

September 1970 75 ¢



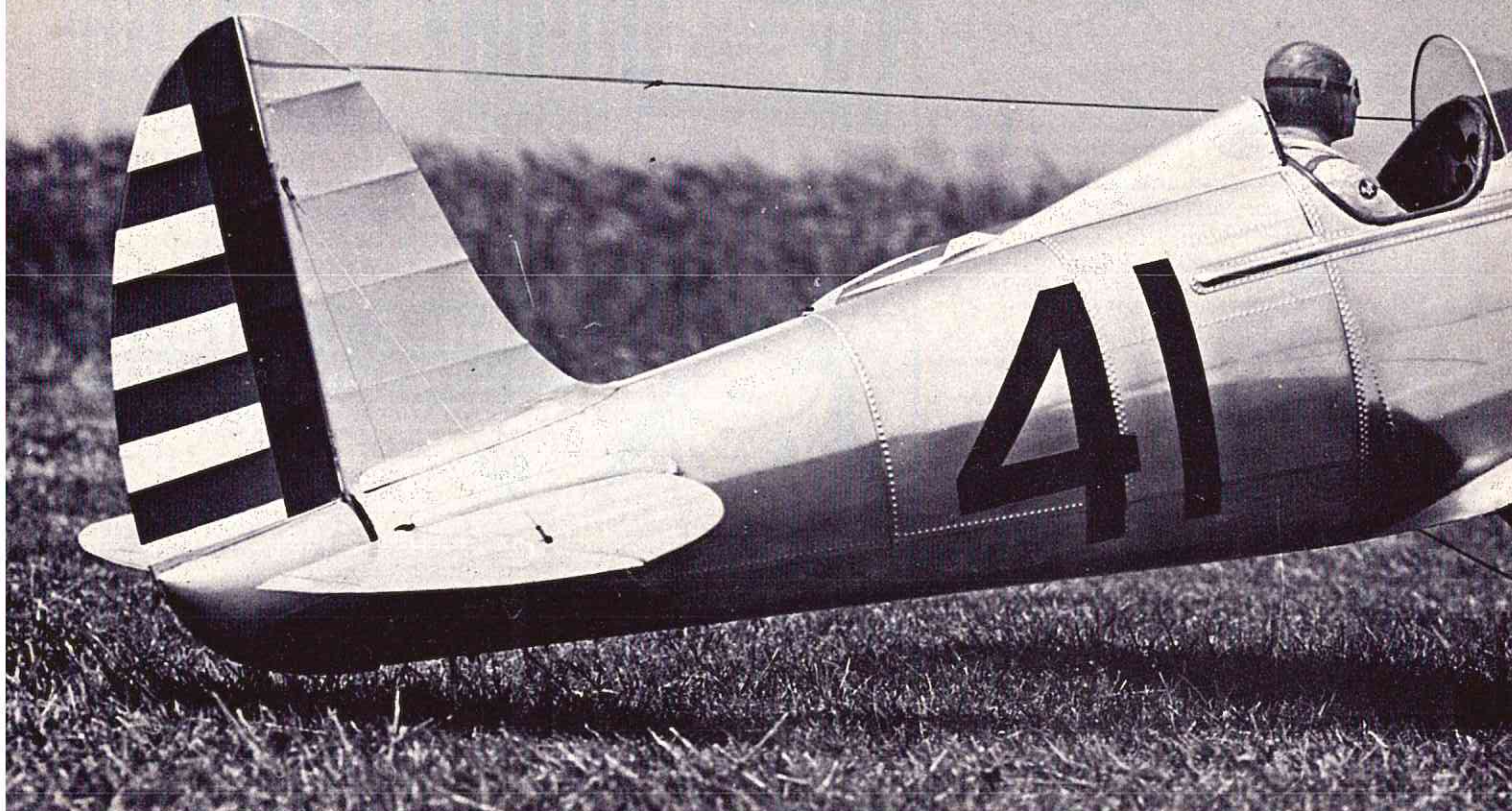
RC MODELER

THE WORLD'S LEADING MAGAZINE FOR RADIO CONTROL ENTHUSIASTS



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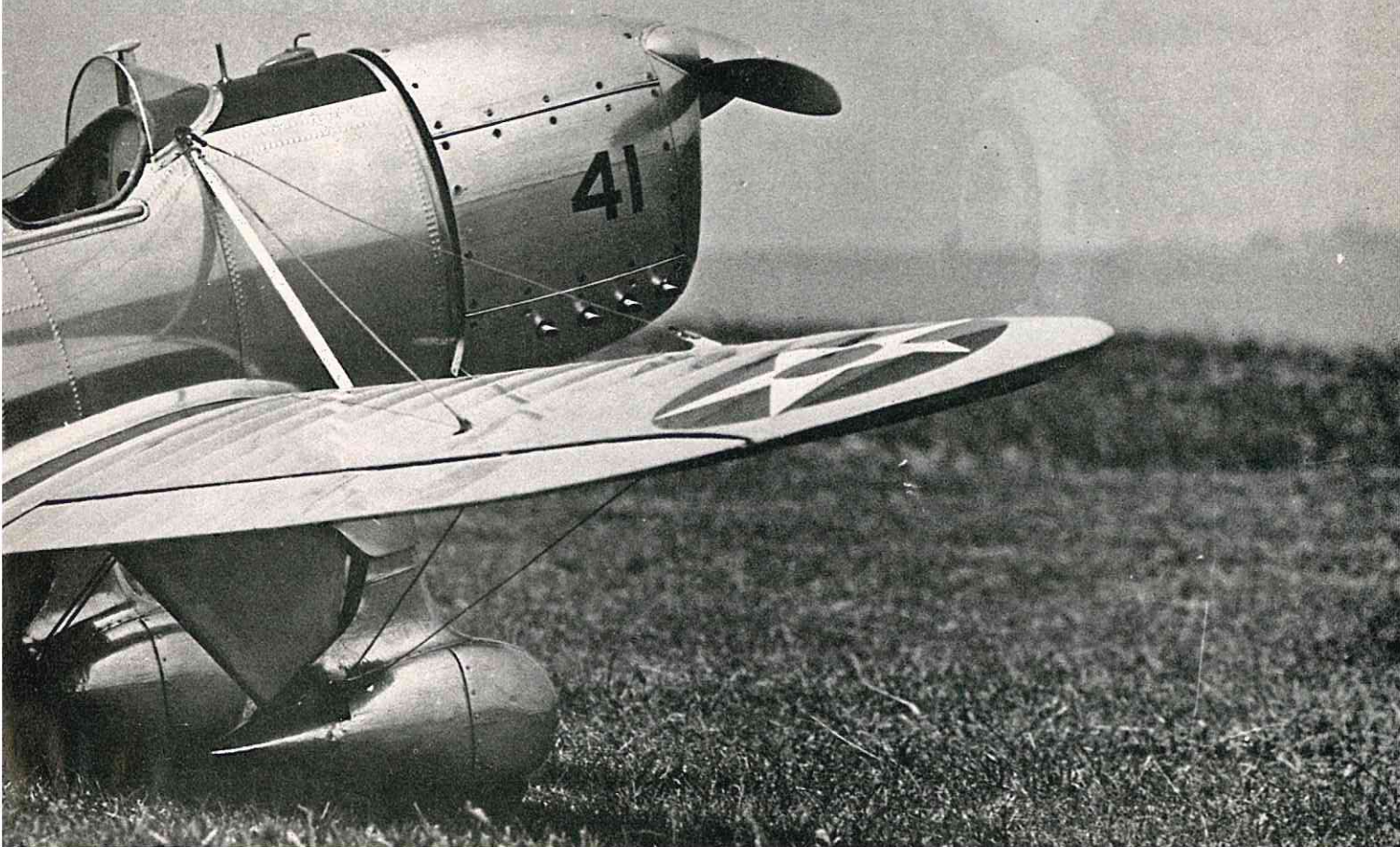
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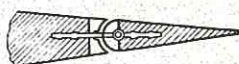
CAROL LUDDEN / Circulation
JEAN O'BRIEN / Customer Service

COVER: Photographers model Pat Campbell poses with nearly completed prototype of California Model Company's new competition stunt kit, The Intruder. Ektachrome transparency by Bob Ramirez.
FRONTSPIECE: Derek Ibbotson built this 1/7th scale JU87 dive bomber of W.W. II. Merco 61 and R.C.S. gear. Placed eighth in British Nationals R/C Scale event. Flies well. Authentic markings obtained from photographs of actual aircraft. Photo by Henry J. Nicholls.



VIEWPOINT

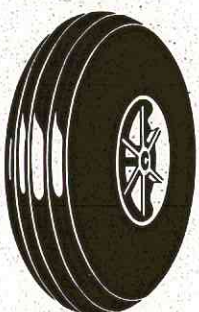
BY: DON DEWEY



CONTROL SURFACE FAIRING
1/4"—5/16"—13/32"—32" Long,
Pair 59 c — 99 c

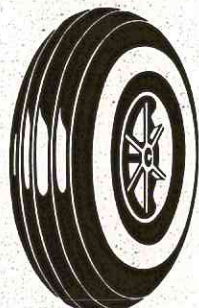
Air wheels
with black tire walls

- φ 1 3/4" (45 mm) \$ 1.39
- φ 2" (50 mm) \$ 1.59
- φ 2 1/4" (56 mm) \$ 1.79
- φ 2 1/2" (62 mm) \$ 1.99
- φ 2 3/4" (68 mm) \$ 2.19
- φ 3" (75 mm) \$ 2.39



Air wheels
with white tire walls

- φ 1 3/4" (45 mm) \$ 1.79
- φ 2" (50 mm) \$ 1.99
- φ 2 1/4" (56 mm) \$ 2.19
- φ 2 1/2" (62 mm) \$ 2.39
- φ 2 3/4" (68 mm) \$ 2.59
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The first scholarships ever to be awarded by the Academy of Model Aeronautics were announced May 22 in Washington, D.C. Winners were nineteen year old Charles W. Reed III, of 5408 Woodson Road, Raytown, Missouri, and eighteen year old Susan M. Weisenbach, of 4568 W. 146th St., Cleveland, Ohio. The winners were selected by AMA's Scholarship Committee which considered such factors as National Merit scholarship test scores, class ranking, and performance in AMA aeromodeling competition activities. They will receive \$1,000 each, to be used in furthering their education at colleges of their choice.

Both winners are outstanding students and ardent model aircraft builders and fliers, having placed at many AMA local, regional, and national sanctioned meets. Their scholarships will be officially presented during air show ceremonies at the 1970 National Model Airplane Championships on August 2nd at the Glenview Naval Air Station near Chicago.

The Academy's scholarship program was established in 1968 and is funded by contributions and an apportionment of dues by members of the organization.

The Fourth Annual WWI Jamboree, better known to vintage scale fans as "Rhinebeck '70", will be held on Saturday and Sunday, September 12-13. Hosted by the Poughkeepsie IBM R/C Club, it is slated for Cole Palen's Old Rhinebeck Aerodrome about two miles north of the intersection of Routes 9 and 308 (Village of Rhinebeck).

Trophies pertinent to the WWI theme of the Jamboree will be presented to the top three places in AMA Scale, Special WWI Maneuvers, Mission and Combat. Duplicate trophies will be awarded in the Combat event.

This year, again in keeping with the theme, realistic flight characteristics and construction detail will be emphasized and recognized. In other words, the Fokker D-VII did not climb out like an F-104, nor was it constructed of plastic and foam! WWI prototypes will be on display during the Jamboree and several will be flown

during a late Sunday afternoon air show.

We urge you, and your family, to attend Rhinebeck '70... one of the most exciting, interesting and unique shows of the year. Contact George Buso, 11 Maple Lane, Hyde Park, New York 12538.

Frank J. Williams, 34, has been named Vice President-General Manager of Orbit Electronics, Anaheim, California. Williams previously served as Engineering Manager for Transco Products, Inc., and as Production Control Manager for Astrodata, Inc. Before that he was a product designer with Beckman Instruments and Epsco West.

In penetrating non-RC modeler markets, recent product applications at Orbit have included control of car-mounted cameras in filming the racing movies, "Grand Prix" and "The Winners," plus, remote control of bulldozers operating in hazardous terrain.

In July 1969, the firm merged with Datatron, Inc., Santa Ana, manufacturer of high performance IBM-compatible disc packs, electronic test equipment, video broadcast control units, plus digital data systems.

In closing, we'd like to pass on a few notes from an old and good friend, Lee Schulman:

I had an incident happen recently — that I just had to write you about — it was so unusual that I feel you might want to use it in your magazine — so others may enjoy learning of this experience: The other day, we took our latest Pattern Airplane — the "T-33" designed by our very good friend Dr. Eddie Dazo and soon to be produced by DuBro Products as a Plastic Ready-To-Win-A-Contest kit. We had an experience which one has to see to believe. Fortunately we had along another flier to witness this — so you non-believers will have to wave your fingers at 2 of us, rather than just myself. The incident unfolds this way....

As we started up our new 60 engine (one of the 'new-breed' of more powerful engines) our good friend

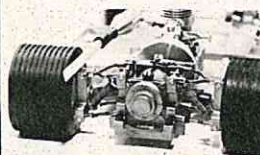
(and witness) Keith Finkenbiner asked how the engine put-out, so I mentioned that it was just beginning to 'come in' after about an hour of bench running and 2 previous flites in this plane - but we will try a short field take-off and steep climb-out. With a stiff breeze blowing, I gave full up elevator and FULL throttle - the tail came down, scraped along the ground and the T-33 literally jumped into the air. The climb was near vertical and accelerating. After a snap-roll on top of the climb out, then a reverse snap - we tried a few inside and outside loops to check the surface alignment, which was O.K. We then tried a few inside loops with snaps, Cuban eights, etc. - then 3 rolls into the wind. The T-33 was really barrelling along and upon recovery into straight and level flight upwind of us - we heard a loud P-O-P and off fluttered some large pieces. We quickly noticed it was both halves of the stabilizer and elevator floating down. I immediately cut the throttle and mentally marked-off this new beautiful machine as a total loss! The nose started to drop for that normally final 'death-dive'. Since I already wrote-off this plane mentally - I reasoned that I may as well try to get it down in as few pieces as possible, then I'll be that much ahead. As Keith and I were commenting about the tail fluttering off, and there goes the new plane, etc., etc., I gave the engine full-throttle and UP came the nose, enough to climb slightly. I saw that I was able to at least maintain altitude, now the next thing was to try to turn the model around back to the field. Mind you, all this in a matter of seconds. I gently banked the model to the left and it responded by coming around - as it did a complete 180° turn (downwind now) Keith yelled to cut the throttle and let it crash in the weeds to minimize damage. If it had continued on it's original course, Telephone and Power lines plus a 4 lane highway lay in the projected crash path. I yelled - "No, I'm going to try to land it". Keith said "but you can't, you have no control". I laughed back and said, "Yeh, I'm not supposed to have any, but the plane doesn't know it and it IS still flying, so I'm going to try a landing anyway". I brought the T-33 completely around while holding full power, slight left aileron and occasional RIGHT rudder to keep the nose UP as it turned. It seemed like hours went by and finally there was the plane in position for it's 'final'

(continued on page 87)

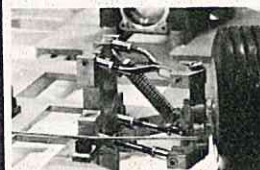
NEW! DYNAMIC R/C CARS



Car with RC gear and Skyglass Fiberglass McLaren Body

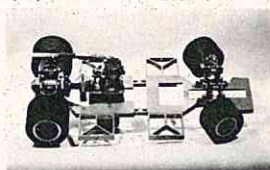


Transmission, rear suspension and universals

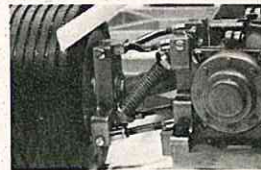


Front Suspension

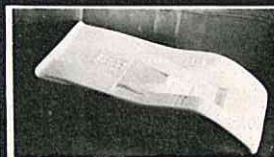
I'm a nut about RC airplanes, but I'll have to admit that this highly detailed Dynamic RC car has gotten me pretty excited. These cars really move with a .19 RC engine. The kick you get out of power sliding around a corner with this snarling and smoking little car is something you've just got to experience. I hope these photos give you an idea of the workmanship and detailing in the Dynamic kit. The suspensions are not only fully operative, but they are actually matched correctly to the weight of the car. The rear end uses fully operative universal joints. All of the parts are cast or machined as you can see in the pictures. Since these cars operate at much closer range than an RC airplane, you can use an old worn out digital propo in the car rather than have to trade off the outfit for a give-away price. Dynamic makes two body styles for the basic chassis. The McLaren kit is the wider body style and allows more room for old, large style servos and receivers. The Matra body is narrower and exposes the beautiful Dynamic front and rear suspensions. It took about 8 hours to assemble the Dynamic kit and another 4 hours to install the engine and RC equipment. We found that Hobby Lobby "Pinlocks" were ideal for hookup of throttle and torque-converter pushrods. Devcon Silicone rubber is invaluable for the seal around the exhaust manifold to the tail pipe. We have made an equipment list for the total assembling job on a Dynamic car kit. If you are wondering what you need to get one of these kits "ready to roll" write and ask us for our "Dynamic RC car and Equipment Price List".



Chassis with engine



Closeup of rear suspension



NEW! SKYGLASS FIBERGLASS McLAREN CAR BODY \$17.95

A beautifully crafted 1/8 scale body to fit the Dynamic McLaren chassis. More durable than butyrate bodies. Prefinished in white. The stiffer fiberglass body does not shift on the chassis as a butyrate body does.

NEW! PATTERN PROMPTER \$1.99

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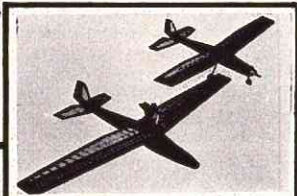
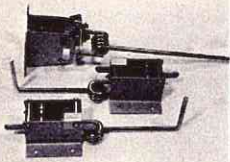
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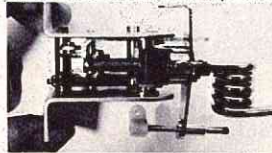
KDH RETRACT LANDING GEARS

Pair of retractable main gears \$39.95 — Steerable retractable nose gear \$26.95

The last time I wrote an ad for these KDH retracts we sold out before the ad came out in the magazine. Once again they are in stock at the time I'm writing this ad. Mr. Dieter-horn assures me that he can meet the demand now, but — I'm taking that with a grain of salt. These retracts are the most beautifully engineered device in the R/C airplane business, and they are absolutely reliable. I can imagine a fellow buying a set of these KDH retracts for the same reasons he'd buy a fine gun or automobile — just to own and admire the workmanship and design. I hope we can ship orders for these with some degree of promptness.



**DUMAS
EVOLUTION**
\$19.95



SPECIAL! AEROPICCOLA ELECTRIC BRAKE

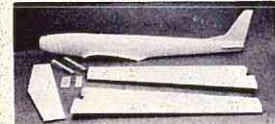
2 for \$9.95
Reg. Price \$5.95 each
The strongest-acting electric brake. Positive, non-slip mounting. Price in effect until August 30, 1970.

HOBBY LOBBY PINLOCKS

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Sun Fli IV — \$44.50

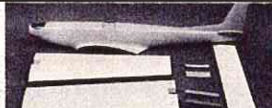
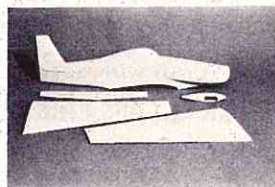


Quik Fli IV — \$44.50

Dealers: Stock this fast-selling line of fiberglass & foam kits. Write for: "Skyglass Dealer Terms Sheet".

Skyglass Fiberglass Kits announces: the "Minnow" hot new Form. I Good-year Racer kit—

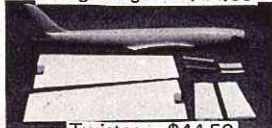
\$44.50



Citron — \$44.50



Long Midget — \$44.50



Twister — \$44.50



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79¢ package

1" or 1 1/4" sizes.
Generous amount.

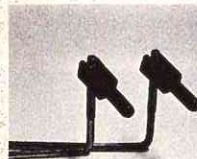
Complete
Single
Channel
Outfit
\$28.88



**DUMAS
MOD-POD**
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Silenceaire MUFFLERS

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To fit: OS 40,50, 58,60, Merco 49, ST40,46,51,56,60, G60, Veco 60, Enya 60, Webra 61.



NEW! ROCKET CITY STRIP AILERON HORNS WITH SWIVEL & CLEVIS

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This gadget is a better device than the ordinary adjustable strip aileron horn. The swivel action on the threaded block prevents the sort of back-up bind which can occur when hooking a Kwik Line to the conventional type of adjustable aileron link.



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To fit: OS 60, Webra 60, Enya 60, Veco 50,61,ST 56, 60, G60.

SILENCEAIRE RACING EXHAUST EXTENSION

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For K & B 40

SEALECTOR DELUXE HEAT SEALING IRON

Reg. price \$10.95. Special price in effect until August 30, 1970.

\$7.99



Kavan Carburetor

\$7.99



To fit: OS19,30,40,50,58,60, Merco 35,49,61,ST19,23,29, 35,40,51,56,60,G60F,G71F, Enya 458B,60,Rossi,Veco 45, 61,K&B 40F,R,Webra 60.



I-M Scale Instrument Kits — 5 per kit 98¢

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THE MODEL WIFE

BY JOAN ALYEA

One of the problems R/C fliers often confront is "What the heck has gotten into the wife!" An in-depth study of the findings of an eminent psychologist (my husband) boils down to "Nobody knows, nobody knows..." However, wives do fall into several reasonably predictable categories, an understanding of which may enable the poor put-upon modeler-flier-hubby to survive. Regarding your personal pigeon, is she . . .

1. *The Vain Wife*: one who steadfastly refuses to even see your newest plane until you have admired and complimented her on her newest dress.

2. *The Amiable Wife*: one who goodnaturedly lets you use her best nylon nightie to cover your wing, provided that you . . . (yes, we read the cartoons, too.)

3. *The Proud Wife*: one who can't boast enough about how you won the last club contest, stressing the fact, of course, that you couldn't have done it alone.

4. *The Shy Wife*: one who hides her head under the back seat of the car when she sees you coming in for a landing.

5. *The Impudent Wife*: one who puts a hex on every new plane that shows up at the field, and the hexes work!

6. *The Scientific Wife*: one who produces several reams of data to prove your stab is on upside down and tops the list with "Because it looks funny, that's why!"

7. *The Unfortunate Wife*: one who has not only a husband but two sons, a father-in-law and two next-door-neighbors who are also modelers and R/C nuts.

8. *The Bewildered Wife*: one whose husband has just handed her the transmitter in flight.

9. *The Nervous Wife*: one who informs you that your fly is unzipped when you are in the middle of a Cuban 8.

(continued on page 87)



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BEAT THE
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Gold N/Push Rods, made from a specially formulated plastic, are 75% more stable than nylon at temperatures up to 180° — that's 75% LESS elongation.

LESS COST, TOO.

Although the new material is more expensive, Pylon Brand know-how has actually reduced the cost to you. Look for these golden colored push rods at your dealer's in the popular 36" size priced at .2 for a buck and a quarter.

Recommended for snaking

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Recommended for Relatively Straight Installation — Elevator & Rudder on Large R/C Aircraft

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Basically for Push & Tork Rods, Wing Spars & Struts

Rigid Fibre Glass GOLD N/PUSH RODS (Arrow Shaft Type) 5/16" O.D. 2-sets \$1.50

NEW: Slant Style Fuel Tanks in 7 Sizes
2 oz., 3 oz., 4 oz., 6 oz., 8 oz., 10 oz., 12 oz.

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KEN WILLARD



Well, the results are in — and not totally unexpected.

I refer, of course, to the replies to the beginners' survey which appeared in the February issue. 470 of you beginners, to date, have sent in your thoughts. For a while, I thought I'd wait for an even 500, but the number of letters now dropped off and the time to arrive at 500 would take too long. As a matter of fact, the percentages had already stabilized by the time I had about 100 replies, and the next 400 just served to confirm the figures.

This has been one of the most interesting programs I've ever undertaken, and it may open the eyes of some manufacturers who think they have to get into the "plastic fantastic" game if they want to stay in the model business.

But let me make one thing clear. When you talk about beginners, you have to identify what type of beginner you mean. In the case of the survey just completed, nearly all of the respondents considered themselves beginners at radio control, but had had previous experience in modeling, either as free flight, or control line flyers. Only 32 had started out with a radio model, and they had become interested by stopping by at some field where modelers were flying. Even of those 32, eleven were full scale pilots.

Naturally, there were many beginners that I missed — simply because they don't know that R/C Modeler magazine or any other magazine exists which is devoted to model airplanes. You met them, I'm sure, at one time or another. The guys who stop by the field, get intrigued, and then after a while ask "Hey, is there any book or something that tells you how to build or fly one of those things?" But they are still in the minority, although the way the sport is growing that may not be true in a few years.

When you look at the table of results, you may be puzzled by the numbers, since I said that 470 replied, yet I've indicated more than that number in some of the categories. The reason is that many modelers indicated dual choices, like "I want the most stable design, and would prefer a biplane, but since they're harder to assemble, I'll settle for either a high wing or a midwing monoplane." How would you tabulate that answer? Well, I gave a check mark to each category. As you can see, it was in the area of design choice that the most "multiple choice" replies were received.

The next highest area of multiple choice showed up in the manner in which the model was marketed. Kits won out by a comfortable margin, with partially assembled kits next, and ARFs last! Two things show up here. First and foremost was the fact that the beginners wanted to be able to say "I built it myself." That is characteristic of former modelers, as most of them were. Price was also a factor, but secondary to the desire to create, at least in most cases.

What really amazed me was the apparently low interest in ARFs, in view of their great popularity. But maybe there's a reason hidden somewhere. Perhaps the guys who fly ARFs

(continued on page 78)

Super
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MD-3



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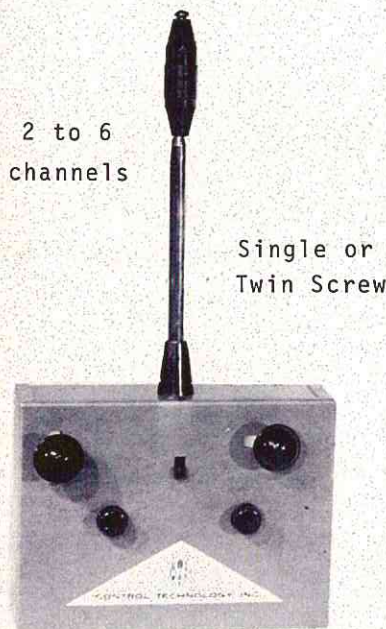
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ENGINE CLINIC

BY CLARENCE LEE

Since starting this column well over a year ago, I have often said things or made comments that I was sure would bring a barrage of letters in opposition. Strangely enough, this has very seldom happened. On the other hand, some small comment that I have not given a second thought to will upset someone and they will fire in a torrid letter. The following letter from a hobby shop owner in Scotland is a good example.

I have been waiting for some member of the retail trade in the States to give you a broadside for your comments in the June issue of RCM. But nothing has appeared in print yet. It was the crack about dealers checking the balance of their props that riled me to start with. My crystal ball tells me you never tried to run a model shop. If you had enough time to do this sort of thing, you wouldn't be busy enough to stay in business! But it was the next bit — I didn't know whether to laugh or cry. Quote "Sure they are going to be stuck with two or three out of every dozen . . ." This is quite a common attitude on the part of the public but coming from someone in the trade — I'm speechless! Take an 11 x 6 Top Flite nylon prop. Costs one dollar. I don't know how the mark-up goes in the States but over here a dozen would cost us \$9 at our rate, including tax. A quick bout of mental arithmetic will show that if we are stuck with three props out of our dozen we have made no profit. In fact, allowing for postage, stationery, etc., we have lost on the deal! I certainly believe in giving service to my customers but this is ridiculous. You appear to labour under the common delusion that all the money a dealer makes goes straight into his pocket. You might not believe this, but one customer actually asked me if I had had to pay for the stock in the shop! Do you wonder at dealers taking a cynical attitude to their customers? To a certain extent you must or you are out. The Aeromodeler seems to be the meanest and least loyal customer there is, from the other side of the counter. I know they are a great bunch, the best, because I spend most of my spare time among them, but just try selling them the necessities of life — !!

Hope this hasn't seemed rude to you, I reckoned you would prefer it straight out as from your column you appear a very direct person. Very good column it is, plenty of practical info. to save us readers years of trial and error. Maybe a little bit dogmatic at times, gives the impression, "This is right, everything else is wrong". Other people have said this to me, too. So long as readers realise that it is a sound, practical basis they are getting, not a rigid rule-book, because heavens knows they need it! There I go again, but this business does it to you, we hear the wildest theories.

Anyway, thanks for a fine column — may your well never run dry!

Yours,
Ian M. Dunn

You may find it strange Mr. Dunn, but yours was the only letter I received. It is true that I have never directly ran a hobby shop myself, but I have had

interests in several over the years, and several of my close friends are present hobby shop owners. I have been in the retail business in another field for over twenty years and am pretty familiar with dealing with the public whether it be modelers or not. There is one thing that you are overlooking, and that is customer GOODWILL. This is one commodity that you cannot put a price on, but can make all the difference in the world whether a business is a success or failure. Sometimes it is better to break even or lose on a small item because it will be made up several times over in future sales. If your customers feel that you have their welfare in mind by doing such a simple thing as checking out the props for balance, they will also come to you for their \$400.00 radios, \$50.00 engines, and \$100.00 airplanes with their related accessories. On the other hand, if they feel that you are out to take them for every nickle and dime that you can, chances are pretty good they will look elsewhere for the high price equipment. I still stand by what I said and feel that throwing out a few bad props is a very small service that the hobby shop owner can provide for his customers. Especially when the sale of the bad prop could well wipe out the customers \$500.00 investment if vibration caused by the propeller should get to the receiver or one of the servos. Any of you other hobby shop owners have anything you would like to say about this?

A friend has a 1918 Gnome N9 rotary engine which he has restored to working condition. It is virtually new as it has been sitting in a work shop on the prairie completely sealed in castor oil and grease (most of which turned to a very hard varnish) since 1918.

Now the question is about the castor oil used for lubrication. The lubrication is similar to the model engines in as far as it is a one way run for the lube (not recirculated) it is not mixed with the fuel (regular car gas) but is pressure fed to all moving parts.

The original service manuals call for a castor oil of medicinal quality, but I gathered from your articles that there is a difference between Baker AA and medicinal castor oil. We have only been able to find medicinal castor oil so far. Would this be sufficient in this case?

Any information you can give us on this will be greatly appreciated as the idea is already being toyed with to build a Nieuport 28 to go along with it.

Awaiting your reply, I remain

Yours truly,
Robert C. Potter

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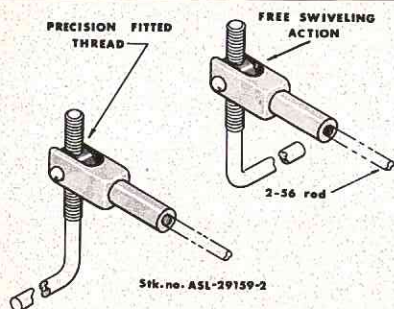
The CASE-MATE accommodates a one gallon fuel can, transmitter, props, starter battery, screwdrivers, wrenches and cleaner. It also has a built in compartment with drawer for smaller parts and tools, yet is completely compact.

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I have been receiving quite a few letters lately wanting to know if it is okay to use 'medicinal quality' castor oil — is Baker AA the same as 'medicinal quality', etc. Baker AA comes in two grades — AA standard, and AA U.S.P. (United States Pharmaceutical). These two oils are processed exactly the same, however the government requires that the U.S.P. grade be processed from domestic beans over which they can control the insecticide sprays, etc. The AA standard can be processed from Mexican and other castor bean sources. Either grade is excellent for engine lubrication. Both are used in model engine fuels. The term 'medicinal' is actually causing the confusion. The U.S.P. is used for medicinal purposes, but this does not mean that the medicinal castor oil that you purchase in a drugstore can be used for lubrication. The drugstore castors are intended for human consumption and have usually been sweetened, deflavored, deodorized, etc. This extra processing can often change the characteristic of the oil. It does not lose its lubrication quality, but the extra additives can cause varnish, etc. To use an ounce or so in a quart of fuel to break in a model engine is okay, but you would not want to use drug store castor with which to mix 'home brew'.

Back in 1918 'medicinal quality' was most likely the purest grade of castor available. Castor oil processing, like everything else, has come a long way over the years. So with better grades available, I would be sure to use one of these. If your 'medicinal quality' oil has a U.S.P. rating, or the Canadian equivalent, it should work fine.

If you do decide to go ahead with the full size Nieuport project, how about sending us some progress pictures. I am sure the scale readers would really go for this.

I have a Veco 45 R/C which is about 7 years old but I have only used it for the past 3 years. I have run about six gallons of fuel through it. One gallon was 75% methanol and 25% castor oil. Four gallons was RO-GO with 5% nitro and one gallon was Peter Chinn with 5% nitro. The engine has never been run on the lean side and it has always performed exceptionally well. From week to week, I have never had to move the needle valve more than a couple of clicks in either direction to gain good top speed. It has always been easy on glow plugs.

The trouble I have had started about 8 flights ago. It would start alright and run at full throttle but at idle, it would quit after a few seconds. In the air it would fly fine but would quit on landing approaches. On the sixth flight, I had a glow plug burn out. On the seventh flight which was two weeks later, the engine ran fine on full throttle and low throttle. When I tried to restart, I found the glow plug element torn loose from the bottom of the plug. The eighth flight, the engine

quit in the air at full throttle. When I checked the plug, the whole end was smashed. I removed the head and back plate to find the bottom of the piston broken and the baffle on top of the piston missing. These pieces were found throughout the engine.

What happened? Is this the life expectancy of most engines?

Sincerely yours,
Floyd Hipshire, Jr.

Floyd, from the description of your trouble I am sure that you had an idle bar come off of the glow plug. This does happen occasionally with the idle bar plugs that use the welded bar. When this happens it can really tear up an engine as you have found out. For some reason the bar does not just blow out of the exhaust as one might think, but stays in the engine usually getting caught in the baffle slot in the head. This breaks the baffle which starts the destruction of the engine.

I am just getting started in R/C. I am building a Tri-Squire, and my Heathkit should be in the mail by now. I have been told that my O.S. Max .19 will have trouble pulling my plane and radio. I need a muffler but I don't think I can afford any power loss although I do want the plane to go as slow as possible. After reading your article on mufflers (July) I figured that either the Silence-Aire or the K & O would be my best bet. However, neither of these mufflers are made in a .19 size. I am wondering if a K & O (they come the closest with their 29) could be modified to fit my engine and still work properly. If modification is not wise or if my plane will not be as under powered as I have been told, what muffler would be the best?

Thank you very much,

John R. Galloway

An OS Max .19 would be marginal power for your Tri-Squire unless you build it very light. If you want to stay with the .19 size, the Veco .19 will turn a lot more prop. A .29 would be a better choice as you could always throttle back if the power was too much for you. Many beginners will make the mistake of underpowering their airplanes so that they will fly slow, and then get into trouble because they stall on take off, etc. Nelson Model Products, who has an ad in this magazine has a line of mufflers for the small size engines.

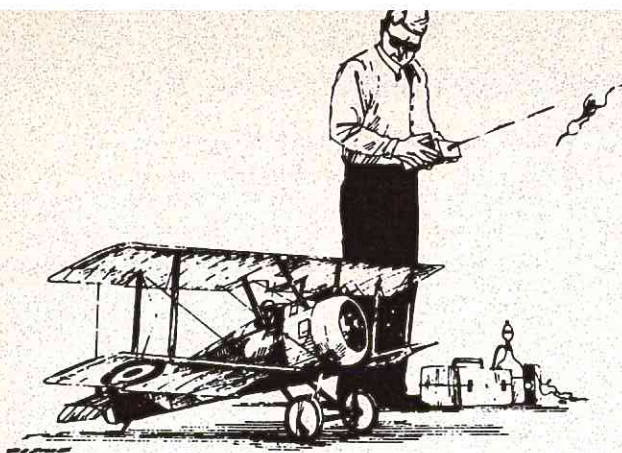
Before you started writing I'm afraid I thought of my engines as a thing to pull my precious radios around. I did things to them I wouldn't think of doing to my servos. To make a long story short you've stopped me from over tweaking and hot runs.

One problem remains. At least for us here in Florida. Sand, sand, sand. Finest grittiest stuff you can imagine. It really makes me miss the alfalfa of Sepulveda. We don't have paved runways and after 27 years I still miff a landing once in a while.

Mufflers keep the stuff out of exhaust but would like your thoughts on some type of air cleaner for venturi? Maybe you might bring this subject up in the column.

I'm running a mild form of pressure off

(continued on page 82)



by DAVE PLATT

(Designer — Top Flite Models)

SCALE IN HAND...

As promised last month, we are going to deal in this month's column with the making of spinners for scale models. But before we get into the actual sequence of the operations, we have a few words of advice, or warning, (call them what you will), concerning spinners.

The first item concerns safety. It is quite probable that the reader is going to interpret this feature in terms of spinners which are beyond the regularly-produced commercial spinners in size. And, if so, this is O.K., because modelers, even scale modelers, do not look for work, and if your subject calls for a spinner of up to 2½" diameter you'll most likely use a commercial one.

No; we are talking here of the 3½" to 5" diameters commonly found on the aircraft from 1935 or so onward: the P-51's, Spitfires and so on. This being so, it's a wise precaution to remember that these spinners get quite heavy, and if the fastening method is not adequate, and if one were to fly off the engine while it were running, things could get dangerous. If you don't use the method of fastening we show, make sure yours is at least as good.

The other warning concerns shape. Believe this or not, it is possible for a well-informed aviation fan to recognise and identify many dozens of aircraft from a photograph of its spinners alone. From this, we may deduce that even a spinner has its own individual character, and its shape combines with everything else on the ship to make it what it is. We've all seen models, or photos of models, where the spinner was a giveaway. For example; a P-51 model with a pointed P-40-style spinner looks wrong and is wrong.

So the moral here is simple — take care when making your template. Another half hour spent getting the shape dead right is time well spent.

Alright. Let's get to it!

As we usually do in such cases as this, we're going to say again that the method here described is obviously not the only one. It may not even be the simplest or the best one, for all we know. It only represents one possible way: it's the method the writer uses and it does give good results.

a) Make an accurate engineering drawing of the entire spinner, including back plate and fastening-screw. As already noted, take care to get the shape right! Fig. 1 shows a typical layout.

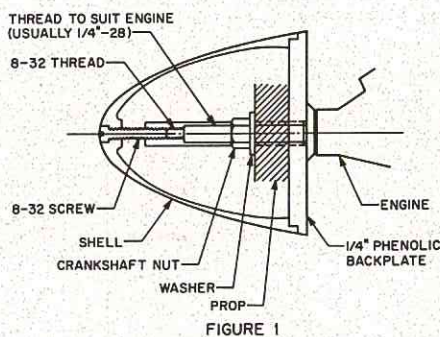


FIGURE 1

b) Make a chucking-shaft from a piece of ½" dia. metal — see Fig. 2.

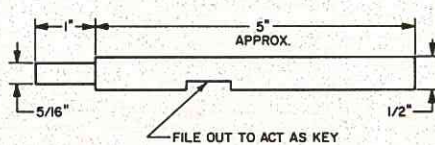


FIGURE 2

c) Find a round container (expedient — not the wife's best coffee cup!) of suitable diameter and depth to hold the spinner. Drill a 5/16" dia. hole in the center of the bottom. Fig. 3.

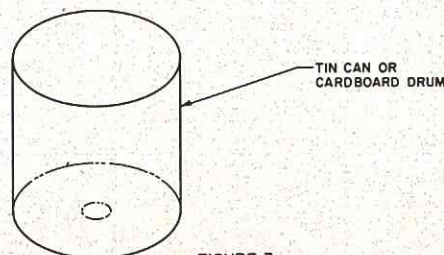


FIGURE 3

d) Support the chucking shaft so that it is centralized in the can with its narrow end poking out ½" or so. Mix enough glass fiber resin to fill the container, pour in and allow to cure. See Fig. 4.

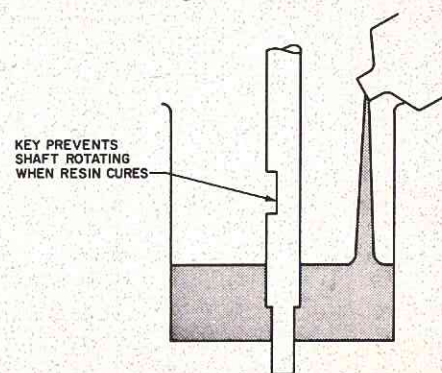


FIGURE 4

e) Make the template of the spinner shape from styrene sheet or card, as shown in Fig. 5.

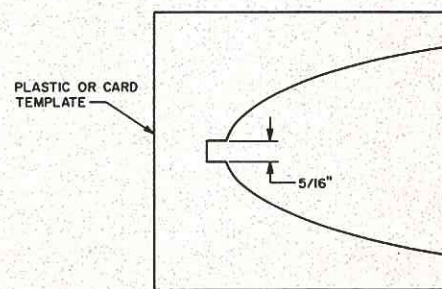


FIGURE 5

f) Cut away the can from the hardened resin block and mount in the lathe, turn the resin at fairly slow rate while converting the big resin block to a beautiful spinner

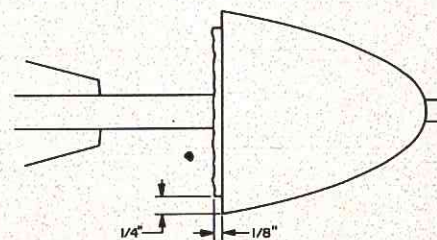


FIGURE 6

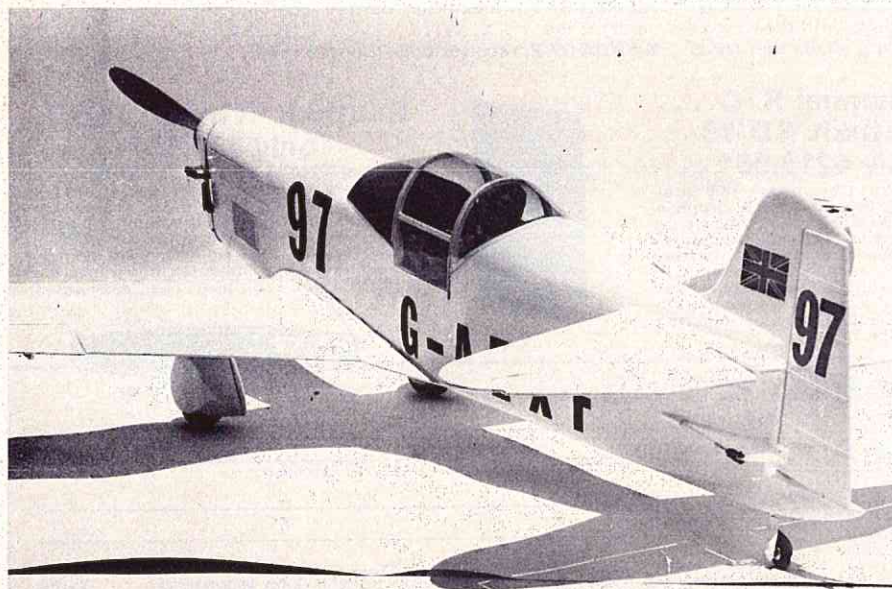
(continued on page 85)

The "Golden Age" of R-C sport flying is here! Especially what can be labeled as "sport-scale" flying. Radio technology and material advances have made it so. Even the pure novice can buy into this great sport for a minimum investment and fly magnetic actuator, proportional rudder airplanes. With this light weight, simple equipment having fantastic reliability by standards of only 5 years ago, he can learn the principles of guided flight and have a ball. For just a few dollars more, he can go with a GG set-up which will give fairly good proportional rudder, elevator, and motor control. Again, simplicity and reliability are now outstanding due to people like Herb Abrams and the folks at Min-X, Controaire, and Ace. Very recently available, and I think the biggest boon to the younger sport flyer who has limited funds and time, is the two actuator pulse system. The renaissance of the old "Kicking Duck" system as it used to be referred to, has to be credited to the beautifully engineered Rand Dual Pack. This package of twin actuators and built-in decoder electronics, used with any of several transmitter-receiver combinations, gives fully proportional rudder and elevator plus trimmable throttle control. Again simple, lightweight, and relatively low in cost. Finally, for those who don't want to be limited in any way by their radio gear and have the additional money, the new minaturized digital systems are the ultimate, providing fantastic performance in extremely small, lightweight packages. Until very recently I had stuck pretty much with pulse rudder and GG systems, not for economic reasons but principally due to the fact that I personally prefer compact models. Big airplanes with .45 and .60's up front, a gallon fuel tank, and a station wagon full of support equipment just turned me off. The new mini-digitals compete pretty well weight and space-wise with any of the single channel stuff giving three controls.

What this all means to sport flying of course is that you can fly what used to be considered small (or even Mickey Mouse) sized airplanes with the precision and reliability of the big, heavy gas eaters. "Small" fields are big enough now! And best of all, from my view-point at least, is that there is no longer any excuse to avoid scale models, even for sport flying. They don't have to be large, expensive, year-long projects to handle full-house gear. Nor are you restricted to the use of stable, high wing-type airplanes because of equipment limitations. So, whatever new gear you may have or are planning to buy, let yourself go and try a sport-scale airplane. They can fly just as well as the balsa boxes and will give you a lot more kicks.

The Mew-Gull presented here was selected as an outstanding sport-scaler which covers the GG thru small digital equipment range. Using a .15 and rudder plus elevator control it's a spry performer with GG or dual actuator systems. With power up to a .19 and one of the small digital sets, all the maneuverability and speed you want is available. In this case, coupled ailerons and rudder (C.A.R.) can be used if desired to give smoother, more precise rolling maneuvers.

To be perfectly honest, I selected the Mew-Gull for my next sport-scale project strictly on the basis of looks. I saw a 3-view and some pictures one evening in Walt Mooney's garage (also known as the Southern California Aviation



PERC

Don Srull's .19 P
In Vintage Aircra



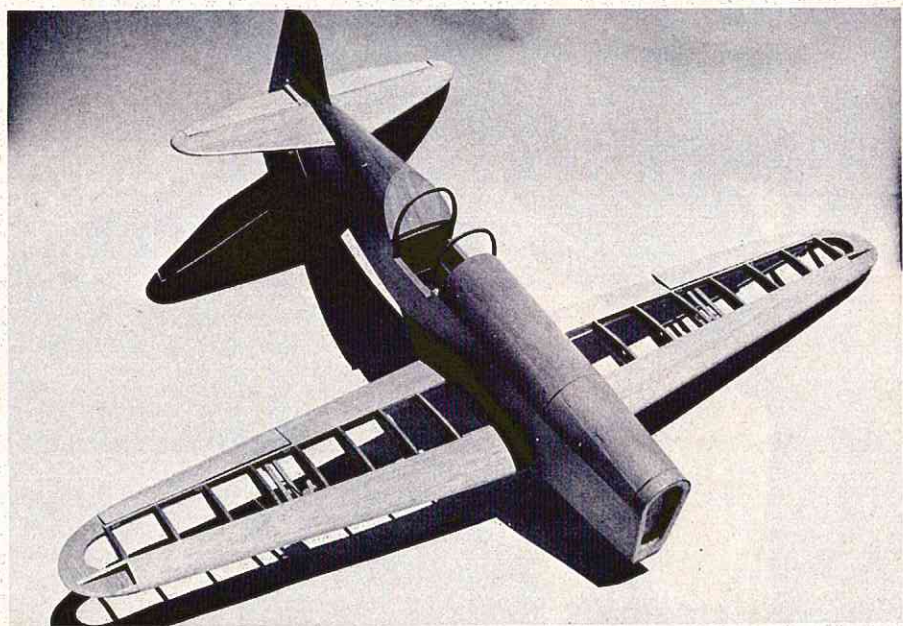
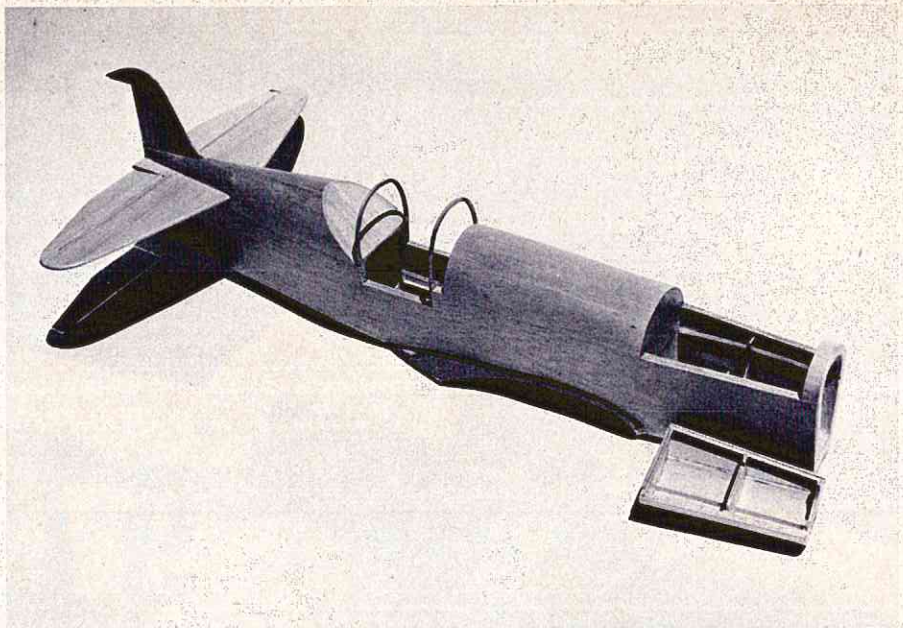
VAL MEW - GULL

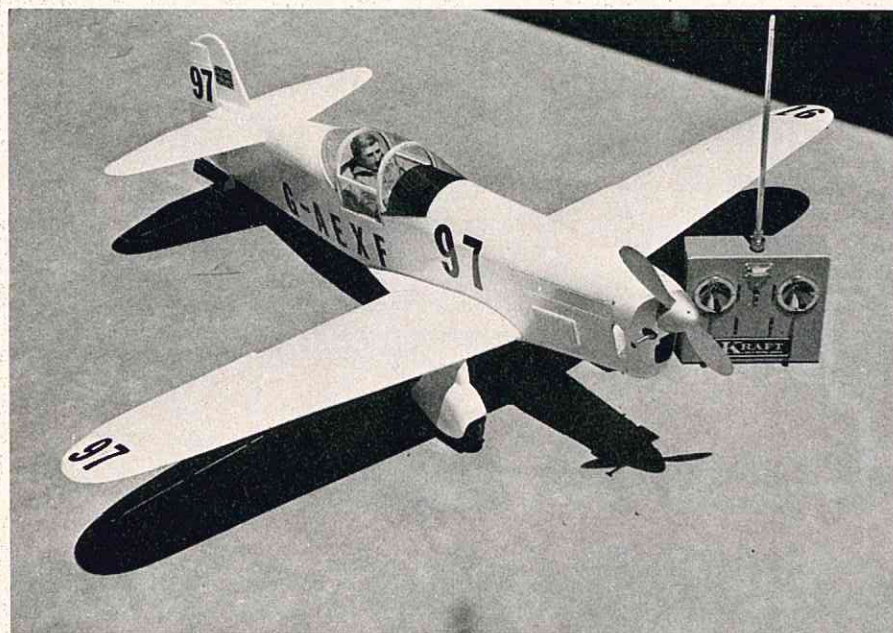
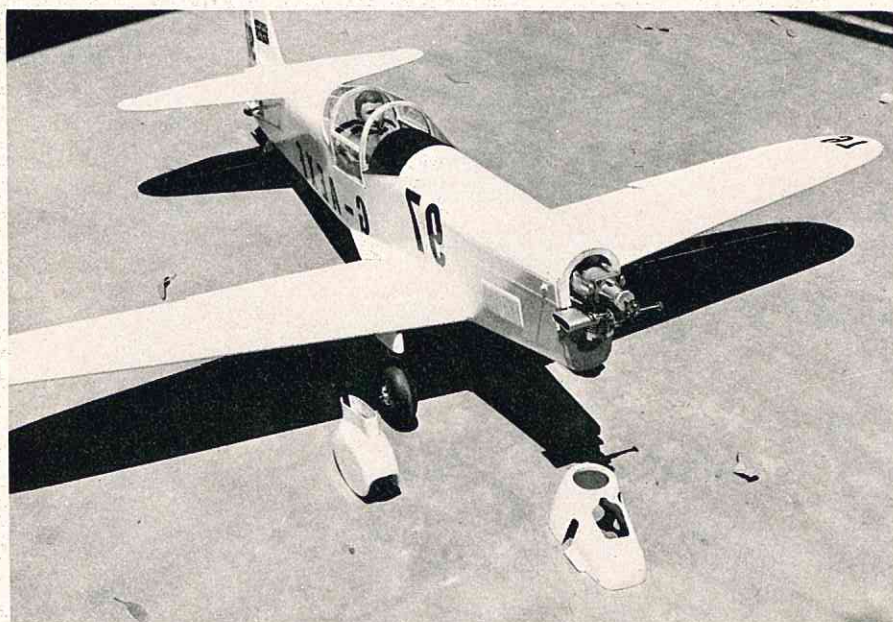
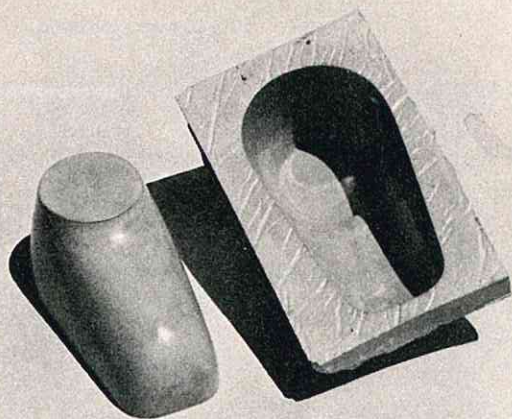
d Sport-Scaler Is A Must For The Sunday Flier With An Interest
or Lightweight Digital Proportional Or Galloping Ghost Systems.

Archives) and decided I had to build one no matter how tough it would be. I only noticed its fine model characteristics while drawing up the initial plans. Some of these nice features are the long nose moment, avoiding the usual tail heavy problems of many scale aircraft. Another is the ample 5° scale dihedral. This is why the model can easily be flown with rudder and elevator only if desired. Finally, the fuselage has sufficient volume for any radio gear, plus two fists and an arm!

The prototype model shown in the pictures does have two slight deviations from scale at which scale purists might sneer. The horizontal tail surfaces were enlarged about 20% to give a stability margin for the GG systems. With Digital systems I think the scale surface area shown on the plans would be perfectly O.K. The other scale sin is the steerable tail wheel – the real ships had a skid. Since I usually fly off of hard surfaces, a tail wheel was necessary to have effective ground steering capability. Another less noticeable variation is that the wings are only partly sheeted and part fabric, while the actual aircraft were all plywood skinned except for control surfaces. If one wished, by correcting the above deviations and adding a few more authentic external and cockpit details, the airplane could be easily turned into a competition-type scale model. However, its original purpose was strictly for fun flying.

In addition to being one of the classiest looking racing airplanes ever built, the Percival Mew Gull has a rather illustrious and interesting history. In 1934, the racing Mew Gull was the first British civil aircraft to exceed 200 miles per hour, and was actually faster than contemporary fighter aircraft. In addition to Capt. Percival, the plane's creator, making fastest time in every King's Cup race from 1934 to 1937, a Mew Gull flown by Alex Henshaw won the 1,012 mile race of 1938 and made fastest time, averaging 236 miles per hour. In 1939 Henshaw also broke the England – South Africa – England record by flying the 12,600 miles in 3 days, 6 hours and 58 minutes. The prototype Mew Gull was designated P.2 and first flew to test a wing section with a Napier Javelin engine. This aircraft was eventually completely rebuilt into the P.6 with a Regnier engine, later changed for a D.H. Gipsy Six I. Eventually three more P.6's were built and they all began competitive racing. The most famous of the aircraft, the ZS – A H M, first appeared in 1934 and was a consistent winner. In 1937 this aircraft became G – A E X F and raced until 1939 when it was dismantled and



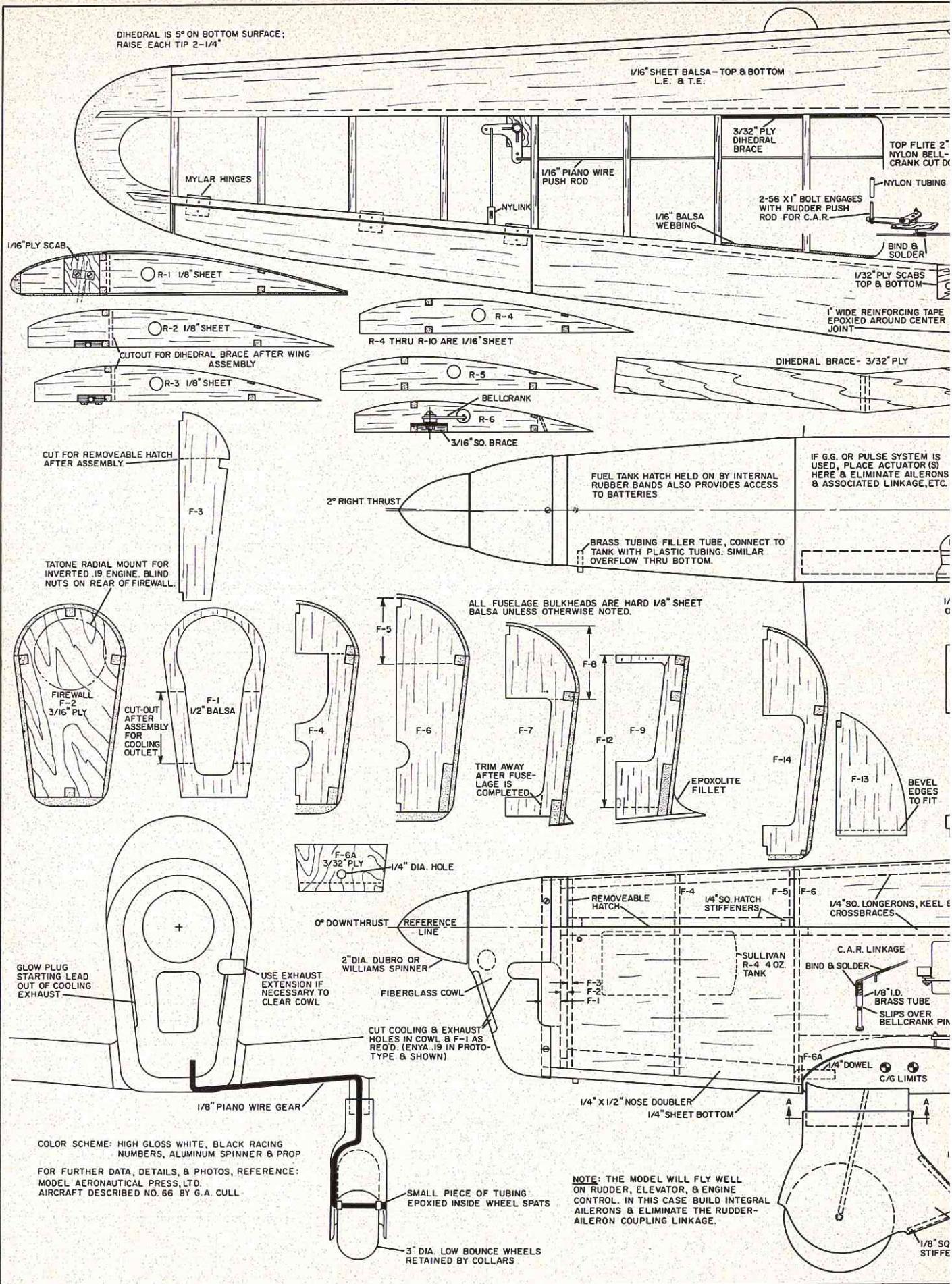


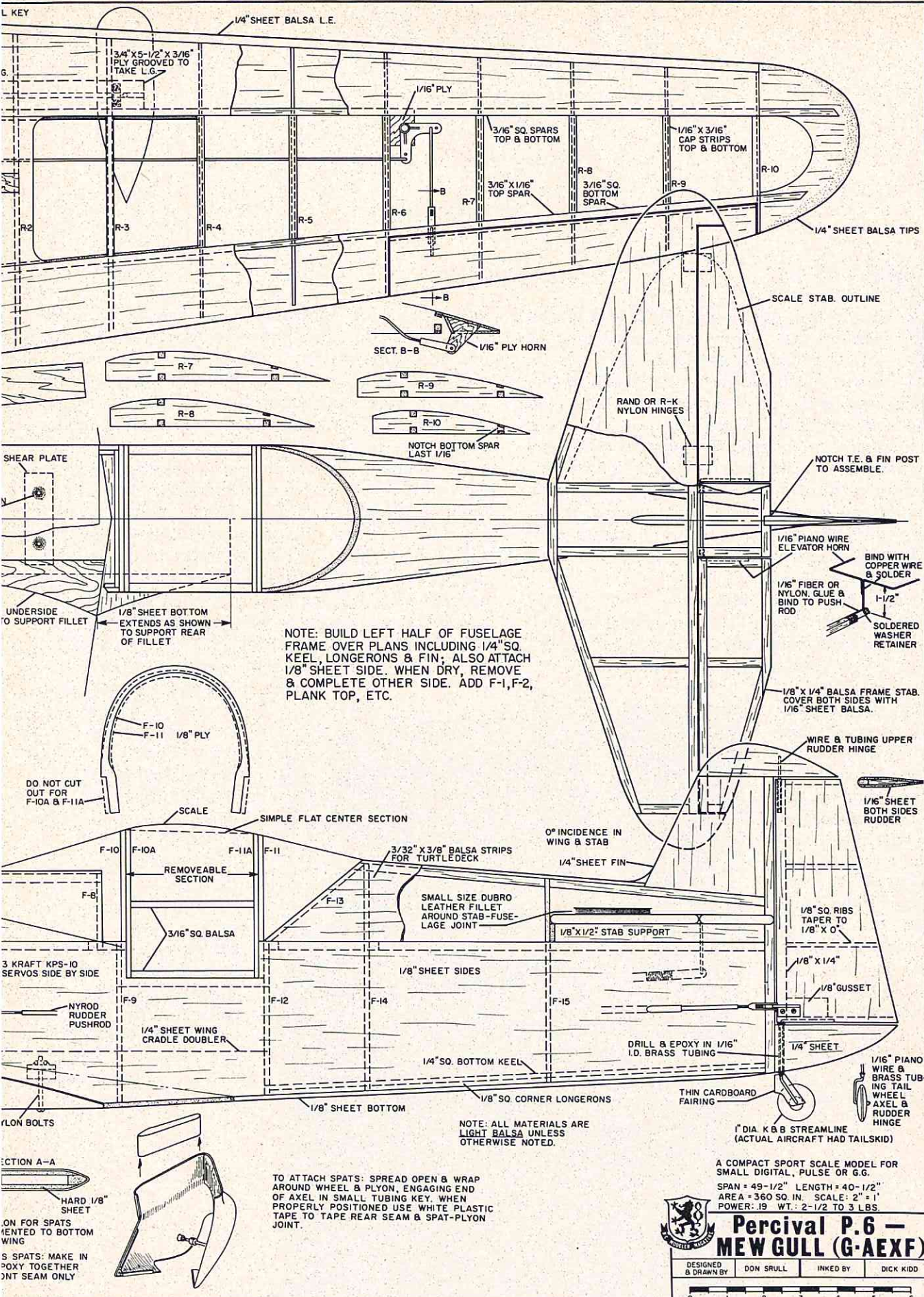
stored in a stable in France during World War II. In 1951 she was racing again, being modified periodically to keep it one of the hottest racing machines of the 1950's. The configuration and markings of G - A E X F, circa May, 1953 were used as the basis for the model presented here. Several pretty good photos and a three view were found in "Aircraft Described No. 66" which appeared in an old Aeromodeller magazine, reprints of which are available from Model Aeronautical Press, Ltd. The specifications of the Mew Gull are as follows: 24 feet 9 inches span; 20 feet 9½ inches in length; 1,850 lbs. max. weight; 256 m.p.h. max. speed and 225 m.p.h. cruising speed. The machines were of conventional all wood construction and covered with plywood, except for control surfaces. The particular aircraft modeled was glossy white overall with black racing numbers and dark blue letters positioned as shown in the photographs. The spinner and prop had a natural dural finish. So, if a sport model of a beautiful, though relatively unknown, racing airplane that flies like a dream sounds tempting, the Mew Gull is for you.

Before the actual construction begins a few comments are in order. First off, even though the model, as presented, has no especially difficult building or flying quirks, it is definitely not a first model - either building or flying. The simple balsa boxes are the winners here for learning the principles of model construction and R.C. flying. Secondly, no matter how many models you have built and flown, you can make this or any other airplane easier to build and much easier to fly if you keep it light. Unfortunately, many of the words written about the advantages of large models over small models concerning Reynolds Number effect, penetration, gust susceptibility etc., etc., are complete hogwash. For a given design type one of the most important (and controllable) variables is wing loading - the weight per lifting surface area. Whether 3 foot or 6 foot span, many good flying scale models at below 16 ounces per square foot would be treacherous beasts at 20 ounces per square foot. Free flight scale modelers have always been well aware of this effect, but the R.C. community, I think, has only recently fully appreciated its importance. The two most recent R.C. flight trainer airplane designs featured in RCM and another (unmentionable) magazine have one principal characteristic in common which will contribute much to their success: light wing loading. Add very much weight to these designs and

(continued on page 71)

DIHEDRAL IS 5° ON BOTTOM SURFACE;
RAISE EACH TIP 2-1/4"





FULL SIZE PLANS AVAILABLE --- SEE PAGE 88

LI'L HONCHO

The Model That Almost Didn't Happen

BY BOB TALLEY

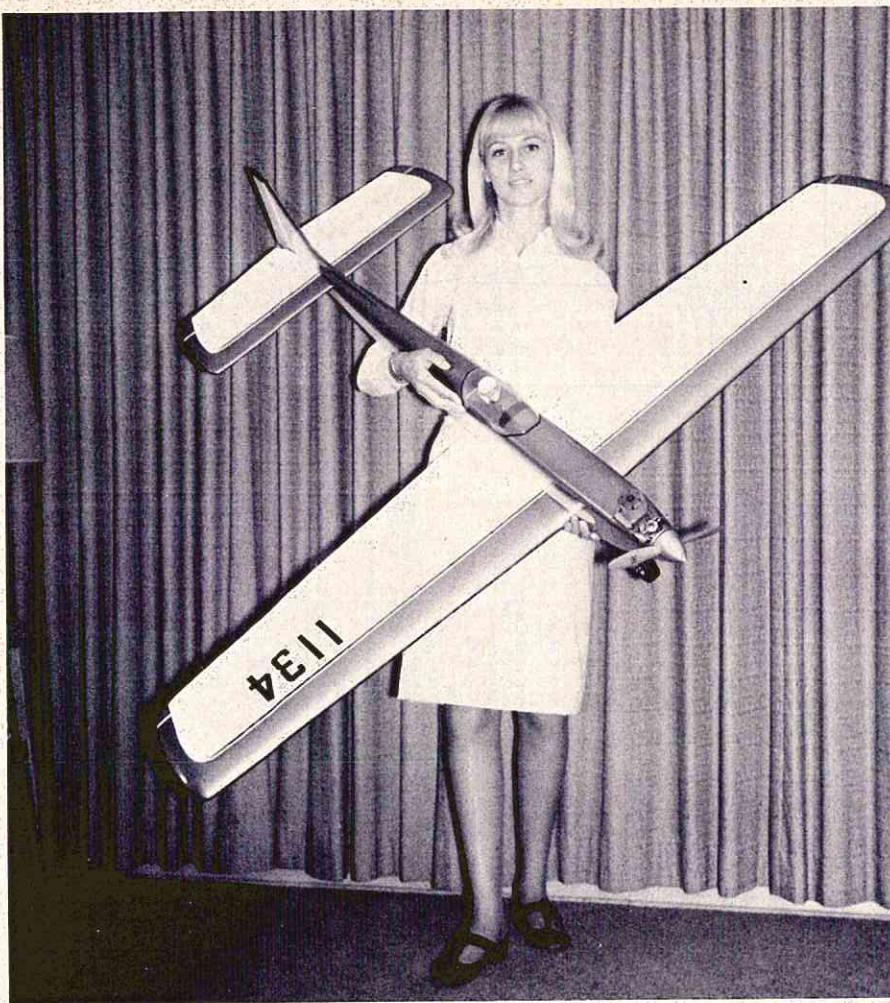
This is the story of a model that almost didn't happen. Now that it did happen, a lot of my later designs almost "aren't". It's so much fun to fly that I hate to take my radio out and put it in anything else. Lil' Honcho will probably never win a contest — it wasn't designed to. It probably wouldn't win any beauty awards — its about as curvy as a two-by-four and just about as subtle. It was designed to do only two things and do them well — and it does. It was designed to: (1) Be capable of doing all the standard AMA and FAI pattern maneuvers, (2) Do them low and slow. Why, takes a bit of explaining.

Having had this obsession — er — "hobby" called R/C since 1953, I've naturally progressed from the old escapement days right on up to propo. However, a few years back, competition wise, I cast my lot with Class II. In 1968 this suddenly became a lost art. Just about the time I was beginning to win a few contests regularly, the event was jerked out from under me. I was so mad (I still am) I continued to fly Class II models in A and B contests for over a year. Finally I built myself a few .60 powered wing-wigglers and entered them in the contests. I also continued to fly a little three foot span shoulder wing model

with only REM controls for fun, and as a comedy act between rounds of the contests. After the last contest of the season I sat back to appraise what I was actually accomplishing. I was having a ball with the comedy act but I wasn't winning any contests. Oh, I'd do OK for a few rounds — until the pressure got a little tough. Then at the most crucial times and usually in the simplest of maneuvers, I'd fall back into my old Class II reflexes and blow it. Mulling this over and over I came to two conclusions. First, I just couldn't mix a Class II comedy act with a Class III type contest machine. The reflexes and timing required were just too different. Second, I needed one heck of a lot of practice with an aileron type low winger just to kill these old Class II reflexes once and for all. It was time to fly or cut balsa! It was right about here that Lil' Honcho almost didn't happen. I already had two or three .60 powered contest bombs laying around the shop and the foam wings all cut for what I hoped would be a new design that would be superior to almost anything flying in contests today. The easiest way would be just to take one of these and go out and practice until I had it licked. As a matter

(continued
on page 56)



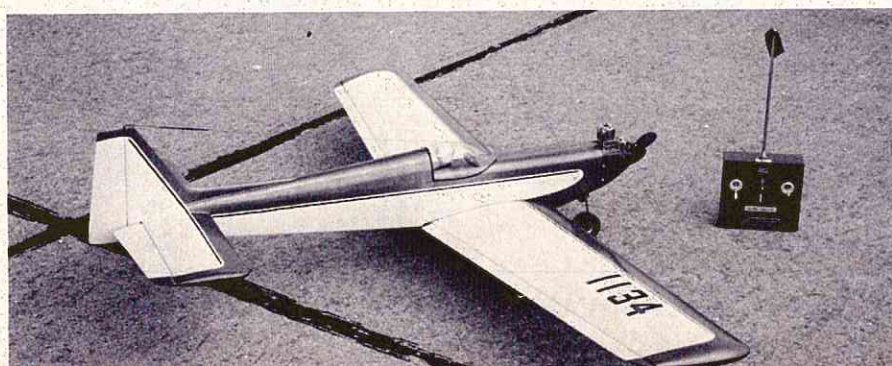


Linda Greer with Magic Dragon.

MAGIC DRAGON

Want to get in the dragon taming business?

Here's how . . . By Alan B. Greer



How's a Dragon grab you? No, No, Clyde, not the fire-breathing Gespitten, Gesmoken maiden snapp'en type; — a friendly flying machine sort; answers to the name, "Puff". Kind of a pretty thing and flies great. So, O.K., stay with us and we'll put you in the dragon taming business.

This beast has an ancestry that runs back to 1959. Over the years I've thrown up (now there's a good word for design) differentiated airframe assemblages (try, "toy airplanes", Clyde) all shooting for that elusive quality of flying that happens to be, "just right". Leaving out some of the less interesting designs, let's take a look at some of these weirdo's on the way to the current Dragon.

First off, back in '59, there was the "Big Meteor". I had a wild idea for a great big, well streamlined, low wing-loaded airplane, that I could stunt right in front of the judges noses and, "Boy-O-Boy", is that what I got. This thing had 1200 square inches with an all-up weight of under 5 lbs., and a 12% thick NACA 0012 symmetrical airfoil. (Yeah, under 5 lbs. with wings that big!) The whole monster was built like an overstressed eggshell with the thought in mind that, the first time I landed hard, it would probably explode into twelve jillion pieces. Fortunately, it had a long successful life, 'til I got it stuck in a flat spin one day and, would you believe, a jillion pieces! Anyhow, it was a real interesting design concept. I used a K & B .45 to provide the urge, such as it was, and it did just as I figured; complete stunt flights at altitudes never over 50 feet. Anyhow, I left it for a little more conventional approach.

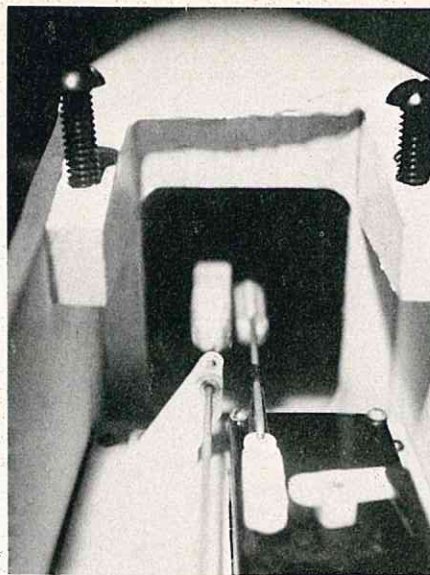
Yeah, conventional, like maybe I went for the world's first mass produced fiberglass fuselage, or therabouts. Remember "Technical Model Products Company" and the "Meteor"? Well, that was the beastie. Shoulder winger again, 750 square inches, NACA 651-212 low lift airfoil. I built three or four of these jobs and we turned out over six hundred kits before we packed up the show for lack of customers. This was quite an interesting airplane. The particular airfoil was virtually stall proof. You could just keep dumping the tail down lower and lower on approach and never really drop out. Unfortunately, when

you tried to do outside you got some wild, egg-shaped doughnuts and the inverted flight was something to behold — from an underground trench. It flew this thing around with both a K&B .45 and a Super Tigre .56; also had a Johnson 32 and Lord knows what else in it at one time or another. Built a “B” version, and when I propped up the trailing edge of the wings to give me 0-0 angular set up it flew a whole lot better than the kit job.

Next along in the series, I built a thing called a “Trident”, which was another 750 square inch, with a shoulder wing and the thrust line set up on the center line of the wing, with kind of an “over-cowl” that came back and quit in the middle of the wing to make the cockpit/instrument board. Yeah, I know it sounds kind of strange — it looked kind of strange, too. This thing used an NACA 0015 symmetrical airfoil, ran a K&B .45, weighed in at about 5 lbs. 4 oz. and it was just a real dandy flying machine. The only problem was, the 0015 airfoil didn’t give me quite what I wanted on landing characteristics. When you flared it out it would s-t-r-e-t-c-h the glide and you’d land somewhere down into the next county.

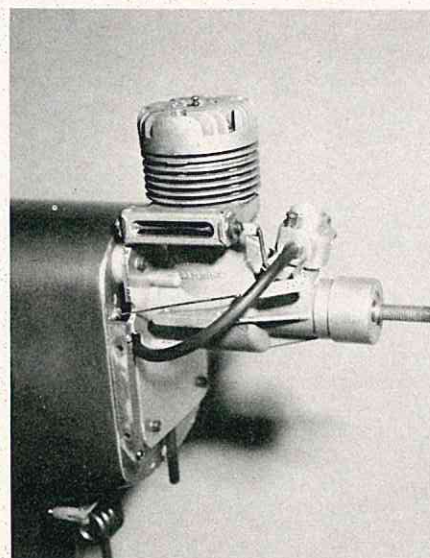
So, undaunted, I cooked up the first of the “Comets” — Comet 1, which was really a Trident with the wing moved down to the bottom — and I went to an NACA 0018 symmetrical airfoil. This job had about 780 square inches and as I recall weighed 5 lbs. 5 oz., or thereabouts. This was a pretty decent flying machine, too. An 0018 airfoil works just great as long as you keep your wing loading down under about 18 ozs. per square.

My flying buddy, Charlie Bossi says, “Let’s make two”. In a weak moment I said, “Why not! I’ll build the fuselages and you build the wings.” and away we went. The only problem was, I didn’t say what kind of wing we wanted. So very unscientifically he turns us out a pair of 750 sq. inch wings with a NACA 2415 airfoil. While I came up with a turtle-back type fuselage — looked quite a bit like the Dragon. We named this highly unscientific airplane “Comet II”, and it set back the science of aerodynamics or aerodesplurgics or whatever I’ve been indulging in, by multi many years by simply flying real, real well. Both airplanes weighed in at about 5½ lbs., and we used Veco .45’s for power. We were using reeds in those days (No, no,



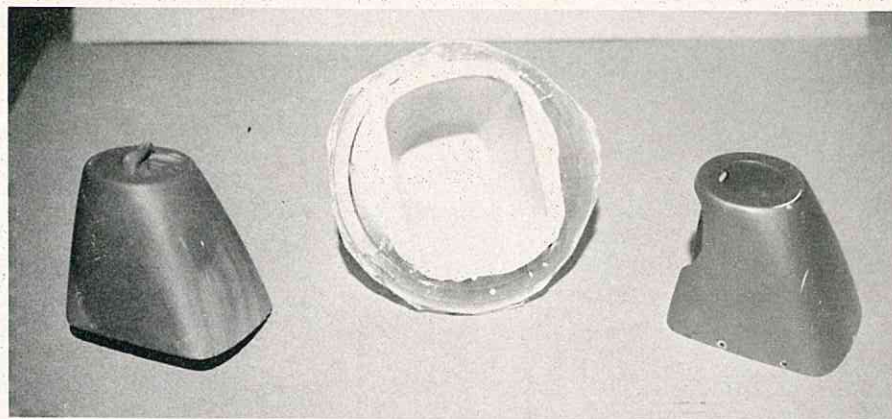
Wing hold-down dowels and nylon horn fairlead on elevator pushrod.

Nose wheel and brake installation.



Supre Tigre .56 engine installation with cowl removed.

Cowl steps: Baloon covered balsa form; female mold; finished cowl.

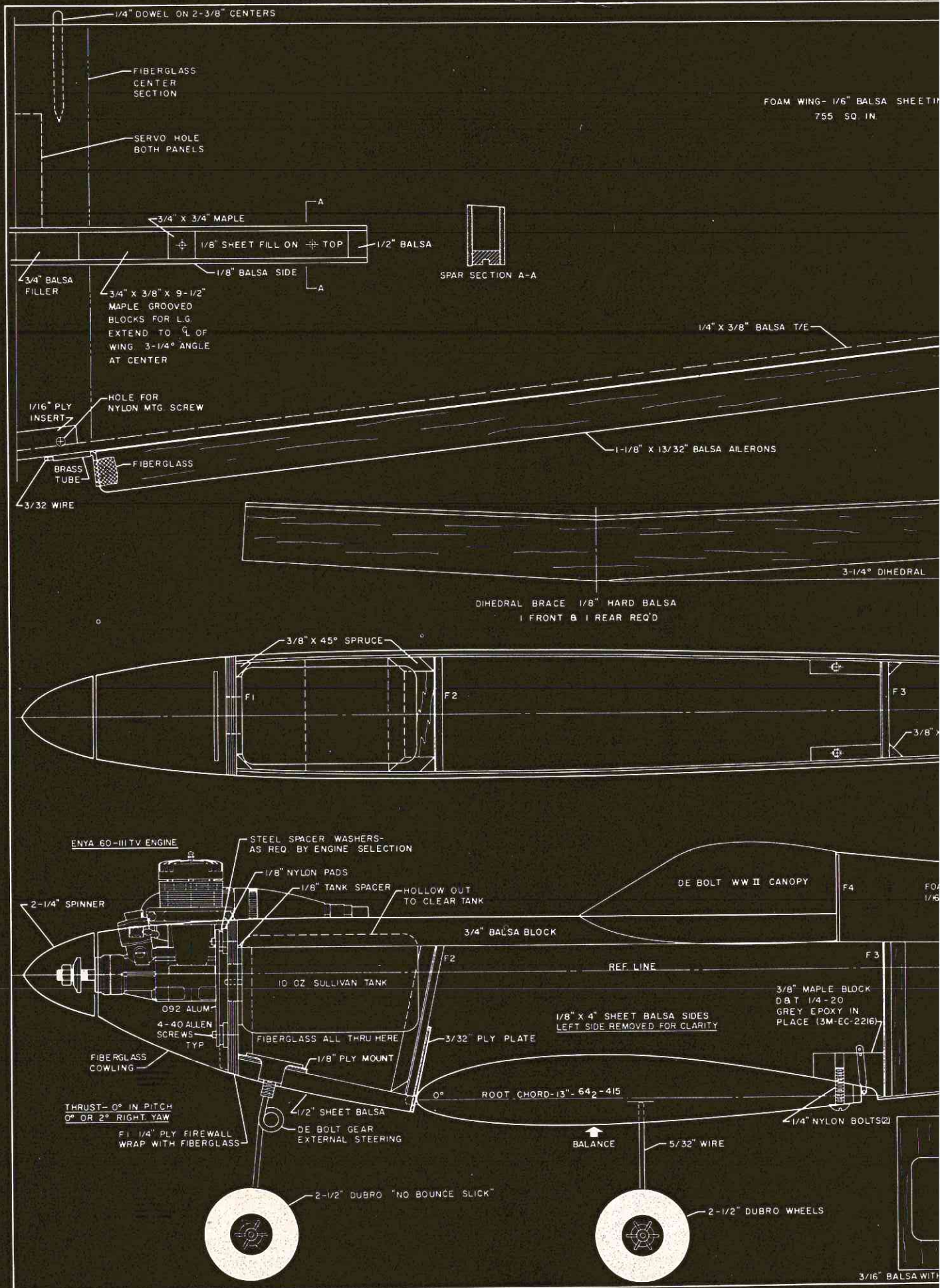


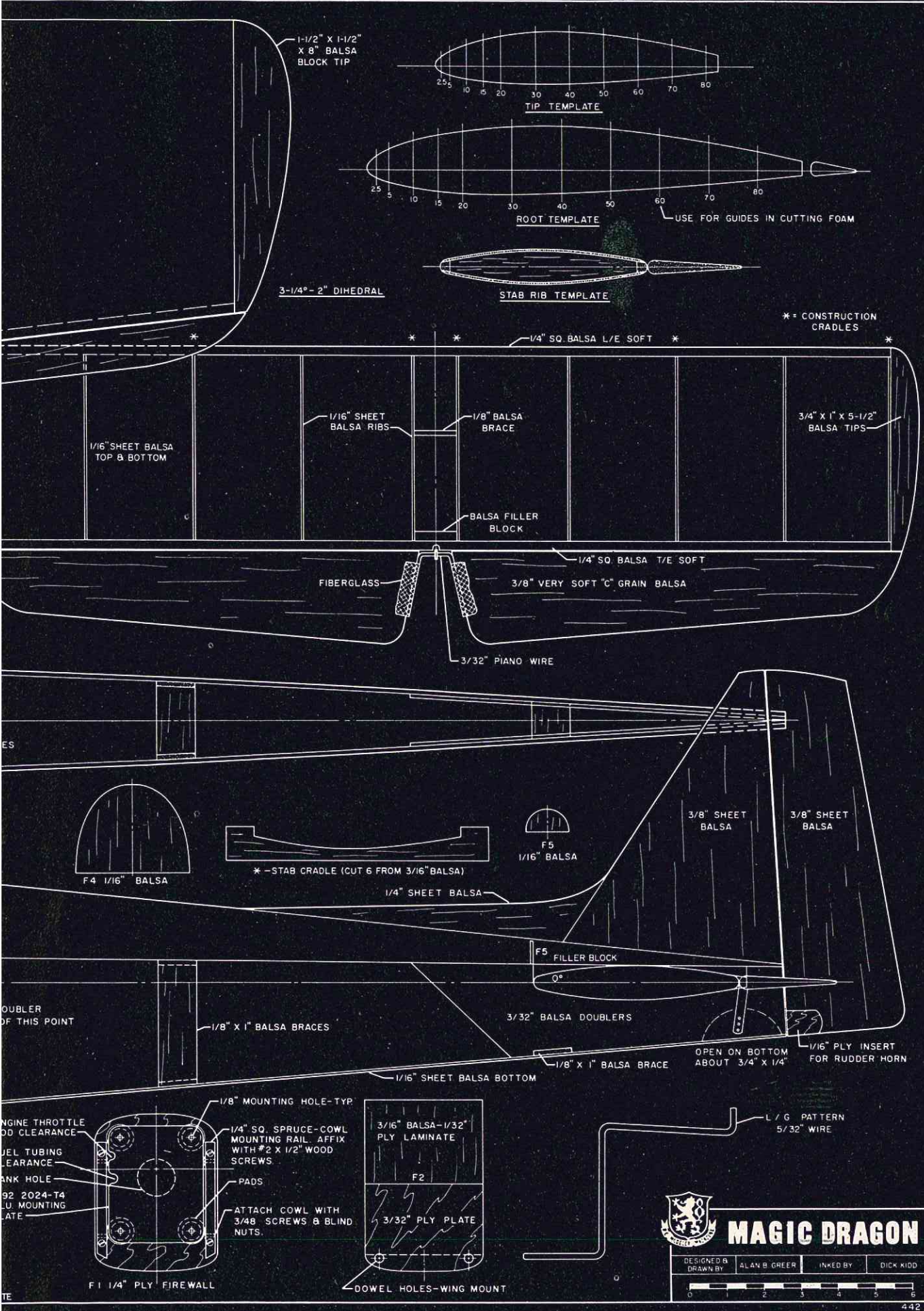
Clyde, not the kind they found Moses in, — the kind that go “Twang” and then quit wobbling when you’re inverted about 5 feet off the deck).

Since we had a good thing, my immediate effort was to see if I could louse it up by going scientific and I came up with Comet III which went all the way down to 625 sq. inches with a 633-015 symmetrical airfoil

with a Veco .45 up front. It went faster than free booze at a lumberjacks convention! The only way you could land it was to aim it towards the ground and hope you had the reflexes to get it more or less flared out when the wheels touched. I never will forget the sound it would make in landing in our grass field. Sort of like a wet pig

(continued on page 60)





MAGIC DRAGON

DESIGNED BY ALAN B. GREER INKED BY DICK KIDD

0 1 2 3 4 5 6



SPOKANE 1970

'To promote modeling as a recognized sport and as a worthwhile recreational and educational activity . . .'

- - - Brig. Gen. Robert F. King

By JERRY KLEINBURG

SPOKANE — and its meaning . . .

Everyone agreed — the 1970 Spokane Internats gave modeling a new direction and impetus while also giving promise of vigorous leadership to bring about significant growth to modeling throughout the country.

These were the principal thoughts of those on hand in Spokane on June 13 and 14. And as it is, they're still talking about the flying and events hosted by the Washington Air National Guard and the Spokane Barons.

To put the contest in its full perspective, the Spokane Internats is part of a comprehensive program sponsored by the State of Washington through the National Guard and its Academy

of Aerospace Science and Modeling to bring together modelers, educators, civic groups, business, industry, and government so as to enhance development of all aerospace interests. And they're serious about it. Serious enough to allocate a sizeable budget, provide a large piece of land on Camp Murray near Tacoma, and assign the best organizational talent to plan and execute the program! But more on that later — first, here's a rundown on the flying and the competition . . .

Whit Stockwell of Los Angeles, California, Junior U.S. RC Champ, repeated his 1969 performance to once again win the Governor's Trophy for highest point accumulation at the Internats. The 16 year old RC

whiz took wins in Pattern, FAI Pylon, and Scale to top the 110 RC entries in 4 pattern events, 2 pylon events, and scale, along with 103 entries in non-RC events also staged at the 1970 epic meet. The weather possibly prevented Whit from winning a trophy in Formula I since his K & B 40 powered Minnow was in top form for the contest . . .

Sharing top honors was AF Capt. Dean Kroger who gratified his fans by edging out an impressive field in the D Expert Pattern event. While weather may have also played a role in limiting the performance of Dean's competition, it didn't stop this "3rd generation" RC competitor from Great Falls, Montana from conclusively showing

his emerging flying talents to 'old timers' such as Doc Brooke, Phil Kraft, Cliff Weirick, and Jerry Nelson. The performance wasn't lost on the current crop of champs, Larry Leonard and Harold Tom of Canada, either. While other 'contemporaries' such as Norm Page and Simon Dreese took note of Dean's work. "4th generation" newcomers — Tom Walker, Paul Cole, Roger Hooper, Chuck Pilkenton, Doug Rankin, J.W. Schuy, Bob Smith, Bob Root, among others — were also giving close attention to the quiet Kroger pattern style.

Ralph "Doc" Brooke — the Seattle dentist — coming back from his 1968

and 1969 pattern "retirement" started to regain his World Championship by taking a strong 2nd in D Expert followed by Larry Leonard, Norm Page and Harold Tom of the 1969 Canadian FAI team. Expert flying somewhat reflected effects of the winter 'layoff' and the "feeling out" of new airplanes. Doc's new ship pretty well showed the trend being followed by top pattern contenders. The "Gladiator" continued the design style of Doc's famous Cutlass, weighs 8½ lbs. and sports KDH retract gear along with a front rotor HP 61 with its muffler. Airborne mixture control is preferred by Doc who uses the 6th

channel of his Whitley Pro-Line radio to obtain this feature. Higher weight planes appear to also be a standard trend as smooth penetration capabilities are given primary attention by expert contenders who evidently feel the greater power from the new engines is best 'spent' in large stable and steady maneuvers flown at medium speeds.

Other pattern winners were:

CN — J.W. Schuy, Bill Westfall, J.B. Howard, Paul Cole, Chuck Pilkenton.

B — Steve Ellison, W.E. Duncan, Ray Moore, Bob Root, Don Griffin.

A — Pat Holland, L. Rodarmel,
(continued to page 54)

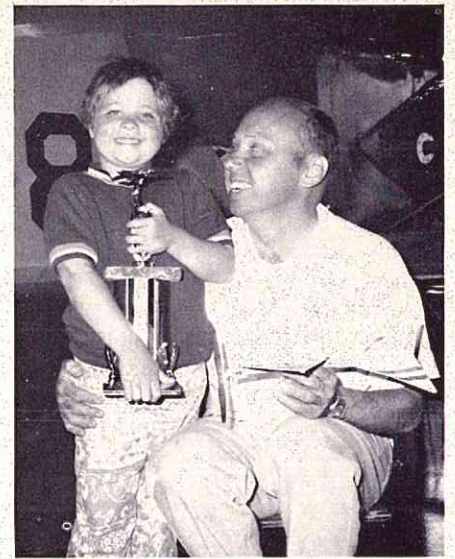


Pylon pit line-up. Great flying layout, good view for all. Bob Root and Loving Special in front. (ANG pic)



Whit Stockwell and fast Minnow.
Weather stalled win sweep.
K & B-Lee 40 power impressive . . .

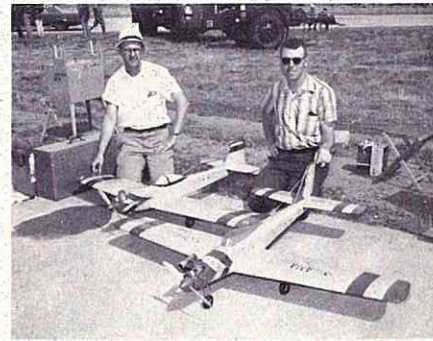
Governor's Trophy repeat . . .
Whit Stockwell took top points in
the 1970 Spokane outing.
Was 2nd in Scale, 2nd in Jr.
Pattern, 1st in FAI Pylon.
Col. Lyle Scott, C.O. of 142nd
ADW, joins with Whit and his dad,
Bob, to check hardware.



And what it's really all about:
To bring better life for future
generations. Ann Brooke with Delta
Dart trophy at Spokane.
Outflew the boys . . .



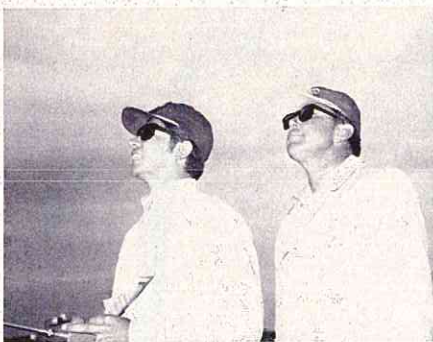
Ralph Brooke and 1970 contender.
"Gladiator" 2nd in DX. 8½#,
HP 21 & muffler. KDH retracts.
Pro-Line with mixture
control on 6th channel.



Harold Tom gets
calls from Bert Sanders during
early DX round. Placed
5th. 1969 Canadian FAI team
member flew Firebird original.



Winner's circle — Dean Koger (r)
took 1st in DX.
Triton 7#, used Webra B/H,
Kraft, KO muffler.
Tom Walker flew modified K/F



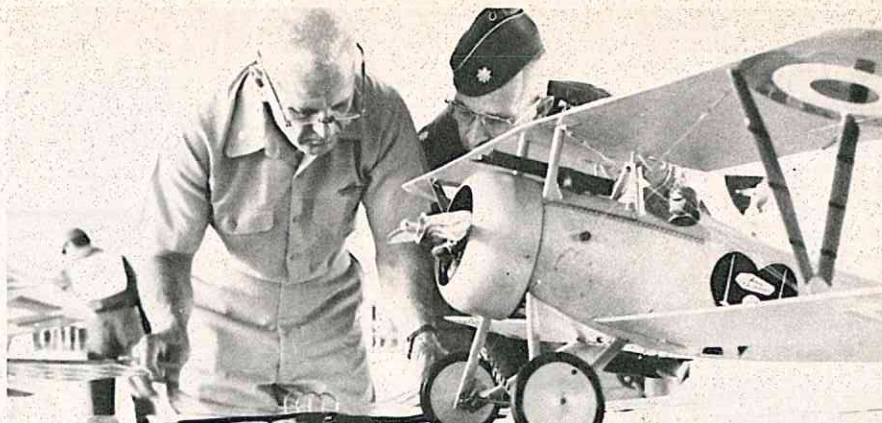
Larry Leonard, 3rd in DX pattern,
gets Phil Kraft maneuver
calls. Yellow Trash K/F III was
last minute substitute for demised
Miss Liberty Bell.

Display hangar was convenient
to flying area. Housed 23
exhibitors and tables of static
displays.





Bob Smith, AMA Pylon record holder and new Stafford Minnow. 1st in Pylon I with 1:40.2 time. Bob also 1st in Jr. pattern. A real Nats threat . . .



Bob and Kathy Root — 4th in B pattern, 2nd in FAI Pylon with pink Loving Spl.

Scale judging in process. Close attention to minute details, complete presentation, pays off. (Heller photo)



Shushonic by Bob Francis. Fuel problems kept new Francis Products racer at the starting line. Lee-K & B 40.



Maurice Woods came from Oke City for pylon. Weather limited rounds, competition. Nats next for speedy Mustang.



Tops in Scale. VECO powered Chipmunk by Simon Drees (r). Neat bird complete to Aresti Key maneuver list in Montana bird. Tom Walker assisted. A magnificent effort by a top scale modeler.



Dawn patrol. 7 AM flight found Joe Bridi and Jerry Krause cranking Proctor Nieuport. Placed 3rd. Ship 5th in Germany in 1969.



John Schuy, 1st in CN, also flew Loving Special in FAI Pylon. G21 ST 40, Micro-Avionics radio.

Mickey Stiffon of Burnaby B.C. and the BC/FC/RC brought 15 lb. DeHaviland Comet. Two Merco 61's, Royal radio, 96" span.



Bill Westfall, Seattle Radio Aero Club, and VK Nieuport 17 was 4th in Scale. 6 1/4#, ST 60. 14 X 6 trimmed prop. Micro-Avionics. Dropped bomb. Bill also 2nd in CN pattern event.



Carl Martin (r), Prexy of Spokane Barons, flew VK Nieuport with Billy Bishop markings to 5th place. ST 60, Micro. Dick Carson, RC CD for epic meet . . .



Flight control board simple, effective. Color coded cards positioned for 6 flight lines. Dave Musgrove, Larry Davenport, Barons.

Chuck Pilkenton (5th CNO and Mike Bailor of Eugene, Ore. Aeronauts brought Dee-Bee Beta. 5 1/2#, VECO 60/Perry, Silenceaire, Pro-Line radio.

4th in C Novice went to Paul Cole (L) flying "El Bandito". ST 56, 6 1/4#, 610 sq. in. Fiberglass fuselage, foam wing to be kitted by Ralph White (r) of Seattle Fliteglas.



Jerry Nelson flew Wester designed AW 40, German kit. 8 1/2#, HP-61. Jerry 5th in FAI Pylon, received CD's Sportsman Trophy.





Major General and Mrs. Howard S. McGee being "piped in" to the Hall of Fame and awards banquet. (Heller photo)



A Scottish toast to modelers, modeling everywhere. Banquet ceremony preceded Model Aviation Hall of Fame installation.



Editors, three. Left to right, Don McGovern, Flying Models; Pat Crews, R/C Modeler; Art Schroeder, Model Airplane News. (Heller photo)



The man who made it all possible, Brig. General Bob King, with AMA Service Award. (Heller photo)

John Worth, AMA Exec. Dir. and Sandy Pimenoff, FAI Pres. of CIAM discussed facilities of Spokane for possible RC World Championship site in 1971 . . .



John Patton, AMA President, inducts Bill Winter, publisher of American Aircraft Modeler, into the Model Aviation Hall of Fame. Bill, a renowned modeler, designer, and writer as well as AAM publisher. (Heller photo)



Willis Brown, AMA President No. 1, was 1st Hall-of-Famer in 1969. Accepted 1970 certificate for Al Lewis. Maj. Gen. Howard McGee, Washington NG Chief, and AMA President John Patton share historic occasion. (ANG pic)

Two to Six Channel I.C. Decoder

Using only eight components, this decoder can be adapted for use with most digital receivers.

By Sid Kauffman

Here's an integrated circuit decoder the scratch builder can afford. Mr. Kauffman's article culminates more than a year of research and flying time, on his part, to present the type and quality article expected by the RCM reader. Although the author designed this decoder for his RCM Classic digital system it is adaptable to others or could be the basis for your own design. While this article is not the step-by-step construction type, little difficulty should be experienced by those of you who have basic kit building experience. The author is providing individual parts or a complete kit of parts for those of you who would like to duplicate his design. If you require further information or experience difficulty while building this decoder, drop a line to Mr. Kauffman at the following address: 4104 Deepwood Circle, Durham, North Carolina 27707.

The decoder described in this article was designed to be used with the Classic receiver, but can easily be adapted to work with other receivers. The circuit requires only eight components for a six-channel decoder, and requires very few interconnections. It will work with a transmitter having from 1 to 6 channels of the standard digital format. It can be built as a 2, 4, or 6-channel unit.

The circuit uses the lowest power circuits available with good drive capability and moderate cost. Current drain of the 6-channel unit is only 9ma. The channel outputs will operate with a load resistance as low as 500 ohms. Component cost for a six-channel unit is about \$25, and a 4-channel unit (omitting I.C.4) costs about \$18. The circuit uses only two capacitors, and these are mil. spec. tantalums. The lack of complexity means ease of construction and increased reliability. The circuit is quite compact. It could have been made somewhat smaller by using flat-paks or MSI (medium-scale integration), but the added cost outweighs the slight decrease in size.

Operation of the I.C. decoder is

similar in principle to the Classic decoder (RCM August 1968). Use the Classic articles as a background and reference for building this decoder, and to better understand its operation.

The basis of this circuit is the J-K flip-flop, a standard computer logic element available in most digital I.C. lines. It is shown in FIGURE 1, along

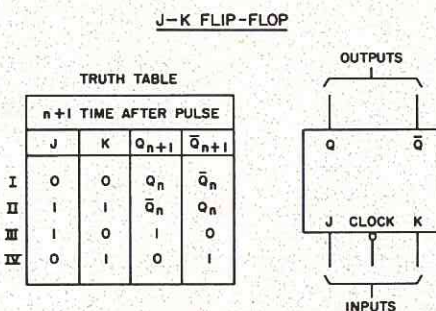


FIGURE 1

with its 'truth table' in which a 1 represents a positive voltage of 2 volts or more and a 0 represents a voltage of 0.6 volts or less. The outputs of the flip-flop are Q and \bar{Q} . One output is always the complement of the other, such that when one output is a 1 the other is a 0 and vice versa. The outputs of the flip-flop are determined by the state of the J and K inputs when a positive pulse is applied to the clock input. If both the J and the K are at 0, the outputs will not change after the arrival of a clock pulse. This is condition I in the 'truth table'. If both the J and the K inputs are at a 1 level, then the outputs will change states after the application of a clock pulse. If the Q output is a 1 before the clock pulse, it will become a 0. If it is a 0, it

will become a 1. This is condition II. If the J input is a 1 and the K input is a 0, the Q output will be a 1 after a clock pulse regardless of its state before the clock pulse. This is condition III. Condition IV shows that a 0 will appear at the Q output if the J is 0 and the K is 1 at the time of a clock pulse. We will be using negative pulses from the receiver for commutation. The output state changes on the NEGATIVE-GOING edge of the clock pulse.

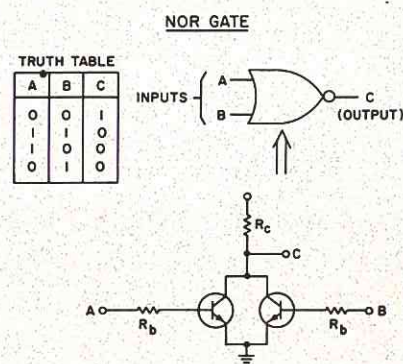


FIGURE 2

Illustrated in FIGURE 2 is a logical NOR element and its 'truth table'. We will only be using this circuit as an ordinary common-emitter inverter. The circuit normally used to make a NOR gate is also shown.

The basic diagram of the decoder is shown in FIGURE 3. We will start out by assuming that the Q outputs of all the flip-flops are 0. We also assume that the output of G3 is a 0 and, therefore, the output of G4 is a 1. Now we will examine what happens when a pulse train arrives from the

BASIC DECODER DIAGRAM

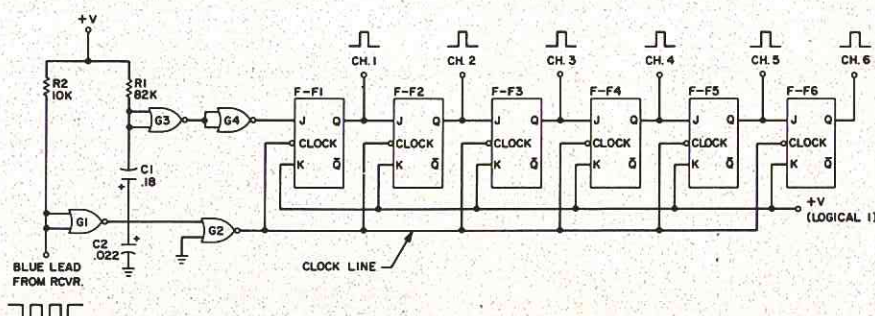
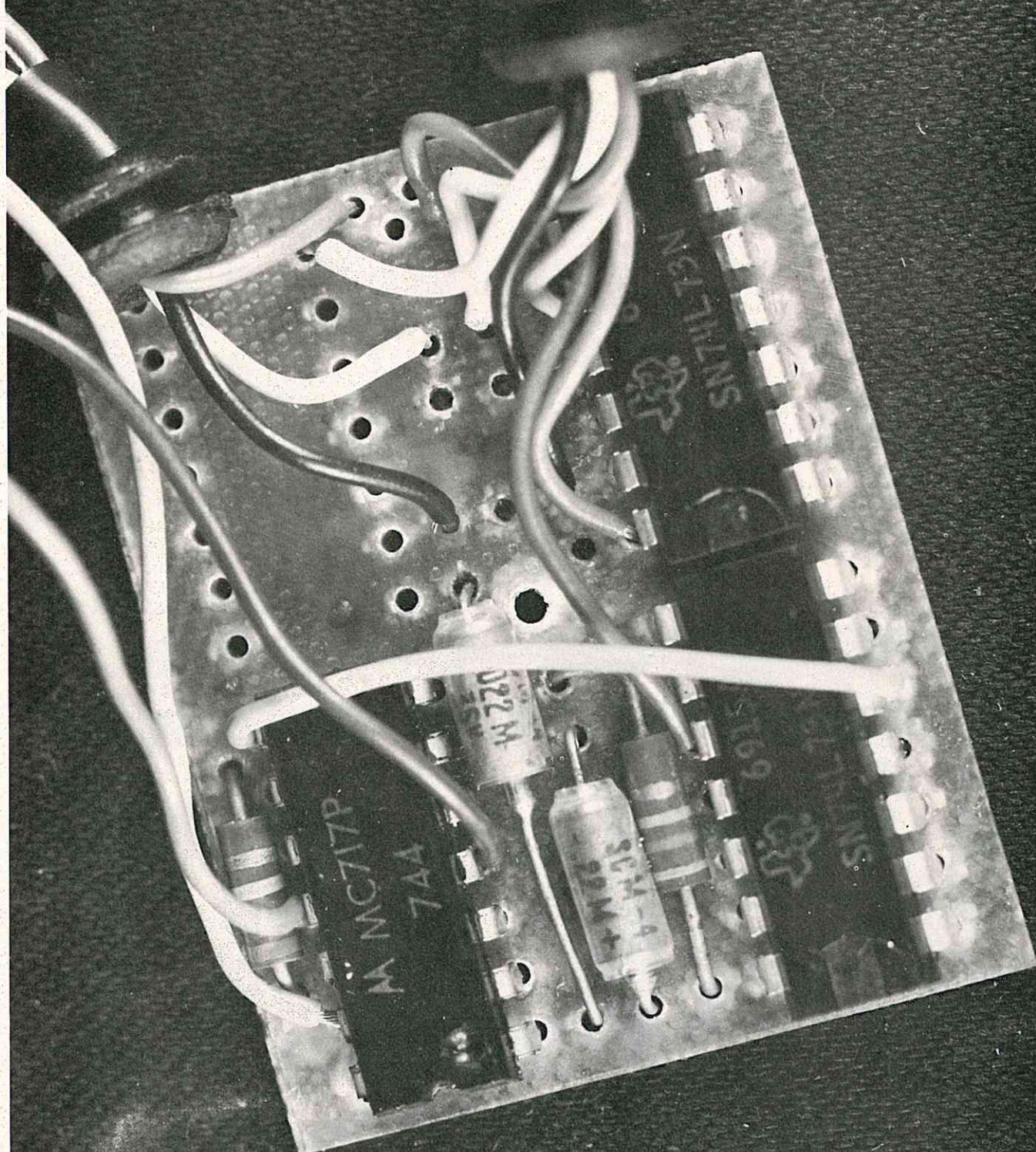


FIGURE 3



receiver. This pulse train is shown in FIGURE 4. First, we will note that the conditions on F-F 1 correspond to condition II of its 'truth table'. The conditions on all the other flip-flops correspond to condition IV. Therefore, the first pulse (negative-going edge) causes F-F 1 to change to the 1 state while the other flip-flops remain in the 0 state.

G1, C1, R1, and G3 form a "one shot/pulse stretcher" whose output appears as shown in FIGURE 4. G4

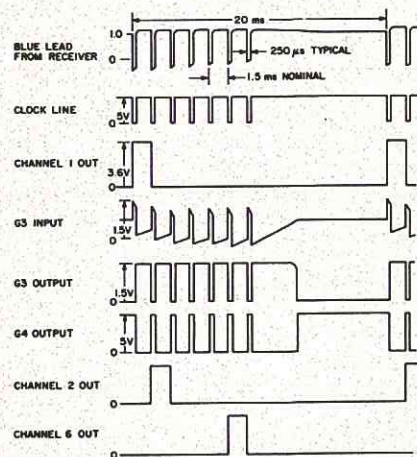


FIGURE 4

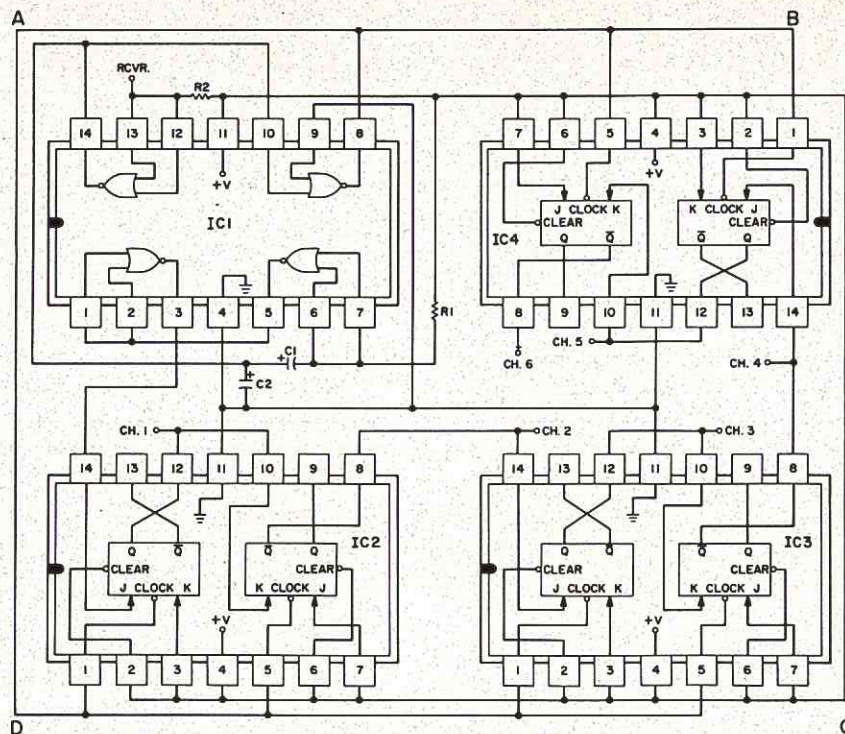
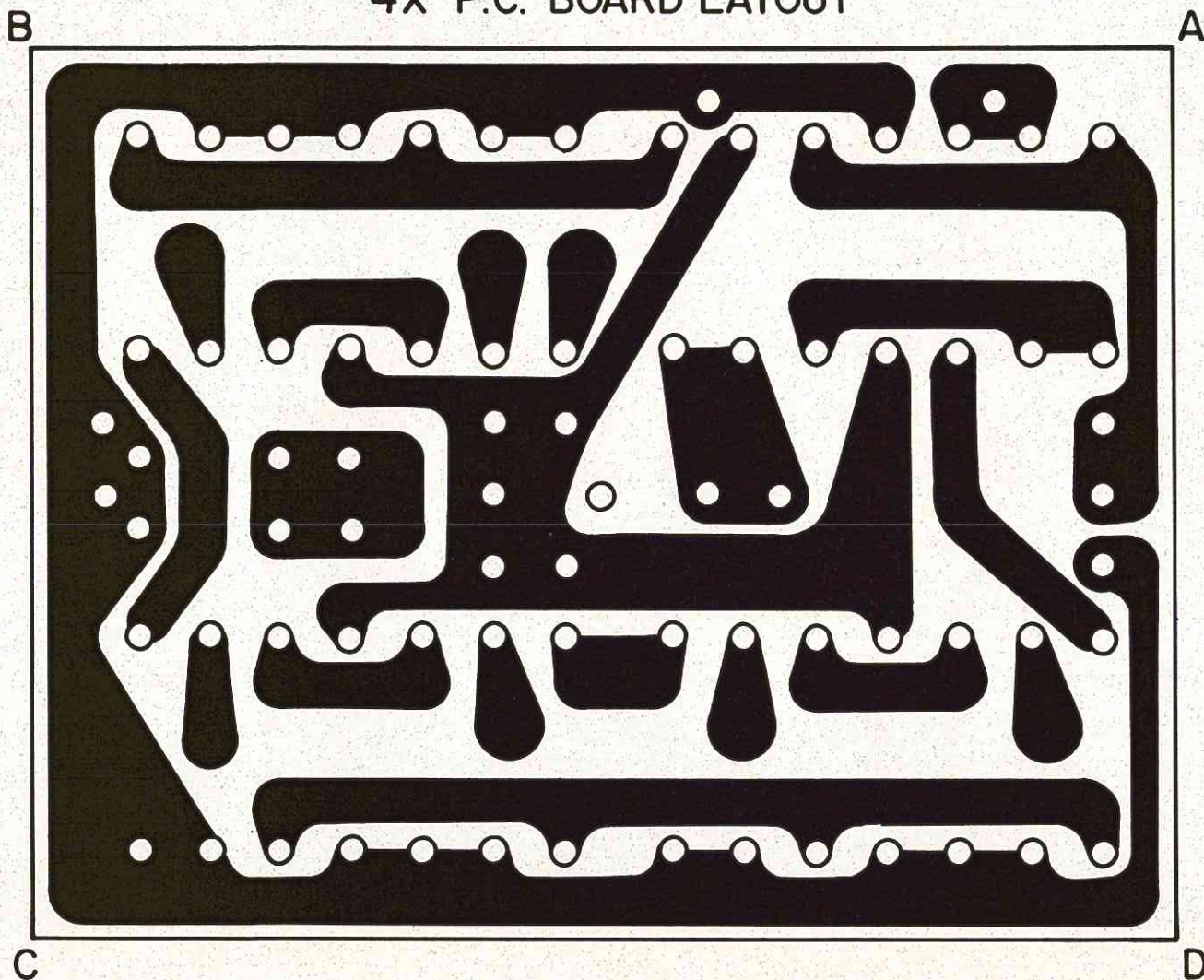


FIGURE 5

4X P.C. BOARD LAYOUT



inverts this signal. It can be seen that for the first pulse of a pulse train, G4 applies a 1 level to F-F 1. For the remainder of the pulses, the one-shot causes a 0 level to appear on the J terminal of F-F 1.

When the second pulse arrives, we see that the conditions on F-F 3 to F-F 6 are unchanged, and F-F 1 is in condition IV. F-F 2, however, is now in condition II. The clock pulse causes F-F 1 to switch back to the 0 state and also causes F-F 2 to change to the 1 state, while the other flip-flops are unaffected. We have just generated the channel 1 output pulse, as shown in FIGURE 4. The inputs of F-F 3 now correspond to condition II, while all the other flip-flops are in condition IV. When the next pulse arrives, F-F 2 returns to zero and F-F 3 changes to the 1 level. This completes the channel 2 output pulse. The other flip-flops are unaffected.

This operation repeats itself until all output pulses have been generated. This leaves all the flip-flops in the 0 state at the end of the pulse train. The one-shot is designed to provide a stretched pulse about four milliseconds long. This pulse is long enough to keep F-F 1 from changing states again before the end of the pulse train, but G3 returns to 0 and G4 to 1 before the arrival of the next pulse train. This is the condition we assumed at the beginning and thus the action repeats itself with each pulse train. If we assume that not all of the outputs of the flip-flops are at 0 initially, and follow the action through, we will find that one pulse train will return all the flip-flops to 0 for the arrival of the next pulse train. The operation is basically the same as shift registers used in digital computers.

FIGURE 5 shows the actual connections used. G1 and G2 provide the

proper bias and amplification for the input signal from the receiver. R2 and G1 work as a voltage divider to provide the proper bias. C2 prevents servo noise from feeding back to the clock line. FIGURE 5 shows that on every other flip-flop we use the K input instead of the J input and the Q output instead of the Q output. A little contemplation should satisfy you that the decoder operation will not be affected. This change was made to allow a more efficient printed circuit layout.

The decoder will operate reliably below 4 volts and below 0° F.

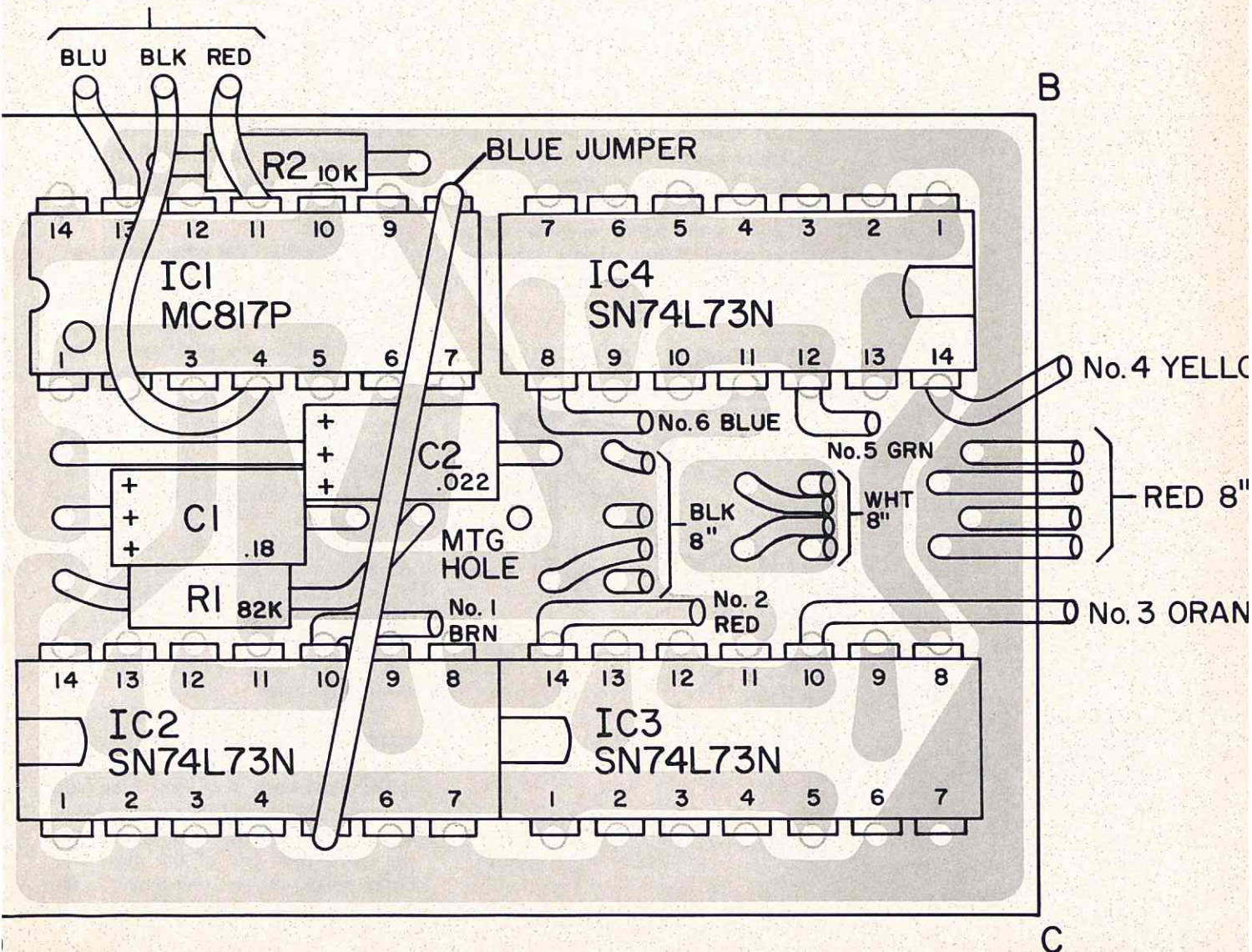
CONSTRUCTION

A 1/32" glass epoxy board should be used. Use a #60 drill for all holes. The center hole should be enlarged for a #2 self-tapping screw. The layout can be made with tape and paint and a little care. FIGURE 6 shows the lay-

(continued on page 80)

COMPONENT LAYOUT

FROM RECEIVER



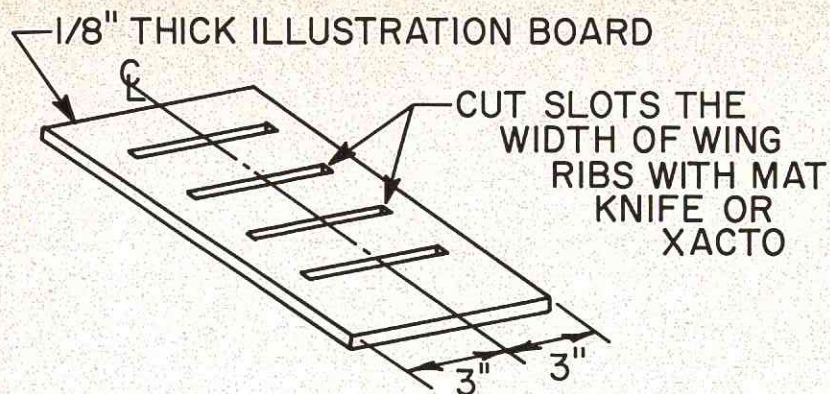


FIG. 1

YOU CAN BUILD A WING JIG FOR \$2.00

If you want an easily constructed wing jig that is accurate, simple to use, and one that can be built for under \$2.00, then we suggest you study the sketches accompanying this article.

This jig is simply built from 1/8" thick illustration board, available in 30" x 40" size from any art supply

store for approximately \$2.00 per sheet. Start by cutting a piece of board slightly longer than the length of one wing panel and approximately 6" wide. Draw a centerline the length of the 6" wide section of your illustration board. With a straight edge mark the location of your wing ribs, then

A two dollar sheet of illustration board and a few scraps of balsa make up this versatile and accurate wing jig
By: Bill Phillips

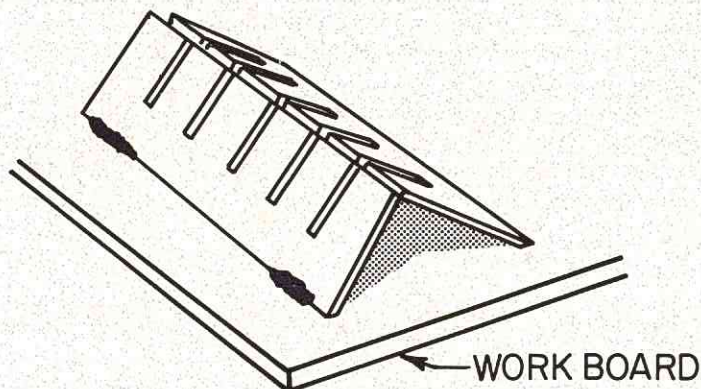


FIG. 2

cut slots in the board with a mat knife or sharp X-Acto #11 blade. Score cut your centerline mark and then fold your board up about 45° to your work table and then tack glue the jig to your work board.

After cutting out your individual wing ribs, draw a centerline on each rib. Measure the depth from the centerline to the base of the rib, and make a horizontal pencil guide line along your jig, adding pieces of scrap balsa at each rib station in order to level the ribs. Use a scrap balsa height gauge from your work table to the centerline of each rib at the leading edge position to make sure that each rib is positioned accurately.

The majority of your wing construction can be carried out in the jig, then the partially finished wing can be removed and reinserted in the jig if necessary. This is an advantage over the rod type of jig where the rods pass through rib holes.

If, like most RC'ers, you dislike building wings, try this simple illustration board wing jig and find out how quickly and easily your next wing can be made. As an added bonus, if you did a careful job on constructing the jig, you'll have one of the most accurate wings you have ever built. ●

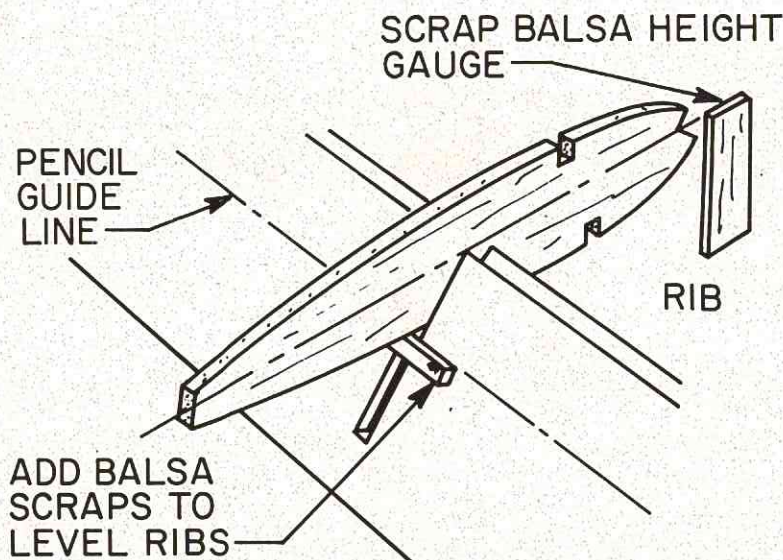
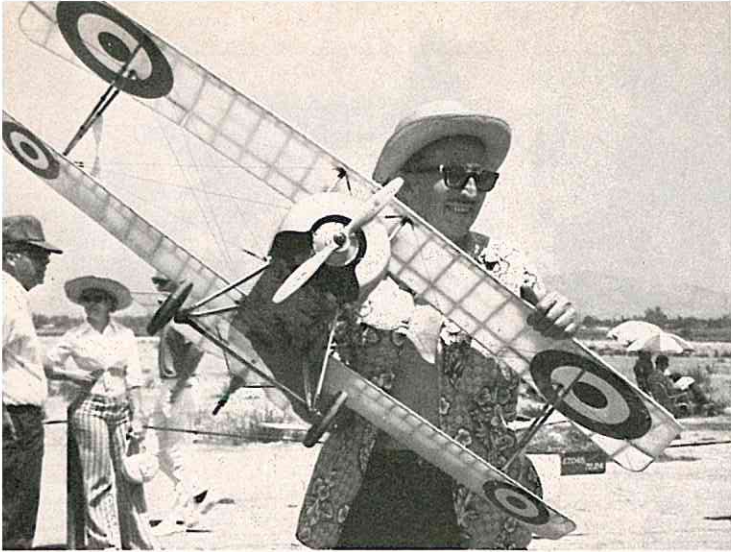


FIG. 3



Joe Tschirgi's Fokker D-8;
a second in AMA Scale event.

Lou Proctor with Nieuport. 1st
place in both AMA and Rallye Scale.

1970 RCM SCALE MEET

Valley Flyers Host Southern California Scale Spectacular

Photos by Cecil Weatherly III



Bob Palmer with DeHavilland
'Chipmunk'. A 3rd in AMA Scale.
Logictrol radio, Veco .50.



Dan Parsons of
Albuquerque, N.M., with ME-210.
Two Enya .60's, Galaxy 5 radio.
2nd in Rallye Scale.

Dan Lutz's Stinson SR-10 built
from Bob Holman plans. Enya .60 up
front, Kraft 6 channel.





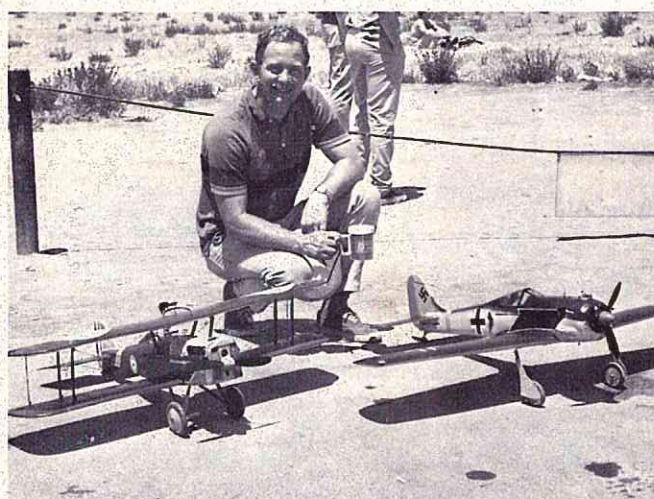
Dick Adams with Webra .61 powered Nieuport 17, Kraft radio.



George Tapandrea of Santa Barbara was plagued with engine problems on PT-19.



Dan Lutz and Rearwin Speedster. K & B .35, Kraft radio.

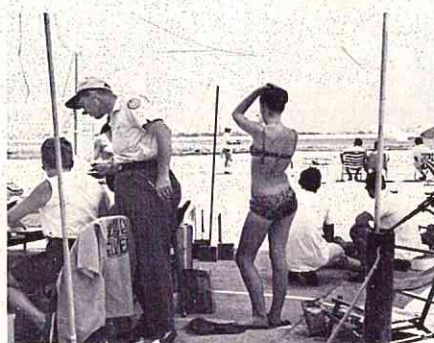


Brief interlude at Sepulveda Basin.

Pat Byrne with his OS .35 powered SE-5 and FW 190 with Enya .45. Orbit radio for both.



Scotty Hewitt's Antoinette, built from own plans. S.T. 56, Kraft radio.



Always something of interest at a scale contest



And the usual heartbreaks

Lou Proctor's famous 'Antic' on display as a seaplane. Flies beautifully from water.



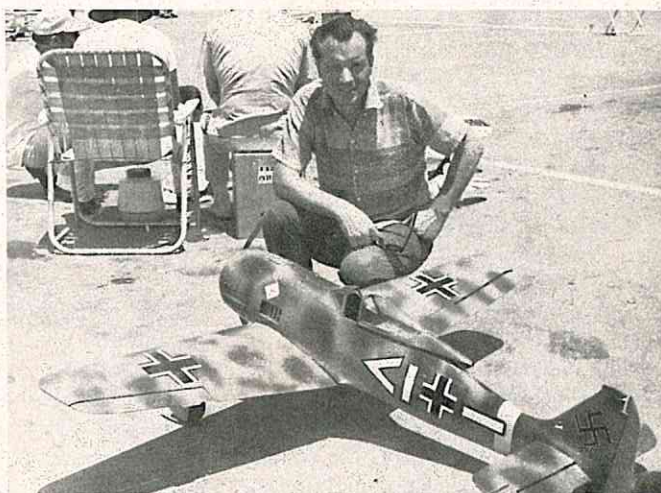


**Loretta Hall's YAK 18 from
Sig kit. Webra .61, Pro-Line radio.**

**Frank Capan with his North
American OV-10A. Two Enya .60's.**



**Paul Moren built this Citabria
from a Sig kit.
Enya .60, Kraft.**

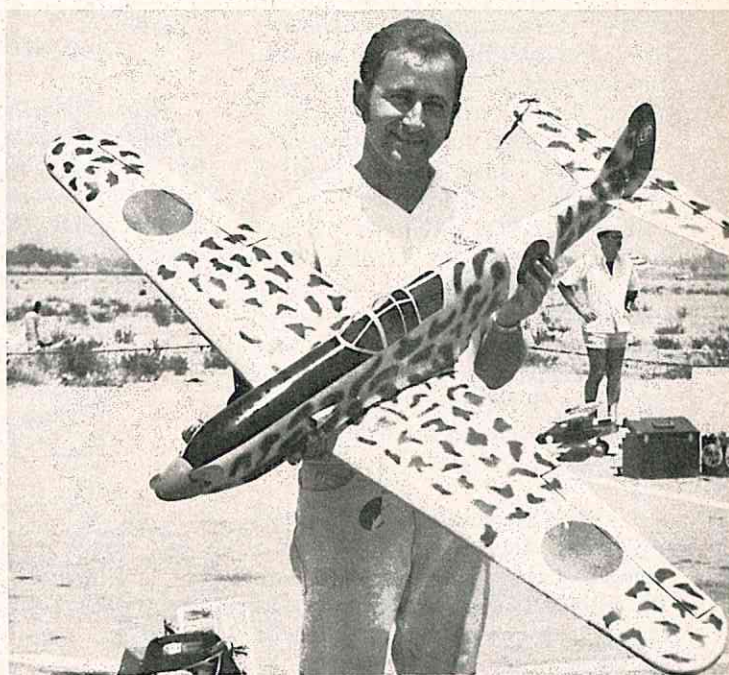


**A beautiful FW-190 by Jack Watson
damaged in take-off.
O.S. .80, Logictrol.**



**An Enya .45 powered Bristol
Scout by Al Altemeier.
Not flown at scale contest.**

**Danny Reiss with Kawasaki Hein.
'Tony' built from own plans.
Veco .61, Kraft proportional.**

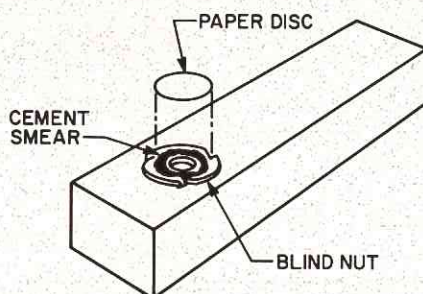


FOR WHAT IT'S WORTH

Jack Schmitt of Corpus Christi, Texas, recommended a quick easy way to clean hard to get at residue from the inside of a fuel tank. Simply use an old toothbrush which makes an excellent scrubber and fits easily through the small stopper opener. Hot soapy water or ammonia and water work very well as a cleaning agent.

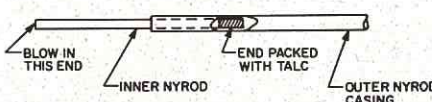
Since many fliers are using the Perry carburetor, Bob Guilfoyle, of Redwood Valley, California, warns that the carburetor body is soluble in acetone and the carburetor, itself, should be cleaned in denatured alcohol. Bob also noted that the molded plastic shank of the Perry carburetor that fits into the engine throat has walls that are only approximately 1/32nd of an inch thick. This is more than adequate under normal conditions, however should you be using a spinner and come to an abrupt stop on landing due to the spinner coming into sharp contact with an immovable object, the spinner has a tendency to peel back to the cylinder taking the carburetor with it. Naturally, the shank separates from the main carburetor body. Rather than junk your twelve dollar carburetor, a little scrounging through your "jewel box" will probably turn up an old knurled collar from a large X-Acto knife handle. With a little reaming of the bottom hole of the Perry, the collar was made to fit snugly, being inserted approximately 1/32nd of an inch. The Perry was then liberally coated around the hole with Plastic Steel as was the upper edge of the collar. When mated, with a little urging from a small vice, the inside of the carburetor was cleaned of excess "steel" and the carburetor "drum" inserted to check for binding. After the "steel" had hardened, the collar can be filed and trimmed to fit the engine throat. This process returned Bob's carburetor to operational use for his Veco 50 with no difference in performance and has saved him money as well as loss of flying time.

When installing engine bearers with blind mounting nuts, glue has a tendency to ooze up the nuts and onto the threads. If this glue happens to be epoxy, this could lead to definite difficulties when inserting the bolt. To

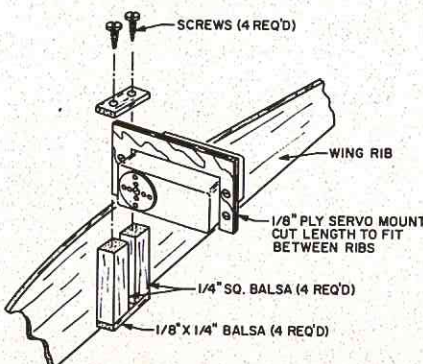


remedy this problem, simply attach a small disc of stiff paper over each nut with a light smearing of extra-fast drying cement. The paper discs may be easily obtained by using a small paper punch. This idea was submitted by Brian Bacher, of Montreal, Quebec, Canada.

Frank Koebel, of Waterloo, Ontario, Canada, recommends talcum powder as an excellent lubricant for NyRod pushrods. The problem of getting the talc into the outer casing can be solved as follows: (1) Sprinkle a small quantity of talc into the palm of your hand. (2) Force the talc into the end of a spare piece of inner rod by pushing the rod into the talc in your hand. (3) Partially insert the rod, packed with talc, into the outer NyRod casing. Blowing into the end of the inner NyRod injects the talc in the outer casing.



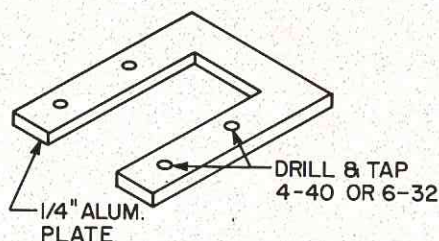
Jerry Hamelman, of Rochester, Indiana, submitted the diagram on how to mount a servo in a wing so that it can be easily removed for use in another plane. Jerry used 1/8" plywood to fabricate the servo board



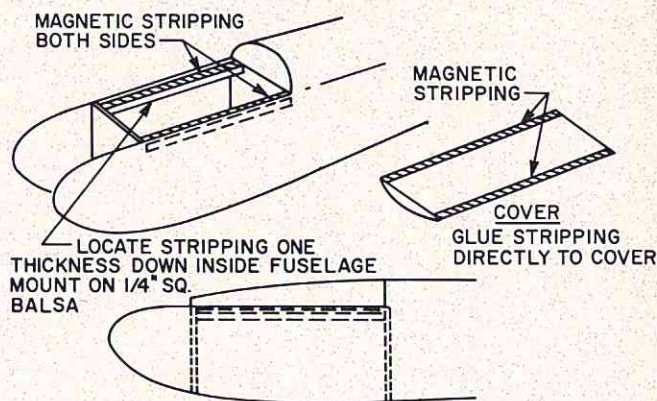
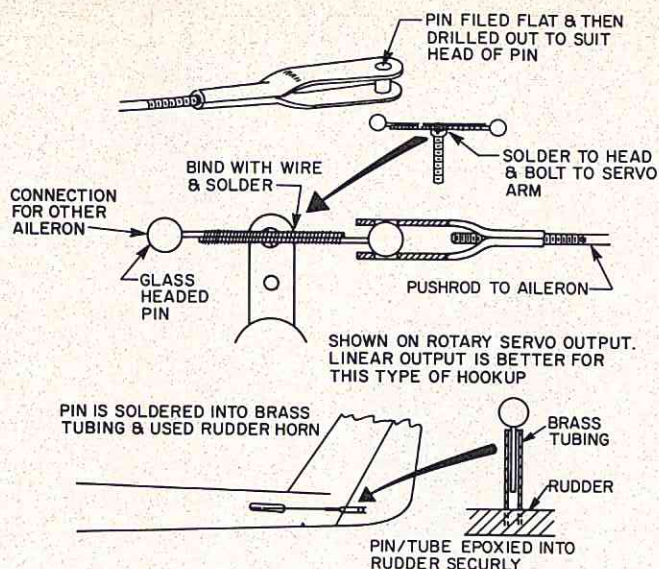
shown in the sketch. This should be cut to the length between your center section ribs. The servo should then be mounted as shown in the drawing. Glue four 1/4" square balsa strips to the sides of the ribs as indicated. After this has been completed, insert the board with the servo mounted, and cut 1/4" x 1/8" balsa and screw on the bottom as shown. If the top sheeting is not in place on the wing it will be necessary to glue a strip on top of the 1/4" x 1/4" balsa stringers. To remove the servo all that is required is to remove the four screws and the linkage to the aileron.

If you have trouble picking up small nuts and bolts that have dropped into inaccessible areas, here's a suggestion from Bud Caddell as printed in the Birmingham RC Newsletter. Simply put a drop of contact cement on the edge of a link of small diameter doweling. Let it set for a moment or two and this will provide just enough stickiness to hold the bolt in place while you pick it up. At the same time, this will work well as a nut holder.

Michael Donovan of Vicksburg, Miss., suggests replacing the plywood motor mount in the VK Cherokee, Sterling Mighty Mambo, and other kits using this type mount, with a mount made from 1/4" aluminum. Drill and tap the mount to accept your engine so that no blind nuts are necessary. Vibration is greatly reduced by using this type of mount and the engine will not loosen as with the plywood unit.



One of the best solutions we have ever seen for attaching ailerons in a glider with knock off wing panels was submitted by Ian Lang, of Natal, South Africa. By taking a normal metal DuBro-Kwik-Link, and filing and drilling, Ian removed the clevis pin. The holes were then enlarged so that the head of a glass headed pin



would be held snugly between the arms as shown in the sketch. The unit was then fitted to his servo mounted in the fuselage. Now the aileron Kwik-Links are easily connected for flying but can still knock off on a hard landing. This idea can also be used on the rudder which in Ian's case, being angled back rather violently, made normal linkage fairly difficult, but in this way the DuBro Kwik-Link and pin act as a ball and joint socket.

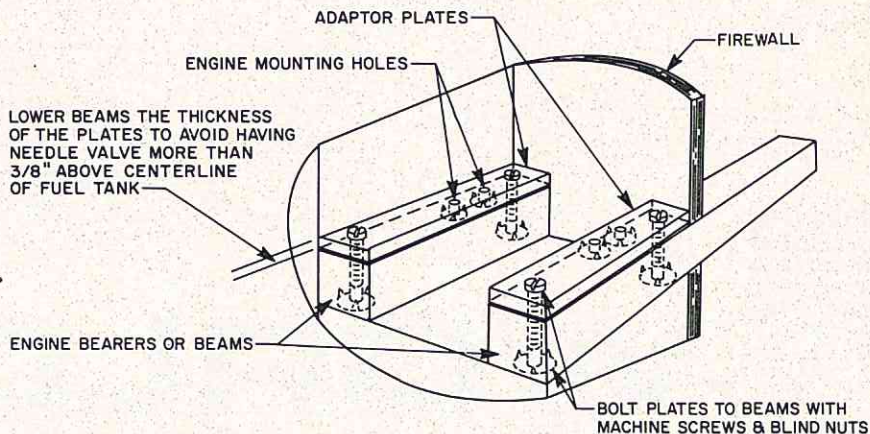
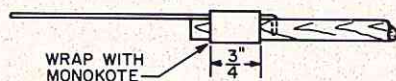
Francis E. Pou, of Bogalusa, Louisiana, found that magnetic stripping, such as that found on refrigerator doors, makes an ideal hold-down for cowlings and hatches. It can be easily cut, is flexible to a degree, and has flat surfaces. It can be installed in small sections or in one continuous length, depending upon how much "holding power" is required. White glue or epoxy glue has proven to be best for this purpose.

If you're tired of expensive balsa fillers, Douglas Williams, of Cucamonga, California, suggests that you try 3M Brand Acryl-Blue Glazing Putty, available at most automotive paint stores. Used directly from the tube, it makes an excellent, easy sanding, lightweight, flexible filler for minor low area. Thin with lacquer thinner for covering large areas. The putty dries in 30-45 minutes and will prepare four or more large aircraft. Rough sand with #120-240 and finish sand with #400. Cover with Super MonoKote, dope, or any automotive paint for a beautiful finish for your model.

M.H. Dailey, of Seattle, Washington, finds that the backing that comes

on Super MonoKote is great for laying over plans when building with glue. It is also excellent for use on the wings saddle when making Epoxiolite fillets. The use of this normally discarded material helps reduce the overall cost of using MonoKote.

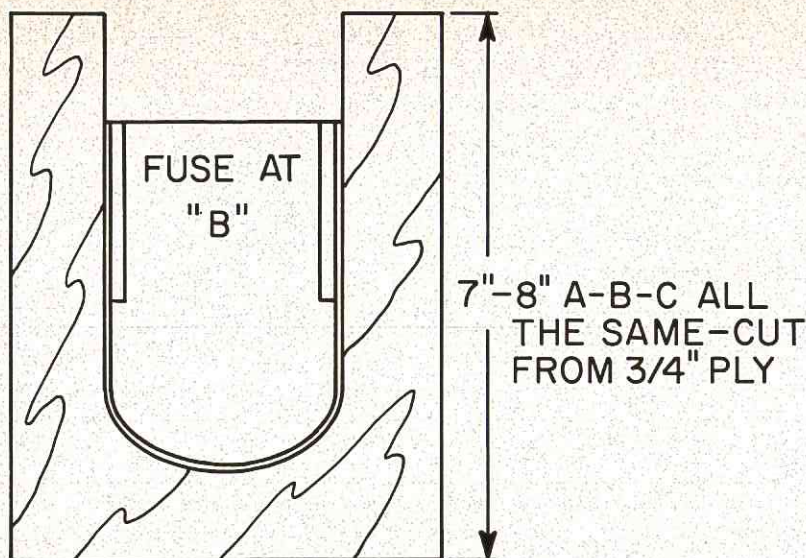
While on the subject of Monokote, one of the best alternate uses we have seen for irregular material is to secure 1/16" wire to the ends of dowel rod or balsa, for use as pushrods. W.R. Headington, of Mt. Vernon, Ohio, first drills a small hole about 1" from the end of the rod to accept a right angle bend on the end of the wire. With the bend about half as long as the thickness of the pushrod, he wraps the two together with a half a dozen wraps of MonoKote which has been cut into a strip three quarters of an inch wide. This is infinitely stronger and less time consuming than the older method of wrapping with thread or string and then gluing the unit together.



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PLYWOOD FUSELAGES

By Ralph Leidner, D.D.S.

Since the publication of Chuck Cunningham's article in the October 1968 issue of R/C Modeler Magazine, I have built six plywood fuselages for my Kwik Fli's and New Orleanians. The first fuselages were built exactly according to Chuck's instructions. Since that time I have found that these "folded" plywood fuselages are second to none, and I definitely prefer them to either conventional balsa, fiberglass, or plastic forms of construction. However, I have made a few extremely minor changes in the construction which simplified the building of these plywood units.

The first of these changes is to incorporate 3/8" maple motor mount beams by simply cutting a 3/8" wide slot in the 1/8" plywood nose doubler **before** attaching the doubler to the unformed 1/32" plywood skin. These slots should extend just past bulkhead "B". The fuselage is then built as per the article **without** the engine beams. After the fuselage has dried, or set, slip in the beams (incorporating right

thrust when cutting the maple motor mount stock) and clamp the engine to the beams with a pair of small C-clamps before the epoxy sets up. This will true up the beams as well as leveling engine seating. 1/4" sheet balsa cowl blocks are epoxied to the outside of the beams to form the cowl after the engine is mounted. I also incorporate a 1/4" sheet bottom and a plywood spinner ring to smoothly fair out the nose section of the model.

I've also found that the tail cone is much easier to form if the balsa tail block is glued to **one side only before** forming the fuselage. This can best be glued (Titebond) at the same time as the doublers are attached. I have discovered 1/4" square spruce to be more suitable for use as longerons than the balsa originally called out in the article. The balsa can crack when forming the tail cone whereas the spruce has sufficient strength to withstand such cracking. Once the balsa tail block is dry, it will not slip around

when pressure is applied by forming the other 1/32" side around it.

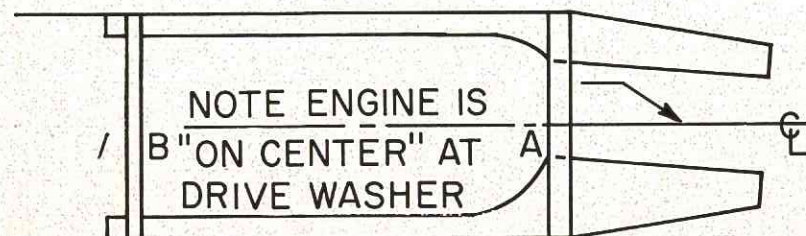
By using this method the vertical height of the fuselage, at the tail post, can be reduced from 3 1/2" to 3" for a more esthetic tail cone. This also makes it easier to use the scrap wood to cover the bottom of the fuselage since a wider piece of 1/32" plywood is left over after cutting out the fuselage blank. The 3" tail cone is too difficult to bend if you do not pre-glue the tail block to one side first since the pressure needed is much greater.

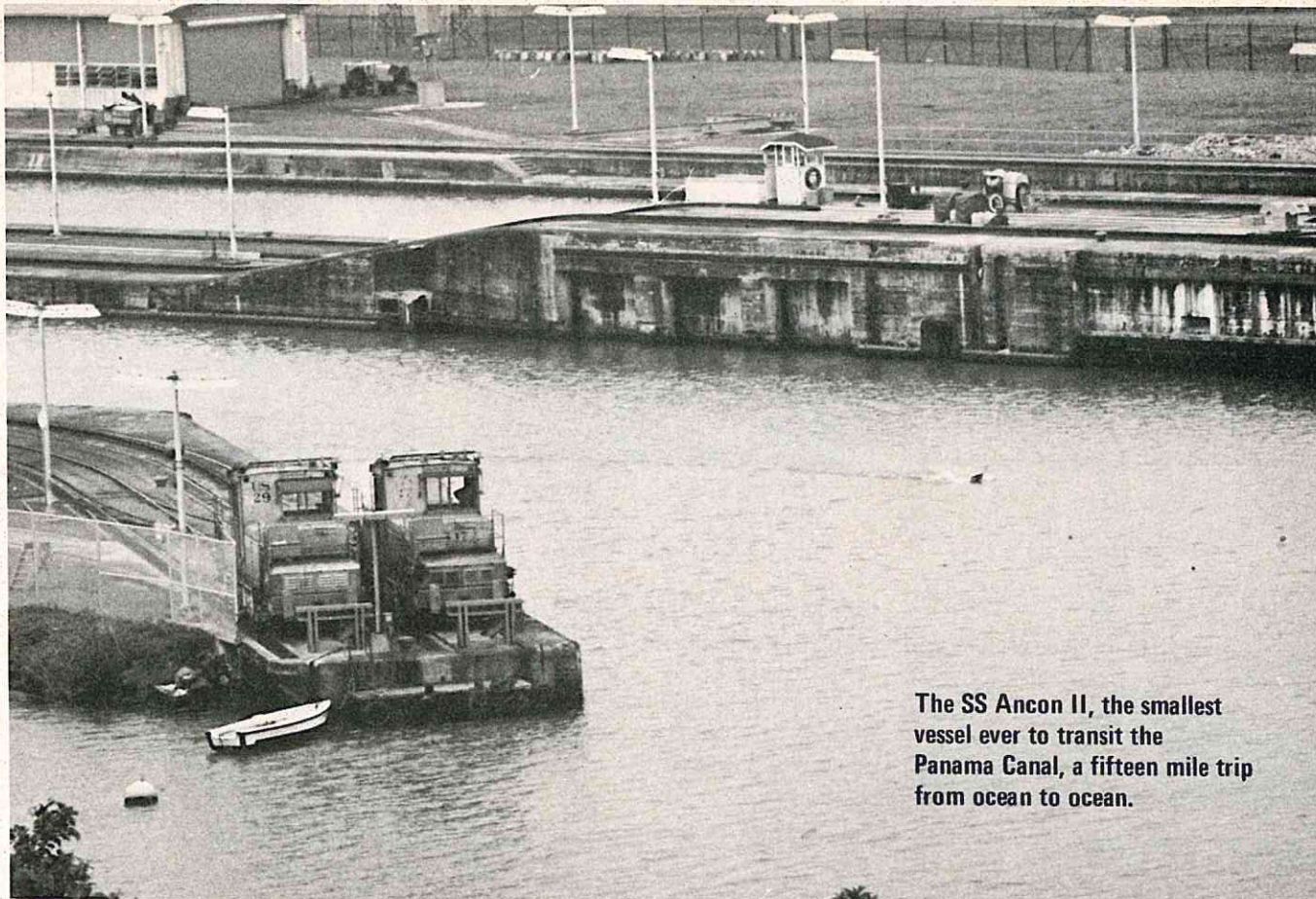
While on the subject of the tail cone, and with nice soft balsa a little hard to find, I have now substituted foam for the soft balsa block. There is usually sufficient scrap foam remaining from wing coring to freely supply the materials. I face the forward end of the foam block with 1/4" sheet balsa and epoxy a fillet to the front of this before removing the side clamps. Please note that foam is too soft to use unless you both pre-glue the block to one side, and also face the forward end as mentioned. Once dry, the fuselage is as tough and noncompressible with foam as it is with balsa. An important advantage is that the tail is lighter exactly where we most need to save weight. In addition, a 3" x 3" x 6" block of balsa costs almost 70¢!

If you want to save the "cussing" part of the fuselage forming that's mentioned in the article as well as eliminating the need for an extra pair of hands, cut 3 "C" shaped pieces of 3/4" plywood to the outside form of the fuselage bulkheads A, B, and C. Be sure to allow room for the 1/32" plywood. The fuselage is slipped into these jig forms **before** the formers are installed. This allows a more accurate fitting of the bulkheads and makes it much easier to glue and align the fuselage as well as reducing the entire operation to a one man job. I have reused these "C" shaped jigs five times already, and prefer them to the hardwood side clamps as mentioned in the original article.

For painting your completed fuselage, I brush on one coat of Hobby-poxy clear each day for three days without sanding between coats. When the third coat has dried, sand with #320 wet or dry paper used wet. Then simply spray on one coat of Hobby-poxy color for a final finish.

If you haven't tried a "folded" plywood fuselage, you are missing one of the finest construction methods ever presented for RC use. ●





The SS Ancon II, the smallest vessel ever to transit the Panama Canal, a fifteen mile trip from ocean to ocean.

New Panama Canal Record Set

THE S.S. ANCON II, A 3-FOOT MODEL R/C CRUISER, BECOMES THE SMALLEST VESSEL TO MAKE THE FIFTEEN MILE TRIP FROM OCEAN TO OCEAN.

The SS Ancon II, a shipshape, 3-foot long model cruiser has become the smallest vessel to transit the Panama Canal.

The 3-foot long craft paid 72¢ on May 23rd for making the fifteen mile trip from ocean to ocean, the minimum rate for a ship in ballast, which means she carried no cargo.

Named for the first commercial ship to make the Canal transit after the waterway was completed in 1914, the Ancon II is a bit different when it comes to draft dimensions and size.

The Canal's smallest customer is powered by an O.S. Max Marine RC engine controlled by an Orbit single stick radio on 27.045 MHz using two servos on throttle and rudder. She has a 12½" beam, and 8½" draft, and weighs approximately 30 pounds.

The Ancon II was constructed in the Canal Zone by Air Force Maj. Kenneth Thomas of the 605th Special Operations Squadron, Howard AFB.

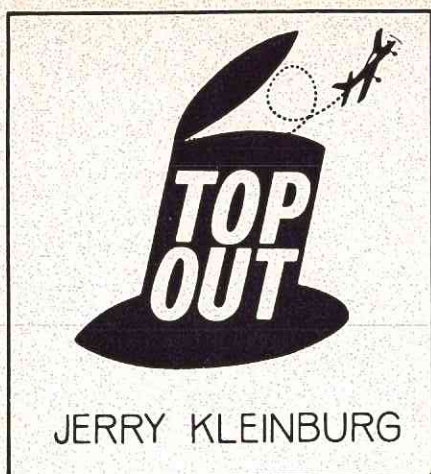
Major Kenneth Thomas with his record setting SS Ancon II. O.S. Max engine, K & B 100 fuel, Orbit radio.



With a hull constructed of mahogany plywood and cedar, the boat features a birch and spruce plywood deck and superstructure. Octura hardware was used throughout with a P-55 propeller being driven by the Max engine. Glow plug used was the K & B #4520 idle bar. 2¼ gallons of K & B 100 fuel was on board with a consumption of 28 ozs. per hour at ten mph for a total fuel consumption of 1-¾ gallons. Finish on the boat was Hobby Pox enamel.

Maj. Thomas conducted sea trials on Cocoli Lake. Due to calm weather and light winds, the Ancon II ended its journey in Cristobal with a speed of 12 knots, the latter having increased from its original 9 knots as the fuel load lessened.

The Ancon II departed the Diablo Spinning Club at 6:35 AM followed by a 17' 85 horsepower chase boat, the Lady Helga, owned by S/Sgt. Ray-
(continued on page 54)



CONTEST CONTAGION

It's that time of the year again, so with a shot of prime into the keyboard let's fire up the old typewriter for a rundown on trips to early contests. And, too, some initial observations on racing and aerobatic competition as 1970's season accelerates its gallop into the record books. Of special interest are reactions to the new Class D FAI stunt event as well as seeing new equipment and techniques being put to the test of competition pressures...

First of the May meets was the Dallas Annual where 74 entrants from 4 states squared off for pattern, open pylon, and scale events. The Dallas RC Club, spearheaded by Sam Fly, Dwayne Brown, and Carl Summers, served up a slick 2-day affair in their park-like flying site on the edge of North Lake near the Big D city. Weather couldn't have been better and it was matched by the calibre of the competition and the quality of the models.

For DX event flyers it meant the first competition try with the new FAI stunt pattern and after 5 rounds their reaction was unanimous: Pabulum! Concern for the future of pattern flying was also widely voiced resulting from what the pilots felt was the further dulling of the event brought about by the FAI maneuver list. "The



Tommy Dodgen, RC veteran at 15, topped large A group in Dallas. Orbit 4-8 his favorite radio.

Bill Thomas and "The Okie" were tops in DX event in Dallas. VECO- Perry-Tatone power package, Logictrol III controls new 5 lb. 10 oz. original. Should be in top 10 at 1970 Nats.

AMA C pattern was bad enough from a spectator viewpoint," they said, "Now this new pattern may well finish the event unless we do something about it." The "something" revolved around a serious discussion to adopt the International Aerobatic Championship system built around the Aresti Key method of describing maneuvers and building efficient and effective routines for full-size planes. "They have an identical problem and resolved

Bill Curtis and Super Barracuda show accessibility. Bill pioneered foam skin techniques, has a new, simple but light and rugged retract gear coming.

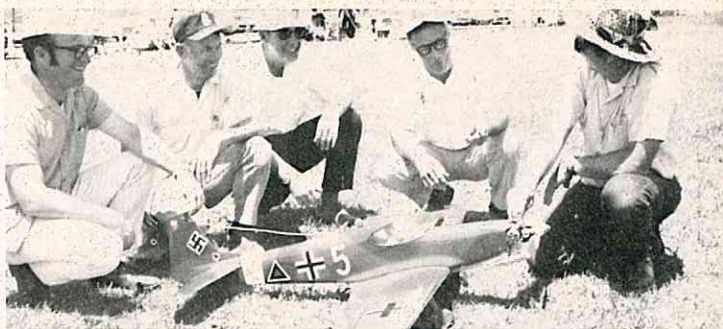


RCM's Jim Simpson tries pattern during Dallas meet. Ted White (1) called, couldn't help. Jim did better in Pylon, was 2nd.

it that way, so why shouldn't we benefit by their experience?" was the consensus. Reasoning behind the move toward use of the Aresti Key was now that RC stunt competition has developed a broad international base (in other words, it's here to stay) it makes sense to follow the example of the methods developed for regular aircraft in international FAI competitions. (An RCM article will appear shortly dealing with details of the Aresti Key system and its use for RC competition.) Meanwhile the contest raged on...

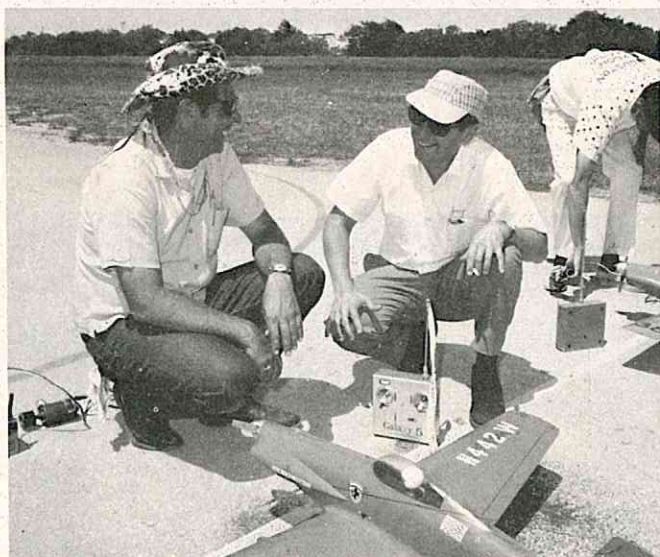
Bill Thomas, Dan Carey, Ted White, Gerry Krause, and Bob Pearce finished in that order in the much-discussed DX event, while Dave Webb, Jeff Bill Aaker and VOD II (Very Odd Design). Dallas sparkplug uses EK Log II and Webra with 11 X 7 prop on original pattern ship.





Scale winner, Justin Shumway and scratch-built D-VIII. ST 56 hauls 6½ lb. gem.

Krause, Thomas, Pearce, and Carey offer Ted White advice on his El Gringo (RCM July '70).



Mexico City visitor, Salo Feiner (r), 1970 Mexican National RC Stunt Champion, gets Formula I story from Ted White before heat in San Antonio.



Dan Carey calls no. 1 pylon for Ted White during San Antonio Formula I heat.

Engine problems were frustrating. Ted topped DX patter event

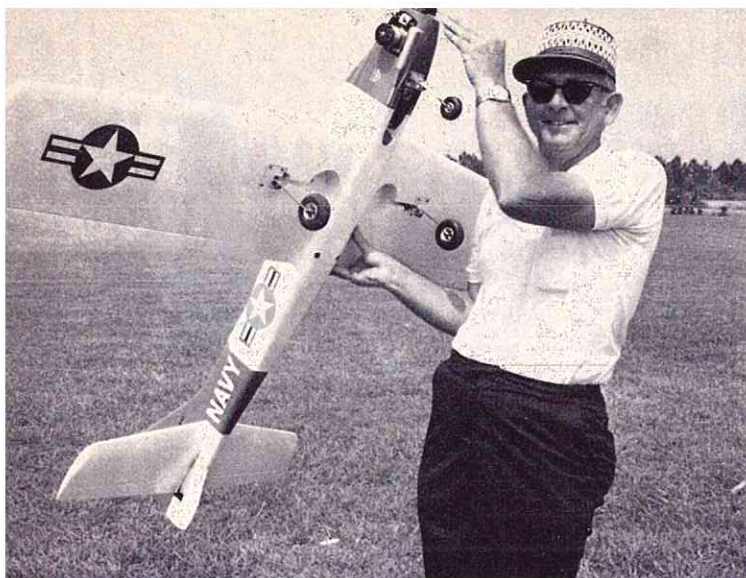
Dr. Bob Pearce and winning Ballerina. Two wins during 1970 in San Antonio. K & B 40, Logictrol. Top Nats contender. Weather perfect, 10 heats flown.



Ed Rankin of Ft. Worth Thunderbirds, 3rd in San Antonio, used new ST 40 ABC engine. Fast but some engine kinks persisted.



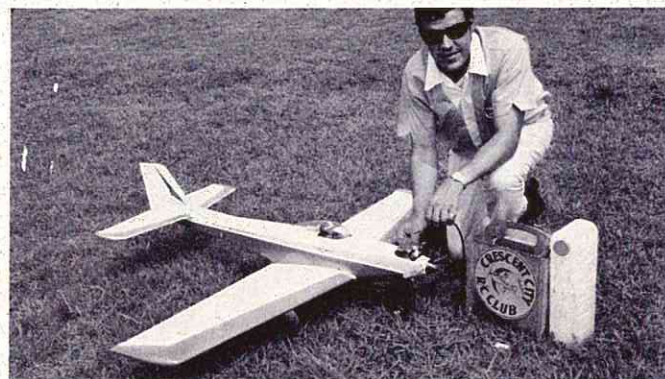
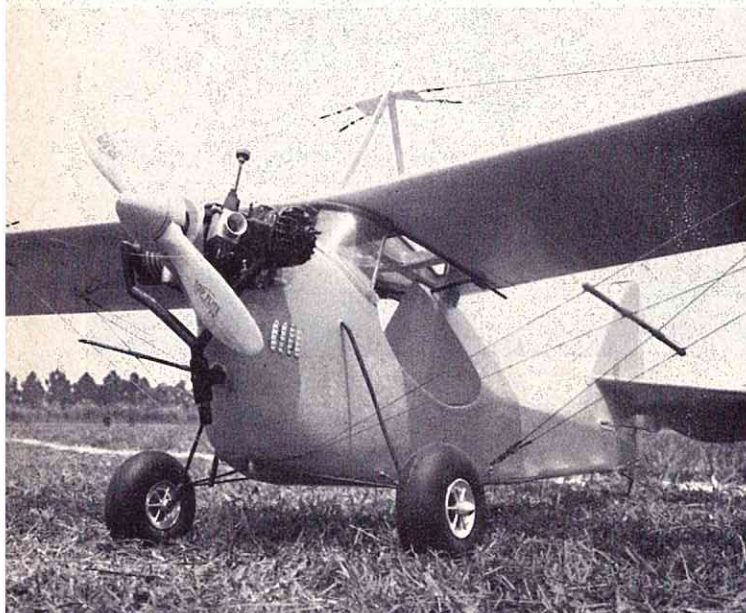
Jensen, and Jody McDaniel went 1-2-3- in the D-Novice category. In A pattern Tommy Dodgen added another notch to his victory string by heading Mike Paulovich and J.D. Alexander. Norm Barnes, Dick Lewis, and Vic Baney topped the large B group in a closely fought event. Scale — thinly attended — went to Justin Shumway with a Fokker DII, George Griffin and a Nieuport 17, and Larry Hyde and a P-51. Twenty entries signed up for Open Pylon which saw Ted White and a 9½ lb. El Gringo breeze to a solid win only to be later disqualified for flying rolls and inverted in the race pattern after completing the standard number of laps. Ted's comment wasn't recorded . . . Roy Klett, RCM's Jim Simpson, Gale Helms, and Bob Pearce also shared top pylon honors. In the judging department Ernie Harwood,



DX event winner, Don Coleman and new Cutlass Supreme. 8½ lbs. Webra B/H, Silenceaire, Pro Line radio.

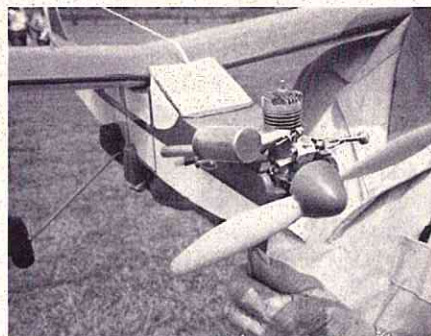


Trophies galore . . . Charley Castaing and Hulin Richard contest impressarios, magnifico!

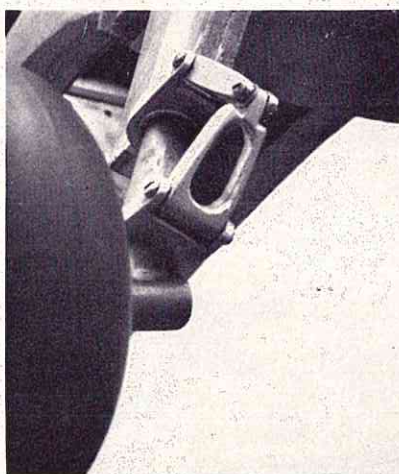


CCRCC newcomer, Ben Mathews, 1st in A. Penrod Mark II, Webra B/H, Olympic Positracts, Pro Line radio, 8 lbs. 6 mos. in RC.

Aeronca C-3 by Ray Resweber. Scratch built, McCoy 19, Celastic fuselage, 4½ lbs.



Toilet brass and silver solder . . . another Ray Resweber creation seen at Lafayette meet. Headmaster's Enya .09 has over-flow pipe muffler. Neat.



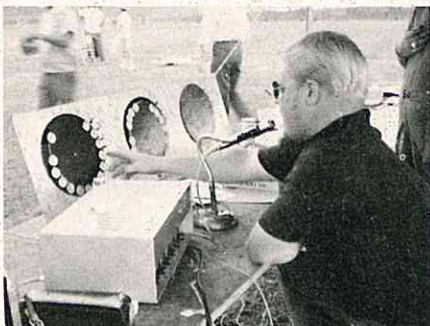
Gear detail of Resweber PT-17. Handmade drag link on fully working oleo.

George Chaderes, Reed Brandenburg, Jim Sims, Mel Avery, and Jim Hautiman shared the hot seats for the 1970 meet.

San Antonio's second sanctioned contest of 1970 followed the Dallas outing and provided an added view of Formula I competition as it shaped up this year. The Alamo RC Society headed by Bill Morgan, laid out the welcome mat at their well-tended flying site with its 300 x 40 foot runway. Some 50 contestants from three states challenged the tornado-threatening weather to take a try at the pattern and pylon events being offered in the mid-May contest. Weather concern vanished on Friday night as the squall lines rattled off into the Gulf of Mexico leaving relieved



At an RC meet?
Ray Resweber was ready for anything. Cruiser was 7 year building task, used as camper. Pitts Spl. Ray's latest.



Mike at the mike.
Mike Wade, pro announcer, kept flying moving.

Time out from editorial wars. Bob Talley of Pt. Arthur Oily Boids and "Talley-Whacker" stunt ship entertained Lafayette spectators.



contest officials and clear skies and mild temperatures. Wind persisted on Saturday with choppy ground currents to make the job of the pattern buffs that much more interesting, but Sunday came along with virtually perfect conditions for Formula I pilots and planes with calm wind all day and 75° temperatures. Engines hummed...

In the DX pattern event Dan Carey found himself and his Thunderbird/New Orleanian edged once again, this time by Ted White who was making up for the loss in Dallas two weeks earlier. (Ted's 2-flight Dallas total had him topping DX but a rule book check revealed DX required a 3-flight score total which gave Ted 3rd place instead.) This is how the San Antonio pattern finished:

A — Mel Whitley, Paul Verger, Bud Wrenn.

B — George Avilla, Vic Baney

DN — Ivan Munninghoff, J. Brown, Cletus Brow,

DX — Ted White, Dan Carey, Steve Helms.

Dr. Bob Pearce once again dominated Formula I but it wasn't an easy win. With competition such as Don Yockey, Ed Rankin, Gale and Steve Helms, John Locke, and Bill Anderson among the 20 contestant field, Bob and his K & B powered Ballerina had no time for any slack or loafing to stay in front for each of the 10 heats flown in the run for 1st place. Dan Carey, who calls for Bob, made sure he kept working at keeping the white Ballerina
(continued on page 54)



RC enthusiast Cledith Armel and Chihuahua/Poodle Angelique were Lafayette visitors. Resweber's Pitts ample for pooch.



Famous UCer, Don Still and SE-5 were 2nd in RC Scale at Lafayette. Top Flite kit, Webra 61, EK Pro radio, 12 X 5 prop, 6 1/4 lbs.

Sig T-34 by Ron Lawson (L). "Butsy" Walker gets details: VECO 61, Kraft, Dupont acrylic with Flex-all. Lafayette layout obvious.





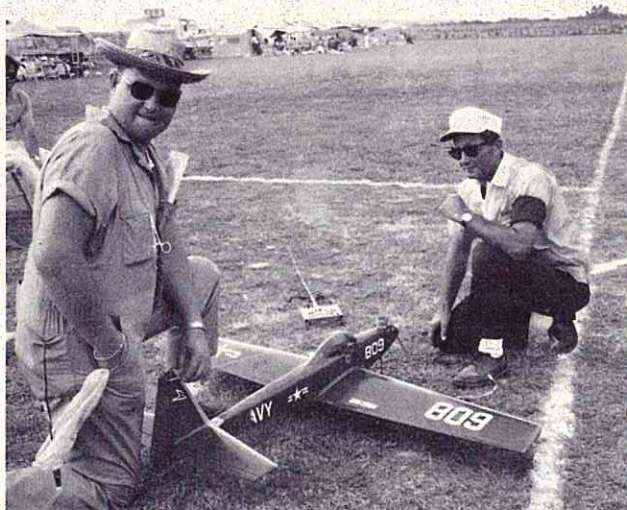
Crawdad boil hi-jinks.
Roger Broussard, Don Breaux, Ken Broussard and Ronny Mellon fill up. Standing are Ron Lawson, "Butsy" Walker, and T.J. Derouen. 600 lbs. of crustacea!



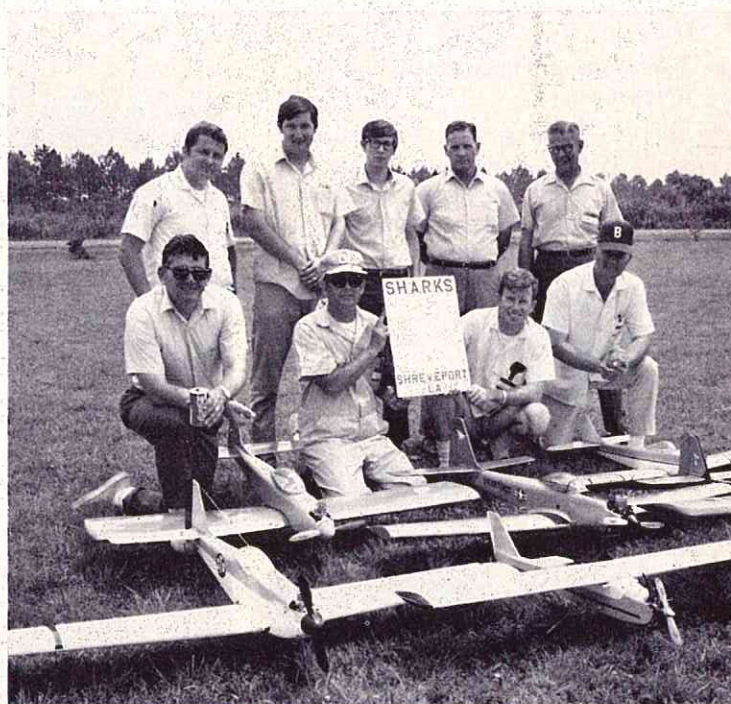
Top Lafayette score earned Dr. Robt. Lien Memorial Award for Cal Scully of Pt. Arthur Oily Boids. Don Breaux and Mrs. Woodrow Taylor made presentation.

Jr. Building contest finalists. Al "Tubby" Rourke, Ark-La. Exchange Club Dist. President made awards during LaFayette Aviation Day meet.

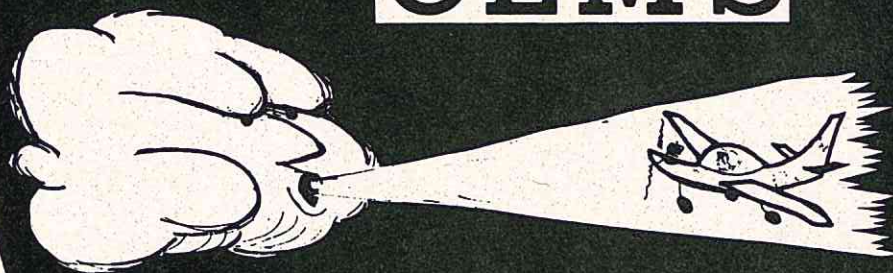
Shreveport SHARKS turned out for Lafayette meet. Making as many contests as possible a club project. Enthusiasm never waned . . .



Jerry Meyers 9r) readies for DX round. Was 4th, 3rd in scale. Larry Jurisich ready to hold, was 1st in B at 2nd Acadian RC meet.



GEMS



GENERALIZATIONS EFFECTING MODELS

BY Jim Simpson and Jim Bonar

Human beings are gregarious by nature. That is, they tend to band together. RC modelers are human beings (regardless of what you might occasionally hear to the contrary!) It naturally follows, therefore, that we (RC modelers) are gregarious, too! If you think not then why do you drive so far to contests, or just to fly with someone, or otherwise go out of your way to contact a fellow RC'er?

There are many, many benefits to be derived from this tendency so let's examine some of them. As we said in the beginning of this series the best things you can do, as a beginner, is to find a local group and begin there. So, what can a local group do for you?

Before you spend one thin dime in this sport just be patient and be very observant! Watch several flying sessions and one or two flyers will obviously stand out from the rest. If they fly like you would like to, then chances are they can, and will, teach you. And if they're willing to teach you, then by all means pay attention! Just between us modelers one of the great sources of sorrow is experienced by experts who spend hours telling a "new guy" the best way they know only to have him do just the opposite!

Suppose you have watched one of us Jim's fly and you are impressed, interested, and inclined. We have similar opinions and would suggest an easy-to-build, easy-to-fly plane (which doesn't look at all like a real airplane except it'll have the big wing in front, little one in back, and so on.) We would suggest one of three different brands of

radio equipment (all within about \$80.00 of each other in retail price) based on their reliability. Back to you now. If you can afford new items of that suggested then buy new ones. If not, tell your mentor and he will probably have an alternative. DO NOT, DO NOT, DO NOT go buy something else and say "see what I got for only two hundred dollars!" You are like a lamb in the lions den if you have no experience in RC and we are sick and tired of people in the know pawning off junk on the "new guy". Remember here that if used equipment is in the offing don't buy unless it's first test flown to your satisfaction.

Example: The heavy Jim has sold his used radios through the years in order to update his gear to the present. He has, when unable to fly the gear, made a trade back guarantee and we know lots of modelers who do likewise. So if you ask advice, heed it!

You can also observe, by watching the local flyers, which types of models fly best there (you don't see small heavy planes at high altitude sites, for instance) and the local group can tell you what frequencies not to fly on, as well.

When you buy the plane and gear and begin the assembly of it all you will be very grateful for any help you can get. So, back to the group you go with thousands of questions! They don't mind helping you so don't be afraid to ask for it.

Let's talk about the group of RC'ers you will meet when you find them. No two groups are alike. In all our travels and experience we've found three basic

types.

The first of these is the 'no-club organization' type. An excellent example of this type is the group on Okinawa. Here is as nice a bunch of guys as you'll find anywhere in the world. They have two primary flying sites available and some alternates if these were lost. They like to fly and have great weather most of the year and acceptable weather the remainder. They have some professional electronics people like John and Sam and some professional pilots like Dave and so what more could they ask for? They are already head and shoulders above their contemporaries! There is one thing missing in Okinawa, though, and that is organization. With no organization no one thought to put up signs in the island's many shops telling where they could be found. As a consequence lots of people have missed them completely.

But now about this organization thing. It can also be a multi headed monster! It can be the best thing that ever happened to a group; or the worst. Let's examine the worst first and save the best for last.

Human beings are also individuals, especially RC'ers. There are some who want to be president and some who don't. And there are some who don't care.

We spent 3 years at a base close to a town which houses one of the oldest and best known clubs in the country. It had as many as 20 and as few as 7 members. Because there was a lot of bad weather there, an organization with regular meetings and interesting agenda would be a tremendous asset. As time went on an issue reared its ugly head. When the shouting, name calling, and back biting had slowed down there were two factions. A Pro and Con, left and right, Ford and Chevy, Democrat and Republican, or what have you. The big problem, here, was not the issue but the reaction to it!

The answer to what makes people split into factions can be found through a careful study of human psychology lasting 500 years or so! If this interests you sell your gear and go to the library!

The answer to "how to prevent the factions" is best paraphrased in an utterance of a truly great American who might have said, "Ask not what your club can do for you but, rather, what can you do for your club!" So, never, never stomp off pouting and refuse to pay your dues just because you don't get your way! And you can obviously see this is an individual responsibility, so take care of it yourself. ●

TOP OUT

(continued from page 51)

close to the pylons... Three Lanier Cosmic Wind ready-built were flown and showed they can be useful assets to pilots seriously competing in the Goodyear racing classic. Their popularity should soon match that of the Lanier Citron pattern ship for those who need a ship in a hurry or a good back-up entry. Another new item, the Super Tiger ABC 40 was also seen and gave a good account of itself during this meet. This engine uses new — to modeling — metallurgy which puts a low-expansion aluminum alloy ringless piston inside a brass cylinder liner that has been chrome plated — thus the “ABC” designation. Experimental engines using these materials have been tried in control line circles over the last couple years but this is the first major commercial try with the system and it’s one which Super Tiger hopes to dent K & B’s supremacy in the racing 40 sized engine market.

Lafayette, La. and the yearly Crawfish Boil was undoubtedly the main RC event of May. The Acadian RC Club, together with the Lafayette Exchange Club — and what seemed to be the entire community — turned May 23rd and 24th into a genuine tribute to modeling and modelers everywhere with the 2nd Annual Model Aviation Day celebration.

Again, as last year, Mayor J. Raymond Bertrand proclaimed the entire week of 18 to 24 May as Model Aviation Week. The week-end flying was dedicated to the memory of Woodrow E. Taylor who was an enthusiastic Enchängite supporter of modeling. Some 70 local businesses joined in supporting a beautiful array of trophies as once again the Acadian RC Club turned RC host at their Comeaux High School flying site. The latter was manicured and trimmed to a country club picture to welcome 45 contestants and a host of visitors who enjoyed the mild sunny weather and outstanding flying. Even the Navy sent a half-dozen Phantoms over to salute the occasion. And of course there was the crawfish boil on Saturday night that saw 500 lbs. of crawdads and 100 lbs of shrimp — all deliciously spice boiled — disappear among the 180 crawdad eatin’ devotees...

And the flying saw a tight DX event race between Lou Penrod, Cal Scully, and Don Coleman who was flying his new super-steady retract gear com-

petition creation he named “Cutlass”. In a flip-flop finish Don finally edged Cal on the last flight although Cal had racked up an outstanding 1630 point flight with his now famous Mr. Ed IV (RCM Feb. ’70). For this he won the Dr. Rob. Lien Memorial Award which was presented by Mrs. Woodrow Taylor and Don Breaux, V.P. of the Lafayette Exchange Club. Lou Penrod settled for 3rd flying his well known Mark II and was followed by Jerry Meyers of the CCRCC flying a Bob Lien designed New Orleanian. Other winners were:

A — Ben Mathews, Andre Jurisich, Paul Verger.

B — Larry Jurisich, Les Sanborn, Bill Reynolds.

Scale — Wallace Armond, Don Still, Jerry Meyers.

Testors Best Finish — Wallace Armond.

A plane building contest for juniors was also sponsored with finalists being presented awards by Al “Tubby” Rourke, Publisher-Editor of the Louisiana Conservative Republican and the President of the Arkansas-Louisians Exchange Club District who came from Alexandria for the occasion. Building contest finalists were Alan Cook, Chas. Carnes, Jim Watson, Howard Ham, Ed Moody, and Monte Richard.

Director of Operations was Hulin Richard who, despite being the hardest working contest promoter we know of, makes it all come out smooth and pleasant. He was ably assisted by Charley Castaing as CD, and Mike Wade and Keith McCoy who kept things lively and moving over the excellent P.A. system. Also lending yeoman service were Bryant Fehlman and Ron Lawson who are the 1970 President and V.P. of the Acadia RC Club. Our hats off to the chief chefs for the crawdad feast — Rogers Broussard, Ronnie Mellon and T.J. Derouen. And those who did the judging at this smooth and efficient contest were Jim Molan, Charles LeBlanc, Eroll Amy, Hulin Richard, Butch Huff, Rogers Broussard, Homer Klieser, Monte Richard, Ron Lawson, and Jim Jennings.

The feeling of the contestants about the calibre of the contest is best typified by Lou Penrod’s words as he volunteered his appreciation to the assembled fliers at the close of the contest. “The best doggone contest I’ve ever been to.” The prolonged applause by the fliers showed they whole-heartedly agreed...

CANAL CROSSING

(continued from page 47)

mond Stack, and entered Miraflores Locks at 7:15. While the craft was being lifted from one level to another, she was tied up to the control boat with her engine running. The passage through the waterway was guided by all times by the Marine Traffic controllers in Balboa.

In addition to her owner, the chase craft had veteran Panama Canal Pilot Capt. William T. Lyons aboard who was in charge of the operation; Sgt. and Mrs. Raymond Stack; and Maj. Vaughn Roberts, another model airplane and model boat buff.

The journey was completed at 3:05 PM when the Ancon II docked at the Cristobal Yacht Club.

Maj. Thomas has been a model airplane and boat enthusiast for the past 20 years although most of his experience has been with model airplanes.

Our thanks to Forrest B. Waller, Secretary and Editor of the Isthmian Model Aero Club, and to the Panama Canal Spillway Newspaper for furnishing the details on this new Canal Record.

SPOKANE INTERNATS

(continued from page 29)

Dale Moore tied with Dave Gould.

HI JR — Bob Smith.

Dave Musgrave of the Barons was the Pattern Event Director who was ably assisted by Larry Davenport as Flight Controller who operated the original and effective IBM card flight distribution board.

Formula I awards had to be based upon qualifying flights made on Saturday since the threat of rain turned into very cold and windy reality on Sunday afternoon. This prevented completion of what promised to be a hot contest of great performances by most of the 28 entries in the event. Understandably, this led to the disappointment of many who would have flown and watched in the rain, but Lt. Col. Bob Hepker and Dick Carson, considering the safety factors above all else, reluctantly made the decision to forego further flying. Possibly the

most disappointed of all was Brig. Gen. Bob King, boss of the Washington ANG, who backed the decision and promised that future contests would more than make up for the temporary setback.

All this didn't mean the qualifying flights weren't hard fought heats in the 4 rounds flown. Although the endurance factor wasn't tested — to see if the hot K & B-Lee 40's and the stamina of the pilots would hold up over a ten heat haul — there was enough action to make veteran RCers shake their heads over the blazing speeds. As Bob Smith of Los Angeles turned in what turned out to be the fastest official time of 1:40.2, Sandy Pimenoff who heads the CIAM of the FAI and had come all the way from Finland to observe the meet, commented that such speeds and pilot performance were unexcelled anywhere. "In pattern the Europeans match U.S. standards; in Pylon 1 you undoubtedly have a big lead all the way around", he summed it up... Behind Bob Smith, Howard Reed settled for 2nd and Ken Thorstad recorded the 3rd fastest performance. The scatter pylon signaling system used signal lights to indicate pylon passage which eliminates the use of flags. An excellent telephone system was also employed and was provided by the 252nd Communications Group. A few bugs evidently needed smoothing out in the signal system to assure 100% light signals which stopped a couple times. This happened on one of Bob Smith's flights and wiped out a time under 1:36... (Bob, by the way, set an AMA pylon record this year with a 1:31.9 in the unlimited class.) He also won the Junior-Senior pattern event making him an all around threat for the Nats this year... Pylon 2 was the FAI variety requiring use of supplied fuel and muffled engines. This event went to Whit Stockwell followed by Bob Root flying a lovely loving Spl., Larry Sperberg, Garry Korpi, and Jerry Nelson. Bill Bone headed up the effective staff of RCers who manned the equipment for pylon events. Sportsmanship was everywhere apparent, as evidenced by Joe Bridi who, unable to compete due to a back injury, loaned his own aircraft to competitor Bror Faber after Faber's mid-air with another pilot.

Dick Rothstein was the RC Scale Event Director, and once he had everyone awake at 7 AM on Sunday after a late Saturday night, the scale flights went off without a hitch. There were

14 entries with 9 ships actually making flights. Scale points had the winner as Simon Dreese flying a neat Chipmunk, closely followed by Whit Stockwell and another Chipmunk up for its maiden flights. Joe Bridi was 3rd with the Proctor Nieuport he flew to 5th place in Lemwerder, Germany last year. Joe, incidentally, has been named as AMA Scale Manager for the U.S. teams heading to England this year. Joe will have the task of keeping tabs on both the RC and Control Line teams for the upcoming Scale World Championships in August...

To give added spice to the 3-ring contest flying, a hangar next to the pylon course housed displays of the latest RC and modeling wares set up by 21 of the top merchandisers. Along with static displays of a wide range of models competing for hardware, it was comparable to many of the winter shows that have become traditional. Dessert topping for all this feast was in the form of a line of vintage full scale aircraft that arrived in formation during Bridi's scale flight and for a moment or so it was hard to pick out Joe's Nieuport... The old ships, including a 1918 Thomas-Morse Scout, were joined by a group of modern aircraft including a very hard and heavy looking F-101 Voodoo interceptor which is now flown by the ANG 142nd Air Defense Wing who hosted the meet.

Finals of a Delta Dart sub-junior program were also held in the display hangar. Finalists from some 20 schools were on hand to try for some of the hardware on a display stand waiting for the winners in all the events. It's interesting to note the highest time was scored by a 7 year old girl who comes from a well known modeling family; little Ann Brooke whose daddy was prouder of her 1st place trophy than the one he received in D Expert... Extensive plans for expansion of the popular Dart program are being set for 1971.

Principle non-flying occasion of the weekend was the Model Hall of Fame Banquet held in the Ridpath Hotel on Saturday night. There wasn't an empty seat in the Empire Ballroom as modelers and guests were bagpipied to their seats by kilted Lt. Col. John McEwing and joined in saluting modeling and the Heads of Nations of the countries represented at the international meet. Welcome address was made by Maj. Gen. Howard S. McGee, Adjutant General of the State of Washington, who introduced Phil Kraft who

then gave an outstanding keynote address for the installation of the 1970 Hall-of-Famers. Al Lewis, Dick Korda, and Bill Winter were accorded the honor and distinction this year and thus joined Dr. Walt Good, Willis Brown, Carl Goldberg, Frank Zaic, and Walt Billet who were the initial Model Aviation Hall of Fame inductees in 1969. Presentation to the 1970 group was made by AMA President, John Patton.

Hosts for the 1970 Spokane Internats were the officers and men of the 142nd Air Defense Wing commanded by Col. Lyle "Scott" Scott — a real friend to modelers — and the 252nd Communications Group headed by Col. Ray Wilson. It was Col. Wilson's electronics crew who manned the frequency monitors and identified serious interference which was detected on Friday. They coordinated with the FCC who shut down two sources, and tracked another to California that was skipping all the way to New York as well as to Spokane. All this on one frequency — 26.995! (Had any trouble there lately?)

Pilots of the 116th Fighter Sqdn. acted as judges for all the pattern events while everyone else pitched in to make all the visitors feel at home. Various Washington clubs worked together with Dick Carson and the Spokane Barons to fulfill the multitude of details required in staging a contest of such magnitude. The Seattle RAMS, Seattle Radio Aero Club, and the Mt. Ranier RC Society gave valuable assistance. Also making the Internats the occasion it was was Col. Lloyd Lamb and Maj. Dale Bailey who both ably represented Brig. Gen. Bob King in assuring a smooth flow of all events.

Of special significance for RC'ers was the attendance of Sandy Pimenoff of Finland mentioned earlier. As President of the FAI aeromodeling committee, his visit was in conjunction with a serious effort being made by the AMA to bring the next World Championships to the U.S. during 1971. With the active backing of Gov. Evans, the State of Washington with its outstanding organizational capability and depth of experience in modeling (among other things, they've been sending observers to the Nats for several years) may very well be the site of the 1971 World event.

And that experience has been no accident as State machinery has purposefully sought information and knowledge to put action where

SPOKANE INTERNATS

creative imagination and foresight led. Under the joint sponsorship of the Washington National Guard and the Department of Aerospace Education of Central Washington State College, a program of aerospace education and activity has been underway for some time now. This is the program referred to earlier that has the Academy of Aerospace Science and Modeling as one of its basic cornerstones. Within this framework the Model Aviation Hall of Fame is established along with the annual Spokane Internats. Last summer some 70 educators from throughout the state gathered at Camp Murray in Tacoma to devote a full month to an Aerospace Workshop which included a full scope orientation and practice of modeling techniques along with many other facets of aerospace activity. Directors of the Workshop were Prof. Althea Adams of Central Washington State College and Brig. Gen. King who brought together a wide range of consultants to insure the attending teachers they were receiving accurate as well as the latest information on the subjects covered. Personal participation by teachers included construction and flight of model planes and rockets which was intended to stress the impact of learning by doing and the use of models in classroom situations, as well as the psychological involvement in the lore and romance of man's attempts at flight.

In his visit to the 1970 Spokane Internats, Gov. Daniel J. Evans pointed up the goals of their program. In a televised press interview he summed it up this way: "It goes without saying we would far rather see positive growth programs such as this — with our National Guard as an adjunct to education, than to be otherwise engaged in unfortunate civil disorder confrontations — and we hope other states will find our example a means of initiating similar activities so that the benefits of aerospace and modeling may be realized to their fullest extent."

To which we add our own amens . . .

LIL HONCHO

(continued from page 22)

of fact, I started to do just that, but after the first few sessions something was still bugging me. Here I'd take this big roaring .60 beast, go blasting off all

over the sky to practice. I'd get the big monster all set up for a maneuver, get halfway thru — goof — and before I had time to make the correction, it was all over and I'd have to go thru the whole elaborate setting up process to start again. At twelve ounces of fuel of flight, yet! (I'm a cheapskate). Moreover, my natural style of flying is close to me and the ground, where I can see exactly what's going on. These big six pound .60 bombs roaring by at eighty mph and twenty feet up and rolling, is enough to rattle even my 200 lb. plus frame! A mistake, here, and there's no time or room to correct. I could do all the maneuvers I needed, but I just couldn't do them well enough — and my progress was painfully slow. I kept wishing for my little three foot span .15 model that I could throw all over the sky, down close to the ground, and if I goofed, so what? There'd be plenty of time and room to correct my mistake. The model was always close enough to me to see the mistakes as soon as they happened, correct, watch the correction and re-correct again if necessary. Anybody who saw my old comedy act will remember that I would do multiple snap rolls and reverse spins starting about thirty feet off the deck. I never quite felt "at home" enough with my .60 bombs to try to throw them around this way — indeed, it wouldn't have been save to try. What I needed was a model I could feel "at home" with down low and close in, yet one which would be capable of all the standard maneuvers. It would have to be small, light, simple, slow and easy to build. Lil' Honcho was about to happen!

Frankly, the fuselage was 'designed' first. I knew I needed side area, but I hated the thought of all the work involved in a turtle deck. Surely there must be a simpler way. What could be simpler than two three-inch wide pieces of balsa — all the way? Three inches wide at the nose and three inches wide at the tail. Why not? Since light weight and a simple structure was another requirement, why not leave out all those time consuming and weighty items in the wings, like landing gear blocks and braces? In fact, why even a nose wheel at all? I already knew how to take off and land with a trike gear, in fact, this was the one area of the pattern that I wasn't having any trouble with. Anyway, it wasn't going to be flown at contests so why clutter it up? A conventional L.G. mounted in the fuselage was the obvious answer, so in it went. There was an unexpected fringe benefit in this which I'll explain later on.

The wing had to be something special. The airfoil had to embody all the aerodynamic knowledge I had accumulated in 30 years of modeling and 16 years in R/C. Armed with all of this know-how, I carefully stole a rib pattern from a Flite-Streak Ukie kit! Seriously, this is an airfoil we're all missing the boat on. About six years ago, I built a couple of semi-scale SE-5 bi-planes using two Flite-Streak wings. While they were not outstanding models otherwise, they did have two good characteristics as R/C models. They did invert easily and they did have good low speed characteristics, especially in the glide and landing approaches — no snap tendencies — nose high glide — just right. The wing span was also determined scientifically — balsa sheets are three feet long, right? Why cut any more balsa than I had to? Dihedral — like, who needs it? It's just another glue joint I didn't need.

The tail turned out to be just a few sheets of ¼ inch balsa sheet hinged together. The fillets at the stab leading edge just happened because I had some scraps left over. I may not use them on the next one, but they do look sorta good. I doubt that they have any other value.

Lil' Honcho was put out on the flight line to all sorts of comments about it looking like a misplaced ukie. I had originally named it Lil' Slabsides, but I quickly decided to re-name it after one of my favorite old ukies, the Veco Chief. For those of you that have never spent any time in the Far East, "Honcho" is G.I./Japanese for "Chief".

The first flights were about average for a new model. At first, I thought I hadn't succeeded in my low and slow bit, but a change to a Top-Flite nylon 9-4 prop and a bit of familiarization was all that was required. The model grooves, both upright and inverted. I've still got a whole heck of a lot of practice ahead of me, but now it's with a model I can feel "at home" with. If the model has any one peculiarity, it's that it seems to fly better inverted than upright. Once a gradual inverted turn is set up, it will continue all the way around without the aileron or elevator — just a touch of engine trim occasionally. The Inverted Figure Eight looks like it was designed for this model — you just initiate the turn, reverse at the crossover and take it out at the end — the rest is hands off. The rest of the maneuvers in the pattern are just about average — you can make them large or small, as you like them. The best part of

it is that Honcho does them slowly enough that you can see the corrections when they are needed, make them, and then watch the results of the corrections. Its almost like watching a slow motion movie. Since I like to do most of my maneuvers at about half or two-thirds throttle, adding power as needed, this effect is enhanced.

The first take-offs and landings with Lil' Honcho showed one unexpected benefit from the 3" deep tail section. The model sits on the ground in what seems to be a natural angle of attack for a take-off or landing without the use of a lot of up elevator. On take-offs, just hold it straight ahead and when it has enough air speed, it'll fly itself right off. On landings, when you flare out and chop power, it sets itself right down on three points. The angle shown seems to be just about right — no need for excessive nose-up attitudes that usually causes ballooning. As far as snap-rolling in slow, dragged in approach, it just hasn't happened to me as yet, and in fact, the longer and slower the approach, the easier seems to be the touch-down. One incident proved its reluctance to snap roll even when stalled. The second Sunday out the winds were gusting from 20 mph to 40 mph. Like usual, I overestimated my fuel supply and suddenly found myself with a dead engine about thirty feet overhead. I decided to land straight ahead into the wind. All was well, until I was about fifteen feet up, when the 40 mph gust I was flying into suddenly dropped to a 20 mph one. The model was nose high, and stalled right there. It fell like a pancake the last 15 feet, wings level. The stab hit a bit of bovine remnants and snapped off, and one wheel bounced thru the bottom of the wing, but of snap rolls, there were none.

A word about the landing gear and fuel hatch. The landing gear looks long and probably could be shortened. At the time I built it, I was leaving room for a .35 sized prop if the .19 didn't prove big enough, but the Max .19 is plenty. However, the long L.G. gives the correct angle of attack I mentioned before and makes take-offs from a grass field most easy. If you are one of those who habitually bounces them in pretty hard, you might want to make the struts out of 5/32" wire to keep from knocking holes in the bottom of the wings with the wheels. The optional foam wings would also cure this, but the thing always seems to land so gentle, I haven't had the reason to try this. The fuel tank hatch was placed on the bottom so I could get the forward placement of the

cockpit I wanted to balance the side areas off. So far, its worked perfectly and I have no reason to change it, but I must warn you to keep the screws tight — R/C models don't fly too hot after the battery has fallen out!

The painting of Lil' Honcho is the second version. Originally, it was solid red with yellow trim, but it looked just like another small R/C Model — which it definitely ain't! I reverted to a scheme I had used on a Ukie back in 1953. Cessna Grey to simulate a military finish (its easier to apply and patch than aluminum paint and still looks "military"). A sheet of Finishing Touch decals (Sheet A-101) were used to simulate the markings of the F-94B's, F-80C's and T-33A's as they were painted and used by the 68th Fighter-Interceptor Squadron at Itazuke AFB in Japan during the period of 1952 thru 1954 — I was dere, Charlie. The squadron insignia was homemade from brown gummed tape. The red and yellow stripes were masked off and doped, but the rest was from the Finishing Touch sheet. I like it and it do stand out in the bunch on the flight line, but you can paint it like you like — it'd be a dull world if we all painted our models the same.

CONSTRUCTION

Two wings are shown, the foam type and the more conventional built-up and sheeted type. The latter is the type used on the original and is the one shown in the photos. It was an experiment to see if I could build a conventional sheeted wing almost as quick as a foam and sheeted one. It works, with the limitations I'll outline later, but right here I'll describe how its done and you can decide for yourself which way you want to go. First, all the wing ribs were cut out and notched. Then the full-depth wing spar was also cut out and notched. The leading edge and trailing edges were marked with the rib locations. The 3/32" x 3/8" strip was contact cemented to the back of the L.E. and notched out to fit the ribs. Then both the L.E. and T.E. were blocked to the proper height and pinned to the work bench. The ribs were then assembled onto the spar, shim sheets placed under the spar and the whole assembly aligned and pinned together to the leading and trailing edges that were already pinned down. Then a liberal application of Titebond was applied to all joints and the whole mess let set to dry for a day or two. This is just about the length of time it takes to get a set of foam wing cores cut by your local wing cutter

anyway, so use the time to build the fuselage and tail. When the basic wing structure is completely dry, remove it from the bench, add the aileron servo mounts and T.E. screw block, trim all the excess glue that oozed from the joints, sand and get ready for the next step. Get two 10" wide sheets of 1/16th balsa sheet (soft) and mark on them the locations of all the wing ribs, the leading edge, spar and trailing edge. The leading edge should be at one edge of the sheet. You are now about fifteen minutes away from a completely sheeted wing. Using a 3/4" wide paintbrush, paint regular contact cement on the sheets on the marks and then on all ribs, the spar, the leading edge and the trailing edge of one side of the wing structure. As soon as this is dry, start at the leading edge and align the sheet and put it in place, and then "roll" it back along the wing structure until the trailing edge is reached. Make sure you have full contact with each rib all the way back. Now trim off the excess from the trailing edge and repeat the process with the other side, bang, you're ready for tips and ailerons and hinges, dowels, and all them goodies. Now for the limitations to this method. It works fine as long as you don't plan on doping the finished product. If you are gonna use MonoKote or Solarfilm or even Hobby-poxy Easy-Does-It method, this'll work fine. If, however, you plan to use regular dope, substitute Titebond for the contact cement and be prepared to wait out the drying time. The reason for this became obvious when I applied the first coat of dope over my pride and joy. The solvents in the dope penetrated thru the balsa sheets and softened the contact cement enough to allow several definite non-airfoil type curves to pop up all over the plane. I finally solved the problem with a hypo full of Titebond, which I injected at each rib and pinned the whole mess down again. Just you decide which way to finish the wing before you build it and save yourself some grief. The foam wing should need no explanation, except that spars would seem to be unnecessary with a wing this short and so lightly loaded.

The fuselage is about as straightforward as you can make it. While I show 3" wide sheet balsa on the plans, this isn't critical. What I mean by this is that almost all the soft balsa sheets seem to have edges that are neither straight or parallel. The average deviation seems to be about 3/32", which I simply trimmed off on the original, giving me a fuselage that was 2-29/32" wide, but

(continued on page 68)

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MAGIC DRAGON

(continued from page 25)

Well, about this time the '65 Nats were barreling down on me, and I decided to really do something different, so I cooked up a thing called the "Thunderbolt". This had fully elliptical surfaces, was 690 squares in the wing and a 632-215 airfoil. This is a somewhat lifting airfoil, about 15 percent thick. It figured that with elliptical wings I had to do something special for the fuselage, so I got hold of a monster block of pine and, with the help of another flying buddy, Frank Deis, we carved out a wooden mold; greased her up, and molded a bunch of fuselages out of epoxy/fiberglass laminate. I used a Merco .61 lying over on its side to provide the urge. The wings were fully built up inside and fully sheeted. With this fairly thin airfoil and only 690 square inches, (of course an elliptical wing gives you real thin tips), this baby was a bomb to end all bombs!

After all these "Kind-of-wild" machines, I figured it was about time I did something more or less middle of the road. So for '66 we stirred the brew and whooped up a "Magic Dragon". We went up to 755 square inches of wing in order to lower the

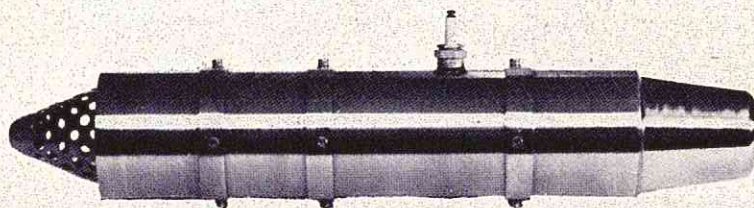
wing loading down somewhere between 20 and 22 oz., which checks in as a pretty decent place to be. We also used an NACA 632-415 airfoil which is a semi-symmetrical airfoil and is somewhat more of a lifting section than the one I was using in the Thunderbolt, though it doesn't run as much lift as the old 2415. Stuffed a .60 in the front of it, used a tail moment that was a little bit longer than what I had been using, and a nose moment that was a trifle shorter. The rudder size and fin area were around what seemed best coming up through the long design series and the stabilizer was the same kind of, cut, whack and chop proposition. We built two of these beasts in the spring of '66 and, man, was I delighted! The Green Box proportional hadn't arrived so I stuck reeds in one of them and went pantin' out to Wright Field to fly it on those long smooth concrete runways. Actually, the wind was blowing about 30 miles an hour (what else for a first flight), but she handled it with "no sweat". Probably the best way to describe the flying characteristics is to say, "it flies with a real light responsive touch", if you know what I mean. Stability is dead neutral and it goes just exactly where you put it by just

the amount you put it there. It moves out right quick and it seems to find a pretty good groove. Rolls are what I've been looking for; it holds them right on a strung line; shows no yaw, wobble, flop, flip or flap; just turns over neatly and cleanly on the old chalk line at about 2 seconds per roll. Landing characteristics are kind of weird; you haul back on the stick and the wing just absolutely refuses to stall out. So you fly and fly and fly and fly. It's darn disconcerting to use 5000 feet of runway to land but it's been known to happen. I haven't really had too much trouble with it as long as I got it down fairly low and slow while we were far out and just let her settle in comfortably. It's awful nice to know that no matter how far you haul back on it, it simply won't drop a wing and snap roll. On the other hand, the airfoil gives mighty interesting inverted performance. Take a quick peek at it and you'll note that the maximum thickness on the bottom is well ahead of the maximum thickness on top. This tends to move your center of lift forward when you're inverted and you don't require so much down trim. Even more important than that, it gives you nice smooth, round outside loops.

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Well, that's our Dragon — not the complete solution by any stretch but a darn fine flying machine — kind of a purty thing too. Of course, as far as that goes, I've yet to see any model that I thought was the complete solution although the Dragon will give you as much as anything I've seen so far.

If you're still with us, (Clyde, — Clyde — somebody give him a punch in the ribs, he's gone to sleep again) — we'll talk about building this gaflamin, gaspitten machine. First off, a quick word of caution, if you haven't built a full house contest type

multi, don't start here. While this bird has no bad habits, neutral stability means just that, and if you're a beginner checking out for the first time, you're sure going to have your hands full.

My structure philosophy (bet you didn't even know a structure had a philosophy) was pretty straightforward. Build it simple, clean, put a minimum number of hours in it, and the minimum number of "kookie" features, and pick up as much in the way of modern time savers as I could. After some of my wild results with the fiberglass T-bolt, I decided to go for a

straightforward, wooden fuselage. One of the things I jazzed it up with was a foam turtleback; this eliminates the problem of the sheet skin making like a roller coaster between the formers giving you that "python-swallowing-an-egg" look and also stiffens the daylight out of the back end of the fuselage. It turned out to be a real good deal. Easy to make and very effective. effective.

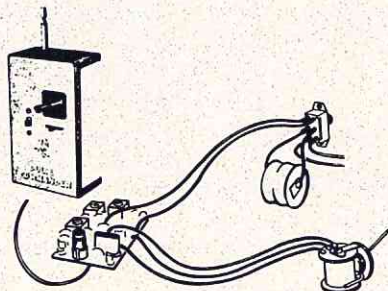
Another novelty was the fiberglass engine cowl; which isn't much of a job to whip out and gives you a nicely shaped gook-proof front end. Nothing upsets me more than that little sump of sludge that collects in the pit between the wooden engine bearers. The fiberglass just whoops the whole thing; wipes out real easy too and lets you get at every part of your engine. Just bolted the engine in place with nylon spacers and it seems to work real well. It sure is handy for servicing the engine. By using an Allen screwdriver you can strip, plate, engine and all off the front of the airplane in something under five minutes. It's a good thing you can too, 'cause the next feature I went for was the completely integral fuel tank with no access hatches. I was carried away by Matty Sullivan's tanks and, when I got around to putting a 10 oz. job in, I put it in permanently with a solid bulkhead behind it. This turned out to be a great thing as it maintains the structural integrity of the whole front end (like it stays in one piece in a crash, Clyde). The only access to the tank is a one inch hole right behind the engine plate and this is just big enough to allow me to pull Matty's super snazzy top out of the tank and jerk all the guts out to change the surgical tubing or what-have-you. I was a little worried about this set-up when I first put it in, but it's caused no problem whatsoever and I heartily recommend it. Another deal was, real simple fuselage sides with just 1/16" ply and 1/8" inch balsa wood and a minimum of bric-a-brac. In other words, I got fed up with making up fuselage sides that look like an engineering model of a Warren Truss bridge.

To hold the wings in place, I used the famous two dowels in front and nailed the trailing edge down with nylon bolts. Now that's something I wouldn't be without. I've screwed this thing into the ground a couple of times and in both cases the nylon bolts snapped off cleanly with an absolute minimum of damage, leaving me with a repairable bird instead of a candidate

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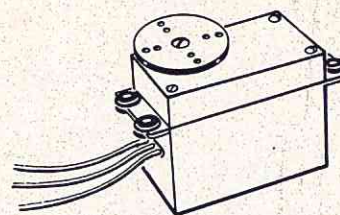
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for kindling the yule log.

The nose gear was a DeBolt mount and while it worked satisfactorily, I'm giving some thought to sticking the nose gear right on the aluminum motor mount on the next one. No good reason, just might make it look neater.

The wings are foam, of course. I did some deep thinking about how to stick them together in the center (deep thinking—like flour and water won't hold, maybe I'd better try something else). So I cooked up a main spar that carries all the landing gear loads, the main wing loads, and just about everything else. This has been another good thought. It wasn't particularly hard to make; simplified joining the wings, and in a couple or three crashes and 500 odd flights, I've yet to have the wings come unstuck in the center.

The stabilizer is the construction type that originated with Jim Walker's Fireball, and I haven't seen anything to beat it yet. Uses a 1/16 skin on top and a 1/16 skin underneath with leading edge, trailing edge and some ribs. No spars, no nothing. I was tempted to use foam here, but this thing is easy to build and light as can be. The fin and rudder are nice soft, juicy 3/8" sheet for the good and

simple reason that it doesn't warp up nearly as badly as the quarter inch stuff and, if you pick your wood carefully, it doesn't weigh much more.

So enough of this blathering about features and such, let's get with the building of this thing. Sweep the dog off the workbench, send the brats off to bed, give your wife a martini and a good book, and let's start construction.

WING

The wing, as we mentioned, is foam and if you haven't cut one of these things, you sure should. We've been using ¼ inch thick masonite for templates and getting two wing panels, one above the other, in a 4 inch block of beaded foam. It took us about 2½ hours to cut 4 panels on Fritz Breisch's dining room table. I don't know how you can do much better than that. The sheeting is more or less conventional except that I like to butt edge all my sheet before I start sticking it on the panels. This gives you a piece about 28 or 30 inches wide by 36 long. If you sand the whole mess down well before you stick it on you'll come up with a real nice finish. For what it's worth, I also stick it on at the trailing edge first and work my way up the bottom camber around the leading

edge and back over the top. But do it whatever way suits you best.

Before you sheet the wing, I hope you cut a big fat old slot for the main joiner and a hole for the servo, 'cause if you didn't—you have a problem. The joiners make up from 1/8" hard balsa front and 1/8" hard balsa rear and I do mean HARD—8 to 12 lb. stock or R/C balsa. Maple landing gear blocks extend the full length of the joiner and are stuck in on the bottom with Hobby Pox. 'Cause of the way the wing tapers, the front edge of the maple landing gear block ought to be just a skeenteenth up from the bottom edge of the front joiner. If you're not sure about this, try laying out the whole mess on the section drawing before you stick it together. And, for Pete's sake, use Hobby Pox or something similar in the way of glue. This is the heart of the whole wing and if you don't stick it together with something better than old number 9 shoe polish you're liable to find yourself at two hundred feet devoid of lifting surface. Stick the balsa and maple separating blocks in the joiner with epoxy and drill the holes through for the landing gear wires and you've got yourself a pretty stout old bridge type beam. Take your two sheeted wing panels

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and sand them at the center with a block to the dihedral angle. I used a wooden cradle that holds the wing panel and supports the sandpaper block for this job. Lather a little Hobby Pox over the butt joint at the center of the wing and over the edges of the joiner which will grab on to the foam and balsa wood, slide the joiner in place, and shove the whole mess together. Surprise, surprise, all at once you've got a wing — unless of course, you did something wrong, in which case, I don't know what you've got. Wrap a four inch wide piece of fiberglass around the center section to give it a little extra strength and, while you're playing around with the epoxy, you might just brush a coat of it over the exposed foam in the servo hole. This protects the foam beautifully and a whole lot easier than lining this sump with 1/16 balsa wood. Ailerons are an odd size of wood, chosen to match in with the airfoil. The best thing I can suggest here, is find yourself a buddy with a tilt table power saw and a hollow ground blade to chop them out. You can hinge them on any old way that suits your fancy. I used nylon tape. The wooden wing mount dowels are a snap; just run the back ends of them through a pencil

sharpener to put on a point, shove them into the leading edge of the wing, pull them out, lather with epoxy and put them back in for keeps. They'll hold. The mounting holes for the quarter inch nylon screws are reinforced with a piece of sixteenth plywood on the bottom; I didn't find it necessary to use anything on the top. Tip blocks are whacked out of lightweight balsa and considering the amount of foam out near the wingtips, I didn't see any particular advantage to hollowing them, so I didn't. For the stab, make yourself up six cradles out of 3/16" balsa wood with the top of the cradles cut to the undercamber of the stabilizer and the bottom flat. Pin them down on the plans, and lay in a piece of sixteenth sheet about 5 1/2 inches wide. Stick in a leading edge, trailing edge, mit ribs in-between, and glue a top sheet over the whole mess. When the glue sets up, you can lift up the whole business out of the cradle and you'll have a very rugged lightweight stabilizer with a building time of about an hour. Flippers are 3/8" soft contest balsa. For a joiner I used a piece of straight 3/32" music wire, and chopped out an elevator horn from 16 gauge hot rolled steel. I polished it up with sandpaper, and slipped it on the

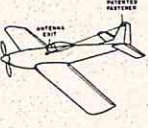
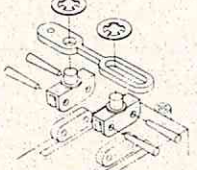
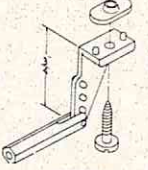



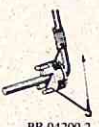


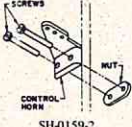
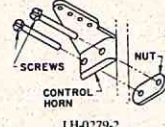
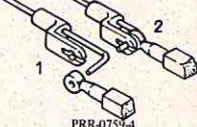

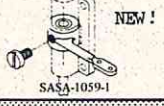



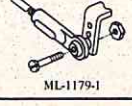

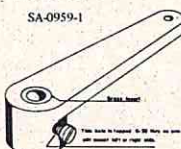
music wire (I hope you drilled the 3/32 hole for the wire). Using a little bit of silver solder, flux, and an ordinary propane torch, you'll find you can stick the whole mess together in a trice-or-two-or-three-or... If you've never used silver solder before, get somebody that has to show you how. It's not hard to do, but it sure is hard to describe. Stick the horn assembly on the flippers with pieces of fiberglass and resin; shove on a couple of tips and you ought to have a stabilizer mit elevator.

EMPENNAGE

The fin and rudder are 3/8" sheet like we said. And if you don't know how to make one of these, Clyde, then maybe you ought to be reading "Play-boy".

FUSELAGE

Make two sides out of 1/8" sheet, and epoxy on 1/16" ply doublers. There's some 3/32" doublers back near the stab, and some 1/8" by 1" braces that you might add at this time. There's also some 3/8" x 45 degree spruce braces up at the front end and 3/8" by 45 degree spruce braces just aft of the wing. You stick these in now to give you some reference points for your bulkheads, and you might just have a Chinaman's chance of getting

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the cotton pickin' thing together. The bulkheads are pretty exotic, with the B and C bulkheads being made up of 3/16" balsa wood laminated with epoxy to 1/32" plywood. This makes a nice unit, and if you haven't tried it before, give it a whirl. The firewall, of course, is 1/4" plywood and, when you got everything chopped out and the sides are dry, you're ready to stick it all together. Put it together upside down on the bench, but note that the top line of the sides is not perfectly straight. Actually, it breaks off at an angle at the rear of the canopy. I recommend using epoxy for all bulkheads unless you're planning your crash for the first flight.

The foam turtleback is no problem; cut it out with a hot wire just like a wing panel. Be particularly careful with the hot wire near the rear template since, if you move too slowly the foam will migrate away from the template pretty badly. (Like migrate means melt, Clyde.) Since the body has a little belly to it in the turtleback area, you'll have to take a sandpaper block and dress the foam down so that it properly fits the top contours. This gives you a little bit of compound curve, but it's no particular problem if you wet the 1/16" sheet before you

wrap it over it. Stick the foam turtleback in place (I hope you put the sheet on it first) and the whole thing suddenly becomes fairly rigid. Use good hard balsa wood for the bottom nose block and put your plywood landing gear mounting plate in place. Use a sheet of fiberglass inside the entire tank compartment to tie the firewall bottom block and sides and B bulkhead all into one unit. Stick your tank in and anchor it permanently in place with a little RTV silicone rubber (You know, Clyde, the stuff in the tube). Lay the top block in place and, "hot-diggity", it's beginning to look like an airplane. After you've got the top block, bottom block, and what-have-you, whacked down to size, wrap a sheet of fiberglass around the firewall and the whole front end running back about 3 inches along the sides. This, too, will help keep the front end on the beastie. If, at this point, you've just suddenly thought about blind nuts for your motor mount, then you do have a problem, — I can't help you — why don't you write Abby.

The blocks for the nylon wing mounting screws are 3/8" maple and, after you have them cut to size, you should use a number 7 drill and run a

hole up through them, rather carefully. You can use a regular 1/4-20 tap to thread the hole and you'll find that maple takes the thread fairly well. I didn't do anything fancy about keying the blocks into the fuselage, I just simply stuck them in place with a special high-strength epoxy. This is 3M-#EC2216 B/A which comes in a two tube kit for a couple of bucks. This is the stuff they use to stick the Hustler bomber together and I've never seen anything quite like it for strength. It never becomes real hard and brittle like other epoxys do, but seems to maintain a little bit of flexibility as well as having fantastic strength — I strongly recommend it. On the other hand, I suppose you can stick these blocks in place with regular airplane glue but please don't ask me to be present when you do your first outside loop; broken balsa bits upset me no end.

The fiberglass cowl, (Hey, come back here, Clyde, what's the matter, you chicken? You, too, can mold fiberglass by following these simple "howzy-dozit" steps.) First, get yourself a balsa wood block and carve it to the shape of the front end of the machine and sand it down fair to middlin', but don't exert yourself.

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R/C MODELER MAGAZINE ANNUAL

WINTER NATIONALS

Then go get a nickel balloon and blow it up until it is about half-way inflated; take balloon in one hand, and block in the other, and proceed to try to push block through balloon. If you've done it right, and let a little bit of air out of the balloon as you went, you'll wind up with the block neatly encased in a double layer of deflated balloon. Cut the balloon open at the neck and kind of strip it around the block like a nylon stocking (son-of-a-gun, that "Playboy" influence again) and you'll wind up with a single layer of rubber balloon all over your wooden block. For this much of the procedure, I give full credit to Bev Smith of some paint company or t'other out on the East Coast. Take your balloon covered block and stick it down to a plastic coffee can lid with contact cement and you've got a male form. Go on down to the local boatyard or marine supply and pick up some epoxy gel coat, some molding epoxy and some fiberglass cloth. Mix up your gel coat per instructions and paint it over the whole mess til it's about a 32nd thick all over. If you get a little thicker than this, it's O.K. but don't exceed a sixteenth. Let it sit until your gel coat is good and stiff but not really hard. You can now stick pieces of fiberglass

cloth on the gel coat and you'll find that it will be tacky enough to hold them. Start brushing on resin and cloth and build it up until the whole business is about an eighth of an inch thick all over. Set it aside and let it harden for 24 hours and you'll be able to strip out the balsa wood male form in the balloon with no great problem. This produces your female mold. Wax this up thoroughly with a good grade of automobile wax and give it a coat of polyvinyl alcohol mold separator (hope you bought some of this at the marine dealer, too). When this whole business is dried, you can paint a thin coating of gel coat inside, let it get semi-hard, lay in your glass cloth, saturate well with resin and — low and behold — you wind up with your fiberglass cowl. Should be about a 32nd thick all over, which will run 2 to 4 layers of middle weight cloth depending on how heavy a cloth you got. Of course, if you're chicken and don't want any part of the whole gooey mess, you can send me along a check for 5 bucks and I'll mod you one. (Yea I know, Clyde, the price is stiff — I do this for a hobby and I'm not really crazy about making anything for sale.)

After your cowl's molded or acquired or what have you, you want

to chop it away to clear your engine. A rotary grinder with a burr in it does a first rate job although it will sure dull up your burrs in a hurry. Sand the cowl down with 280 paper and paint it with Hobby Pox in whatever color your fuselage is going to be. For mounting, I used 2 quarter inch square spruce rails, wood screwed to the firewall, running up and down the edges with just enough clearance to mount the cowl flush with the outside edge of the fuselage. Stick a couple 2-56 or 3-48 blind nuts in the inside of these rails, and just bolt the cowl in place with 4 screws. Seems to work.

For the engine mount plate you'll want to scrounge up a piece of .092 2024-T4 aluminum. This is the old 24ST. I wouldn't use any other alloy than this unless you can obtain some 7075-T6 which will also do the job. You might try Williams and Co. or some local non-ferrous metal distributor. Chop it out with saw, file, axe, can opener, or what-have-you and bolt your engine on. Be sure to leave a substantial clearance groove for the throttle control push rod 'cause if it rubs up against this plate — it gives glitches. Also leave a good size slot for the fuel tubing. For mounting the

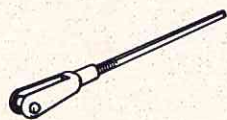


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CG MINI-LINK

I think a lot of modelers are going to like our new MINI-LINK. It's strong enough to hang 3 big 7 lb. ships from it. But it's small enough to look right on the new small models. Made of tough nylon, so you can use it anywhere because it makes no electrical noise. MINI-LINK comes with a long, strong rod (needs no connector) and has a mini-price—29¢. See your dealer for it.

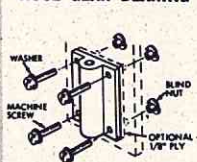


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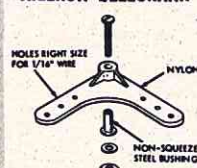
FITTINGS and ACCESSORIES

NOSE GEAR BEARING



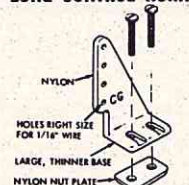
One-piece Nosegear Bearing mounts easily to firewall without alignment problems. If extra steering angle is desired, use 1/8" fly stand-off. Includes blind nuts, screws, etc.60¢

AILERON BELLCRANK



Bellcrank has steel bushing of proper size, so crank can be screwed firmly in place without binding. No electrical noise—all metal parts are screwed tightly together. 50¢ for 2

LONG CONTROL HORN



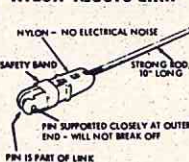
Control Horn has right size holes for 1/16" wire, and nut plate for simplest mounting to control surface. Horn is long for maximum range of throw; can be cut down. 50¢ for 2

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Extremely tough. When applied with heavy coats of cement, it approaches fiberglass. Excellent hinge material. 3/4" wide x 5 ft.25¢

NYLON AJUSTO-LINK



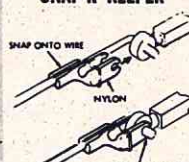
Ajusto-Link is used for adjusting linkage to control surfaces, throttle, steerable nose gear, etc. Nylon-tough and no electrical noise. Takes heavy load.25¢

SHEET METAL SCREWS



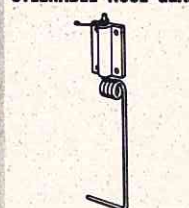
Sheet metal screws—like wood screws, but better. Sharp, clean, full-depth threads, hard and strong. Excellent for mounting servos, etc. Includes washers. #2x5/16 20¢ for 10, #4x3/8 20¢ for 8

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whole mess on the front of the fuselage, I find 4-40 Allen screws work just dandy and I recommend them or some other type of hardened steel screw.

FINISHING

(Come back here, Clyde, you're going to suffer with the rest of us.) I give the whole bird two brushed-on coats of heavy clear dope, sand it well between each, then I cover the whole thing with wet silk. I use silk because it makes such a tidy little package to keep the broken bits in. After silking, I brush on a good thick coat of clear and dust it down with 220 or 240 paper, just enough to grab the raw edges but not enough to raise the fuzz. Now comes the tricky part. I load up the old spray gun with a filler made up of talc and dope, running a whole lot of talc and not too much dope and lots of thinner. You'll find this stuff sprays pretty good. I spray a pretty hefty coat over the whole machine, using a base coat followed by a wet pass before the base is dried. I usually use about a quart of mixture for the whole airplane. Set it aside and let it dry no less than 24 hours while you go watch television or indulge in some

other indoor activity. Sand it down thoroughly with 180 or 220 paper and start spraying on coats of clear dope. Generally, wind up spraying on about 3 to 4 coats of clear to get a decent surface. When you're done with the clear, spray on your color and that's it. I find that spraying the filler gives you a nice even base without any brush marks to sand out and simplifies the finishing no end. If you haven't tried it yet, give it a go, you'll be surprised.

For color on the original pair, I used Daytona White with Whirlpool Copper trim. (What's that you say about Whirlpool Copper, Clyde? Well, it's a long story but it's the same copper color that is used on some Whirlpool appliances). You can make up a splendid metallic copper or gold by obtaining some bronzing powder from your local art supply house; mix it with clear dope; cut to spraying consistency so that you've got about 3 to 5% by volume of powder and spray it on. Makes a striking color scheme. The only problem I've had with it, is that the copper tends to react to perspiration. After a period of time, I get some of the wildest looking sets of

fingerprints you've ever seen. Spraying a layer of clear dope over the top doesn't seem to help too much, so I figure it's the price of being different.

EQUIPMENT INSTALLATION

I've been using my Green Box for well over 500 flights and I've yet to have any problems with it. Fearless Leader may or may not have run my lousy Polaroid picture of the installation that I made. If he did, I suggest that you take a good look at it, if not, then I suggest that you do some careful planning. Nothing louses up the flying of an airplane like some right hand bends in the push rods. Do a little sweat'n and get 'em straight and they'll pay off in the flying department. Another comment that I might make, is that, if you're relatively new to proportional, take heed and avoid electrical noise. That is, unless you really like to glitch. I used nylon tubing for my engine pushrod and my nose wheel steering. Put the holes in for the tubing after the bird is built. Do this by taking a long piece of music wire the size of the nylon tubing and

(continued on page 69)



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who cares? It's a lot more important to have the top and bottom straight and parallel than to meet an exact dimension.

The rest of the fuselage is about as common as fleas on a hippie. The only point where the cheese gets a bit tight is you have to be certain that the aileron pushrods, the wing mount screw and the rudder, elevator and engine pushrods don't decide to argue with each other. I originally used dowel pushrods to the tail with the regular wire ends, but they were always getting in each others way and they had to be bent "just so" in order to keep them from flexing at the ends, so I said to heck with it and put in NyRods. I ordinarily don't care to use these on larger models because I figure there's usually enough control surface drag to keep the servos fully loaded anyway, but on a model this small and light this becomes a negligible factor. More important is that I could epoxy the ends in place and not have them wander all over the inside of the fuselage and get tangled up. The engine servo then proceeded to become tangled with the aileron pushrods. The alternatives were to either lay one of the two servos down

on its side or to move the engine servo out in front of the receiver. Since the EK receiver has very convenient mounting lugs, this is the approach I took, although there are those receivers which would not easily lend themselves to this. In these cases a side mount of the engine servo would be best. I guess you also could lay the aileron servo on its side and use the usual mess of wires and bellcranks thru the wing, but, man, thats like work, and I like to avoid as much of that as possible! The same goes for the nose section. It could easily be rounded off to meet the spinner and give that all-too-common flatsided bullet appearance to the entire fuselage, but why bother, the cylinder head is gonna stick out somewhere anyway, and so is the needle valve, so whats a few extra bumps among friends?

The tail is just a batch of light 1/4" sheet balsa, glued together in the right places. If you have troubles with warping tails, you can add some stiffeners, but I've never had the problem, so I've never bothered. One cure for this, if it bugs you, is to use the Hobbypoxy Easy-Does-It method of coating the surfaces with Formula II Epoxy before doping. This effectively seals out the moisture and solvents from the wood

and insures a true surface, provided you started out with a true surface.

The original came out to about three pounds, dry, but I don't suspect this is too critical. I haven't finished the foam wing version yet, so I can't tell you how much it'll weigh, but it should be somewhere near the same. I started off with a Thimble-Drone 8-5 nylon prop, which lets the Max .19 wind out, but doesn't give the pull through the bigger manuevers that I like. It also allowed the model to fly faster in level flight than I wanted. A much better prop was the Top-Flite nylon 9-4. I would like to try a 9-4 or 9-6 wood Power Prop, but I haven't been able to locate one in my area. As far as the engine goes, I sure can't fault that Max .19. Its a GREAT little engine, although I'm sure there are others that could cut the mustard equally well. You takes your choice and you pays your price.

So theres the story of the model that almost didn't happen. When it did happen, it just sorta' happened the way it did, and I'm glad 'cause I like it that way. I like it too much. I still can't beat Cal Scully in pattern yet, and maybe I never will, but at least now I'm working on it - and at only four ounces of fuel a flight, too!

(continued from page 67)

grinding two flats on the tip so that it looks sort of like a screw driver blade, then turn it 90 degrees and grind a fairly shallow angle point on it. It'll wind up looking kind of like a tip of a drill and that's just what it is. Chuck it in your electric drill, aim it and go. Just be careful you don't drill through the fuel tank — with it completely sealed into the front end — my, but that gets messy. After you've got your holes you can usually stick through a long piece of skinny wire and thread your nylon tubing in along the wire. For a nose wheel brake, I used one of these dollar wrap-around spring jobs similar to the Rocket City brake, except I bought mine from a personable fellow at the Toledo conference last year. If you haven't tried this brake, get with it — certainly is the answer. I used monofilament nylon running through 1/16 diameter nylon tubing to operate it.

One other more-or-less novel feature; I had some problem with the elevator pushrod rattling around in flight and making tremendous noises. I took a nylon control horn, bolted it down to the servo board, and ran the front end of the pushrod wire through one of the holes on the control horn. Makes a first class fairlead. If you're having chattering push-rod-itis, try it.

TRIM

Well, you've got it built, Clyde, looks great and now you're going to take it out to fly it so you figure maybe I should sit here and give you complete instructions. Oh, no, you don't! Get your local expert to get you through the first flight or if you are the local expert, write and tell me how you did it. Anyhow, I hope you set up your surfaces for minimum travel. The elevator pushrod should be connected to the lowest hole on the elevator horn about 1-5/16" out and your aileron horns ought to be somewhere between 1-3/8" and 1 1/2"; anything less than this and you don't have a Dragon — you've got a tiger on your hands. You'll find that it flies like we said — with a real light touch; but very smooth and responsive. Rolls are as pretty as a picture, right down the line and wingovers are something to see. I do my wingovers full bore — you haul

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back on that stick and she goes up, up, up, up like it's never going to stop — Finally, at the very top you kick her over and bring her back down. I swear, I must be doing wing overs 200 feet tall. For what it's worth I'm using an Enya .60 with an 11/8 Top-Flight Prop and, alternately, a Tigre .56 with an 11/7½ Rev Up Prop

for power. To get it to kick over at the top of the wingover, I'm using absolutely the inside hole on the rudder horn, so that the rudder kicks all the way over and just clears the stabilizer. This combination will produce a right smart looking wing walk as well. (You know wing-walking, Clyde, that's where you throw her over into a near vertical

bank and kick in top rudder and hold it.) It's kind of a peculiar way to fly; the airplane slows down quite a bit, and your controls cross and uncross. You find yourself using both ailerons and elevator to maintain bank angle and you just keep the rudder crammed hard over in the corner of the box. You should play with it for awhile, it's a lot of fun, but just don't do any downwind corners in a 30 knot breeze too low to the deck.

Inverted spins are another speciality of the house and you'll find that no particular problem to flip her over, shove the stick forward, chop back your throttle and kick it in — full rudder and full opposite aileron. It will pop back out of the spin just wherever you tell it to with very little fuss and bother. Inverted snap rolls are the same sort of proposition, except that you get her up on the step full bore and really moving out in the inverted position, then cram your rudder stick hard over one way and your aileron full over the other way with full down elevator — all at once. At this point, airplane ceases to fly and begins to flop all over the sky, which is most spectacular.

I was playing around with Falling Leaf a little bit last summer but never got real good at it. This requires tremendous coordination; pull your nose up, hold it right on the step with power and then slide the bird from side to side with rudder using your ailerons to maintain a level roll attitude and feeding in just enough elevator to hold it up on the step. Try it sometime if you want a challenge.

Square loops, both inside and outside, are no particular problem and you'll find that this airfoil will flip over on its back as smooth as glass. One of the maneuvers I was playing with was an Inverted Eight with descending rolls. This is a proposition



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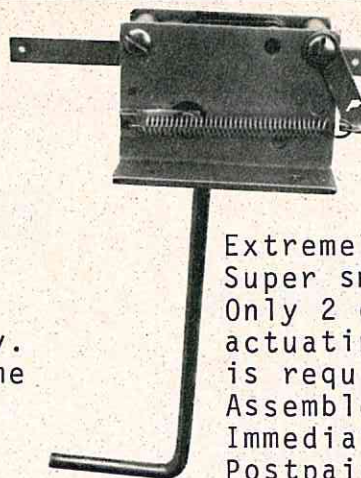
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where you flip over on the back, pull in a little up so that the airplane descends, come up over and around for 3/4 of a loop, do a half roll, cram in the down, and go up over for 3/4 of the loop, do a half roll, pull out inverted, then roll to level flight. Looks very much like a Cuban Eight with an entry at the top and exit at the bottom, except done inverted. You might give it a whirl.

Then there's the full power on touch and go. Now, with nice long concrete runways like we have at Wright Field, you can really lay it in there. But I want to tell you, it sure gives you a tight feeling in the bottom of the stomach. I quit doing this one when I hit a little piece of rubble on the runway and threw it up half-way through the underside of my wing.

Took me about 10 hours to repair all the damage. Anyhow, there's some suggestions on flying — Now suppose, you go give it a try.

Well, you've hung with me this far, Clyde, so why don't you go slay yourself a Dragon, fling it around by the tail and who knows — maybe some fair maiden in distress will make your scene, too.

MEW GULL

(continued from page 19)

you would have a good old fashioned (standard) R.C. airplane, tough to fly and tougher to land. Not only that, the top speed would be reduced and the stall speed would be increased. So take heed — build light. The use of contest

grade balsa throughout, except for spars and fuselage bulkheads, will almost guarantee a light airplane. It's also much much easier to work with.

Before you start cutting balsa, decide on the engine and radio gear you will be using. If digital gear is used also decide whether you wish to use the C.A.R. control set-up or not. It is a little more trouble, but flying does improve. If you insist, you can add a little more weight and use four servos and have separate rudder and aileron control. Once these decisions are made you can plan the detailed internal arrangements of your Mew Gull. Start by carefully cutting out all of the balsa and plywood parts like a good pre-fab kit.

WING

It will be helpful to begin with the wing because it is used in building the



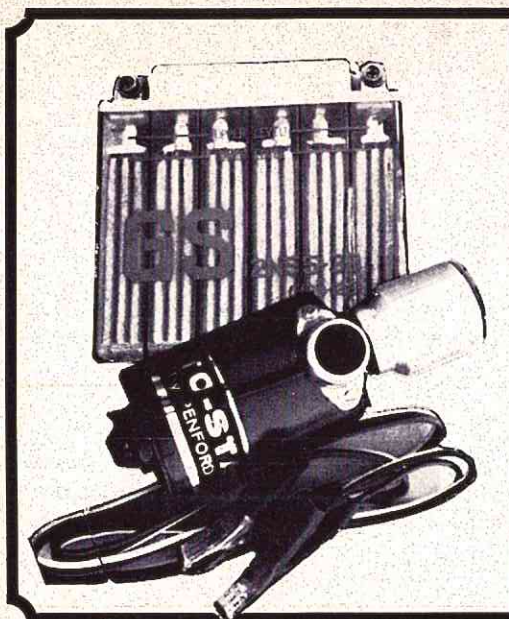
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fuselage. Lay out the 1/16" sheet leading and trailing edge lower sheets and the landing gear mounting strips. Glue on the lower spars, the tips, the bottom capstrips and finally the ribs; leaving ribs R-1 unglued for the moment. Fit and glue the ¼" sheet leading edge. Next, complete the left wing panel by first tilting rib R-1 about 5° (the dihedral angle) before glueing and then add the top spars and the upper T.E. sheeting, leaving the L.E. uncovered for now. When completely dry, unpin the left panel from the building board and raise it so the tip is 4½ inches above the board. Make sure the bottom of the wing ribs are exactly parallel to the board to prevent any wing twist from being built in. Complete the right panel exactly as you did the left. With your razor saw, cut out 3/32" slots in ribs R-1, R-2, and R-3 behind the front spars,

and glue in the plywood dihedral brace. While the wing is drying, bend both landing gear legs from 1/8" piano wire. When the wing is dry, remove from the board and fit and line up the landing gear legs, using ¼" sheet metal screws to attach the metal clips. Sheet the L.E., add the top cap strips, and sheet the center section. Carve the L.E. to shape and sand the entire wing.

If you are not going to use ailerons, you are about finished with the wing. For aileron control, cut out the ailerons from the trailing edge using a razor saw and X-Acto knife. Add aileron end ribs, the plywood horn, and 1/16" sheeting to the aileron open face. Hinge with sheet nylon hinges and add the bellcranks and push rod motion. A Top Flite 2" nylon bellcrank is cut down as shown and mounted on a 1/16" ply insert. Shim up the bot-

tom of the bellcrank bearing so that its axis is at right angles to the bottom of the wing airfoil. The C.A.R. configuration shown is designed for 3 abreast Kraft KPS-10 servos, with the center servo used for rudder/aileron control. If you are using other equipment, you may have to move things a bit.

To complete the wing for now, add the 1/32" ply scabs and drill the holes for the 8-32 nylon bolts. Build and attach the wheel spat pylons.

FUSELAGE — EMPENNAGE

The left half of the fuselage is built over the plans by first laying out the ¼" square keel pieces and the fin. Next, the half-bulkhead formers, the longerons and doublers are glued on, making sure they are square to the building board. The 1/8" sheet side is now glued in place. If the wood you used for the sides is a little

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too stiff to negotiate the slight bending, you may have to moisten it at these points. When the left side is completely dry, lift it from the board and finish the other side also adding formers F-1, F-2 and the 1/4 square stiffener cross pieces. Cut the fuel tank hatch framework free and you can now plank the upper nose with soft 3/32" sheet. If you're careful, two pieces will do the job. By the way, on all of the sheet covering of the fuselage and tail, I find that good old fashioned airplane glue, (like Ambroid) works great because it dries fast and sands very easily. With soft, light balsa sheeting, I have found that most other glues are just too hard. Fit the 1/4" sheet nose bottom and now you can tackle the only rather tricky job: building the wing saddle and fairings. If you take your time you'll find it easier than it looks. Trim up and sand the bottom of the wing saddle so the wing fits reasonable well. A pretty good, but loose fit is what you want. Next, glue the wing dowel key former F-6a and the 3/32" ply sheer plate in place, locating as accurately as possible by using the wing as a guide.

Epoxy the 1/4" inch diameter dowel into the wing and the two 8-32 nuts on top of the sheer plate in one operation. This is easy if you remember to use oversize holes for the screws and dowel and proceed as follows: apply a small amount of epoxy to the dowel (you can fill any gaps later with glue), insert into the wing L.E., put the wing into place and bolt the rear edge down. When it's all straight, to your satisfaction, run a bead of epoxy around the 8-32 nuts and let dry. Epoxy the 1/32" ply fairing support onto the fuselage by squeezing into place with the wing. A piece of Saranwrap over the wing will prevent you from inadvertently building a one piece airplane. We will leave the actual wing fillet until after the empenage is completed.

The stab-elevator, a standard sheeted frame construction, is now built. The rather long elevator horn, built from 1/16" piano wire, is required to reduce the throw of the large, scale surface. After shaping and sanding, the stab-elevator is glued in place, making sure it is properly aligned. The internal elevator

push-rod is connected to the elevator horn at this time, remembering that there is no access to it after the ship is complete. The top and bottom sheeting of the aft-fuselage can now be added, and you may as well build and attach the rudder as shown. After shaping and sanding the entire fuselage - empennage assembly the wing fillets are built up from Epoxolite. This is a very light weight, epoxy putty material which is tailor made for such applications. An article in the February 1968 issue of RCM detailed the construction of wing fillets from this material. One important reminder; even though the material can be sanded after it sets, a lot of work can be saved by modeling the fillets initially as close to the final shape as possible.

Glue on the cabin formers F-10 and F-11, and build the canopy hatch in place. Finally, a small DUBRO leather fillet around the stab-fuselage joint will finish off the fuselage.

COWL AND SPATS

There are several ways to build the cowl and wheel spats. The most straight

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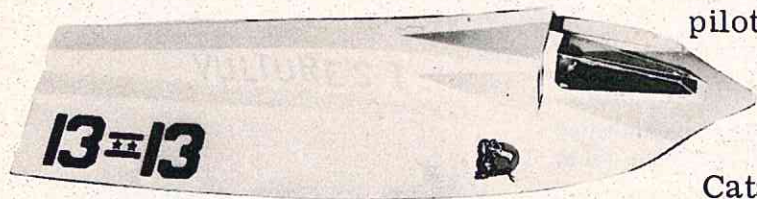
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-forward would be to build them up from balsa and cover with light weight fiberglass. The Hobby-Pody-Easy-Does-It method is a lot simpler and produces stronger, lighter units. On the prototype model shown in the pictures I used a female plaster mold to form the cowl and spats of reinforced epoxy. Exact replicas of the cowl and spats are built up and carved from balsa and finished to slick, smooth surface. The form for the spats is split down the center to form a right and left half. After heavily waxing the forms, casting plaster is poured over them to form the plaster female molds. The plaster molds are waxed and sprayed with a release agent (I used PARTALL FILM NO. 10, which works very well). Epoxy and cloth are then pressed into the mold. When set-up, they are removed, trimmed with a small tin-snips and the spat halves are epoxied together along the front seam. The advantage of this process is that when the unit is pulled from the plaster mold, it has a final surface finish and color — no scraping, sanding or painting the tough resin surface. The final shape

and surface finish is put on the balsa form, and balsa is a lot easier to finish than resin. An added bonus is that only one form is required (and need be finished) for both identical spats. In any case, I recommend using the HobbyPoxy cloth and Formula II resin — two layers for the cowl and one layer for the spats — since it is extremely tough and flexible compared to the standard fiberglass cloth and resin. One last tip here; a little dab of white resin-tinting liquid in the epoxy used to mold the cowl and spats will result in sparkling white color all the way thru — no painting required. I also used a little of this white coloring in the epoxy glue used to join the spats together at the front seam.

COVERING AND PAINTING

Super Monokote would be an ideal lightweight covering for the Mew Gull. Since I hadn't had any experience with this material at the time, I chickened-out and used the old-fashioned materials as follows: after final sanding the entire airplane, give it 3 coats of thin clear dope. Cover the wing with silk and the rest of

the airplane with medium weight silk-span. Apply two more coats of dope and three coats of filler, sanding between each coat, and it's ready for color. Three light spray coats of white will cover everything nicely. Mask off the area above and inside the windscreen and paint it dull black. Talcum powder added to plain black dope will yield a nice flat finish. Make accurate paper patterns for the front and rear canopy sections. Cut them from thin clear sheet plastic and glue on. Another tip here — I have found that the best glue for attaching canopies is the clear Testor's fast drying airplane glue. It sticks much better than even epoxy, is nearly invisible, and is much easier to use. The removable hatch section of the canopy actually should have a slight bulge in the top as shown on the plans. For real accuracy you could heat and stretch sheet plastic over a form — I cheated and used a straight flat section.

Plain black, 2 inch and 3 inch decals from SIG were used for the racing numbers and lettering as shown in the photographs. A small British flag painted on the

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fin completes the exterior trim. The whole ship was given a coat of Fullers' Plast — a clear, glossy synthetic varnish that is fuel proof. A coat of clear polyurethane varnish would be as good. Finish up by adding an instrument panel, a pilot, and any other interior details you may fancy. Install the engine and radio gear and you are ready to fly.

FLYING

Don't be nervous about that first flight — the worst that can happen is you will cream your beautiful new airplane and demolish your radio gear! I just want to emphasize that if you follow these check-out procedures religiously, the Mew Gull will fly O.K. the first time. If you don't, you're on your own.

First off — is the finished weight within limits? 2 to 2½ pounds for pulse and 2½ to 3 pounds for digital. If you are a little over this, alright. If you are way over, the plane will be much more difficult to trim out, and at the high speed it will have to fly and land — — — ! Next step — check the C.G. Move batteries or add ballast if necessary to get it as

shown. Use a yardstick or piece of string to check the incidence of wing and tail, and the thrust line. Finally make sure your radio gear works to perfection, all linkages are free, and you have used the outside holes in the rudder and ailerons (if used) to minimize throw.

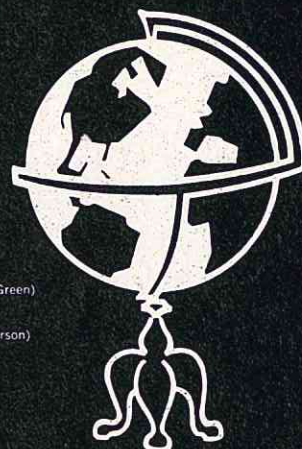
First taxiing and flight sessions should be made without the cowl and wheel pants. It will ruin the looks of the airplane but engine starting and adjusting will be much simpler, and less-than-perfect landings will be easier on the bottom of the wings.

Before flying, taxi around a bit to get the feel of the airplane. When you feel ready, give it full power and keep it tracking straight with the tail raised off. Don't let it break ground until a really good head of speed is built up. Then, very gently ease in a little up elevator until it breaks ground in a shallow fast climb. Remember, elevator response is pretty rapid. Don't try to turn until at least 50 to 100 feet of altitude have been gained, and then a very gentle right turn while still climbing is the ticket. Don't throw

the stick around at all until plenty more altitude is gained and your goose bumps subside. Now, use rudder, elevator, rudder plus elevator; throttle back and feel out her medium speed capabilities. While still up high, throttle way back and get an idea of what the response during landing will be like. O.K., time to land. At medium low throttle descend and get into the landing pattern. Remember to approach at a reasonably good speed; don't try for a stalled 3-point touch down just yet. Fly it in and chop the throttle when 5 to 10 feet off of the ground. (For GG systems of course, its necessary to throttle full back at higher altitudes and land. Using the throttle at low altitudes is not recommended.)

Now that you're back on the ground in one piece, tweak any of the linkage to correct for trim problems. After a few more flights when you feel comfortable with the inverted engine, and the lands get smooth, put on the cowl and wheel spats. Now, wasn't it worth that little extra work to have the 'purtiest' airplane on the field?

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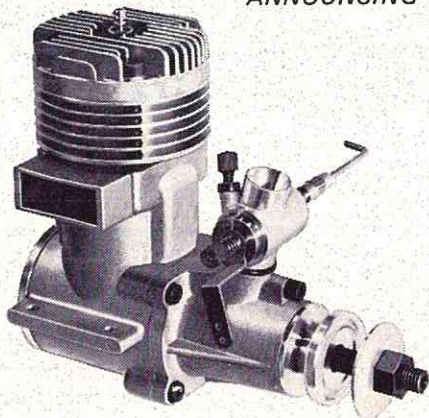


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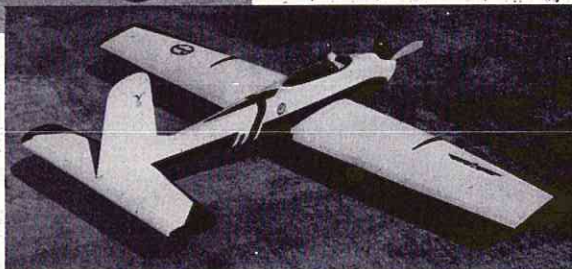
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SUNDAY FLIER

(continued from page 8)

aren't beginners, or maybe the price is too steep. Possibly it's just that the beginners who have flown other types of models, free flight, etc., figure they can build a model cheaper and faster, and maybe even better. I don't know. All I know is that 57% of the replies said "I want a kit". 35% wanted a partially assembled kit, and only 8% wanted ARFs.

WRITE KEN WILLARD
Chief Sunday Flier

c/o R/C Modeler Magazine
P.O. Box 487
Sierra Madre, California 91024

Several letters were received from glider enthusiasts who felt that I had slighted them. In a way, they're right, too. I probably should have included them as a category. However, I'll worm my way out of it by saying "Look, fellas . . . It's hardly fair to group gliders with power models. That's like asking a power cruiser club to say what kind of a sailboat do they prefer. So maybe I'll do a survey on gliders later on. OK?" How does that sound? No? All right, then, I'm sorry I didn't include them. I like gliders, too!

Another idea was suggested by some other modelers. When I try to design a beginner's model that fulfills the requirements as specified by the survey, why don't I design several — to take care of those who don't agree with the majority. Well, I'll tell you. The figures are all there, and as you can see, there are so many combinations possible that it would take a lot of designs. So, thanks, but for now I'll stick with something that will please the majority. It will be a basic trainer for beginners — and will look like one, too. But I think you'll like it. I've got it all laid out and will have it built and tested in a couple of months. If it performs as well as I hope, it should be a good basic trainer for radio control newcomers during the 1970s and that's what I'm gonna call it — BT-70.

One thing I was glad of, and that is the overwhelming popularity of the digital proportional. Much as I used to enjoy tinkering with single channel and galloping ghost, I prefer the ease

and reliability of digital propo. And with the weights down to where it can be used in any size ship (I've put one in a Roaring 20!) I can still tinker with small models.

So there you have it. A survey to determine what the beginner wants. You may not agree with the final result, but that's no problem. There are enough airplanes available in one form or another, for you to buy almost any type design you prefer. But the BT-70 will be designed to meet the statistical favorite as shown in the survey.

For those of you who are interested in the many variations, I am repeating here all of the questions and categories, with the number of replies in each. And beneath each group, as the computer boys say, is "the readout."

BEGINNERS' SURVEY

THE QUESTION

1. What size model? (480)
 - a. Five to six foot. 101
 - b. Four to five foot. 280
 - c. Three to four foot. 99

THE READOUT:

FOUR TO FIVE FT. SPAN

2. If marketed as an ARF (490)
 - a. Foam plastic 99
 - b. Vacuum formed plastic 20
 - c. Balsa and plywood 331
 - d. Other 0
 - e. No preference 40

THE READOUT:

BALSA AND PLYWOOD

3. If marketed as a kit, (510)
 - a. Kit 292
 - b. Partially assembled 178
 - c. ARF 40

THE READOUT:

KIT

4. Design preference? (600)
 - a. High wing monoplane 168
 - b. Midwing 72
 - c. Low wing 78
 - d. Biplane 42
 - e. Amphibian 40
 - f. Other (glider?) 29
 - g. Most stable design 171

THE READOUT:

HIGH WING

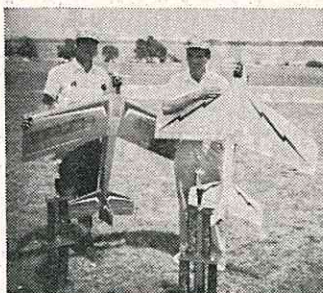
MOST STABLE DESIGN

5. Radio system (470)
 - a. Single channel, rudder 8
 - b. Galloping Ghost 20
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THE READOUT:

DIGITAL PROPORTIONAL

FOX 59RC PLACES 1ST & 2ND AT NATIONAL FUN FLY CHAMPIONSHIPS



Edd Alexander - right - 1st, 289 points
Garry Clay - left - 2nd, 256 points
The winners also used Fox Glo-Plugs and Fox Fuel.



1970 Model Fox 59RC
Still the lightest of all RC motors. 12 ounces.

BORE - .907
STROKE - .906
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NEW FOR 1970

• Improved 36RC type carburetor • New sturdier con rod • More massive head
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The National Fun Fly Championships, co-sponsored by the Fort Worth Thunderbirds and RC Modeler magazine, was something new in contests. Contestants were allowed 30 seconds to gain altitude, then spin as many turns as possible. Following this, pull out and roll as many rolls as possible, in 30 seconds and also, loop as many loops as possible in 30 seconds. Additional points were earned by a spot landing if the engine was still running.

The Fox 59RC excels in this type event because its high power and light weight gets the model up there. Its fantastic ability to keep running stays with you through the spins where most motors die.

The winner, Edd Alexander, operates Fort Worth's leading hobby shop and has flown about every engine sold, many selling for twice Fox 59RC's price. When he is after hardware, Fox 59RC is his choice. It's powerful...lightweight and fantastically reliable on the idle.

Many modelers have asked me about ball bearings, the Dykes rings and Perry and Kavan type carburetors. My thoughts may interest you. 1- The Dykes' no tension type piston ring runs real well but does not hold compression so well at cranking speeds, which I consider important for easy starting. 2- Regarding ball bearings, these add weight and expense. I do not believe they run any faster or last any longer than a good cast bronze bushing. Do not confuse the Fox 59RC main bearing with cheap powered metal types whose pores won't support an oil film. 3- Carburetor - many carburetors have a low speed and high speed adjustment. Only a Fox carburetor has an intermediate adjustment. Most quitting on closing throttle problems relate to an over-rich intermediate.

Duke Fox



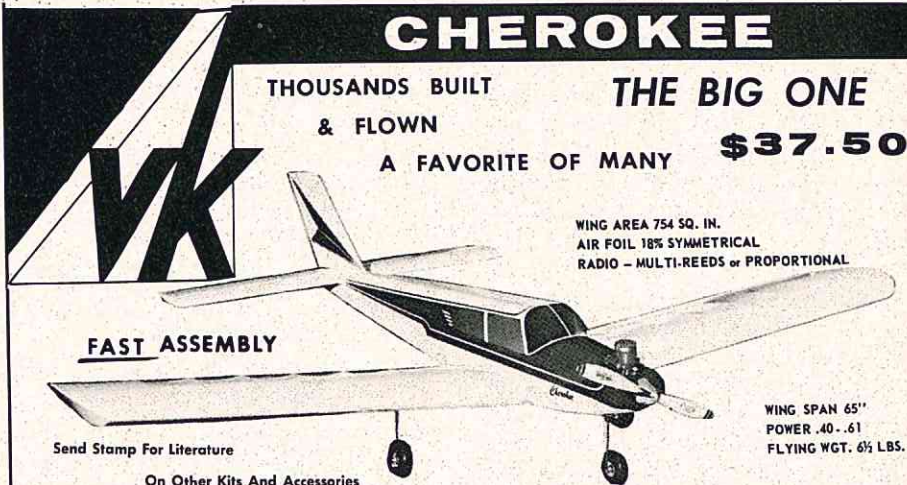
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.49 - .60 ENGINES



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- The Twin-boom Invictus.
- Converting the Heath proportional to single stick.
- Plus much, much more.

ON SALE SEPT. 1, 1970

I.C. DECODER

(continued from page 37)

out. The important thing is to leave as much copper as possible without risking shorts. Use a soldering iron that is just hot enough to get the job done QUICKLY. FIGURE 7 shows parts location.

Install R1(82K), R2(10K), C1(0.18 Mfd.), and C2(.022 Mfd.), making sure you get the capacitor polarities right ("positive" ends toward edge of board). Insert each of the integrated circuits. If you are building less than six channels, omit the highest numbered I.C.(s). To add channels later, all that is necessary is the I.C. and the connectors. No other changes are needed.

Bend over and solder all the I.C. leads which will not be connected to wires as shown in FIGURE 7. Next, insert the jumper wire and other wires in the same holes as the I.C. pins, using an awl to enlarge the holes a little if necessary. Bend over the wires and pins, and solder. Do not connect the leads from the receiver until after the electrical checks. Install the remaining wires depending on the number of channels desired. File, clean, and inspect the board. This completes the construction of the decoder.

ELECTRICAL CHECKS

Apply 5 volts to the decoder. Current consumption should be about 8 ma. for the six-channel unit. The outputs of G1 and G3 should be about zero volts. G2 and G4 outputs should be about 5 volts. The junction of R2 and G1 should measure about one volt. One output of each flip-flop (Q & Q) should be a logical 1, and the other a logical 0. If you haven't found

anything wrong, your decoder should work.

Connect the receiver and decoder together. C18 of the Classic receiver must be reversed in polarity (negative end to decoder). If you've already built the receiver, C18 will probably have to be replaced.

INSTALLATION

Route all the wires and install in the same way as shown for the Classic decoder. The decoder will fit the Classic case with no modification, but you will probably want to put your receiver and decoder in a smaller case. The prototype was installed in a case 16/16" high with no difficulty. If you did a careful and neat job on the receiver and a neat job of filing down your solder joints, you should have no trouble installing the system in a case one inch high or less. This is up to you. Use the Classic case dimensions as a guide. This will result in a unit that is even smaller than the already ultra small Classic. Now you can show all your skeptical friends (all friends are skeptical about homemade radio gear) what a small receiver you have. Then you can wrap it up in two inches of foam rubber and G-pad and stick it in a plane that you consider expendable. Happy flying!!

DECODER PARTS LIST

| ITEM | DESCRIPTION |
|---------|--|
| CI | 0.18 Mfd. Tantalum Capacitor, 10%, Sprague 150D184X9035A2 |
| C2 | 0.022 Mfd. Tantalum Capacitor, 10%, Sprague 150D223X9035A2 |
| R1 | 82K Resistor, 1/4 W, 10%, Allen Bradley |
| R2 | 10K Resistor, 1/4 W, 10%, Allen Bradley |
| IC1 | Quad 2-Input NOR Gates, Motorola MC717P |
| IC2,3,4 | Dual J-K Flip-Flops, Texas Instr. SN74L73N |

MISCELLANEOUS

1/32" Glass Epoxy P.C. Board
#26 Hookup Wire
#2X1/4" Self-Tapping Screw
1/8" I.D. Rubber Grommets
1/64" Phenolic Insulator

All parts and complete designer approved kit of parts available from Kaufman Kits, 4104 Deepwood Circle, Durham, N.C. 27707. See ad this issue for prices. ●

(continued from page 79)

As I said right at the beginning, the results might surprise some manufacturers. Specifically, I am referring to the overwhelming preference for balsa and plywood. And I think I know the reason. Beginners have a premonition that they're going to clobber a plane or two, and if they can make repairs, they can save some money. Also, as I said, most of the modelers who sent in replies had previous experience, so they know how to effect repairs with balsa and plywood, while plastic leaves them unprepared. Another reason is that balsa and plywood are readily available at hobby shops, while plastic repair material isn't.

So, if balsa and plywood are the preferred materials, and kits are the preferred source for the beginner, then you might well ask "how about the balsa and plywood kits on the market today?" A good question.

Many of the kits available today are designed with the beginner in mind, and do a pretty good job of filling the requirement. One of the best, for example, has been around for so many years that it's hard to recall when it came out. I am referring to Harold DeBolt's "Champion." It is basically a sport free flight design adapted to R/C, and many a beginner has learned with it.

Top Flite's Schoolmaster is another good one — particularly now that digital propo is light enough to install in it. The Headmaster is a little more advanced, due to the semi-symmetrical wing, but still does a good job.

Then there's the models which were put out by Dale Myers — the Mayfly, Shoofly, Old Timer, but which, for some reason, never seemed to catch the fancy of enough modelers to really get the nationwide acceptance which a manufacturer needs in order to keep putting out his product. Dale is an old timer, and his balsa and plywood kits were available in kit form, partially assembled, or practically complete. They were good models, too. Perhaps they were too basic for the times, because it is only recently that the number of beginners has spiraled upward, and when there were only a relatively few newcomers, they didn't constitute a big enough market by themselves. A model had to appeal to more advanced flyers as well.

Midwest's Esquire series do a pretty good job for beginners in R/C who have had previous building experience.



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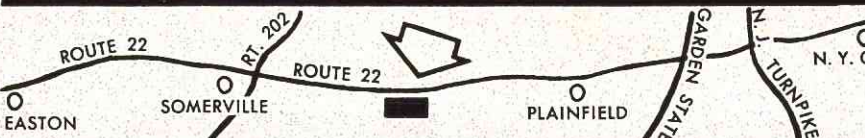
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|----------|--|-------------|
| C1 | 0.18 Tantalum Capacitor, 10%, Sprague 50D184X9035A2 | \$1.34 |
| C2 | 0.022 Mfd. Tantalum Capacitor 10%, Sprague 150D223X9035A2 | 1.35 .10 |
| C2 | 10% Sprague 150D184X9035A2 0.022 Mfd. Tantalum Capacitor | 1.35 |
| | 10%, Sprague 150D223X9035A2 | |
| R1 | 82K Resistor, 1/4W, 10%, Allen Bradley | .10 |
| R2 | 10K Resistor, 1/4W, 10%, Allen Bradley | .10 |
| IC1 | Quad 2-Input NOR Gates, Motorola MC717P | 1.08 |
| IC2,3,4, | Dual J-K Flip-Flops, Texas Instr. SN74L73N | 5.99 |

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| 2 Channel | \$14.00 |
| 4 Channel | 18.00 |
| 6 Channel | 22.00 |

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Likewise the foam wing jobs like the Whiz Kid — although they tend to be a little fast on the response due to their relatively heavier wing loading in proportion to the scale.

Goldberg's Falcon 56 has been a good trainer for many modelers. It should still do well, especially with the new lightweight props installed.

A newcomer, one that looks good for the R/C beginner with free flight experience, is the Dumas "Evolution." It has the feature of an extra wing for glider enthusiasts, too.

There are other good kits for beginners who like balsa and plywood. But a little more thought can make them even better. Top Flite has made a good start with their TAC (True Alignment Construction) feature. As they perfect this, so that even the rawest beginner can construct a model if he has a flat surface to work on, then the bane of all modelers — misalignment of surfaces — can be overcome. Then, with some simple instructions, an R/C beginner should be able to get his airplane into the air and back on the ground safely just by letting it free flight to safe altitude, then push it around gently, letting it recover independently if he gets confused, and letting it land by itself — although it will take a wide open space to do all that. I even received one letter which suggested the beginner's plane have no landing gear, just a skid, because where he lived there wasn't any place to take off, so the model had to be hand launched, then landed in the pasture — hopefully not in some of the usual pasture-type obstacles!

Now to get back to the workshop and complete the BT-70. I'll keep you informed as it progresses.

Meanwhile, see if you can locate someone with a buddy-box system. I've let anyone who wanted to take a stab at flying the Showmaster with my new Kraft Series 70 with the buddy box. It's the greatest thing for beginners yet devised. Try it if you can.

It makes "instant Sunday Fliers", out of beginners!

ENGINE CLINIC

(continued from page 12)

muffler which seems to be proportional to throttle setting and aids primary by closing off muffler with finger and flipping prop a couple times so venturi need not be open for primary but its hard to figure how much air would be cut off by using something over venturi.

Sincerely,
Chuck Baker

An air cleaner would be a great idea, but unfortunately these little engines gulp great quantities of air. Any thing in the way of an effective cleaner would seriously restrict the flow of air. A mesh screen would keep out the big rocks, but it is the fine silt that does most of the damage. A cleaner with a close mesh filtering material would have to have considerable area and be rather large to use on a model, although something along this line could possibly be worked out.

I bought a new Veco 35 a month ago and am having trouble with it heating up. I use Supersonic Hi-Lo fuel, by K & B. It idles good but I can't keep it from heating up.

I broke the engine in slow and easy. I am using a 10-6 prop and have moved the fuel tank in different positions but nothing seems to help.

Could you give me some suggestions for keeping the engine cool? I am very disappointed with the engine and am about ready to scrap it. I would appreciate any advice you could give me.

Yours,
Greg Whitaker

The first thing I would do Greg, is switch to Supersonic 100 fuel. K & B Hi-Lo is half castor oil and half Ucon oil. The Ucon's do run hotter. 100 is all castor and will run cooler. If the problem persists, then it is quite possible that you are just running the engine too lean. Try running it a little richer. There is always the possibility that the engine is still tight and just needs additional running time. You did not say how much break in time you gave the engine.

I would much appreciate your advice on an apparent engine overheating problem I have. My brand new Merco 61 had its 'proper' breaking-in according to your program. (Many short runs, mod. rich setting, proper prop, 25% Castor oil - 75% Methanol fuel). The instructions call for the 12-6 prop and the fuel ratio as above. So, eventually I had enough time on the engine to fly, still using the same prop and the fuel at rich setting. Now I have about 3 hrs. on the engine and she is sizzling hot after every run. This is the case even if she is so rich that she four cycles all the way. No apparent ill effects are noted - i.e. compression, starting are still good and I never had a seizing-up. Is this acceptable for the engine? I am worried since my other engines (ST 51-60, four of them) never get sizzling hot, even on 10% nitro fuels.

Yours,
John Farkas, MD

I am assuming that your new Merco is a Mk III. The new Mk III does run hotter than the older models because of the steel fins. In fact I am puzzled as to why Merco chose to go back to this set up. However, if you are not having any other problems with leaning out, seizing up, etc., I would not be too concerned. Engines with aluminum cooling fins will dissipate the heat faster and cool off



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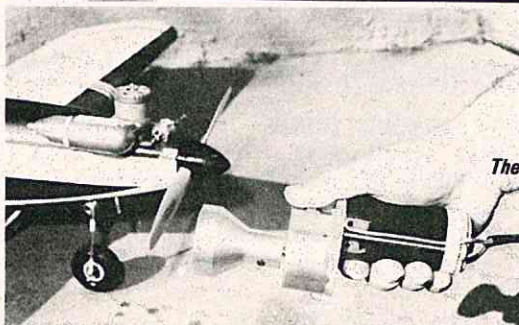
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I've noticed what appears to be excessive main bearing wear after a relatively short running time on my plain bearing engines, .35 and smaller. It seems to be more on the piston-end rather than the prop-end.

Is there a way to minimize this wear? Is one fuel better than another for this? More oil? Prop balance?

I notice that Cox has a "special blend" fuel for their ready-to-run cars that is claimed to give consistent needle settings, lower temperature and wear. What is so special about this? Would it help an RC engine?

Sincerely,
Jerry J. Greaves

The short life of sleeve bearing engines is the main reason that most of your R/C engine manufacturers have gone to ball bearings. An R/C flier can put as much time on an engine in a month as a U-control or free flight modeler will do in a year. Prior to R/C, sleeve bearings worked fine, but with the advent of R/C flying, their shortcomings quickly showed up. Prop balance, lubrication, and material, all play a part. Especially material. Not all of the manufacturers have used the best choice of materials. The old K & B .45 and sleeve bearing models of the Veco line never had this trouble. I could name a couple of other makes that are only good for a few hours of running time before being over the hill.

Not being associated with Cox, I cannot say for sure what additives are in their fuels. Several years ago I had a talk with Dale Kirn who was an engineer with Cox at that time. Dale told me they were using Lubricin. I would imagine this is still true. The fuel should work fine in R/C engines, the only drawback being the price as it only comes in pint cans as far as I know.

That wraps it up for another month, gang. The letters have been slowing down lately. If you have a question that you would like answered but are just sitting back waiting for the other guy to write in, get off your duff and send it in. I need the material to keep this column going.

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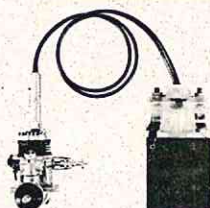
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SCALE IN HAND

(continued from page 14)

pattern. Check shape with template as final cuts are taken. When the shape and finish are good, make a rear-edge relief as shown in Fig. 6.

- g) Remove pattern from lathe. Cut a ring of 1/16" styrene sheet, about 1 1/4" wide, to fit rear cut. Then cut a similar ring from 1/4" balsa. See Fig. 7.

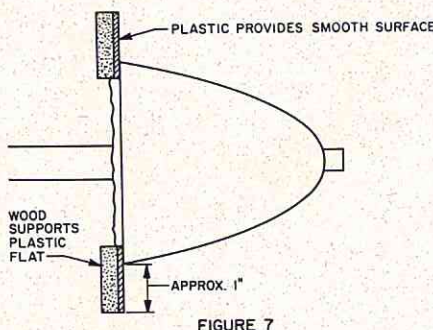


FIGURE 7

- h) The pattern is now finished. Though the procedure may seem long, up to this point it should have taken no more than two evenings. We now make the female spinner mould from the pattern as follows: Cut off the excess chucking-shaft at the rear end. Lay the pattern flat on the table, point upwards, and lightly wax the whole pattern including the front stab shaft. Pour on the liquid release agent till entirely covered. Allow the excess liquid to drain off — any that sticks will be enough. Allow to dry.

- i) Make a standard glass-fiber layup on the pattern, using 6-10 oz. cloth and hard-setting resin. Build up to about 1/16" thick. See Fig. 8. Leave to cure at least two days.

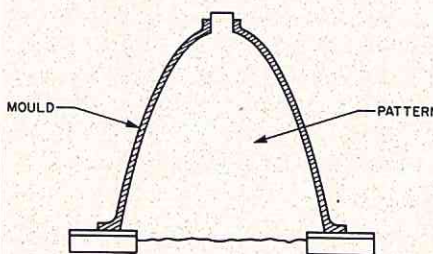
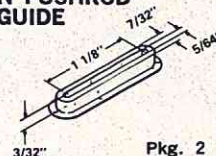


FIGURE 8

- j) Tap mould firmly and remove pattern. Wash inside of mould well. Lightly wax mould interior; pour in

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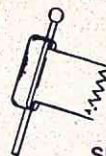
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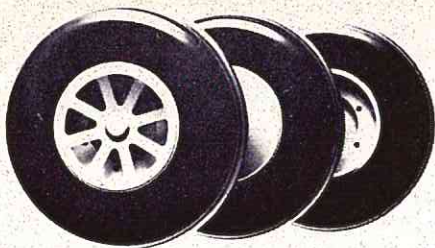
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release agent, slosh around until 100% covered and allow to drain and dry.

- k) Turn a nose-piece (to represent the fixing-bolt). Push into mould front and coat with release agent. See Fig. 9.

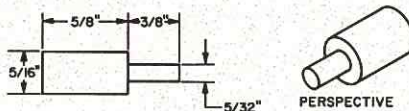


FIGURE 9

- l) Standard layup for spinner, using 6-oz. cloth. Build up to 1/4" over length at rear. See Fig. 10.

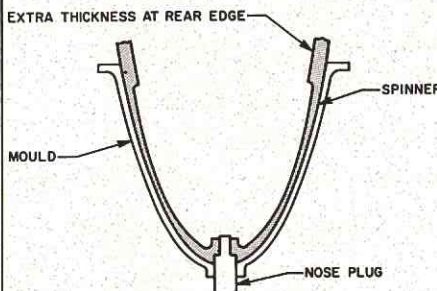


FIGURE 10

- m) Twist and remove the nose plug. Remove the spinner from the mould. Mount spinner in the lathe. Check for concentric running. Turn "step" in the rear end to accept the backplate. (See layout drawing — Fig. 1)

- n) Make the backplate from 1/4" phenolic to fit the step turned in the spinner. Make the prop-nut as shown in Fig. 1 to suit spinner and engine.

Well, that's it, gang. Sounds like a lot when you read it all like this — I know it does because it was a lot to write! But, in fact, this is one of those procedures that is easier to do than to describe, and you'll find it really doesn't take more than about 4 evenings' work to make the whole gadget. Make a second spinner in the mould to serve as a scale spinner, unless you are flying with a scale prop or the real plane had a 2-blader. There's no need to make another backplate or prop-nut, of course.

It seems as if we ran out of space for any photos or news this month — we'll just have to catch up with these items next time, when we'll also give a few hints on moulding canopies. Join us then?

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THE MODEL WIFE

(continued from page 6)

10. *The Honest Wife*: one who tells her husband she can't stand models and why doesn't he shove them . . .

11. *The Dishonest Wife*: one who makes her husband think she really does know how the servos work.

12. *The Foolish Wife*: one who made her husband give up golf for R/C flying so he would be able to spend more time at home.

13. *The Prompt Wife*: one who says, "Well, you flew, it's 11:15, let's go buy lunch," at the very minute you are gassed up to go again.

14. *The Miserable Wife*: one who has been watching hubby fly all day long at a field where there is no restroom.

SORRY

Due to the extensive
amount of material
contained in this issue,

Readers Exchange
will not appear this month.

15. *The Unsociable Wife*: one who takes a nap in the car while the old man puts on a show.

16. *The Strategic Wife*: one who hides your new proportional set that came in the mail until her new mink coat is delivered.

17. *The Deluded Wife*: one who thinks R/C flying is only for a few weekends in the summer.

18. *The Cute Wife*: one who smiles sweetly and hums as she helps you pick up the pieces after a prang.

19. *The Darn Mean Wife*: one who giggles gleefully when the wind starts blowing a gale on Sunday morning.

20. *The Disappointed Wife*: one who hoped it would rain, snow or something on her birthday and it didn't and hubby is at the field as usual.

21. *The Wise Wife*: one who knows when to shut up.

22. *The Sensitive Wife*: one who cries when you prang.

VIEWPOINT

(continued from page 5)

onto the dirt road we use as a flying strip. Meanwhile Keith and I are bantering back and forth about this being 'impossible', and it just can't be happening, it ain't so, etc., etc., and both of us laughing between deep gasps for breath. As I throttled back slowly, the nose lowered for it's descent. At this instant a thought flashed in my mind to the National's. Last summer, when little Brian Sattler chopped off the tail of my Shoestring Formula 2 Racer during the 'finals' and how the plane went into a 'death-dive' as I cut the power to see it fall and crash like a Buzz-Bomb of WW II. I didn't want this to happen now, especially since I already had it lined up for a landing on the road. So I gently worked the throttle like an elevator and the plane began to descend in a near normal path. As it neared the ground, the nose lowered rather sharply so I gave the engine a 'blast' of power - the nose came up again while a foot over the road, then I chopped the throttle quickly - and in it came, kind of fast but flat and level! As it rolled along the road it struck a rut, and as the nose wheel flexed back the prop hit the ground and broke a blade, stopping the engine. Other than that the plane was unmarked except of course, for the missing horizontal tail which was completely broken off. As we both regained our breath and began to laugh loudly, we commented that this whole incident was 'crazy' - it just couldn't happen, but it DID! We went upwind and picked up the broken pieces that fell from the plane and then tried to analyze what had happened. Naturally, it was structural failure of the horizontal tail but there were no knicks or dents that we could find that would have caused the tail to disintegrate that way. The conclusion we drew was that the excessive high speed, plus possible air turbulence (it WAS gusty) set up a flutter in the tail and shattered it. How the plane was able to be controlled and flown back to a successful landing - well, we are still trying to figure that one out!

Since this unusual event, we have refitted the plane with a new, stronger tail surface, and it has been flying extremely well - living on borrowed time!

Leon Shulman



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