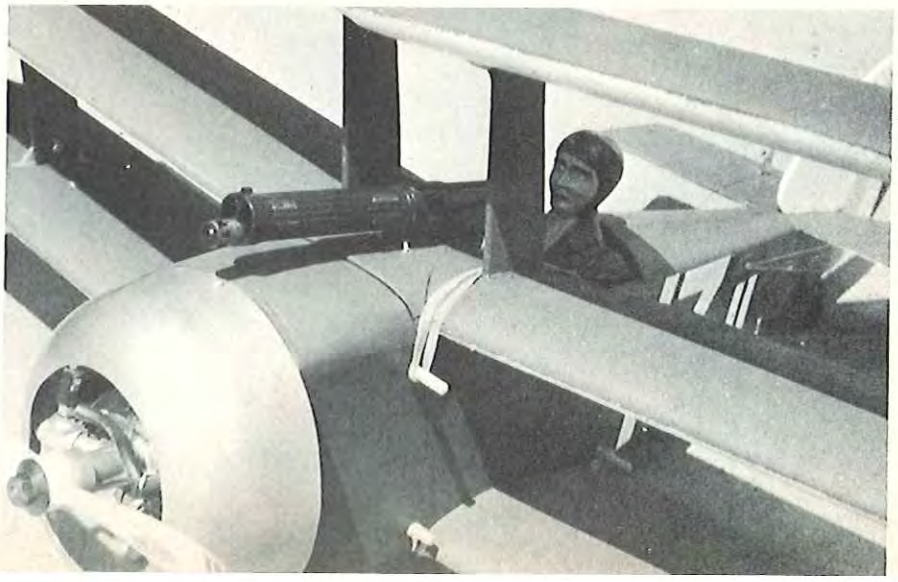
1) Cut out the fuselage sides and the doublers.
2) Glue down the 1/8" sq. balsa framing to the fuselage sides.
3) Using liquid contact cement (not spray) glue down the doublers. Be sure to have the grain vertical (opposite to the sides). Then glue down the tripler with the grain opposite to the doubler.



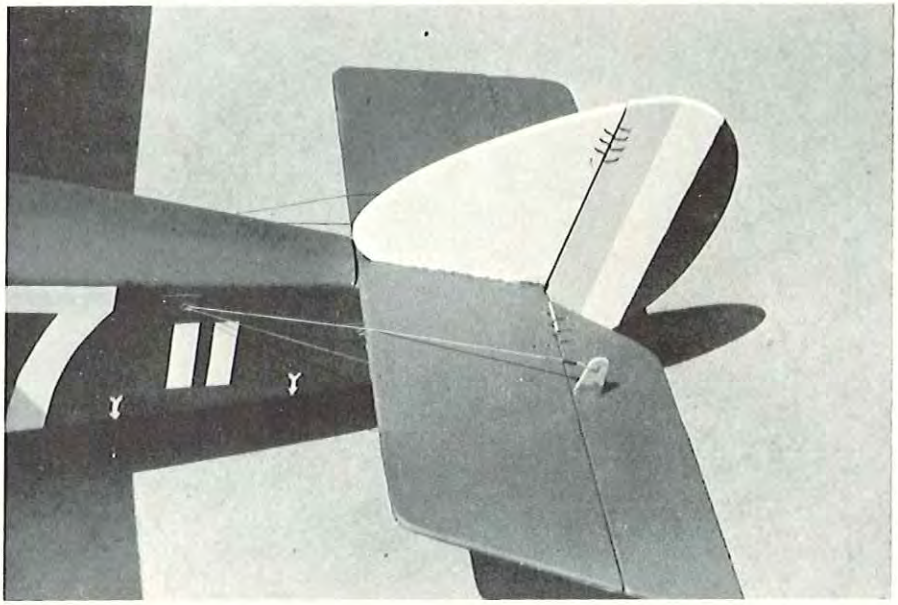
Top two foam wings detach as one integral unit. Use of Ace Foam wings simplify construction immensely. BELOW: Field assembly of Sopwith consists of top wing unit, lower wing, and landing gear assembly, all ruber-banded in place.



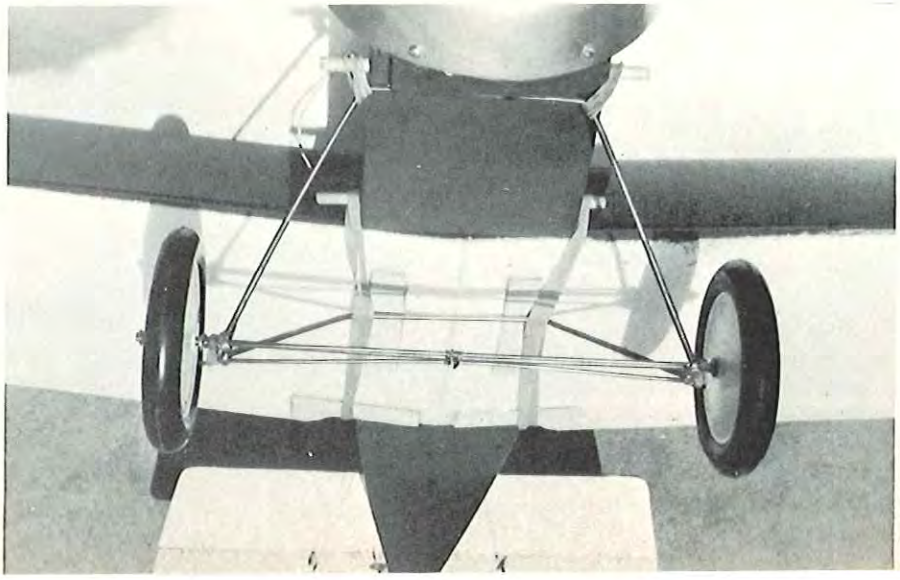
BELOW: Close-up of top wing struts which are epoxied permanently in place. Williams Bros. pilot and machine gun kit add to overall appearance. Fibreglass cowl uses large Cool Whip container as mold. O.S. max .15 engine provides plenty of power.



ABOVE: Detail view of outer wing struts. Plywood units are epoxied into top wings and bolted to lower foam wing panels. BELOW: 'Seuenstrand' fishing leader cable and ply horns add to realism but standard pushrods can be used.

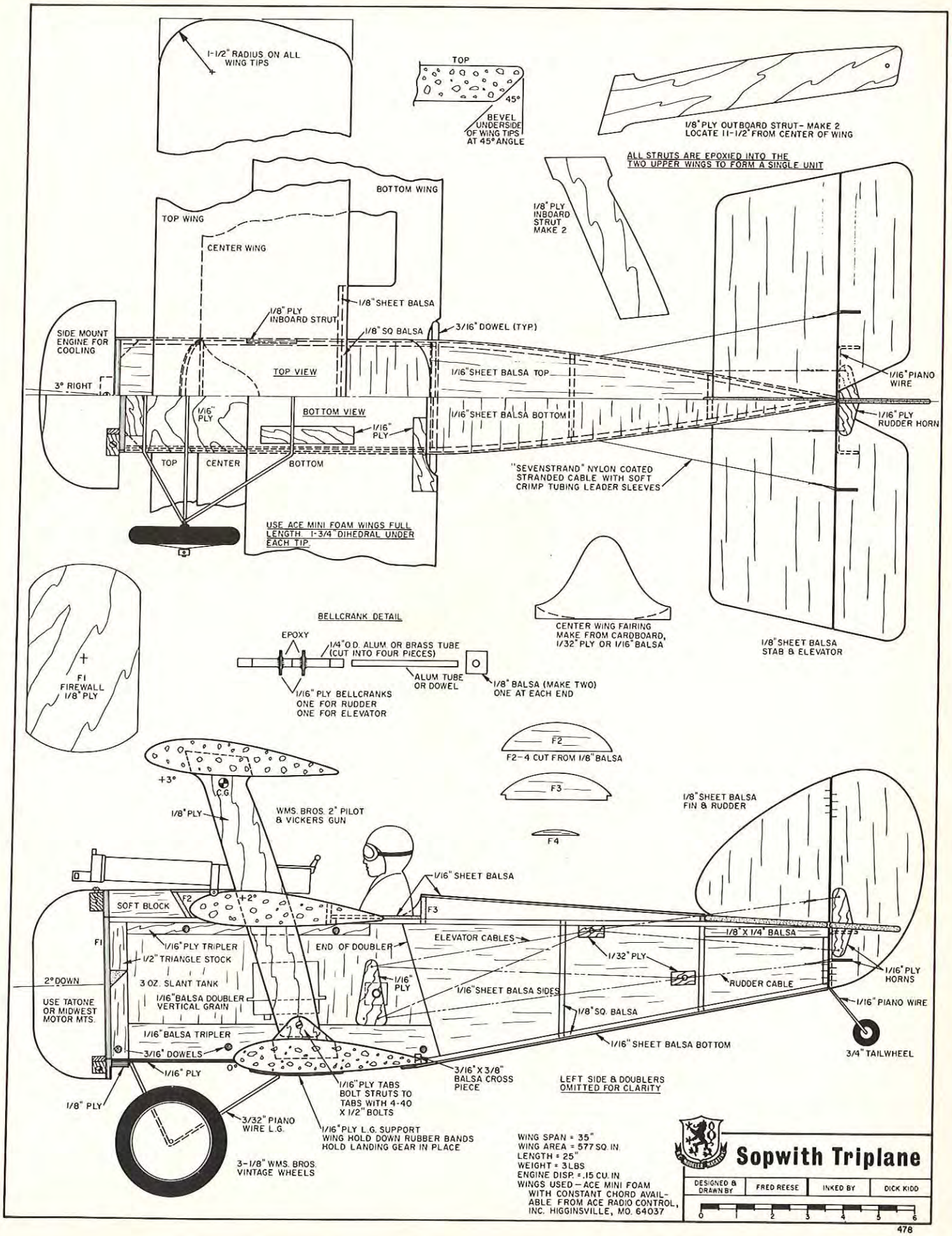


BELOW: Shock absorbing main landing gear is simple to duplicate and is rubber banded into position. Note plywood strips on Ace foam wing to absorb landing impacts and prevent crushing of foam cores. Wheels are standard Williams Bros. 3-1/8" vintage units.



4) Cut out the 1/8" plywood firewall, the 3/16" x 3/8" balsa (crosspiece behind the bottom wing) and the top bulkhead behind the cockpit. Also, prepare two pieces of 4" x 1/2" triangle or 1/2" square or 3/8" square balsa.
5) Epoxy the firewall to the fuselage sides and add the 4" triangle stock reinforcement. Unless specified differently, I use Devcon 5-Minute Epoxy or Hobbypoxy Formula 4 epoxy.
6) Locate and glue into place the bulkhead behind the cockpit and the crosspiece behind the bottom wing.
7) Add the 1/16" sheet balsa cockpit floor and the top-front block, and the 1/16" plywood foreward fuselage bottom.
8) Pull the fuselage sides together at the tail and glue, making sure that the fuselage is straight.
9) Add the 1/8" square balsa crossbraces top and bottom and the 1/16" sheet balsa bottom sheeting.
10) Cut a sheet of 1/16" balsa for the top turtledeck. Use Titebond or other slow drying cement and masking tape to glue into place.
11) Cut out the 3/16" sheet balsa rudder and stabilizer and glue into place with epoxy or Titebond.
12) Make a cardboard template of the wing cross-section. Draw a line on the wing centerline using the molding flash on the leading and trailing edge to locate the center line. You will use this template to position all three wings.
13) Sand the dihedral angle on all of the wing halves in preparation to joining. Follow the instructions that come with the Ace foam wings for this job.
14) Carefully block up the three wings when you epoxy the halves together so that they all have the same amount of dihedral.
15) Make the cutouts in the center of the middle and lower wings to fit the fuselage openings and line these cutouts with scrap 1/8" sheet balsa so that the rubber bands holding the wings in place do not cut into the foam. Use only epoxy or Titebond or other white glue on the foam wings. Do not use any other model airplane cement as it will dissolve the foam, leaving a large hole wherever the glue touched. If in doubt test your glue on some of the

To Page 77


1-1/2" RADIUS ON ALL WING TIPS
TOP
45°
BEVEL UNDERSIDE OF WING TIPS AT 45° ANGLE
1/8" PLY OUTBOARD STRUT- MAKE 2 LOCATE 11-1/2" FROM CENTER OF WING
ALL STRUTS ARE EPOXIED INTO THE TWO UPPER WINGS TO FORM A SINGLE UNIT
1/8" PLY INBOARD STRUT MAKE 2
BOTTOM WING
TOP WING
CENTER WING
1/8" SHEET BALSA
1/8" PLY INBOARD STRUT
1/8" SQ BALSA
3/16" DOWEL (TYP)
SIDE MOUNT ENGINE FOR COOLING
3° RIGHT
TOP VIEW
1/16" SHEET BALSA TOP
1/16" PIANO WIRE
1/16" PLY RUDDER HORN
1/16" PLY
BOTTOM VIEW
1/16" PLY
1/16" SHEET BALSA BOTTOM
TOP
CENTER
BOTTOM
"SEVENSTRAND" NYLON COATED STRANDED CABLE WITH SOFT CRIMP TUBING LEADER SLEEVES
USE ACE MINI FOAM WINGS FULL LENGTH 1-3/4" DIHEDRAL UNDER EACH TIP.
CENTER WING FAIRING MAKE FROM CARDBOARD, 1/32" PLY OR 1/16" BALSA
1/8" SHEET BALSA STAB & ELEVATOR
BELLCRANK DETAIL
EPOXY
1/4" O.D. ALUM OR BRASS TUBE (CUT INTO FOUR PIECES)
ALUM TUBE OR DOWEL
1/8" BALSA (MAKE TWO) ONE AT EACH END
1/16" PLY BELLCRANKS ONE FOR RUDDER ONE FOR ELEVATOR
F1 FIREWALL 1/8" PLY
F2
F2-4 CUT FROM 1/8" BALSA
F3
F4
1/8" SHEET BALSA FIN & RUDDER
+3°
C.G.
1/8" PLY
WMS. BROS. 2" PILOT & VICKERS GUN
1/16" SHEET BALSA
SOFT BLOCK
F2
+2°
F3
F1
1/16" PLY TRIPLER
1/2" TRIANGLE STOCK
END OF DOUBLER
ELEVATOR CABLES
1/8" X 1/4" BALSA
1/32" PLY
1/16" PLY HORNS
2° DOWN
3 OZ. SLANT TANK
1/16" PLY
1/16" SHEET BALSA SIDES
RUDDER CABLE
USE TATONE OR MIDWEST MOTOR MTS.
1/16" BALSA DOUBLER VERTICAL GRAIN
1/8" SQ. BALSA
1/16" PIANO WIRE
1/16" BALSA TRIPLER
1/16" SHEET BALSA BOTTOM
3/16" DOWELS
3/4" TAILWHEEL
1/16" PLY
3/16" X 3/8" BALSA CROSS PIECE
LEFT SIDE & DOUBLERS OMITTED FOR CLARITY
1/8" PLY
1/16" PLY TABS BOLT STRUTS TO TABS WITH 4-40 X 1/2" BOLTS
3/32" PIANO WIRE L.G.
1/16" PLY L.G. SUPPORT WING HOLD DOWN RUBBER BANDS HOLD LANDING GEAR IN PLACE
3-1/8" WMS. BROS. VINTAGE WHEELS
WING SPAN = 35"
WING AREA = 577 SQ. IN.
LENGTH = 25"
WEIGHT = 3 LBS
ENGINE DISP. = .15 CU. IN.
WINGS USED – ACE MINI FOAM WITH CONSTANT CHORD AVAILABLE FROM ACE RADIO CONTROL, INC. HIGGINSVILLE, MO. 64037
Sopwith Triplane
DESIGNED & DRAWN BY
FRED REESE
INKED BY
DICK KIDD
0 1 2 3 4 5 6
478


N697C


N697C

SUPER CHIP

A HIGHLY COMPETITIVE 1/2A CLASS PYLON RACER WITH OUTSTANDING SPORT-PATTERN PERFORMANCE FOR THAT LITTLE FLYING FIELD CLOSE TO HOME.

BY JERRY COLE

Photos by Lou Francavillo, Jr.

Super Chip was designed to be a highly competitive 1/2 A class pylon racer; an excellent sport-pattern performer; and capable of glider-like performance after the race is over. As an added bonus, it is also somewhat scale, in that it was patterned after a full size pylon racer. Like most small aircraft, it can be constructed, complete with everything except the radio, for considerably less than the cost of an R/C engine used in more common larger designs. Construction is straightforward, and the resultant aircraft is strong enough to be considered a good trainer.

Does this all seem too good to be true? Must it defy the laws of aeronautics? No, it is the result of defying the traditional concept that a bigger airplane with a more powerful engine generates a more desirable aircraft, and therefore more flying fun.

This design, like many of the new breed of 1/2 A powered racing and sport aircraft, combine small, lightweight airframes, high performance engines, and one of the new subminiature digital radio systems. The aircraft that results is considerably different from the rudder-only training and sport aircraft that were so common in this size range in the past decade. Most of this difference is due to state-of-the-art improvements in digital proportional systems, especially the new 2 and 3 channel radios with the receiver and two servos in one crash-resistant package.

If you're just beginning in R/C, and you're looking for something more than just a rudder-elevator trainer, Super Chip would be a good step up. It is capable of exciting performance without the expense of larger aircraft and engines. For you experts, there is enough competition potential in this new small racing class to satisfy the most proficient flyer. This particular design can put you right up there in the winners circle. When not racing, Super Chip makes an excellent sport pattern ship for that little flying field close to home. As for me, I just think she is a cute little ship, and fun to fly.

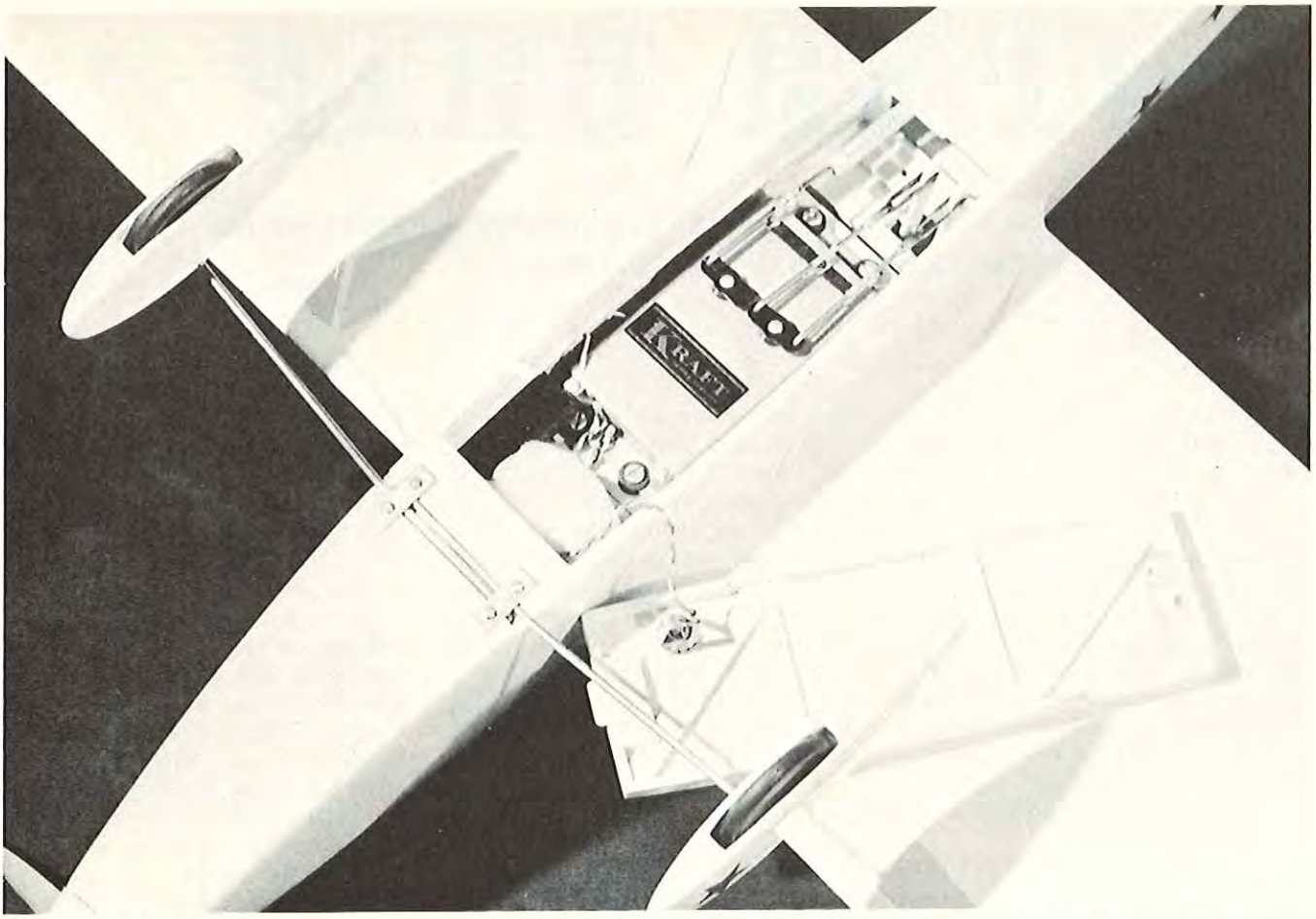
Super Chip was designed after a full season of experience flying in 1/2 A races sponsored by the Aeroguidance Society, Inc. I raced a kit Junior Falcon modified to resemble the shoulder wing Miss Cosmic Wind. Flying with rudder and elevator control, it was a satisfactory racer. I felt that its aerobatic potential, however, was limited. The new design had to retain the scale-like appearance of the Miss Cosmic Wind, but must have

ailerons for smoother aerobatics, a much stronger but lighter wing, better longitudinal weight distribution, and be as aerodynamically clean as practical. A search for a full size shoulder wing racer with a constant chord wing turned up many cassutt versions, the Bonzo, the Buster, and other often modeled designs. While looking through "Racing Planes Guide" by Joe Christy, I spotted a photo of Ned Kensinger's Tater Chip design. Raced by Jim Rice at Fort Wayne in 1956, this design met all the requirements. Another good photo was found, and off to the old drawing board. The rudder shape was altered to move the center of vertical area rearward, but the modified design still had the sleek lines of old number 88. Because of the more modernistic tail shape, I named the new racer Super Chip.

A one-piece shoulder wing design, utilizing a belly hatch for access to the radio gear, had been used with considerable success on the earlier Miss Cosmic Wind, and these features were retained on the Super Chip. This one-piece design makes perfect alignment much easier, promotes a rugged but lightweight structure, and really protects the radio in event of a mishap. The Miss Cosmic Wind is still racing after hitting two wood pylon poles and a snow fence, so the latter feature was a little over-tested! Also, aileron linkages are somewhat easier to design and install if the wing and fuselage stay together. When using the two channel brick-type radio systems, this becomes even more important. To eliminate the lack of torsional rigidity common in wings of smaller aircraft, diagonal ribs were used in conjunction with fore-and-aft closed D-tube sections. Sufficient space was made available between the D-tubes to mount most radio gear, thereby providing maximum survivability for these expensive components.

Drag reduction was enhanced by keeping all control horns and linkage inside the slipstream, incorporating a spinner, and by extensive use of fillets around the wing, canopy, and tail surfaces. Narrow wheel pants were used for good looks and drag reduction on the removable torsion-bar landing gear, and have yet to cause a nose-over in the thick grass of local flying fields. If in doubt about the wheel pants, build an extra set of landing gear without pants for practice flying.

With the hot Cox Tee Dee .049 providing plenty of reliable go-power, the little ship has been a delightful



View showing hatch details and Kraft brick installation. Note how radio rests inside the wing structure, and ease with which the aileron connections can be made. Tab on hatch leading edge fits into former behind landing gear while screw holds down rear. Wire and plug is for battery charging without removing hatch. Fillets add strength, reduce drag.

performer. Power off, the light wing loading becomes apparent, as Super Chip glides like a single-channel trainer. All of my design objectives have been met or exceeded. If these objectives are similar to your requirements for your next project, then clear the workbench and let's go.

Construction of the model is quite conventional, although there are a few techniques that have been used to save time and assure alignment. I've tried to include sufficient detail such that most beginners will have a good chance of success. Use soft contest balsa throughout unless otherwise noted. In a small aircraft such as this one, you can afford to be more selective, choosing the right piece for the job.

WING

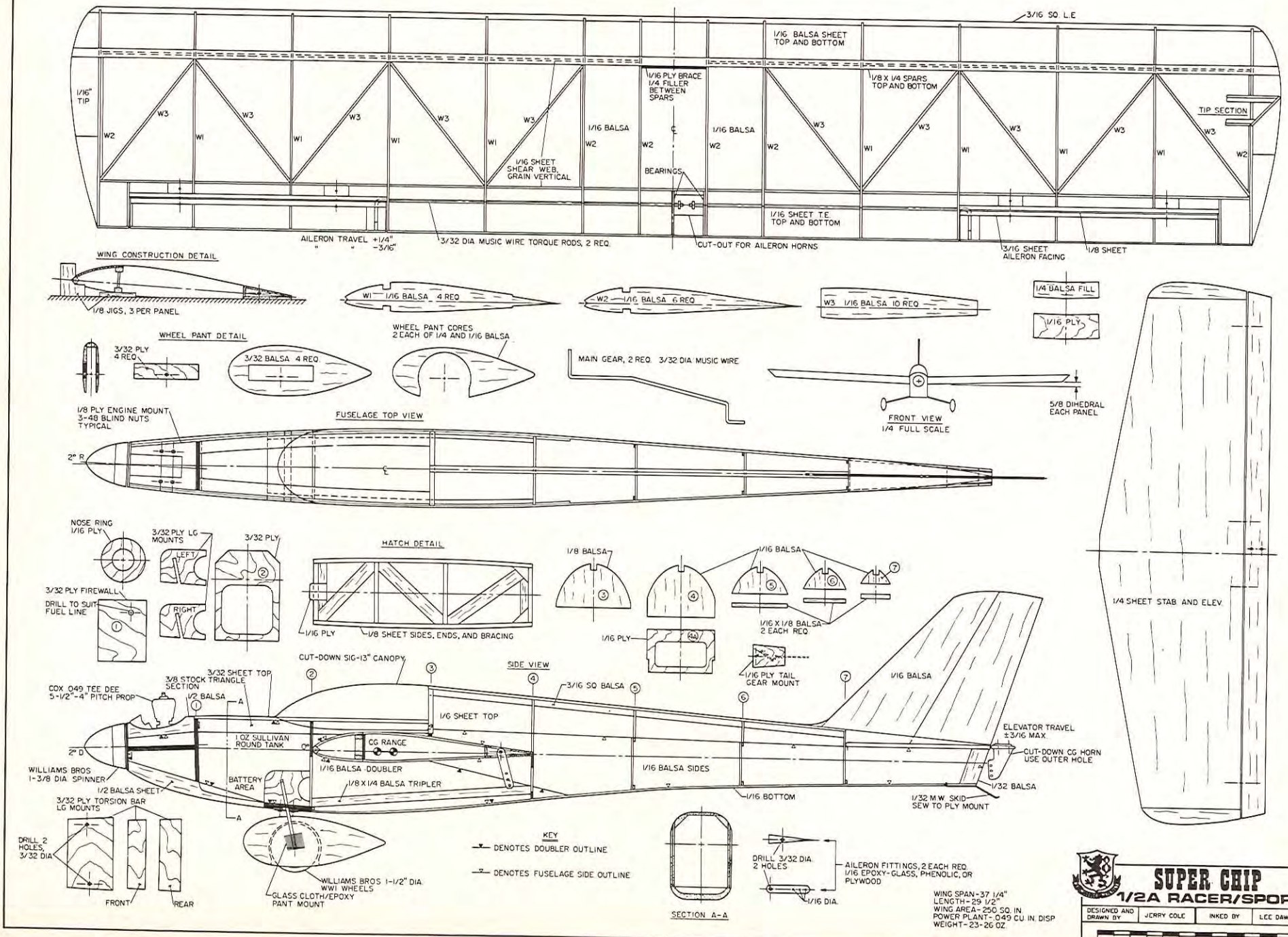
As stated earlier, the wing is really only two closed D-tubes, running from wing tip to wing tip, with both conventional and diagonal ribs between them. This type of structure is really rigid, so build it straight the first time. You'll find a straight wing is easy if 1) you use a really flat building board, and 2) you use jig pieces similar to those shown on the plan. Cut six leading edge jigs from 1/8" hard balsa or plywood, using a jigsaw or bandsaw, if available. Be sure they are exactly the same. Tack glue or pin them, equally spaced along each wing panel, over the plan. Do the same with some 1/8" thick balsa shims at the lower spar location. The result, shown in the Wing Construction Detail on the plan, is a quick but accurate wing jig.

Cut out all of the wing components. Leading and trailing edge sheeting is cut from 2 sheets of 1/16" by 3" soft balsa, preferably 48" long, saving the leftover sheet for the ribs. Spars are 1/8" by 1/4" medium hard balsa, and the leading edge 3/16" square hard balsa. Note that the top spar extends beyond the end of the tip rib, all the way to the tip outline. It is used to support the wing tip sheeting during those vertical three point landings (wing tip, propeller spinner, and the vertical fin, in that order). Wing shear webs, grain vertical, run between the wing spars and between the top and bottom trailing edge sheeting. These webs complete the structural D-tubes, and thus increase wing strength far beyond what their small size and weight may indicate. Cut a 10" long piece of 1/16" balsa sheet to the proper width, and slice off the required number of shear webs for both locations, all at once. You may notice on the plans that I did not cut a hole in the ribs for the aileron torque rods until after the ribs were glued to the bottom trailing edge sheet. To do so before this step might weaken the ribs enough to complicate assembly.

Actual wing construction is quite easy, once all the parts have been cut. Tack glue or pin the leading edge in position in the jig blocks. Pin the lower spar and the trailing edge sheet in place on the building board, with the spar shimmed up 1/8". Start assembly with the tip ribs, omitting the diagonal ribs until later. Glue a rib in place, followed by the spar and trailing edge shear webs, then another rib, etc. If you're off a little when you get to the center, I won't tell. The center section sheeting will cover it up anyway. The upper spar is added next, followed by a break to let the glue set.

As suggested earlier, now is the best time to cut the clearance holes for the

To Page 68


3/16 SQ. L.E
1/16 BALSA SHEET TOP AND BOTTOM
1/16" TIP
W1
W2
W3
1/16 PLY BRACE 1/4 FILLER BETWEEN SPARS
1/8 X 1/4 SPARS TOP AND BOTTOM
TIP SECTION
1/16 BALSA
1/16 SHEET SHEAR WEB GRAIN VERTICAL
BEARINGS
1/16 SHEET T.E. TOP AND BOTTOM
AILERON TRAVEL +1/4" -3/16"
3/32 DIA MUSIC WIRE TORQUE RODS, 2 REQ.
CUT-OUT FOR AILERON HORNS
3/16 SHEET AILERON FACING
1/8 SHEET
WING CONSTRUCTION DETAIL
1/8 JIGS, 3 PER PANEL
W1 1/16 BALSA 4 REQ
W2 1/16 BALSA 6 REQ
W3 1/16 BALSA 10 REQ
1/4 BALSA FILL
1/16 PLY
WHEEL PANT DETAIL
3/32 PLY 4 REQ.
3/32 BALSA 4 REQ.
WHEEL PANT CORES 2 EACH OF 1/4 AND 1/16 BALSA
MAIN GEAR, 2 REQ. 3/32 DIA MUSIC WIRE
FRONT VIEW 1/4 FULL SCALE
5/8 DIHEDRAL EACH PANEL
1/8 PLY ENGINE MOUNT 3-48 BLIND NUTS TYPICAL
FUSELAGE TOP VIEW
2° R
1/4 SHEET STAB AND ELEV.
NOSE RING 1/16 PLY
3/32 PLY LG MOUNTS
LEFT
RIGHT
3/32 PLY
3/32 PLY FIREWALL
DRILL TO SUIT FUEL LINE
HATCH DETAIL
1/16 PLY
1/8 SHEET SIDES, ENDS, AND BRACING
1/8 BALSA
1/16 BALSA
1/16 X 1/8 BALSA 2 EACH REQ.
1/16 PLY
1/16 PLY TAIL GEAR MOUNT
CUT-DOWN SIG-13" CANOPY
SIDE VIEW
3/32 SHEET TOP
3/8 STOCK TRIANGLE SECTION
1/2 BALSA
COX 049 TEE DEE 5-1/2"-4" PITCH PROP
3/16 SQ BALSA
1/16 SHEET TOP
1/16 BALSA
1 OZ SULLIVAN ROUND TANK
CG RANGE
2° D
1/16 BALSA DOUBLER
1/16 BALSA SIDES
WILLIAMS BROS 1-3/8 DIA SPINNER
1/2 BALSA SHEET
BATTERY AREA
1/8 X 1/4 BALSA TRIPLER
1/16 BOTTOM
1/32 M.W. SKID SEW TO PLY MOUNT
1/32 BALSA
ELEVATOR TRAVEL ±3/16 MAX
CUT-DOWN CG HORN USE OUTER HOLE
3/32 PLY TORSION BAR LG MOUNTS
DRILL 2 HOLES, 3/32 DIA
FRONT
REAR
WILLIAMS BROS 1-1/2" DIA. WWI WHEELS
GLASS CLOTH/EPOXY PANT MOUNT
KEY
DENOTES DOUBLER OUTLINE
DENOTES FUSELAGE SIDE OUTLINE
SECTION A-A
DRILL 3/32 DIA. 2 HOLES
1/16 DIA.
AILERON FITTINGS, 2 EACH REQ. 1/16 EPOXY-GLASS, PHENOLIC, OR PLYWOOD
WING SPAN-37 1/4"
LENGTH-29 1/2"
WING AREA-250 SQ. IN.
POWER PLANT-.049 CU. IN. DISP
WEIGHT-23-26 OZ.
SUPER CHIP
1/2A RACER/SPORT
DESIGNED AND DRAWN BY
JERRY COLE
INKED BY
LEE DAWALD
0 1 2 3 4 5 6

THE RCM 12 VOLT STARTING SYSTEM

"Want to borrow my electric starter?"

"No, thanks, I'm doing okay."

Five minutes and several unprintable words later: "NOW do you want to borrow my starter?"

"Well . . . okay."

Twenty seconds later: "Where did you say you can get one of these? That works pretty good. Thanks!"

The point of this dialogue is that an electric starter is not a lazy mans gadget. Today, it is absoutely a vital part of the standard gear we should have at the flying field. It will save many minutes of time every time you start your engine and, with a balky mill, it is a really great asset. If your engine is capable of starting at all, an electric starter will make it run with a minimum of effort.

For some time, we have been using a single 12 volt motorcycle battery to power not only our electric starter, but to provide power to the electric fuel pump as well as providing the proper voltage to the engine glow plug . . . all from the single 12 volt source. In this article we'd like to show you these ideas submitted by Bill Thomas, Harold Jackson, Mike Miles, and Ray Davis of Model Engineering of Decatur, Georgia. All of these ideas have been combined into a single system many months ago and have proved extremely reliable in actual field usage. So if you want to save space and weight in your field box, as well as providing yourself with a reliable and complete starting system from a single 12 volt battery, this method is for you.

First, we suggest that you purchase a new 12 volt motorcycle battery such as the GS12N5.5-3B (MG3-12E) available from virtually all motorcycle shops that handle Japanese motorcycles. This battery measures 5¼" long x 5" high x 2¼" deep and weighs approximately 4½ pounds. Priced in the $10.00 and under price range, it is also extremely compact and will fit in even the smallest field box. While you are at the motorcycle shop purchase a 6-12 volt battery charger such as a Norko Battery Charger which charges

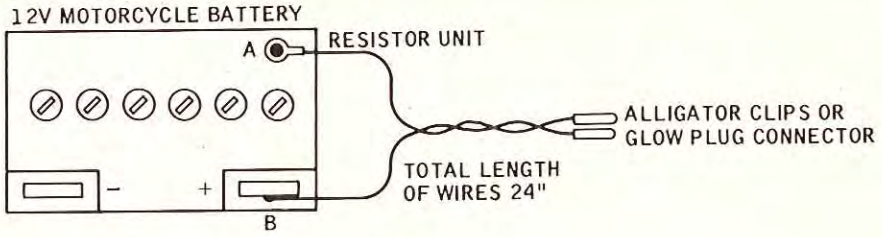
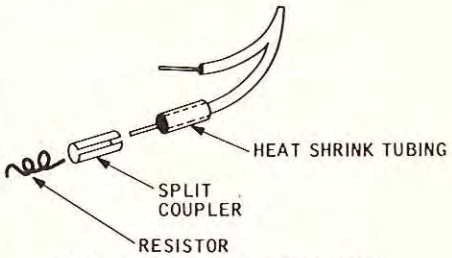


FIG. 1

6 and 12 volt batteries at one amp. This is Model Number 11612 as manufactured by the Schauer Mfg. Corp., Cincinnatti, Ohio 45242. Priced at approximately $10.00 this small charger will provide an excellent occasional overnight charge for your motorcycle battery in order to maintain maximum charge and thus provide maximum torque for your electric starter.

The next step in the 12 volt starting system is to obtain the Model Engineering Dropping Resistor from Model Engineering, 3655 Calumet Rd., Decatur, Ga. 30034. This unit is priced at $1.00 and, when it's properly attached to your 12 volt battery, will provide the proper voltage for your glow plug clip. After obtaining the Dropping Resistor, drill a small hole as shown at point A in Figure 1, so that a self tapping sheet metal screw or a 4-40 bolt may be screwed into the lead connector strap which is visible at the rear of the battery. Hold the battery up at eye level with the terminals away from your face in order to see and locate the lead connector strap. The latter will be visible at the top of the battery plates. Be absolutely certain that you do not drill into the battery plates as shorting will occur and ruin the battery. Connect one lead to the battery terminal at point B and screw the resistor unit with the other lead to the battery at point A. The resistor unit is assembled by putting the heat shrink tubing over the wire to be soldered to the resistor unit, then inserting the wire into one end of the split coupling and straight wire on the resistor unit into the other end of the split coupling. Solder together. As soon as cool, slide the heat shrink tubing over the split coupling until it touches the resistor unit. Heat with a match until shrinkage of the heat shrink tubing occurs. The wires from the resistor unit to your glow plug clip should be 24".



ASSEMBLY OF MODEL ENGINEERING DROPPING RESISTOR

FIG. 2

If you prefer to use a separate glow plug battery, such as a 1.25 volt nickel cadmium cell, here is a method that will overcome the short-lived starting battery and low voltage nickel cadmium cells. Mount your 12 volt battery in your field box and run a short length of wire from the plus side to a switch and, from the switch, attach a 25 watt resistor in the line that will terminate in an alligator clip. From the minus side of your 12 volt battery run a straight wire which will terminate in an alligator clip and attach to the negative side of your glow plug battery. Now, as you load up the car ready to go flying, turn on the switch and keep it on until you are ready to head for home at the end of the flying session. This simple circuit provides a continuous charge to your nickel cadmium glow plug battery during the 3 to 4 hours that you are at the flying field. It also provides a voltage to the glow plug that is from 10 to 25 percent higher than without this connection. Although this will work extremely well with a single "D"

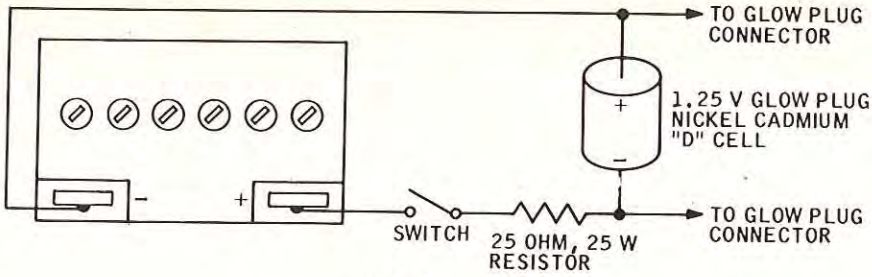


FIG. 3

size nickel cadmium cell and will provide approximately 400 to 500 milliamps charging current, keeping the cell in a continuous "ready" condition, this circuit will work equally well for the "liquid-in-plastic" high current nickel cadmium glow plug battery by dropping the resistor to 20 ohms.

For the electric fuel pump we use a Nifty Electric Fuel Pump from Sonic-Tronics, 8042 Craig Street, Philadelphia, Pennsylvania 19136. This unit will operate quite efficiently at 6 or 8 volts. All that is required is to drill and tap for a 4-40 bolt at point C as shown on the sketch. Run one lead from the fuel pump to that connection point and the other to the plus side of your starting battery. This will eliminate the need for an additional battery to power your electric fuel pump.

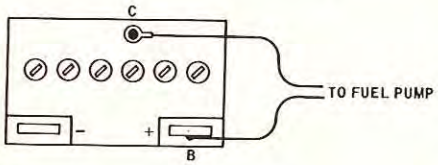


FIG. 4

With regard to the electric starter itself, we have used both the Sonic-Tronics and the Penford Starter with equal success and they have both proved extremely reliable over two years of operation. If, however, you want to construct your own starter here is an inexpensive yet an effective way to construct your own with a little bit of work and experimentation. First, go to any auto junkyard and buy the electric heater or defroster motor out of virtually any car. Most yards will charge 50 cents or a dollar for this type of motor. Be sure that you obtain one that utilized a 12 volt electrical system. You will find that the majority of these used motors have a "T" shaped fitting on the drive shaft. The original purpose of the fitting is to connect a fan or blower. If you obtain this fitting, it is an ideal device for mounting the rubber connector which will drive the spinner when you are using the motor as a starter.

After obtaining the motor, go to a hardware or plumbing store and buy a rubber female connector of the type used to connect hoses to water faucets. In other words, the kind you'd use if you wanted to connect a hose to a wash tub in a basement. You'll find that most of these rubber connectors have a different size opening at either end. One end (the end normally connected to a hose) will fit exactly over the T-shaped fitting on your newly acquired junk motor. The other end will fit any model airplane spinner and will even fit over a plain AMA prop nut.

The connector is easily mounted over the fitting. If you take the fitting along with you when you buy the connector you'll be able to find one which is a tight fit over the fitting on the motor. Secure the connector on the fitting with an old fashioned hose clamp. This works fine, although it does create a slight vibration, since the screw on the clamp causes an out-of-balance condition. This is no problem, but you may find a way to secure the connector without inducing vibration.

Next, stop by your local electrical supply store and buy a normally-off push button switch. Drill a hole in the motor case and mount the switch in such a position that you can depress it with your thumb turning the electric starter on. You will find that there are some motors which revolve in the wrong direction for engine starting but this is easy to correct. Simply rotate the housing in the motor 180 degrees then button up the case and you'll find you are operating in the proper direction.

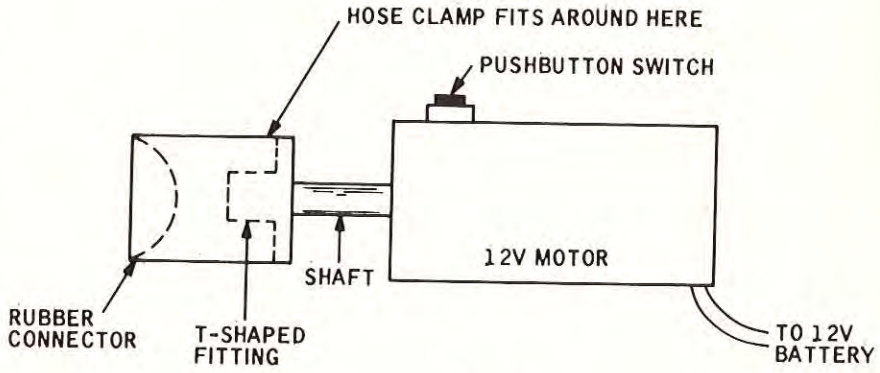


FIG. 5

If you've obtained a motor with a standard shaft and no fitting you will find that a 1¾" hole saw obtainable at any hardware store is a perfect housing for the surgical rubber rings which are sold as accessory items in most hobby shops and by the manufacturer's of electrical starters. If you do not have a shank, a brass plumbing fitting will thread into the hole saw. Be sure to grind away the teeth on the hole saw

To Page 64

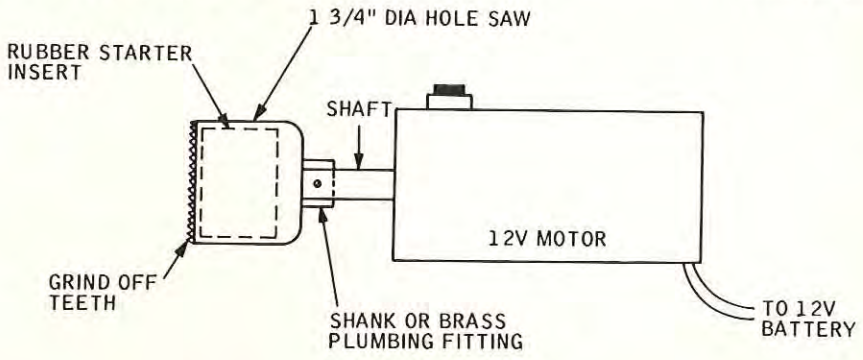


FIG. 6

RHINEBECK 1971

BY BERNIE MURPHY

Harold Penny's 3" scale Nieuport 17 used O & R Compact engine, weighed 12 lbs., 11 oz.

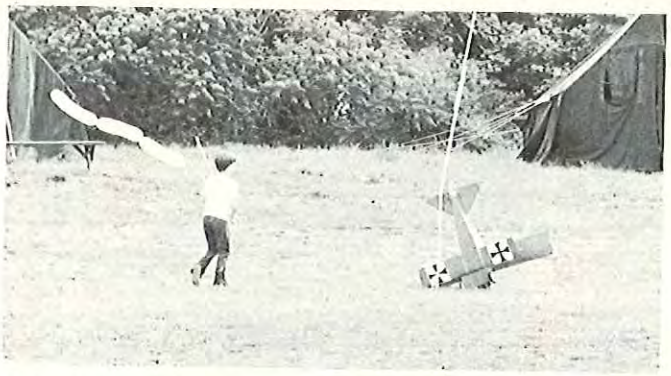
As this is being written, the '71 Rhinebeck Jamboree is but a memory, having been delayed because of the time and space required by the R/C World Championships.

As always, this years World War 1 Jamboree was another of R/C's great events. Each year this scale spectacular sees more entries, together with more spectators. It is, by far, the largest, for an event of this type, with 104 entries this year, and with paid attendance in the thousands.

For those of you who may not be familiar with the Rhinebeck WW 1 meet, it is designed with one prime objective, to recreate the spirit of early aviation via R/C building and flying. All entries **must** be scale models of aircraft built and flown prior to 1919. Four different events are flown, and the contestants may enter any or all events. The events are Scale, Maneuvers (modified pattern consistent with WW 1 aircraft), Mission, and Combat. The Mission event involves the accurate dropping of a bomb on a target, the bursting of an 'observation' balloon, finally landing within a given area. The Combat event is a team effort, with the goal being to simulate, as realistically as possible, aerial combat between two WW 1 military ships. Scoring is based on realism, speed, firing passes and evasive action, and overall presentation.

As has been the case each year, the weather was near perfect, although the entire East was being deluged with heavy rains, raining almost constantly within ten miles of the field! The overcast did help to cut down the sunburn which usually plagues us for a week following the meet. Saturday's flying was begun at 8 A.M. and lasted until about 6 P.M., while Sunday's lasted only from 8 A.M. till 2 P.M. During this time, a total of 355 scored flights were flown, so you can see, there was a lot of action. Following the R/C meet, Cole Palen, who owns and operates the "Old Rhinebeck Aerodrome" where the meet is held, treats all to his spectacular WW 1 show. This is, in itself, well worth the trip to Rhinebeck. Each year we have seen the Palen 'Air Force' grow, until now it is a sizeable force. Here you can actually see the old Fokkers, Spads, Sopwiths and Nieuports, not in a museum atmosphere but rather in their natural surroundings – in the air, in combat. These shows are staged every Sunday afternoon during the Summer so if you can't make it for the meet, try to plan a trip into the area next Summer, with a stop at the Aerodrome. We know that you will long remember **that** afternoon!

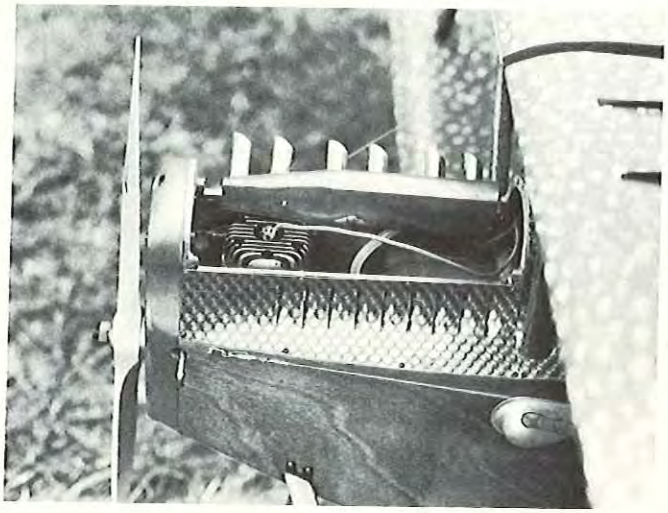
The meet itself seemed to suffer somewhat this year, not from an entry standpoint, but rather from the administration end of the operation. It appears that success could spoil



LEFT: Close-up view of cockpit area detail in Penny's magnificent Nieuport. ABOVE: Mission event can be disastrous! You're supposed to break the balloon!

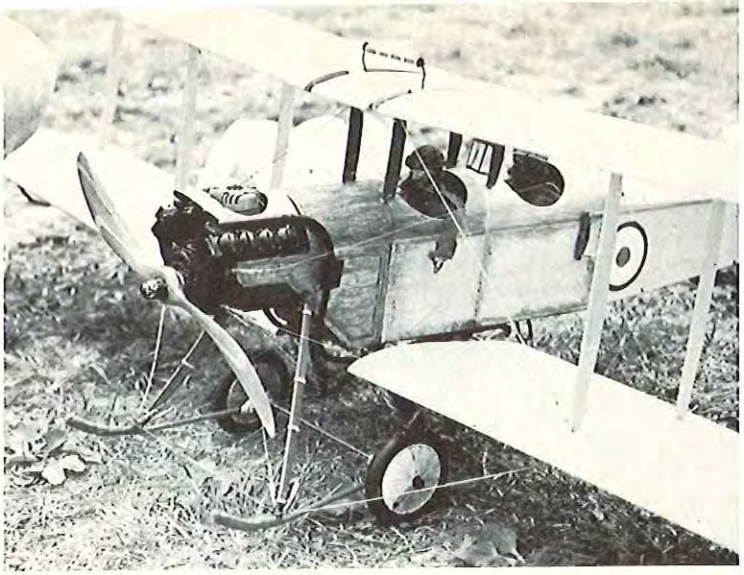
Frank Knowles and VK Nieuport 17, 1st in maneuvers again! A tough pair to beat.

Nick Ziroli and Karl Collins check out Eindecker E III.



LEFT AND ABOVE: Photos of Josh Titus' S.T. .60 powered Ansalvo SVA 5. 8¼ pound model guided by Kraft radio.

Rhinebeck unless some policy changes occur in the near future. An entry list of 104 contestants entered in four events and flying in a rather limited space must necessarily create problems, and as the entries increase, so do the problems. In general, the contest management carried out its job with unusual efficiency, but there is a limit to everyones capabilities and mistakes do creep in. We at RCM are proud of the accomplishments that have been made at Rhinebeck and we are happy to have been able to take part and to be represented from its very inception. There is a very warm spot in our hearts for the many new freinds that have been made there and the pleasant times that have been shared. We anxiously await next years Jamboree. We hope that the contest committee



ABOVE: Howard Griffith starts up Spad 7 for official flight. RIGHT: Hansel Hall's Bleriot BE2; S.T. .60, Kraft.

Bob Wischer with Sopwith 1½ Strutter.

Jim Martin's Jenny JN4 taking off.

Leon Schulman and Nieuport 28.

From Page 41

will weigh the situation carefully and openly consider the complaints and suggestions that were voiced to them. The Rhinebeck Jamboree must continue! It must continue for all – with equal opportunity to participate and with the same rules for everyone – no exceptions or unannounced changes! We believe that ALL models should be **required** to meet some minimum 'scale' qualifications before being considered as an entry. This is within the stated intent of the meet and would serve to hold the number of qualified entries to a controllable level.

In any event, we WILL be at Rhinebeck again next year. It is probably the most enjoyable R/C weekend of the year. A trip through the photos may give some idea of the activities, but nothing can show the true picture of this Jamboree – you must be there to sense the drama, the thrill and the romance that is RHINEBECK. It is truly beyond description. See YOU there! □

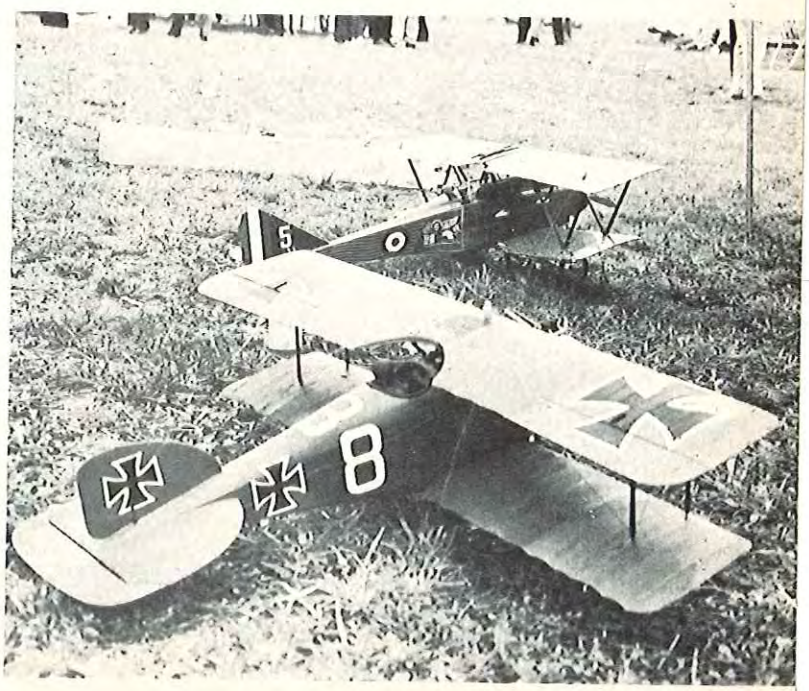
Bob Temple's Nieuport goes into the sod. Did Leon Schulman, in foreground, really use live ammunition on Temple's Nieuport?

VK Prototype Sopwith Camel – could be next kit from VK factory!

Howard Griffith and Spad 7 – first ever entered at Rhinebeck.

Schulman's Eindecker and Bob Temple's Nieuport 17.

Schulman and Temple in combat.



ABOVE: Combat – a wild show! These two finally had mid-air collision. In this photo, Jim Martin's Jenny is about to pull a quick Split-S to avoid being shot down by Dennis Donohue's Eindecker. RIGHT: An unidentified Albatross evidenced the highest quality scale craftsmanship.

One modeler's solutions
to various problems encountered
in R/C. Maybe you'll find the solution
to an unanswered problem
in this article on

HOW TO....

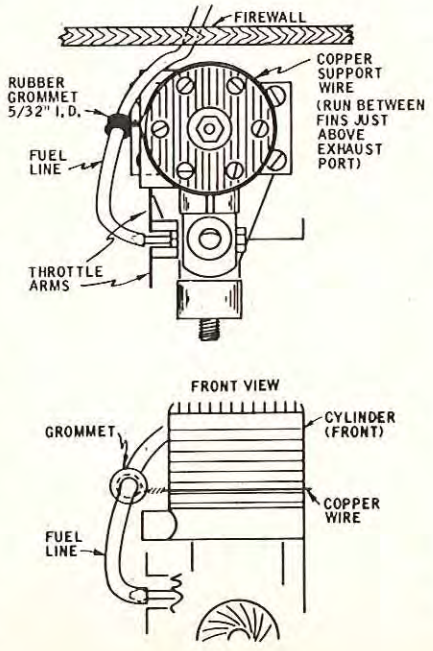
BY STEPHEN A. HACKNEY

I have always wondered how a modeler could take the time to sit down and write out all of the ideas that he has had to use in his particular installation. I say, "had to use," because R/C Modeler Magazine is full of inquiries from modelers asking "how to do this or that," or "why does so and so do this?" Instead, I have, in the past, asked someone in the local area about a problem that it seemed he had solved. Or, alternately, I just sat at my work table and doodled until I found a usable solution. Of course, the "For What It's Worth" column in RCM is of great value, but more often than not, I only found other peoples solutions to their own problems.

As I showed up at club meetings and the flying field with my own small inventions or, should I say, "stolen solutions," usually someone would say, "Why don't you send that idea in to RCM?" Well, back in those days I was too busy to even think about writing something down; I always had a wing to cover or a new kit to start. Now, I'm not writing because I've stopped building RC paraphernalia and, in fact, I'd like to finish the newest project that sits in front of me. But after a tangle with a .60, my best two building fingers are a little stiff with the stitches, Band Aids, etc. My respect for the tips of a twelve inch prop turning 10,000 rpm has increased immensely! Besides, my flight surgeon warned me not to play with knives for at least two weeks.

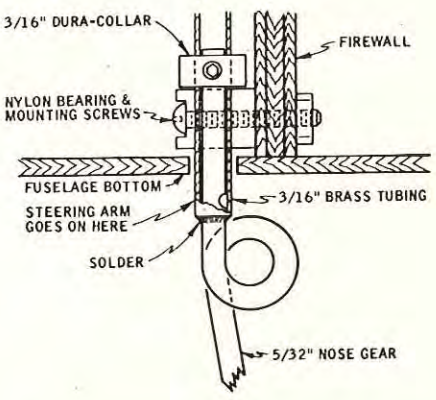
So, for the first time in ten years, I find myself in a perfect position to complete a little overdue paperwork. So, here are a few ideas that I have developed or borrowed, but have not seen in RCM. Most of the ideas were developed out of necessity for a special situation, and progress to ideas that try to improve on readily available parts and proven installations. I will list the items and try to give a short explanation of why I tried each.

I'm sure a lot of Super Tigre fans remember the throttle with the straight-through spray bar. I guess it was about two or three years ago that this thing with the fuel nipple on the right side, centered between the opposing arms, first came out. The problem seemed to be to keep the fuel line away from the throttle pushrod and the hot exhaust to prevent tangling or melting of the fuel line. With the pre-mag throttle, the fuel line and throttle arm were on the same side of the throttle. As shown in the sketch the fuel line is routed above the exhaust port to prevent overheating the fuel being fed to the engine. An insulating rubber grommet supports the fuel line. This grommet is connected to the cylinder by using stiff copper wire which runs around the cylinder; is twisted, and then wrapped around the grommet in the groove.



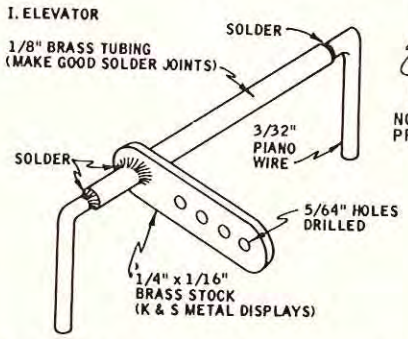
This support can be adjusted to almost any direction to route the fuel line clear of the exhaust baffle and throttle arms in the shortest direction. It proved itself with a Super Tigre .56 inverted in a Lanier P-51. The idle was reliable and the top end was not lean. The same idea would work for virtually almost any engine.

Last summer, after about 3 months of flying time on a Lanier Apache (that's about 10 gallons of fuel for me) I started going through $2.00 worth of props a day! The reason was that the nose gear had weakened and the ply bearing in the bottom nose had worn out. In fact, many steerable nose gear installations call for the gear to be put on the front of the firewall, below and behind the engine. It then becomes necessary to put the steering arm outside the fuselage just above the coil on the gear. Joe Bridi's Sun Fli is an example. Usually a notch is filed into the gear to hold the set screw to the steering arm. After many hard touch-and-go's, the gear begins to weaken and bend backwards. This can be strengthened by slipping a length of 3/16" brass tubing over the gear and soldering. In this fashion, the gear is strengthened many times over. Of course a 3/16" drill must be run through the nylon bearing blocks in the fuselage bottom. However, going to this larger size bearing surface allows you to reposition the axis to the gear slightly and true-up the holes. This method works well in Lanier aircraft where the distance from the plywood bearing to the coil is large and bending in this area has proven to be a severe problem. Lengthening of the gear is also practical in this same fashion.

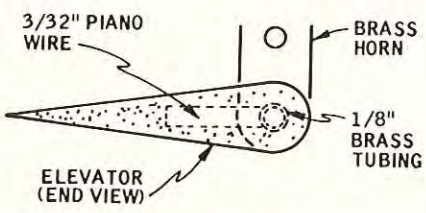


Have you ever tried to decide where to put the compression damage on a nicely painted elevator with a screw-on control horn? Well, why put even the

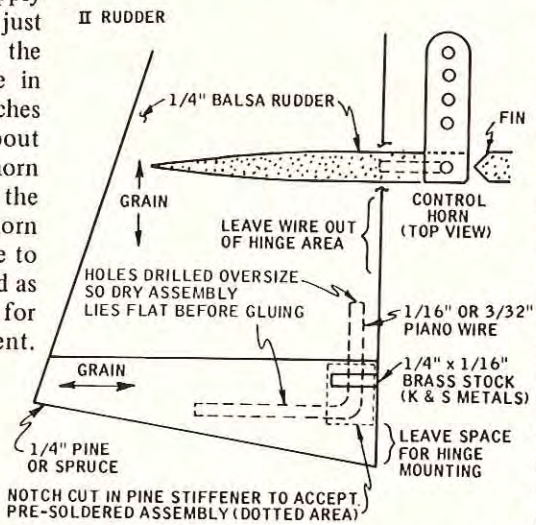
smallest scratch on your precious paint job? Make a 3 cent control horn out of brass stock, solder to the yoke you've made especially for your elevator and you will obtain a strong, functional, custom made assembly. This method precludes the possibility of a nylon horn breaking, which has happened frequently to some of the club members here in Pensacola. Also, no hard wood is needed to support the nylon type horn and no unsightly screws or a backup plate is needed. K & S has had the foresight to supply an excellent variety of metals in just about every shape and size the modeler could use, and available in virtually every hobby shop. 12 inches of their 1/4" brass stock costs about 20 cents. Say 1-1/8" for each horn made is quite a savings over the specially made nylon types. This horn can be soldered at the desired angle to the elevator, then can be positioned as close to the empennage as needed for the most efficient pushrod placement.



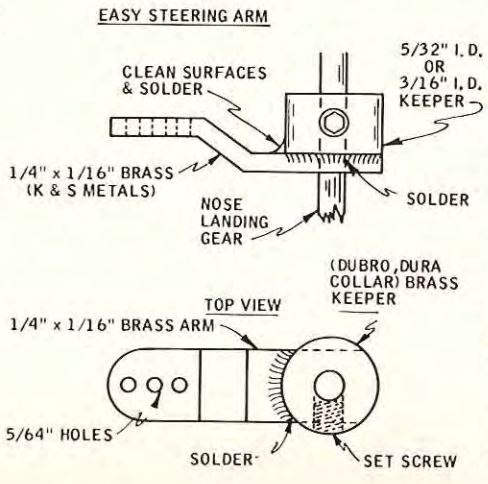
A notch is cut in the elevator half to accept the horn and the entire assembly is epoxied as close to the axis of the elevator as possible. A good trick to use when joining elevator halves with this method is to drill oversized holes in each elevator half (about 7/64" diameter) so that if the two 90 degree bends you have made in the 3/32" wire do not line up perfectly, you will still have a true elevator after taking out the pins. The oversized holes are packed with epoxy which will not soak into the wood.



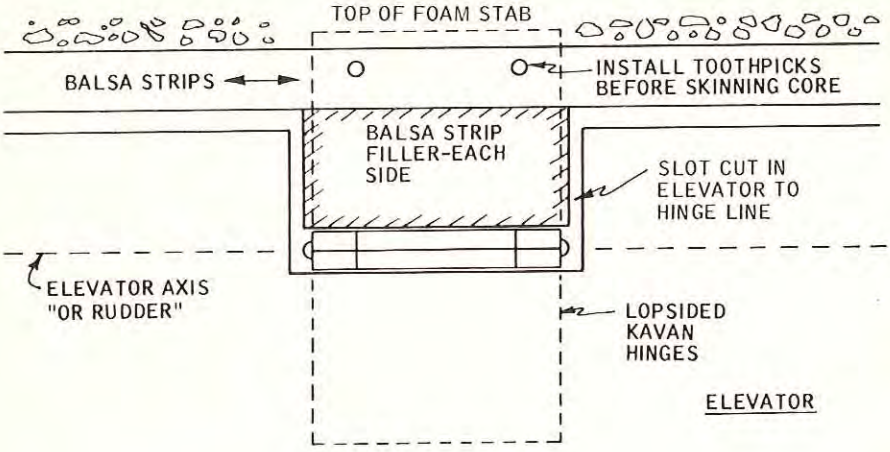
You can also make an easy control horn for your rudder by examining the sketch attached. This assembly is built right on the rudder, removed and soldered, then the entire rudder is assembled with one batch of epoxy glue or putty. Conap Easy Poxy is excellent for this filling as it does not run, bonds to everything except nylon and holds dope without priming. All horns soldered this way should be checked for about 10 pounds test before installing to preclude having a cold solder joint and possible failure of the horn. The result is extremely clean, strong, and provides an economical control horn setup.



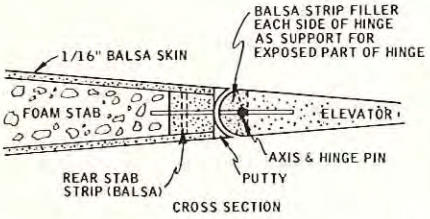
The easy steering arm was developed to get the right amount of nose wheel movement. Also, I was perplexed about how to get the set screw pointing in the direction of the Allen wrench when installed. I found that, by making a little sketch of the proposed nose gear area, I could determine the moment arm and the direction from which the Allen wrench would approach. This information let me know how long to make the arm; whether to solder the Dura-collar on the top or bottom of the arm, and in what direction the set screw should be put. I believe the extra hour spent in the planning and fabricating of this arm was made up over and over again in the ease of installation and accessibility obtained. This arrangement presents an unlimited number of possible shapes and sizes. The arm can be soldered to be above or below the keeper. It can also be left straight or bent to the center of the keeper as shown in the sketch. The set screw can be placed anywhere through 360 degrees to allow for easy access in your own installation. This presents a method whereby you can make a steering arm which will do the best job possible for you without trying to modify the limited number of shapes and sizes on the market. You could also put the arm off-center for operation close to the firewall. Since there are many good nylon pushrod connectors available, metal-to-metal noise is no problem. The Carl Goldberg Mini-Links are almost as small as the outside diameter of the Pylon Gold'N Rods making for a clean, no-slop, gratifyingly good looking hookup. Before soldering, however, the cadmium plating on the 5/32" keeper should be sanded off to make the strongest solder joint. 5/64" holes were drilled in the arm, thus decreasing friction of the Mini-Link without showing any appreciable slop.



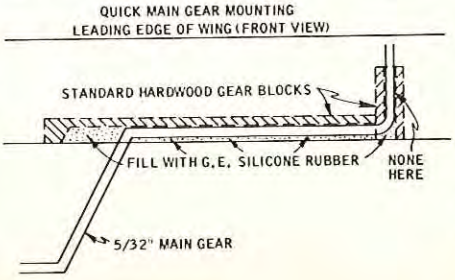
I think I have pre-flighted a couple of hundred T-28 Trojans since I started flying for the Navy. Everytime I look at the control surfaces, I think of why the hinge axis is within the control surface itself. I can see that the rudder and elevator have a slight overhang forward of the hinge line. This, I understand, is supposed to decrease stick pressure at high deflections of the surfaces. Also, sheet fairings extend from the stab and fin to where they almost touch the rudder and elevator. These are supposed to cut down the form or parasitic drag, I suppose. So, I think, if this construction helps this overpowered beast do acrobatics maybe it could increase the effectiveness of controls in an RC contest ship. So with the help of the Kavan "lopsided" hinge, I present my version of standoff hinges showing how the hinge line can be almost faired out of sight. By extending part of the long side of the Kavan hinge beyond the backside of the stab, the hinge pin can be placed on the axis of the elevator if you wish to add some "overhang aerodynamic balance" to the elevator, thus decreasing drag on the servo, the hinge can be extended further to the rear. But, with the hinge



pin on the elevator axis, you can all but hide the hinge line. The Kavan hinge fairings can be installed or putty, such as Sig Epoxolite or Atlas Epoxybond, can be stuffed into the groove with Saran Wrap or Handywrap covering the elevator. The elevator is temporarily placed on the hinges which are previously epoxied to the stab and taped into place. After the putty hardens, the elevator is removed and a 3/8" piece of dowel with 240 grit sandpaper is used to sand some clearance into the fairings. Slots for the sturdy Kavan hinges must be cut with an X-Acto pointed razor saw to get enough clearance (about 1/32").



Did you ever get ready to put the finishing touches on a kit just to find that you have misplaced some of the hardware? I mean, what do you do when there are no straps to be found to hold in the main gear wire? While jointly building a Sun Fli 4 last Fall, a friend and I were contemplating the test flight when the straps were discovered missing. We wanted to get in more than one flight the next day and where could 4 straps hide in an 8' x 8' room filled with 10 years collection of RC junk? It didn't take long – only a few phone calls – to find that the straps were not included in the kit! Returning to the work room and picking up our cold coffee, we noticed a tube of G.E. Silicone Rubber that we had been using to install the tank. Why not? We simultaneously reached for the silicone rubber tube each getting about half of the tube and its contents. We managed to salvage enough of the compound with popsicle sticks to completely cover the gear wire and all areas within one inch of the gear blocks. This saved us the job of painting the bare wood in the vicinity of the gear blocks, and the extended feathering we had inadvertently applied, peeled away in the morning and was neatly trimmed off, leaving a smooth neat appearance. We'd had some doubts about the merit of our accidental gear installation but upon watching it closely for 3 months, no separation was noticed. Then, a few weeks ago, the transmitter turned itself off (?) and the airplane forgot everything we had taught it – a split S after a low pass? Surprisingly, the twisted main gear, though no longer part of the wing, was still firmly attached to the hardwood gear blocks. Of course, you can't replace the gear with floats in 15 minutes like you can with conventional straps, but as that fellow said in print the other day, "It's almost as good as girls." Well, with regards to that matter I can remember about 10 years ago, I wouldn't look at a girl for weeks while I installed my F & M Pioneer in my lovable Sea Cat. Fortunately, for my wife and me too, I've outgrown this problem. In fact, I see her pass the door of my work room at least twice a day!



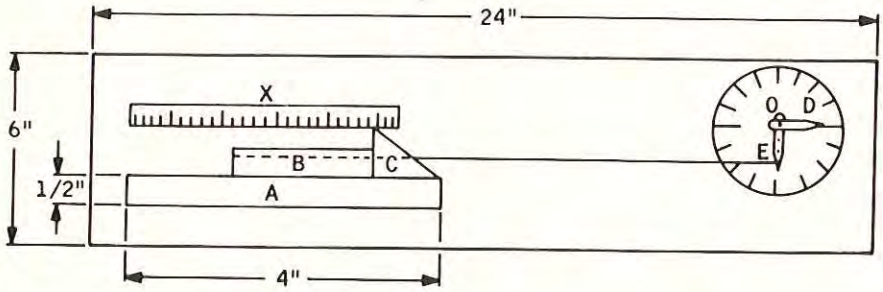
With regard to the fitting of the main gear, after fitting the gear wire to the hardwood blocks (make sure the full length of the wire contacts the bottom of the groove and the lengthwise block with no stress), put a length of Silicone Sealer over the wire to seal all cracks and generally fill any open spaces. Smooth with the finger and let dry. Be careful not to fill the vertical block hole with Silicone as this may make the installation permanent. To remove the gear, run a sharp knife along each side of the wire, cutting the sealer and lift out the gear. The Silicone can be cleaned from the gear wire with a few strokes of coarse sandpaper and the installation used again. The properties of G.E. Silicone Rubber allows the torque action of the gear to be retained while maintaining a near permanent bond between the wing and the main landing gear. Other benefits include lack of holes in the wing in the vicinity of the gear mounts due to screwdrivers slipping off retaining screws. This system has been tested in a Citron and a Sun Fli 4. The result is that after 3 months, there has been no break in the sealer and the bond is still good. As a side note, for the best possible bond, put ¼" masking tape over the gear mounting blocks while painting the wings to keep the slot clean in the bare hardwood mounts. The sealer keeps oil, water, etc., from reaching the wood.

Do you want an easier way to mount those big .60's? Do you hate to pay a dollar for four 6-32 mounting bolts? Do you curse when you find some epoxy that fouled the threads on your hidden blind nuts? Do you tighten one bolt just enough to pop off the head? Did your engine quit because the bolts vibrated loose in the air? Was one mounting hole off just enough to strip the threads as you screwed in the last screw? Does your nose run?

If the answer to any of the above is yes, you need Hackney's Wonder Mount! A proven strong, very easy, accurate and nearly permanent engine mount can be had with the long underrated panhead screw. People say: "Those woodscrews will never last; castor oil will soften the wood and the engine will fall out in your hand when

To Page 63

R/C CONTROL MOVEMENT INDICATOR



A - 4" x 1/2" x 1/8"
B - 2" x 1-1/2 x 1/4"
C - 1" THICKNESS 1/8"
1/2"

FIG. 1

This simple device has been constructed for R/C modelers. The main purpose of this apparatus is to give you a precise idea about the movement of the control surfaces with respect to the linear movement available from a particular servo.

The apparatus is very simple and easy to construct. All that one needs is a small plank of wood about 24" x 6" x ¼", some scrap balsa, a few pieces of plywood and about 1" of 14 s.w.g. piano wire.

CONSTRUCTION

The following parts are to be cut out from scrap balsa according to the dimensions shown on Fig. 1.

Two pointers 2½" long are made from thin plastic or tin. On one of the pointers (E) drill holes at measured distances from the hinge point (O) corresponding to the holes available on the horn that you have. Cement A to the plank and stick B & C together. Now, on drilling a thin hole through B from end to end, one piano wire is pushed through this hole. The other end of the wire is bent at right angle so that it can be fixed on any one of the holes drilled in E. The two pointers D and E should be bolted on to the plank so that they are free to rotate about the bolt and also so that the angle between them can be altered when required.

Taking the hinge point of D & E as the central point measure out and mark different angles on the board. A linear scale X is marked out in mm on a strip of paper and is pasted on the plank in the position shown in the sketch. This scale is used to measure the linear movement of B and C by taking the readings from the pointer.

Care is to be taken in constructing the R/C Control Movement Indicator since it will provide very accurate results, thus helping you to get the best performance out of your model.

The R/C Control Movement Indicator shows you the change in angular movements of the control surfaces for each change in the horn angle or the change in distance between the connecting rod and the central point of the control surfaces (horn length). This helps you to choose the particular horn which will fulfill your requirements.

HOW TO USE THE R/C CONTROL MOVEMENT INDICATOR

If you have a servo on which the minimum and maximum linear movements available are X and Y mm (as an example) respectively, then the corresponding movement on the control surfaces can be determined by this device. All that you have to do now is to set the pointers D and E at right angles to each other, then take the loose end of the piano wire and fix it on one of the holes in E corresponding to the horn length that you wish to use. Then on observing the reading on the scale X, the pointer C is moved by X mm in either direction.

Then the angular movements of the control surfaces can be read off by observing the change in angle of the pointer D. If a 90° horn is used the angular movements will be same in both directions.

To obtain better aerobatic performances the controls may have to be so arranged that we obtain greater movement in one direction than in the other. This is usually achieved by choosing horns having angles less than or greater than 90° depending upon the side on which you want a greater movement. Thus it becomes essential for you to know what the effect will be of changing the angle of the horn on the movement of the control surfaces. The R/C Control Movement

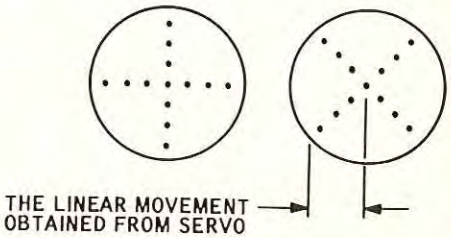


FIG. 2

Indicator is also capable of giving you a very good idea of this point. You can achieve this by changing the angle between pointers D and E. Keep the pointer E fixed and move D so that the angle between them is equal to the angle of the horn you are using in the actual model. Then you can find out the angular movement of the controls

To Page 63

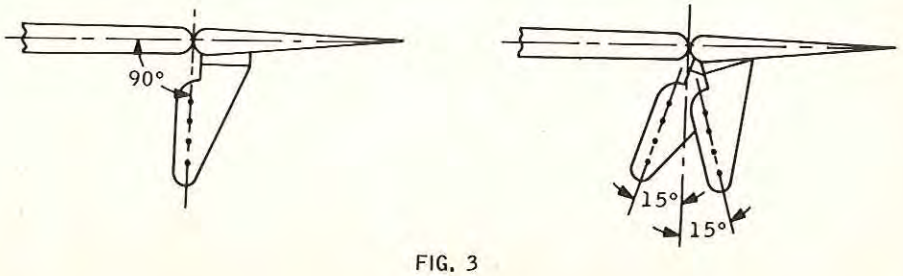
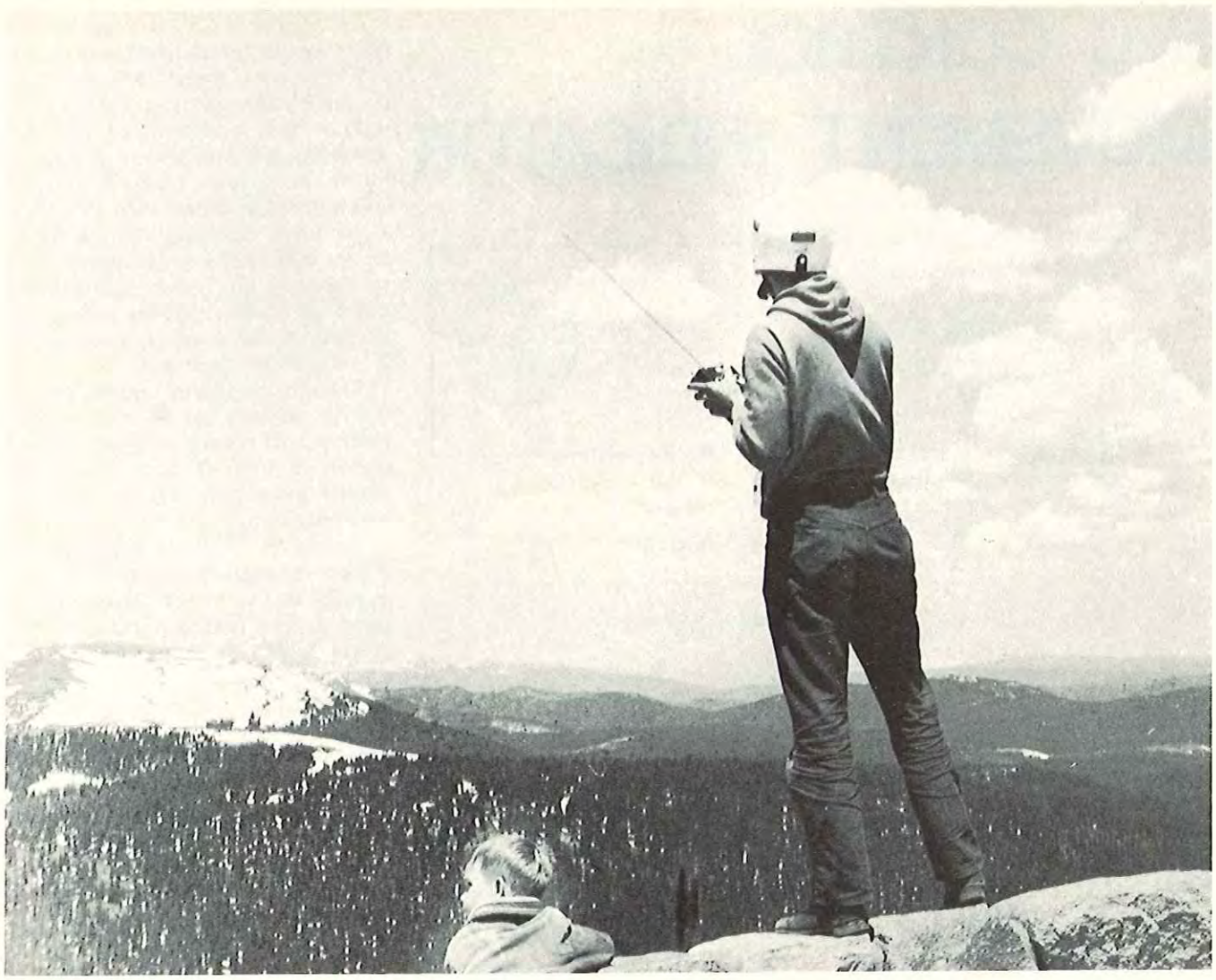


FIG. 3



Author flying sailplane out over valley near Summit House, altitude 12,000 feet plus. "Whatcha 'fishin' fer, Buddy?" "Mountain Trout." "Ain't gonna catch none in that there valley!" You have to get up early to beat out the smart alec tourists . . . .

SLOPE SOARING IN COLORADO'S HIGH COUNTRY

by dave thornburg

TWO SPORTS, MOTORCYCLING AND R/C SAILPLANING ARE COMBINED IN THIS ACCOUNT OF SOARING IN THE ROCKIES.

Photos by Jan Thornburg and Don Spellum

Soaring the Rockies! The idea was born during a midnight bull session in miserable windy January: a five-day trip through Colorado that would combine slope soaring, fishing, camping, and motorcycling. The crew was to consist of veteran Albuquerque slope soarer Don Spellum, the club's junior expert, Steve Work, my wife Jan, and myself.

Wheels-up date was set for Saturday, June 19, and everyone scheduled their vacations accordingly. With six months to design and build in, we planned to take along three of the snazziest knock-apart sailplanes in the country. Then, suddenly, June 12 arrived and all three were still in the design stage. At the last minute Don adapted folding Jedelsky-type sheet wings to one of his old standbys, a six-foot vee-tail along Standard Austria lines. Steve stayed up till 5 a.m. the night before to stick together a sturdy all-balsa original with Jedelskys and a knock-off nose. (All noses, Don keeps pointing out, are knock-off.) I hastily threw together the "Clod Nine," an all-balsa pod and boom design with those ubiquitous Jedelsky wings and

"This is the way we stow our planes, stow our planes . . . ." Clod Nine nestles in foam wing box. Transmitter is padded with foam. Wings join by wire-and-tube method.

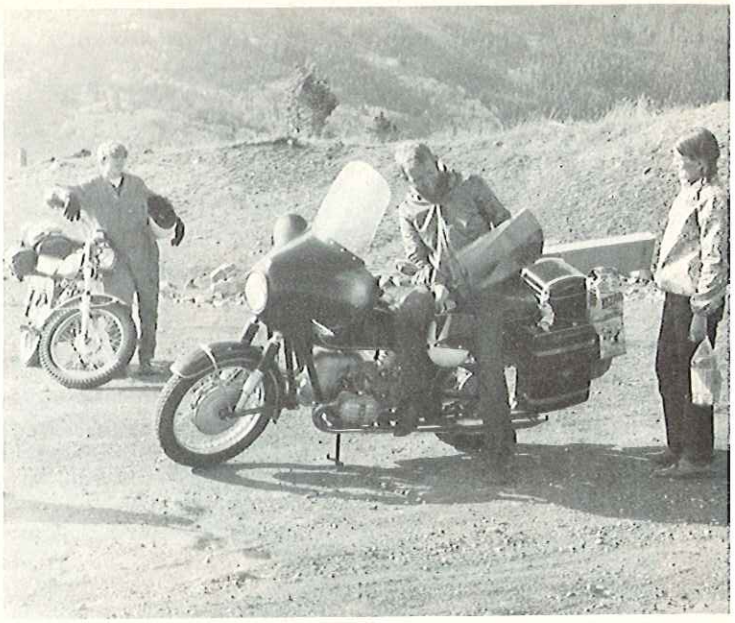
Work at work. "Say, Buddy, why doncha' build yer planes at home?" Dig newspaper padding in carrying case. Photo at Green Mountain Reservoir.

LEFT: Steve Work assembles his toy for towlining at Green Mt. Reservoir. Scratch-built in one night. ABOVE: Don Spellum readies his 'Standard Austria' for a checkout flight.

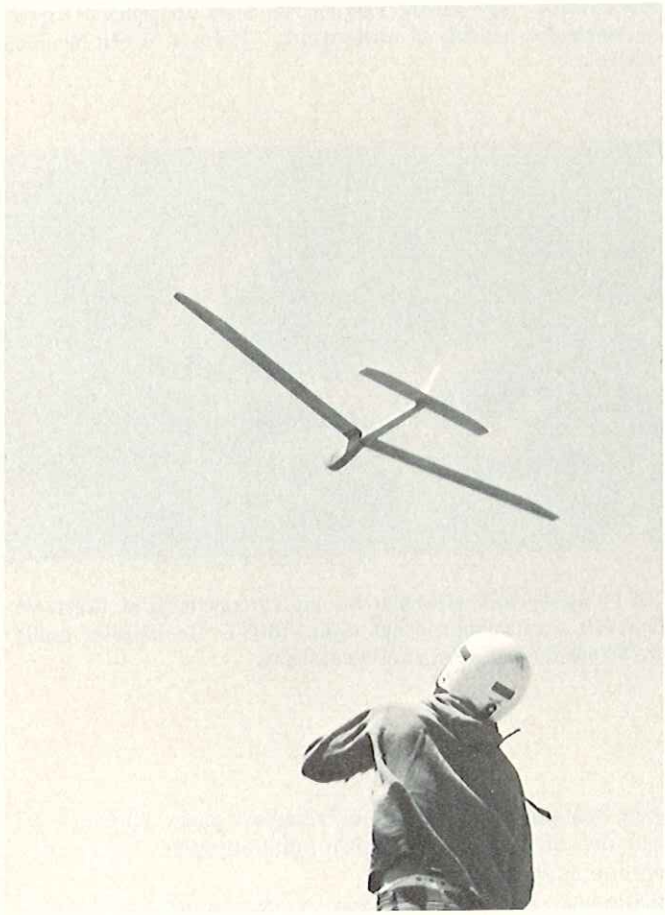
one of the ugliest rudders ever attached to a sailplane. We quickly stuffed these three beauties into Sig Foam Wing boxes, strapped them to the bikes, and rolled out on schedule Saturday morning.

Buena Vista, a small town in south-central Colorado, was the jumping-off point. Don and Steve trailered their bikes to there; Jan and I followed them on our BMW. After final grocery shopping, we thundered out of town about three in the afternoon, holding a tight Hells Angels formation and blowing kazoos at one another. This part of Colorado is one big golf course, with rolling hills and lush green grass from horizon to horizon – a real treat for sand-and-sage New Mexicans. Far to the north, the snow-capped peaks of Colorado's highest ranges winked at us through a hundred miles of cool clear air.

It was an afternoon of old mining towns: Leadville, Climax, Frisco – we gawked and pointed and shouted about them all. Night found us camped on Dillon Reservoir, fishing and flying gear still packed – we'd gotten too caught up in doing the

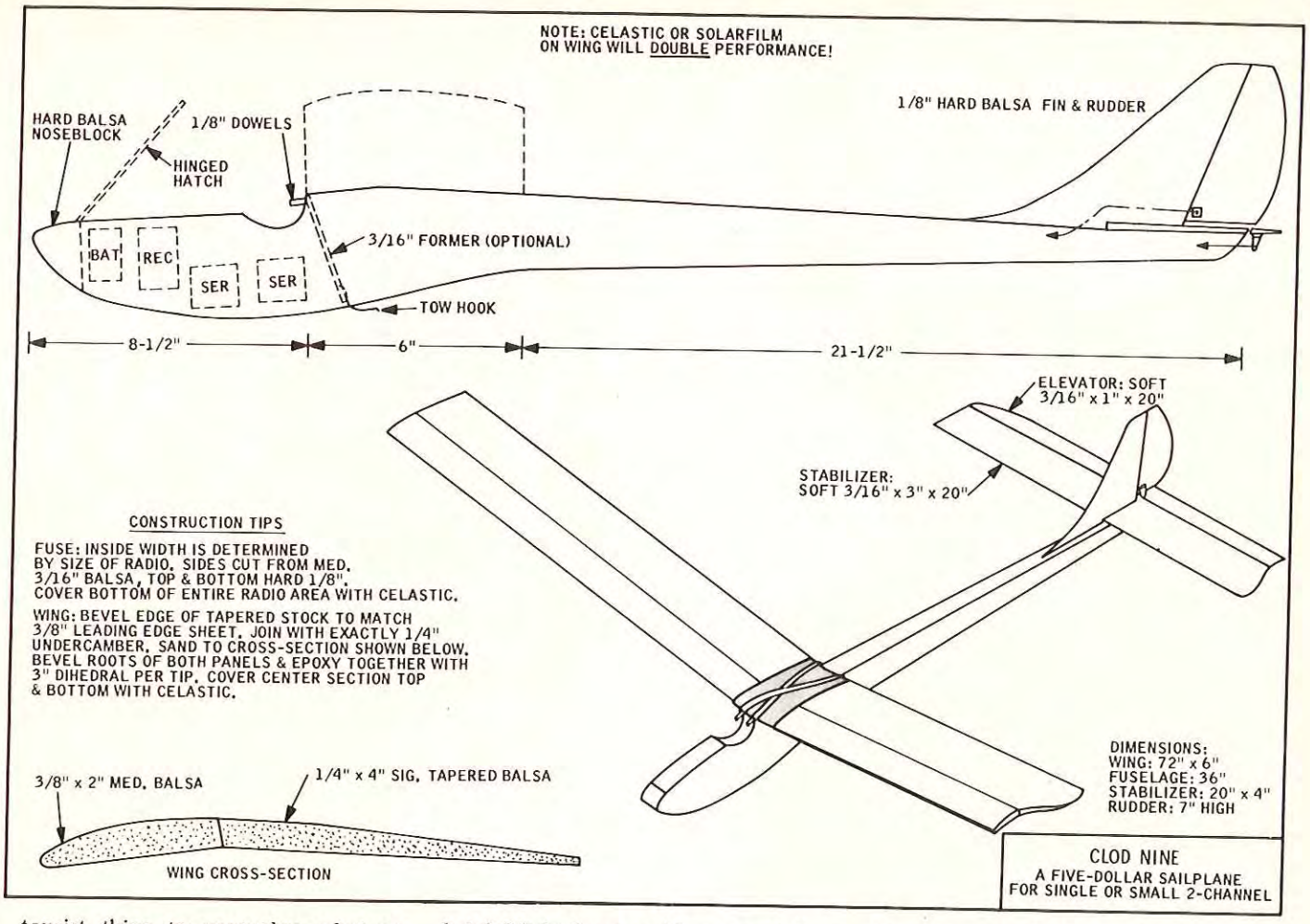


LEFT: Don rides the marginal lift at Williams Mountain, near Kremmling. ABOVE: Jan holds bread while illiterate author pretends to consult map. Steve Work (who seldom does) looks on in utter contempt. Photo taken halfway up western slope of Trail Ridge Road.



Over the ledge! Clod Nine (author's ninth ugly this season) finds no immediate 'bump' on the edge of these 10,000 foot plus mountains. The rising air is often way out over the valley. Helmet protects large ears from frostbite, spectators.

ABOVE: Author launches 'Clod' in wee hours of a cold Tuesday morning. Site near Trail Ridge High Point, 12,183 ft. at snow level – even higher around nose and ears. BELOW: Don Spellum pronouncing Secular Mass (often profane) over Standard Austria before consigning it to 1500 foot limbo.



tourist thing to remember what we came for!

But the next day was Sunday – traditional flying day – and we made up for lost time. Halfway to Kremmling, on State Highway 9, we stopped in the flower-strewn meadows around Green Mountain Reservoir for a bit of towlining – "just to check the trim," we reminded one another because, of course, "we're here to fly slope." Steve and Don had their planes together in minutes, and a light breeze off the water made hand towing a cinch. Both planes were light, but the thermals were lighter still, so we were soon on the highway again, scanning both sides of the broad valley for that "perfect" slope.

Just before noon we spotted it: a dirt road zigzagging up the face of a high mountain to our right. Almost without communication we all three swung off the highway and up the dirt, stopping at each hairpin to test the wind. The site looked surprisingly like the Milpitas (California) slope site, and we all had high hopes. But the wind was light, and no matter how high on the hill we got, the lift was marginal, even for eight-ounce-per-foot birds with undercambered foils. After a few brief "fight-for-your-life attempts," I succeeded in steering Clod Nine into the tallest bunch of Aspen in sight, and we decided to give it up for the afternoon. We hadn't yet learned to fly the high country – that was a lesson reserved for the following day – so we packed up and headed for Rocky Mountain Park, leaving behind what was probably a perfectly good slope, had we known how to fly it.

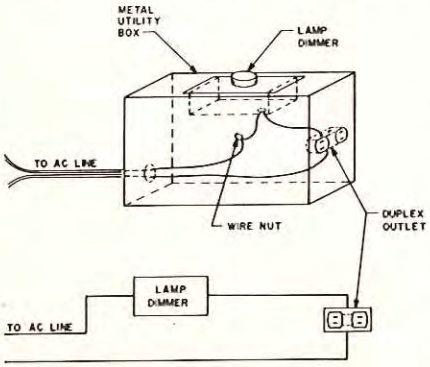
We camped that night on Grand Lake, hassled with a flat on Steve's

To Page 61

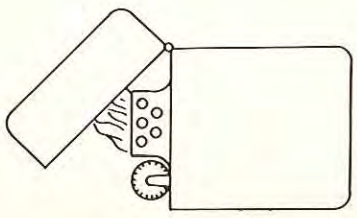
On the road and headed down hill to Estes Park after a highly successful afternoon of soaring near the Summit House.

FOR WHAT IT'S WORTH

A simple device that can be used as a speed control for a drill or Moto Tool can be constructed from a lamp dimmer, a duplex outlet, a line cord, and a metal box, as suggested by Bruce Doan, of Bayport, New York. The control provides reliable speed variation for motors with brushes and can also be used to tame down an over-enthusiastic soldering iron. Parts should be readily available from virtually any hardware, department, or electrical supply store. The addition of a fuse, on-off switch, or a pilot light is up to the individual builder. Despite these elaborations, the price can be as little as half that of a built-up unit.

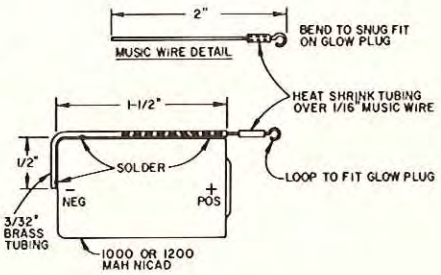


Being an avid user of the heat sensitive covering materials such as Solarfilm, Jim D. Slaughter, of Wichita, Kansas, has, from time to time, encountered the problem of how to re-seal an edge which may have come loose while flying. Since there is no electricity at most flying fields and since Jim doesn't like patching with the stick-on covering, another solution had to be found. That solution was by simply using a cigarette lighter such as a Zippo. Simply light the lighter and then hold it in such a way that the flame heats up the lid of the lighter. Then, very quickly, apply the heated part of the lighter to the loose material. You'll find that this will work each and every time.



Don Williams, of Phoenix, Arizona, suggests a fast and easy method he uses for filling as well as obtaining a hard and smooth base on which to apply color on his models. First, sand the entire model as per normal and cover with your favorite material such as silk or silkspan, and brush on about two coats of clear dope thinned about 15%. Sand lightly to get any little burrs off. Sand only after the second coat of clear dope. Next, using Hobbypoxy Stuff, place 1/3rd of the can in a quart spray container and fill with dope thinner, shake well, and spray over the entire model. Shake the Stuff-thinner mixture frequently as Hobbypoxy Stuff does not readily mix with dope thinner. Spray on two to three coats, letting one hour lapse between coats. When the last coat is dry, sand with #320 wet-or-dry sandpaper used wet. Sand very lightly as this filler cuts down quite rapidly. The entire model should be sanded and ready for color in about 30 minutes if epoxy color is used. For a dope finish, spray on one more coat of clear dope, let dry, sand lightly, and apply two coats of color. Ordinarily, epoxy does not stick to dope very well unless the dope has been well cured. In our case, the epoxy is mixed in with the dope, but only for a filler. The reason for so much thinner is: to make a spraying solution, it softens the clear dope already on the model so the epoxy will stick, and it evaporates quickly so it doesn't take as long to dry. This filler coat of epoxy positively will not separate from the dope and works so easily it's unbelievable. Only one day is all that is required for a beautiful finish.

Want to save a few bucks on starting batteries? Then take the suggestion of Bob Rufener of Warren, Ohio, and get over to any nearby electronic supply house and pick up a "D" nickel cadmium cell of 1200 mah variety, which usually sells for less than a dollar. Now that you have this nickel cadmium cell, dig into your scrap box for a 2" length of 3/32" brass tubing; a 2½" long piece of 1/16" music wire; a length of 1/4" heat shrink tubing; and soldering iron, and get to work. Bend the 3/32" tubing so it has one leg that is 1½" long while the other is ½" long. Next, take the music wire and bend a hoop to fit snugly around the tip of your glow plug. The brass tubing is now soldered to the nickel cadmium cell in several places, then the music wire is slipped inside the tubing and you have just completed a jumper battery for less than 10 minutes work and a cash outlay of no more than $1.00. Bob has found that if you bend the music wire slightly, or nick it with a pair of side cutters, it will not slide in and out of the tubing so easily, thus retaining its adjustment for a longer period of time. If you so desire, you may set this up for whatever motor you are now flying and solder it permanently in place. You can always readjust it for the next engine and re-solder it again.

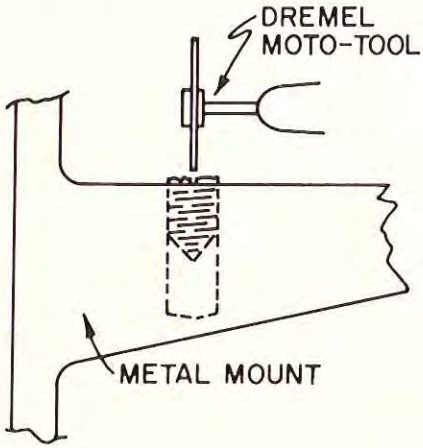


One of the most overlooked tools in the RC'ers shop is that of taps. As an example, according to Ed Betancourt, FPO San Francisco, there is only one way to thread NyRod and that is with a 2-56 tap. Ed has, and believes that all modelers should own, at least the following taps: 2-56, 4-40, 6-32, and 1/4-20. As an example of several uses for taps it often happens that epoxy runs down onto blind mounting nuts and hardens inside. To eliminate this, simply run the proper tap through the nut before inserting the screw and the threads will not only be clean but straight. Additionally, mounting an engine to a metal mount becomes a lot easier if the mount is drilled and tapped while the use of nuts is also eliminated. Another use for a tap is that wing mounting nuts can be fabricated from hardwood or plywood using the 1/4-20 tap. To completely go first class, starting and bottoming taps as well as the tap and clearance drills are required. Here are the sizes you will need:

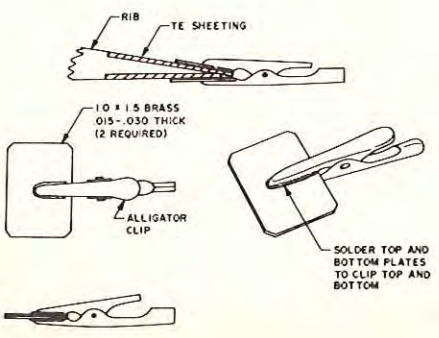
Screw	Clearance Drill	Tap Drill
2-56	No. 42 (.093)	No. 50 (.079)
4-40	No. 31 (.120)	No. 43 (.089)
6-32	No. 27 (.144)	No. 36 (.107)
1/4-20	17/64	No. 7 (.201)

For copper, aluminum, bakelite or similar material, use one size larger than those specified in the table above.

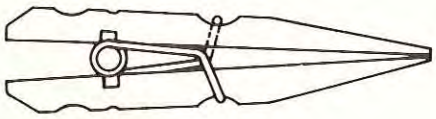
Have you ever sheared off a motor from a metal mount and had the metal screw stubs remain and try to get them out with no success? Well, the following idea has worked for Stanley W. Pfost, D.D.S., of Winter Park, Florida. Take a Dremel Moto-Tool and place a thin carborundum disc in the chuck. Make a new screw head by simply grinding a groove across the existing head of the stub. If it is a little below the surface just grind into the mount surface until you can make a sufficient groove in the screw stub and then take a screwdriver and remove the remaining part.



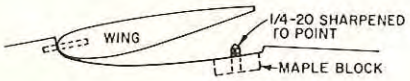
Alfred C. Falone, of Covina, California, suggests that an alligator clip and some scrap brass are all that is needed to make some very practical tapered clamps. They can be used to clamp wing trailing edge sheets; fuselage ends, etc. One nice thing is that the brass will flex to assume various angles. The large bearing surface won't mar the clamped surface. The sketch should be completely self-explanatory.



Tom Blaney, of Rockaway, New Jersey, suggests a simple way of converting a spring type clothespin into a more useful item. Simply take the clothespin apart and reverse the wood sticks so that the flat side of the pin is on the inside, then take the spring and put it between the two sticks with the coil in line with the slot for the end of the spring. The end of the spring is centered in the groove for the coil. Now you have a more powerful clip with a longer reach for those hard to reach spots.

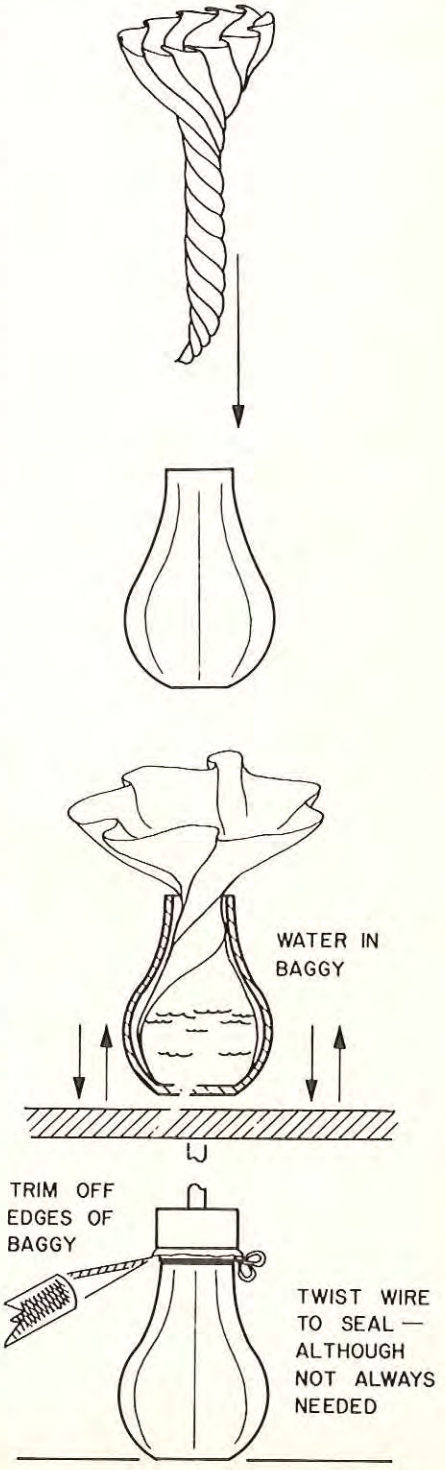


Bill Morrison, of Owen Sound, Ontario, Canada, suggests that for locating where to drill your holes in wings for hold down bolts, the following precedure be used: First, epoxy your maple blocks into the fuselage. Then drill and tap for the size of nylon bolt to be used such as 1/4"-20. Use an end piece of nylon bolt and sharpen the end and screw into the mounting blocks. Insert the wing dowels in backward and press down the wing on the sharp points. When you take the wing off and drill you will find that you have exactly located the spot for the wing mounting bolt clearance holes.



If you have trouble keeping the dust out of your engine over the Winter months, try enclosing the engine in a Glad Bag. Different sizes are available in almost all supermarkets and will accomodate almost any size engine. Glad Bags have an overlapping flap at the top, and after overlapping the top, seal it with Scotch Tape. Be sure the engine is clean, though, because excess glow fuel will leak through the porous surface of the plastic bag. This idea was submitted by Joe T. Baxter, Jr., Lawrenceburg, Tennessee.

Mike Garshin, of Berrien Springs, Michigan, suggests a plastic bulb liner for fuel bulbs to eliminate rubber fragment in the carburetor as well as reviving old bulbs or making sure that your new bulb will virtually last forever. First, insert a Baggie which is twisted and inserted into the fuel bulb. Add a couple of ounces of water and bounce against a hard surface to form a bag. Continue adding water and pounding until the bulb is full. Lift the bag edges occasionally to let out trapped air between the fuel bulb and the Baggie. The bag remains against the side held by vacuum. You will find that there is no more rubber in your carburetor plus your fuel bulb will last season after season without deteriorating. □



FLIGHT TRAINING COURSE

CHAPTER IV

The subject of the selection of your radio equipment is one that is always open for debate at any gathering of radio control enthusiasts or at any flying field. If you were to visit numerous contests and general flying sessions at local fields around the country, you would see a predominance of one manufacturer's equipment in one given locale, and a predominance of a competitive manufacturer's equipment in another area. In years past, when radio equipment had not yet reached its present level of technical excellence, the element of reliability was one of definite concern. Today, virtually all of the major manufacturers of proportional control equipment offer systems that are virtually trouble-free and offer the highest degree of technical know-how and workmanship possible. Each of them is backed with a factory warranty and every manufacturer has repair facilities in various parts of the country to facilitate fast repairs in the case of system damage due to crashes and the like. The predominance of one manufacturer's equipment over another in a given area is usually due to the physical location of the manufacturer or his repair facility in relationship to the local club. Then, too, a great many fliers in a club want to own the same type of equipment as the club's top fliers use for their flying or contest participation. A major contest win or, better yet, a nationals or internationals win by a particular brand of equipment, will boost sales for that brand of equipment considerably during the coming year, thus seeing a definite influx of that brand name at his flying field.

So, rather than go on record as preferring one brand over another, we suggest that your first logical step in starting in R/C would be to join the local club in your area, if there is one, or join together with the individual fliers, if no club exists. Ask questions about their equipment, watch it perform in the air, and then read the advertisements in R/C Modeler Magazine and make your own decision as to what equipment you prefer. When you do make your decision, plan to stick with that brand of proportional system.

What we are going to attempt to do here is to give you a brief description of the various configurations of equipment offered by the manufacturers and thus help you to make a wise decision as to the type of equipment you can buy consistent with the amount of money you wish to spend.

To begin with, it is our recommendation that you purchase at least a four channel digital proportional system. The RCM Trainer designed by Don Dewey and Joe Bridi, and presented with this Flight Training Course will require a four channel digital system. We are not of the school of thought that believes in starting out with any other type of equipment other than digital proportional, since we feel that it is the most trouble-free and reliable equipment that money can buy. A four to seven channel system provides all of the control functions required for even the most complex models. A complete system includes everything necessary for radio control: the transmitter, receiver, servos, transmitter and receiver rechargeable battery packs, chargers, switch harness and in most cases, several mounting trays. A four channel system will operate four servos with one servo being used for each control function. A six channel system will operate six servos although, in most cases, only four servos are included in the system price with the additional auxiliary servos available as an optional extra, or being added by the individual buyer at a later date.

Also available from many manufacturers are three channel systems which have answered the demand for a high quality system for use where a greater number of channels is not required. These systems usually consist of a single two axis mechanically trimmable control stick with the third channel being actuated by a lever located on the side of the transmitter face. The three channel system is also available with two single axis, mechanically trimmable control sticks with one stick moving in the vertical plane and the other in a horizontal plane. In both cases the primary stick, or sticks, are self neutralizing while the third channel lever is a positionable type stick which remains in whatever position you place it. Most three channel systems consist of transmitter, receiver, rechargeable transmitter receiver battery packs, charger, switch harness, and two servos. Again, additional servos are optional at extra cost.

The most modestly priced digital proportional sets are the new two channel systems which are well suited for any application requiring two proportional functions such as in cars, boats, gliders, and small powered aircraft. The small transmitter, again, features either two single-axis mechanically trimmable control sticks or a single two axis mechanically trimmable control stick. The new two channel systems usually incorporate the receiver and servos integrated into one rugged nylon case which mounts easily into the aircraft with four screws. A wired battery box is provided and, in some cases, is designed to use four alkaline pen cell batteries with a rechargeable nickel cadimum pack being available as an optional extra.

The next decision that you will have to make in selecting your proportional system will be as to what frequency you desire. If you have an amateur radio license in the Technicians Class, you can order your transmitter on one of the available six meter frequencies. Those who do not possess such a license, must decide

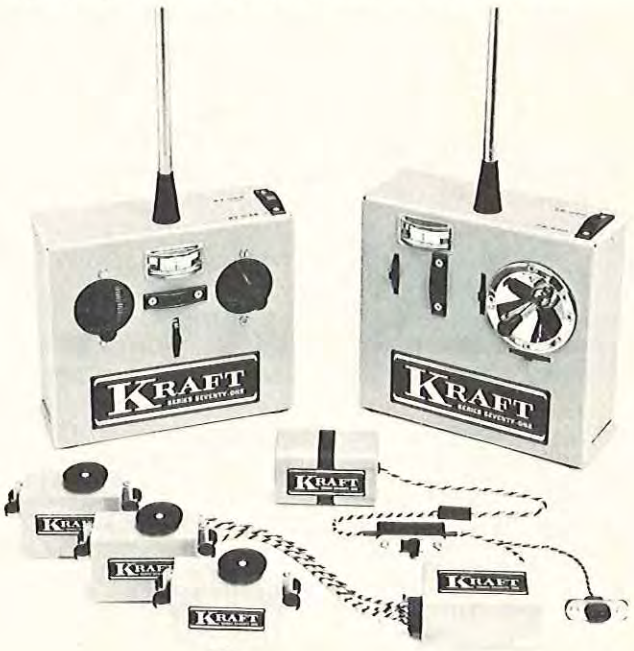
The most modestly priced digital proportional sets are the new two channel systems which are well suited for any application requiring two proportional functions.

whether they wish their frequency on one of the 27 MHz Citizens Band frequencies or one of the newer 72-76 MHz frequencies. There are advantages and disadvantages to both. With the allocation of these 72-76 MHz frequencies for radio control usage, a majority of R/C fliers have moved up to these frequencies to avoid the interference often encountered on the lower Citizens Band frequencies. Thus, if you are in an area with a great number of R/C fliers, you will find the 72-76 MHz frequencies quite crowded at your local field. Less crowded today are the 27 MHz frequencies, although the chance of interference from an illegal Citizens Band operator is much greater. The choice is up to you. At least two manufacturers currently offer an optional dual frequency system which provides two frequencies in your transmitter and a separate switch on your airborne pack which allows you to change that portion of your system to match the transmitter frequency. Thus, a flyer, seeing that one of his frequencies is quite crowded at the field while another is virtually unused, can change frequencies simply by flipping a switch on his transmitter and in his airborne system.

A great many times the question will come up concerning the purchase of a used radio system. With the new sub-miniature digital proportional systems now on the market, there is usually a good supply of used systems available and can be found in the classified advertisements of R/C Modeler Magazine as well as through local hobby shops and from local club members themselves. There are a great many reasons why used proportional systems are for sale. In some cases a flier may have two different systems and decide to sell one and purchase another system to match his original so that he will have the advantage of interchanging servos. Another flier may decide to update his older or larger equipment to one of the new miniature systems or possibly a more expensive and larger system such as from a four channel to a six channel. Yet others decide that radio control is not for them and decide to sell out all of their equipment. And, there is always the equipment that has given the owner a great deal of difficulty and so he places it up for sale. All that we can tell you is that if you know the individual as well as being familiar with the past performance of his equipment, you may have a good buy for your first proportional system. If you are not familiar with the seller, the best way to purchase used equipment is to actually see the system perform in the air over a period of several flights. If it works without any apparent problems, that's the most you can expect.

To Page 65

The three channel proportional systems, available with either a two-axis single control stick or two stick configuration provide three proportional channels of control.



The Amigo III is a popular subject for pilots competing in CIAM's A-program.

SOARING.....

.... with Don Dewey

--- By Otto Stensbol, Norway

Once again, the Cirrus RC Club of Oslo, Norway, managed to lead some of the best Scandinavian RC pilots to Pellestova Hotel for the annual RC "Soar Together." During the period 26 June – 4 July, American Dale Willoughby, and German Georg Friedrich, both world famous soaring aces, flashed the crystal-clean Norwegian sky together with a bunch of keen Scandinavian RC pilots. The Pellestova Hotel was almost filled up with sporty pilots and their families. This was a holiday in a wonderful mixture of soaring; footwalks up and down the many slopes in use; discussions of soaring matters and, not the least --- recreation with the nicest families you could dream of. Have you, by the way, ever met a RC-family that you did not like?

A detailed story of all the interesting happenings is impossible in this short report, so we will concentrate on the main features in order to give you some idea of the arrangement. Shown below, therefore, is a comparison between last years event and the 1971 'Soar Together'. It may, hopefully, show you the trend in RC sailplane activity over here:

	1970	1971
RC clubs attending	9	13
RC pilots attending	15	43
RC sailplanes used	28	62
RC gears used	16	41
RC competitions held	0	5
RC records established	2	3
wives/kids present	21	46
spectators/visitors	50	Approx. 150
newspaper coverages	2	7
TV & Radio coverages	1	3

This should offer proof of what we in Cirrus RC Club have foreseen for years: RC soaring, combined with family life in the wonderful mountains, will steadily increase in popularity! It has proved to be good for people under stress, and it creates a healthy picture of recreation and modern times hobby in a pleasing, silent way. The wife and kids just love it, no engine noise, no messing with fuel, dirt, batteries, dead plugs and no shattering crack-ups of roaring motorplanes. And, of even greater importance, no real problem with 'flying safety', all peaceful and so nice to look at.

This was graceful, silent flight riding the elements of nature – slope wind and thermals. Standing at ease on the slope-ridge or lying lazily on the soft moss, the RC pilots had a real game! What a change from the ear-cracking conditions at an airfield where pylon racers or RC pattern type planes are flown! You, too, should try this soaring game, you'll deeply regret you never tried before. No doubt this is the reason for the world-wide progress in RC sailplane activity.

Now then, back to 'earth' again – what did we fly this year? Generally, larger types than before. Varying from scale ASW-15 (wing span, 385 inches) and Ka-6e (wing span, 366 inches) through Cirrus (wing span, 300 inches) to trainer-types like Dandy (wing span, 166 inches). A total of 25 'standard' types were in use plus 8 different original designs. The most popular single design was the Cirrus (6) and Uranus with 5. Ailerons were more in use than ever before, even as C.A.R. Spoilers, however, were only for the very few. This is probably due to the most popular program flown being CIAM's B-program, which does not put up the need for spoilers.

In the 5 competitions held the following programs were flown:

27 June – CIAM's B- program.

28 June – CIAM's B-program.

29 June – "League of Silent Flight" Precision.

2 July – German Aero Club's RC IV A.

3 July – Distance to given target for precision landing.

Individual performances of the pilots were much improved from last year. And newcomers were given special flying-safety briefings every day in order to prevent hazards on top of the slope. Also, general flying techniques were briefed and demonstrated by experts. This, we feel, is very important for an efficient training of new pilots and, of course, in order to increase flying safety for all!

Both Dale Willoughby and Georg Friedrich put up some splendid flying. They mastered the slopes and the thermals with remarkable skill. It was regrettable that the wind did not stay stable enough for new world records in endurance and distance on closed circuit. This had been the main 'goal' for Dale and Georg during the last months before the "D-Day" of 26 June. Their sailplanes and tedious preparations were impressive, to say the least!

The Scandinavian pilots did, however, give both Dale and Georg tough competition. In fact, your humble correspondent and Dale shared the first place as an average from all competitions held. It should, however, be noted here that Dale flew with a borrowed Diamant which he had never

Jacob Arneklein ready to launch his Standard Cirrus guided by Simprop Digi 5. Cirrus a fine performer if flown with aileron control CAR works fine.

Photo taken at one of many slopes in use at Norwegian 'Soar Together.' Sailplane marked LN-GRE is a 1:6 scale ASW that flies like a dream.

Otto Stensbol ready for a distance flight with a Standard Cirrus using Simprop Digi 5 on elevator and coupled ailerons-rudder. This model best overall performer during the Nordic RC affair. In the background is the Swedish RC ace, Kurt Lenna, a fine sailplane pilot. At left, Knut Lund launches his big ASW 15.

flown before. In spite of that he flew like the maestro he certainly is.

Two Norwegian pilots put up 3 new records. In "Endurance" Einar Myr, Cirrus RC Club, flew 6 hours, 14 minutes to a new Norwegian and Scandinavian record in class F3B. In "Distance Closed Circuit", Bjarue Aosbo, Vingtor RC Club, came up with the first-ever recorded Norwegian record in this category for class F3B. Both would have done far better if 'Father Wind' had been good to them!

Next year there will be another RC "Soar Together" at Pellestove Hotel. We in the Cirrus RC Club are already working on the project! We expect further increase in all aspects of RC sailplane activity, so the forthcoming arrangement will probably be quite large. Details will be revealed later through this magazine. In the meantime, listen to my advice . . . build yourself an RC sailplane and start flying! Maybe we'll meet next year at Pellestove? Think it over – take your family with you and you'll never regret it!

The East Coast Soaring Society's fourth contest was held at the Lakehurst Naval Air Station in Northern New Jersey on August 15. It was sponsored by the Northern Jersey Radio Control Club and directed by Gene Fuller.

The contest ran smoothly all day without any major problems and all 61 contestants were able to get in three

The old master RC'er, Howard McEntee, on a third round max flight at E.C.S.S. contest, Lakehurst N.J.

rounds before 4 o'clock.

The Lakehurst N.A.S. is an excellent place for a soaring contest with its runways reaching in all directions and each one several miles long and a hundred feet wide. Two landing circles were set up, one in the grass and one on the runway. Four winches were used and no hi-starts or hand launches were permitted.

Howard McIntee was back on the flight line again after a leave of absence for an operation. It was good to see Howard maxing his little Kurwi again. We all wish Howard improved health in the future and hope to see him at the next two ECSS contests.

Dr. Walt Good and his new ARF Cumulus 2800 sailplane at ECSS meet.

A very light breeze was present all day. The light ships and top flyers were out working the light lift and landing points for the winning positions. Richard Jansson, flying a Kurwi 68, acquired the top position in the first round with a 632 flight. Ray Smith flying his pod and boom Osprey to a 589 flight placed him in second position. George Durney and his Ellipsoar flew to 563 and Bud Roane finished the first round with a 536 flight on his American Eagle.

The second round found Ray Smith with another 589 flight placing him in first position. Bud Roane moved from 4th to 2nd place with a 630 flight. Jansson moved down to third with a 528 flight and Durney moved down to fourth place with a flight of 590 points.

During the third round Tom Rankin moved into fourth place flying a 14 foot Osprey with flight times of 358, 646 and 647. Jansson moved down another position to fifth place with a 447 on his last flight. Durney moved back up to third place with his 542 flight. This left Roane and Smith to do battle for first place. Bud Roane slipped his beautiful red, American Eagle into the circle with a 554 flight. This meant Ray Smith had to make a 542 flight to keep first place. All eyes were on Ray as his pod and boom Osprey left the runway and stuck into the sky where it stayed until Ray uttered the secret word and it glided down to the middle of the circle with a 547 flight and five big points above Roane.

Walt Good, flying his new Cumulus, finished only 17 points behind Jansson to give him sixth place. Robert Humbert flying a Cirrus flew to 7th place with 1519 points. Bruce Hagerman flying his little Mosquito placed 8th with 1229 points. Robert Waldhous flying a little bigger "T" collected 1139 points which included 3 spot landings to give him 9th place. Don Clark flew his modified Kurwi to 10th place with 1083 points.

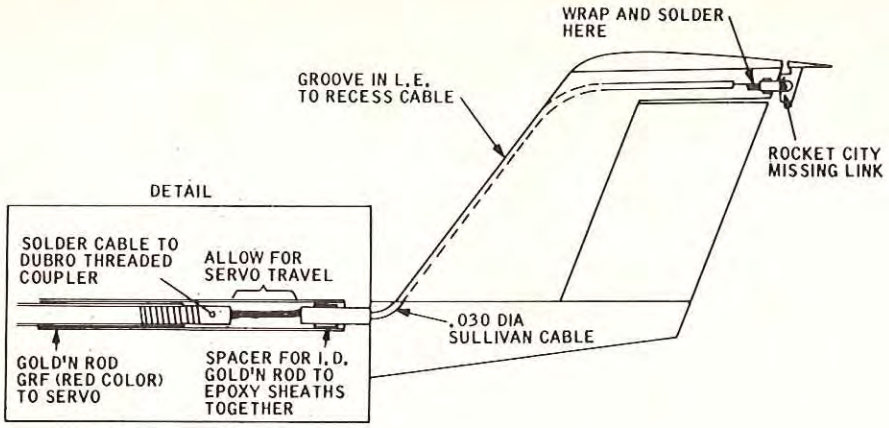
The next 10 places had less than 167 points separating 10th and 20th place. Eleventh place was Ed Richter followed by Herschel Terry, Bruce Russell, Dick Sarpolus, Don Goughnour, Jay McMaster, Carl Maroney, Robert Tweed, Robert Schow, and Clive Sadler.

Bill Davidson, of Huntington Beach, California, wrote that, while in the Sonora Pass Mountains with Bill O'Brien (RCM's second best sailplane pilot), they had to finish a glider for the next day's flying. The team effort consisted of Norm Burke, who was to build the fuselage, while Bill Davidson was to finish the empennage and wing, and Bill O'Brien was to hinge all surfaces and give free advice. Tootie Burke (Norm's wife) was the Solarfilm applicator - - - the reason she was given the job was due to the shortage of material and, with typical female cunning, she proceeded to do the job and have Solarfilm left over. This was the process she used: First she made newspaper patterns to cover all the parts. Then she wet the newspaper patterns and laid them on the solarfilm backing sheet, to which they stuck very nicely in their wetted condition. This allowed for a minimum waste of material. According to Bill, after some tall ones and an evening bench flying session, it evolved that Tootie had covered other planes in Solarfilm using the same wet pattern method. So, the moral of this hint and kink is to get those wives involved covering sailplanes with Solarfilm. Try the method suggested by Bill – you'll save enough on the next sailplane to buy another roll of Solarfilm.

Jerry J. Greaves, of Newtown, Connecticut, writes that the RCM Can Winch has worked perfectly for him, doing everything we said it would and more. Jerry suggests building a parachute out of heavy button thread for shroud line and using some plastic sheet from a trash can liner for the chute, itself, and then two key rings and some Scotch Tape. The chute has worked perfectly for him each time.

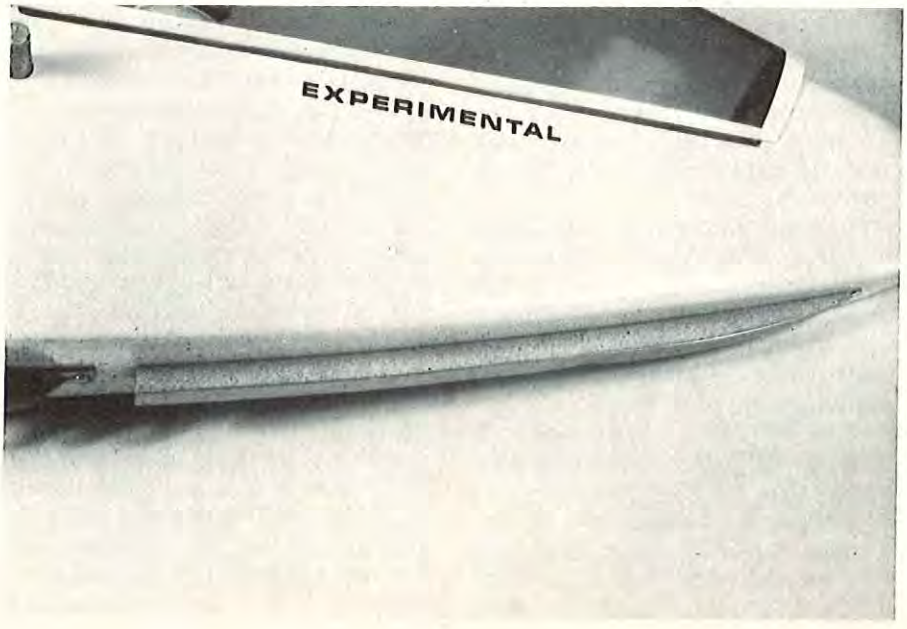
Wanting to add elevator to an already completed T-tailed glider, Pat Potega of Madison, Wisconsin, came up with the following method which is a variation on the flexible cable or nylon rod installation. The advantages, as evidenced by the sketch, are that the .030 cable affords extreme flexing for sharp radii, while the use of nylon tubing eliminates a long length of wire inside the fuselage as a safeguard against receiver antenna problems at the extremes of range, or with an already marginal system. Be sure to anchor the Gold'N Rod in the tail.

If you want an ideal glider skid that is simple, quick to install, and will absorb most of the shock of hard landings, try either one of the following variations: Cut a strip of G-Pad to the length desired for the sailplane



skid. Taper the front of the G-Pad with an X-Acto knife and sanding block, then contact cement the G-Pad strip to the bottom of the sailplane. Next, put a thin strip of sheet brass the same width and length as the G-Pad and contact cement it to the latter. This will provide an almost indestructible glider skid that also absorbs impact shock. An even simpler method is to use one or two strips of "double-stick" servo mounting tape and face this with a length of polypropelene .020 living hinge. No contact cement is used and, instead of tapering the front of the skid material, the skid can simply be attached in place with a wood screw that will compress the servo tape material, giving a contour shape to the front of the skid itself.

As we were closing out this column, we received word from RCM Contributing Editor, Jim Simpson, that the first Omaha Sailplane Contest saw the Airtronics Olympic Sailplane take first through third places against a variety of sailplane designs. The Airtronics Olympic is designed for two channel rudder and elevator control and features an 88" or 99" wing with undercambered NACA 6409 airfoil for maximum duration with excellent penetration. The kit features spruce cap spars with precision die cut plywood and balsa ribs. The center joint has 5/32" diameter tempered straight joiners and brass tubes for convenient transportation. No sheeting or cap strips are utilized on this quickly built and rugged wing. The kit also features one piece fuselage sides with rugged balsa and plywood construction. All parts are precision machined with True Lock Construction and ready for quick assembly. A pop-off wing and stab offers excellent crash resistance. A complete hardware package in the $29.95 kit includes push rods, horns, tow hook, etc. This is one of the most complete and finest kits we have ever seen offered in the R/C field. Available from your local dealer or from Airtronics, P.O. Box 132, Sierra Madre, California 91024. □



SLOPE SOARING IN COLORADO'S HIGH COUNTRY

From Page 51

Yamaha, and rolled out the next morning over Trail Ridge Road – the highest strip of continuous highway in the U.S. Don took the lead on his overbored Honda 90, and that amazing little machine led us right up to the top of Milner Pass – 10,759' – at speeds of thirty to forty miles an hour. Half a mile from the Summit House we stopped on a long curve that hangs out over an incredible 1500-foot-deep valley full of little pinpoint trees and a hairline river that snakes off to the north. We were right at 12,000' here; the air was cool, almost sharp, blowing right in off the snowbanks of the Mummy Range, and the vertical component felt promising. I strapped Clod Nine together and heaved her over the side. There was no heartening leap as she left my hand – just a long slow sink. Steer left, steer right, hug the edge like the book says – still she sank, and everybody's heart with her. What the hell, it's already a hundred feet down, might as well make it a good hike – I steered straight out over the valley. Nothing but cow elk and virgin wilderness below. Well below!

About 600 feet out she gave a familiar bump, paused, found her head, and suddenly it's up all over! The plane shot past eye level and maybe 200 feet above in just seconds – I could put it right out of sight overhead in this boomer! I steered back to the hill and into lighter air. What a slope! Once you find the green air and get some altitude, it's possible to fly above and behind you, further up the mountain. A white streak zipped by and Don's Standard Austria was airborne. Steve followed, and within a quarter-hour we had a good-sized crowd of spectators.

We all four slipped into Public Relations gear: "No, Ma'am, it's not attached to a string . . . Yes, it runs on little batteries . . . Yeah, I know it **looks** like a fishing pole . . . " A ranger comes by, nervous about the traffic jam, and Don sidled over to give him the pitch . . . in ten minutes he left, determined to have one of them things some day. Man, this is what the hobby's all about! Jan made tuna fish sandwiches, passed them around, answered the questions while every-

To Page 62

SLOPE SOARING IN COLORADO'S HIGH COUNTRY

From Page 61

body ate and flew singlehandedly. Sun and wind were both low before we gave it up for the day.

We camped that evening in Estes Park. On the way down we spotted a couple of "even better" slopes, so early next morning we were back on the mountainside fighting the shadowy cold and wet – fingering the air at every curve. One slope, almost a mile long and facing vaguely southwest, paid off – but only after we got up the courage to bore out over the valley where the high lift waits. Yesterday's lesson was hard to swallow, but true: you can't work the edges of these gently-sloping mountains – you have to set your jaw and steer right out over the pit to find green air. This takes real faith in your radio and airframe, but it pays off in the strongest and least-turbulent lift I've ever experienced – every inch of that Colorado air is silky-smooth.

About noon our luck ran out: receiver packs suddenly began remembering how long it's been since they were charged, and Steve and I spun in just minutes apart. Fortunately, both ships were close in when disaster struck, and neither one went over the edge. Both of them simply dove into those big soft-looking snowbanks . . . and a pile of concrete blocks couldn't have broken their fall any more effectively! Sticks and splinters projected at crazy angles from Clod Nine's snowbank, looking like a miniature Boot Hill in January. Should have spent last night in a motel charging batteries, like we'd planned! Don, who had been manning the camera and doing the PR spiels all morning, ducked behind a snowbank to chuckle.

We surveyed the damage and decided to knock off a day early, so that Don and Steve could make a leisurely ride back to Buena Vista, maybe even get in some of that fishing that was supposed to be part of the trip. For Jan and I, the soaring venture was only the first leg of a long cycle trip east, and since our toy was bent we were anxious to get on the road. Back at the Summit House we said final goodbyes, promised to do it all again, and rode off in separate directions through some of the greatest inland slope-soaring country in the west. □

TAKE A LOOK AT THIS..

Aero Publishers, Inc., 329 Aviation Road, Fallbrook, California 92028, publishes some of the most interesting aviation books to be found anywhere in the world. Among these are Racing Planes and Air Races 1909-1971. Printed in seven volumes, these books are printed on the finest high gloss paper available and the beautiful collection of large, extremely sharp photographs will make these books a delight to collectors and an invaluable aid to racing plane enthusiasts and modelers. The inclusion of splendid three view scale drawings by Dustin Carter, Bob Pauley and Russ Brown add greatly to the value of the series. All the major air races which were held in the U.S. during 1970 plus data on the Formula One International held in England, are covered in this newest air race Annual. The American races that are covered in detail with words and beautiful photos are the Florida National Air Races, Wilson Air Races, the St. Louis Air Races, the Reno National Championship Air Races, and the California 1,000 Mile Air Race. All volumes in the series are priced at $3.00 each with the exception of Volume VII which is priced at $3.95.

The Brookstone Company, Peterborough, New Hampshire, has introduced a new miniature welding torch capable of precision micro-joining of all weldable materials. Called the "Mini-Pro", the torch features a controllable stable flame down to 1/32 of an inch and smaller.

It is ideal for applying flame temperatures up to 6300°F to extremely localized areas on all metals and can also be used to soften or melt plastics, glass and other materials. Perfect for making and repairing miniature parts and equipment of all kinds.

The Mini-Pro torch is versatile. It operates efficiently and economically on 4 types of fuel: oxy-acetylene; oxy-hydrogen; oxy-propane or oxy-natural gas. Although priced 40% below comparable torches, the Mini-Pro is a fine industrial quality instrument. It is made of lightweight anodized aluminum and has a chrome plated tip chuck and stainless steel valve.

The Mini-Pro comes complete with a set of 5 interchangeable copper tips – 4 with drilled synthetic ruby nozzles to insure precise gas flow and longest possible tip life. Also comes with 5½ feet of color coded hose and 9/16"-18 thread brass fittings for attachment to standard regulators. $50.75 ppd. Money-back guarantee. For complete information write for free literature: Brookstone Company, 2687RT Brookstone Building, Peterborough, New Hampshire 03458.

Hobbymate is a non-soluble floating material produced by Diversified Electronic Engineering Company, P.O. Box 3244, Santa Fe Springs, California 90605. Designed as a fire retardant, non-toxic abrasive material for use for fishing floats and the like, this micro-balloon like material is extremely lightweight and is truly outstanding when mixed with either epoxy or normal Duco cement in use as wing and tail surface fillets. It can also be mixed with dope as a filler to keep dope from running. In addition, you can mix 10% of Hobbymate with your normal aircraft glue since it will make strong joints, extend your cement and make your plane lighter. Hobbymate will readily mix with polyester, epoxy, vinyl plastisol and other liquid resin systems. Upon cure, a strong, low density product results. Priced at $1.50 per bottle, it is available at your local hobby dealer. Tested, Approved and Recommended by RCM.

Royal Products Corporation, 6190 East Evans Avenue, Denver, Colorado, has recently added two additional kits to their line of scale radio controlled model aircraft. The first is a Pitts Special designed for engines in the .49-.61 size range. Sporting a wing span of 50¾", it has a total wing area of 856 sq. inches and a fuselage length of 43½". The all balsa kit is priced at $59.95. The second item is the Kavan Speed Plane designed for .60 engines. With a wing span of 44" and a wing area of 417 sq. inches. With a fuselage length of 50", the kit features a fiberglass body, foam wing cores and plans. This is a world speed record holder at 200 mph plus. Price is $44.95. Both kits are extremely well done and extensively prefabricated.

To Page 64

R/C CONTROL MOVEMENT INDICATOR

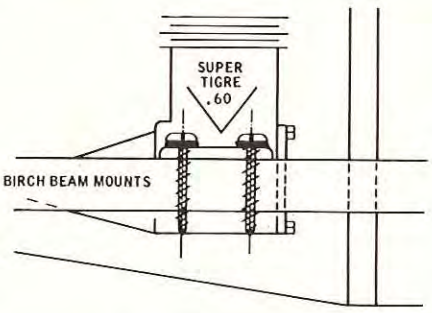
From Page 47

as in the previous case. Thus, once you have made the R/C Control Movement Indicator, you know exactly where you stand even before you have started working on your model. And, let me tell you that it is immensely helpful to have a fair idea as to what you are going to do, especially when we come to consider the cost of an R/C model. So, best of luck and happy flying. □

HOW TO . . .

From Page 46

you try to start it." Phooey! Panhead screws, or metal tapping screws as they are sometimes called, have about 10 times the holding power of regular wood screws. That's because they are not tapered and no oversized pilot hole is needed for clearance of the top unthreaded part of the screw. Furthermore, the Wonder Mount includes a castor oil seal! Silicone Rubber is used in the mounting holes and under the engine mounting tabs to make the area of the beams under the engine a perfect oil seal. Of course the mounts are sealed with epoxy as is the whole engine and tank compartments during the early stages of construction. As I mentioned before, I had a Lanier Apache for a few months with a Super Tigre .56 on it. One day the pot wiper arm in the elevator servo curled up and died, according to Jim Fosgate. With engine parts spread all over the concrete, wouldn't you know, the lower part of the crankcase was still tightly in place on the broken off beam mount. When I was loading the parts of the .56 in a small box to send to World Engines Repair Service, I noticed that no castor oil could be found in the mounting holes or in any splinters of the beams. How about that? An accurate mounting can be achieved with #8 x 1" panhead screws. First, the mounting holes on the engine must be at least 5/32" which is the clearance for #8 threads. The beam mounts should be drilled to 1/8" which is the minimum thread width of #8 threads. Then star washers are used in the installations to lock the screws to the engine. To prevent castor oil from seeping into the holes during flying, G.E. Silicone is used to fill the holes and seat the engine. After the engine has been fitted, simply fill the mounting screw holes with Silicone, putting a thin layer where the engine mounts will sit, and install the engine. Reach under the engine and smooth Silicone over the screw ends where it has been forced out by the screws. So why use 6-32 bolts and blind nuts? The cost of this installation is about 3 cents since #8



panheads are 2-for-a-penny, star washers are about 5 cents a dozen. Every hardware store I've been in carry these items. The results shows that there are no drawbacks to report. This method will provide good engine alignment, better oil seal, a stronger mount, much easier to install, the screws will not loosen yet may be removed easily, and there will be no stripped threads to worry about, etc., etc., etc.

For this next idea, I decided not to confuse you with a sketch, so here goes. If your engine ends up tight (against the firewall, that is) this fuel tank arrangement may help. First, replace the hard brass supplied with the tank by using soft brass tubing and extend the tubing about 1½ to 2 inches outside the tank. This leaves long leads which can be bent and routed after the tank is glued into place. With about 2 inches of the brass tubing extending straight out of the tank, place a short plug of 1/8" diameter dowel in one end, then the other tube which has been moistened with the ink from a black felt tipped pen. Carefully slide the tank into place and press the moistened plug up to the back of the firewall to mark the intended hole position. Do this for both tubes being careful to note that the breather tube is at the top of the fuselage and you know which tube is which. I think a lot of us have been guilty of trying to start an engine connected to the breather of the tank! If you have a big hand and you drop the tank into the fuselage making many black spots, try again with a red pen. This is fine. You have the holes marked but how do you make the marks into holes? Lucky for you, I remember how I did it. Take a 6 to 8 inch length of 3/32" piano wire pointed at the tip and roughened with a file. With your electric drill, push this wire through the marks and, if the firewall does not catch on fire from the friction, you are ready for the next step. Enlarge the holes to about 1/8" from the outside (a 1/8" drill works well). Now check the fit of the tank to see if you can get the brass tubes to feed through their intended holes. If you can, you're all done. For the rest of us, continue to enlarge the holes in the appropriate direction indicated by your test fitting of the tank. Soon you will be able to see both tubes at the same time! Now you're getting warm. I ended up with a slot 1/4" x 3/4" and this is a good goal to shoot for. Now is a good time to clean the front of the tank with Isopropyl alcohol. Seal the entire plug of the tank with Silicone Rubber and install the tank with the breather up. With the fuselage upside down, glue the tank to the top of the compartment with Silicone on a stick. Or, if this does not place the tank level with the engine throttle, shim the tank to the proper position. It's good to do this before drilling the holes. When the Silicone cures, you should have a pretty good seal at the firewall. To further support the brass tubing, set the engine in place and route the brass tubes before the next step. Fill the remainder of the hole in the firewall with an epoxy paste, such as Easy Poxy or a mixture of Hobbypoxy glue and balsa dust will suffice. Now the brass tubes are part of the airplane. The tank is floating on the Silicone rubber sealer and the rubber plug in the tank allows the tank to move a few millimeters without snapping off the brass tubes.

These are a few ideas that I, personally, have used with success and which I hope may be of some value to you. If they are, from time to time I'll pass on some more in the hopes that they might save you a little bit of time and money in this sport and hobby of ours. □

TAKE A LOOK AT THIS

From Page 62

Sterling Models, Inc., of Philadelphia, Pennsylvania, feels that the modeler builders will be as enthusiastic as they are about the brand new Nylon Low Profile Washer-Head Screw, which they have just introduced. Precision molded from pure virgin Nylon, which is most solvent resistant and insoluble in common acids, oils, greases, etc., these Nylon Screws are tough and extremely durable.

Low Profile Washer-Head type are available in the following sizes: Part #100, Four 6/32 x 3/4, $.35; Part #101, Four 10/32 x 1, $.40; Part #102, Four 1/4-20 x 1, $.45. Also available, Part #103, Four 1/4-20 x 2 (Round Head), $.59, for those long screw requirements.

Integral molded washer provides a large surface area, which prevents slipping and distributes the load, so that structure underneath is not crushed or pierced when the Screw is tightened down.

It is recommended that wherever possible, all installations be made with Nylon Screws. Wood nut blocks are best to use with Nylon Screws. They can be made by drilling hole and tapping block with inexpensive tap set, available in any hardware store. Combination when tightened, resists loosening under most severe vibration conditions.

Typical installations where Nylon Screws are used include wing mounting, stabilizer mounting, radio equipment mounting, etc. All four sizes of Screws, attractively packaged, are now available at all Hobby Shops. Tested, Approved and Recommended by RCM.

From Flite Line Products, 3207 34th St., Lubbock, Texas 79410, comes the Skooter II, an R/C multi design which can be used for either a trainer or sport flying. With a wing span of 48" and a total area of 480 sq. inches, the Skooter II has a fuselage length of 38" and an all up weight of 3½ pounds. Designed as a low wing multi, it can also be built as a shoulder wing basic trainer. With a .19 engine, it is extremely docile and easy to handle. With a .40 at 3½ lbs., it is hot! Designed and engineered by Riley Wooten, this tail dragger can also be built as a tricycle geared ship by simply turning the landing gear legs around and adding your favorite nose gear. The kit is extremely prefabricated and comes complete with foam wing cores and a special coated cardboard type wing covering. This airplane will go together in a weekend and provides an extremely rugged and durable aircraft that suits the bill perfectly as a basic and intermediate trainer and also as a sport aircraft, designed for the Sunday flier. Available at your local hobby shop or from Tom Thumb Hobby Center, 7020 E. Colfax Avenue, Denver, Colorado 80220. Tested, Approved, and Recommended by RCM.

Now available from R/C Modeler Corporation, P.O. Box 487, Sierra Madre, California 91024, is the newest in the RCM Anthology Library Series, "The R/C Engine," by Clarence Lee. This book contains edited reprints of the best of Clarence Lee's popular Engine Clinic column by subject material. It also includes full size drawings and specifications as well as mounting templates for many popular R/C engines. Priced at $3.95, this book was virtually sold out before it was received from the printer, but is now currently available from RCM. Included are such subjects as engine break-in, propellers, fuel and fuel additives, engine mounting, fuel tanks, glow plugs, carburetors, piston rings, mufflers, engine accessories, engine care and maintenance, reworking racing engines, pressurization, tuned pipes, tachometers and pyrometers, H.P. ratings, multiple cylinder engines, the revolutionary Wankel, and engine data. Don't miss adding this valuable reference book to your library. □

RCM 12 VOLT STARTING SYSTEM

From Page 39

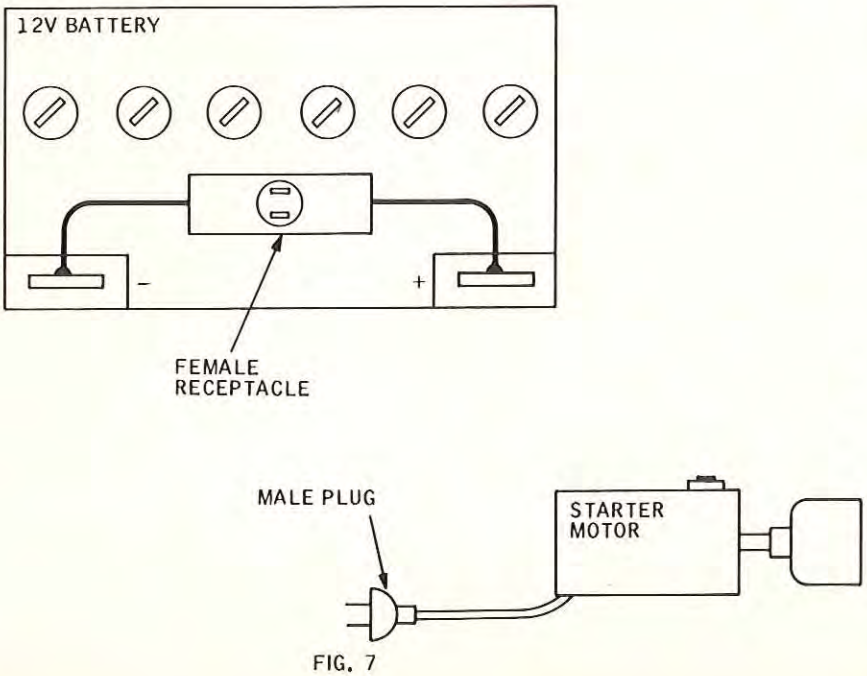


FIG. 7

to prevent damaging the spinner in case of a slip up!

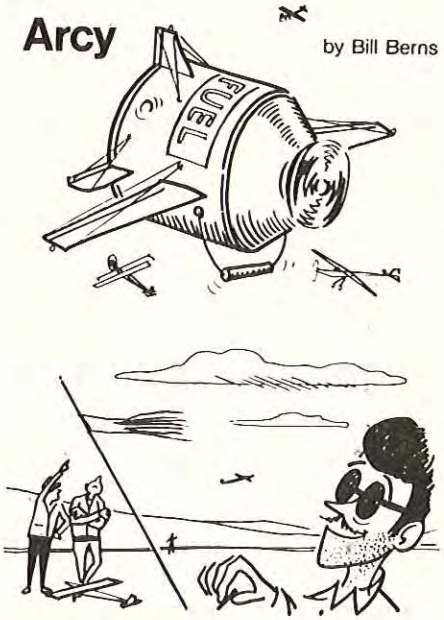
Of course, if you have access to a lathe, a machined metal coupling to fit on the end of your motor shaft would be the ideal solution, however both of the aforementioned methods will work quite well.

When hooking up the wires to your starter motor, make sure that the cable is long enough! It's surprising how **short** a 6 foot cable can seem when you've got a 60" airplane, starting battery, gas cans, RCM field box, and five little kids between you and the starter battery. The cable should be at least 9 or 10 feet long which doesn't seem to cause any noticeable voltage drop. Ordinary plastic two wire extension cords will work quite well. Another point is to paint your starter motor case a loud color. While the thing is laying in the grass it can be tripped on, so make it visible to other fliers on the field.

Although connecting the starter cable to your 12 volt battery can be done with standard battery clips, we

would recommend against it. This puts too much tension on the cable as in cases when you are picking the starter up and moving around with it which can pull the clips off the battery terminals. This minor inconvenience can be avoided by mounting an ordinary extension cord female connector permanently on top of the 12 volt battery. The cable can be made up with an ordinary household male extension cord connector. When you are ready to go, just plug the cable into the battery. The receptacle can be simply fastened on with several wrap-arounds of plastic electrical tape or mounted with silicon rubber.

Once you have completed your 12 volt RCM starter system you'll find it one of the most compact and convenient systems you have ever used. Be sure to maintain the proper distilled water level in your 12 volt battery as indicated by the upper and lower level marks on the outside of the transparent battery case. Be sure to keep your battery in a state of peak charge since the torque of your starter motor will depend upon the state of charge of your 12 volt battery. By utilizing this system, you will find that, for a small investment in time and money, you will have a complete starting system that eliminates the normal glow plug starting battery as well as the starting battery for your electric fuel pump. We have been using this system at RCM for quite some time and have found it to be extremely reliable, convenient, and practical. □



"Sure. You know it can't fly. I know it can't fly. But it's been up there all weekend!"

FLIGHT TRAINING COURSE

From Page 57

Also on the market today are several digital proportional construction kits. The two major kit manufacturers in this field are the Heath Company of Benton Harbor, Michigan and Cannon Electronics of North Hollywood, California. Both systems perform well and will present little problem for the individual with some electronic construction experience. As a matter of fact, all that really is required is a knowledge of the normal tools used for constructing electronic kits and a knowledge of how to solder properly. If you feel that you would like to purchase an R/C kit and build your own proportional system, you will also gain the knowledge of the basic fundamentals of how this system operates. If you are ham handed with a soldering iron, you will be far better off to purchase a factory assembled commercial unit that has been factory tested and is fully guaranteed. □

FEEDBACK

From Page 8

engine. Put on fresh wing seating tape and chuck the whole thing into a big plastic handi-bag (the size used for lawn care is good). Don't seal the bag airtight, since condensation might occur inside the bag.

7) Clean the wing, especially around the aileron hinges. Check all linkages and then put this assembly into another baggie. Store the plane where it won't get smashed (or thrown away!). Come next Spring, all will be fresh and ready for another season of flying.

Hobby Hints

As time passes and people, being more intelligent than energetic, find a new and/or better way of doing an old hard job – like fillets. For simple fillets that work like balsa wood and form as simple as window putty, try some Micro Balloons, a pulverized phenolic weighing about 4 oz. per cubic foot which can mix with your favorite non-shrinking cement. Actually, only the epoxies and resins work, but there are many varieties that are suitable such as Hobbypoxy, Devcon 5-Minute, polyester resins, and epoxy resins.

Mix until about the consistency of peanut butter and apply to a fillet lacking area and smooth out to the desired fillet. When the resin sets, go to work for a real joy in sanding, filing, or shaping. Remember, the longer a resin sets the harder it gets, so the Micro Balloon fillet will get about as hard as spruce after 3 or 4 days, but at no time are they hard to work with.

According to this report in the Orange Coast RC Club Inc., *Hangar Talk*, Midway City, California, the writer tried Micro Balloons with Francis Resin and was able to sand it in about 20 minutes and still be able to work it a week later.

Durability and ARTF Airplanes

The case in favor of most ARTF planes is a good one. Airplanes such as the Lanier Citron, Dee Bee Beta, Pilot Cavelier, fly like dreams – they are just great in the air. Next, they go together in less than 1/3rd the time of a balsa built-up - - - two evenings and some 5-minute epoxy should see most of them ready to take to the field – that is, if you've had some experience with them. And last, they are certainly competitive in cost. Figure the cost of a balsa contest kit, add silk/dope or MonoKote and you are almost dollar for dollar in cost of arriving at the flight line.

BUT – and it is a big "but" . . .

Evidence is mounting at a rapid rate that they simply do not stand up. Time after time at our club's "show and tell" portion of meetings, this fact has been stressed over again. At breeze-sessions on the field, one modeler after another has pointed out checks and cracks on new models that have flown only a few times and always been landed gently. Let me be specific.

In our own club, you have but to talk to Dick Spalding, Ken Smalley, Al Siegel, Jack Rufggiero, Skip Poccia, to name but a few. The ARTF's with vacuum formed fuselages, need constant maintenance. (I specifically do not refer to fiberglass shells.)

To emphasize the outright brass of one factory, Skip Poccia called them about bubbles forming in the semi-soft covering on his wing – and was told that This Is Common. He was told to slit the bubble, force epoxy underneath it, and press it back down. The factory did not say "we are changing adhesives" or "we are changing coverings" or "Gee, we are sorry" . . . no, they said this is a common prob-

lem – "You go fix it."

I believe that it is our right as modelers to bring pressure on the factories to improve both the materials used in the planes and the information they give us in their brochures and ads so that we know what to expect – and if we still want to buy after knowing all the truths, then we have no complaint. There has been very little news about the less favorable durability features of the ARTF's in the national hobby magazines – but no manufacturer can survive adverse word of mouth from modelers – it can go coast to coast in a few weeks, and sales will slack off.

The stresses caused by ROG and landing on grass fields, the problems caused by vibration, do continual damage to the ARTF materials. Surely modern research, chemicals and plastics, and some further exploration into construction methods can find an answer so that many of us are not forced to abandon these fine flying airplanes. Reprinted from the Eugene R/C Aeronauts, Inc. *Chatter,* Eugene, Oregon.

Your Camera In The Air

You can have a lot of fun with your camera installed in your latest flying creation if you follow a few basic conditions.

1) Use a high wing, relatively slow flying airplane. (Ugly Stik or the Dee Bee Alpha are good subjects).
2) Use a pre-wound camera. (Film is automatically exposed and advanced every time you take a picture).
3) An inexpensive camera takes good pictures. (As an example the spring wound Instamatic X-25).
4) Bring your exposed film to a photo store and tell them you want the film to be developed in D76 for 7½ minutes at 68 degrees with normal agitation. You should come up to an 8 x 10 enlargement without any apparent grain. Too many aerial negatives are ruined from grain or over-exposure.
5) A word about the film - - - use Pan-X black and white film with shutter set at 1/500th of a second. Lens opening should be at f/5.6. Of course an automatic-electric eye camera cures all errors.

Installation: Connect camera to throttle servo (low throttle and trim). Adjust wire, from servo to film release trigger, so that the camera takes a picture with low throttle trim. You can expect trouble with vibration if you don't pack your camera with foam padding. Light cameras tend to easily pick up vibrations, wobble and weave when subjected to air buffeting.

Flying: Two maneuvers will assure you of sharp negatives.

(1) The forward slip with engine cut back.

(2) Lazy Eight where, at the peak of climb, you relax controls, and fall into a side slip rather than follow through in a perfect execution of the Lazy Eight. This maneuver offers you a split second, at low throttle, where the plane just hangs on for an instant thus affording you the opportunity to shoot your picture motionless. By Bill Kopp as printed in the LIRCS *Low Passes*, L.I., New York.

Quarter Midgets: Tennessee

From the *Glow Plug* official bulletin of the Middle Tennessee RC Society, Nashville, Tennessee, a report of their Quarter Midget Rally which was held to help determine the popularity of this sporting event and the workability of rules. With 15 members turning out for the event, all planes met the weight and measurements with the exception of wing thickness. Presently, a 3/4" and 7/8" thickness are recommended in different quarters of the country. In the opinion of the Middle Tennessee group, the 7/8" wing should be standardized to retain the sport concept. Due to some early complaints of other layouts, the club elected to use 2 pylons at 606 feet with the starting line 100 feet from one end, and in line with the course. This worked well and met with the approval of the entire club. The time for operating 8 rounds with 3 plane heats averaged 25 minutes per round. The times recorded for the fast quarter midgets are in the same time bracket as slow Formula I sport planes – 2.25 is a decent race speed. Some points that were used in their event that should be considered for standard rules are as follows:

1. Proof of idle should be a requirement.
2. 1 second interval handicap start.
3. Fuel should be the same for all engines furnished by the contest group. Standard sport fuel with limited Nitro content.
4. Wing thickness measured at side of fuselage should be 7/8" minimum.
5. Weight, wing area, and fuselage size should be as previously proposed.
6. Point scoring system with qualifying heat to determine handicap starting.
7. Engine "on" landing should be eliminated as not realistic for all types of fields.

Included in the event were 3 Ballerinas, 2 Minnows, 2 Rivets, 3 Cassutts, and a P-39 and an original design.

Quarter Midgets: Ohio

From Bob Penko, of the Mentor Area RC Society, Kirtland, Ohio, came the following letter:

You sure started something when you proposed a 300 sq. in. .15 powered racing event back in 1968!

Some of our club members built planes to your suggested specifications and liked them so well that the club decided to take up your challenge and develop the rules further.

We sent out questionnaires to prominent fliers and built several planes. The net result is that our final rules are just about the same as the originals presented in RCM. We did adopt a 10% wing thickness rule, however, because it is an advantage to build a tapered wing with only the wing root governed. And we also wanted to encourage biplanes, which can compete favorably now.

Engine rules are always a problem in enforcement. Our power-on landing rule (plane must stop rolling with engine still running) has worked out very well. The light wing loading requires a good idle to be able to land, which keeps most engines honestly stock and also requires decent wheels, landing gear, and ground balance. It also balances the trike gear plane out a little versus the 2 wheel gear which has less drag.

The AMA tentatively voted to adopt Quarter Midget rules as a provisional event, then tabled it as "not having enough interest."

Enclosed is my AMA report of entries in our third annual Quarter Midget World Championship with

Ed Webora's winning DeNight Special. S.T. .15, Kraft radio. Quarter Midgets coming on strong throughout U.S.

winners to fifth and third place in Novice. Novice winners were determined by dividing the total entries by 2, then taking the next 2 places back for 1st, 2nd and 3rd Novice.

We had 24 entries in the Quarter Midget event. This, after only 3 years of promotion. We've been running Formula I and II for six years now and seldom get over a dozen entires in each class. We believe this speaks for itself - - - that the event is a good one; the rules are sensible and easy to enforce; and that it should be adopted by the AMA.

If your readers think so too, we'd appreciate it if they would write to the AMA Contest Board or Vice President and let them know the interest in Quarter Midgets is widespread!

1/4 Midget World Championships

NAME	Duration or Speed (MPH)
Ed Nobora	2:06.2
Bob Gademer	2:15.3
Garry Villard	2:17.6
Harry Walker	2:17.8
Marv Kowalewski	2:23.3
NOVICE	
Bob Nutter	2:57.5
James Hansen	3:23.9
Fred Sheplavy	3:29.6

Ed Nobora's 1/4 Midget was a DeNight Special, ST .15 engine.

SUPER CHIP

From Page 36

aileron torque rods, and install the rods in the wing. Sheet the top of the wing, including center section and tips, and add the diagonal ribs. The latter should be trimmed to fit as required. Let the wing dry overnight.

The wing may now be removed from the jig, and the sheeting of the bottom leading edge, center section, and tips completed. The wing tips are easier if you follow the following procedure: 1) Cut the top sheeting to the outline shown in the wing top view. 2) Use a sanding block to bevel both the top and bottom sheeting and the spars to the cross-section shown in the Tip Section on the plan. 3) Glue pieces of 1½" long soft 1/16" sheet balsa together to form two pieces, each 8" wide. The object is to cover the undersurface of the tip with one smooth piece, with the grain running spanwise. 4) Glue and pin the pieces to the tips. The result is a tip that is strong, light, and aerodynamically efficient.

Shape the wing with a sanding block, and cut out the ailerons. Glue the 1/16" and 1/4" thick aileron ribs in place, and cut 5/16" off the leading edge of each aileron to allow for facing. Face the ailerons with 3/16" thick balsa. Glue the soft balsa hinge support blocks in place between the top and bottom wing trailing edge sheeting. Face the trailing edge of the wing in the area of the ailerons with 1/8" sheet, cutting a slot in the facing to clear the aileron torque rods.

The wing panels can now be joined, but be sure to install the torque rod bearings at the wing center section. I glued the dihedral braces and torque rod bearings into the right panel. After the joint had set, I applied more glue and mated both panels. Raise one wing tip 1¼" off the bench for the proper dihedral, and check the aileron torque rods for freedom of movement.

FUSELAGE

You may note the ample use of plywood in the fuselage, most of it forward of the center of gravity. As nose weight is often required in these smaller aircraft due to the light weight

To Page 72

SUPER CHIP

From Page 68

of the engines used, I chose to make the weight in this area do some useful work.

Begin by cutting out all the plywood and balsa parts. To prevent splitting, the grain direction of the doublers run at an angle to that of the fuselage sides. The 1/8" by 1/4" balsa triplers reinforce the radio equipment and landing gear area, as well as support the belly hatch.

To aid in fuselage alignment, draw vertical centerlines on all formers and cross braces. Assemble the fuselage inverted over the top view on the plan. Lay the two side pieces flat on the workbench, assuring yourself that you have both a left and a right side. Glue all balsa doublers and triplers, plywood landing gear mounts (note that left and right mounts are different), the top triangular section, 1/16" by 1/8" vertical side reinforcements, and 1/32" tail doublers in place. After sufficient drying time, usually overnight, remove from the bench and glue formers 2 and 4A in place between the sides. Pin the assembly in place over the top view on the plan. Add the 1/16" by 1/8" top and bottom cross braces at stations 5,6, and 7. Return to the nose area, pull in, and epoxy the firewall in place at station 1. Check alignment thus far by sighting down former and cross brace centerlines and the centerline on the plan. Epoxy the 1/16" plywood tail skid mount in place, and sheet the fuselage bottom from the tail skid mount forward to station 4. Prepare the 1/8" thick plywood motor mount by pressing 3-48 blind nuts in place. Epoxy the mount in place, along with the 3/32" plywood torsion bar mounts and the 1/2" thick balsa nose block. Let the whole thing dry and cure overnight.

Turn the fuselage upright, and add the top nose block, top 3/32" sheet, and the turtledeck formers at stations 3 through 7. The 3/16" square top stringer may now be glued in place. Cut the top turtledeck sides to approximate shape, and initially glue them only to the fuselage sides. After that glue joint has dried, the sides may be moistened with liquid ammonia on the outside, bent into shape, and held with masking tape until dry. Trim the top edge, pull the sheets back slightly, and glue to the formers and the top stringer. Do both sides simultaneously, again holding the sides in place with strips of masking tape until dry. The procedure is more difficult to describe than to perform. The result is a smooth sheeting job, free from pull-in between formers.

Sand the nose blocks and sides to match the 2 degrees right and down thrust in the motor mount, and epoxy the 1/16" plywood nose ring in place.

The belly hatch is built up by pinning the pieces right into the fuselage, with scraps of wax paper in the corners allowing removal when the hatch framework is complete. Hatch sides, ends, and cross braces are cut from 1/8" sheet balsa. When all the parts have been glued in place and the joints are dry, sand the hatch flush with the bottom of the fuselage sides. Remove the hatch, and cover the bottom with 1/16" sheet balsa. The bottom of the fuselage sides between stations 2 and 4 should now be covered with pieces of scrap 1/16" by 1/8" balsa, with the grain running parallel to the sides. Trim the hatch sheeting, and tack glue the hatch back in place in the fuselage.

The entire fuselage, including the hatch, may now be carved and sanded to final shape. Don't spare the effort in this step, as it is a key to light

weight and good looks in any design.

TAIL SURFACES

Everything back here is sheet balsa. Weight is critical, so use fairly soft stock for everything except the vertical fin, which needs medium grade for strength. I feel the key to high strength, no warpage, and light weight in these very thin surfaces is the exclusive use of epoxy in fabrication and final finish. I used Hobbypoxy Formula II for all joints. The Easy-Does-It Method works perfectly for the finish, provided that all the scraping is done **before** the stab and vertical fin are attached to the fuselage. Do the scraping on a smooth, flat surface, and you'll be amazed at the warp-free surfaces that can be obtained.

LANDING GEAR

Bend the two main gear legs to shape from 3/32" diameter music wire. The tail skid is 1/32" diameter wire, sewn to its plywood mount with carpet thread, and then coated with epoxy.

The wheel pants are not really necessary, but as they are very narrow, they don't seem to be a handicap during landings on even rough grass fields. They add measurably to the appearance and the authenticity of a pylon racer, however, and those described here are really quite easy to make and install. The pant cores are cut from either one sheet of 5/16" balsa, or laminated from sheets of 1/16" and 1/4" stock. Sandwich the cores between the balsa side sheets, add the plywood mounting blocks, and carve and sand to final shape.

FINAL ASSEMBLY AND FINISHING

Remove the belly hatch, slide the wing into the fuselage, and epoxy securely. Epoxy the horizontal stabilizer in position on the fuselage, checking for alignment with the wing. Carve some soft balsa blocks to flare the vertical fin into the fuselage, and epoxy both the fillets and the fin in place. Epoxy the aileron horns in place on the torque rods as shown in the fuselage side view. The differential action and center-hinged ailerons give smooth rolls without adverse yaw.

Paint the cockpit area with flat black enamel or Aero Gloss. The canopy I used is a cut-down Sig 13" model, dyed with Rit #29 Royal Blue. The tinted canopy, with flat black underneath, makes the cockpit seem larger and more nearly to scale. Notch the turtledeck sheeting at former #3 about 1/64" deep, and back towards the tail about 1/16". This allows the canopy to seat flush with the surface of the turtledeck. Glue the canopy in place with Aero Gloss C-77 cement. When dry, completely cover the canopy to within 1/8" of the edge with masking tape to protect it during subsequent finishing steps.

Add the 1/2" square plywood front hatch hold down tab to the hatch. Fit it so that it just slips over the lip of the former at station 2. I used a long 4-40 screw and nut to hold down the rear of the hatch, but you may have a cleaner solution.

Everyone has their own way of applying surface preparation and final finish to a model. There isn't much surface area on the Super Chip, but light weight is important. Some may prefer to use MonoKote for lightness and ease of application. I suggest the following method. For small aircraft, I feel it's the best of the many I've tried.

Sand everything smooth, working down to #400 sandpaper, and apply two coats of clear butyrate dope to everything except those Hobbypoxy-coated tail surfaces. Cover the wing with medium weight Silkspan, applied wet. Cover the fuselage and wheel pants with very light weight silk, also applied wet. Seal the covering with three coats of clear, sanding well

between coats.

Add fillets, using Sig Epoxylite, to the canopy and the wing. After the fillets have been sanded to final contour, give everything except those tail surfaces a coat of 50/50 dope and talc mixture. Sand carefully, and finish the surface preparation with a thin coat of clear over everything.

Cut a small square of finish away from the inside of each wheel pant, and slide pants and wheels onto their gear legs. Install the gear temporarily on the model, and epoxy the pants in place. Reinforce the attachment with a small patch of glass cloth epoxied in place over that spot of bare wood on the inside. While you're mixing epoxy, apply a coat or two to the interior of the engine mount area.

Hinge the ailerons and elevator to suit your taste. Epoxy the ailerons to the torque rods in the process. Leave your masterpiece alone for three days, allowing the dope solvents to evaporate prior to finish coats.

The color finish on most of my small models is Hobbypoxy. Hot 1/2 A fuels and even the best hot fuel proof dopes just aren't compatible. Lightly sand the entire aircraft with #400 paper, clean well, dry, and spray Hobbypoxy. I'm sure a letter to the folks at Hobbypoxy will get you the details. Remove the masking tape from the canopy, and allow the finish to cure for a week before exposing to raw fuel.

EQUIPMENT INSTALLATION

I used a Kraft two channel brick system in the prototype, although there is room for two servos from a conventional system. The brick was mounted on two 1/4" by 1/2" spruce rails laid across the fuselage. a 225 mah. battery pack was located in the nose, under the 1 oz. Sullivan fuel tank. I wired a separate charging plug into the battery pack, and attached the plug to the belly hatch. I now can charge the system without the need to remove the hatch.

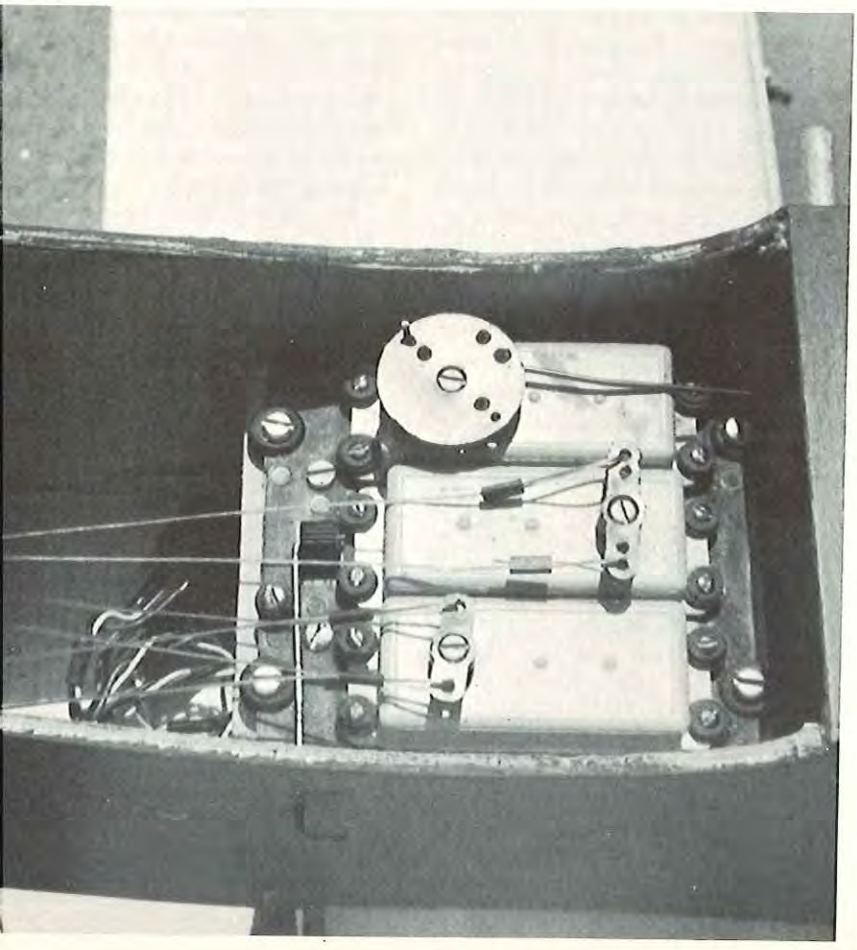
Make up the aileron and elevator pushrods, the latter incorporating a length of 3/16" diameter dowel. Numerous commercial fittings are available, so I'll leave the choice to you. Suggestions for control surface throws shown on the plan give lively aerobatic performance. A little less elevator might be advisable for a beginner, especially with a rearward center of gravity location. The Tee Dee .049 used on my prototype has run well with a 5½/4 Cox prop. For best performance, be sure the prop is balanced and the spinner is running true.

Check the center of gravity location, and add weight if necessary. If the CG is much behind the rear limit shown on the plan, I suggest you move all spectators back 100 feet for each 1/4" of aft CG. Small models need a more forward CG to help in pitch stability due to their lower inertia about the pitch axis. Otherwise, they're wild!

FLYING

Flying weight, less fuel, should be between 21 and 26 ounces. Choose a calm day to get used to the small size and greater apparent speed of your Super Chip. When you become accustomed to these little aircraft, windy weather flying is no problem. A hand launch is suggested for the first flights. If you're new to aileron flying, get someone more experienced to do the test flying.

Good luck, and let me know how you like your Super Chip. Start racing with anything available. Organize club races at your local level, and let R/C Modeler Magazine and your AMA representatives know of your interest in 1/2 A racing. Only in this way can this racing class for everyone grow and mature. □



View of radio installation using cable controls. Standard pushrods can be used. Virtually any size radio will fit in wide Sopwith fuselage.

SOPWITH TRIPLANE

From Page 32

scrap foam pieces.

16) Shape the wing tips. They are all the same. Use rough sandpaper to shape and then finish with very fine sandpaper. Also, at this time, and with the fine sandpaper, remove all of the flash along the leading and trailing edge and any other bumps on the wings surfaces.

17) Carefully cut out the 1/8" plywood wing struts. Lay them, one at a time, on the plans and use the wing template you made to mark the proper wing alignment on the struts.

18) Mark the strut locations on the top and center wing. The inboard

struts are three inches apart or 1½ inches from the center. The outboard struts are 11½ inches from the center or twenty-three inches apart. Cut out the slots in the wings so that the struts fit snugly. If these holes are too large it is difficult to obtain proper alignment of the wings. Please note that because of the dihedral these slots will be angled slightly through the wings. Make the slots in the top wing only as deep as the struts go. Do not cut completely through the wing.

19) Temporarily assemble the upper wings and struts to make sure everything lines up and the struts are vertical. When you are satisfied that everything is right, you may proceed. If you make a mistake you can plug up a hole with some of the scrap foam pieces and some white glue.
20) Epoxy the two inboard struts into the center wing one at a time. Make doubly sure that the forward angle of the struts is the same as the plans. **This is the most critical step and will determine how well your airplane will fly.**
21) Epoxy into place the two outboard struts through the center wing. Be sure they are in line with the two inboard struts and the holes in the top wing.
22) When the struts are all firmly epoxied into the center wing, trial fit the top wing again to be sure all of the holes still line up. Use Hobbypoxy Formula II or other slower drying epoxy to glue on the top wing. Do not use 5-minute epoxy unless you are prepared to buy two more wings and start over. It can be done, but it is not worth the trouble if you don't get everything aligned before the stuff sets up.
23) Epoxy into the bottom wing the 1/16" plywood tabs which will bolt to the outboard wing struts.

The airplane is now ready for paint and gear installation.

FINISH

Give all of the wood at least two coats of clear dope to seal the grain. Sand lightly with 360 wet or dry paper between coats. I used water based, artists acrylic polymer to paint my triplane and I highly recommend it. It is available at artists supply shops under the brand name of Liquitex or Hyplar. This paint covers well, will not attack foam, is fuel proof and dries quickly. Any color can be mixed from a wide variety of colors and it goes a long way. Another feature, for future reference, is that dope may be applied over the acrylic on foam wings. Use two coats of the acrylic to completely seal all of the pores of the foam before spraying on the dope.

To mix the WW I olive drab color, add one part of *Cadmium Red Medium* to four parts of *Chrome Oxide Green* and one or two parts of water to thin. The paint will still be thick but it brushes easily.

Give the fuselage and top sides of the wings and stabilizer two coats of

the olive drab. I left the undersides of the wings unpainted and painted the rudder and undersides of the stabilizer white. The rudder is then painted red, white and blue. *Cerulean Blue* with some white added is just right for the rudder and the wing roundels. The wing roundels were painted on by hand with the help of a compass. Refer to Dave Platt's article "Scale in Hand" in the September, 1971 issue of RCM for the correct proportions of the roundels. The white fuselage markings can be painted or white contact paper or MonoKote trim can be used.

The cowl turned out to be an easy 10 minute job. After a great deal of worrying and searching for the right sized plastic container. The large size 'Cool Whip' container located in the freezer section of the market proved to be perfect for the job. This container can be trimmed and used as is or it can be used as a mold to make a fiberglass cowl. Polyester resin will not stick to this plastic so no parting agent is needed. Cut several pieces of glass cloth so that they will lay in place inside the bowl without wrinkling. One or two layers of cloth is adequate. Pour in some resin and rotate the bowl until all of the cloth is saturated and then pour out the excess resin and allow to cure. Carefully free the cowl from the bowl and trim. Sand lightly and fill any pinholes with putty and paint. I used AeroGloss Silvaire Aluminum.

Conventional pushrods to the rudder and elevator would be easier to maintain than the cables and I would recommend them except to the more experienced modeler. If you choose to use cables, build the bellcrank system. Hooking the cables directly to the servo output arms will work, but if the servos should shift, or pop out of their grommets from a hard landing or crash, the rudder and stabilizer will be ripped off by the cables. I found this out the hard way!

Plastic coated stranded steel cable and crimp fasteners are available from fishing tackle shops. The brand I used was "Sevenstrand" and was rated at thirty pounds test. The plastic coating will melt with heat and will fuse to itself for non-slip attachment with the crimp fasteners to the bellcranks and control horns.

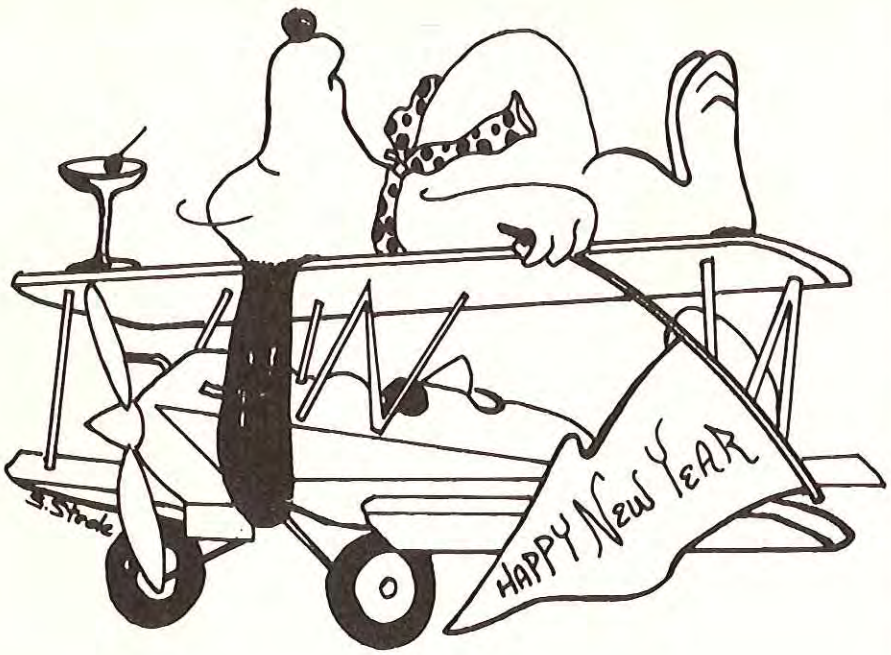
Bend the landing gear from 3/32" music wire and bind the joints with fine copper wire before soldering. The rear of the landing gear is free to slide against the plywood strips on the underside of the bottom wing. The wing rubber bands keep the landing gear in place. This system works very well and is very forgiving for rough landings.

Get the Profile Publications' profile on the Sopwith Triplane for more information and details of this historic airplane.

FLYING

Pick a calm day for that first flight and an experienced RC'er to fly it if you are not an experienced pilot yourself. I have seen too many new airplanes needlessly crashed because they were out of trim when a more experienced pilot could have flown them safely and then made the necessary adjustments to the model.

Release the airplane directly into the wind with full power and allow the airplane to lift off the ground by itself. Some right rudder correction will be necessary during takeoff, but apply gently. After the plane is airborne, keep it headed straight ahead until some altitude is reached before starting the first turn. Altitude is a new airplane's best friend! Generally, you should fly at least two mistakes high!



EDITORS NOTE: A complete set of 3 foam wings are available for the Sopwith Triplane from all Ace dealers or direct from Ace R/C, 203 W. 19th Street, Higginsville, Mo. 64037. Price is $6.95 for set of 3 wings. Specify catalog #13L205.

Once the airplane is a couple of hundred feet high you can begin to adjust the trim levers for straight and level flight. Do not let go of the sticks for anything until you are **at least** that high. Then you can relax and find out how much fun slow flying can be. □

JUNKERS J.U. 52

From Page 29

face. Check with the photographs in your Profile Book, and Plastic Kit and determine how the corrugated metal was used and in which areas. When all is O.K., mark a centre line on the fuselage top and the basic side – planked joint above the windows. Now, strip the sheet down into 1/8" strips. Coat an area about 1" wide with sanding sealer on the fuselage and, using the guideline, lay the strips in place using a scrap piece of 1/8" sheet as a distance gauge between strips. The pre-sealed surfaces will weld together with the action of the wet sealer you have applied to the surface. Just keep going – checking that you are not applying strip wood in places where there was flat metal. When the fuselage top is covered, give yourself a boost by rubbing down to shape. This is a piece of cake. Take a soft length of 3/8" x 3/8" balsa and using contact adhesive, glue fine sandpaper to it. Cut into usable lengths of 5" – 6". Now wedge it down between the strips and push back and forth. This will very quickly form a section approaching a triangle. When complete, take a flat sanding block and rub gently across the top surfaces, taking off about 1/32". Dust off, and apply a good coat of sealer. Stand back and look at it. Ain't it pretty? Now that you have convinced yourself that you can do it, just keep going. It will look 100% better with the first coat of colour. The wings can be covered with 3/32" or 1/8" soft strip and all the tail surfaces with 1/16" (also flaps and ailerons or, again, corrugated paper). When all is finished it receives a total of two coats of sealer on the corrugations. The main cockpit canopy can be moulded from plastic over a carved balsa form or built up on ply frames and glazed with celluloid. The interior of the cockpit can be fitted out and crewed, but this is a matter of the individuals need or ability. My own model has two crew members in the cockpit with expressions of frozen alarm. They really had no need to worry! Aerial, D.F. Loop, oil coolers, gun, etc., can be fitted prior to painting, but here again, the amount of detail depends on the individual. Panels around the nose area are simple pieces of thin card with short pins pushed into the corners. Doors are cut from card – corrugations are applied – and the doors fixed with sanding sealer.

I should say that nothing was spared on the original, apart from keeping a careful eye on the wood selection used behind the C of G., and the beast came out at 11½ lbs. At this weight the model floats like a sailplane and to date seven different members of the West Essex Club have 'had a go on the box,' including such stalwarts as Ken Marsh and Syd Sutherland, and all have been delighted with its handling. We feel that the weight could easily go to an illegal 13 lbs. without affecting performance. In fact, we feel

that in its present weight a Merco .49 would fly it. However, I digress – the aircraft now receives two coats of colour to the chosen scheme. I used Kingston Diamond Eggshell Polyurethane, thinned with cellulose thinners. Individual markings will have to be handpainted unless you are a genius with decals.

FLYING

No problem! C of G, as shown, was on the original, and the model needed only slight down trim and slight right aileron trim. This was on its first flight at USAF Lakenheath in early August this year, where we were on invitation of the servicemen there in the base model club. On landing, adjustment was made to the elevator Q-Link and nothing has been touched since, the model really notching up the flights.

So, to sum up, play it safe! Do not allow the C of G to creep back. A little forward would do no harm. Wind on a little down elevator, fire up the motors and let her go. The drill is to climb on full motor, maintain height, then cruise at 2/3rd throttle, and land on idle. And when you do land it, be ready for the applause – this bird really drives the crowd wild!

And the best of British luck! (Or should it be German?) □

SUNDAY FLIER

From Page 14

Length 22½"; width 3½"; depth 2¼" at step (on C.G.). The top of the floats have zero incidence. Small underfin below elevator which also carries the tail skid.

Thanks for a great design, Ken.
Yours Faithfully,
Tom Charlesworth
162 Old Farm Road
Hamilton, New Zealand

The two photos Tom sent show you what an attractive modification he did. You can see the forward portion of the "underfin" as he calls it. (Also known as a ventral fin, or sub-fin). It's a very important part of almost all conversions of landplane designs into floatplanes. The reason is simple – you add a lot of side area to the profile of the plane – most of it forward of the C.G. Unless you have a very generously sized fin to begin with, you must compensate for the increased side area forward of the C.G., otherwise your directional stability will become marginal. I've actually seen cases where a modeler added floats without increasing fin area, and the first time he applied rudder the model did a 'Dutch Roll' completely through inverted flight and around to right side up. It all happened so fast he didn't have time to think about correcting the maneuver with opposite rudder. Then, on a delayed reflex, he did just that, only to have the model roll violently in the opposite direction, this time winding up in the drink.

"I don't understand it," he said wonderingly, "it never did that as a landplane – and the floats weigh just about the same as the wheels, maybe an ounce or two more, that's all."

After the model dried out, and the

radio was checked (fortunately, the water was fresh, not salt), and additional fin area in the form of a ventral, or sub-fin, was installed, the problem was solved.

How much area should you add? Depends on the individual design. Perhaps the best rule of thumb I could suggest would be "try one-third of the existing area to begin with." Normally, if the airplane flies well as a landplane (you know, goes where you point it until you send a control command to go in a different direction) then the addition of 1/3rd more fin area will make it do the same as a seaplane.

Another broad general rule of thumb is that you can get by with adding a smaller amount of fin area – even none in some cases, if you use ailerons primarily in turns, since you get away from the initial skid which is the prime cause of the 'Dutch Roll' instability.

In any event, it's always challenging, interesting, and rewarding to make a successful conversion of your R/C model from landplane to seaplane. And sometimes, in between the challenge and the reward, it can be exasperating.

But it's always exciting.

★ ★ ★ ★ ★ ★ ★ ★ ★ ★

Recently a new variation of an old art form, wire sculptures, has come on the modeling scene. It came to my attention through the League of Silent Flight. I was out at the field one day and there was George Popa intently trying to catch a few thermals for LSF qualifying flights. Well, it was early, and the lift hadn't shown up, so, after a couple of flights, we decided to take a break. As he put his glider down alongside his equipment box, I noticed a small, silver wire outline model.

"Hey, that looks like a Cirrus," I said.

"It should," said George. "I made it right from the scale 3-view."

"Oh?"

"Yes. It's an art form I enjoy, and since I also like airplanes and gliders, I decided to combine them. I've been making scale wire sculptures mostly using Wylam plans, of many airplanes."

I was intrigued, and asked George to show me some. He has several, and I picked his wire sculpture of the Wright Model A to show to you. The intricate wire frame is mounted on an attractive base, and for aviation enthusiasts, it's a great conversation piece for the den, in addition to being a work of art.

George can make these wire sculptures from any 3-view drawing; spans run from six to twelve inches. He even made a sculpture of a launching winch which was presented to Gerry Wolfram, "World's Greatest Winch Boss," by the LSF.

If you'd like a wire sculpture of your favorite plane, write to George at 6708 John Drive, San Jose, California 95129. He'll quote you a fair price which will depend on how intricate the job is. And, of course, I'll dun him a bit so part of your payment will help defray some of the cost of running the League of Silent Flight.

That way, everybody's happy. □

SCALE IN HAND

From Page 12

Let's talk now for a moment about the relative merits of putting cockpit detail into a model during the building or after the airplane is flown and trimmed out. For several years, we heard many modelers say that they wouldn't put any detail into a model until it had proven to be a "going concern." Frankly, there were and are, many sound logical reasons for putting detail in after the initial flights. Mostly, of course, if the model does not prove out well, it isn't worth a whole lot of additional effort, and can be relegated to Standoff Scale events where loads of detail are not required. In a really serious case a model could be abandoned. While this is no big laugh, it is better to do with a semi-finished model than a 700-hour project, as no one will deny.

Furthermore, the trimming process of a new model (the first two or three flights, when the model is adjusting the pilot to suit its liking) is a somewhat fraught period for all concerned, and we wouldn't want to shake up or knock off time-consuming details which can safely be installed after man and model have learned to co-operate.

The other side of the argument (and for awhile the one we favored) held that (a) a model can only be trimmed correctly in its final configuration, with weight and C.G. position determined; (b) it's almost impossible to get cockpit detail into an otherwise finished model; and (c) when a model is in flying shape it is psychologically difficult to get around to finishing it, which often means it just doesn't get done.

Well, take your choice. We would point out, however, that the second argument has lost favor with us, because (a) above has not proven to be a problem, (b) has been solved by the present "module" system of cockpit detailing, and (c) is solved partly by answer (b).

All things considered, we now feel that the strong arguments for detailing after trimming make more sense. Certainly, for the newcomer to scale this is a better way to go. By the time experience has been gained, the modeler will fall into a natural procedure that suits him best.

★ ★ ★

Before we can start on the reproduction of the actual details, we'd better get some materials to hand, and maybe a few tools too. And, right here, we'd like you to meet a material which you may not have had previous experience with – plastic.

Now, don't go away mad. We aren't succumbing to the dreaded disease "RTF-itis!" What we are going to do is order and get some hi-impact polystyrene sheet, in various thicknesses. We need the regular white plastic sheet in .010", .020", .030" and .060" sizes. Try your local industrial plastics supplier for this – prices are very reason-

ught a 6' x 3' sheet of each
zes a few years ago; the total
't over $20.00 and there's
left for a few more scale jobs

ow, let's take a trip to the local
del shop. We need a sheet of clear
atyrate about .015", a package of
hose instrument faces they sell; don't
worry if the size isn't right, get the
biggest size you can. The next thing is
ome "Plastruck" tubing. Probably the
dealer will have one of Plastruct's cute
evolving stands; pick out a length of
ach of the sizes of white plastic
ubing. If this is not available locally,
ither order it through your shop or
vrite one of the big mail order houses
uch as Stanton's. Some glue and a few
ew No. 11 X-Acto blades completes
ur requirements. Get Plastruct's own
quid cement or Testor's Liquid
ement, each works well. You may as
ell buy a tube of plastic cement, too,
or those times when a thicker and
ore sticky type of glue is necessary.
ot contact-cement at home? If not,
et a tube.

Now, while you fellows are doing
this, we're going out flying. But
e'll be back next month with the
ntinuing saga of the cockpit detail-
g. Don't miss it; you won't find a lot
use for all that stuff you've bought,
ewhere! □

UNNINGHAM ON R/C

om Page 16

ued the skins on with contact
ment, turned the jig over, glued the
nts exposed on the other side with
hot glue gun, again installed the
ns with contact, and was able to
nove the completed wing panel in
s than 30 minutes from when I
rted sliding the ribs over the ¼"
s. The other half was constructed
rapidly, and then the two wing
nels were joined with 5-minute
oxy. When dry, I wrapped a band of
erglass tape around the center,
ked up some polyester resin to coat
band, set this under a drying lamp,
the basic wing was completed in
little time. I have used 5-minute
xy for a long time, and the
blem here is to mix up small
ches of glue to allow time enough
glue just the area that you are
king on. With the hot glue gun you
keep moving along, and the glue is
in 60 seconds. The fuselage was
rely constructed with the hot gun,
pt around the firewall, which was

done with epoxy. One tip, though, when using the glue gun, watch out, the glue is darn hot, and you can burn the heck out of your fingers if you are not careful. I quickly learned that the best way to glue a small part to a large part was not to put hot glue on the small part, then stick it to the larger one, but squirt the hot glue on the larger part, then press the smaller one to it. Don't worry about the glue oozing out around the part, this fillet of glue adds a lot of strength to the glue bond. Only in places that you are going to sand should you wipe away the excess glue with a rag before it sets up.

By using this type of glue, you can cut your building time down considerably, and with the added "plus" of very little objectionable odor.

I received a letter the other day asking how was the best way to measure battery voltage under load. Should a checker be constructed to simulate the load of receiver and servos, or just what would be the best way to check the voltage? The method that I use is simple, cheap, and easy. I use a volt meter, with the normal probes attached. But, I use two wires with an alligator clip on each end of each wire. One end of each wire clips on the volt meter probe, and the other end clips on a straight pin. Then I pull the battery plug out of the receiver plug just a little way, enough to make contact with the plug prongs with the pins clipped to the voltmeter leads. By turning on the switch, you can check the battery under the load of the receiver and servos. Operate the transmitter sticks so that the servos are moving, and you will be able to give the battery a good load check. If you run out of hands during this operation, draft your wife to move the transmitter sticks while you hold the pin-probes on the battery lead. Be sure not to ground the pins against each other as you will short out the battery, and cause it an early death. If you are in doubt about your battery, leave the transmitter and receiver turned on for half an hour. Move the sticks every few minutes to give the battery a good amount of work, and then take another voltmeter reading. Don't forget to check the transmitter battery pack too while you are making all of these voltage checks.

If you keep a regular pattern of charging and discharging your battery packs, both transmitter and receiver, your packs will last for years. Nickel cadmium packs, that is. Remember, too, that all batteries have a "shelf life", and that some of that shelf life has been consumed on the dealers shelf. This is especially true of dry cells used in battery packs for the less expensive radio sets. Check this type of pack often, and always under load.

The RCM National Fun Fly Championships have been scheduled for 1972. It will be held on the 18th and 19th of June, 1972, again at Thunderbird Field, on the shores of Lake

Benbrook near Fort Worth, Texas. Make your plans now to attend. The rules for this year will be the same as last year, with the minor exception that the total time allowed for the climb out and spin-down portion of the competition will be reduced from 90 seconds to 60 seconds. This change will save a little wear and tear on the part of the judges, 'cause these fast climbing aircraft can get pretty high in a short time, and trying to count a rapidly spinning aircraft coming down from a high altitude is rough. Both RCM and the Fort Worth Thunderbirds hope that you will plan to make the National Fun Fly this year part of your contest plan.

I hope that a lot of you sport fliers will take the time to answer the questions posed in the earlier part of this column, and if you have any additional comments on what type of aircraft you like, jot 'em down. Let's hear from you.

Good Luck, and Good Flying. □

ENGINE CLINIC

From Page 10

.60 size engine in very cold weather, you are asking for trouble. A blade can come off and catch you right in the face or worse, an eye. Why risk it? I personally used to use a nylon prop when bench running engines. When you have a lot of engines to run the wooden hubs have a tendency to gradually compress and I had to keep throwing away otherwise good props. The nylon prop seemed like the answer. That is, until one let loose and caught me in the shoulder. Fortunately, I was wearing a leather jacket. And this was with a Veco .45, not a .60. I have a good friend who had a nylon propeller throw a blade and catch him in the arm without the benefit of a leather jacket. I do not recall the number of stitches the arm required, but it was quite a few.

While on this subject, how about any of you fellows who have had similar experiences of this nature writing in and letting us know. Everytime I mention the hazards of nylon propellers, I receive several indignant letters from modelers who doubt that any such dangers exist and want substantiated proof. So, if a few of you fellows who have had nylon props come apart would write in, we might convince some of these doubters that the danger does exist.

Dear Mr. Lee,

I am a regular reader of your articles in RCM and enjoy them very much as I am new to the sport.

I have a Veco .50 with a Perry carb., which I snapped the base tube off even with the body in a bad landing. I tried, without success, to buy a new body, so I ordered and received a new complete carb, which came in a box marked Veco .50. My problem is that they don't come close to the same size except the tube fits my engine and the throttle and baffle arm are the same. I took it back to the shop that ordered it for me and compared it to a new .50 in the box and it was smaller. The one on the new .50

and a new .61 look the same on the outside, are they interchangeable?

I would appreciate any help you can give me, also is it possible to get parts for these Perry's and where?

Thank You
G. Ritter
Sandusky, Ohio

The later model Perry carburetors for the Veco .50 use a smaller body now than was used originally. The original Perry carburetors for the .50 had the same size body as the .61. Evidently the new Veco .50 you compared your new one with still had one of the early carburetors. Either the small or large carburetor intended for the Veco .50 are interchangeable. The smaller body just being a later model.

I get quite a few letters from modelers wanting to know where they can get replacement parts for their Perry carburetors. This is somewhat of a puzzle to me because an instruction sheet and parts list is packed in every box. It is under the plastic foam that supports the carburetor. I guess some of you guys are just not bothering to lift the piece of foam out. Anyhow, if your local hobby shop does not have them you can get replacement parts for your Perry carburetor from Perry Aeromotive, 6887 Farmdale, North Hollywood, California 91606.

Dear Mr. Lee,

I am having problems with my home-made fuel.

The fuel is a 70-20 mixture using re-agent grade methanol and nitro and Bakers AA castor. The problems are hard starting and low rpm. The hard starting problem is really bad in the .15 and smaller engines. I've changed plugs and even gone to 3 volts on some plugs but this doesn't seem to help much.

Where have I gone wrong and what can I do about it, if anything?

Thank You,
Paul Roberts
Gainesville, Florida

Paul, I believe your problem is with your re-agent grade methanol. This is used in chemical labs and I am not too sure how it would work as an engine fuel. There are many grades of methanol and only one or two are suitable for model fuel use. Methanol comes in many degrees of dryness (water content) and only the driest can be used. Best to find the local hot rod shop in your area that sells fuel for the drag racers and purchase your methanol from them. Dragsters use only the top grade as required for our fuels.

Dear Mr. Lee,

I have a Veco .19BB R/C which I would like to disassemble for cleaning. However, I cannot get the connecting rod off of the crankshaft in order to remove the piston. I have both a Veco .61 and Super Tigre .60 that have a hole in the back of the case for fishing out the wrist pin so the piston can be removed. My Veco .19 does not have a hole, so how do I get it apart?

Sincerely,
Bob Lewis
Modesto, Calif.

Several fellows have had this problem with their old Veco .45's and Veco .19's. No hole was provided in the back of the case for 'fishing' out the wrist pin as one was not generally needed. Once in awhile you will come across an engine with the crank pin a hair on the long side, or the con-rod fit a little tight. During assembly a slight tap popped it over the crank pin into place. Taking it back off does sometimes present a problem with some engines. I have a precision tool for this job that usually cracks people up when they see it. It is nothing more than an ordinary ¼" carriage bolt that you can purchase at any hardware store. The carriage bolt has a half round head and a short square section beneath. Place the head of the bolt in the port hole in the crankshaft with the edge of the bolt head under the edge of the rod (piston at top center), and a slight downward motion will pop the rod right off and you will not have to use vice grips and a crow bar as some have tried.

Dear Clarence,

I was surprised to see my question on the K & B .40 with the exhaust problem in the April '71 RCM. Thank you for the correct solution to the problem.

In all sincerity, your column in RCM is still tops by a wide margin for you write it as it is and do not spare any manufacturers and their problems. It seems that some of the editors can use a lot of space to say little or nothing or justify something.

Should an assembled K & B .35, front rotor, series 64 minus glow plug and off of T.D.C. or B.D.C. rotate so that the piston appears heavy and goes to the opposite end depending if the engine is upright or inverted?

Sincerely,
Richard Sobezak
Waterford, Wisconsin

The piston in any lapped engine should drop to the bottom. It would also in a ringed engine if it were not for the ring drag. When balancing an engine you only balance out the rotating weight and part of the reciprocating weight . . . generally, the con-

necting rod and part of the wrist pin weight. Some designers balance 1/2 to 2/3 the combined weight of the piston, wrist pin, and connecting rod. A lot of trial and error comes into play here. In any event, you do not balance out the complete piston weight as the engine would vibrate more than with no counter-balance at all.

That about does it for another month, gang. The letters and ideas have been slowing down lately. Don't leave it up to the other guy to write in. I need the material to work with. □

LETTERS

From Page 5

A MATTER OF IMAGE

Dear Sir:

You may not want to use your magazine to carry on a continuing dialogue of "Letters to the Editor," but I would like to respond to two of those who responded to my letter which appeared in the June '71 issue. I would appreciate it if you would forward this letter to Messrs. J.A. Saintsburg and Leroy McCormack. I enclose two additional copies to send to them. I'm quite committed to the model airplane hobby, and since these people were concerned enough to write, I am concerned enough to answer them.

To Mr. Saintsburg; the point of my letter is that I think we can improve the image of the model airplane hobby as a whole, in the eyes of the general public and such groups as park commissions, recreation commissions, and the like if we show a concern and interest in youth; if we project the idea that model airplaning is a healthy, educational, profitable pursuit for youth, and that the adult contingent of the hobby stands ready and willing to help youth develop in the hobby. I don't think we do project that image now.

There is nothing wrong with 45 year old people in the model airplane hobby. All I'm saying is that if there were more young people in the hobby, it might have a more attractive image. I know that there are young people in the hobby; just go to the NATS, or any large contest, and see how many Juniors and Seniors are there, mostly flying F/F and C/L. I also know that in most towns, if you ask the man on the street about model airplanes, he'll point you to the local R/C field, where you probably will not find many youths. I'm not knocking it, I'm just saying that R/C is primarily an adult segment of the hobby as a whole, and if we are concerned about image, I think we could improve it by gathering in the youth, and their thing will most likely be C/L and F/F, at least in the beginning.

To Mr. McCormack; you missed the whole point of my letter. I don't have a bone to pick with R/C, but apparently the public and public officials in some places, Los Angeles in particular, do. I don't mind the heat; I'm in the kitchen, I've been there for about 35 years, I like it, and I'm staying there.

With respect to noise, in my reference to adult R/C noise versus 15 year old C/L noise, you apparently didn't notice the word **subjective**, which was printed bold faced for emphasis. I know the whole bit about lawnmowers, diesel trucks, highways, motorcycles, airliners and all. It just proves my point; people will complain bitterly about model airplanes, but will put up with all the other noise pollution. They will complain about noise from kids with models, but it seems they complain more about noise from adults with models.

I don't go for mufflers any more than the next guy; as it happens we don't need them at our R/C field, or at the place where I fly C/L. If in some localities noise is causing the loss of flying sites, and that is clearly true, and probably will be more true in the future, we had better get on with the development of good, practical mufflers. I think the handwriting is on the wall, we ought to get ready.

With respect to your comment on the increasing age in the hobby, you are just agreeing with me; what answers do you and the multitudes want? I don't know any way to reduce the cost or complexity of R/C, do you? So what do we do to get youth into the hobby? Maybe we should encourage them to start at the bottom, with C/L or F/F models that are within their capability to build and pocketbooks to buy. Your comparison of $125.00 for a full race C/L speed job is sort of silly, most kids would start with something like a Ringmaster with a McCoy .35 in it, and might end up with $25.00 in it, ready to go.

Kids are faddists, I speak from experience as a parent and as an active Scoutmaster. The reason they are, is that in today's society, they are encouraged to be. There is such a huge variety of recreational opportunities available, so many different things for youth to do, many of which don't

require much effort, that it is hard to persuade a kid that he ought to spend hours building a model airplane which he will then go crash.

You talk about a "responsible adult," and if you will read my letter, I say, ". . . . . unless really encouraged." I "try that on for size," and I guess you are agreeing with me again.

If you think noise, cost and image are "tripe," I'm not going to be able to convince you otherwise. If you don't think R/C is the key to the whole problem, then what is? There are more R/C people, they spend more money, they are older, and hopefully more responsible, and should therefore assume the leadership role.

As a taxpayer, you may well have a voice in planning a park or recreational facility, but your voice may not be listened to if that image you think is "tripe" is poor. Just look at what happened in L.A.!

Finally, if you say there are no flying sites in the St. Louis city limits, I won't argue. I seem to recall reading about the C/L International team eliminations being held there a couple of years ago, but maybe it was in the county rather than the city. I don't know what difference it makes. I **do** know that there are flying sites, both R/C and C/L, in New York City, and I imagine they do require club membership, since I think they were acquired through the efforts of those clubs.

Sincerely,
George F. Abbott
Raleigh, N.C.

Dear Sir:

I just picked up the September issue of your magazine and was eating up every word of it until I came to Craig Covello's letter. I found myself agreeing with most of his comments until I read his last paragraph. I can not see how an RC enthusiast could call model airplanes "toys" but, even more alarming, claim that when this so called fact is known that RC modeling will "really become popular." The idea that RC models are toys and that popularity of the hobby depends upon such a realization is diametrically opposed!!! The American Heritage Dictionary defines "toy" as an object for children to play with; a trinket, a small ornament or used as a verb – to amuse oneself idly. I can find no similarity between RC models and "toys," by definition, or by any other way. Furthermore, it is this very idea of being a "toy" that we as model

.ust fight. It is only when
gnized as skilled craftsman
a need to duplicate the world
.ture and to give life to these
.ns that RC modeling will
.y become popular." When people
ne to this realization they will
.ccept us not as kids who never left
puberty but as expressive adults, and it
naturally will follow that RC modeling
vill free itself from the "toy" mis-
onception.

Sincerely,
Glen A. Dean
Lt(jg) USNR
Mountain View, Calif.

OVICES SLIGHTED

ear Sir:

Nearly 50 C Pattern Novices who
ew at the Nats feel slighted! Your
overage of Glenview was great – but
complete if you fail to recognize the
ys struggling up to the Expert cate-
ry in C Pattern. It was a great
mpetitive battle right to the last
ght. The Novices fell only 20 points
ort for the qualifying rounds!

Carl G. Weber
Waukesha, Wisconsin

JINX?

ar Sir:

I bought a Perfex camera, they
nt out of business.
I bought a Crosley Auto, they went
of business.
I bought a Studebaker, they went
of business.
My first radio set – a Micro-
onics 1969 XL-1C-4D – and now I
't see them advertised anywhere –
t's happened to them?
For a price, I'll jinx a company for
.

Sincerely,
Kenneth Holt
Media, Pa.

*Contact Orbit Electronics, 18065
id Street, P.O. Box 8657, Foun-
Valley, California 92708, with
m Micro-Avionics merged some
ago.* □

WPOINT

n Page 3

EL TYPES
following is the listing, in order of
ntile preference, of the interest areas
C Modeler Magazine readers:
eneral Sport Aircraft

2) Sport Scale Aircraft
3) Pattern Competition Aircraft
4) Scale Competition Aircraft
5) Slope or Thermal Sailplanes
6) Seaplanes
7) Quarter Midget Pylon Racers
8) Open Pylon Racers
9) Formula I Pylon Racers
10) Half-A Pylon Racers
11) Rudder Only Pulse Proportional Aircraft
12) One-Eighth Scale Auto Racing
13) R/C Boats
14) Galloping Ghost Aircraft

RADIO EQUIPMENT OWNED

92% Digital Proportional Systems
17% Galloping Ghost Systems
16% Pulse Proportional Rudder Only Systems

ENGINE SIZE PREFERENCE

The following is the listing in percentile order of the preferred engine sizes in cu. in. displacement:

(1) .45-.61
(2) .20-.40
(3) .049-.19
(4) All sizes

READERSHIP INTEREST AREA ANALYSIS: In the first category listed, i.e. Model Types, General Sport Aircraft was, by far, the popular favorite. As in the 1969 Survey, Sport Scale Aircraft was very close behind, in percentage. Substantially behind in popularity was the category of Pattern Competition Aircraft which edged out Scale Competition Aircraft for third place that the latter held on the survey of two years ago. In 5th place by an extremely wide margin was Slope or Thermal Sailplanes which showed a radical increase in popularity during the past two years. The largest decline in interest was in Formula I Racing, which dropped from 5th to 9th place in the two years since RCM's 1969 Survey. Seaplanes showed a slight increase with a definite increase in interest in the new Quarter Midget Pylon Racing event created by R/C Modeler Magazine. The last three items on the category included 1/8th Scale Auto Racing, R/C Boats and Galloping Ghost Aircraft, which received so few replies that to accurately state that one was better than the other would be unjustified. All three of these received almost no response whatsoever.

Although not seemingly significant as simply a listing of preference, there are several significant factors involved in this section of the Reader Interest Survey, particularly when coupled with the consensus of comments contained on those surveys. To begin with, Sport Scale, or "stand-off scale" aircraft ranked a close second to General Sport Aircraft, evidencing a desire towards more realism in the radio control models desired by the consumer. It came as no surprise that Galloping Ghost type aircraft received no response whatsoever since it has been evident for some time that this phase of radio control has been relegated to R/C's past history. Rudder Only Pulse Proportional did show an increase over the past survey and can be attributed to the consumers desire for small, lightweight models that can be flown out of the smallest of areas and what we would call "after work and before dinner" flying activities. The majority of those responding to the fact that they enjoyed single channel aircraft and owned single channel equipment also stated that they owned one or more digital proportional systems. While Formula I Pylon racing suffered the greatest decline of interest in this years survey, this does not indiciate a loss of interest in racing, per se, since the .15 cubic inch engine size Quarter Midget Pylon Racers and Open Pylon

showed an increase in popularity. And, if Formula I showed the greatest single decline in popularity, the greatest increase in popularity was in Slope and Thermal Soaring. This has been evidenced quite strongly during the past year by the increasing number of sailplane kits available and the continuing interest evidenced by readers letters and editorial submissions to R/C Modeler Magazine. It is our prediction that General Sport Aircraft will continue to maintain its Number One position during the coming 24 months, while Sport Scale Aircraft and Sailplanes will show the greatest increase in popularity.

Boating and radio controlled cars are definitely out insofar as a wide scale market is concerned. Although both the 1967 and 1969 RCM Surveys rated R/C boating in last place, this years percentage showed an even more marked decline in popularity over the preceding two reports. Virtually no interest was evidenced in R/C cars even though sophisticated equipment for this facet of radio control has been available for the past year and a half.

With regard to the radio equipment owned, it is interesting to note that 92% of those responding, own full house proportional equipment, while 17% had Galloping Ghost equipment and 16% own single channel pulse proportional equipment. Of the equipment owned, commercial equipment constituted 74% of the total while 18% had home built equipment exclusively and a total of 21% own both home built and commercial equipment.

With regard to the home built equipment, the majority was built from kits while others were built from magazine construction articles. Once again, the engine size category showed a definite preference for the larger sized engines in the .45-.61 cubic inch displacement range. The key to this category is in the word 'preference', since the sales of radio control kits in the smaller engine size categories are at an all time high, not to mention the sales of magazine plans for this same type of aircraft. Whereas the individual consumer may be limited to a smaller field for his general sport flying or other similar reasons, he still would "prefer" to fly the larger size aircraft with the .60 size engines.

With regard to competition in general, the concensus on the surveys was that we need a new "shot in the arm" for Pattern competition, such as the Aresti Key or Free Style event and more of an emphasis on the "stand-off" scale type event. It was also interesting to note the large number of comments strongly suggesting the inclusion of team entries for the AMA Competition Scale event. This team entry system would consist of a builder and a flyer which, according to the opinions expressed in the survey, would encourage more good scale builders who are not qualified fliers to enter scale events knowing that their months of painstaking effort would not end up as a first flight disaster.

RCM FEATURE
AND
DEPARTMENT INTEREST AREAS

DEPARTMENTS

The following is the standing of the regular monthly departments of R/C Modeler Magazine in order of reader preference:

1) Engine Clinic by Clarence Lee
2) For What It's Worth
3) Sunday Flier by Ken Willard
4) Cunningham on R/C by Chuck Cunningham
5) Kits and Pieces by Bernie Murphy and Dick Sonheim
6) Take A Look At This (Product News)
7) Viewpoint by Don Dewey
8) Electronics by Ed Thompson

9) Gems
10) Top Out by Jerry Kleinburg
11) Wagger by Loren Dietrich

FEATURES

The following is the list of R/C Modeler Magazine features in order of reader preference:

1) Aircraft Construction Articles
2) Special How-To-Do-It Articles
3) RCM Product Reports
4) Technical Type Articles
5) Electronic Construction Articles
6) RCM Visits Features
7) Club and Contest News
8) Boat Construction Articles

RCM FEATURE AND DEPARTMENT INTEREST AREA ANALYSIS: Even more than in preceding surveys of 1967 and 1969, it is immediately apparent that you want to know "how-to-do-it" — your preferences in both departments and features emphasize this desire for more and better projects, construction articles, as well as how-to features and the like. And this is exactly what RCM concentrates upon each month. An examination of the preference for RCM's regular monthly departments shows that Engine Clinic by Clarence Lee is, once again, in first place. In second place is For What It's Worth — the "hints and kinks" department which RCM expanded following the 1969 survey. The third and fourth place positions are Sunday Flier by Ken Willard and Cunningham on R/C by Chuck Cunningham, almost an identical tie with Sunday Flier having a slight edge. In fifth place was Kits and Pieces by Bernie Murphy and Dick Sonheim where individual manufacturers kits and accessory items are reviewed as accurately and honestly as is humanly possible by our testing staff. In sixth place was Product News which consists of news releases from manufacturers and/or their agencies concerning their new products. Unfortunately, due to editorial omission on the survey form, Scale in Hand by Dave Platt was inadvertently left out. However, enough individual readers wrote in this column so that we do have a strong indication that it would be in the first five places in order of preference if it had been included on the survey. This would also be borne out by the interest in R/C Scale throughout the country. If we look under the "features" department, we find that your preference for the type of features you prefer to see in R/C Modeler Magazine closely follow your preference for column subject material with Aircraft Construction Articles obviously being of prime importance and special How-To-Do-It Articles in second place. It is interesting that RCM Product Reports is once again in third place as it was in the 1969 survey with Club and Contest News being virtually the least interesting aspect of the publication. Boat construction articles, although listed in eighth position, received so few responses that it virtually did not rate a position on the chart.

Since it is the policy of R/C Modeler Magazine to provide its readers with exactly the type of material you desire in order to make it the most effective model aviation publication in the country, certain changes have already been made in the format of R/C Modeler Magazine since the tabulation of this survey. These included dropping Viewpoint by Don Dewey which was the editorial section of the magazine as well as dropping the Gems and Wagger columns. The Electronics Construction segment of the magazine has been de-emphasized and a further de-emphasis will be placed on Club and Contest News by removing the Top Out column and utilizing these writers on special assignment in their particular field of interest. By thus complying with the wishes of our readers we hope to further enhance the

effectiveness of this publication. With regard to RCM Product Reports, several thousand dollars is spent by RCM each year testing, evaluating and researching products and market data for its advertisers. Test pilots we use in the field know how to fly, and how to fly well. The evaluation is based upon the product itself and the reports are written on that basis – not on the basis of advertising percentage, friendship, or an other extraneous influence.

PUBLICATION INTEREST AREA

PREFERENCE OF PUBLICATION
The following is the listing, in order of percentile preference, of the standings of the model aviation publications:

(1) R/C Modeler Magazine
(2) Model Airplane News
(3) American Aircraft Modeler
(4) Flying Models

PUBLICATION INFLUENCE ON TOTAL CONSUMER CONSUMPTION
In response to the question as to how much of what each reader purchased in the way of radio systems, kits, accessories, engines, etc., is influenced by editorial or advertising copy which appears in R/C Modeler Magazine, the following is the percentile breakdown:

Influence	Percentage of Readers
100%	14%
50-95%	22%
26-49%	37%
0-25%	27%

The following is the total percentage of influence on consumer purchases from all sources:
Influenced by R/C Modeler Magazine: 62%
Influenced by all other magazines combined: 12.5%
Other influences: 25.5%

PRIMARY AND SECONDARY CIRCULATION
In response to the question as to how many people read each copy of R/C Modeler Magazine, the average was 1.8 persons.

MODEL MAGAZINE PURCHASED REGULARLY
In response to the question as to what model magazine the reader purchased regularly, the following was the order of preferred purchase:
1) R/C Modeler Magazine
2) American Aircraft Modeler
3) Model Airplane News
4) Flying Models

SOURCE OF PURCHASE OF R/C MODELER MAGAZINE
In response to the question as to how their monthly copies of R/C Modeler Magazine were obtained, the following is the percentile breakdown:

Mail Subscription	57%
Hobby Shop	31%
Newsstand	12%

INDIVIDUAL ADVERTISING IMPACT
In response to the question, "What is your favorite ad in this issue," the following was the order of preference:
1) Hobby People
2) Kraft Systems, Inc.
3) Royal Products
4) World Engines, Inc.
5) Hobby Lobby International

Once again it is interesting to note that 98% of all Reader Interest Surveys selected R/C Modeler Magazine as their first choice of model aviation publications. Model Air-

plane News retained its second place position that it held in the 1969 survey although American Aircraft Modeler made tremendous strides towards that second place position ending up with a virtual tie for second place. This is in definite contrast to the 1969 survey which gave Model Airplane News a substantial edge over American Aircraft Modeler. Flying Models was in fourth place, substantially behind American Aircraft Modeler.

The single most important factor in the publication interest area was the total consumer consumption. On the 1969 survey R/C Modeler Magazine was responsible for an influence of 55% of total consumer purchases while on this current 1971 survey, 62% of what the consumer purchased was influenced by R/C Modeler Magazine. The total of the other magazines combined accounted for 12.5% of influence while other influences such as hobby shops, "word of mouth", and geographical location preferences accounted for a total of 25.5% of influence on the consumers purchasing dollar.

In response to the question as to how many people read each copy of R/C Modeler Magazine, the average was 1.8 persons which gives R/C Modeler Magazine a primary circulation of 70,000 copies per month with a combined primary and secondary circulation of 126,000 readers. With regard to the question as to what model magazines the reader purchased regularly, American Aircraft Modeler edged out Model Airplane News for second place. This could possibly be attributed to the fact that every member of the Academy of Model Aeronautics receives American Aircraft Modeler as a part of his membership in the Academy. With regard to the question as to the source of purchase of R/C Modeler, 57% of those responding were subscribers, 31% purchased theirs at a hobby shop and the remaining 12% purchased at a general newsstand.

With regard to the question concerning the individual readers preference for his favorite ad in the issue in which this survey was contained, the Hobby People ad was unquestionably in first place with Kraft Systems in second, Royal Products, third, World Engines, fourth and Hobby Lobby International in fifth place. Two of these were the so-called "institutional" type ads, while the others contained numerous photographs and substantial detail on a great number of products these firms had to offer. It is also interesting to note that none of these ads were less than one page in size and that four of the five were one page or more.

READER INTEREST SURVEY GENERAL SUMMARY

This concludes the general data contained in the R/C Modeler Magazine 1971 Reader Interest Survey. This has been an extremely time consuming and costly project. The thousands of replies received were quite explicit in their preferences - - - your likes and dislikes. Although we have conducted this survey in 1967 and 1969, we still had not anticipated anywhere near the response we received this year - - - particularly when you consider that the individual reader was asked to complete a lengthy two-page questionnaire. As previously mentioned, a great percentage contained many additional notes and comments, all of which were read and summarized by our staff in order that we might make the necessary changes in our publication to meet our readers' desires. And that is our business - - - giving you, the adult radio control sportsman and hobbyist, the type of publication you want and can trust for reliability, integrity, and technical competency. •