

RC MODELER

THE WORLD'S LEADING MAGAZINE FOR RADIO CONTROL ENTHUSIASTS



THIS MONTH

- 3 **VIEWPOINT** By Don Dewey
- 4 **LETTERS** From RCM Readers
- 6 **KITS & PIECES** Hagi Twin Comanche by Bill Hollenbeck
- 8 **SCALE IN HAND** By Dave Platt
- 10 **ENGINE CLINIC** By Clarence Lee
- 12 **RCM 1970 SLOPE SOARING TROPHY RACES**
By Ken Willard
- 16 **RUMPLESTADT C-TYPE** .10 to .15 sport biplane by
Bob Lovejoy
- 20 **MACS '71** RCM covers the nations largest model show
- 25 **CUSTOM TECHNIQUES FOR ARF's** By Will D. Mitchell
- 26 **CESSNA AGWAGON** Scale cropduster by Gil Horstman
- 30 **SOLARFILM: RCM PRODUCT REPORT**
- 32 **SPECTRA II** .60 powered amphibian by Don Haines &
Paul Rhen
- 42 **BUILD YOUR OWN Balsa FINISHER** by W.R. Headington
- 45 **RCM TOURS WITH CLIFF** By Dick Tichenor
- 50 **FOR WHAT IT'S WORTH** Hints & Kinks
- 52 **PHOTO ENLARGING 3-VIEWS** By Gus Morfis &
Jack Headley
- 54 **TAKE A LOOK AT THIS** RCM's Product News Section
- 55 **ARCY** By Bill Berns
- 56 **TOP OUT** By Jerry Kleinburg

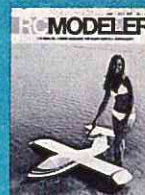
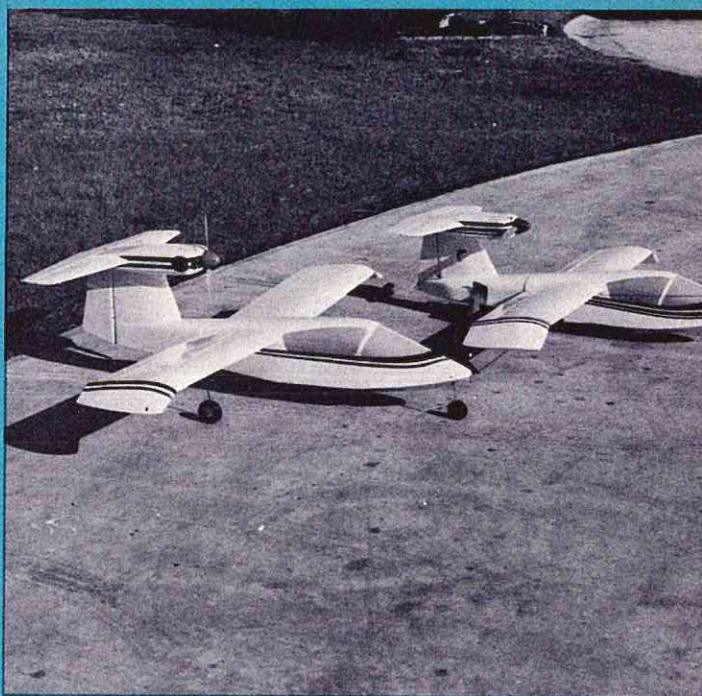
THIS MONTHS COVER

Miss Carol Bales, lovely young secretary with the Lunar Module Program at Kennedy Space Center, poses with the Spectra II at Satellite Beach, Florida. Ektachrome transparency by Paul E. Rhen.

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SPECTRA II

One of this months featured construction articles is one of the most beautiful scale ships ever published by RCM.



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JULY

1971

VIEWPOINT

DON DEWEY

This issue marks the last time Viewpoint will appear in R/C Modeler Magazine.

Formally known as Editor's Memo, this column has appeared every month since RCM's first issue in 1963. It will appear no more.

Whether or not you agreed with the content of the editorial in each issue is unimportant now. Each individual editorial brought a barrage of letters both for and against any given subject. However, our current Reader Interest Survey shows that you, the reader prefer a less abstract type of material. It was summed up very succinctly by one RCM reader who stated – "there is enough trouble in this world, in our daily lives, without having the troubles inherent in our hobby continuously brought to our attention."

I could not agree more fully. As a modeler, I did not always like to write editorials, or to take up a so-called "crusade." This was simply done as a feeling of responsibility to you, my fellow modelers, and the readers of this publication. Each and every editorial, was written for one purpose – to attempt to preserve and improve certain aspects of our relationships to each other, to the general public, and to promote the general welfare of this sport and hobby on a sustaining basis. In all honesty, I would much rather talk with you as if you were sitting in my garage and shop and tell you about some of the products we've been working with during the month, some of the building techniques we use, and some of the hints and kinks that save us all a bit of time and money in this hobby. And that, my friends, will be the subject material of the new column which will appear starting next month entitled From The Shop.

So, as we close off eight and a half years of what has been known as Editor's Memo and Viewpoint, we'd like you to take the time to read the following piece entitled, "Alvin Dolittle, Modeler 1985." This was written by Ted Bozanich of the Antelope Valley Tailwinds for RCM.

I hope that it will entertain you as it is a well-written piece of fiction.

I hope you will think about it, as many of the editorials we have written over the past years were designed to circumvent this end.

I hope you will not forget it. For the newcomers to our hobby it may seem almost far-fetched. But ask a few of the old-timers in this hobby if that is, in fact, so . . . or just how close we have come to this in the past.

As we grow in this sport and hobby, and as we expand in ever increasing numbers, let us grow with the sense of responsibility and wisdom that comes with maturity.

*Our sport has come of age --- it has grown up.
Let us walk tall.*

ALVIN DOLITTLE, MODELER 1985

The lone dim light bulb in the far corner of the room spotlighted the big, beautiful, green and white model airplane. The wings, gleaming in the light, seemed to be beckoning even as the thin, bespectacled frame of Alvin Dolittle quietly crept into the poorly lit room. This dusty

den, softened by the smell of freshly painted dope, had become a refuge for many months for Alvin.

Tonight was something special for him. By tomorrow morning there would be a realization of all the months of hard work. Alvin slipped into the beat-up, overstuffed easy chair, his thoughts drifting back to how it all began.

The job transfer to the West Coast had meant buying a new home. In the moving process he had come across several big stacks of old magazines. Included in the magazines were many old model airplane books from a by-gone era. He had a few thoughts about throwing them out, but in thumbing through them he had retained the model books and placed them in his den. This, he now realized was his downfall. Evenings while sitting in the den he went from thumbing through the magazine to the how-to-do-it radio and plane construction articles and began reading in earnest. His job at the Credit Card Company, where he worked as a computer technician, suffered. He came to work with only one or two hours sleep, the equipment started suffering from lack of maintenance and, most of all, from lack of parts, as Alvin became aware that the computer contained most of the transistors, resistors, and switches that the schematics called for in the magazine articles. A lot of credit card users suffered too, especially when they received their monthly bills. The computer, long since repaired by Alvin, was operating normally, and the business office was still swearing to the customers that the computer didn't make mistakes. And Alvin . . . Alvin had a very complete four channel, proportional radio control transmitter and receiver.

The gas model engine had been a problem, but he eventually obtained an almost new .56 on the black market, complete with prop and glo-plug from an ex-hobby dealer who ran a tinker-toy shop as a front. The balsa wood was obtained from a life-raft purchased at a nearby Naval Supply Depot. The airplane a 52 inch span, high wing trainer, was constructed from plans in one of the old magazine articles. The construction notes and various articles pertaining to the eventual flight itself were well written. These articles, alone, evoked a feeling of confidence in Alvin's ability to take to the air.

Alvin stirred out of his day dreams and the comfort of the easy chair, turned up the high intensity light over the workbench and picked up the old March 1977 issue of R/C Modeler Magazine. The pages were still turned to the editorial page, and for the last time he re-read the article.

"This month's issue will be the last issue of this magazine. As we stated in a previous issue, the Model Industry will have to survive in order for this magazine to survive. The in-action by the Industry and the modeler that we warned about in past editorials has, in fact, become a reality. The recent rejection by the Citizens Communications Committee (CCC), for frequency usage for R/C operation has made the radio control model obsolete. This, coupled with the recent picketing and demonstrations by various groups, the jaded and slanted news stories in the press media, have resulted in legislation banning the

(continued on page 92)

**SILICONE
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Three 12" long sizes:
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**Dee Bee SUPER EYEBALL
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Eyeball. Please write or
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Blue Max 4 CHANNEL DELUXE DIGITAL PROPORTIONAL SEMI KIT \$159.00

What more do I say about an outfit that we've advertised repeatedly? These SEMI kits were supposed to have run out during May, but we're still able to get them. So, as long as they're available we'll stock 'em!

The Blue Max SEMI kit is by far the least expensive way to acquire a reliable "full house" deluxe digital proportional. Outfit is quite easy to assemble requiring only mechanical assembly and inter connecting between the pre-assembled, pre-tested printed circuit boards. I'd suggest you do order this outfit right away because I have no idea how much longer the SEMI kit will be available at this price.

Outfit includes semi kits for transmitter, receiver, 4 servos, all nicads for transmitter and receiver, chargers, wiring harness, instructions.



[Assembled Outfit Shown]



PROPELLER Decal
6 3/4" x 8 1/4" \$3.45



1/8 SCALE RC CAR Decal
10" x 8 1/4" \$4.45



PYLON RACER Decal
9" x 8 1/4" \$3.85

NEW! KDH DECALS The most beautiful decal sheets we've seen. Printed in up to 11 colors! Extraordinary detailing and fuel proof. PROPELLER decal includes, "Hartzell", "Aeromatic", "EAA" etc. 1/8" SCALE R/C CAR decal includes hard-to-find European marques such as "Cibie", "Bosch", "Elf", "Kleber", "Castrol", "Martini", "Dunlop". PYLON RACER decal is for Goodyear.

KDH INSIDE BLIND NUT SETS 75¢ Set

Screw these into your hardwood beam engine mounts. Then fasten engine by inserting the provided machine screws into the inside threaded section of these blind nuts. Sort of a "helicoil" for wood. Very strong.

4 nuts and machine bolts per set. Specify LARGE for .60's and above, SMALL for other engines.



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**NEW! Goldberg "SAFETY
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ing, double-ended screwdriver for
1/4" nylon wing bolts. It's cupped
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Letters

Gentlemen,

Plans have been formulated for a Radio Control Amateur Radio combined operation. This is based on the assumption that many active RC'ers are also active amateur radio operators. Our preliminary survey shows this assumption to be correct and that the formation of such an operation should be rather easy to get underway. The one thing that we lack is nation-wide publicity and for this reason we are approaching your magazine to help us in this respect.

We have set up a tentative schedule for dates and frequencies that RC'ers can meet. The prime idea of these meetings is to locate other RC-ham enthusiasts and give them a place on the ham bands where they can expect to find other people in the same category. It is felt that a lot of useful information can be passed among RC'ers in this manner.

The schedule we have set up is as follows:

Monday	2100 CST	3975 Khz
Tuesday	1900 CST	21415 Khz
Wednesday	2100 CST	7265 Khz
Thursday	1900 CST	14330 Khz
Friday	1900 CST	28600 Khz
Saturday &	1400 CST	28600 Khz
Sunday	1500 CST	21415 Khz
	1600 CST	14330 Khz

Tuning and calling should be made within 5 Khz on each side of the above given center frequencies. Time Conversions: CST to EST, Add 1 Hour; CST to MST, Deduct 1 Hour; CST to PST, Deduct 2 Hours.

If anyone would want further information on the above RC Net, please have them contact the writer at my address. A periodic newsletter on the RC Net will be sent to each person who will drop me a card and give me their name and address.

Sincerely yours,
John G. Mathias

721 South Meadow Road
Evansville, Indiana 47715

As a parting shot, we'd like to share with you a letter from a fellow publisher and active RC'er and contributor to RCM, Walt Mitchell, of Atlanta, Georgia.

Dear Don:

Well, about this time of year I usually take a moment to write a few letters to my good friends; this is the time when I remember all the good things and indulge myself to the

extent of getting a little sentimental.

It is a blustery evening, but here in my workshop it's cozy and comfortable. I'm sitting here waiting for some parts to dry, idly pecking on my typewriter, listening to the hi-fi and slowly sipping a nice, very dry double martini. The least I can do is toast your health and happiness, so time out, old pal, while I bend an elbow to you.

I just took time out to mix another martini, and while I was up in the kitchen I thought of all the time I would waste this evening (why save it with 5-Minute Epoxy, then waste it) if I went out to mix another drink every once in awhile, so I just made up a big pitcher of Martinis and brought it back down with me so I'd have it right here beside me and wouldn't have to waste time making more of them. So now I'm all set and here goes. Besides Martinis are agreeable drinks. For some reason the never seem to affect me in the slightest. Can drink them all night long and no damage, never cut my finger.

So here goes.

The greatest thing in the world is our hobby. If it rains, you model if it shines you fly. Who can beat that eh? Nobody, I tell you. You show me a man that thinks building model airplanes is sissy, I'll show you a man whose got some kind of hangup. Perhaps from a broken home and who knows? Beside I can whip any man doesn't build models.

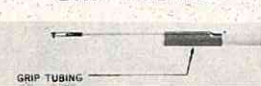
Damn picker is empty so I just went out and made another one, and I sure wish you were here old pal to help me drink these martinis because they are simply delicious. Pardon me while I fill your glass to you good health once more because your magazine is certainly a comfort and an inspiration to us modelers. This man came to or field last Saturday and he says hey shorty-ha ha that's a laugh, for I am five ft. & 16 inches and can handle a max of 80 without a kit chitchen stik-hey shorty he says where do you buy these toys???

That was a lousy thing for them to say, about planes was just toys. Damn, I'm damn if I understand that. That was lousy thing for anybody to say and only a first class heel would say it. To hell with him.

Anyway, old pal you keep on publishing such a good book and we will keep flying. Don't worry about a thing. You are a great editor! Best persons regard.

WLAT

NEW! IM Heat Shrink GRIP TUBING



99¢ per package.

Quick and easy way to attach push rod wire to a balsa or spruce push rod or dowel.



NEW! Goldberg MINI SNAP LINKS 29¢ each.

These lock in closed position — very clever! Also SAFE!



NEW! Tatone "TWISTER" PROPS

First new prop in quite a while. Greater thrust results from built-in true pitch and unusual blade shape. Sizes: 9-6, 10-6, 75¢ each. 11-6, 11-8, 12-6, 85¢ each. Availability not the greatest at present, but we've had a few.

Hobby Lobby-EK 4 CHANNEL "Champion" DIGITAL PROPORTIONAL

\$199.00

The contest-quality EK 4 Channel "Champion" digital proportional is now being made exclusively for Hobby Lobby by EK Products. In line with Hobby Lobby's policy of giving you the MOST radio for your R/C dollars the Hobby Lobby-EK "Champion" incorporates some incredible features:

- Only 1 1/2 ounce airborne weight!
- The smallest servos in the entire industry the EK Super Mini servos which weigh only 1 ounce each!
- Well-proven reliability due to EK's design know-how, and the fact that servo electronic components are cleverly housed in the less shock-susceptible receiver housing.
- Highest servo resolution available in any RC system.
- Lowest servo cost: Extra servos cost you only \$10 each! At these servo prices you can furnish a second airplane with 4 servos for just \$40 and easily transfer receiver and battery pack to it — almost like owning 2 digital props.

27 mhz.
[ADD \$10
FOR 72 mhz.]



72 mhz. frequencies available for only \$10 extra cost.

90 day factory warranty.

OUTFIT IS COMPLETE AND READY-TO-FLY AS PICTURED AND INCLUDES:

- 2 stick 4 channel transmitter with built-in charger, nickel cadmium batteries, output meter and switch guard.
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- 4 EK Super Mini Servos.
- Switch and harness, and airborne nickel cadmium battery pack.



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Pack of 2 98¢



NEW! Weller 30 SECOND AUTOMATIC GLUE GUN \$10.95

This is the most useful tool to hit the model airplane hobby since the X-acto knife. ANY joint (wood-to-wood, plastic-to-wood, fiberglass, etc.) FULLY bonded in 30 SECONDS. No clamping, NO WAITING, and the waterproof, fuelproof glue joint is as strong as an epoxied joint.

There are other glue guns but none with the Weller features; Automatic feed of the glue sticks, fine glue tip that is drip proof, quick initial heat-up, and a work light.

Included is a fitted carrying and storage case, portable bench stand, instructions, one year warranty. IF YOU ORDER BEFORE JULY 30, 1971 WE WILL INCLUDE AT NO EXTRA CHARGE A BOX OF 60 GLUE STICKS WORTH \$2.59.



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KITS & PIECES

Bill Hollenbeck



ABOVE: Twins are twice as much fun... flies easily on one mill. Stable, fast. A mild flier. Bill enthusiastic. **BELOW:** The goodies—neat, complete. Excellent balsa, great plastic molds. Hebi Twin Comanche recommended.

After having flown a Goldberg Skylark as a twin (two-23's) for eight months, the Hebi Twin Comanche caught my eye and I decided that this would be my next twin project. The only modification that would be made to the kit being the installation of a set of RMK retractable landing gear.

The kit was purchased through

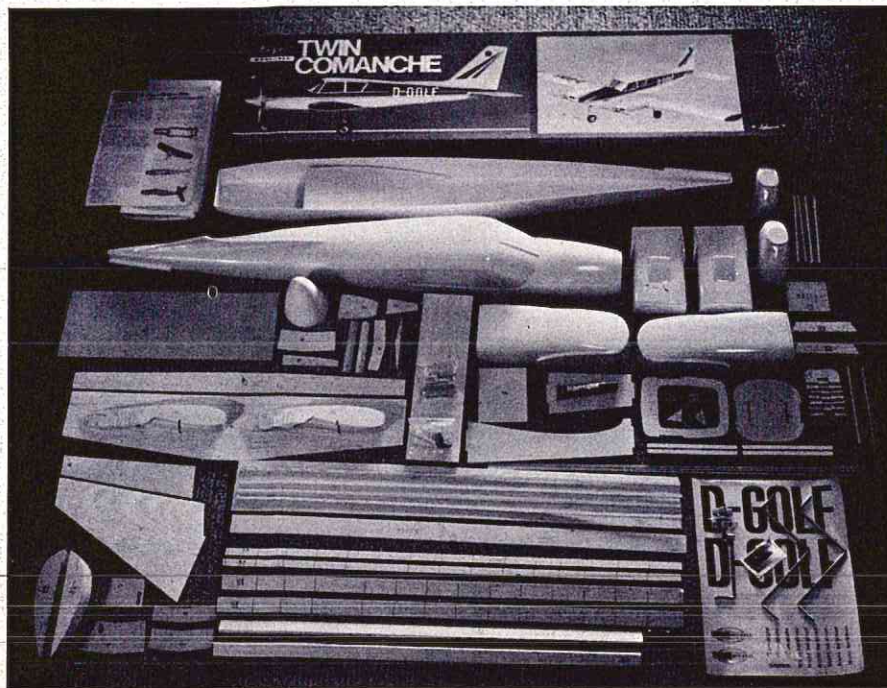
Midwest Model Supplies and the following narrative covers the building, modification for the retractable landing gear, finishing, and concludes with a review of the flying of the model.

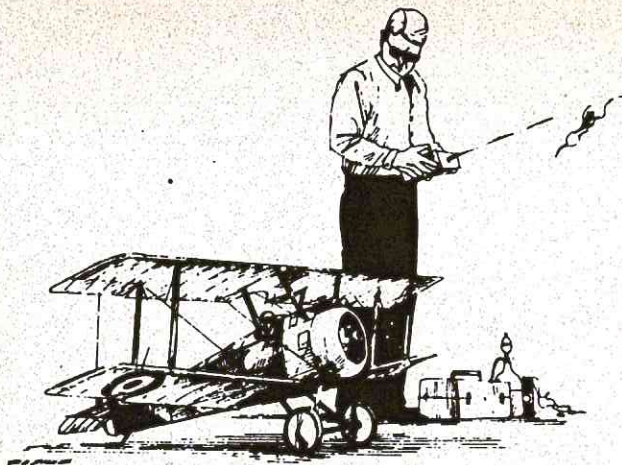
Let's open the box and get with it. The first hour was spent by your author just drooling over all the goodies. The die-cutting was excellent, being very clean and requiring very little, if any, sanding prior to assembly. The ABS plastic parts are truly a work of art and consist of the upper and lower halves of the fuselage, and nacelles, a formed nose cone and the engine cowlings. The outer surfaces are glass smooth and the fuselage halves have the door openings and windows recessed. The leading and trailing edges of the wing are shaped and notched and hardwood upper and lower spars are furnished. Ailerons are of the strip type and are shaped while the tip blocks are cut to outline.

The landing gear is furnished bent to shape, including the nosewheel mounting and steering hardware. A hardware package containing various nuts and bolts, as well as nylon hinges and horns is included. A unique set of motor mounts (2) is included in another package. These mounts consist of two pieces of angled aluminum that have been drilled and countersunk to accept machine screws which are used to join the parts. Heavyweight silkspan covering material and the decals required to produce the German registered (D-GOLF) twin Comanche are furnished. The latter are not of U.S. quality and would be the only portion of the kit that I would downgrade. However, most U.S. builders will use U.S. registration numbers as I did and this is a small matter. You will also find a tube of UHU contact cement for joining the plastic parts to the wooden framework.

Full size plans of the wing and a side view of the fuselage showing various station views is provided for construction. Full size outlines of all wing ribs are contained in one corner of these plans and these proved to be very valuable in the installation of the retractable landing gear. Completing the kit is a construction manual (in German) that includes many photographs taken throughout the construction of the model and this, although unreadable unless you happen to read German, provides the information you need to construct the model. (One picture worth a thousand words, or something like that). As an additional

(continued on page 86)

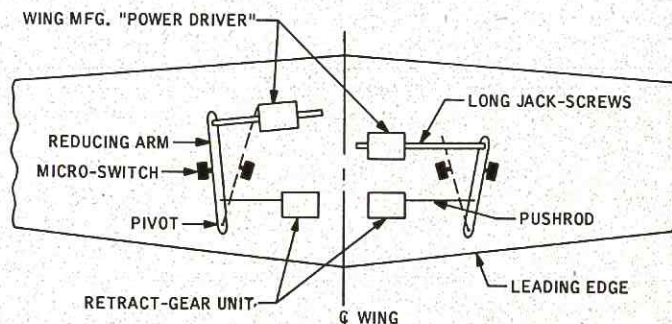
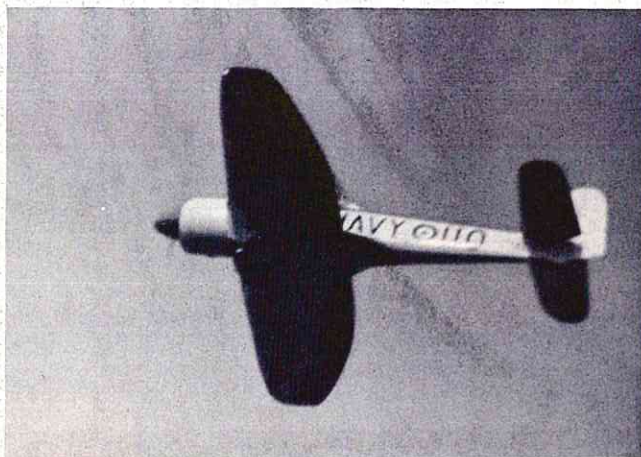




by DAVE PLATT

(Designer — Top Flite Models)

SCALE IN HAND...



To start out with this time, we're going to tell you what we have coming up next month. (How's this for putting last things first?)

A number of readers wrote following our retract-gear feature, querying how the up-with-twist mechanism found on, say a Corsair or a P-40 might be designed. This writer has never yet built such a gear, but there are a number of ways to do it. Some of these are dead simple while others are a little more involved. Since we have never seen this feature brought to a good practical result on a model, we're simply going to tell you all the ways in which it might be done, and let you make your choice.

Meanwhile . . .

Couple of really nice photos this month from our Canadian friend, Don McTaggart. It's a rare thing to find good in-flight pictures of scale models, but these of Don's Hawker Sea Fury leave little to be desired. How about it, you guys? Let's see some more of these — seemingly the admitted difficulties of in-flight shots are putting us off, but with good R/C it shouldn't be so hard. Incidentally, plans are available for Don's model (from Bob Holman Plans) so if any of you out

there fancy an offbeat, but tremendously handsome airplane, this might be for you. Don also mentions his continuing difficulties with the retract-gear in this ship and it's good to know that someone else is chasing down this problem.

All of which leads very well into our next piece of info. . . .

For a way to get the uneven retraction (one leg taking a different time than the other) for his upcoming Nats airplane, your scribe hit upon a scheme which brought other benefits in its wake. Take a look at the diagram.

By making the reducing-arms of different lengths we get the uneven retraction. But, much more important, it's obvious that this method provides vastly increased power to the unit. Since most, if not all of our difficulties with RLG set-ups in scale models are brought about by marginal power to drive the long/heavy legs, the reducing-arm system is attractive even when uneven leg retraction is not required. Of course, the plastic jackscrews provided with the Wing Mfg. "Power-Driver" must be replaced with very long ones, but a piece of threaded rod, obtainable at good hardware

stores, soon solves this problem.

Retraction speed is reduced to realistic levels at the same time. The micro-switch electrical cutoffs are best arranged so that the reducing-arm itself makes/breaks them.

Since the jackscrew moves in an arc at its outer (reducing-arm) end, the "Power-Driver" must be mounted on one bolt and allowed to swivel.

The system, as shown, is being used in our new model and proved to be so powerful that even with the long and heavy legs of a Me 109E, balancing the legs was unnecessary. On 4.8 volts, the gear worked fine; balancing was, nevertheless, added since only good could result from this, and the whole set-up has proved very satisfactory, indeed. Time will tell, but right now it looks like the breakthrough we've needed has been found.

Furthermore, tho' it came too late to be incorporated into this model, improvements in the locking method

(continued on page 84)

engine clinic

By
Clarence
Lee



The pylon racing season is getting under way now and it looks like there will be increasing interest in the FAI event. FAI pylon racing has been scheduled for the upcoming Nationals to replace Formula II. One part of the FAI rules has caused problems in the past and will continue to do so in the future. Part 3.3.1 reads — “The engine shall be fitted with an effective silencer. The use of tuned exhaust systems is prohibited.”

Defining the difference between a tuned exhaust and effective silencer can be a tough situation and one that few Contest Directors care to cope with. The result of all this is that most FAI contests held in this country have not required a muffler. A rule that cannot be enforced should be eliminated or amended so that it can be enforced. Mufflers will be required at the coming Nationals and the noise level determined by a decibel meter. Some of the fellows are going to complain about having to use a muffler in a racing event. If we intend to eventually pick an FAI pylon racing team to compete with the Europeans, then we had better start using mufflers on the FAI racers and gain the necessary operating knowledge.

However, the specific portion of this rule to which I take exception is the prohibiting of tuned exhaust systems. I imagine the original intent of the rule was to ban the double coned tuned pipe used in U-Control speed flying. However, there is more to exhaust tuning than the double coned pipe and, by prohibiting the use of tuned exhausts, we are holding back development of efficient mufflers. Presently, most of your better mufflers only take 150 to 200 rpm off of

the top end of an engine. Muffler manufacturers are striving to even eliminate this small power loss. If a manufacturer were to develop a muffler that would add as little as 50 rpm (even one rpm for that matter) to the speed of the engine it could be considered ‘tuned’ and prohibited from FAI pylon competition.

Exhaust tuning is a fast developing technology in the full size engine field. Full size race cars, motorcycles, and many of your other competition engines have used various forms of tuned exhausts for years. Now many of your outboard boat motors are extracting more power from the engine through the use of a tuned exhaust. So let’s look into exactly what constitutes a tuned exhaust and how it works.

If you were to install a short length of exhaust pipe to your engine and experiment with the length — roughly two to four inches, depending upon the displacement and rpm of the engine, you would realize a small increase in rpm. In the 11,000 to 12,000 rpm range you might pick up only 200 or 300 rpm, while in the 17,000 to 18,000 range as much as 500 rpm. At least this has been my experience. Others may have achieved even higher gains. For those of you who might like to try an experiment for yourselves, the E.D. Power Pipe that we reviewed in a past issue of the Engine Clinic comes with a small adapter that connects the Power Pipe to the engine. This short adapter pipe itself is good for 200 to 300 rpm. World Engines has a tuned-pipe adapter or elbow for the Super Tigre speed engines. This, also, is good for a 200 to 300 rpm gain. A final example is the

new Ross twin. The Ross exhausts out the back of the engine and extension pipes are used to carry the exhaust downward. These short extension pipes are good for a small increase in rpm. Temperature, humidity, barometric pressure, and the rpm at which you are running the engine all play a part. Some days you may notice less of an improvement and on other days more. So how does this rpm increase come about with only the addition of a short length of pipe?

Every time the engine fires and the piston opens the exhaust port, a pressure wave goes down the exhaust pipe. If the pipe is correctly tuned (the right length), when the pressure wave reaches the end of the exhaust pipe it will be reflected back toward the piston. However, when it reaches the exhaust port it will create a low pressure, or vacuum condition. This vacuum, in turn, helps scavenge the engine, pulling the exhaust gases out and the fresh mixture through the engine from the intake side. For best results, then, this negative pressure should arrive at the exhaust port when the piston is at bottom dead center and the exhaust port fully open. To time this properly you shorten or lengthen the exhaust pipe. Although this length will only be right for that particular rpm, some benefit will be spread over the entire rpm range.

Most of you, at some time or another, have probably seen motorcycles or race cars with long tapering exhaust pipes sticking out the rear. The pipe starting small and increasing in diameter towards the rear. This type of exhaust is called a megaphone. The megaphone works on the same princi-

(continued on page 82)

John Baxter, Sam Crawford, Joe Corr Win RCM's 1970 SLOPE SOARING Trophy Races

The 1971 R/C Modeler Magazine's Annual Slope Soaring Trophy Races are now history — and a more exciting occasion in R/C modeling will be hard to come by.

As in the past, the event was held at Sunset Beach State Park, some fourteen miles south of Santa Cruz, California. Naturally, most of the modelers were from the west coast, but Val Hutchison came all the way out from down Texas way to have some fun with his Canyon Plastics foam Schweitzer. And fun he did have, too, judging from his enthusiasm.

Once again the host club was the R/C Bees of Santa Cruz, with the ubiquitous Whitey Pritchard as Contest Director, aided as always by his hard working wife Edna, who handled the paper work with her usual aplomb.

Just to refresh your memory, here's a brief description of the course. Two pylons are set up on the slope, 600 feet apart. Sighting poles are aligned with the pylon poles so the pylon judges can accurately determine when a racing sailplane has passed the pylon (any part of the plane passing the pylon makes it a legal turn).

Four contestants race in each heat. At the far pylon, four pylon judges, or flagmen, are stationed. Each is assigned one of the planes, and, as the plane passes the pylon, he waves a colored flag to signify the passage. The contestant has a "pitman" who watches the flagman (the pilot is far too busy watching his plane) and calls "Turn!" when the flag is waved.

At the near pylon, the pilot can usually judge his passage, but the pitman still calls the turn. Together, they stand almost in line with the pylon and sighting pole, so the turn can be as close as possible. Understand — the plane does not have to go around the pylon — just past it (any part of the plane) before turning. Turns are always made into the wind, which is blowing in off the sea.

If a pylon is "cut" then the plane must return and go past it. A cut is denoted at the far pylon by wild waving of the flag by the assigned

flagman for the plane which didn't make the legal passage; at the near pylon, the judge bellows "Cut!" which is usually followed by "Aww-w-C'mon!" by the contestant, who frantically comes back with his plane.

This year an innovation in starting was tried. Instead of a cadenced countdown, which the racer could try to anticipate by diving out of his holding pattern behind the starting line so that he would cross the starting line at high speed just as the starting signal was sounded, the starter this year set an alarm to go off at roughly fifteen seconds after the cry "Clock going!" But the time varied, so the start was pretty sporty — you couldn't be sure, so if you took a chance, you could

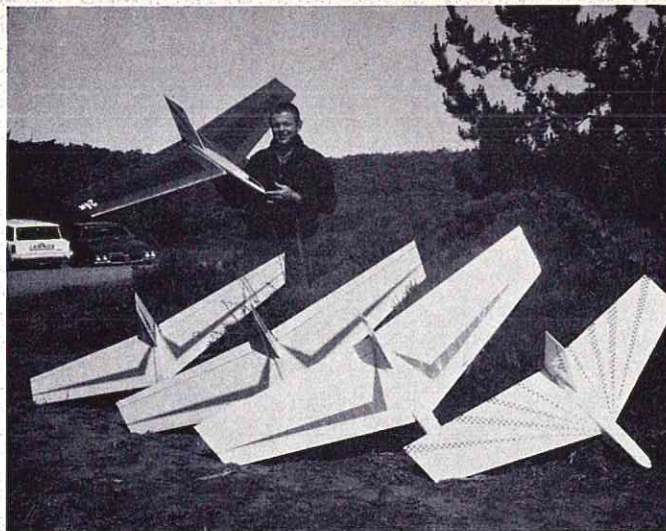


ABOVE: Cal Street launches John Baxter's KA-6 on the winning flight. **BELOW:** The winners! John Baxter with his KA-6, Sam Crawford with the Jalapeno, Joe Corr with his original design, based on a Phoebe fuselage.

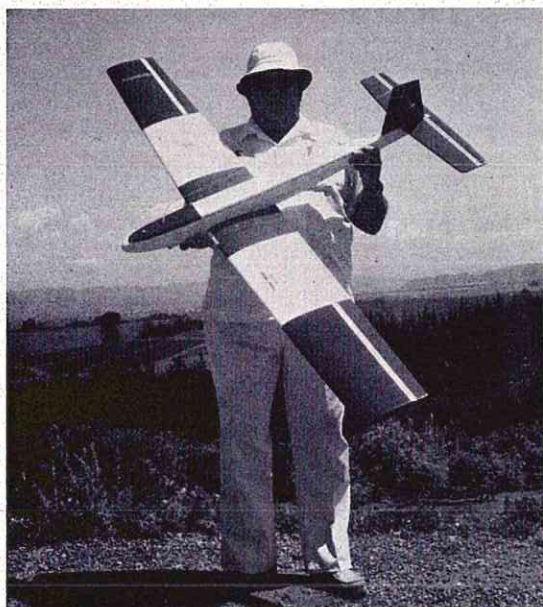


RIGHT: Joe Corr sends his third placer up. Look at all the lead taped on it!

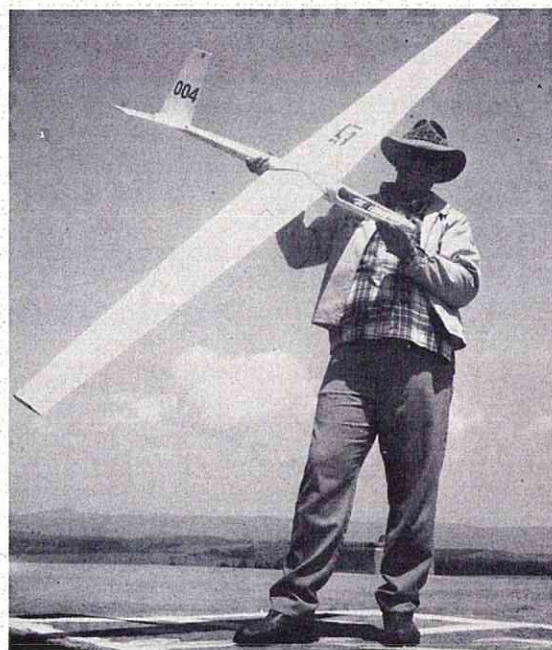




ABOVE: Carl Tobin's "Xavier." Most beautiful model in the races. Original design. **ABOVE, RIGHT:** The Gryphon was the most popular single design. Eight were present. Here's Ron Neal, the designer, with five of them. He's holding mine, which I used as a spare. Good aerobatic ship, but not fast enough for the RCM Trophy event. **RIGHT:** Bob Andris with his Peregrine Mark II. Fastest plane there, but lost out when involved in a midair. Fiberglass fuselage, foam core wing covered with 1/16" balsa, then covered all over with fiberglass. Rugged – but not enough to survive a crash at 50 mph. **BELOW:** Sam Crawford with Jalapeno.



RIGHT: Racers on the course. Far out in front is Baxter's KA-6. Trailing him is Bill Woodward's low-wing power multi with engine replaced by lead. Just rounding the pylon is Ron Neal's Gryphon.



have to back and restart – while the others went merrily on, leaving you far behind. Also, you could luck out, and leave them behind.

But that was the only element of luck – other than the case of bad luck and a midair crash. The rest was all skill and teamwork between the pilot and his pitman.

Each race consisted of five laps, including a final turn and upwind passage of the near pylon. Thus the official distance covered was 6000 feet – although the planes would cover about 8000 feet during a race. And this gives you an idea of the speeds which were reached. The fastest race took a few seconds over two

minutes to complete, so average speed of the model was close to 45 mph – and that means that in the straightaway the speeds were over 60 mph!

One of the reasons for the high speeds this year was the perfect conditions which existed on Sunday the
(continued on page 80)

RUMPLESTADT C TYPE

By Bob Lovejoy

This is a true-to-scale model of a plane built by the Rumpelstadt factory in 1917. It was built to fulfill military requirements for a two place "C" type airplane of outstanding performance. It was to be faster than a Spad, more maneuverable than a Camel, have a better rate of climb than a Nieuport, have better dive performance than an S.E. 5A, be more stable than an Avro trainer, and have a stalling speed of less than twenty kilometers per hour. It was also requested that the plane be built in fewer man hours than any other plane in the world. Although these requirements seemed a little idealistic, this little heard of company somehow managed to build what was undoubtedly the best airplane of World War I.

The Rumpelstadt C Type exceeded every requirement with flying colors

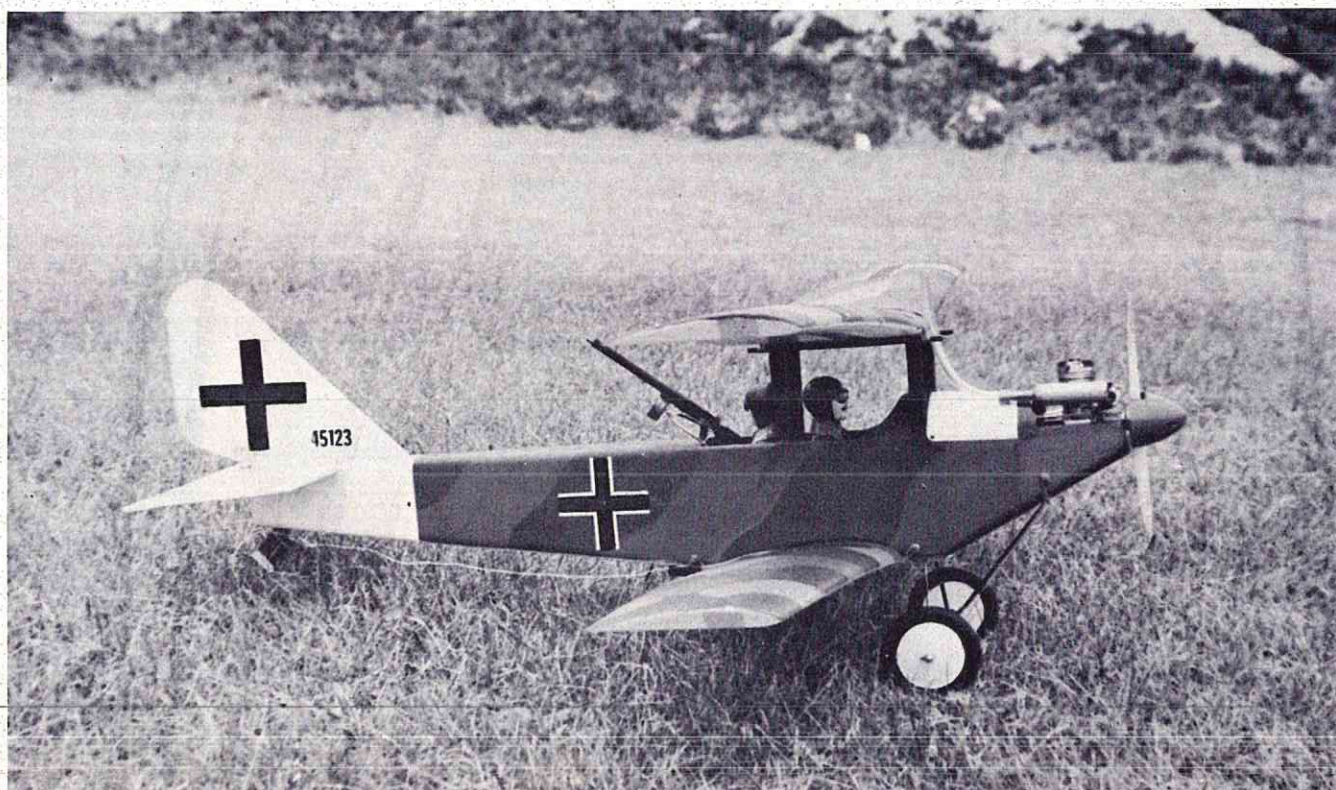
and yet it was not accepted by military officials! There were two major reasons for the plane being rejected: One being the lack of interplane struts and the other being the molded styrene foam wings. Although these innovations were sheer brainstorms, designer Reinhold Sturmkoef could not convince anyone of his airplane's structural integrity. Another area of skepticism was the single cylinder air-cooled engine that did not spin with the propeller but remained attached to the fuselage. The two prototypes were then destroyed in a fit of frustrated passion and all but one set of blueprints were torched. Now the only existing source of plans for this outstanding airplane is a magazine titled *R/C Modeler*.

The model is not a put on. It flies great and can be built in a few hours.

The fuselage construction is very simple and straightforward while the foam wings are from Goldberg's Ranger 42. These can be purchased separately at most major hobby shops. They eliminate one drawback of a model biplane — building two wings!

The Rumpelstadt was designed with short field performance in mind, figuring a well muffled fifteen could be flown from a school yard without offending anyone. I have found this to be true. Anyway, I kept a few things in mind as I layed out the Rump: substantial nose moment for balance, good tail moment and vertical area for stability, high thrust to minimize zoom, plenty of distance between the wings to increase efficiency and differential wing incidence to minimize sensitivity to small elevator deflections, common in flat bottom wings.

The original Rumpelstadt just prior to its capture by the British during World War I.





The Rumplesstadt after modifications, by the British. Transparent orange solarfilm on the fuselage, yellow Solarfilm on foam wings and sheet balsa tail surfaces.

The two efficient Goldberg wings provide gobs of lift, yet not much drag. Consequently, the Rump has both good low speed performance and good wind penetration. For example, you can head into a ten mile an hour wind, chop the throttle to twenty-five percent, ease the stick back about eighty percent and maintain altitude with near zero ground speed. I have even made vertical landings without a rollout. High throttle takeoffs are very short and can be followed by a steep climbout if desired. Seventy-five percent throttle will give you longer, smoother, more realistic takeoffs. I have never ground looped the Rump on takeoff but beware of crosswinds, both on taking off and on landing. High speed flight is responsive but predictable. Though it won't fly inverted or slow roll, it will barrel roll okay and snap rolls are "right now". The mid-throttle range gives docile trainer-like performance. Here the plane flies on the wings instead of the engine. The Rump does not fall off in a stall but rather wobbles and mashes downward until airspeed is regained. You will find yourself making tight turns at lower and lower airspeeds without consequences, but get used to the airplane first. That about covers it, so if you are ready, let's get into the construction.

FUSELAGE: First lay out and cut

the 1/16" or 3/32" sides with a ruler or yardstick. The triangular piece cut off under the nose may be used as the nose doubler which is to be glued on now. With the fuselage sides laying flat, (be sure you have a left and a right), glue on the 3/16" square longerons and cross braces. Be sure to leave spaces for the 1/8" ply cabane struts to fit. Next, glue in the 1/8" balsa doublers that provide a saddle for the lower wing and anchors for the struts.

Since you have the 1/8" sheet in front of you, you might as well cut out the two formers, front and rear, and the gussets for the rear lower wing holddown (or up) dowel. Now, glue in the struts, measuring to make sure the left and right sides are equal in height, then glue in the dowel gussets. Next, glue on the front balsa pieces and the hardwood engine mounts. Let both sides dry before moving on to the next step. Now glue the front and rear formers in place on one fuselage side and glue the other side to the formers. Use tape or rubber bands to hold the fuselage sides against the front former while you glue the two sides together at the tailpost. When this dries glue in the 3/16" square cross pieces to the top and bottom fuselage longerons. Now glue in the front and rear floor pieces, making sure the engine fits snugly between the hardwood mounts. Glue on the 1/8" ply tailskid or

tailwheel mount and the 1/8" ply nose cap. Now the top and bottom sheeting can be glued on, 1/16" balsa for the rear, 1/16" ply for the front. Cut out the semi-circular firewall piece and glue it just ahead of the front struts. The 1/16" sheet decking is made from a paper pattern. Add the cross brace behind the engine mounts, the wing dowels, and the landing gear dowel. The upper wing dowel should be attached to the struts with epoxy and cloth pieces wrapped over to insure strength. That should be it. Now on to the easy parts.

WINGS: The Ranger wings can be used right out of the box, however, here are some modifications that will improve strength and performance. By sticking a strip of filament tape to the bottom surface from tip to tip, you will increase the lifting g-load strength of the wing tremendously. Also, if you glue small pieces of 1/16" ply to the foam where it is held against the wood, you will prevent foam crushing that takes place in this area. 1/8" ply skids on the lower wing tip are also a good idea. If you want to improve rudder response, cut the wings in half and epoxy them back together with a couple more inches of dihedral.

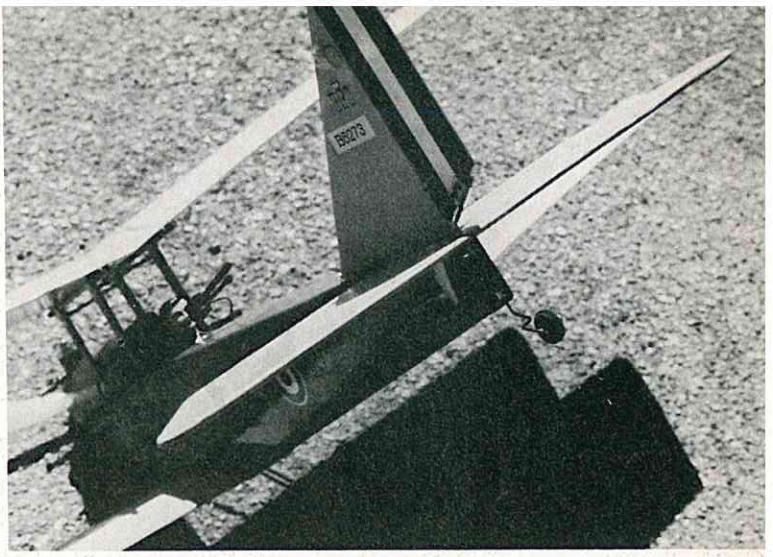
MISCELLANEOUS: The tail can be made from 3/16" "Foam Core" and 3/16" square spars, or built up with

(continued on page 78)

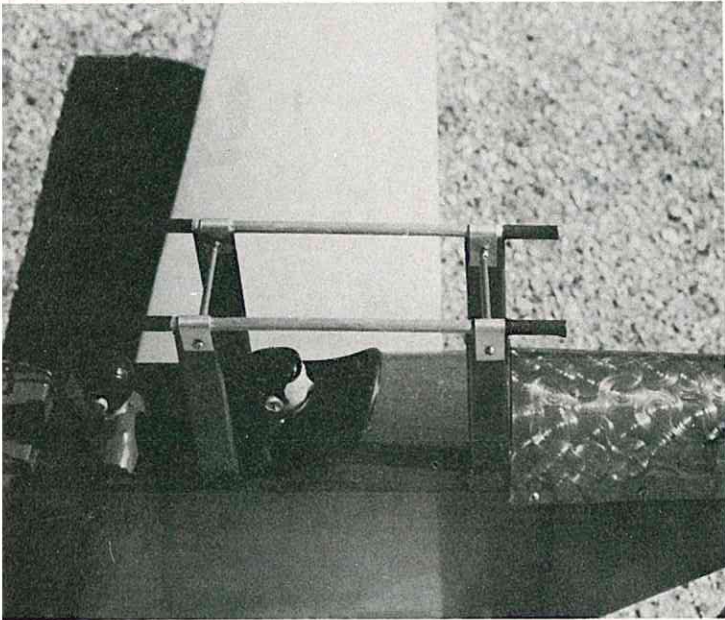




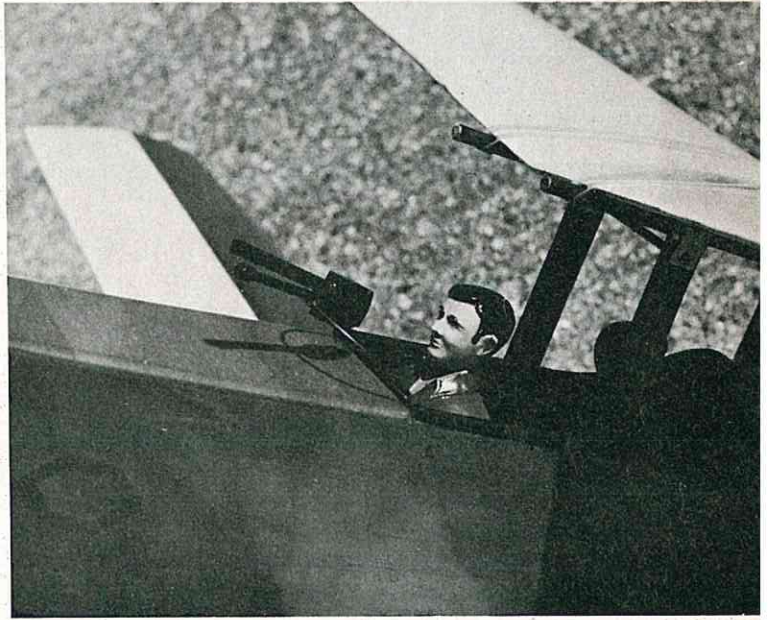
Cowling is cut from 7-up or Coke can, wet sanded to remove paint, then "scrolled" with a piece of doweling in a electric drill. Engine is O.S. Max .15.



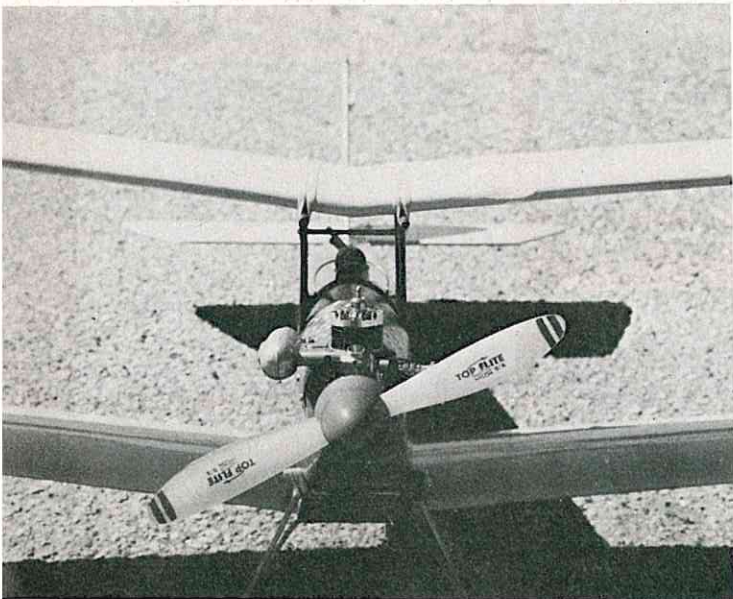
Optional tail wheel installed on RCM Editor Don Dewey's prototype allows excellent ground handling. Decals by Finishing Touch.

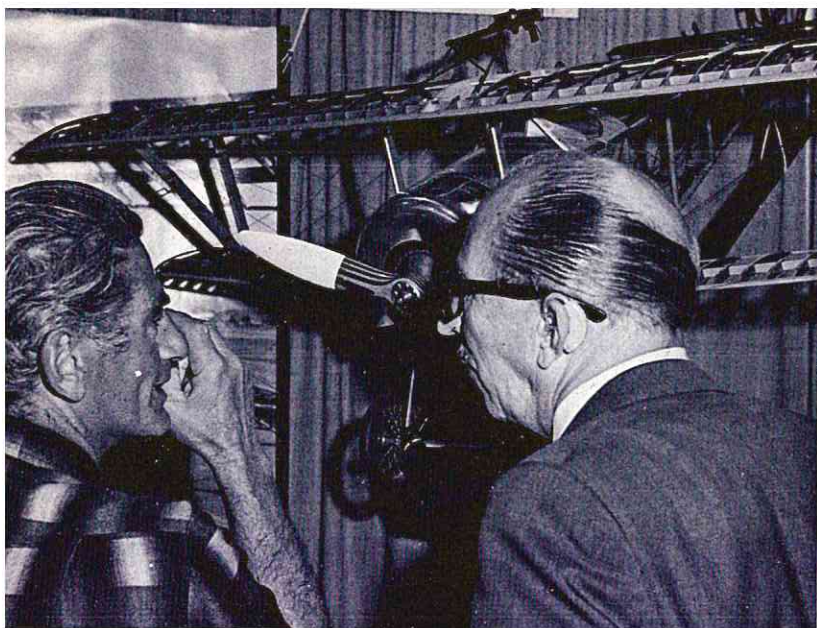


ABOVE: Wing support straps from tin can stock; 4-40 x 1/2" bolts through aluminum tubing add extra support to cabane. After Dewey snap-rolled too many times in succession. BELOW: Top Flite 9-4 prop ideal for this aircraft.



ABOVE: Williams Bros. pilots and machine gun made from tubing and scrap plywood. BELOW: Rumplestadt can be flown out of any small field; comes off ground in about ten feet.

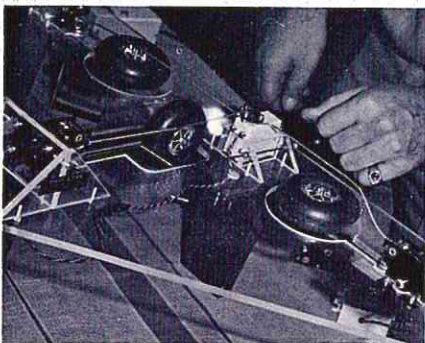




Lou Proctor in front of his magnificent Nieuport framework.

32,000 attend the nations largest model and crafts show hosted by the Orange Coast Radio Control Club and the Southern California Hobby Industry Association.

RCM Photos by
Dick Sonheim and Swami Rivera



Pro-Line's remarkable retract gear display.



Joe Bridi with prototypes of Bridi Enterprises kits.



Royal Electronics Royal Classic propo system.



ABOVE: Phil Kraft at ever-popular Kraft Systems booth. BELOW: Lanier Colt on display at RCM booth. Lee Renaud assists with magazine literature.



A-Justo-Jig demonstration shows how accurately wings can be built.



Bob Francis with one of the kits from the outstanding line of Francis kits.



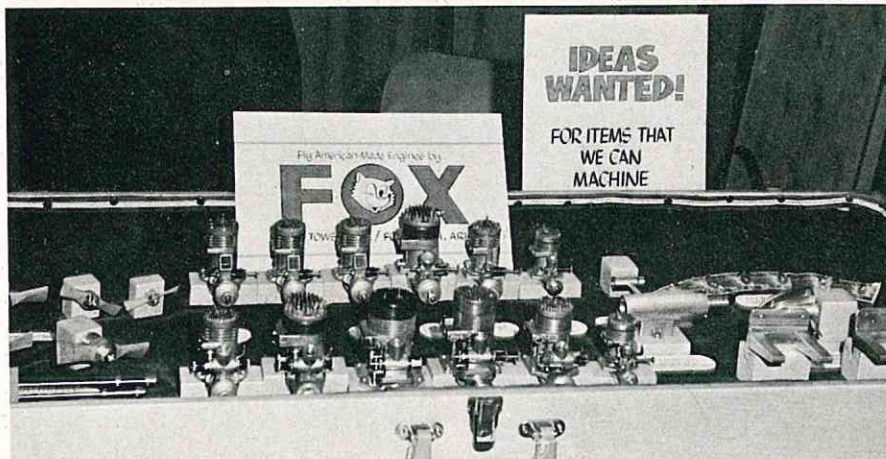
ABOVE: New S & O proportional system evidences 'top-of-line' handcrafted quality. LEFT: RCM's Clarence Lee talks shop with John Brodbeck of K & B-Veco.

MACS '71

FIRST WESTERN ANNUAL MODEL AND CRAFT SHOW



ABOVE: Beautiful kit prototypes hang above Kyosho booth. RIGHT: Fox displayed complete line of engines in all sizes.



Bob Elliott, half of E.K. Products radio team.



Hank Hankinson of Sonic-Tronics. RIGHT: X-Acto display popular with serious builders.



Ron Murray of Royal Products answers questions . . . and then more questions!



LEFT: The Heath Co. displayed radio-auto lines for 1971. ABOVE: RCM's Executive Editor, Pat Crews, graced RCM booth . . . much prettier than Dewey who hides from trade shows.



ABOVE: Astro-Flight's Fournier RF4-D prior to flight demo. BELOW: Frank Garcher and Jimmy Grier of Midwest Products.





ABOVE: John Tatone with unbelievable array of high quality accessories. LEFT: K & K Industries was hard to find — the crowds kept surrounding them!



Top Flite's MonoKote line and new scale kits attracted top attention from the crowd.



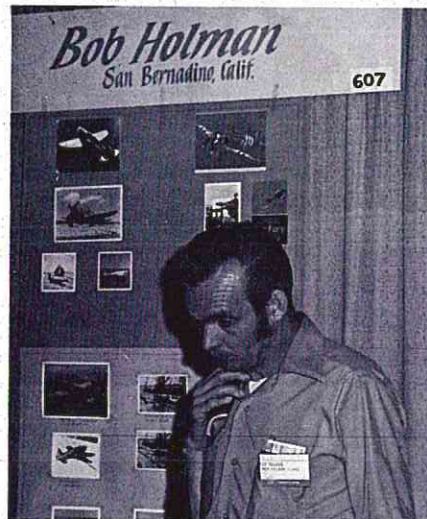
CAS retract gear proved popular demonstration.



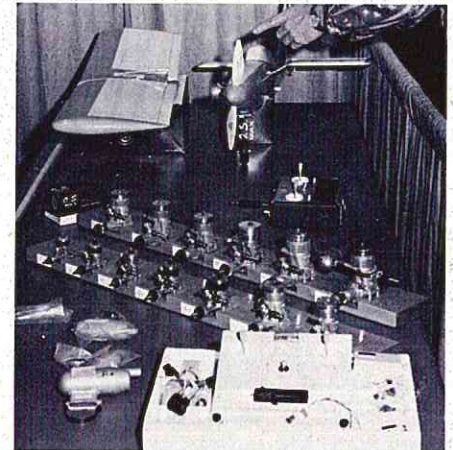
Big John Elliott describes Orbit's 1971 radio line.



AR Flight's Glaskin wings best we have seen.



Bob Holman ponders a question at Holman Plans booth. Below: R/C Models presented all-new line of glass fuselages with Glaskin wings. Tops!



World Engine's booth was manned by none other than personable Jim Kirkland.



Larson Electronics with 1971 propo line.



Dumas line versatile and popular with sport fliers.



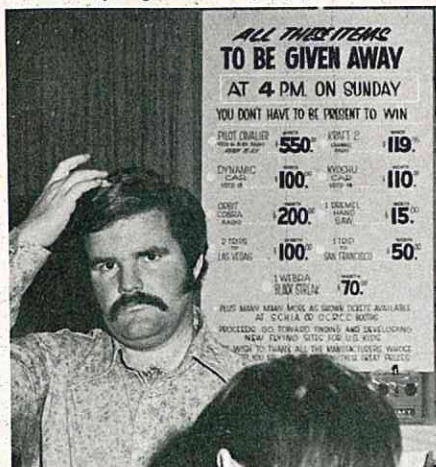
Tom Runge discussed Ace R/C's 1971 line of accessories, single channel propo.



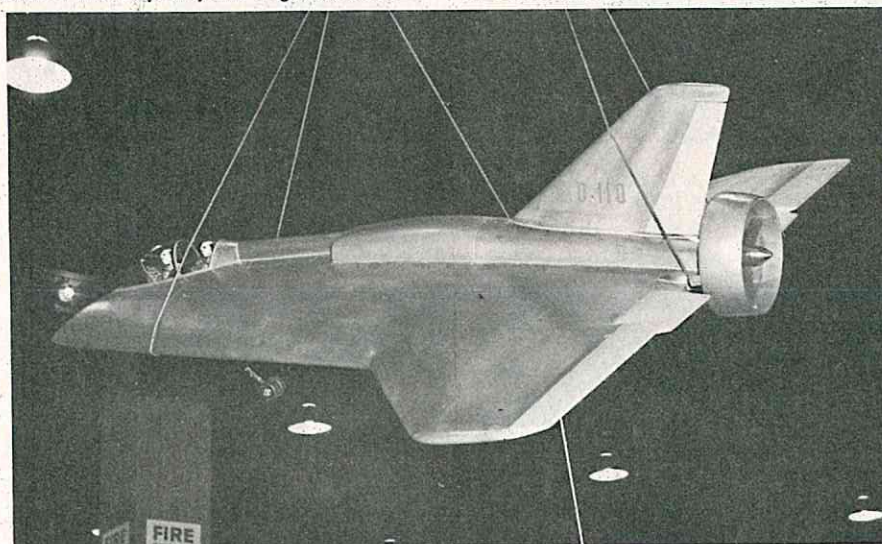
Dick Barnett and his wife comprise family team of R & B quality line of glass aircraft.



A few of the trophies and aircraft on display at '71 M.A.C.S.



Whaddaya' do about a guy from Vegas winning a free trip to his own town?



Not all of the aircraft were of standard configuration, as illustrated by this model on display.



Bill O'Brien and Lee Renaud discuss the merits of Solarfilm polymer covering.



Jack Stafford answers questions about Stafford kits and their popular Minnow.



Karl Maas of C & D Supply, a new So. Calif. distributing firm.



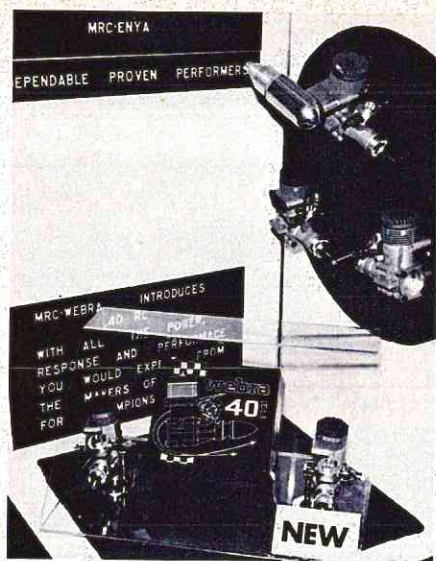
Bob and Roland Boucher make quick repairs before flying session.



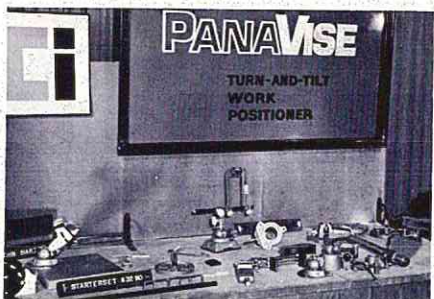
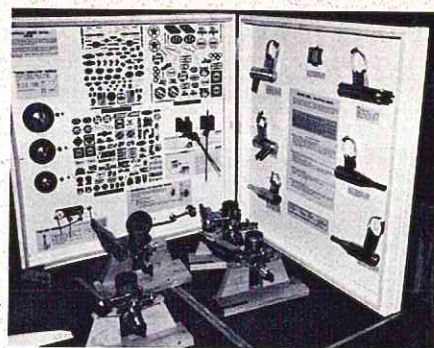
The Competition Models display of contest winning kit designs.



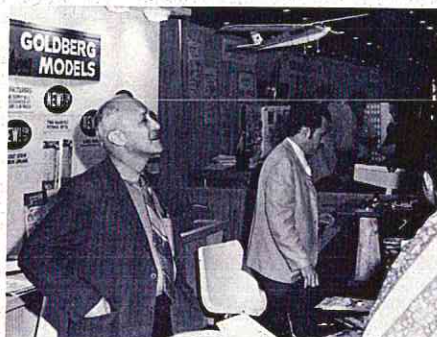
Pro-Line Electronics introduced their new radio as well as retract gear system.



ABOVE: MRC-Enya's booth displayed their renowned engine line. RIGHT: The PanaVise line of precision shop vises.



LEFT: The Technisales line of imported mufflers and accessories. BELOW: 'Mr. Modeling,' Carl Goldberg, with new retract gears, quality accessories. Many came just to say hello to a grand man.



Bev Smith stands beneath his beautifully finished Lil' Toot and tells 'em how it's done with Hobbypoxy products.



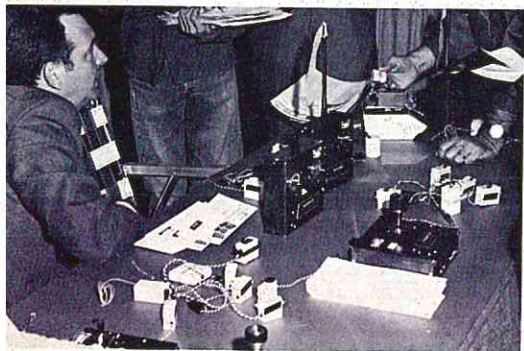
The Dremel booth was a hit... allowed young modelers to try the power tools on display.



Hobby People's booth — firm also manufactures top quality electrocane glow plugs.



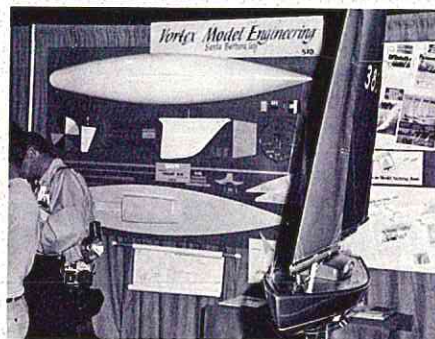
Vortex Engineering and their magnificent Santa Barbara One Design sail yacht.



ABOVE: Cannon Electronics radio line for '71. BELOW: "Look, Willoughby, just keep your gliders below 5,000 ft. or else!"



ABOVE: Top Formula 1 pilot, Whit Stockwell, ponders Champions shirt. BELOW: "I was taking a nap and you have to wake me up for a dumb photo." Williams Bros. line, tops in scale.



One of the beautiful scale ships and a well deserved trophy.



CUSTOM TECHNIQUES FOR PLASTIC AND FIBREGLASS ARF'S

By Will D. Mitchell

For What It's Worth, with the proliferation of plastic and fiberglass airplanes around, these techniques are well tried and handy.

(1) Visit your local veterinarian supply and buy a small and a large hypodermic syringe. Also get an assortment of needles from about 3/32" down. This will set you back about \$2.00.

Next time you ding a wing on your Lanier or Dee Bee, fill a syringe with white silicone rubber (sold as bath tub caulking by G.E. or Dow). Add a large needle, 1/16" will do.

Insert the needle at the edge of the ding and carefully separate the skin from the foam. Then inject silicone rubber into the void. Put a little too much in, withdraw the needle, and squeeze out the excess as you massage the ding flat. Put a small piece of Saran Wrap over the hole and wrap a piece of sheet balsa over the ex-ding while it cures. The rubber cures to about the same consistency as foam. and the fix is invisible if you're careful.

(2) When you're beset with bubbles next time you cast a fiberglass this-or-that, break out your syringe and a smaller needle. The needle will easily pierce cured fiberglass, so you can wait till it is hard. Fill the syringe with a new batch of epoxy or resin mixed to cure fast. Poke an air hole at one end of the bubble, and fill it up from the other end. It's so easy you'll be amazed.

You can do a marvelous job of correcting pinholes caused by insufficient resin, as they are usually all connected by tiny air passages. Just poke the needle in the middle of them and squeeze. They'll all fill up like magic. Then go on to the next batch and fill them up. Oh yes, fill up the bubbles or pinholes before taking the this-or-that off of the form.

Don't forget to clean your syringes. At 50 cents each they won't break you, but at today's gas prices, the trip downtown will.

(3) Here's why my plastic planes look different. You can make a hundred things from the scrap plastic in a kit: cowl flaps, reinforcements,

pushrod exits, gas filler caps, doors, antenna exits and hooks, tubes, bubbles, bulges, switch covers, etc. All you need is an ordinary iron.

Set the iron on Rayon or Wool for a start. Find the temperature at which the plastic starts to bubble, and set the iron just below that. To iron a piece of scrap flat, either set it on the iron and watch it, or help it a little with your finger. Wet your finger and you won't be burned. The iron's not that hot. When the plastic is hot and limber, lay it on a glass or formica table and press quickly down on it with a flat piece of metal, like an ice cube tray. It cools quickly to a nice finish.

Bulges and bubbles, etc., are made by simply carving a form out of balsa, or molding it with modeling clay. Sometimes a marble or a rock will be just perfect. Then place a piece of hot flat plastic over your form and press it in place with a wet cloth. If it doesn't look exactly right when cool, just iron it in place with the iron. Then trim it and cement in place.

Pushrod exits can be made this way also, or you can lay a proper sized screwdriver on the iron until it is just as hot as the iron. Hold a flat piece of plastic in your fingers and let the hot screwdriver form just the groove you want. It may take several applications to get the depth you want. Cowl bulges are neatly made with the point of the iron in this same manner.

For reinforcements around compound curves, simply heat a piece of plastic and form it directly on the plane. It will not stick to the plane at

all. If the contour is not perfect, reheat the bad part and remold it. Use a wet cloth to hold it until cool. You can touch up any tiny imperfection with a hot table knife or spoon, or by reheating the plastic and using a cold spoon. I double up all areas that are prone to vibration cracks this way, such as engine cowls.

Tubes can reinforce the holes around wing hold down bolts. Find a screwdriver, wood dowel, pencil, etc., and wrap hot plastic around it. Trim where the seam will be and make final reheatings and corrections. If you used a screwdriver, remove the tube, then glue the seam.

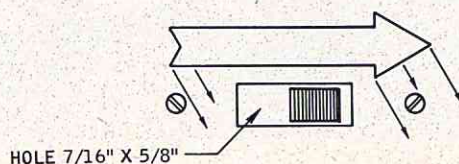
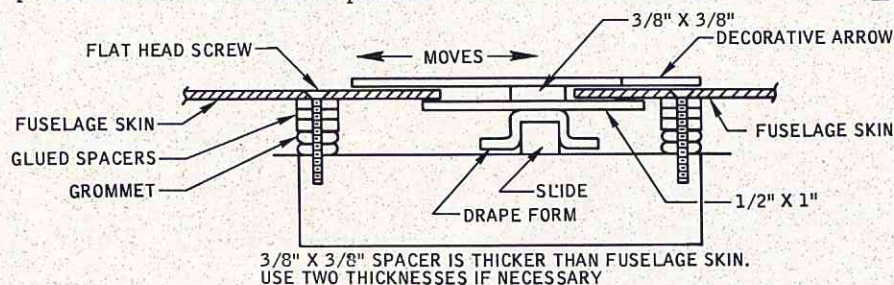
You can camouflage a receiver switch to be invisible. It can be a cowl flap that opens, or any number of things. My favorite is a piece of decorative trim that moves!

I cut out the trim, say in the shape of an arrow, and glue an identical piece of trim on the other side of the fuselage. I cut the hole for the switch, and glue three thicknesses of plastic inside the fuselage where the screws will go. Then I drill and countersink the holes for flat head screws that will be flush with the fuselage surface.

Next, drape form a piece of plastic over the slide of the switch and trim it to shape. Next, I glue a 1/2 x 1" piece of plastic to the formed piece, and a 3/8" square to that.

Then I mount the switch, with the plastic assembly pressed in place. Rubber grommets and spacers insure that the plastic 3/8" square piece is just flush with the fuselage. Then I carefully glue on the decorative arrow. If you plan to remove the switch later, make the arrow short enough that it uncovers one screw when the switch is on, and the other when off.

Trouble is, you'll usually have to chase your bird if you land long with a dead engine. Nobody else can figure out how to turn it off! □



CESSNA AGWAGON

By Gil Horstman

AN EASY-TO-BUILD, EASY-TO-FLY MODEL OF THE POPULAR 1966 OR 1968 CESSNA AGRICULTURAL WORKHORSE

Picture this for a moment; you want to build a scale R/C model with a wing span of approximately 5' to 6'. You know that your favorite model has been built over and over, so many times it's almost assured that every scale contest will have at least one entered in competition. You want to be original, maybe different is a better word, so a trip to the local airport is in order. There are many good subjects, but the one that caught my eye was the Cessna Agwagon. Here is an airplane that certainly is different. I had not seen any of the Ag planes built as an R/C scale model, so the Agwagon was my choice.

Upon request, Cessna sent along three view drawings and color pictures of their 1966 Agwagon. I picked the 1½" to 1' scale so that I would end up with a 5' wingspan. I have mixed emotions about big airplanes, after working with Eddie Morgan and his 9-foot "Cubs" in years past, so that's why the 5-foot span.

After flying Formula I racing with some success using a Stafford "Midget Mustang," I used my superior aerodynamic engineering skills and deduced that my Cessna should fly as well as the Mustang because wing area, tail area, and power were identical. I went so far as to even use Jack's method of construction. By the way, this model is as close to true scale, dimension wise, as I could compute it, which goes to prove that scale tail will fly. (What? . . . Ed.)

If you don't already have a Stafford kit, you should rush out and buy one because Jack has the instructions for building my Cessna down pat. I guess after building at least one each of all of his kits, I have the system down pat myself.

The fuselage is very easy to build. It only has five formers and seven other pieces. The cowling was somewhat of a job for me. Living in the backwoods (Las Vegas . . . backwoods? — Ed) it is hard to get up to date on the fiberglass

techniques, etc., but with the help of one Kent, I have a nice fiberglass cowling.

The tail is simply cut out of ¼" sheet and sanded to shape. If you have ever built a Formula I racer, you know how to do this.

The wing on my plane is built up and sheeted with 3/32" contest balsa. It has to be built in three pieces or on a special jig set up for it. By using the root and tip ribs, a foam core could easily be cut, I'm sure.

The cabin was carved from a balsa block and hollowed. On the 1968 model Agwagon, Cessna has put windows all around the back for 360 degree visibility; so take your pick of 1966 or 1968 models. The windshield and side windows are installed exactly like it is on the Goldberg Skylane and it works out nicely.

That brings us to the finish. I'll tell you all I know about finishing models (?). Wow! In other words, use the finish of your choice.





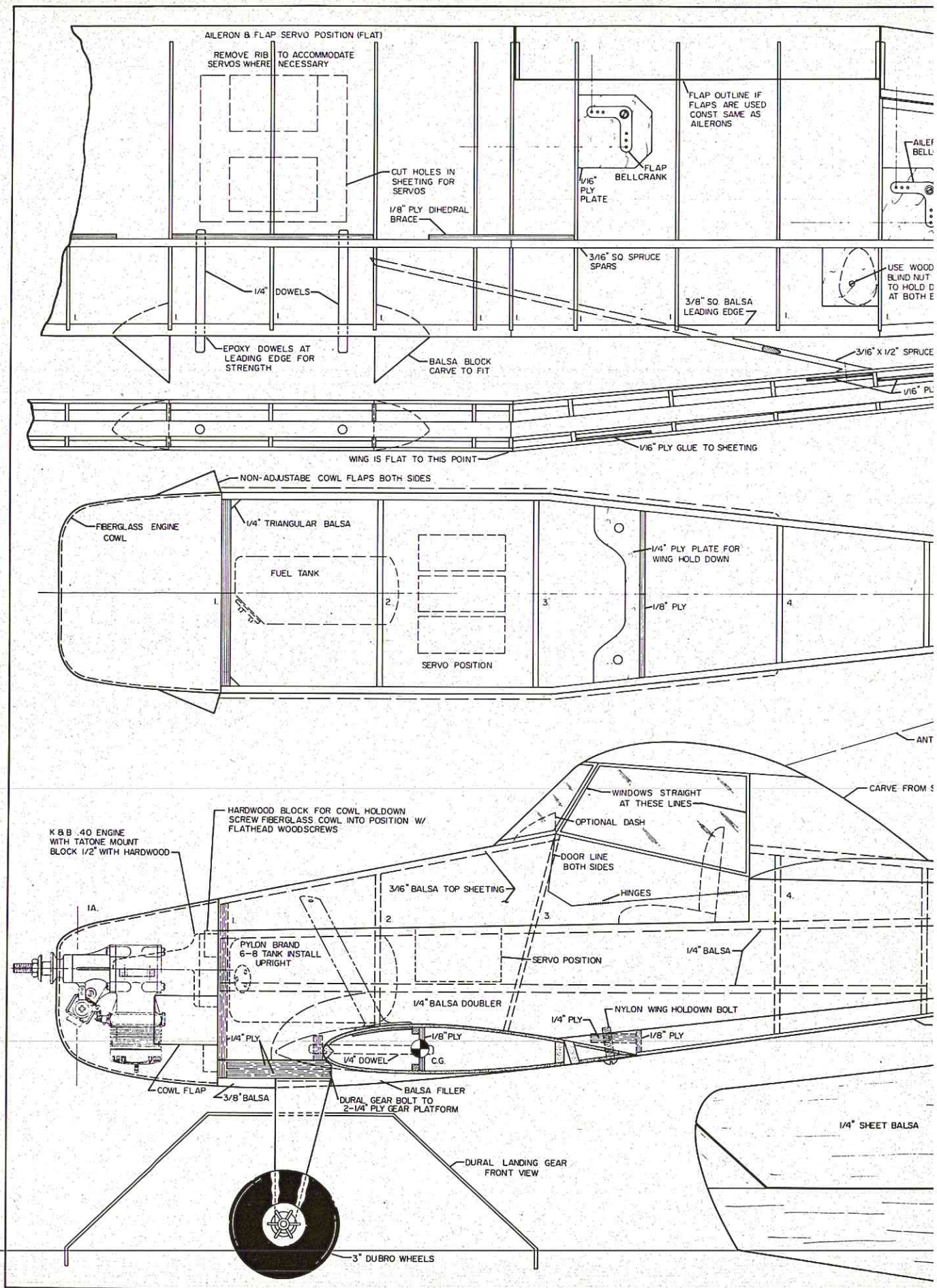
ABOVE: A beautiful photograph of Gil Horstman's 1966 Cessna Agwagon in front of the powerful, full-size 1968 version at a Las Vegas airport. Model is simple to construct and an ideal first scale project. **BELOW:** A close-up view of the construction prototype illustrating scale details.

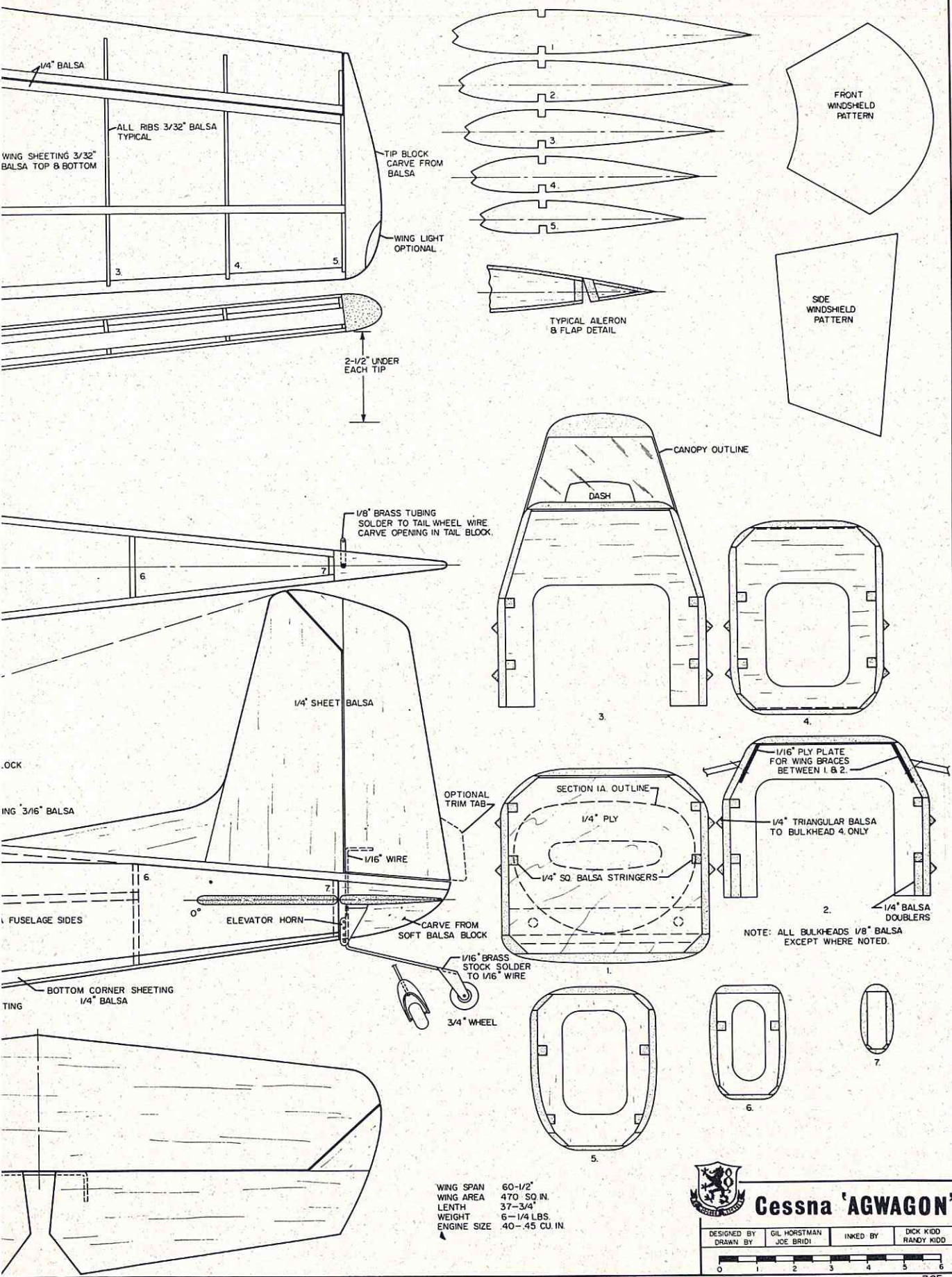


After all of that work, you now have to fly it. This is my first effort at building a scale model from scratch (three views on up). After I got all finished, I threw the Agwagon into a rented trailer and headed for the Nats. I hope you don't test hop yours at the Nats! Maynard Hill and I finally agreed on something, and that is that scale planes should be flown before the actual Nats competition. My plane could have placed a lot higher in the competition if I had flown it beforehand.

My prototype weighs in at 6¼ pounds and handles like a dream in the air. I have made a couple of deadstick landings with about 30 degree flap, and the plane lands like a Taurus. The takeoffs require a little bit of rudder until the tail comes up, but what tail dragger doesn't? Just keep the CG around 25%.

Good luck and send me a picture of your model c/o R/C Modeler Magazine. □





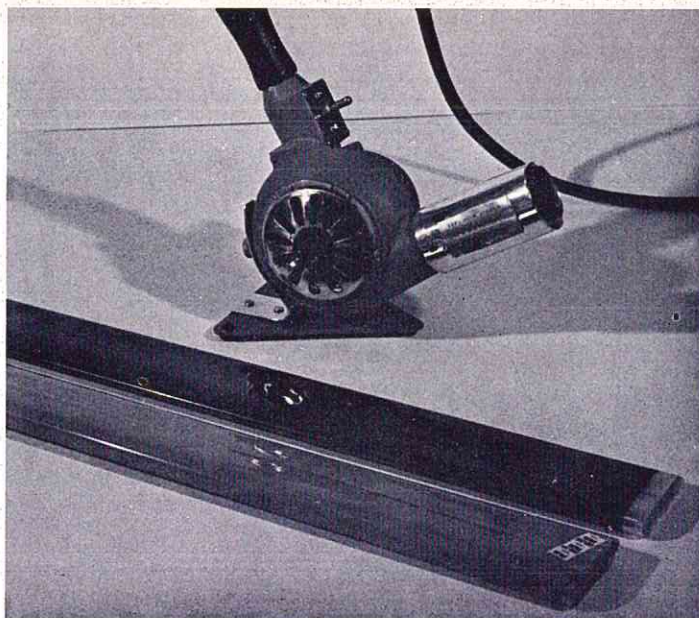
Cessna 'AGWAGON'

DESIGNED BY GIL HORSTMAN
DRAWN BY JOE BRIDI

INKED BY DICK KIDD
RANDY KIDD

SOLARFILM

A STEP-BY-STEP TECHNIQUE
FOR USING THIS REMARKABLE NEW
POLYMER FINISHING MATERIAL



One of the most remarkable products in the area of aircraft finishing is Solarfilm, manufactured in Great Britain and distributed in the United States by Technisales, P.O. Box 822, San Gabriel, California 91775.

Solarfilm is a micro-thin, super-strength polymer with a strength of 25,000 lb./sq. in. It is coated on one side with a layer of color and a powerful, dry heat sensitive adhesive. The adhesive side of the film is protected by a clear plastic sheet which is removed before applying the film.

Available in nine opaque colors, three metallic colors, and four transparent shades, Solarfilm is extremely light, adding a total weight of between 3 and 4 ounces to a standard size multi aircraft. During the past year and a half, RCM has extensively tested this material and has used it on approximately 100 models varying from the smallest to the largest powered aircraft as well as on all sizes of R/C sailplanes. We have found some very unique properties of this material that make it one of the finest covering materials that you can possibly use.

To begin with, as with any of the polymer type "plastic" covering materials, a superb finish can be achieved in much less time than with conventional finishing methods. But, unlike other polymer materials, Solarfilm is unique in that it can be applied over a doped surface, if desired, and virtually any type of paint can be applied over it — dope, enamel, acrylic lacquers, etc. In addition, and perhaps it's most remarkable characteristic, is its extreme flexibility. This material is so completely flexible, that it is very much like working with a very thin rubber film. For example, a wing tip

could actually be done in one piece, as could a wheel pant or cheek cowl, with absolutely no wrinkles. It also requires far less heat than other materials of the same type and can be applied directly to molded foam wings such as the Midwest, Testors, or Ace units without affecting the foam underneath. As we previously mentioned, the strength of the material is outstanding, and it appears to have the highest puncture resistance of any type of material of this nature that we have previously tested. An added benefit is that this material is extremely stable and has very little tendency to expand or contract during humidity changes. It will not slacken, crack, or become brittle with age. Solarfilm also markets a product called Solarfilm Solvent, which allows you to trim your aircraft with the same material by simply wiping the adhesive side lightly with the Solvent and then placing it in position. All that is necessary then is to seal the edges with a warm iron.

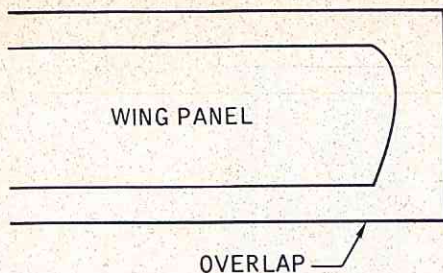
If it sounds like we are enthused about this product, we are. But, as with any item there are certain disadvantages. Although minor in nature, we can fault the fact that the solid colors of Solarfilm are not quite as opaque as they could be particularly in the yellow and white. We also noticed that there are what appears to be roller coating marks on the very edge of the material which means that the first inch or two of the sheet ends should be trimmed off and not used. The individual sheets of solarfilm are actually oversize from the advertised sheet size so this is not wasted material. If Solarfilm is applied using too much heat, there will be some exces-

sive bleed of the adhesive squeezing out from the edge of the overlapped material. This, however, is not a fault of the material, but rather of improper application. We also noticed that there is a variation from sheet to sheet of the same color with regard to the weight of the sheet when weighed on a gram scale. This weight differential is insignificant to the RC'er but should be checked by the free flight enthusiast intending to use this material. In all other areas, the material exceeds its own specifications and provides a magnificent finish with very little effort.

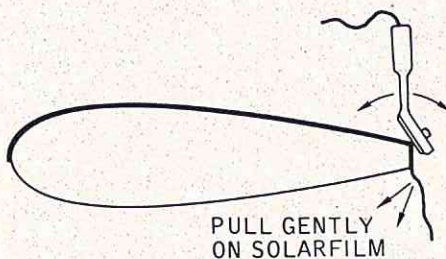
With regards to the actual method of finishing with Solarfilm, there are two basic procedures. First is the standard method using a Sealelectric iron and/or household iron, and the second is what we would term the application of Solarfilm for an exhibition class finish. Following is a brief description of both of these methods.

Regardless of whether you want a "quick and dirty" or an exhibition class finish, the final result will be only as good as the surface on which it is applied. The balsa wood, itself, should be sanded to the best of your ability using progressively finer paper until you end up using 600 wet-or-dry paper, used dry. Prior to applying Solarfilm to a given area, the area should be wiped free of all balsa dust and other sediment using a tack cloth.

Before proceeding further, read the Solarfilm instructions carefully. Let's assume that we are going to cover a wing first. Lay the sheet of Solarfilm out with the plastic liner side facing up. Make sure that you put the Solarfilm on a smooth surface such as a large sheet of cardboard or something



similar. Lay the wing panel over the plastic liner and, using a grease pencil, mark off the size of the Solarfilm panel you wish to cut. For a wing, provide about an inch overlap on each side of the wing chord and about 3" overlap at the wing tip. Cut the panel out with a sharp modeling knife and peel back the clear plastic sheet from one end of the prepared section of Solarfilm. If you are using a household iron, and preferably one with a Teflon coated base, set it to low heat (rayon) and make sure that you have allowed at least 10 minutes for it to reach a steady temperature. The Sealectric iron has a tendency to vary in temperature, and ours is set at about $\frac{3}{4}$ full position. Others we have used have been set at the half way mark. The proper temperature is determined by a slight discoloration of the material when heat is applied. This discoloration will disappear as shrinkage takes place and is dissipated. Smooth the Solarfilm sheet to the wing surface, applying to the underside of the wing first. Tack down all four

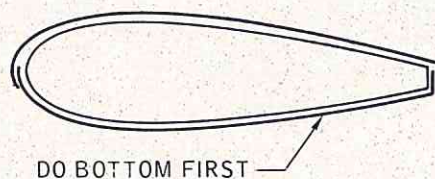


edges of the framework with the Sealectric iron working from the center of the panel towards the root and then from the center of the panel towards the tip. Do this for both the leading and trailing edges. Next, seal down the root chordwise. Finally, seal the tip down but do not attempt to wrap the material around the tip at this time.

Now, apply the larger iron slowly, starting in the middle and moving out towards the edges. Pressure on the iron is not necessary and, again, the proper iron temperature can be determined as the material changes to a darker color which disappears as it cools. Wrinkles will appear in areas just outside the

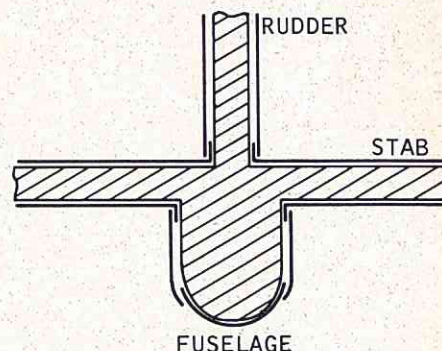
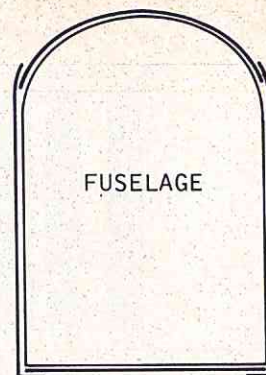
immediate area of where you are applying the heat. This is due to the fact that Solarfilm shrinks and adheres where heat is applied. If you find that you are developing some rather large wrinkles, apply heat at the edge of the wing and pull gently but firmly out to help eliminate the wrinkle. The tremendous shrinkage of Solarfilm will eliminate virtually all wrinkles that do occur but you can aid this process and achieve a smoother job.

When you get to the tip, use the small Sealectric iron and roll the iron over the edge while you pull, pulling the wrinkles completely out. Due to the extreme flexibility of Solarfilm, it is entirely possible to go completely around the tip and up to the top side of the wing, although our standard procedure is to go just past the center of the tip. You'll be amazed at the ease with which Solarfilm goes around compound curves. When you are ready to trim the excess Solarfilm, do a neat job and use a length of $\frac{1}{4}$ " masking tape all the way around the wing. Now take a sharp X-Acto blade and trim along the masking tape. When you remove the masking tape the excess material will come with it and you'll have a clean straight edge all the way around the bottom panel of the wing.

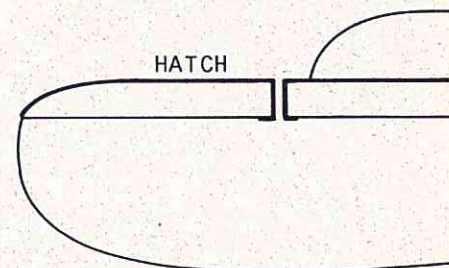


Now repeat this process for the opposite bottom wing panel and then start the top panel following the exact same procedure. Make sure that the material overlaps approximately $\frac{1}{8}$ " to $\frac{3}{16}$ " all the way around for a firm, fuel-proof seal. The adhesive that may squeeze out underneath the overlap edges can be easily removed by wiping with a cloth dampened with household alcohol.

When doing the fuselage, we prefer to do the top and bottom first followed by the two sides. The sides can then go up over the edge and overlap the top and bottom pieces slightly. Using the method of the two irons, do not seal around all four edges of the fuselage or any other flat surface. It is better to lay the material on the sheet balsa surface to be covered then work from the middle towards each end, smoothing out and pulling the overlap with your fingers to help eliminate wrinkles. This way, any

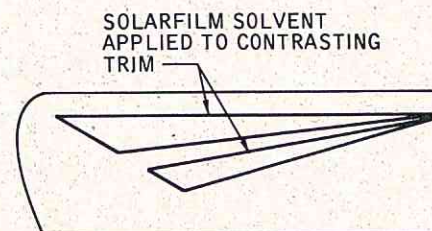


trapped air can be forced out to the ends of the material which are done last. Should you trap an air bubble, do not try to force it down with the iron since this will dent the balsa wood underneath and leave discernable marks on your finished surface. Simply prick the air bubble with a pin and continue sealing with the iron. Again, make sure that you have an overlap all the way around.

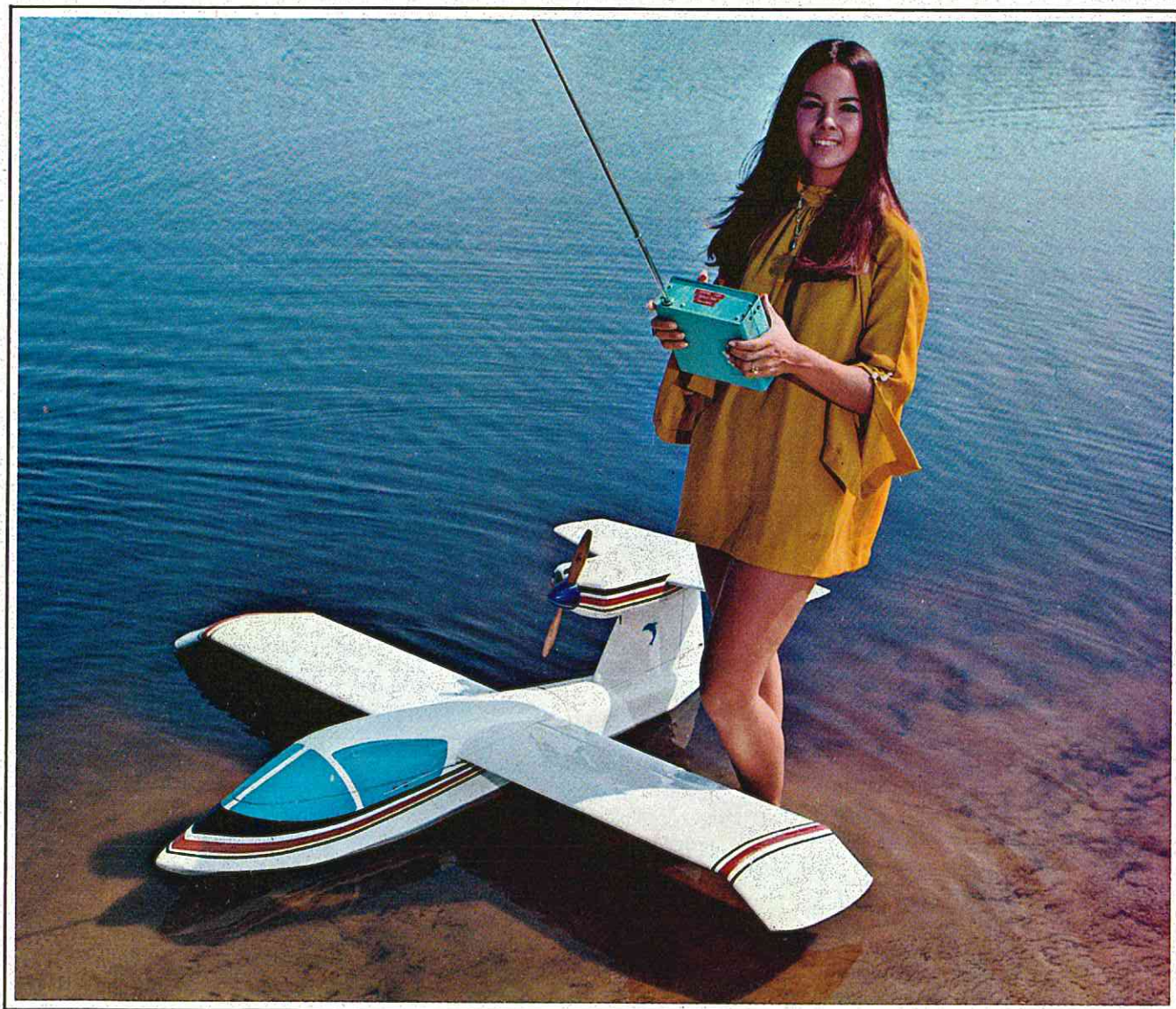


Inside the engine compartment, we always seal the edges of the material with Hobbypoxy Clear or a light trace of epoxy glue since fuel will eventually seep underneath in an area where it is likely to become saturated.

(continued on page 76)



THE SPECTRA



By Don Haines & Paul Rhen

R/C MODELER MAGAZINE PRESENTS A FULL SCALE MODEL
OF ISLAND AIRCRAFT'S SPECTRA AMPHIBIAN.

THIS BEAUTIFUL AIRCRAFT IS THE RCM EDITOR'S CHOICE AS 'MODEL OF THE YEAR.'

R/C Modeler Magazine is proud to present the Spectra, the most beautiful and unique R/C amphibian design ever published by the model press.

As presented on the following pages, the Spectra is a 1/6th scale radio controlled engineering test model built by Island Aircraft Corporation, 10 Granada Avenue, Merritt Island, Florida 32952, as their engineering test model for the full scale prototype. The fully proportional ailerons, rudder, elevator, throttle and flap controls closely correspond to the full scale vehicle.

The full size Spectra is a bold design approach that yields exceptional performance coupled with startling good looks in a completely new amphibian aircraft concept. The secret to the Spectra's performance is in its unique configuration that eliminates most of the drag penalties paid by amphibians in the past. This new configuration is in the patent pending stage now by Island Aircraft Corporation and will usher in a new dimension in airplane versatility, performance, and safety.

RCM readers will note the full scale Spectra shown in one of the photographs. This is Island Aircraft Corporation's research test vehicle and, except for some nacelle reshaping and relocation of the pitot boom, it represents Spectra's final configuration. Thus the model as presented here is virtually fully scale.

With regard to some interesting notes on the design features of the full scale Spectra, the engine location finally chosen is a result of an exhaustive preliminary design study to find a propeller location that avoided problems most previous single engine propeller driven amphibians have had — e.g., distorted air flow into the propeller caused by flow around wings, nacelles, pylons, or fuselages, and direct spray impingement on the propeller blades.

The configuration chosen for Spectra solves both these problems. The wing provides an effective spray shield under all conditions except when taxiing at low speeds under choppy conditions. Spectra's aft tractor engine arrangement provides all the advantages of a tractor installation and most of the advantages of a pusher; the propeller always "sees" undisturbed air, and the high velocity flow aft of the propeller does not impinge on the bulk of the fuselage causing extra drag as it does in most single engine landplanes. Instead, the high velocity air impinges only on the tail which means less drag and excellent tail control under all flight conditions. The tail mounted engine nacelle permits very efficient cooling air flow, resulting in less cooling drag. The exhaust runs straight aft producing a little thrust in the right direction.

Another interesting feature are the unique wing tips on the Spectra which serve several functions. At rest, and at low taxi speeds, they provide lateral stability. They provide this function at essentially no aerodynamic drag penalty. Their airfoil shape acts like a wing extension causing no more drag than a section of wing of equal length. In fact, some aerodynamic advantages caused by the end plate effect of these tips are expected. High speed taxi tests have demonstrated that the broad flat planing undersurface of the tips are very effective. Attempts to bury a tip on high speed runs have been made with hard over aileron control but the tip refuses to submerge.

The full scale Spectra cockpit is built around the pilot. The

throttle lever is mounted at the forward end of the center arm rest providing a degree of comfort seldom found in a light plane. The pitch trim wheel is immediately under the pilot's thumb; the flap switch is mounted on the throttle arm near the pilot's forefinger. The pilot can raise and lower flaps, retrim, and change power levels without moving his hand from the throttle or his arm from the comfortable arm rest. Trim changes can be made simultaneously with power changes — a feature that is particularly convenient on a full-flap go-around.

A boom mike mounted on the canopy frame and a mike switch on the control wheel help reduce to a minimum the amount of time the pilot's hands must be removed from the controls.

No other reciprocating engine airplane, single or twin, has a cockpit as quiet as Spectra, simply because no other airplane has a cockpit as far from the propeller and exhaust system.

A great deal of attention has been paid to enhancing pilot visibility in the full scale prototype. The result is a combination of pleasing aerodynamics and excellent optics; the windshield is made with a single degree of curvature that virtually eliminates any distortion. The pointed nose and generous plexiglass area provides a level of visibility that far exceeds that available in any other single engine airplanes (or most any other kind, for that matter).

The pilot sits ahead of the wing, allowing unrestricted vision both up and down. Structural members in the canopy are made as narrow as practicable in order to keep "blind areas" to a minimum.

Another factor that contributes to the full scale Spectra's exceptional performance is its retractable step. The relatively simple but effective retractable step continues to operate very well on Island Aircraft Corp's test vehicle. When retracted the step produces almost no aerodynamic drag.

The main gear will be stowed in the wings and will have a relatively wide tread providing very stable ground handling. When extended, the nose gear rotates up and forward out of the nose through a 270 degree arc into the down and locked position. This arrangement avoids putting a hole through the hull

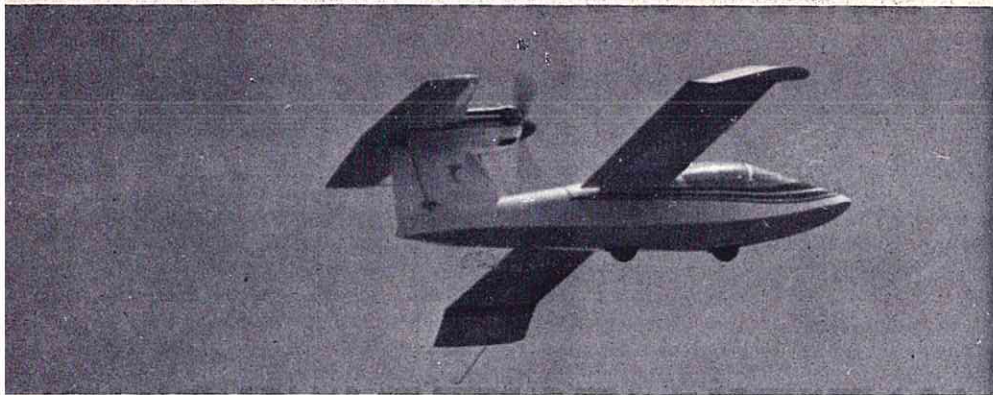
which keeps high water pressures off the well doors and outside the hull. The nose wheel can also be placed in the "bumper" or straightforward position where it acts as a fender for docking operations.

The full size Spectra is presently conducting water taxi tests. Speeds up to 40 mph have been attained and several step locations have been examined and the best arrangement has been selected. The spray rail configuration has received a great deal of attention; the simplest design proved to be the best.

The calculated performance and particulars of the full scale Spectra include a maximum speed in excess of 200 mph; a cruising speed of 190 mph at 75% power; a range of 1200 statute miles with auxiliary tanks; a gross weight of 3300 pounds; a horsepower rating of 310; a payload of 4 passengers and 120 lbs. of baggage; wing span of 37' and a wing area of 200 sq. ft.; and a fuselage length of 27'.

The model presented in this issue of RCM is a duplicate of the full sized Spectra, actually used by the manufacturer for engineering tests for the full scale prototype. R/C Modeler extends its congratulations to the Island Aircraft Corp. for one of the most outstanding light aircraft designs of our era. . . . The Editors





One of Spectra prototypes flies with S.T. .60, Heath radio on rudder, elevator, ailerons, flaps and throttle.

The challenge of R/C Scale! More and more scale models are being built every year. Why is it happening? It's because of the tremendous advances made in the design of the radio control equipment. Gone is the requirement for an airplane which is stable as a rock, light as a feather, and streamlined as an arrow. A pilot who is proficient at flying today's stunt-pattern aircraft is fully capable of controlling a neutrally stable or somewhat unstable scale model. Scale models also tend to be heavy, but thanks to today's big (and dependable) engines, the weight problem has almost been eliminated.

The project I embarked on presented this challenge and more; build and fly a scale model to test a new concept in airplane design. The design, an amphibian with the engine nacelle mounted on the vertical fin, presented intriguing structural and aerodynamic questions.

The aircraft presented here is the second of two 1/6th scale engineering test models built and incorporates the latest changes in the design of the full scale prototype. During the flight test program various combinations of the engine thrust line, horizontal stabilizer and wing incidence, wing dihedral and control surface area were investigated using the model. The knowledge gained from this testing has made a significant contribution to the final design of the prototype. In many areas, characteristics of the model were found to be directly applicable to the full size prototype—the water spray pattern during takeoff was identical to the prototype (over the wing)—and the addition of short spray rails solved the problem. The model's airfoil was changed from a Clark Y to the NACA 2415. Two

degrees of dihedral and a 7" increase in span were added to the wings on the second model. The nacelle and aft fuselage were slenderized, and the area of the vertical stabilizer and rudder were increased. A weight reduction effort during construction of the second model resulted in a savings of about one pound with no sacrifice in strength. It is still a heavy model, weighing 11½ lbs. dry. Power for both models has been a ST .60. The newer, more powerful Veco's, Enya's or Webra's are recommended.

Construction is fairly straightforward, however, here are a few notes before the details. We used good old Titebond on the original model, but changed to epoxy for all gluing on the second ship because of problems encountered with water softening the Titebond (it's water soluble) after a day of flying at our favorite lake. Use extra care to seal all exposed surfaces and joints where water may enter. Remember, happiness is a dry airplane. By the way, if you don't have a good sanding board in your set of model building tools spend a few minutes making one. It will save you hours over the long run, and you will have straight and true surfaces for gluing. Here's how: Find a piece of perfectly flat and smooth 1 x 4 inch pine about 9 inches long. Cut a piece of #80 open coat aluminum oxide paper approximately 1/8" smaller than the outside dimensions of the 1" x 4". Be

sure to use a heavy duty aluminum oxide paper; regular sandpaper or garnet paper will last only a few hours. Glue the paper to the block, place another block and weights on top and let the glue dry thoroughly. I've used the same block for over a year now without wearing it out. Just be sure that the board is flat.

FUSELAGE: Keel construction was chosen as the simplest method of obtaining a structure strong enough to withstand the anticipated loads generated during the flight test program. The main keel is 1/8" balsa sheet with a 3/32" plywood sheet backbone over the wings and the main supporting member for the horizontal stabilizer and nacelle. All formers are 3/32" balsa with 3/32" stiffener strips, except formers 25A, 90A and 230C which are 3/32" plywood. Formers 100, 120, 140, and 160 are cut partially through at the fuselage parting line prior to assembly. Later, when the fuselage sheeting is completed and the top planking shaped, a few quick slices with your razor saw should allow the top to slip off nicely. Care should be taken to keep the formers perpendicular to the keel while the epoxy is curing, and don't forget to allow the 1/8" for the fuselage bottom to butt join to the keel. After the formers are set, the 3/32" balsa longerons are added and the side is ready for sheeting.

The bottom sheeting is done in two sections—the side is one piece. The aft section is easy; however, the front section has compound curves and must be pinned securely until the epoxy has set. I found that if I used one hour epoxy with a spot of the 5-Minute type here and there on the curves the tedious job of pinning and clamping

Equally at home on land or water, two Spectra prototypes illustrate amphibian profiles.



could be greatly reduced. Be sure that the sheet remains in contact with each former along its full length. The center of the sheet tends to pull away from the formers when it is pulled down at the front. While waiting for the epoxy to cure, rough cut and fit the canopy planking. Now lift the keel from the board, add the formers and longerons to the other side, and then the sheeting. Do not sheet the top of the forward section of the fuselage from station 25 to station 90 at this time. You have some weight and balance checks to make and about two pounds of lead and resin to add prior to closing up this area.

The leading edge and left and right halves of the vertical stabilizer ribs can be added at this time and the bellcranks and control rods installed. Check the installation carefully for free movement because there will be no access to these linkages after the skin is installed. You can use NyRod, Golden-Rod, or flexible cable, etc., however, I found that this increased the slop in the controls and reduced the throw where multiple bends existed in the control line run. I tried NyRods on the first model, but switched back to bellcranks on the second one. Motor control is the only control still using cable or NyRod.

If you are installing landing gear, you will have to fabricate a plywood bulkhead (25A) and a removable nose

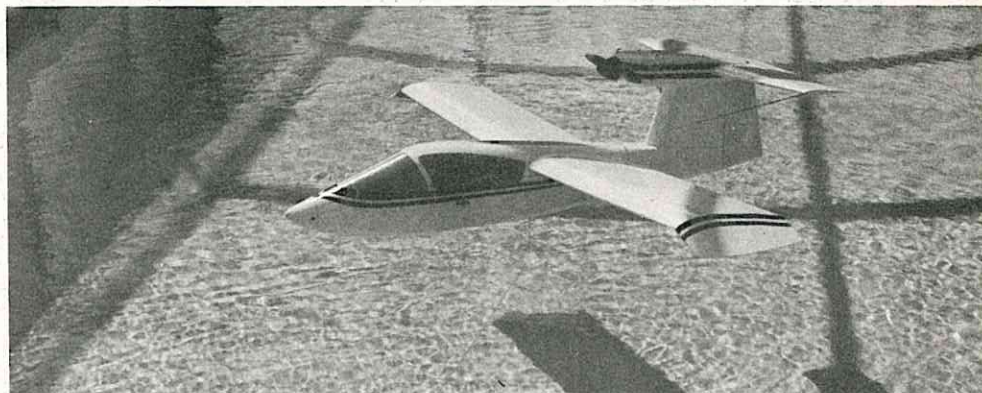
pin it in place. Now glue the 3/32" sheet inboard trailing edge to the rear spar, install the rib sections and then the bottom trailing edge sheeting. Use soft balsa for this sheeting. I glued the back edge together without trying to taper it. Use clothespins to clamp it. You can sand it later after you pull it off the board. This method also ensures straight and strong trailing edges.

Now glue in the bottom forward spar and let it set.

While it is curing, start the ailerons. Put some Saran Wrap over the rib jig and rear wing spar to keep the aileron and wing separated. Pin the 3/32" top sheet in place; glue the aileron spar and the ribs to it. Glue in a piece of 1/2" behind the aileron spar where the control horn goes. Install the 3/32" bottom sheet using the same method for clamping the trailing edge. Glue the bottom forward 3/32" x 3" sheeting in place. When the epoxy is cured, turn the wing over, trim the tabs off and add the top leading edge sheeting.

of the sheeting on the inboard section of the wing. You could probably sheet the whole wing without much increase in weight and the appearance would be improved. Slip the completed wing into the top section of the fuselage. Make sure the wing incidence angle (zero degrees) and alignment are correct and draw a line along the fuselage/wing intersection. Remove the wing, coat the joints with epoxy, and glue the two together, using the lines to ensure proper alignment.

HORIZONTAL STABILIZER: Cut and shape the rear stabilizer spar and the elevator spar. Cut the leading edge and mark the centerline on the inside. Notch the leading edge and rear spar for the ribs, and block the leading edge so that the centerline is parallel to your workbench. Cut the ribs from 3/32" sheet and mark the centerline on each at the leading edge. Drop the ribs into place making sure that the centerlines line up. Now cover the ribs with 1/16" balsa sheet for the stabilizer and 3/32" balsa sheet for the



In its seaplane version, the Spectra is a remarkably beautiful aircraft.

section. If you intend to fly it only as a seaplane, forget the plywood, glue on a chunk of balsa and carve it to shape. The plans show the landing gear version. In converting the ship from landplane to seaplane, make sure you put some silicone glue on the nose wheel pushrod hole to make it water tight after you remove the nose gear.

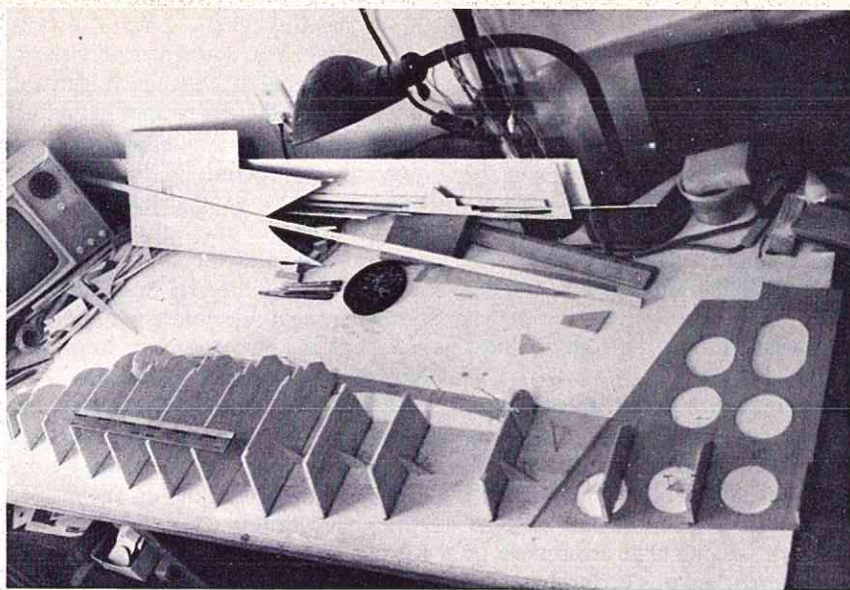
WINGS: Wing construction is also quite conventional. The rear spar and aileron spar are made from 1/2" balsa sheet. The leading edge is one of the standard blunt shapes available in hobby shops. Place the forward spar on the blueprint and glue the ribs in place using the notched leading edge and rear spar to hold the ribs in alignment. As soon as the epoxy sets, pull the leading edge, fill the notches with epoxy and pin it in place. An hour later you can pull the rear spar, fill the notches in it with epoxy, and

Cut the ends off the wing section as shown between the 2nd and 3rd ribs. Carefully cut the ends to achieve the desired 25 degree droop angle for the tip and glue it back on. Install the rough cut block balsa wing tip and carve it to shape. Remember, the tips are also the floats, so don't change the shape of the bottom surface. The amount of dihedral shown is required to provide tip clearance during water takeoffs. The original model was built with the dihedral shown, then modified to zero dihedral angle at the request of the designer. Subsequent water taxi tests showed that the clearance was insufficient, and many of the high speed runs ended in water loops caused by a wing tip dragging along the surface.

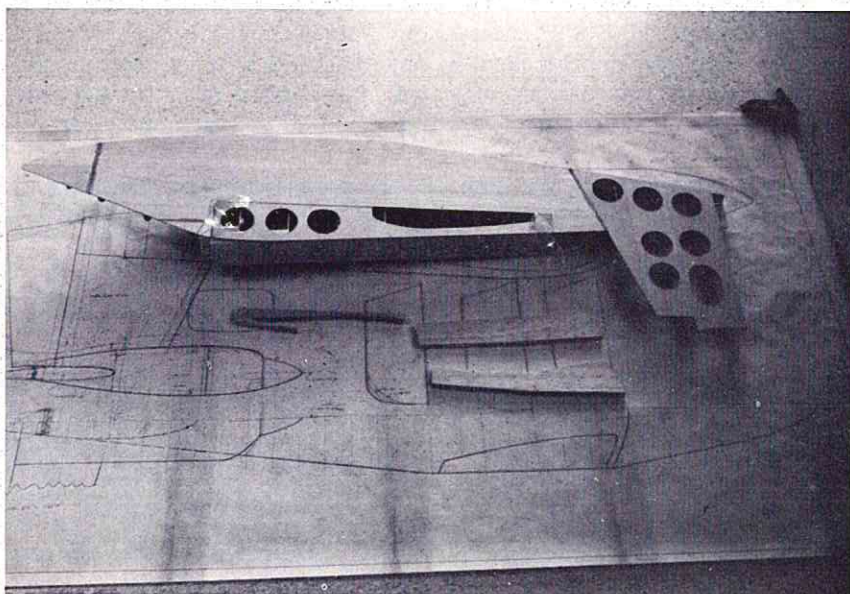
After the wing halves are joined, add the servo mounting board and the controls for the ailerons. Add the rest

elevator. Remove the stabilizer, cut off the tabs, and glue on the other skin. After the sheeting is dry, taper the leading edge to match the sheet. Shape and sand the elevator hinge area for a smooth operation prior to final assembly.

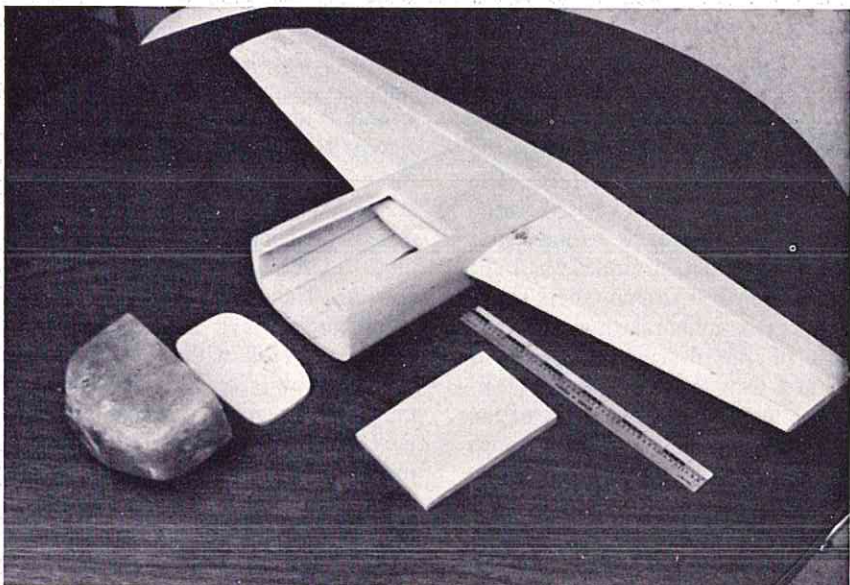
NACELLE: The forward section of the nacelle is molded fiberglass. If you are going to use a molded cowl, now is the time to make it. Make a 1/4" plywood firewall that fits inside the cowl. The nacelle aft of the firewall is built up from 1/2" sheet and 3/4" x 3/4" triangular stock with a hatch in the top to allow access to a 10 oz. fuel tank and the engine control linkage. I tack-glued the top piece of 1/2" sheet in place originally and shaped the nacelle completely before cutting the hatch. Glue the firewall in place on the nacelle. (Don't put any glue on the top piece.) Put the cowl in place and



Basic fuselage built on center keel. Note lightening holes in vertical stabilizer.



ABOVE: Fuselage planked on one side. BELOW: Engine nacelle and horizontal stabilizer assembly.



draw a line around the intersection with the nacelle. Carve and sand the nacelle to shape using this line as the reference. After it is carved to shape and the stabilizer fitted, the top is cut loose and the hatch cut out. This ensures that the hatch has the correct shape and fit.

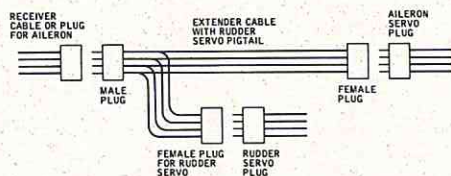
Now is a good time to pin the stabilizer and nacelle together and check the fit and alignment on top of the vertical fin. Draw a line on the plywood keel for the vertical fin along the bottom of the nacelle. This will ensure that you have the proper angle of incidence (zero degrees) when you epoxy it in place. Also, with the nacelle temporarily in place, work out the control pushrod runs for the rudder, elevator and engine. Now you can remove the nacelle, glue the horizontal stabilizer and nacelle together, glue on the top of the nacelle, and then glue the nacelle to the vertical fin. After the nacelle is glued in place, and all control linkages are operating satisfactorily, the vertical stabilizer can be sheathed with 1/32" ply which adds all of the strength required for many hours of flying. The rudder sheeting is 1/16" balsa.

WEIGHT AND BALANCE: Install the engine and cowl on the nacelle. Temporarily install all of the radio equipment. Then, assemble the complete model including landing gear, if used. At this point the model should be complete except for the 1/8" sheeting on the top front section of the fuselage and the MonoKote covering. Put 10 ounces of weight in the nacelle fuel tank area to simulate a full fuel load. Add weight to the front two bays of the fuselage until the CG comes to the location shown on the plan. Now, remove approximately 6 oz. of the weight from the nose section. Mix up 6 oz. of resin and pour it over the weights to seal them in position. This also greatly strengthens the forward hull section. I coated the bottom surface of the third bay with resin also, since you can't seal this bay when the top front sheeting is installed. When the resin sets up you can install the 1/8" balsa sheeting on the top of the front section and you're ready to cover the airplane.

COVERING: The model was covered with Top Flite's Super MonoKote. This keeps the weight down and the wife happy. You also keep the Hobby Store owner happy when you buy more than 15 feet of the stuff. Make sure your seams are all overlapping and well sealed.

RADIO INSTALLATION: Installation of the radio equipment is conventional and there is plenty of room. You get some added vibration insulation effect with the engine located on the top of the tail far from the equipment. This doesn't mean that you can forget the foam around the batteries and receiver, since they need all the cushioning you can provide.

The only thing different is the extender cable needed to run from the receiver back to the aileron servo. If you are going to use coupled aileron and rudder, this is the convenient place to make the "pigtail" to tie rudder into the ailerons. The sketch shows how I did it on my Heathkit. Kraft has a similar cable commercially available for their system this year.

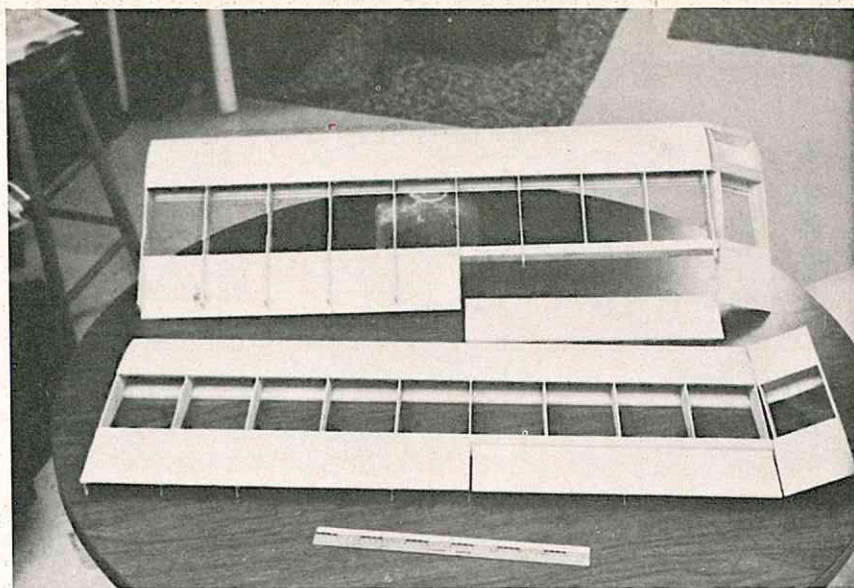


Make sure that you can do this with your system prior to trying it. I know it will work on both the Heathkit and Kraft systems. Make sure you have the rudder servo output hooked up such that the rudder moves right when you move the aileron stick control to the right. If your servos are properly set up with the transmitter, you should be able to shift from separate aileron and rudder to coupled controls without adjusting the rudder control linkage. However, if you aren't familiar with your equipment or don't know someone who is, don't try this adjustment; just remember to adjust the mechanical linkage for the rudder when shifting from one method to the other.

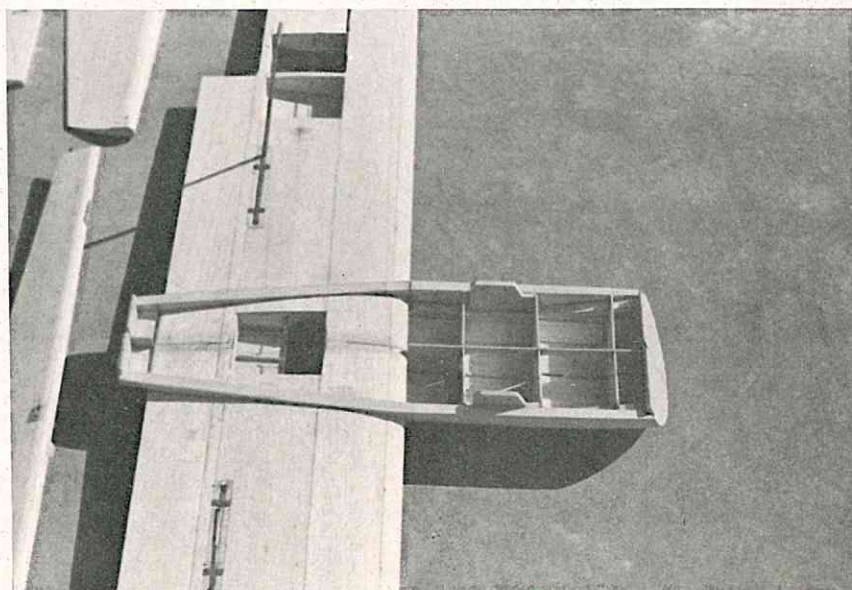
FLYING: First, be sure the main landing gear is installed as shown. If the CG is correct, the airplane should stay on the tail if it is tipped back even with the fuel tank empty. I strongly recommend that you make the first flights using coupled ailerons and rudder. You will find that the adverse yaw effect of the long nose and ailerons requires a large amount of rudder especially at low speeds.

Ensure that the elevator is at zero deflection angle at neutral trim. Then set the elevator trim on the transmitter to full up for takeoff. For the first takeoff, make sure you have plenty of smooth runway available. As the speed

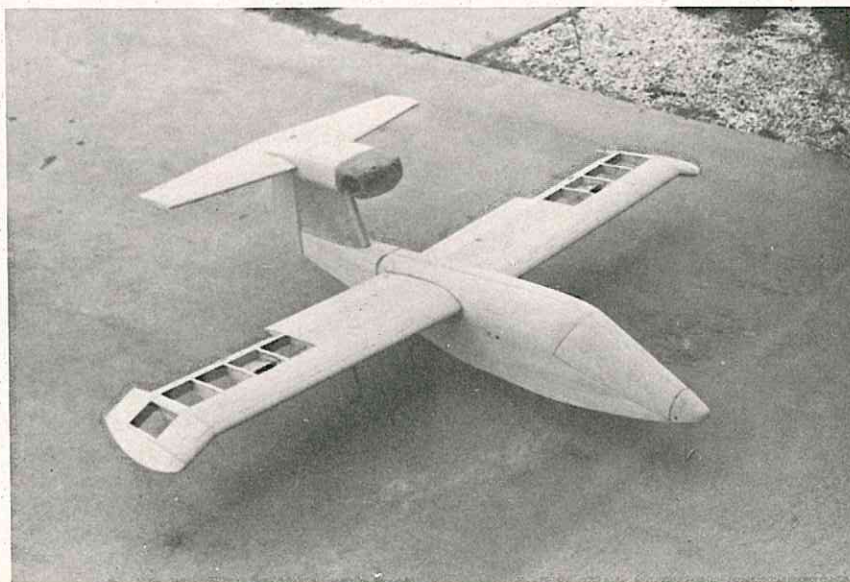
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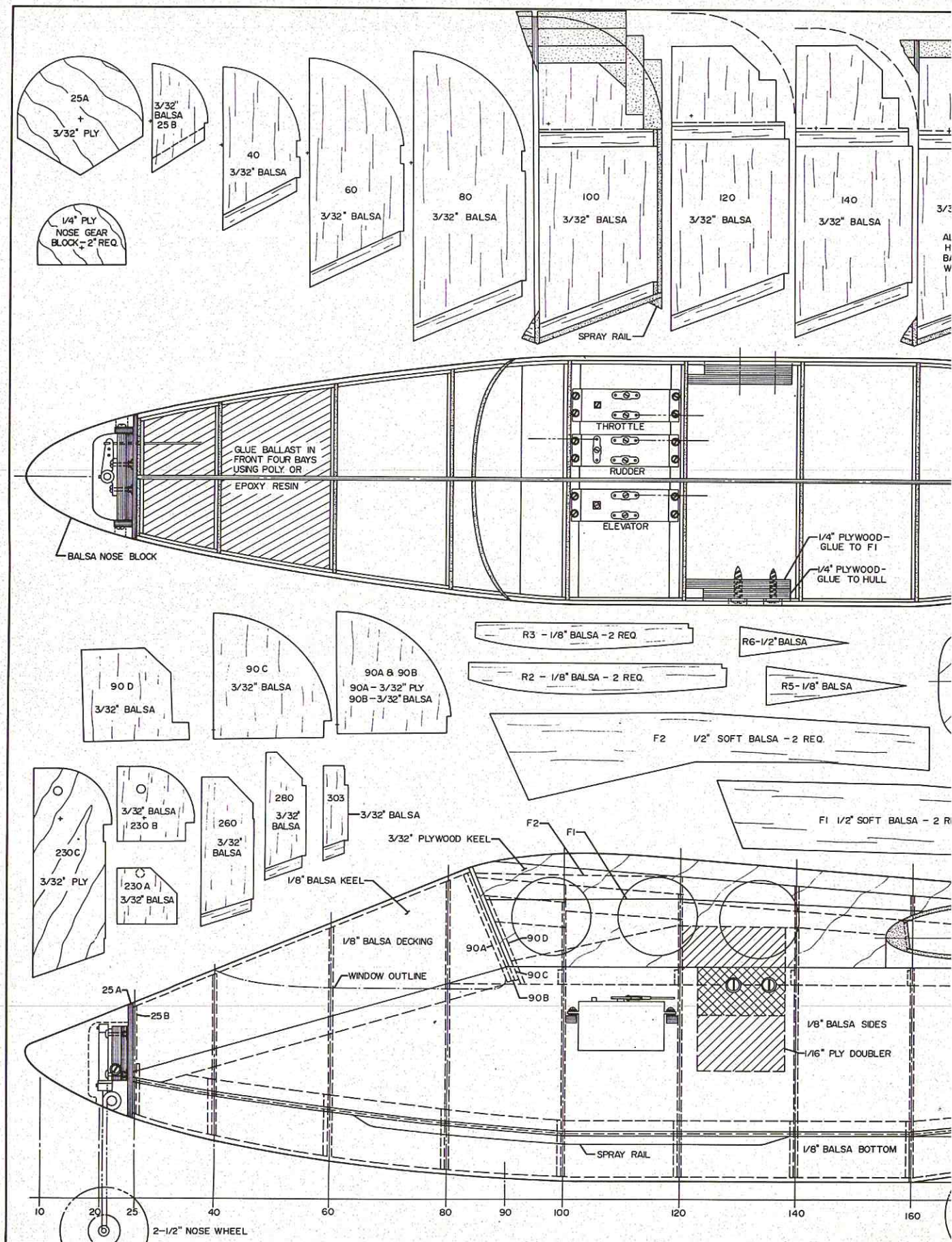


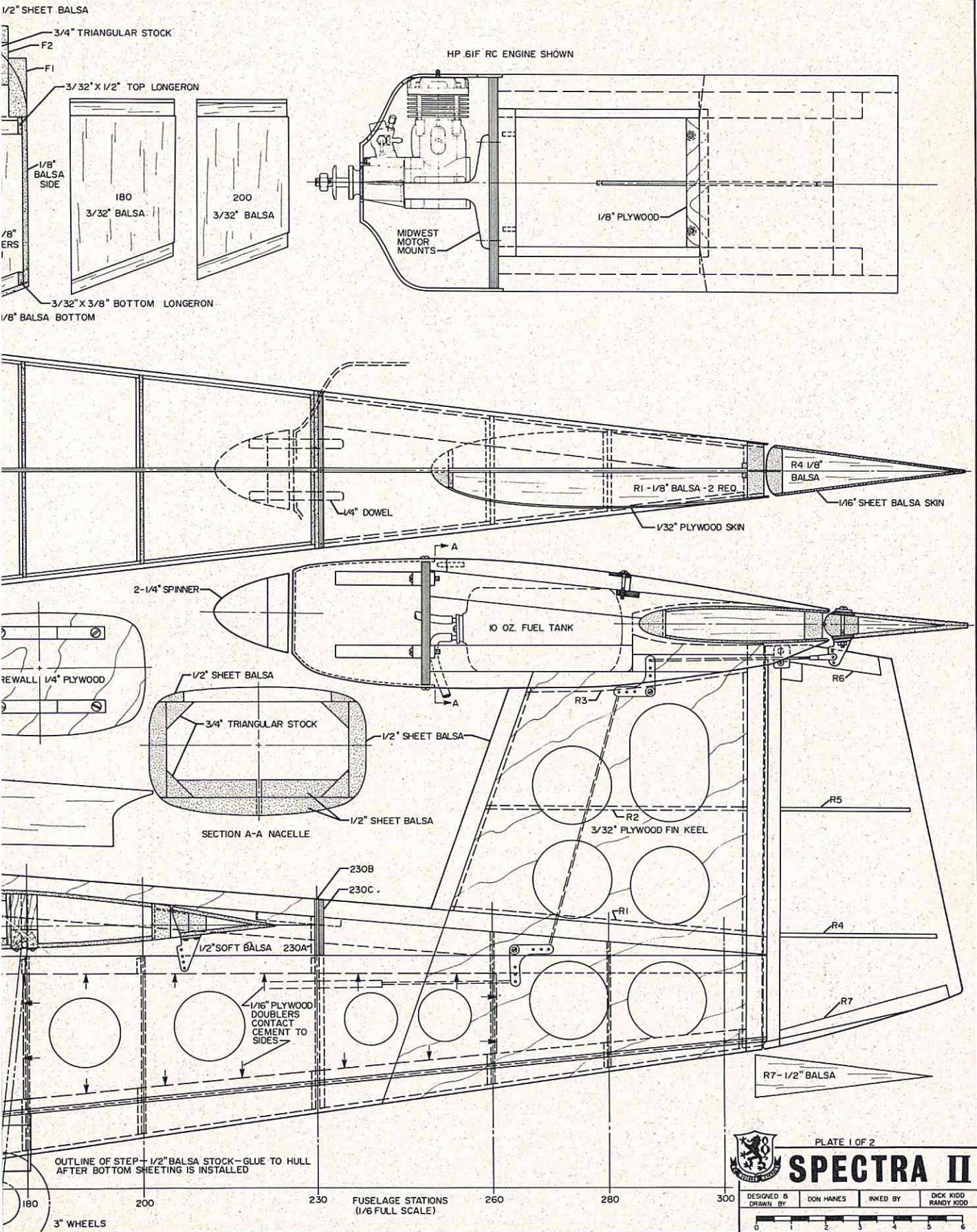
Wing panels partially completed. Nose tip assembly.

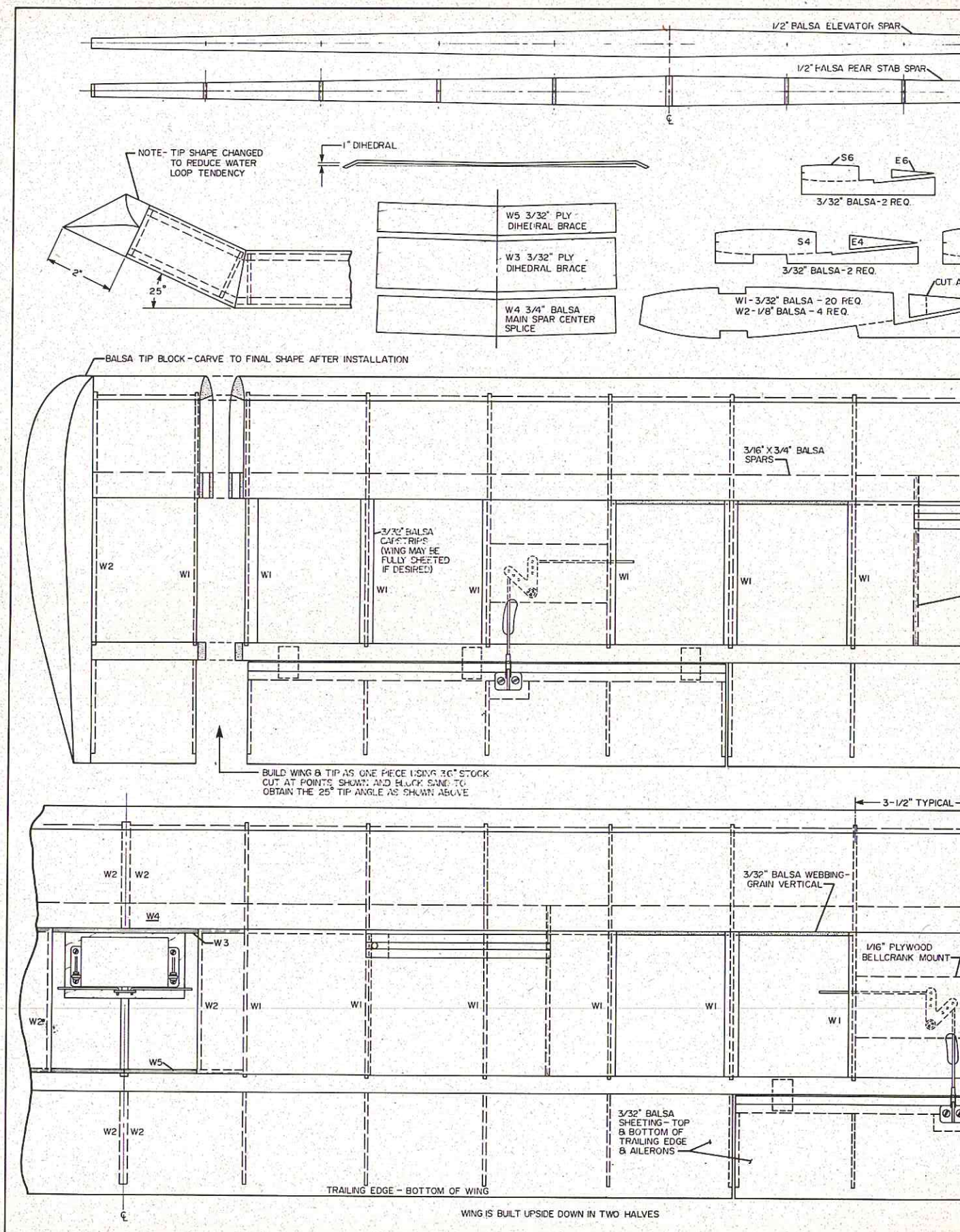


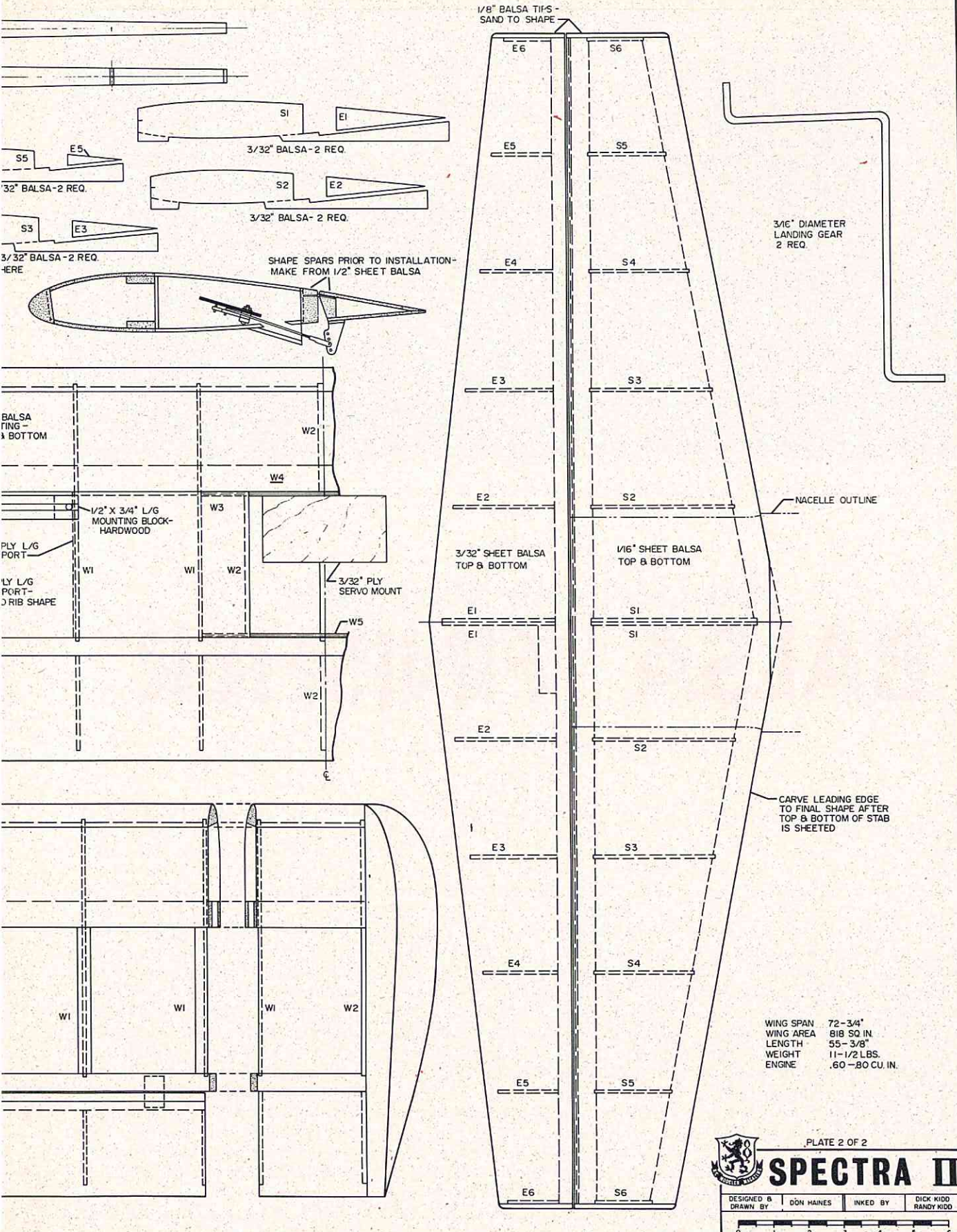
ABOVE: Completed wing showing detachable fuselage top section. BELOW: Finished Spectra framework.

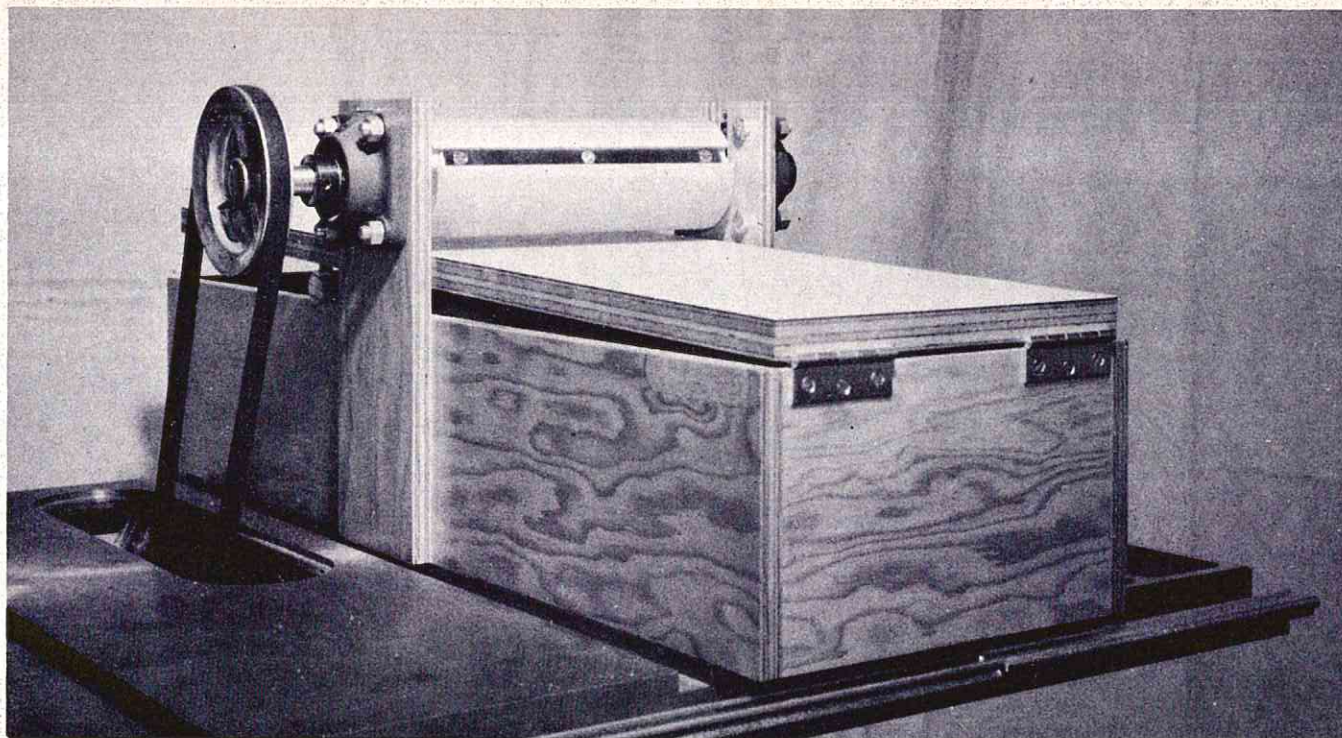












For less than \$25.00, this homemade balsa finisher can make all the balsa sheet you need at less than one-fourth the commercial price.

YOU CAN BUILD YOUR OWN **BALSA FINISHER**

By W.R. HEADINGTON

Would you say that twenty-five dollars is a pretty good investment for a homemade balsa finisher to make all the balsa you wanted at less than one-fourth the commercial price? If your answer is "Yes," then read on, because this is the article for you.

Balsa is high priced (nobody will argue with this statement) and one of the reasons for its high price is the labor necessary to transform it from a rough log to the product we normally see only in its finished state. Since most modelers have more time than money anyhow, spending an evening in the workshop finishing up a six-months supply of balsa can amount to a considerable savings.

Rough-sawed balsa blocks are used commercially by the construction industry for an insulating material and finding a source for the balsa logs just becomes a matter of phoning the lumber stores or local contractors in

your area for their supplier. Those logs are 3 to 6 feet in length and in widths up to 12 inches. You may have to sort through a pile of stock to find the width, density and quality you want, but, considering the savings, the time is well worth the effort. The price for the balsa at this point should be 55 to 65 dollars per hundred board feet. The balsa logs must then be cut on a bandsaw about $3/32$ " more than the desired finished thickness and then finished to the final dimensions with the balsa sander. Result? Perfect balsa every time!

To figure the savings, compare the cost of homemade $1/16$ " x 4" sheeting 36 inches long against the "high-priced spread." The rough sheeting will be $5/32$ " thick, plus $1/16$ " for the saw cut, making 0.218 board feet and costing 12 to 14 cents. This is less than one-fourth the commercial price.

But the balsa sander does more

than just turn out perfect sheeting. It's great for smoothing those built-up stabs before sheeting, for sanding rudders and elevators, or for any other sanding job on either hard or soft woods.

When I started this project, I had intended to make the sander a separate tool with legs and its own motor mounted under the table to drive the drum. But, as construction progressed, it became apparent that because of the very narrow width, it would probably wind up being top heavy and likely to tip over, so I decided to try mounting it on top of my table saw and driving it from a pulley mounted on the arbor, in place of the saw blade. This method of driving the sander has several advantages. First, the expense of a separate motor and switch is eliminated and, since the arbor on the saw is adjustable up and down, you can use this feature to adjust the belt tension

to the sander. I was able to use the belt from my band saw so that I don't have an extra belt lying around which would probably get misplaced between sanding jobs.

This has worked out very well and it isn't even necessary to clamp the sander down; a block clamped on each side of the sander to keep it from sliding around on the table is all that is necessary. If you decide to drive your sander this way, check the speed of the motor and the pulley sizes and select your arbor and drum pulleys to give a drum speed of about 1500 to 1800 rpm.

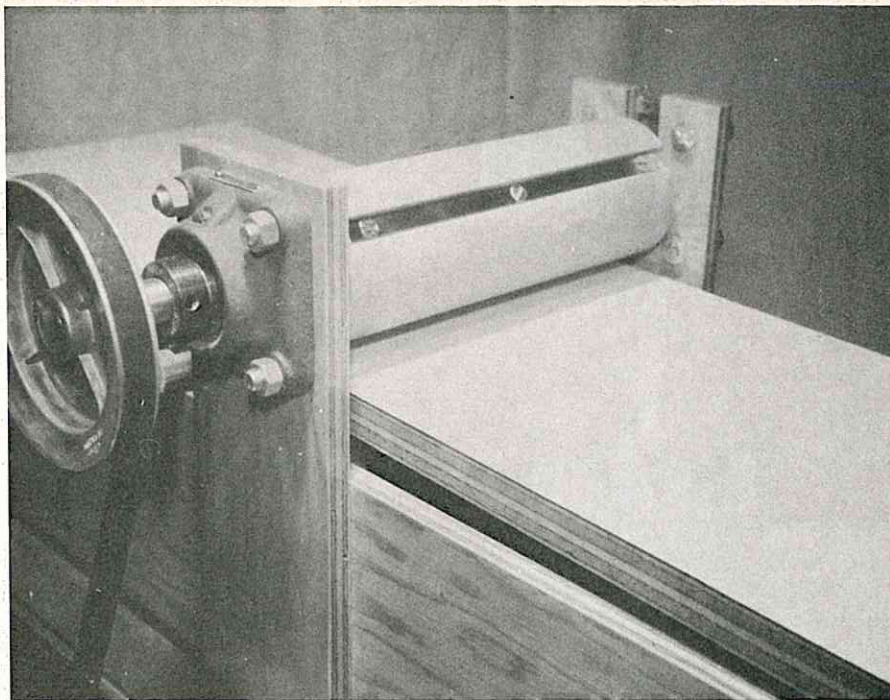
There are several reasons for selecting this drum speed. One is that the surface speed of the sandpaper is about 1400 feet per minute, which is comparable with the surface speed on commercial belt sanders and gives excellent paper life, but equally important is the unbalanced forces of the drum which increase with the square of the speed. The slot in the sanding drum would cause an unbalanced force of 14 pounds at 1750 rpm, without the steel bar, and at 3500 rpm this unbalance would be 56 pounds.

It is important, therefore, to make the steel bar to the dimensions shown because the weight of the bar and the screws is almost exactly the same as the aluminum removed from the drum. The small unbalance that remains will hardly be noticeable at 1750 rpm.

Building the sander is straightforward and all necessary dimensions are shown on the construction drawing.

Make the sanding drum first to get the hard part out of the way and because you will need this for final assembly of the frame. The sanding drum is 9" long and 3-5/16" in diameter. It is the most important part of the sander and should be machined accurately so, unless you have a lathe and a milling machine, it would be best to farm this out to a local machine shop. The dimensions of the drum are such that a standard 9" x 11" piece of sandpaper will overlap about 9/16" at the groove and pull the paper tight on the drum when the clamp bar is tightened down.

The diameter of the drum can be made a little smaller, say 3", if this is the only size material available, and the only inconvenience will be having to trim a little from the length of the sandpaper. Aluminum was selected for the drum because it is easy to machine and the weight removed by the slot



Close-up view of the sanding drum and bearing support. Don't substitute on bearing call-outs.

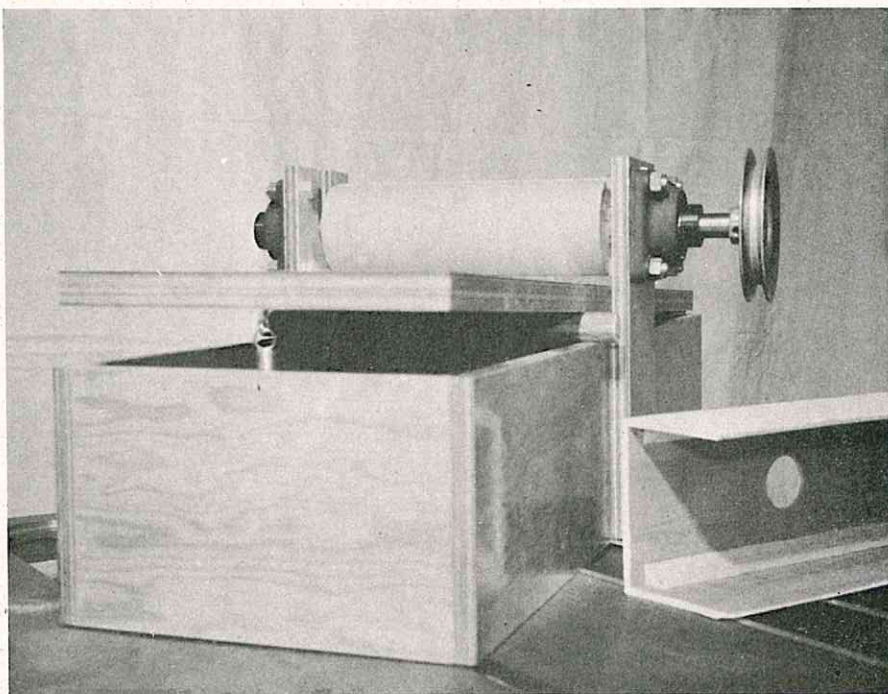
can be balanced easily by a steel bar used to clamp down the sandpaper. There is no reason why the drum couldn't be made from hard wood or from steel but, if you go this way, you'll have to work out the balance problem for yourself.

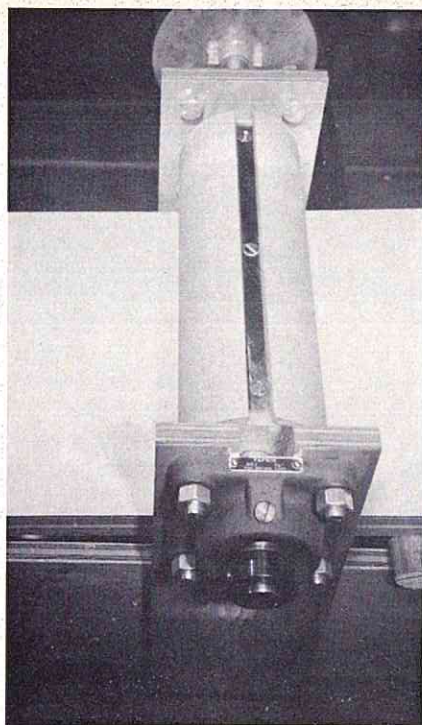
Start the machining by drilling and reaming a 3/4" hole through the center of the bar and then machine the O.D. from a 3/4" mandrel through this hole. This will make the sanding surface

concentric with the shaft. Machine a 1/2" slot 1/4" deep on one side of the drum. Drill and tap three 10/32" holes from the center of the slot through to the shaft hole. These three holes will serve a dual purpose. When the drum is assembled to its shaft, 1/2" long set screws will lock them together and flat head screws through the steel bar will clamp the sandpaper to the drum.

Make sure that any burrs on the inside of the hole are removed after

End view of the balsa finisher illustrates simple but effective method of elevating sanding table.





the tapping operation as this will gall the aluminum when you install the shaft. The hard part is now finished.

Make the shaft from either cold rolled steel or drill rod. I prefer cold rolled steel because the diameter is a few thousandths under $\frac{3}{4}$ ", making it easier to assemble. Whichever one you use, though, lubricate the shaft and drum bore before you put them together.

Locate the three places on the shaft

where the set screws will hit and file a small flat spot. If you ever have to remove the shaft from the drum later on this will keep the set screw marks on the shaft under the shaft radius.

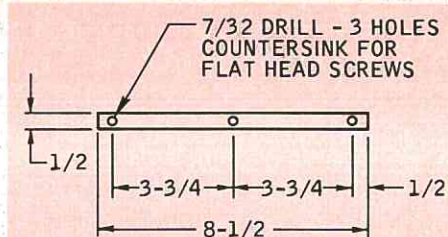
The two shaft support bearings used are a self-aligning, sealed, precision ball-bearing type which will last forever. For the $\frac{3}{4}$ " shaft size, this is Boston Gear Catalog Number 4F or Fafnir Part Number RCJ $\frac{3}{4}$ ", and both have the same mounting dimensions. The list price is about seven dollars each.

Why not use bronze bearing pillow blocks instead of precision bearings? Bronze bearing pillow blocks only cost about two dollars, but they need frequent oiling, they don't seal out the sawdust, and the clearance in the bearing produces a washboard finish on the balsa. This definitely is not the place to try to save money.

The frame is half-inch interior plywood throughout and the top is $\frac{3}{4}$ " plywood with Formica glued to one side. The smooth surface of the Formica is necessary to support the balsa and allow it to be pulled through the sander with a minimum of drag.

Be sure that the $\frac{3}{4}$ " top piece is flat under the sanding drum because any unevenness here would cause a variation in thickness of the finished balsa. The top piece is $9\frac{1}{4}$ " wide and 30" long and can be made from the cut-out for a double kitchen sink.

Assemble the rectangular frame



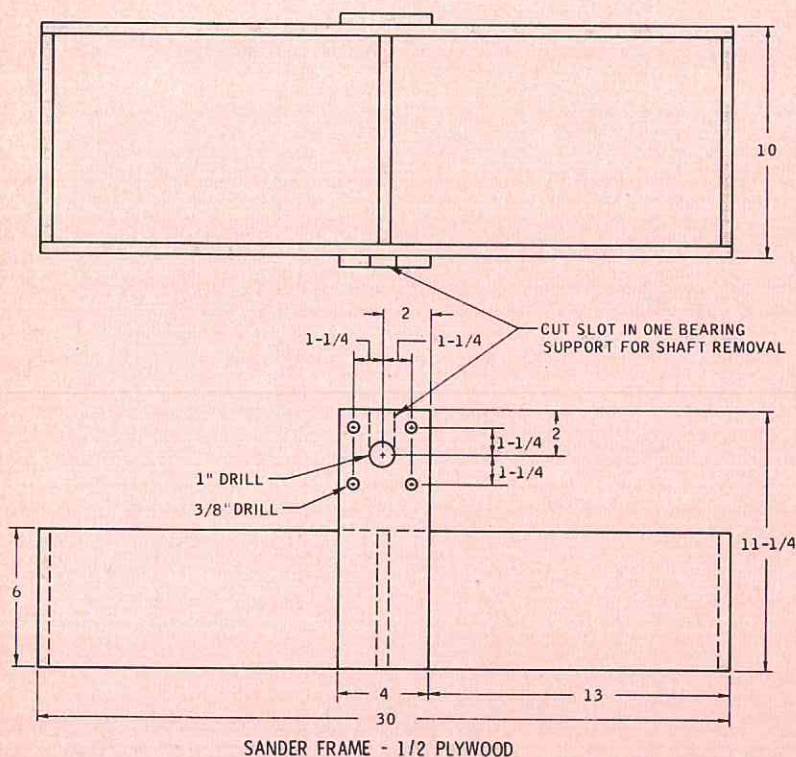
CLAMP ~ $\frac{1}{8}$ x $\frac{3}{8}$ STEEL

using finish nails and glue, but omit one of the vertical bearing supports for the time being. Install the top piece with two butt hinges or a piano hinge on one end and a medium-stiff spring on the inside of the frame at the other end to hold the top down. Bolt the shaft bearings to their supports and slide the shaft and drum through the bearings. Clamp the remaining bearing support to the side of the frame in its approximate final location.

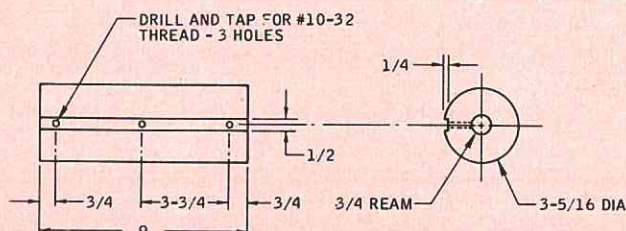
Now, elevate the table until it almost touches the drum by wedging a round dowel (about 1" diameter and $10\frac{1}{2}$ " long) between the bottom of the table and the top of the frame. The spring will hold the dowel firmly in this position. Note the clearance between the drum and the Formica top at each end of the drum.

Glue the free bearing support piece to the frame when the clearance is the same. With the sander in operation, one end of the dowel can be moved back and forth to change the balsa thickness on that side of the table.

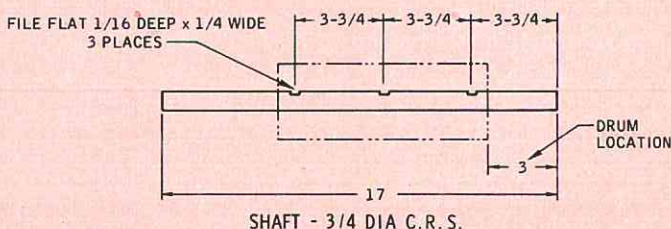
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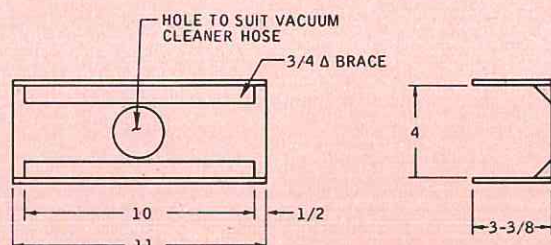
SANDER FRAME - $\frac{1}{2}$ PLYWOOD



SANDING DRUM ~ ALUMINUM



SHAFT - $\frac{3}{4}$ DIA C.R.S.



DUST COLLECTOR - $\frac{1}{4}$ PLYWOOD



Cliff Weirick cranks up the Kraft Systems Cessna 310 at the start of one of his cross country club tours. Dick Tichenor accompanied Cliff to record the tour for R/C Modeler Magazine.

rcm TOURS WITH CLIFF

My old buddy Cliffie told me that he was going on a trip to visit some R/C Clubs and asked if I'd like to go along. This sounded interesting, I could make the time available, and maybe I could learn something, so why not? Then I became curious. Where are we going? What's it all about?

Where we were going was to Texas, Louisiana, New Mexico and Arizona to visit AMA chartered clubs on a public relations tour. It sounded like a sneaky approach for a high pressure sales pitch to me, since Cliff Weirick is the Executive Vice President of Kraft Systems, Inc. Not so, as I and the clubs we visited found out, since his efforts were aimed primarily toward helping the R/C modelers get the most use from their radio sets by proper installation and maintenance, regardless of the brand they were using.

Night after night I heard the description of Joe Hacker buying an R/C system, opening the box, and the first maneuver is to throw away the instruc-

tion booklet. Don't do it! The manufacturers want you to get the most from your gear and they tell you how to do it. Properly installing the system in a model is really no mysterious ritual; follow the instructions and remember that vibration isolation is probably the most important factor.

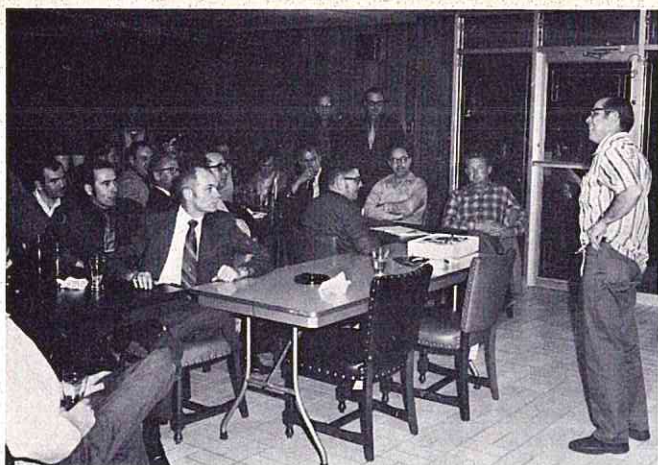
CLIFF WEIRICK is one of RC's most renowned fliers and personalities. As Executive Vice President of Kraft Systems, Inc., Cliff's public relations tours take him to virtually every part of the country. A past president of the A.M.A., Weirick's enthusiasm and abilities have made him one of the most respected and well-liked members of the R/C fraternity.



There are many ways to prolong the life of the R/C gear and models, and these were described in detail by Cliff whose accomplishments in the R/C modeling world lend credence to his words.

Following the talk on the care and feeding of a radio came the question and answer session. Wow! Questions ranged from aardvark to zebra. I'm glad I didn't have to face the barrage of questions that were thrown at Cliff but let's face it, he's qualified to answer them and answer he did. Here was an opportunity for the average modeler to get an authoritative answer on almost any R/C question he might have. You just can't believe how many erroneous rumors run through this hobby!

Our trip was made in a Cessna 310, a pretty little white bird with blue trim that's owned by Kraft Systems. (Just how *did* Cliff promote a company airplane for which he's the only person in the company qualified to fly?) A true airspeed of 220 mph



Cliff Weirick does his thing at Shreveport, La.



At Dallas, Kraft's VP answers questions on just about anything R/C.



At San Antonio, Texas, Bill Hollenbeck and Art Williams show Cliff their newest model as RCM's Jerry Kleinburg looks on.



A few of the Houston, Texas group pose for a photo with Kraft's traveling ambassador.

makes for nice traveling and I found out it doesn't handle like a J-3 Cub. The first leg of our journey was from Oceanside, California to El Paso, Texas. I thought of Don Dewey and RCM covers when the shapely ramp girl in a red jump suit guided us into a parking space. Then came the jump to Beaumont. You can't see much of Texas at 3,500 feet on top of the

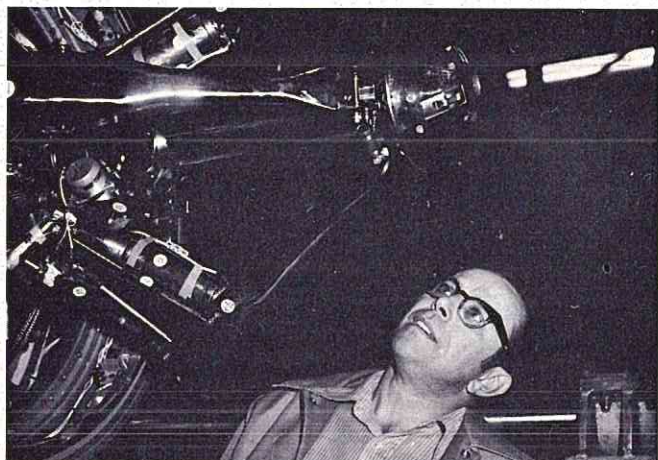
clouds.

Our first visit was with the Beaumont R/C Club who had invited the Port Arthur Oily Birds over for this affair. Hors d'oeuvres and cocktails with a "get-acquainted" session preceded the meeting. Here we heard the story of a man and his son, each with a model on the same frequency, father landed, turned off his trans-

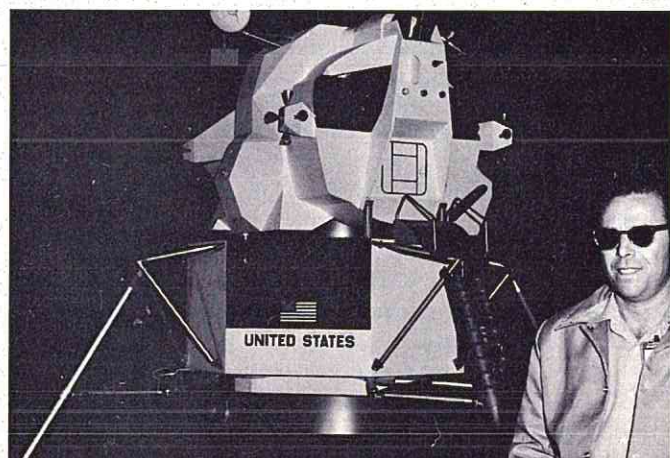
mitter, son fired up and father's model went into high throttle and promptly ran full bore into another ship on the ground. Wow!

Don Still showed us their 'poor mans' pylon racer. Using Goldberg control line profile racer kits, Fox .15 engines and two channel radio (elevator and aileron/rudder) they have 2¼ lb. racers flying about 65 mph for

At the NASA facility, Weirick looks over the Lunar docking probe.



While on the NASA tour, Cliff pauses beside a model of the Lunar module.



less than \$130.00 total including radio. Looks like a great way to get started in pylon racing.

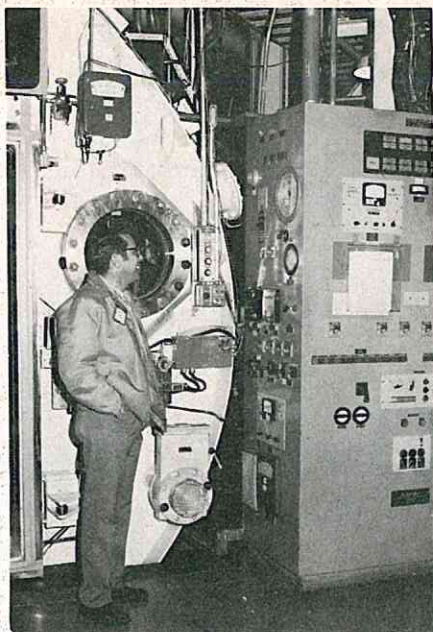
On to Shreveport, Louisiana. Jake Shirer, president of the Shreveport Area Radio Kontrollers (SHARKS) was our gracious host. Jake is a KC-135 pilot at Barksdale. The meeting was held at the local Schlitz dealers' meeting room, and all that beer and barbeque before the meeting; good, good, good.



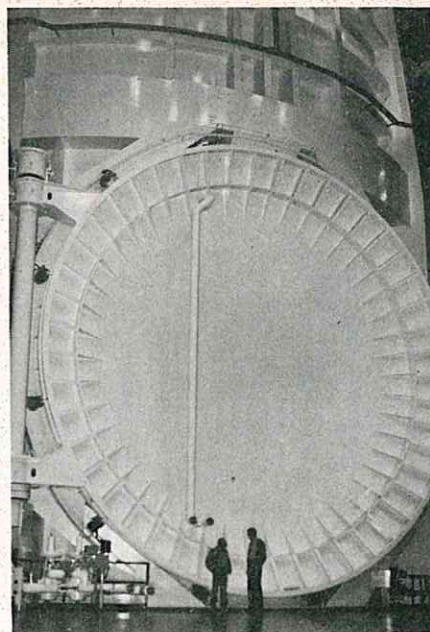
Then inclement weather trapped us so we flew commercial to Dallas. At least Delta's stewardess Merry Tucker made the refreshment situation better than that available on the 310. The Dallas R/C Club president, Justin Shumway, advised me that their club is 24 years old. I'm sure many RCM readers can recall the early R/C events at the Dallas Nats of years ago.

Back to Shreveport to pick up the 310 and head for San Antonio. Our contact was Art Williams who is an engineer for Miller Aviation on the San Antonio airport. On one of Art's drafting tables was a 450 sq. in. layout of the Little Gem that he's building. Jim Miller, Art's boss, designed and built the original Little Gem which is now known as Ole Tiger and raced by Bob Downey. Art showed us their shops where they modify the new Twin Comanche with bigger engines, new nacelles, nose, vortex tips and dorsal fin to make a real high performance bird. They are also flying an R/C scale model of a new airplane for flight data before building the full size prototype. It has some unconventional new features so I didn't get to photograph it. The Alamo R/C Society meets in a hospital and I guess that's a good place to be if the club's business meeting gets a little too rough. Our good Top Out friend, Jerry Kleinburg, was on hand with his camera.

Houston was our next stop. It will be a long time before Cliff and I get back to earth. The Manned Space Center R/C Club can boast of having some of NASA's top scientific and management people within its mem-



Among the many aspects of NASA operations is their complement of computers.



Dwarfed by the NASA pressure chamber, Weirick talks with his tour host.



The motel at Tucson, Arizona was complete with airport facilities.

bership and they graciously escorted us on tours through MCS. We were taken into the viewing room at Mission Control Center during the Apollo 14 moon walk; that's the room you see on TV with the rows of consoles and big viewing screens up front. The thrill of being that close to the action was undescrivable. I think I could write a book about being in the Lunar Module simulator, walking on the simulated moon surface, as well as seeing the many, many labs, computers, ships and testing facilities. John Kiker

showed us the docking probe and demonstrated the problems encountered only a couple of days earlier with this equipment on the initial Command Module and Lunar Module docking. Our special thanks to John, Jim Brown, Bob Ermill, Mike Guadiano and Don Wilson for a memorable visit.

From the balmy Houston weather we headed for Wichita Falls, to see another R/C modeler, Lt. Col. Bob

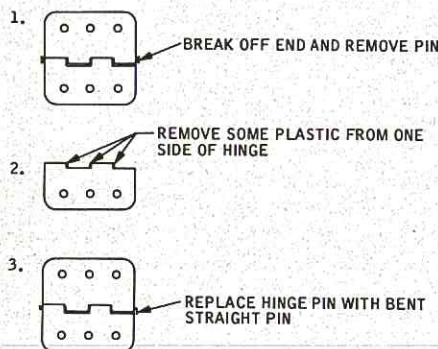
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FOR WHAT IT'S WORTH

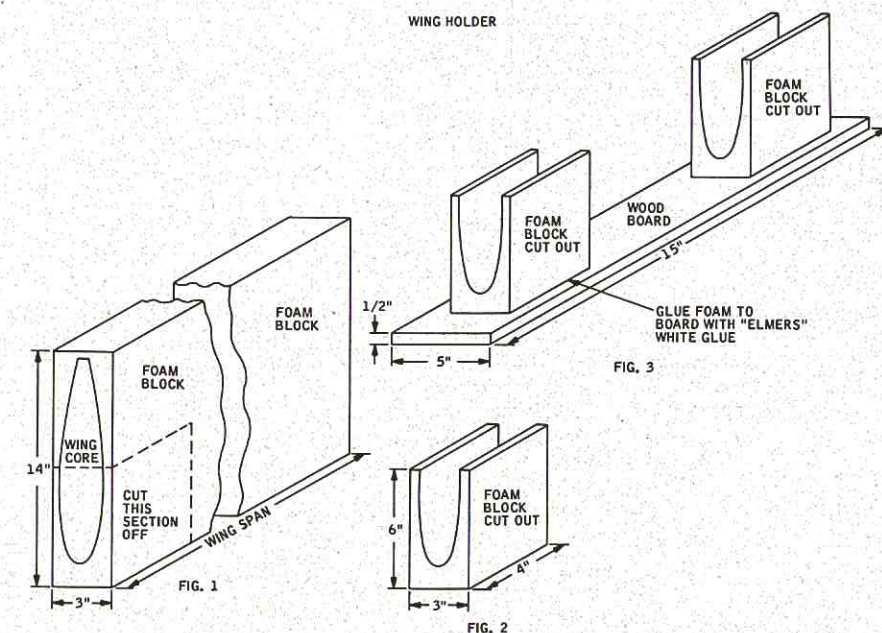
Bob Greene, of Penfield, New York, submitted the diagram for a wing holder which is made from the foam block from which your foam wings are cut. The wing holder comes in handy for storing wings as well as for transporting them to and from the flying field. Bob has also found that the holder comes in handy while building the wing, especially while installing aileron hinges and linkages.

If you're a scale modeler and looking for a good source of supply for odd sized telescoping tubing and shim stock, try the replacement Walkie-Talkie antennas available from any radio supply store for about a dollar. This idea submitted by Bill Westphal, of Mountlake Terrace, Washington:

If you find that your pin-type hinges are too stiff and you want a freer action, try this method from Bob Price of State College, Pennsylvania. All that is required is to break off the end of the metal pin and remove it completely. Next, remove a small amount of plastic from one side of the hinge, then replace the hinge pin with a bent straight pin. You will find that your hinges are now completely free with no binding whatsoever.



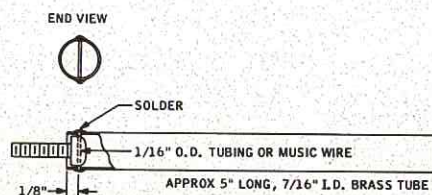
John Lloyd, of Jackson, Mississippi, has long searched for a way to polish a canopy after it has become foggy due to the fine scratches encountered from everyday use. Recently he discovered that canopies can be made clear again by applying toothpaste with a soft cloth much in the same manner as you would apply rubbing compound to your paint. This, of course, will not remove the deeper scars but will certainly make them less noticeable. As an interesting



side effect John's canopies now have 15% fewer cavities.

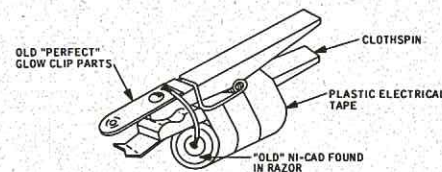
Don Henry Jr., of Kansas City, Missouri, suggests that once a surface to be painted is cleaned, it should never be touched with the fingers since body oils will cause a film that resists paint. Since Don mentions that he was never clever enough to handle things without using his hands, this presented a very definite problem. His solution is the wearing of latex examination gloves. These fit like your skin and provide an excellent feel. They not only keep your work clean, but also your hands, and they are inexpensive since they only cost about \$6.00 per hundred and can be re-used several times. The source is any medical or surgical supply company in your area.

Bill Mitch, of Merrillville, Indiana, has been punching holes in the bottom of his wings everytime the screwdriver slips off the head of the nylon wing bolt. To remedy this situation, Bill took a 7/16" I.D. brass tube and drilled a 1/16" hole on each side, 1/8"



in from the end of the tube. Then, he put a piece of 1/16" O.D. brass tube or 1/16" diameter music wire through the holes and soldered it in at both ends. The head of the screw fits inside the tube and the 1/16" tube fits in the slot of the screw. Use it like a screwdriver and you'll never again slip off the head of a wing hold down bolt.

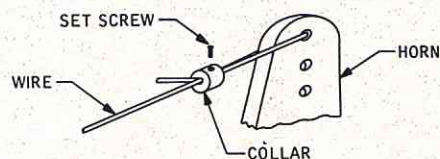
While repairing his electric razor, Dan Harrison, of Palmdale, California, found that one of its nickel cadmium cells was defective but the other was still in good condition. After buying two new ones for the razor, he attached the older good one on a clothespin as shown in the drawing. This is not used full time, but only while out on the runway some distance from the flight box. Be careful and watch for shorts through the spring while assembling.



Save those T-pins! When they become covered with glue, don't throw them away, or scrape or sandpaper them, since the latter will remove the plating. Simply drop them in water with a little detergent added and let

them set overnight. Wipe them dry and clean the next day — even epoxy will come off with this treatment although a little longer soak may be required. While on the subject of cleanliness, Dale Hindenburg, of Sycamore, Illinois, also suggests using a piece of Saran Wrap or other plastic wrap between the lid and your can of dope. Use a piece of wrap large enough to cover the top of the can with overlap, then press on the lid. This makes the lid much easier to get off the second time around and helps keep dope cans and lids clean.

For the vintage plane enthusiast who would like to use wire control cables or rigging wires, here is a simple means of attaching and then tightening them. For the cable, Alexander Meek, of Victoria, Australia, uses 40 lb. Nylon Coated Stainless Steel 7-ply wire commonly sold in sporting good stores for the fisherman. A 1/16" Du-Bro collar is threaded onto an end. The end is then passed through a control horn or suitable hole and passed back through the collar. The collar is tightened when the desired length or tension is achieved.



Here is a low cost fixture from Norberto Dini, of Buenos Aires, Argentina, that provides for quickly interchanging servos between different scale models. First, cut 1/16" plywood for each servo of the same height but 3/4" wider than the servo itself as in Figure 1. Next, cut two pieces of hard

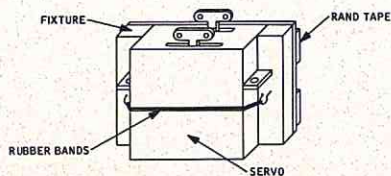
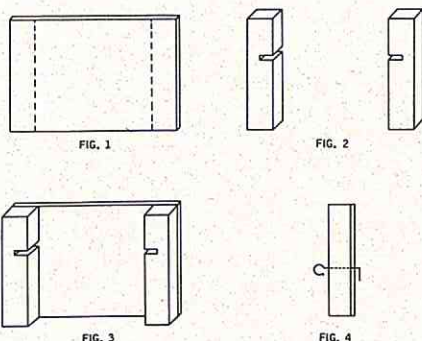


FIG. 5

balsa wood 1/4" x 3/8" with a length equal to the height of the servo. Make a slot in each block to fit the mounting lugs of the servo as shown in Figure 2. Now, using the same servo as a guide, cement the blocks of balsa over the plywood. Put a 1/32" diameter steel wire hook in the middle of each balsa block bending the other end of them, as shown in Figure 4, and cement in place with epoxy. The fixture is placed permanently in the desired place with Rand Servo Mounting Tape. The servo is placed in the fixture and held with a rubber band as shown in Figure 5. This system permits you to quickly change the servo from one plane to another by simply taking off a rubber band.

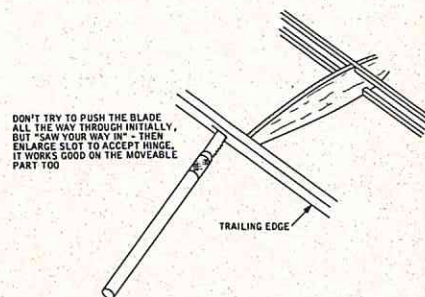
When working with fiberglass, there is always the need for a release agent. Duie Matenkosky, of Pittsburgh, Pennsylvania, mentions that every article he has ever read leaves you hanging as to what to use for this particular item. After trying them all, Duie suggests initially waxing the model three times using a pure carnuba wax such as Simoniz Paste Wax. Wait three hours between coats so that the wax can properly evaporate. Finally, spray your mold with polyvinyl alcohol. This material is a water soluble product with the consistency of water, is dark green or purple in color, and very sweet smelling. After spraying, wait an hour or so for the alcohol to dry, then lay up your glass cloth. This method is guaranteed to give "pop-out" products every time.

Having used Sig Epoxolite epoxy putty for some years for making fillets, Max Blose, passes on a superior material suggested and used by Don McConaghie, of Irving, Texas. First, mix up Hobbypoxy Formula 2 to the proper consistency. Then mix in regular corn starch until it becomes the proper consistency for applying as fillets. The mixture can then be smoothed out with water or thinner using your finger. This material can be sanded extremely well and if your wife asks you, you can tell her you were making taffy!

Major R.H. Jacquot, being an inveterate tinkerer, offers the following improvement on RCM's article in the February issue on the Heath retractable gear servo. The approach to the added gear in the article seemed all right in concept but was full of pos-

sibilities for malfunction in that one would have to reposition each gear and shim it with pieces of NyRod, which is a great deal of work and not completely satisfactory from Major Jacquot's viewpoint. His suggestion is as follows: Use a Heath Motor coupling gear, stop #451-50, and a Gear Pin #452-19 and install in approximately the same place as in the article. But, instead of driving the brass gear on the motor down on the shaft, bring it up until it just clears the original nylon motor drive gear. Then, the new gear is installed so that it meshes with the brass gear and the original motor drive gear. That is all, no repositioning the other gears is required. The new gear is simply held in place by drilling a hole for the pin case and epoxying a short length of NyRod to the top of the case. Of course, the top has to be relieved for the brass gear as well as the new gear. This method has proved to be much simpler and more reliable.

Dale Harber, of Yoder, Indiana, submitted this idea for making hinge slots in your control surfaces. First, purchase a small saw blade to fit your X-Acto knife. Decide where you want the hinge and push the tip of the saw blade into the balsa. Don't try to push the blade all the way through initially, but "saw your way in," then enlarge the slot to accept the hinge. Begin working the blade in and out, at the same time going in deeper until you obtain the proper depth. Then merely continue sawing until you obtain the proper width and bear against the sides of the opening with the teeth until the hinge will go in easily.



If you want to match that MonoKote color to those little hard to get spots or scratches, just soak a small strip of MonoKote in hot fuel proof thinner. Then, scrape off the softened pigment with a small screwdriver and apply to those areas. This method works quite well according to Al Beckman, of Anacortes, Washington.

A STEP-BY-STEP TECHNIQUE FOR

PHOTO ENLARGING THREE-VIEWS AT HOME

A DO-IT-YOURSELF METHOD FOR
ENLARGING 3-VIEWS AT HOME WITHOUT
THE EXPENSIVE
PHOTO ENLARGEMENT.

By Gus Morfis and Jack Headley

Throughout the years a lot has been written about how to enlarge model plans (both scale and non-scale) to a particular size. Unfortunately, too much folk-lore and jargon has been allowed to cloud the entire project and to scare off the average modeler.

One of the easiest and most accurate methods for enlarging a set of three-views is by photographic enlargement. It is also the most expensive method if you want to order a set of super-sized photo enlargements! The secret for keeping the cost down to about \$1.00 per plan is quite simple. Do it yourself, and dispense with the expensive photo-enlargement.

Here's how it's done:

The first thing to decide upon is, naturally, what plan to enlarge. The easy rule to remember is that the bigger and clearer the three-view you want to enlarge, the better. Look for a three-view with bold, simple, crisp line

work. Those "arty" looking jobs with lots of wispy lines and shading look quite nice, but when they get blown up 15 to 20 times, those details fade out.

The drawings in the Profile Publications series reproduce beautifully as do Wylam's drawings and the drawings in the older Flying Review International magazine. The silhouettes in Jane's 'All The Worlds Aircraft' are of good reproduction quality, but they are quite small and the drawings in Wm. Green's Warplanes series are even smaller. It is wise to point out here that most of these drawings are copyrighted. This means (in non-legal words) that you must not sell copies of these drawings to anyone. All rights belong to the copyright holder. However, there is usually no objection to an individual making copies for his own personal use.

We don't plan to get into a lot of

photographic jargon in this article since this is a modeling magazine and our comments will be kept to the how-to-do-it level. If you feel the need for more background and theory, I suggest you check with your local camera dealer who will be glad to help you, I am sure.

Just about any camera which will shoot color slides in 35MM or Instamatic size will work satisfactorily. The only adapter you need for it is a close-up lens, the "closest" you can find. The lens should come with a data chart which tells how close you can move in on your subject at various range settings.

Now we come to Big Secret #1, the film. Get film for color transparencies (slides). My favorites are Kodachrome or Ektachrome (free plug). Other manufacturer's film will work, of course, but I prefer Kodak. They've given me excellent service throughout the years and every time I try switching to save a dime, I wind up going back. Your experience might be different than mine, however. Regular black and white negative producing film won't do. Nor will Kodacolor which produces color negatives. What you want is an exact copy of your drawing — black lines on a clear film background.

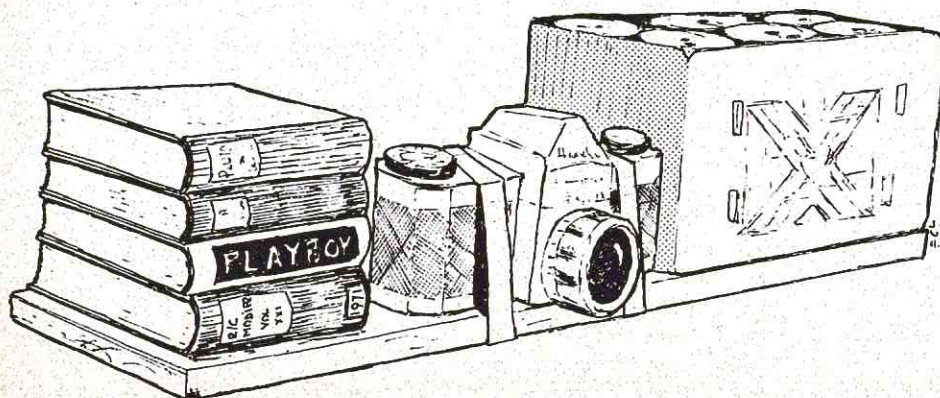
Reversal type films which are used in making black and white slides are ideal for this application, but this film is difficult to find in a drug store and might cause you extra confusion in getting processing. For most of us non photo-expert types, Kodachrome is the easiest to get our hands on, the simplest to have processed, and produces the best image.

We now come to the most "exotic" part of our photo technique — the camera setup.

If you can't borrow a tripod to stand your camera on, you are going to have to improvise something which will do the same job; and that job is simply to hold the camera steady. Your setup can be real simple and crude as long as it holds the camera and prevents any wiggle or shifting in the camera at all. Let's put it another way; if it isn't steady — forget the whole thing!

One possible way to do this is to tape your camera to a piece of wood approximately one inch thick, maybe three to six inches wide and 12 to 24 inches long (Figure 1). Set this lash-up on the edge of a table with the camera facing out toward a flat blank wall. Put all the heavy groceries in the house on the board to hold the camera still.

FIGURE 1 — Set it up any way you want to but remember that the object is to hold the camera absolutely steady.



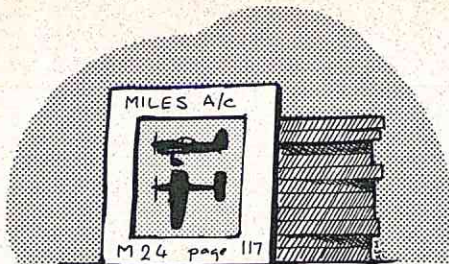


FIGURE 2 — Be sure to identify each slide so that you can go back and find your data for showing the scale judges.

A couple of five pound bags of flour or beans, or whatever, will do the job fine. Remember that you still have to advance the film and release the shutter, so don't "paint" yourself into a corner.

Next mount the plans you want to copy on a wall exactly centered in front of your camera. Use a little masking tape on the corners to hold your drawing on the wall. If your wall is papered you will certainly run the risk of ruining the wallpaper with the masking tape. Your best bet in this case is to use the door. However you do it, make sure your plans are flat. If you are copying something out of a book you have a real problem and I don't know what the answer is except that you might want to cut that page out. It's a bit drastic, I'm sure, but very effective. The center of the plans should be the same distance up from the floor as the camera lens.

Next, set your camera at the closest range setting you can, which should be somewhere between 3 and 3½ feet for the average Instamatic type, the manual that came with your camera should tell you what it should be exactly.

Take a look at the chart which came with the close-up lens you just bought and slide your camera up to the wall exactly to the dimension given on the chart. You should measure from the wall to the lens. Be careful here, the more accurate you are, the sharper your slides will be.

Finally, after all this fooling around, you are ready to shoot. I assume that you have film in the camera and that it is cocked, etc., etc. Stick a good flash cube on it and cover the cube with a layer of white tissue. All you old-time modellers may use a layer of white silk-span just for old times sake. Try one shot like this and then try another using two layers of tissue to cut down the amount of light emitted by your flash-cube. I really wouldn't be afraid to try a third shot with three layers of tissue just to be on

the safe side.

Those of you who don't have a flash set-up, I suggest you move the whole rig into the back yard. Stick your three-view on the garage door and wait until the sun is overhead and no shadows fall on your subject.

Now don't blow the whole roll of film on this lash-up the first time out. Take some shots of the kids, the dog and even the wife if you have to. Drop the roll into your favorite processing house (drug store) or send it directly to your local Kodak Processing Center (my preferred method). When your slides come back run them through your projector and admire your handiwork. (Figure 2)

If they are too dark take a layer of tissue off the flash cube next time.

If (as is more likely) they are too "washed-out" looking, add another layer or two of tissue over your flash cube and try again.

If the lines are all fuzzy this means you are out of focus. Measure your setup again. You have to be extremely careful with your distances in this kind of a setup, since even an error of ¼" can be noticed at this short range. If you can't seem to find the solution, you might have to try a series of 4 or 5 shots, each ½" different in distance (two shots closer and two more distant) from your original setup.

If your picture seems "smeared"

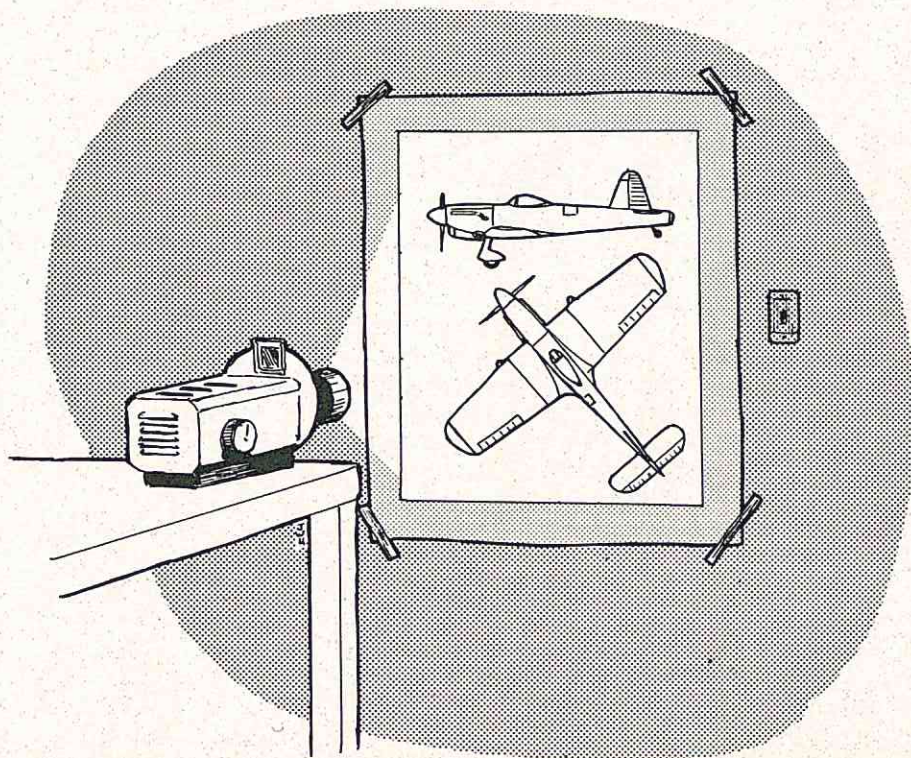
the chance is very good that you moved the camera when you tripped the shutter. The camera should be tripped with a slow, smooth motion with some follow-through, being careful not to touch the camera body.

But of course your slides came back perfect and you've loaded them into your projector and shown them on the wall. The airplane looks magnificent and you can't wait to start flying — at least to start building.

Well, here's Big Secret #2. Get some paper, tape it to the wall and trace the outlines of the model on to it as the projector shines the image on it (Figure 3 shows what this will look like). Most likely you will have to shift and re-focus your projector a number of times until you get just exactly the size image you want. Tracing the outline is really a lot cheaper than getting a super-sized enlargement made. As for the paper, you can get vellum at most stationery and artists supply stores. It comes in a variety of sizes up to 36" rolls. It is beautiful stuff to draw on, but it isn't too cheap.

You might prefer to send the wife to the market to sweet-talk the butcher out of six or seven feet of his plain white wrapping paper. It may not be as classy as vellum, but it's a lot cheaper and that's what this article is all about. □

FIGURE 3 — It's a lot cheaper tracing this outline than having a giant-sized enlargement made. That is, even if you can get the photo-lab to get it exactly the right size!



TAKE A LOOK AT THIS..

An easy way to make neat, convenient, and efficient fillets is by the use of Pattern Makers Leather Fillet. Packaged now for the modeler, it is applicable for all phases of modeling. This fillet is extremely lightweight and because it is leather, adds a tremendous strength to joints and stress points. Three sizes are now available: 1/8" x 24" at 75 cents each; 3/16" x 24" at 98 cents each; and 3/8" x 24" at \$1.25 each. A-L Specialties is a distributor for the Southwestern United States. Distributor inquiries for other areas are invited. Tested, approved and recommended by RCM. George A. Bahrman, 10644 Burbank Blvd., North Hollywood, California 91601, is the man to contact.

A new see-through family look has been given to the packaging of products manufactured by Dremel Manufacturing Company, 4915 21st Street, Racine, Wisconsin. The firm announced the new packaging today for its complete line of Moto-Tools, Moto-Shop Accessory kit, Electric Engraver, Speed Control and a number of accessory sets.



"The advantage of our new see-through design," said Ed Erdman, Vice President of Sales, "is twofold. First, it gives our packaging a family look. And second, it lets the customer see exactly what the tools and accessories look like without having to take the items out of the package."

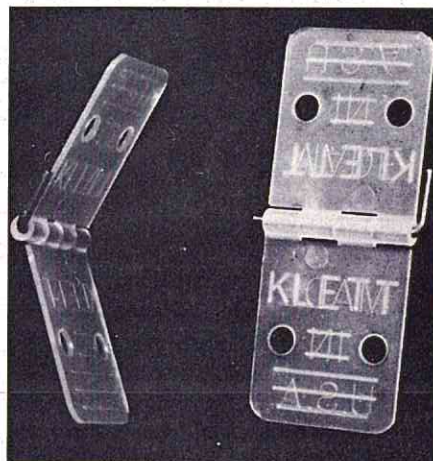
In addition the cartons have a modern, graphic look that is right in tune with today's modern merchandising trends. Dremel Power Tools and accessories are available through hobby dealers and hardware stores. For complete information and catalog,

write Dremel Manufacturing Co., Racine, Wisconsin.

For glider enthusiasts, the Jansson Thermal Sensor is now available from Willoughby Enterprises, 14659 Candeda Place, Tustin, California 92680. Now, for the first time, a commercially produced crystal controlled, lightweight telemetry sensor for every R/C glider fan. Transistorized modern space age circuitry packaged in a small crash resistant container is 1-5/8" in diameter, 1 1/2" long, and weighs 1 1/2 ounces. The current drain is lower than most R/C receivers and provides a range of over one mile, which is further than the naked eye can see most R/C sailplanes. The Jansson Thermal Sensor model GTS-1, broadcasts barometric pressure changes (thermal air) by variation in tone. For example, a low tone indicates the glider is descending while a high tone indicates the glider is ascending. The audibly detected tone stabilizes at about 1,000 Hz and increases or decreases at 3 feet per second rate of change. The circuitry has been dampened to nearly eliminate "stick thermals" generated by the ground base pilot. It will broadcast thermal activity before the effect of rising air on the airborne glider is visibly detected. Therefore, the alert R/C glider buff can really sense thermals by the variation in tone audible through the ground based receiver. As a bonus feature, this thermal sensor will serve as an excellent Direction Finder in case of a downwind loss of your sailplane. If connected to the airborne battery pack, will broadcast continuously until the battery is dead, which is about 8 hours on a 500 MaH nickel cadmium battery pack. Furnished with a pocket sized portable AM/FM receiver with ear plug and 9 volt battery, the price is \$95.00. The Thermal Sensor without matching receiver is \$75.00. A choice of five frequencies are available on the two Meter Amateur Band (Technician Class License) to the individual consumer. For further information write Willoughby Enterprises.

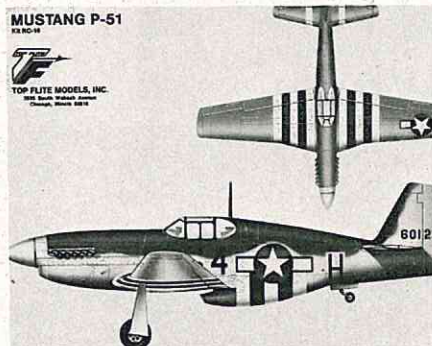
For the man who likes to fly his models rather than spend hours building R/C planes, North Shore Models, 25 Locust Road, Northport, New York 11768, can solve your problems. If finding the time to build keeps you grounded and if the plastic ARF's are not your bag, choose an R/C plane, ready-to-fly, from North Shore's com-

plete stock of sport, stunt, scale, Goodyear, Formula I and II and Pattern types. They also build the DeeBee's and Laniers too, just in case. Any model is available built-to-order in four to five weeks, so if the latest model shown in RCM, or one of the other model magazines, is to your liking, write to North Shore Models for a free estimate. Models can be had covered and clear doped, MonoKoted in choice of colors, or color doped in two or three colors to your specifications. Prices depend upon degree of completeness. Planes with retractable gears are available on special request. When writing, enclose a self addressed stamped envelope for price on the plane of your choice with or without engines and radio gear. North Shore Models is proud to represent both the Pro-Line and Kraft Radio Systems. North Shore will gladly furnish names of satisfied repeat customers throughout the U.S. Color photos of representative models are provided upon your request but you are asked to return them as the supply is limited and demand is great. A catalog listing is available from the firm and all merchandise is guaranteed to be as listed on the stock sheet and all planes are accurately described. Planes are built by qualified, top-notch builders and fliers to ensure your satisfaction or your money will be refunded in full. Prices reflect workmanship, finish and the amount of detail in the model.



Roy Klett, of Klett Plastics, the designer of the original RK Nylon Hinge, has designed, and is now manufacturing, his new smaller RK2 hinge. It is extremely strong and so thin that all you need is a knife slit to install it. The new Klett Hinge is molded of virgin polycarbonate resin in a hardened steel die. Steel music wire is used for the hinge. The hinge is 1" long by 7/16" wide and only .018"

thin. These hinges are of absolute top quality but priced at only \$1.95 for fifteen and \$1.10 for seven. Klett Nylon Hinges are manufactured by Klett Plastics and exclusively marketed by Carl Goldberg Models, 2549 W. Cermak Rd., Chicago, Illinois 60608.



Top Flite Models, Inc., has just introduced three more colors in their Super MonoKote line, bringing the selection up to sixteen. The new finishes include Chrome, Plumb Crazy (metallic purple), and Clear. The clear finish can be used to show the structure of the model. However, it features a special coating and can be painted if the modeler so desires. In addition, there are also five new MonoKote trims now on the market. A new Chrome trim which sells for 89 cents and four different Check-Boards list for \$1.19 and include a red on white, red on clear, black on white, and black on clear. Each trim sheet is 5" x 35". In addition, Top Flite Models, Inc., has just introduced a new R/C model that flies like a sport model, takes about the same amount of building time as a Kwik-Fli, but looks just like a scale model. This new kit, the Mustang P-51, is technically a 'Stand-off' scale. However, because of the close attention Top Flite designer, Dave Platt, gave to keeping the essential Mustang "character," at ten feet most modelers would take it for an authentic scale model. The Mustang was created especially for the many modeling enthusiasts who would like to have an actual scale model but can't spend the time required to build one. Top Flite's new Mustang is as close as a modeler can possibly get to having a scale model without actually building one. Designed for quick, easy assembly, this kit features a 60" wing span that performs beautifully with a .40 to a .60 engine and full house R/C. The flaps can be stationary or operable, and are included ready-made in the kit, as are the ailerons. Also included are parts for installing the engine inverted or upright. The Mus-

tang P-51 kit features full-sheeted wings for strength and scale appearance. An important innovation is the full-color insert showing paint schemes for the P-51 A's through the D's. The model can be built as any version. The kit is now available at dealers and lists for \$39.95.

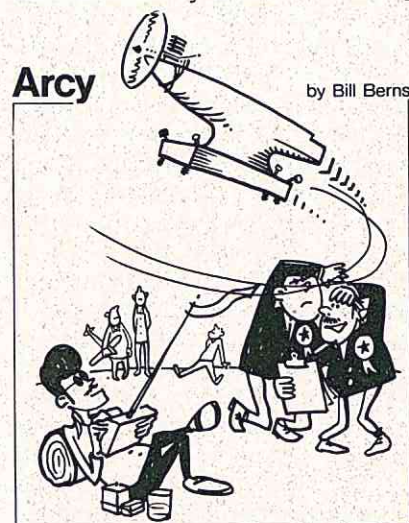
If you've had trouble installing hinges, you'll be interested in this Hinge Grooving Tool from Taran Products, 466 Giannini Drive, Santa Clara, California 95051. Now perfectly uniform and neat, these hinges can be installed in a few minutes. The tool can be used to install any type of flat hinge but was specifically designed to compliment the Taran E-Z Flex Hinge. All that is necessary is to simply adjust the blade to any desired distance from the flange and tighten the wing nut. Gently rotate the saw blade back and forth at the desired groove location with the flange pressed lightly against the flying surface. Allow the blade to cut deep enough for the center mandrel to contact the surface. Now continue this action while pulling in one direction to elongate the groove to accept the full length of the hinge. Only a few minutes of practice are required to become expert with this proven tool.



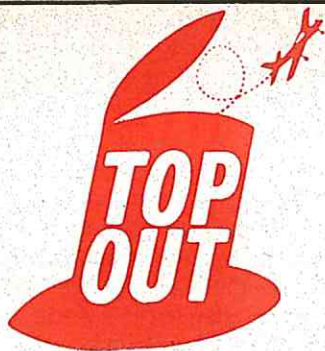
A new line of precision engineered 1/12th scale R/C cars has been introduced by Jerobee Industries of Redmond, Washington. Each model comes complete and ready-to-roll with assembled chassis and body; mounted Cox engine, receiver and servo system installed, radio transmitter, antenna and decals. Only fuel and batteries need to be added. The fully proportional, under 100-mw radio control system made by EK Products ranges up to 200 feet. Servo system is completely enclosed in a tamper-proof, shock mounted brick. Five different racing crystals are available. A Cox .049 cu. in. engine featuring a recoil pull starter and centrifugal clutch drives the Jerobee cars up to a scale

240 mph in the straightaways. The models have a 7½" wheel base and a 4' turning radius. Track weight is 30 ounces. All models feature independent front suspension and heavy duty rear axles and mag-type wheels. Quick detaching interchangeable high strength Cycolac bodies will be available in a variety of designs. All cars undergo thorough pre-road testing to aerospace standards. Two models are now offered by Jerobee: the Comando, Formula I type with a gear ratio of 5.6:1 and Duo-Servo separate throttle and control system, and the Bandero, Porsche type with a gear ratio of 7.0:1, featuring a Uni-Servo combined throttle and steering system. Suggested retail prices are \$109.95 for the Comando, and \$89.95 for the Bandero. Distribution will be through retail hobby stores and hobby departments nationwide. Jerobee is a subsidiary of Rocket Research Corporation, manufacturer of aerospace hardware. More information and a free full-color brochure can be obtained by writing Jerobee Industries, Inc., York Center, Redmond, Washington 98052.

PMP Manufacturing Company, P.O. Box 10233, Denver, Colorado 80210, has produced an entire packaged line of racing figures. Each of these packages consists of three racing numbers which are die stamped from MonoKote and all that is required is to peel off and install on your ¼ or Half-A-Midget racers. A pack of three sells for 49 cents and are available in all combinations of racing numbers and colors. These are well made and certainly save a lot of time in creating the racing number and their matching color roundel. Tested, Approved and Recommended by RCM. □



I am certainly impressed with the power and performance. Now what about style?



JERRY KLEINBURG

NATS PREVIEW — 1971

As expected, the world's biggest modeling event will be held again in Chicago this summer. Dates are July 26 through August 1st, with the location exactly where it was in 1970, 'aboard' the Glenview Naval Air Station situated among the numerous northside suburbs of the Windy City. It's a good time and location with highways and motels plentiful and nearby. Of course the weather is predicted to be perfect for flying all through the 7-day affair.

Although AMA's announcement indicated this to be the 31st Nats, our reckoning shows it will be more like the 40th national outing for the classic since the 1923 St. Louis National Air Races run by the NAA. AMA got rolling in directing the Nats in 1937 and later teamed with the U.S. Naval Reserve Training Command in 1947 to continue sponsoring the No. 1 annual modeling extravaganza. However, numbers and history aside, Chicago in 1971 will again be a modeling mecca for over 1,000 contestants who will compete in more than 40 events with a major portion of those giving principal attention to the R/C action. Scale, pattern, racing and gliding are, again, expected to be the main R/C attractions for fliers from virtually all sections of the U.S. along with those from several other countries.

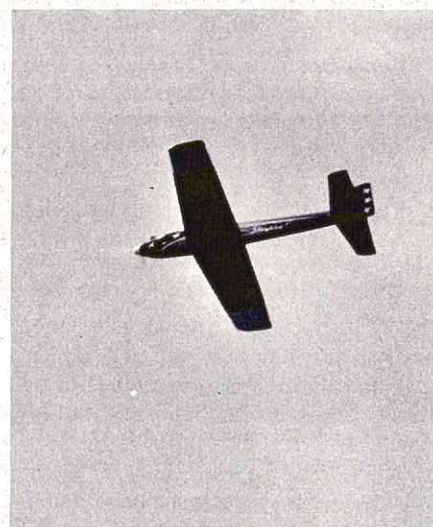
In R/C aerobatics, the FAI class will not be flown as attention is shifted back to the AMA patterns. Of course much of the spectator gallery will be watching for members of the U.S. Internats Team — Jim Whitley, Phil Kraft and Ron Chidgey, with Jim Kirkland as alternate — as they exercise their World Championship styles and reflexes in aerobatic competition. It all should prove interesting and produce a great deal of discussion as



Pete Reed, NMPRA Pres., readies his sleek Minnow racer for Pylon I heat in 1970 N.Y. State Championship. Pete won, will be defending title in Rochester meet 5 & 6 June.



ABOVE: Gale Helms (r) of Ft. Worth Thunderbirds, hauls in top trophy for sport pylon in Alamo Regional meet. Bud Wrenn, ARCS Prexy, does honors. RIGHT: "Star Fire" by Ed Keck shows pattern form during 1970 N.Y. Championships. Webra, Pro-Line retracts and radio. Ed, member of R/C Club of Rochester which will sponsor 1971 meet. 4 classes of pattern to be flown in 12th outing.



the 'big' event in Doylestown, Pa., due 6 weeks later, draws closer. A record turnout in all four pattern events is almost a certainty . . .

Another hot corner in R/C competition — the hottest, in fact — will be the Pylon events where East and West will continue the flying duel that was fully ignited in last year's meet. Larry Leonard will be trying for another national R/C crown by heading off fellow Californian Bob Smith as well as containing the efforts of a host of Eastern stalwarts headed by pylon shavers such as Pete Reed, Al Sager and Vern Smith. For 1971, Pylon II will give way to the FAI variety which was recently approved by the CIAM and will provide the opportunity to see if it will be popular

at this Nats debut. This event will be a new 'ball game' for race fans that calls for mild fuel, mufflers on the 600 sq. in. ships. Despite all, speeds are expected to be respectable in comparison with those that were posted for Pylon I not too long ago. And speeds in 450 — well, how about 1:25?

Of course scale will be another wow in 1971, especially with berths on the 1972 Internats team in the offing for top placers. A prize collection of gems are expected in Chicago where a record number will turn out for honors in the replica competition which has a history of being one Nats R/C event that's always wide open and not considered to be in anyone's 'pocket'. For that matter, it's not seen to be dominated by any particular 'in'

group which helps stimulate further entry by new scalars. Sentimental favorite for many will be Dario Brisaghella who will be trying to overcome 1970's monumental set of misfortunes that kept his top scale point earning Sea Hornet on the ground in four heart-breaking tries in flying competition. The scale event is also recognized as the place to see engine innovations — a Ross Twin powered John Roth's 5th place Volksplane last year — so don't be surprised to see a Wankle or two making a Nats debut for the revolutionary power plant that's been in development so long. This year, for the first time, R/C scalars might be found in other scale events — U/C, free flight, etc. — as they vie for the new national Scale Championship crown.

Hopefully, gliding will also be a Chicago attraction for R/C buffs. However, as we go to press there has been no word about plans for any 1971 soaring action. Nevertheless, with its rapid growth over the last couple of years, and on the basis of a successful tryout at the 1970 Nats, glider fliers are once again expected to be among the Nats happenings of 1971. Competitive edge in soaring has to go to the Californians with Eastern and Midwestern fliers providing stiff challenges.

Despite the 2 buck-per-event entry increase for R/C at the 1971 Nats, a big turnout is anticipated in all categories. For the first time there will also be a small fee for campers who use the base's facilities during Nats week. Camping has grown in popularity in the last few years and with the advent of convenient powered campers, a sizeable contingent will park on the edge of the Glenview NAS golf course where it touches the runway complex. And management of the modeling extravaganza which drew universal praise last year is expected to be seen again from the virtual army of volunteers it takes to stage the big 'show'. So, come July 26th, we'll be looking forward to seeing you all there . . .

ENGINE RUMBLES. After a period of relative quiet, it appears that engine innovators are active again with news and rumors running rampant of new 'breakthroughs' that will give us all big servings of power not available before. Besides a multitude of 'new' engines that are mainly reworked standards with, perhaps, an extra touch of color in the ad copy or on the engine to liven the trade, or bar-stock experiments that are des-

igned to litter the landscape like the dry holes of oil drillers, there are a couple items that have reached practical levels in the idea-to-distribution chain that finally gets the hardware into our hands.

The long awaited Wankle is trickling into use and there should be a good number to see at local contests and by the Sunday flier in use this season. Their compression pattern is bound to raise eyebrows with its 'strangeness' but more important is the surprising throttle response and excellent power output, not to mention its effective silencer.

Of greater immediate interest is the line of new Kavan carburetors now in preparation for distribution that feature venturi openings to almost a full half-inch! They also have cam actuated valves that switch fuel from pressure feed at wide open to suction feed for idle settings. For attachments to these carburetors Kavan is creating a line of new motors of distinct look and concept. Leading the development is a .61 that's built like the proverbial brick shipyard with a square set of fins extending all the way down to its ankles. The first of these has a rear rotor, but hold your hat for a later dream version — it incorporates a front rotor intake! This is a long sought goal that has been considered an 'ultimate' for engine designers.

From Ross, whose twin helped make Nats history in 1970, we read of more multi-cylindere magic in the making that promises vertical twins and even 4-cylinder opposed versions. Like one of those 4 cylinder jobs? We hear they are going for \$450.00 a piece, which is enough to make them mighty interesting for rank-and-file fliers — watching from the sidelines, that is . . . HP's new offering, after recouping from their initial problems, is in the form of a tall, deep-finned .40 that is supposed to deliver power from where the K & B's and ST ABC's leave off in the race for most-power-to-the-cubic-inch. Their .61 will be fitted with forged connecting rods along with other minor developments to eke out and contain the horses in competition with the Webra Blackhead.

While engine manufacturers are pushing more horses into straining metal stables, our antenna picks up vibrations that spell possible power loss as the need for mufflers creeps forward inexorably. (He means it can't be stopped . . . Ed.) Last month we quoted an item from Hear Ye, the newsletter of the Valley Forge R/C

Club, commenting on a db noise measuring meter and its use in engine noise tests. The V.F. club did an important noise survey for AMA and is continuing to look into muffler realities that point to current equipment doing more of a camouflage task than the noise muffling task they're supposed to do to satisfy present rules and club regulations. The latest issue of Hear Ye (No. 51) continues the meaningful dialogue — give a listen to Jack Malriat who checked the Radio Shack meter (#33-1028 — remember this one, it *may* become important later on . . .) being used as a basis for noise level standards. Here's what Jack reported:

"I calibrated the Radio Shack sound level meter suggested by Fred Van Keuren and found it to be a consistently 3db high throughout the range of interest to us. This, to me, indicates sufficient accuracy and repeatability for use as a club standard. The Walsh-Healey Act is primarily concerned with industrial hearing hazards and is not applicable to us, but can serve as a useful guide to set our standards. This Act provides limits based upon a weighted scale . . . designed to simulate the responses of the human ear which react to frequency as well as sound pressure . . . The Walsh-Healey Act allows an 8 hour exposure to sound levels of 90db. Since all our engines have shaft speeds of 0 to 24,000 rpm, their fundamental frequencies would be in the range of 0 to 400 Hz. If we chose a maximum meter reading of 90db, it can be seen that we will never exceed the Walsh-Healey 8-hour limit in the 0 to 400 cps range. Since spectators should generally be no closer than 20 feet, it seems that 20 feet would be a reasonable distance at which to take this reading.

"This is very interesting, particularly since John Worth brought results of the AMA testing of the same type meter. They also felt the meter looked to be a practical, reasonably priced method of standardizing on acceptable noise levels. *The AMA apparently will recommend a 90db level as measured 15 feet from the exhaust stack of the engine. They are also looking for field measurements and comments.*" (Emphasis added . . . Ed.)

From another newsletter source (Relay Chatter — March 1971) Cliff Piper, AMA District I VP, reports from the Executive Council meeting of 26 February 1971, held in Toledo:

"A device sold by Allied Radio

(continued on page 62)

(continued from page 58)

Shack stores, called a sound level meter under the label of "Realistic" and selling for \$39.95, will be used to check some sound levels of our "effective" mufflers in months to come. We must remember that no definite db level can be set, for many variables affect this reading. The type of pavement, number of people around, humidity, and on and on and on. We may get a few broad guidelines, at any rate. This is not a recommendation for the instrument, just a notice that this is what we will be using for a study."

From these 'surfacings' it's clear some action is going on to establish a way to check which mufflers are doing the job and which one hasn't been 'modified' by a flier to degrade noise suppression qualities in order to get more power. It's also clear that some levels of sound are fairly well set in the minds of those making the studies. If you have any ideas on the subject now is the time to speak up and contribute...

Marine Celebration — Aviation history via R/C models was the way Sqdn. 267 of the U.S. Marines presented "Aviation — Past and Present" at a recent 'dining-in' for officers of the squadron. Lt. Col. R.J. Blanc, commander of the squadron that transitions pilots in UH-1E Huey helicopters and OV-10A Broncos, provided the opportunity for R/C models to be used to show the span of Marine history in Aviation. Models by Dick Adams and Loretta Hall among others, impressed the Marine pilots and their guests at the gala occasion at Camp Pendleton, California.



Lt. Col. R.J. Blanc, C.O. of Marine Sqdn. 267, and Carol Sawyer enjoy YAK-18 scale handwork of Loretta Hall during dining-in at Camp Pendleton. "Aviation — Past & Present," was theme for occasion.

AMA SCHOLARSHIPS — Another Nats event this year will be the naming of recipients of the 1971 scholarships, an honor that brings \$1000 for college education to the fortunate selectee. Funds for the program come from a 10 cent allocation from each AMA member's dues, plus voluntary contributions. The program is intended to stimulate and encourage young modelers and was started in 1970 at the Nats when Susan Weisenbach of Cleveland, Ohio, and Bill Reed of Raytown, Mo., were named as initial scholarship selections. However, it was Matty Sullivan of Pylon Brand Prod., who put momentum behind the idea and backed it up with a big contribution to get the program started. Selections are made by a 3 man committee who consider the National Merit Test scores, class ranking, and AMA competition performances of applicants. Any current member is eligible for 1972 scholarships who will graduate from high school and has taken the National Merit Test. Model competition in 1971 sanctioned contests will be considered for the 1972 selections. Application for the 1972 awards are due by 31 December 1971, and forms for the application are available from AMA headquarters.

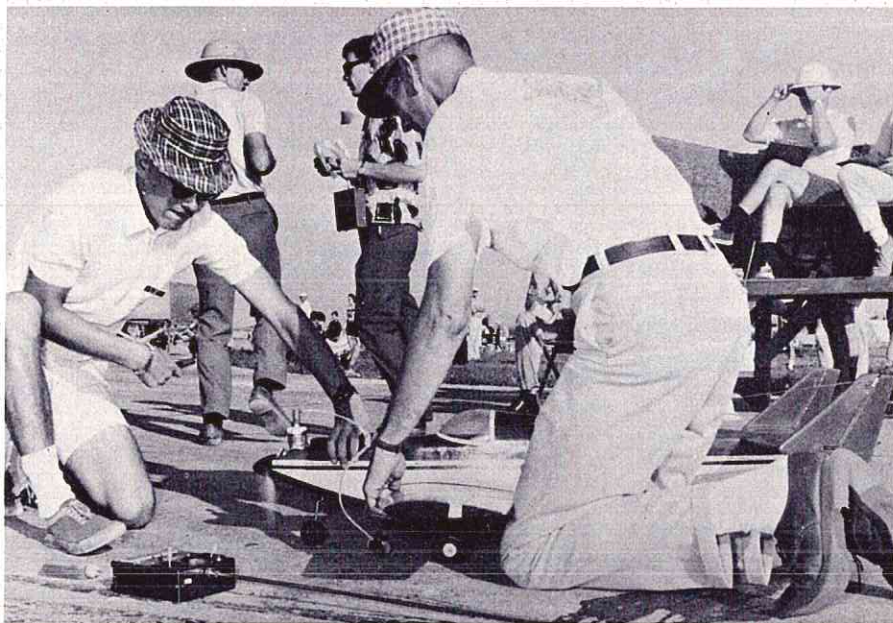
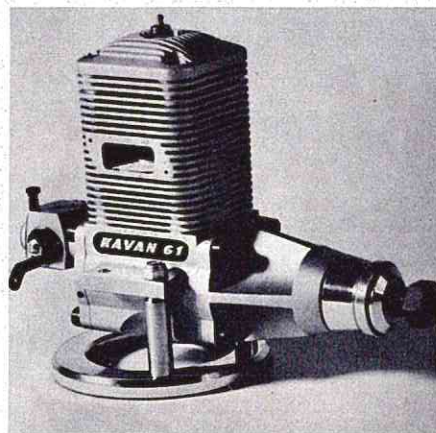
BIRMINGHAM. A scale contest to suit shy performers. This was the objective of the Birmingham R/C Club

BELOW: 1970 AMA Scholarship winner, Bill Reed, chicken-sticks his ST .60 to life for 1969 Nats flight that helped qualify him for scholarship honors. Scene is reminder that 1971 award will be made at the Chicago Nats; that 1972 applications are due Dec. 31st. RIGHT: The shape of things to come... Prototype Kavan .61 has distinct shape, new carb mechanics. Future design will have front rotor intake, a long sought goal.

in its first contest for replica artists. A secondary goal was to make the meet an annual affair so that club members could plan their building projects with a definite time table in mind. Points for construction, fidelity, and finish were considered. Jim McNeil reports points for realism in takeoff and landing were given special emphasis. Points were also given for optional maneuvers. An extra category was established for static ships to allow entry by fliers who weren't quite ready for flying but had their models sufficiently completed for judging. A separate trophy for best finish was also awarded. After the dust settled, here is how they lined up in the winners' circle:

FLYING SCALE
Herb Davis — Zlin Akrobat
Ed McClusky — Eindecker
STATIC SCALE
Fred Watkins — Thomas-Morse Scout
Al Whitley — Citabria
BEST FINISH
Ed Cox — Eindecker

(continued on page 66)



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RCM TOURS WITH CLIFF

(continued from page 47)

Ward, at Sheppard AFB. Within an hour after arriving came the snow, wind, and cold, but it was warm and most interesting in the Officers Club. Bob served a tour in Viet Nam flying F4's and is now an operations officer at Sheppard so we were fascinated by tales of his exciting experiences. Before departing Wichita Falls, Bob introduced us to Charlie King who owns King Flight Services, Inc. Charlie also raises and trains cutting horses. It seems that he had a very smart cutting horse that was inclined to be a bit lazy so Charlie rigged up a single channel R/C unit to operate a cattle prod. Whenever the horse decided to goof-off Charlie could punch the transmitter and the horse would get a little jolt of high tension in the flanks; and that made a believer of him! Fun loving Charlie came up with another wild idea; he bought an ape and trained him to ride the cutting horses. He would take the ape to rodeos dressed in blue jeans and have the ape put on cutting horse demonstrations. That didn't last too long as the rodeo association outlawed his participation because he was performing as well as the human riders!

A gentleman working for Charlie is Jack Specht who holds the distinction of taking the first photographs from an airplane. Jack has a copy of this photo which shows the Army Signal Corps encampment at San Antonio, Texas. He was riding in a Wright Biplane piloted by Marilyn Stinson. His photo album contains first hand early history of aviation including the first Wright Brothers airplane delivered to the US Army Signal Corps and many other early flying machines. He was also closely associated with Gen. Billy Mitchell before and during the famous court martial.

Next on the agenda was a hop to Amarillo, Texas, with a landing on a 13,000 foot runway and taxiing that kind of distance through snow and slush is sorta interesting (would you believe messy?). The Amarillo Radio Kontrol Society is ten years old, meets in the Santa Fe Railroad Building, and had guests from 6 other Texas towns as well as Clovis, New Mexico. The ARKS president, Earl Parge, carries color photos of his beautiful scale models in his wallet where most guys

have family snapshots. I was amused at the name of the local hobby shop, "Crash Miller's Models". Gerald Miller from Herford, Texas, attended the meeting, flies R/C, is a crop duster and owns a ME-109 that he flew in the movie, "Battle of Britain". Gerald is also a colonel in the Confederate Air Force, a fact which came out in a friendly tavern after the meeting. Seems that there was some quiet conversation about Cliffie getting back to Texas, becoming a member of the Confederate Air Force and flying a real live F4-U Corsair.

Then we jumped over the mountains to Albuquerque, New Mexico, for their session in a cement plant meeting room with a good group of guys and loads of questions. Much interest was shown in the new Kraft retractable landing gear that Cliff just happened to have along.

Over more mountains to Tucson. You just ain't really lived until you are at 11,000 foot altitude, unscrew the cup off the thermos bottle and get a big lap full of steaming hot coffee. The girl in the Albuquerque airport coffee shop didn't put the cap on the bottle — that smarts. The Tucson R/C Club had a quiz show and there were heavy discussions on the proper running of big R/C contests. Since they host the Winter Nationals for RCM, they are quite concerned with a large scale activity.

Club member Tom Prescott is working on his masters degree in aeronautical engineering and is involved in a study related to the tip vortices of large aircraft. Preliminary experiments are being made by flying R/C models through the vortex of light planes. An interesting and complex program to acquire the necessary data in a safe manner. R/C contributes again.

Our last visit on this trip was to Phoenix, Arizona. The Arizona Radio Control Society, Inc., is 12 years old and boasts 130 members. Their meeting place is an Electricians Union Hall. For many years they have held the sessions first big R/C contest in the West, the Southwestern Regionals at Buckeye, Arizona. They are a lively group headed by Tom Gadwa, president.

The final leg of our journey was the greatest, CAVU and smooth as if California was welcoming us home. Somehow I miss the omni stations and the Jeppesen plates. My tally on this tour shows that we visited nine clubs with a total membership of 523 modelers. Combined age of those clubs is 83½ years. Attendance at the meet-

ings was 357 which included representatives from 27 clubs. Something I've known all along was reconfirmed during these two weeks; there are some great people involved in R/C but why did so many of them look disappointed when they saw me instead of Charlie Brown touring with Cliff?

If your charter club is on his list, just hang on, Cliffie will be there as soon as he can. If not, have your president drop him a line because that 310 gets around and he can help you to enjoy happier R/C flying. □

BALSA FINISHER

(continued from page 44)

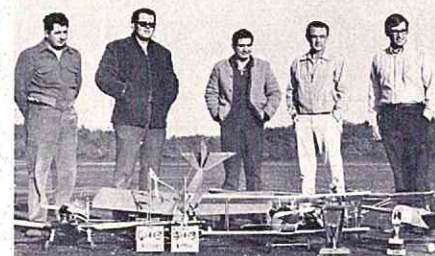
Have several different diameter dowels available and, depending on the thickness of the wood you are finishing, use one which places the dowel six inches or less from the drum. The spring will then hold the table firmly against the dowel and the dowel will keep the table from bending during a heavy cut.

This just about finishes the sander, except for a "U" shaped guard over the drum. The sides of the guard should clear the table by about ¼" when the table is in its highest position. This can be made from galvanized sheet, plywood, plexiglass or whatever is handy. Cut a hole in the top of the guard for a snug fit on your vacuum cleaner hose and that's it.

Very little needs to be said about operating the sander because if you have followed the above directions, it will fly right from the board. I have found that the fine grit Carborundum Aloxite paper gives a super finish and seems to last indefinitely. Feed the wood through the sander against the rotation of the drum and keep the piece moving. If you stop part way through, you will find a low spot where you stopped and will have to take another cut to clean this up. The amount that can be sanded off in one pass can be as little as a few thousandths or as much as a quarter inch. Adjusting the finished balsa thickness with a round dowel under the table may seem a little crude at first, but this has proven to be more than adequate. Fancier methods of adjusting the table height are left to the individual builder's ingenuity. □

TOP OUT

(continued from page 62)



Birmingham R/C Club 1st Annual Scale Meet saw Herb Davis and Zlin Akrobat win. Other winners include Ed McClusky, Fred Watkins, Al Whitley and Ed Cox. Meet featured flying and static scale and best finish categories.

San Antonio. While late winter blizzards raged in the north and midwest, Texas RC'ers gathered in San Antonio for the 3rd Annual Alamo Regionals that saw clear skies and warm temperatures give a running start to the 1971 contest season and to the competition minded fliers. Taking advantage of the almost ideal weather were pilots from 14 Texas cities who were joined by a contingent from Louisiana. There was also an entry from Monterrey, Mexico, which gives evidence of the continuing US-Mexico interest in all contests and meets on both sides of the border.

Jerry Jackson, as CD, and Bud Wrenn, the Alamo R/C Society's President, had the club's well experienced contest crew ready for the meet which featured three classes of pattern, scale and open sport pylon. Altogether, some 40 contestants entered and the south Texas community was treated to a show of R/C artistry that had the ARC's field filled to near capacity by spectators who stayed long and late for the 2 day meet. With 2 flight lines, five rounds of pattern were completed together with scale flying. Sunday afternoon was reserved for sport pylon races that proved as stimulating to the fliers and exciting to the spectators as the hotter forms of pylon racing.

Dan Carey of the Ft. Worth Thunderbirds, showed his national rating pattern prowess by besting the field in DX. Dick Duncan, formerly of Rapid City, where the Propbusters hold forth, represented the Waco Hot MAC's and in placing 2nd and showed plenty of pattern savvy. A slim Gary Pannell came through for 3rd place in the expert class. Butch Huff, a comer

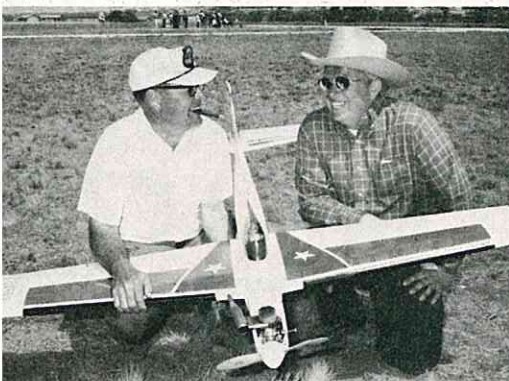
from Louisiana, led the pack in B where a newcomer, Don Curtiss, showed a rare combination of design and building capability together with piloting skill to take 2nd place in his contest debut. In general, the meet clearly showed aerobatic flying is in a strong healthy state with plenty of new aggressive and talented fliers who offer spirited competition to established pattern veterans. Here's the entire line-up of winners:

A — Keith Bourdreaux, Bill Walker, Kim Johnson.

B — Butch Huff, Don Curtiss, Ed Hurt.



ABOVE: Don Curtiss flew original beauty, Don Juan II, in San Antonio meet. 7 lb. ST .60, Kraft. Immaculate finish, flew very well. Don placed 2nd in B in first contest try. Pro-Line retracts. BELOW: A heap a trouble! Gary Pannel warns Dan Carey at season opener at San Antonio. Dan went on to win DX, Pannel 3rd. Ship is a Texan with Webra B/H, Logictrol, KDH retracts.



Rent-a-plane... Bill Walker (r), rented Tarmen pattern ship from Weatherford, Texas hobby shop for ARCS contest, placed 2nd in A. Bill added Pro-Line radio and gives Bill Morgan (l) details. ABOVE: Helmer Johnson and son Kim were Ft. Worth Thunderbird entry in San Antonio meet. Kim, 14, was 3rd in A. Ship a Texan with Veco .61, KDH retracts, EK Pro-Series.



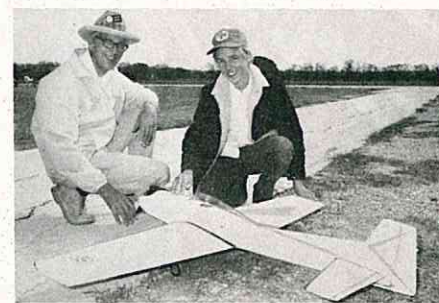
DN — Ivan Munninghoff, Bill Morgan, Ken Ables.

DX — Dan Carey, Dick Duncan, Gary Pannell.

SCALE — George Avila, Nieuport 17; Dick Valentine, Spirit of St. Louis; Bill Hollenbach, Me. 210 (RCM, April 1971).

PYLON — Gale Helms, Bill Morgan, Jim Pope.

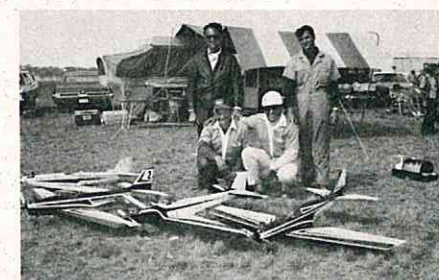
Judges for the meet were: Jim Albers, Don Bottoms, Bob Fogg, Don McClusky, Jack Malchoff, Roy Parks, Lyle Sievers, Bud Wrenn, Clyde Stokes and Kemp Solcher. Other members of the 65 man club who officiated at the meet were: Dick Valentine, Erwin Workman, Jim Waterman, Bill Hollenbach, Rex O'Connor, George Aldrich, Bob Maurer, Don Curtiss, Jim Houston, Lou Mason, Ed Deshae, Lou Mango, Neil Moses, Jim Kessler, Bruce Maurer, Wyatt Stedman, Larry Goland, and Frank Kleinburg.



BELOW: 2nd in DX, Dick Duncan and Coleman Cutlass represented Waco Hot MACs at San Antonio meet. Ship 8½ lbs., Webra B/H, EK Pro-Series. No failures in 200 cycles of RMK retracts...



Lafayette, La., Acadian RC'ers saw action in San Antonio, won 2 trophies in pattern. Keith Bourdreaux, Monte Richard, Hulen Richard and Butch Huff had hospitality camper. Ships include Cajun Classic Mk V.



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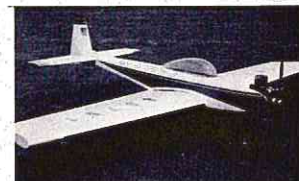
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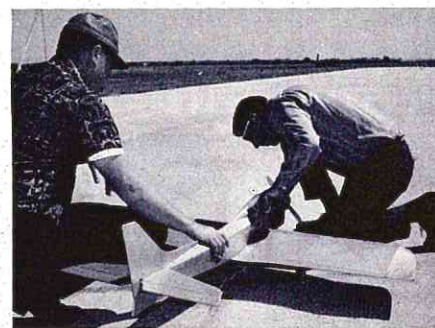
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DN winner, Ivan Munninghoff, and "Border Eagle" mod of Texan. Veco .61, 7 lb., Hudson retracts, Pro-Line radio. Ivan now graduates to Expert category.

Dick Valentine readies for scale flight at ARCS meet. Spirit of St. Louis derived from Goldberg Sr. Falcon. Ken Ables holds. ST .56, EK radio.



ABOVE: From Mexico, "Toto" Elizondo readies Contender for sport pylon heat. US-Mexico competition growing. Art Brock holds. Rex O'Connor, Roy Klett, and Bud Wrenn, scale out Rex's 9' Taylorcraft. Ship is product of ARCS 'group therapy' project. 14 lbs., Max .80, 18" prop, Kraft radio.

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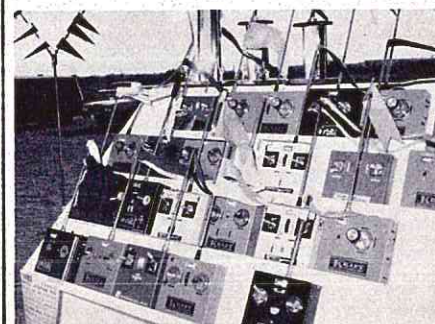
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BELOW: ARCS innovation for transmitter impound was seen at 1971 season-opener. Wide variety of radio brands...



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Jack Malchoff, ARCS sparkplug, models 'club' shirt at ARCS show. Gets attention especially from peace officers. Ship now hangared in Huntsville, Texas....

Midwest Flea-Fli + 10 is fun ship for Mike McDougall of San Antonio ARCS. Max .35 does power chore easily, KO muffler, Kraft full house controls 4 lb. ship.



WITH THE FLIERS

California. We're not sure how it happened, but Lee Kufchak of Fountain Valley tells us he received a set of RCM plans only 48 hours after requesting them and posting the letter! Just shows that Southern California mail service can't all be bad... Lee didn't waste the saved time either. He converted the neat prints into a slick Rapier that has given a lot of flying satisfaction in 50 flights so far. The veteran Garden Grove RC'er put a 3 year old Kraft propo into the ship which Lee claims weighs, all together, about 6 pounds. (How 'bout 7 pounds, Lee?) An equally ancient Super Tiger .60 on a Tatone mount gives the streamlined bird plenty of zip. Lee is also happy with the results of his first try in using Hobbypoxy epoxy paint



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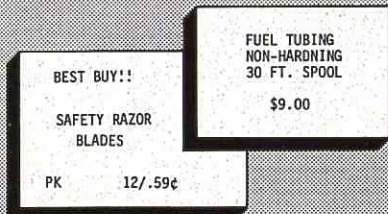
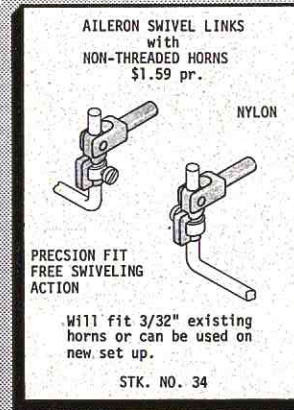
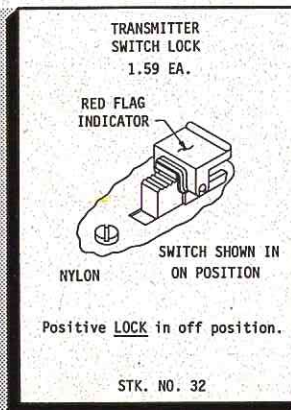
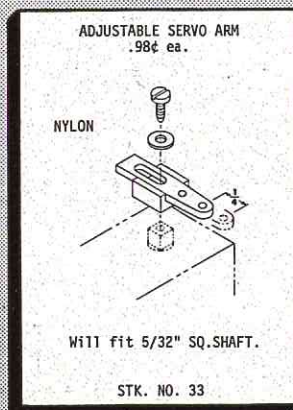
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WATCH HERE FOR MORE TO COME !!!!!

that gave the ship a gleaming white and orange complexion. Lee is joined in on the flying fun by his wife Paula.

Texas. Kingsville NAS is the place where student aviator, Ensign Bob Gibson completed an RC XB-70, after more than a year of effort that included design computations and construction to create a ducted fan replica of the famous but ill-fated USAF experimental bomber. Bob's model is 4 foot long and powered by an OS .19. Balsa construction was employed with a mylar film covering. Four servos drive directional spoilers (instead of ailerons), elevators and the dual rudders. Except for variations for landing gear, the airfoil, and the ducts, the ship is virtually scale. Bob, at 23, can also be considered as almost a pure 'product' of aviation. After being trained by his father who was an FAA test pilot, Bob earned his BS degree in aero engineering, then went on to work with NASA at Edwards AFB where he watched the B-70 in action, followed by entering the Navy for pilot training. JO3 Larry Crofwell tells us that when Bob is not flying the Valkyrie model, he's putting in jet time in the TA-4J Skyhawks of the VT-23 Training Sqdn. at Kingsville



ABOVE: Contest action — Bill Morgan winds HP .61 on his original Texan for pattern flight. Dave Jackson holds. Scene 1970 Kingsville NAS contest. 1971 meet set. BELOW: Ens. Bob Gibson and scale Valkyrie B-70 bomber. Replica is 4' long, uses 4 servos, OS Max. .19 for power in ducted fan ship. Bob is Cal Tech aero engineer, worked for NASA prior to Naval pilot training in VT-23. (Navy pic.)

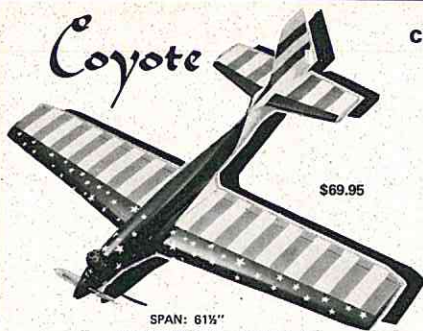


NAS where, incidentally, the Kingsville R/C Club holds its annual contest.

Missouri. Varied action is the key to a successful R/C club. This simple principle guides the efforts of the Kansas City R/C Club that not only stages a major sanctioned contest every year, but holds fun-flies, outings and has special events at club meetings to keep interest high. "Show-and-Tell", "Plane of the Month" with a Travel Trophy along with construction presentations by members liven club meetings. Fred Hulen reports that the 1971 KCRC annual contest in June will be a "go for broke" affair in an all-out attempt to make it the biggest and best ever . . .

Take a 2nd look, it's an Ugly Stik! Toni Arnone shows how to un-ugly Kraft's famous Ugly Stik, was awarded KCRC Plane-of-the-Month Award. Club president, Don Henry, makes presentation.





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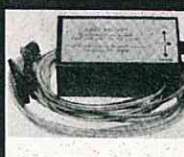
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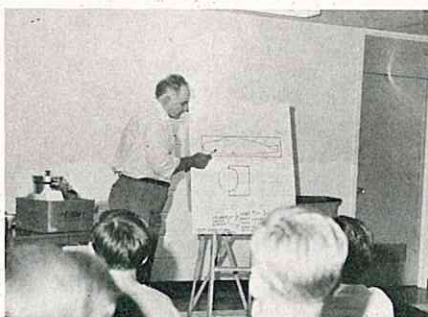
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ABOVE: "Show-and-Tell" is regular feature of KCRC Club meetings. Kansas club has varied flying and meeting program to satisfy members' wide interests. 1971 officers — Don Henry, Jerry Smith, Bob Rodkey.



LEFT: KCRC "Grand Prix" event requires run to ship with prop nut balanced on prop. This and other fun-fly events are regularly held for Kansas RC'ers as a part of complete club program. ABOVE: Construction techniques are regular meeting feature of Kansas City R/C Club. Recent presentation by Bob Almes told of ins and outs of fiberglass molding. BELOW: Flying idyll — KCRC club flying site has sylvan appeal for members and families. Successful club satisfies many interests at field and at meetings.

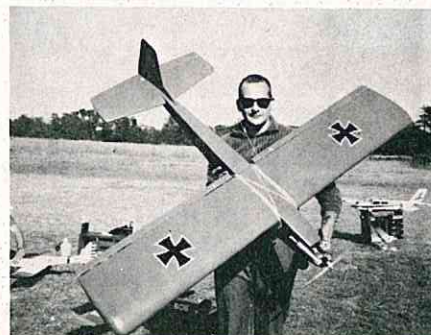


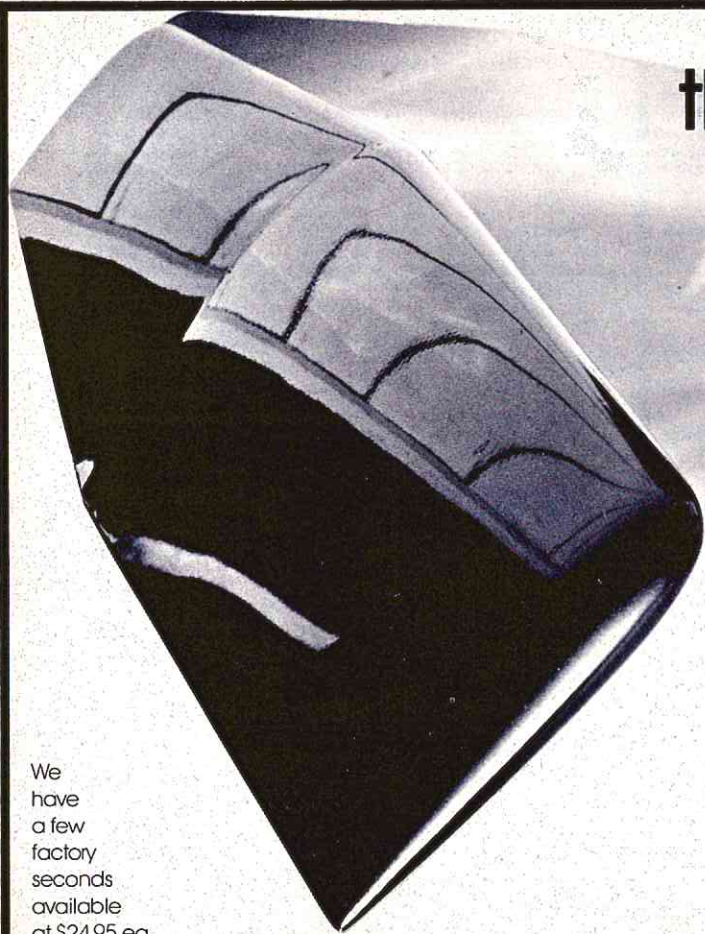
New Jersey. From Eugene Carol and the West Jersey R/C Club we get a rundown on their Fun-Fly with the South Jersey Flyaways as guests. Bomb Drop, Limbo, Le Mans, and Spot Landing were featured. The Limbo had a different twist: dollar



bills were hung from the limbo line and if a flier didn't chew it up too bad in knocking it down from the line he had something to spend for his skill and effort. Aside from the contest, one problem the club has is in finding models that go down in the nearby swamps and canebrakes surrounding the flying site. Eugene asks, "Is there any type of electronic beeper that anyone has designed that will emit a sound and radiate pulses on the same frequency after the engine stops?" Does anyone know of such a device that will do the job Eugene would like done but won't cause interference, say

WJRC Club Bomb Drop winner was Bill Kegel and original fun-fly ship. Steady flier can turn loop in 15', has semi-symmetrical wing section, deep fuselage for stability.





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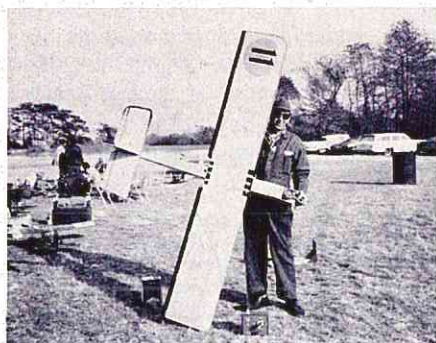
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when an engine cuts out over the field and radio control is still needed for the dead stick landing?

"Monster" is 8 1/2' original by Carmen Licata of West Jersey R/C Club. ST .71 hauls 11 lb. slow-flying ship.



New York. Rochester will again be the site of the 12th Annual New York State Championships to be sponsored by the R/C Club of Rochester. Events will include A, B, DN, and DX pattern classes, Formula I and II pylon racing and Scale. Bob Clemens tells us the dates are June 5th and 6th and that a big turnout is expected as usual. □

Part of Scale event lineup at 1970 Rochester meet. Bud McDermot had Chipmunk (2nd), Spitfire by Dick Smith (3rd), and Bob Noll's Nieuport won Bill Anderson Memorial Trophy. Scale will be featured in 1971 meet.



SOLARFILM

(continued from page 31)

With regard to trim colors, simply cut your pattern from the Solarfilm color of your choice, marking the pattern on the plastic backing sheet. Remove the backing sheet and wipe the adhesive side of the trim strip with a light trace of Solarfilm Solvent. This liquifies the adhesive enough to make the material tacky. Simply position the strip, relifting and repositioning as

necessary until you have it properly applied. The best method of applying the trim strip to your covered surface is to apply it from the middle to each end using a thin piece of cardboard, such as a match folder to smooth out any bubbles trapped between the two surfaces. Any remaining bubbles can be eliminated by pricking with a pin and re-smoothing once again. Seal the edges of the trim with a lukewarm iron and allow it to dry thoroughly. This same Solvent can be used for emergency field repairs. Carry a few scraps of your base color with you and if you should get a puncture or a tear, simply cut off a rectangle of the scrap material and apply to the damaged area with Solarfilm Solvent. It will dry in a matter of a few minutes and your repair will be simply and quickly accomplished.

For the exhibition class finish that is completely free of any marks, air bubbles or pockets, and is the equivalent to the finest of finishes, we recommend the use of a hot air gun similar to those used in electronic firms for shrinking thermoshrink tubing. The one we use in the RCM shop is a Model #HG301 Heat Gun manufactured by Master Appliance Corporation of Racine, Wisconsin.

This is a 300 degree minimum variable temperature heat gun that draws 12 amps and comes complete with a stand. Price is approximately \$45.00. The procedure used here was given to us by our good friend Sam Crawford and works as follows:

Use the same procedure for covering as mentioned earlier but simply tack the edges all the way around the material either on a wing or on a sheet surface. Turn on the air gun (which reaches full heat instantly) and move briskly back and forth across a small area of the wing panel or fuselage side. Set the iron down and quickly rub the given area with a small pad of Kleenex. The heat of the gun is so intense and is applied under such pressure that you can actually feel the air coming through the back side of a sheet of balsa wood. What results from this method is that the adhesive is actually fused to the balsa wood evenly and the Kleenex firmly adheres the Solarfilm to the wood with no scratches, dents or nicks that occurs when using a hard surfaced iron. You will also find that air bubbles are very rarely trapped between the Solarfilm and the balsa surface, and when they are, a simple pin prick will remove them instantly without any of the pock marks that usually result from ironing out a bubble with a standard Sealelectric or household iron. The resulting finish is so fantastic that it has to be seen to be appreciated. Once you have used the hot air gun, you will never use another method of applying a polymer film covering material.

In the same type of finish, when one panel is applied to the wood we wipe the edges with a cloth dampened with alcohol and, when the alcohol has dried, we lightly sand the edge of the Solarfilm with 600 grade wet-or-dry paper, used dry. This fairs out the edge and allows the overlapping Solarfilm to present less of a "ridge." You will be particularly impressed by the hot air gun when you go to cover a wing tip. Do not allow too much overlap on a compound curve, such as a wing tip, since the hot air gun will actually do most of the forming for you and the overlap material will curl right up and adhere to the other side of the material. As with any polymer film with an adhesive backing, when the heated adhesive touches another piece of material, it is difficult to remove without removing the color with it. What we do in this case is to hang two or three clothespins on the overhanging material of the wing tip, then

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apply the hot air and rub quickly with a Kleenex. You will find that even if you have an overlap wrinkle, which can never be removed with a standard iron, this wrinkle will disappear without a trace if the heat is properly applied. You are warned not to apply the heat gun too close since you can severely burn your hands not to mention melting the Solarfilm. Shrinkage of the Solarfilm is far greater with the hot air gun than with the standard iron.

As we mentioned, if for any reason you should want to paint the trim stripes on the material, Solarfilm will

readily accept dope, enamel, or acrylic finishes. If you have a model with a coat or two of dope already on the balsa wood, the Solarfilm can be applied directly over it since the dope will not bubble underneath due to the low heat required for the application of this material.

With any type of finish material, it takes practice to learn to do a professional job. We feel that once you have used Solarfilm you will be as sold on it's merits as much as we are. Presently, Solarfilm is available in transparent red, transparent orange, transparent yellow, transparent blue, white, silver,

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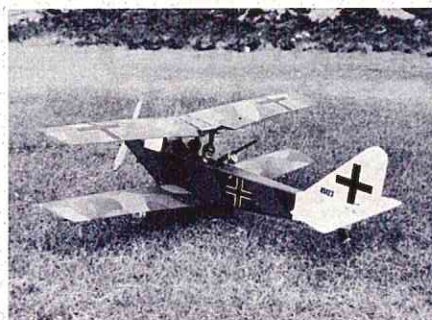
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dark red, blue, midnight blue, yellow, orange, bright red, metallic gold, metallic red, and metallic green. Sole distributor in the United States is Technisales. Prices are highly competitive and the material has proved extremely economical to use considering the superb finish that can be achieved with it. Solarfilm should be available shortly at your local hobby store or it can be ordered direct from the distributor. As we mentioned, this material has been extensively tested and researched by R/C Modeler Magazine and carries our unqualified recommendation and approval. □

RUMPLESTADT C TYPE

(continued from page 17)



Just before capture by the British.

1/20" sheet over a 5/32" frame using a 1/4" square spar at the hinge line. Or, you can simply use 1/4" square soft balsa. Remember, as in most planes, to keep the weight down in the tail area. The landing gear is made from music wire pieces soldered to a music wire axle. Then the axle is cut in the middle and a piece of rubber tubing slipped over the cut. This allows the landing gear legs to spring apart on landings.

FINISHING: All balsa parts are covered with two coats of 50-50 clear dope and lightly sanded after each coat has dried. Then the entire plane was painted with Liquitex artist acrylic available wherever artist supplies are sold. It should be thinned with a slight amount of water, but left fairly thick as it smooths out nice. It dries to the touch in less than an hour but takes about twelve to eighteen hours to dry thoroughly and about forty-eight to cure completely. As always, it is best to try test samples first. You can detail it to suit your own taste. I used Williams Bros. wheels and pilots and mocked up the machine gun. Our Editor, Don Dewey, used Solarfilm on his versions including yellow Solarfilm directly over the

foam wings.

FLYING: Gas it up. Start it. Check the controls on high and low engine. Take off. Fly! □

The Rumpelstadt takes to the air.



SPECTRA

(continued from page 37)

increases, hold full back stick: Rotation and lift-off will occur at the speed where elevator effectiveness overcomes the nose-down pitching movement due to the engine thrust. Do not release all of the back pressure immediately upon takeoff or you will be right back on (or in) the ground at high speed. As the speed builds up, gradually reduce the amount of back pressure. The ship should level out or continue in a slight climb with the stick in neutral. Adjust the trim setting for level flight. It should be somewhere between full up and neutral. Now reduce the throttle setting to about 2/3rds without touching the elevator. There should only be a slight change in flight attitude and only a small trim adjustment should be required to maintain level flight.

You can roll the airplane if you want, just keep the speed up. One difference is apparent, and that is because of the engine location, you will need little if any down elevator while inverted. The ship will loop and it will spin if you work at it. However, if you do plan to spin it, make sure your CG is not farther aft than shown or you may get into a spin from which you won't recover. I made this mistake with the original ship and spent three weeks putting it back together. Later spins, made with the proper CG, were easy to recover from with the model spinning in a very steep nose-down attitude. Try not to pull too many G's on recovery. Remember this is a heavy airplane, so start your maneuvers high and recover early.

When you are ready to start your landing approach, put in a lot of down trim. On the Heathkit GD47 transmitter with the Bonner type sticks, I use full down trim. Other systems with

League of Silent Flight



By Le Gray

LEAGUE OF
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Perhaps you are curious about the LSF...the League of Silent Flight. Many people are these days, because the LSF is attracting the attention of R/C sailplane fliers throughout the world. Recent press coverage has given many details, but other points may also be of interest.

The LSF is an association of people who have a common interest... R/C soaring. It is designed for the individual... it is a "program"... it is not a club. Participation in the LSF neither conflicts with nor requires club membership. In fact, many clubs find that group participation in the LSF program can excite new areas of interest and be the basis of new growth.

The League of Silent Flight Soaring Accomplishments Program provides a realistic challenge to the serious R/C soaring enthusiast through a series of meaningful standards of flying proficiency... goals that can be attained at most local flying sites. Membership in the League can only be earned...by personal, documented performance. Membership cannot be "bought"...there are no membership dues or fees.

To become a member, an R/C sportsman must fulfill the requirements of Level I of the LSF Soaring Accomplishments Program: a 5 minute thermal soaring flight, a 15 minute slope soaring flight or a second 5 minute thermal flight, and five spot landings within 3 meters (9.84 feet) or a target point.

Advanced levels in the Soaring Accomplishments Program are progressively more difficult. Level V, for example, requires a 2 hour thermal flight, an 8 hour slope flight, a 10 km (6.21 miles) goal and return flight, as well as considerable contest success.

Only members... sportsmen who have achieved Level I or higher... are privileged to display the LSF insignia. The LSF emblem on a jacket or sailplane is a symbol of proven performance... it has been earned... and is displayed with pride anywhere in the R/C soaring world.

The LSF is growing... fast... but the "grass roots" concept, the personal challenge for the independent sportsman, will be maintained, because that is the League of Silent Flight.

Serious sportsmen are invited to associate with the LSF by submitting the following to the Executive Board: (a) name; (b) mailing address; (c) FAI organization affiliate and license or membership number; (d) radio operator's license number; and (e) a statement similar to the following:

"I, (the undersigned), support the philosophies, concepts and criteria set forth in the By-laws of THE LEAGUE OF SILENT FLIGHT and give notice herewith of intention to attain Level I of the LSF Soaring Accomplishments Program, and by so doing, earn full recognition and privilege of membership."

All correspondence to the LSF should include at least 12 cents in stamps for return postage. Correspondence should be addressed to The League of Silent Flight, P.O. Box 2606, Mission Station, Santa Clara, California, 95052, USA.

LSF SOARING ACCOMPLISHMENTS PROGRAM - REQUIREMENTS SUMMARY

LEVEL REQUIREMENTS	PRIMARY	INTERMEDIATE			ADVANCED
	(I)	(II)	(III)	(IV)	(V)
THERMAL DURATION	5 MIN.	15 MIN.	30 MIN.	1 HOUR	2 HOURS
SLOPE DURATION	15 MIN.*	1 HOUR*	2 HOURS*	4 HOURS*	8 HOURS
PRECISION SPOT LANDINGS	5 LANDINGS 3m (9.84 FT.) OR LESS	10 LANDINGS 1.5m (4.92 FT.) OR LESS	NONE	NONE	NONE
GOAL AND RETURN	NONE	NONE	1 km. (0.62 mi.)	2 km. (1.24 mi.)	10 km. (6.21 mi.)
COMPETITION	NONE	6 CONTESTS WITH 1 PLACE OR 3000 POINTS	6 CONTESTS WITH 2 PLACES OR 4500 POINTS	6 CONTESTS WITH 2 PLACES AND 1 WIN OR 6000 POINTS	6 CONTESTS WITH 12000 POINTS, INCLUDING 3 WINS

*A second thermal flight which meets the basic Thermal Duration requirement for this Level may be flown in lieu of the Slope Duration requirement. However, the second thermal flight may not be flown on the same day as the first.

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INSTRUCTOR (RCM Plan) \$7.95	*NEW ERA (RCM Plan) \$5.95
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UGLY STIK \$8.95	SHOW OFF (RCM Plan) (2 wings) \$10.95
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SUN-FLI IV* (RCM Plan) \$9.95	KWIK-FLI III* (MAN Plan) \$9.95
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RCM EXPERT (RCM Plan) \$7.95	III PERFECTION (RCM Plan) \$9.95
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NEW ERA II (.40 size 500 sq. in.) \$7.95	RAPIER (RCM Plan) \$9.95
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KWIK-FLI (Tapered Wing) \$9.95	SCOTCH LASS (RCM Plan) \$5.95
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the electrical type trim adjustment may not require full down. This trim adjustment should keep the nose down as power is reduced, and allow you to use back stick during the landing. If you still have to hold forward stick during the final approach, you either have the center of gravity too far aft or not enough down-trim. Keep the nose down and the speed up during the approach. If the nose gets too high and the speed too slow, it will tend to wallow when you make a turn. If your approach isn't in the groove and you feel you may have to go around, make your decision before you get below an altitude of 10 feet if you can. This will leave you sufficient height for the additional loss in altitude you will get when you give it full throttle. I would recommend making a simulated approach at about 50 to 100 feet altitude the first time just to get the feel of how much up-elevator is required to keep the airplane level when power is applied for a go-around.

I think the model's appearance in the seaplane configuration is prettiest. It also presents the airplane as the full-scale ship will appear with the landing gear retracted. Again, make sure it is water-tight before you put it in the water. See you at the lake! □

RCM'S 1970 SLOPE SOARING

(continued from page 14)



Typical launch at start.

18th. Only one round was flown on Saturday because there had been a storm on Friday night, and the winds following the storm were blowing at 30 mph with gusts occasionally above 40, and more than half of the planes which flew were pretty heavily damaged on landing as the wind tossed them around in the manzanita covering the hill. But Sunday was a different story. Calm in the morning, with the wind picking up around 10 A.M., and finally settling down for the final races in the afternoon at a firm 20-25 mph. Lift was fantastic; Bill Woodward, who had damaged his

slope soarers in the wind, entered a standard, low wing multi ship, normally with a .60 up front, which he replaced with a pound of lead. He removed the main gear, but left the nose gear in place. Launching was tricky, to say the least. Since it's hard to hold a low wing job and hand launch it, he resorted to an unusual procedure; his assistant actually launched the plane inverted, then Bill flew it out over the beach, rolled it upright, and then went on up to his holding pattern for the start of the race!

The lift was so strong that following the races I saw Rick Walters soaring a quarter midget L'il Toni racer, complete with landing gear and Max.15 up front — but with the engine dead. He raced it up and down the course for ten or fifteen minutes just for pure sport. Any model which could glide would have stayed up. And that meant that the racing gliders could really load up with lead. I was racing my "Led Nalivag" (Del Gavilan spelled backwards) at 5½ pounds — nearly double its normal weight of 3 pounds. Bob Andris doubled the weight of his Peregrine Mk2, and still had excess lift. In my opinion, for the conditions which existed, he had the fastest plane aloft. Unfortunately, he had a midair crash with Jerry Arana, which put them both out of the final race.

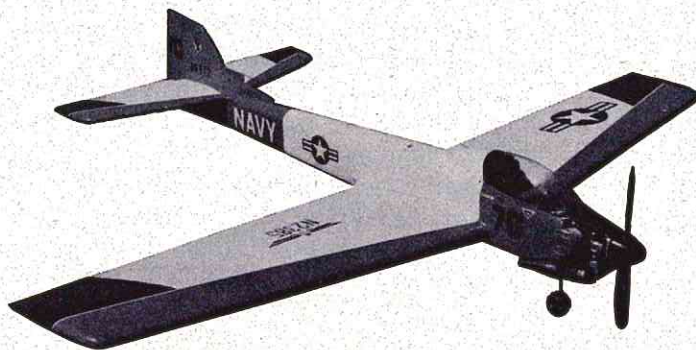
Some fifty contestants were entered this year. When the qualifying rounds were over, twenty fliers competed in the semi-final heats. Out of these twenty, three fliers emerged with the same number of points — John Baxter, Sam Crawford, and Joe Corr.

Unfortunately, Sam and John were on the same frequency. They had the option of flying against the clock or, alternatively, one of them changing frequency. The decision was to fly against the clock. It was too bad, because it took away the challenge of head-to-head confrontation on the course. Even so, it was exciting, particularly if you had a watch and could see the comparative times emerge at the end of each lap.

John Baxter, flying a KA-6, won the RCM perpetual trophy for 1971 with a beautiful flight of two minutes and eight seconds. It is the first time that a full potential of the KA-6 has been realized in this annual event — and only because John spent many hours in serious practice with his KA-6.

Second place went to Sam Craw-

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ford, flying a standard Jalapeno. This is the new low wing slope soarer marketed by Jac-Mac. Sam's time was just four seconds slower than John's.

Joe Corr came in third, with a time of two minutes and eighteen seconds. Joe was flying an original design; he used a Fliteglas Phoebus fuselage, but made his own wing and mounted a

flying stab on the fuselage in place of the T-tail.

The above times are unofficial, since I didn't have the chance to check them with the timers, but they're close enough, and serve to illustrate that, had the race been against each other instead of against the clock, the jockeying for position could well have

changed the final outcome. We'll never know. In any event, all three flyers put on a first class show of speed and flying skill, and deserved to win their prizes.

As always, the races are only a part of the story. Here are some photos of the interesting items which accompanied the racing events. □

ENGINE CLINIC

(continued from page 10)

ple as the short length of exhaust pipe but increases the length of time of the vacuum, or negative pulse. This, in turn, results in even more effective scavenging. However, this can also result in a considerable increase in fuel consumption as the intake charge is being pulled completely through the engine and on out the exhaust. Both the short pipe principle and megaphone can be incorporated into a compact model engine muffler, resulting in a small power increase.

Finally, we come to the principle of the double coned tuned pipe as used in U-Control speed. The double coned tuned pipe is also known as a closed megaphone in the big car and motorcycle world. By closing the end of the expanding megaphone with a contracting megaphone a series of positive and negative waves are created. As with the open megaphone a negative wave scavenges the engine, pulling the fresh mixture through the engine into the short neck, or adapter, that connects the engine to the megaphone. The closed end, or reverse megaphone, then reflects back a positive wave that tries to ram this mixture back into the engine. If this positive wave arrives back at the exhaust port while the exhaust port is still open, but the intake port has closed, a supercharging effect takes place. The exhaust port in engines intended for use with the double coned pipe is usually raised

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considerably so that the exhaust opening leads the intake opening by a considerable margin. This is the reason why a double coned pipe will not work effectively on a standard or unmodified engine. The scavenging is increased but the supercharging effect is not being used to its full advantage. Timing the positive wave to be at the exhaust port at exactly the right time is accomplished by increasing or decreasing the overall length of the double coned pipe itself. This can be a very tricky matter as many variables are involved. Temperature, humidity, and barometric pressure all having a part in making the double coned pipe very 'peaky'. Assuming the engine will be turning 20,000 in the air you then tune the pipe for this rpm. If the engine does not come up to this rpm, or exceeds it, there will be a considerable drop in performance. This is the reason a double coned pipe would not be too practical in pylon racing. In U-Control speed the model is whipped up to speed and the pipe 'comes in'. In pylon racing you might have trouble getting the pipe to come in unless you could gain some altitude and put the ship into a dive. Acceleration would be considerably slower until the pipe did come in and, by that time, the rest of the field might be a lap or two ahead.

So there you have it as far as tuned exhausts are concerned. Like the exhaust, the intake can also be tuned, but intake tuning does not achieve as large a performance gain as does tuning the exhaust. But who knows what developments may come about in the next few years. Exhaust tuning has been with us for many years, but it is only recently that it is being developed to its full potential.

As for the FAI rule, I believe it should be amended to read—"The engine shall be fitted with any commercially available effective silencer.



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The double coned type of tune pipe is prohibited." If a manufacturer can develop a muffler using the tuned principle to improve performance, then let's not hinder progress with unrealistic rules. After all, what manufacturer is going to spend time and money developing a muffler that would give a small power increase only

to have its use prohibited. If the intent of the rule was to keep speeds down by, hopefully, placing a limit on the power of the engine, then we had better prohibit the use of high compression heads and large bore carburetors, as well.

One fly in the ointment now is the recent ruling that the current FAI

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rules will remain in effect for the next four years. How and why this decision came about is rather vague at the time of this writing. I am sure there must have been a good reason for the decision although it does not seem to be in the best interests of international modeling at the present time. I am sure our FAI representatives will not let this stand without protest. □

SCALE IN HAND

(continued from page 8)

have dawned on us—more details later.

★ ★ ★

And so, from the sublime to the cor-blimey, as an Englishman would say... our offer of Standoff rules brought a most heartening response. Literally dozens of these have been sent out to individuals and club secretaries and a fair amount of feedback has resulted. Accept our thanks, those who wrote back with reactions. Overall, impressions of the RCM

Standoff Rules are good. Most correspondents saw few or no changes needed. One beef that did arise several times, was the need for a rule to prevent the entry of an AMA-standard Scale model into the Standoff Scale event. This was seen as a bad thing because it would lead to an escalation of the required standards in the model; eventually depriving the very people for whom the event was created. Therefore, to solve this problem we have added one rule (thanks to Jerry Worth for a shrewd solution). It reads: "No model containing cockpit detail, other than a pilot, is allowed to compete."

Of course it's obvious that an "AMA Scale" model without cockpit detail is no AMA model! This is, as we said, a shrewd solution to an otherwise difficult line-drawing problem.

Anyway, several clubs are running Standoff events this season; what was especially encouraging was that some of these wrote that they ran only Pattern before but saw this as an ideal

"fun type" event which, of course, is exactly right.

The offer is still open; if you want a set of rules, write me at 104 Talcott Ct., Bolingbrook, Illinois 60439.

★ ★ ★

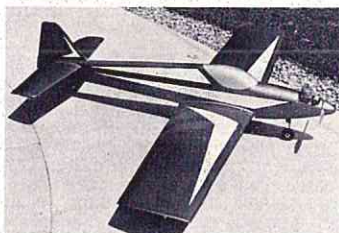
Having aroused your interest (we hope), here's a few of the upcoming contests in the Midwest area: Des Moines, Iowa, on June 19-20. Write Jim Bonanno, 201 S.E. Rose, Des Moines, Iowa 50315 or call him at (515) 244-3793 for a flyer.

Chicago Scalemasters All-Scale Rally has a Standoff event to RCM rules, in addition to AMA Scale R/C, C/L Scale and F/F Scale. Date is August 29. Write to Keith Ward, 636 Swain Street, Elmhurst, Illinois 60126 for information.

West Suburban RC'ers (Chicago area) has a Standoff event on September 19. Get all the dope on this one from Al's Hobby Shop, 129 West 1st Street, Elmhurst, Illinois 60126.

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the only ones for which we have complete details. If your club is running a Scale event and wants a plug, write us at least 3 months in advance.

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Here's a letter from a chap who needs your help. If you want to express an opinion write him direct.

My firm is considering the manufacture of wire wheels for model aircraft. These would be similar to the E-B wheels, which I understand are no longer made.

A method of manufacture has been devised, which could produce a very authentic scale wheel.

My firm is seeking the following knowledge:

1. What wheel sizes should be produced?
2. What price range would be acceptable?
3. The wheels must of necessity be expensive, since they are a complex manufacturing project. What sales volume might be anticipated, granted that retail price is acceptable?
- 4 It is the present desire of my firm to market the wheels by direct mail, in order to reduce the price to the model builder. Do you think this practical?

I am aware that you cannot act as a market advisory service, and do not expect this. However, I know that you are very much in touch with the needs and desires of model builders. If it is possible, please show this letter to your associates, obtain a general opinion on the listed questions, and forward this information to my firm. We believe that serious vintage modelers deserve a source of fine wire wheels, and any help you can give will bring this closer to reality.

Sincerely

James I. Harvey, Jr.

Northstar Universal

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★ ★ ★

For those who have written us over the years asking for plans of our various Nationals Scale R/C entries, we have some news. The first of these is now available — the F.W. 190 A-7 at 2" scale. On three 24" x 72" sheets, detailed completely to the retract-gear (finally got it licked!), flaps, canopy slides, etc., the plans cost \$12.50. Write direct to your columnist at the address given at the beginning of this article for more details.

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Dear Dave,

I just finished reading your article in RCM and I may have some information for you. Styrene sheets may be obtained from Auto World, 701 North Keyser Avenue, Scranton, Pa. 18508.

They come in sheets 3½ by 6½ and 6½ by 10 and .040, .060, .080, and .100 thickness. They also have plastic beams, channels, angles, tees, and round and square tubes as well as 4 by 12 sheets but they are not made of

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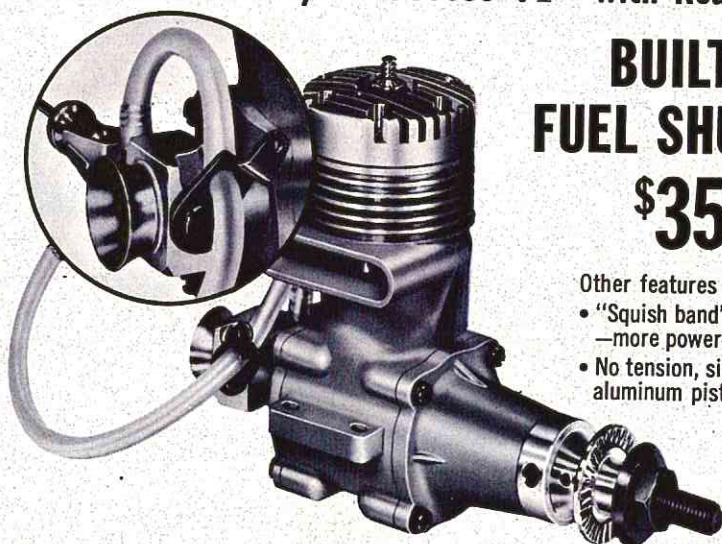
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They also have an item called "Mini Men". They are available in 1/32 and 1/24 scale. They are molded in pieces, arms, legs, heads, chests, hips, etc. They take considerable work to finish them, but they can be assembled in almost any position, and are reasonably priced at 4 for .98 cents.

They also have a hot knife called "Auto Cutter", priced at \$3.95, for cutting plastic that really works well.

I picked up Auto World's catalog at a newsstand for .60 cents, which was refunded on the first order.

Sincerely yours,
James Ranney

★ ★ ★

And now to finish up with, here's a letter from faraway temperate — oops! — hot Australia. Ah well, don't they say that he who never makes a goof never makes anything?

Dear Sir:

Dave Platt is A-1 on aeromodeling, but he only gets F-6 for geography. His lumping Australia in with England and Canada as God's frozen people is a bit much to take as I sit here writing this letter on our 7th successive day over 90°. Today's actual temperature is 96° and the forecast for tomorrow is 96°. And this is on our south coast!

Please tell Dave that Australia is about 10° latitude closer to the equator than the U.S.A., and our coldest climes are about equal to San Francisco!

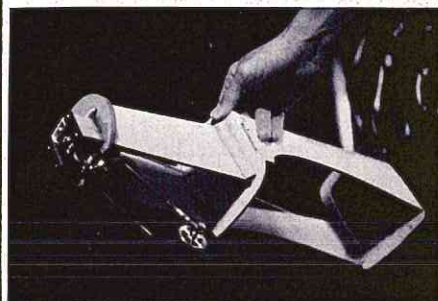
Best Wishes,
Fred Parkes
Melbourne, Australia

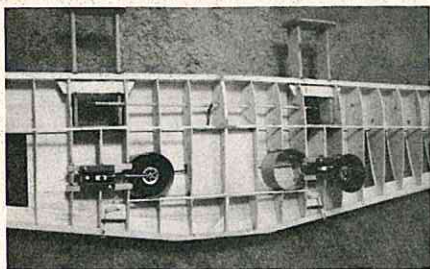
KITS & PIECES

(continued from page 6)

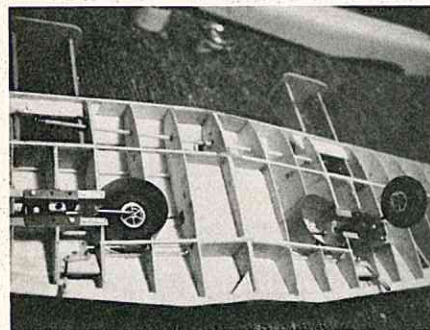
aid to construction, all of the parts are stamped with numbers and the pictures contained in the manual have the numbers superimposed on the photographs.

RMK nose gear hardware. Spacer blocks added so retract fits. Filler triangles also added for durability.





ABOVE: Wing goes together quick. Sturdy. RMK mains fit readily. Nacelle frames vibration-proof. BELOW: Retractable close-up shows simple throttle hook-up, bellcrank aileron linkage.

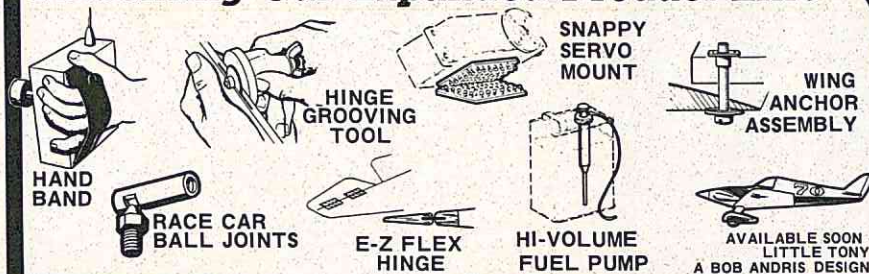


Only one sheet of approximately one quarter inch plywood containing the nacelle sides, firewalls and nose-wheel mount are not furnished cut out. The outlines of the parts have, however, been impressed into the plywood and if you follow the lines, the parts fit like a glove. These parts were cut out and sanded in fifteen minutes.

Construction of the fuselage and installation of the RMK retractable nosegear: The basic fuselage structure consists of seven pieces of plywood that form a crutch to which the fuselage halves are joined, the nosegear mounted and forms the wing saddle support. All of the parts are notched and tongued and assembly is straightforward. Installation of the RMK nosegear required modification of former no. 1 with the installation of hardwood spacers and cutout for the gear and steering mechanism. The hardwood block spacers were required to position the nosewheel strut in the position shown on the plan and also permit the gear, when retracted, to fit between the mounting former and the former preceding the leading edge of the wing.

Installation of the completed crutch assembly into the fuselage halves is a two man job and will require a little patience. After trimming the plastic shells and cutting the appropriate hole for the retractable gear in the lower half, the crutch assembly should be trial fitted into the

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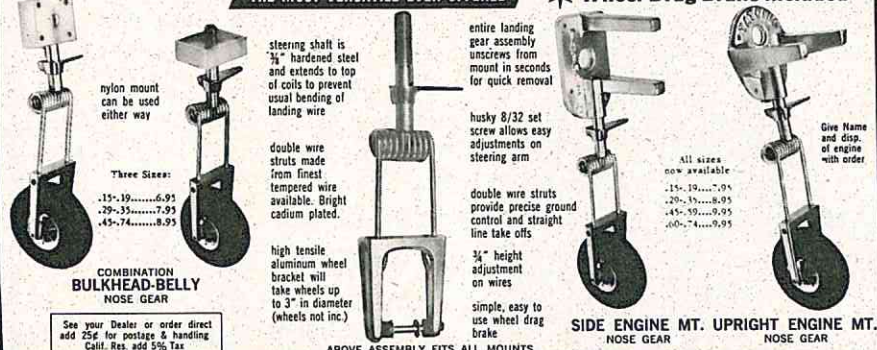
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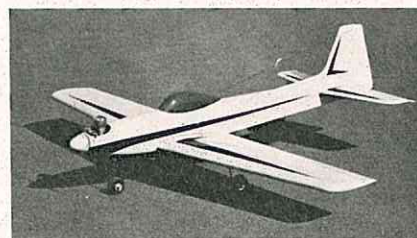
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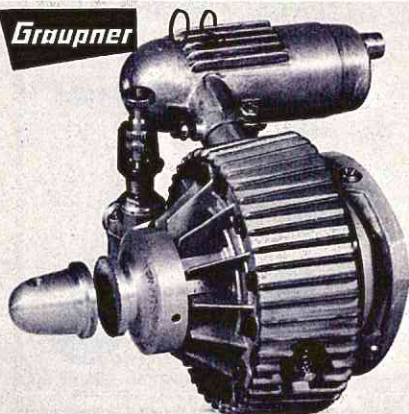
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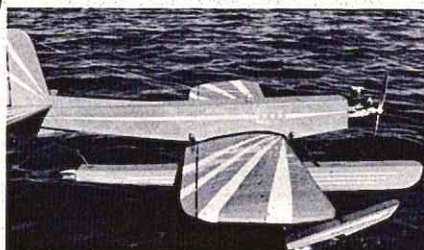
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lower shell and its position marked with a felt tip pen. Using the contact cement provided (excellent quality), apply the cement to both the crutch and the shell where contact will be made. Let it dry for at least one hour before attempting assembly. Now for the part that will make or break you. With one person spreading the plastic fuselage sides apart, the other person inserts the crutch, checking for alignment. Contact should be made with the bottom first and then the sides. If you took your time and did it right it will be perfectly aligned; if not, forget it since that contact cement won't let go without damaging the plastic.

The sheet balsa tail assembly is now epoxied together per the pictures and contact cemented to the lower fuselage shell. Again, take your time and insure alignment.

The upper fuselage shell can now be fitted to the completed lower assembly and the position of the former marked with a felt tip pen on the inside. An overlap of one quarter inch on each side is recommended and using a felt tip pen again, (invaluable building aid) mark the bottom of the fuselage where the upper shell overlaps. This will be a big help in insuring alignment. Spread contact cement on the upper half of the crutch, the upper part of the elevator where it contacts the shell, and on the upper shell where it contacts these parts. Do not put any cement in the rudder slot in the upper shell or on the rudder, itself, or you will be unable to assemble the halves. Let it dry for one hour and then call your friend again. Join the halves in the following manner; one person spreading the forward portion, the other the rear and slowly lower the upper shell onto the lower assembly. First contact should be made with the crutch and then, checking alignment marks to insure you are perfectly aligned, contact is made with the elevator. In this manner, no bulges will exist in either half when the seam is completed. The two fuselage halves are now bonded along their length by using acetone (A-la Lanier). In addition, you can now squeeze some contact cement into the rudder-fuselage joint which, when dry, will make that joint immovable. Install the nose cone using acetone to bond it to the fuselage halves. The fuselage was lightly sanded to permit better paint adhesion and the joining seams filled using Epoxilite smoothed out with wet fingers. Once sanded, the joining seams will be completely

hidden resulting in what seems to be a one-piece fuselage.

Rather than have a large gaping hole when the nosewheel was retracted, a pair of opening and closing wheel well doors were added. After four hours of trying various methods, none of which satisfied me, the following method was tried and proven to be faultless. Using the piece cut out of the bottom, a pair of doors were made and hinged to the fuselage. Metal hinges were used although nylon would work. These hinges were contact cemented to the parts and then Epoxilite was added to further strengthen the bond. Music wire hooks were installed at the upper rear of the doors and a rubber band stretched between them to hold the doors in an open position. Another pair of music wire hooks were added to the lower portion of the door whereby, when the wheel was retracted, the strut would contact a rubberband stretched between the hooks and pull the doors closed. All four hooks were installed on the doors using Epoxilite. A door stop was fashioned from some of the scrap plastic trimmed from the fuselage shells and installed at the rear of the wheel well. This insures the doors will be flush with the fuselage sides when retracted.

Construction of the wing and installation of the RMK retractable main gears: The wing construction is conventional and, using the trailing edge alignment jigs on the ribs, a straight and true wing can easily be built. The only problem encountered in building the wing was that rib numbers 25 and 27 had the wrong numbers stamped on them but this was very evident since it is a tapered wing. Using the rib outlines previously mentioned on the plans, 1/16" plywood duplicates of rib numbers 21, 23 and 24 were made. These were used to provide a solid mounting surface for the hardwood mounting blocks used to mount the RMK retractable main gears. Again, the RMK strut location was matched to that shown on the plans. It will require you to remove the strut from the gear and form a new one shorter in length. I used the main gear in the kit for my strut material just rebending as necessary and cutting to the proper length. Placing the proper size wheel on the gear, it is placed in its retract position, and the ribs and the wheel contacts are marked and then cut out to allow the wheel to fit into the wing when retracted. I used some scrap 1/64" plywood to



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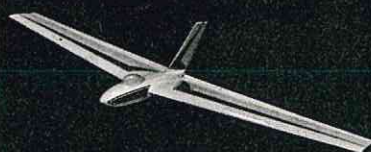
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form a wheel well that would keep from having another gaping hole in the bottom of the wing. It was soaked in ammonia and, when pliable, formed into a ring and installed. All planking was completed and the wing joined.

The wing joint was fiberglassed to provide additional strength.

Plastic doors, made from scrap trimmed from the fuselage, were installed on the main gear. These doors open and close with the retraction and this was accomplished as follows: A plastic sleeve was made that attaches to the door and fits over the landing gear strut. When the gear is retracted the sleeve rides down the strut and the door closes. The doors are permanently attached to the wing using metal hinges and contact cement.

Engine nacelles consist of four pieces of plywood notched and tongued to insure alignment. I found no difficulty in assembly and alignment proved to be exact. Prior to installing the plastic upper and lower halves of the nacelles it will be necessary to install the motor control torque rod and pushrod, motor mounts and fuel tank (I'm using six ounce Pylon slants). The nacelle lower half is installed first using contact cement and then the upper half can be installed following the same procedures as outlined before. Again, fill the seam with Epoxilite and sand. Three blocks were epoxied to the firewall for the cowling mount and the cowling openings cut to accommodate the engine. Small wood screws hold the cowling in place. One recommendation resulting from the first flight of the model follows: Use heavy wall surgical tubing for all fuel lines and make sure your tank installation is exactly right because this is a sealed installation and you can't get to it to change things without cutting a hatch in the nacelle (guess who broke a fuel line and now has a hatch in the upper cowling whereby the tanks can be checked and removed?).

The wing is completed by installing the aileron linkages. Although the plans show a NyRod type installation, it will be necessary to go to a bellcrank since the retractable landing gear limits the area in which you have to work. The wing was covered with Sylron and the exposed wood of the tail surfaces were covered with silkspan to lessen the fill required. Talcum and dope, along with aircraft primer, were used in preparing the surfaces for paint. The color scheme chosen was the one used by Miller Aviation in their first Jet

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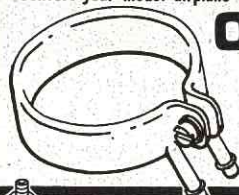
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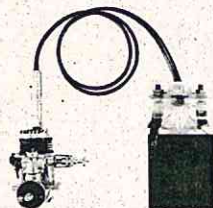
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After all the gear was installed, the balance was checked and, much to my surprise, the model balanced right on the dot. Total weight with empty tanks was found to be seven pounds and six ounces. I felt good until I checked the wing area and found that there was only 445 square inches. The wing, however, is very thick, being two inches in the center section and approximately one and a half at the tips. Upon arriving at the field and conducting some taxi tests and, finally running out of excuses why I shouldn't fly it, the first flight was made.

The model lifted off in approximately one hundred and fifty feet and went into a shallow climb. As airspeed increased it became increasingly evident that some wild trim changes were necessary. The model wanted to dive to the right and the torque from the two screaming Super Tiger .23's (George Aldrich Customs) had no effect. Cranking in full left trim on both the rudder and ailerons helped a little but under full power it still had a solid right turn. Up elevator trim solved the diving problem. The model was flown in this condition at approximately one hundred feet altitude for a full five minutes (seemed like days) and all of a sudden the din subsided and only one engine was running, the right engine having given up the ghost. (Instant Panic). I was truly amazed that the model showed no tendency to veer off heading and in fact lost no altitude whatsoever. A full traffic pattern approach was made and, when on final, the left engine was throttled back (mistake number one). To make a long story short I landed short of the runway in some grass and the model came to an abrupt halt. There was no damage so I immediately set out to change the trim setting looking forward to the second flight in which I would try the retracts (no guts on the first flight).

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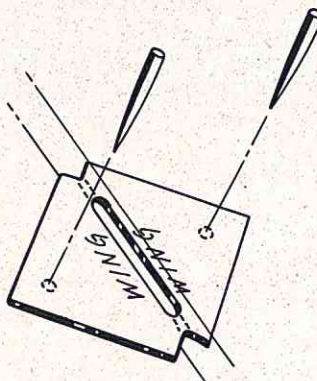
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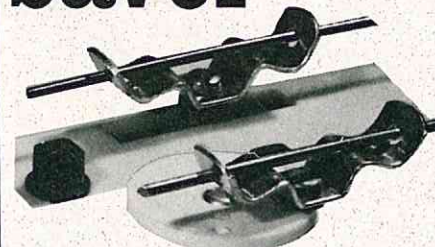
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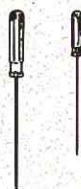
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cameraman showed up and was taking some footage to fill in on their local 10:00 PM newscast and when he saw the Comanche he had to have pictures. He took several feet of film of my changing the trim settings and then wanted some footage of it flying. No sweat said I, just stand half way down the runway and you can get some beautiful footage of the lift-off. I don't believe he will ever speak to me again since on three attempts to get airborne as the model approached takeoff speed and was just short of where he was standing the right engine would quit and the model would veer directly at him. As pointed out further on up in the article, the hard landing had caused the tank to shift forward ever so slightly and a broken fuel line resulted. This has since been fixed and the model flown. The retracts work like a charm and seem to be holding up to my landings with no difficulty. The model will fly on one engine and will actually climb out at a gentle attitude.

In conclusion, if you are tired of the everyday airplane, want to try a twin and want an airplane that looks like the real thing when done, I highly recommend the Hegi Comanche since, after all, everything that is good must be better if there are two of them! □

VIEWPOINT

(continued from page 3)

building of any flying model airplane, and in particular, any gasoline powered flying model airplane. ... SO IT COMES TO REST ... The Editor."

Alvin put the magazine down, leaned over and picked up the magnificent "black box". He turned on the receiver and flipped on the transmitter. The control surfaces responded quickly and quietly, just as the article stated they should. The "dry run" flights in the den had now come to an end.

Alvin glanced at his watch. Only two hours till sunrise. "Better get moving," he thought. The flying site had been cautiously picked many months ago. Just an hour and a half drive east to the desert, near Death Valley, to a small abandoned air strip. Carefully packing up his tool box, fuel, battery, clips, transmitter, antenna, and small tools, Alvin quietly opened the garage door off of the den and raised the trunk lid of the car. He placed the equipment in the trunk, returned to the work bench and carried the carefully polished model airplane to the car. Once again he returned to the house, placed a note

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on the desk for his wife, something
about computer problems at work,
and went back to the car.

Traffic was sparse this morning and,
right on schedule, Alvin turned off the
freeway and slowly made his way
down the dirt road towards Death
Valley. The horizon was just turning
gold and green as Alvin pulled up to
the airstrip.

"Beautiful morning," he thought as
he opened the trunk. He placed the
wing on the plane and mentally re-
viewed the pre-flight check offs he had
read. "Wing on, fueled, receiver on,
transmitter on, range check, glo-plug
clip on, little prime . . ." the old .56
came to life immediately.

As Alvin leaned out the engine, the
smell of the fuel seemed to pump the
blood through his body at twice the
normal speed. He moved the trans-
mitter lever to idle and stepped back.
Very slowly he increased the engine
speed and the model moved away. He
carefully taxied down the old runway,
back up the runway, stopped, checked
the wind, pushed in full throttle, and
held his breath. The model airplane
moved swiftly down the runway, gain-
ing flying speed. Very slowly he pulled
the model into the sky.

Wings level, not too steep, gentle
climb, get the altitude, now a nice easy
left turn, hold a little up, now level
off. Little bit of down trim now. Just
the way the magazine flight training
course had said. Alvin relaxed, caught
his breath for the first time in a
minute, and commenced a turn.
"Great," he said out loud. Back and
forth in front of him the model flew.
Up and over for a loop. Back down the
strip, another turn, level, now up for
another loop. But, just as the plane
started up into the second loop . . .
ZZAAAAP!

A blinding sliver of light beamed to
the model airplane. The aircraft hesi-
tated in mid-air, slowly disintegrated,
and fell to earth. Even before the
pieces reached the ground Alvin heard
the flutter of the helicopter blades.
The brilliant red helicopter with the
laser beam rack settled to the ground
behind him. Without turning around
Alvin could see the letters C.C.C.
(Citizens Communications Committee)
above the door on the helicopter.

As Alvin turned, two red-clad, uni-
formed men flanked him as a third
walked up to face him. The third man
opened a black book and read:

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rights"

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