

R/C ***MODELER***

THE LEADING MAGAZINE FOR RADIO CONTROL • MAY 1968 • 60¢



A few words about me.

I am Electronic Engineer and this is my day job.

From tender age two things attracted my interest and I managed to have them in my life.

The first was electricity and the second the bluesky.

I've found the model airplanes hobby in October 1973.

I love the wooden structures from scratch airplanes and boats also.

I started collecting plans, articles, books and anything else that could help the hobby of many years ago and have created a very large personal collection of them.

Since 2004 I became involved with the digitization and restoration of them and started to share the plans from public domain with my fellow modelers.

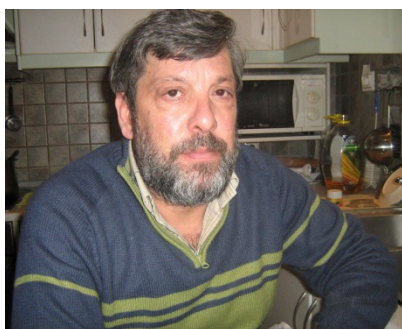
Now after all this experience I have decided to digitize, to clean and to re publish in digital edition and free of all issues RC Modeler magazine from 1963 to 2005 and others books and magazines.

Certainly this will be a very long, difficult and tedious task but I believe with the help of all of you I will finish it in a short time.

I apologize in advance because my English is poor. It is not my mother language because I am Greek. I wish all of you who choose to collect and read this my work good enjoyment and enjoy your buildings.

My name is Elijah Efthimiopoulos. (H.E)
My nickname Hlsat.

My country is Greece, and the my city is Xanthi.



Λίγα λόγια για μένα.

Είμαι Μηχανικός Ηλεκτρονικός και αυτό είναι το αληθινό μου επάγγελμα εργασίας.

Από μικρός δυο πράγματα μου κέντρισαν το ενδιαφέρον και ασχολήθηκα με αυτά.

Πρώτον ο ηλεκτρισμός και δεύτερον το απέραντο γαλάζιο του ουρανού και ο αέρας αυτού.

Το χόμπι του αερομοντελισμού το πρωτογνώρισα τον Οκτώβριο του 1973.

Μου αρέσουν οι ξύλινες κατασκευές αεροπλάνων και σκαφών από το μηδέν.

Ξεκίνησα να συλλέγω σχέδια, άρθρα, βιβλία και ότι άλλο μπορούσε να με βοηθήσει στο χόμπι από τα πολύ παλιά χρόνια.

Έχω δημιουργήσει μια πολύ μεγάλη προσωπική συλλογή από αυτά.

Από το 2004 άρχισα να ασχολούμαι με την ψηφιοποίηση τους, τον καθαρισμό τους αλλά και να τα μοιράζομαι μαζί σας αφού τα δημοσιοποιώ στο διαδίκτυο (όσα από αυτά επιτρέπεται λόγω των πνευματικών δικαιωμάτων τους).

Σήμερα μετά από όλη αυτήν την εμπειρία που έχω αποκτήσει, αποφάσισα να ψηφιοποιήσω, να καθαρίσω και να ξαναδημοσιεύσω σε ψηφιακή έκδοση και ελεύθερα όλα τα τεύχη του περιοδικού RC Modeler από το 1963 μέχρι το 2005 και κάποια άλλα βιβλία και περιοδικά.

Σίγουρα είναι μια πολύ μεγάλη, δύσκολη και επίπονη εργασία αλλά πιστεύω με την βοήθεια όλων σας να την τελειώσω σε ένα καλό αλλά μεγάλο χρονικό διάστημα.

Ζητώ συγγνώμη εκ των προτέρων γιατί τα Αγγλικά μου είναι φτωχά.

Δεν είναι η μητρική μου γλώσσα γιατί είμαι Έλληνας.

Εύχομαι σε όλους εσάς που θα επιλέξετε να τα συλλέξετε και να τα διαβάσετε αυτήν την εργασία μου καλή απόλαυση και καλές κατασκευές.

Το όνομα μου είναι Ηλίας Ευθυμιόπουλος. (H.E)

Το ψευδώνυμο μου Hlsat.

Η χώρα μου η Ελλάδα και η πολη μου η Ξάνθη.



RCM Magazine Editing and Resampling.

Work Done:

- 1) Advertisements removed.
- 2) Plans building plane removed and hyperlinked.
- 3) Articles building plane removed and hyperlinked.
- 4) Pages reordered.
- 5) Topics list added.

Now you can read these great issues and find the plans and building articles on multiple sites on the internet.

All Plans can be found here:

Hlsat Blog RCModeler Free Plans and Articles.

<http://www.rcgroups.com/forums/showthread.php?t=2354459>

AeroFred Gallery Free Plans.

<http://aerofred.com/index.php>

Hip Pocket Aeronautics Gallery Free Plans.

http://www.hippocketaeronautics.com/hpa_plans/index.php

James Hatton Blog Free Plans and Articles.

<http://pulling-gz.blogspot.gr/?view=flipcard>

Vintage & Old-Timer RCM Free Plans.

<http://www.rcgroups.com/forums/showthread.php?t=2233857>

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Thanks Elijah from Greece.



R/C MODELER

MAY, 1968

VOLUME 5, NUMBER 5

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Members of the Valley Flyers and 'Das Liddle Stiks.' 4" x 5" Ektachrome transparency by Reed Packard.

R/C MODELER Magazine is published monthly by R/C Modeler Corporation, Don Dewey, President. Editorial and Advertising offices at 171 W. Sierra Madre Blvd., Sierra Madre, California, 91024. (213) 356-1066. Entered as second class matter at Sierra Madre, California and additional offices. Subscriptions \$6.50 per year, \$12.00 two years. Single copies 60 cents each. Add \$2.00 for postage outside U.S. and Canada. (Except APO's.) Change of address notices, undelivered copies, and orders for subscriptions are to be sent to P. O. Box 487, Sierra Madre, California 91024. Not responsible for unsolicited manuscripts, which must be accompanied by return postage. Copyright 1968, R/C Modeler Corporation. All rights reserved. Reproduction in whole or part without permission is prohibited.

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R/C MODELER
THE LEADING MAGAZINE FOR RADIO CONTROL • MAY 1968 • \$6



EDITOR'S MEMO



RCM Classic flight tests. L to R: Dick Ludden, Ed Thompson, Don Dewey, Dick Sonheim.

MISMANAGEMENT and MINORITIES...

By Don Dewey

THE elimination of the radio control C Pattern Event from the 1968 Nationals, announced in a one line sentence in AMA Bulletin No. 12, came as a total surprise to most modelers throughout the country. The action of the Executive Council to limit pattern flying at the Olathe Nationals to FAI team selection only, with all of its attendant questionable legality, precipitated a deluge of angry letters of dissent from R/C'ers from coast to coast. It is, indeed, a sad commentary on the entire governmental structure of the governing body of our hobby and sport, when these modelers feel that the only way in which they can be heard or democratically represented, is to appeal directly to the model press. Here is an example of just one of these many letters:

Sir:

I ask for a change in the R/C portion of the AMA.

I am an active modeler with 37 years experience in every phase of the hobby. I am patient. I have never before made a public statement in this field.

I have just read AMA mailing No. 12.

I have observed AMA mismanagement for years. With the growth of R/C, I have wondered why we would allow the minority to control the majority. AMA Bulletin No. 12 has provoked me into a public statement at last.

There are literally hundreds of cases and thousands of words to illustrate the above accusations. Since brevity will encourage the editor to put my plea into print, I will rest my case on just one example of each area; both are contained in AMA Bulletin No. 12.

AMA mismanagement: Bulletin No. 12 spends several pages attempting to explain away late membership cards, late rule books and late magazines. Nowhere will

you find evidence of any attempt to start 1968 paper work in time to actually get it out on schedule. In other words, if it takes six months to get out membership cards, then it should be plain that it must be started six months ahead of a known deadline. For a business with a budget of over \$60,000, this isn't asking too much. It is a fact, it has been 1968 for over a month, and I don't have membership card or rule book for a year that is 1/12th gone. This problem seems to be growing worse each year.

Minority rule: It is a fact there are more R/C'ers than all of the categories of AMA combined. I was shocked by the information in Bulletin No. 12. This year, at the Nationals, there will not be offered any R/C event which represents an AMA membership approved set of rules. FAI pattern does not represent what has been discussed, tried, and approved through last year or previous years by AMA membership vote or usage. Therefore, I do not believe that having FAI pattern only at the NAT's is consistent with the desires of most R/C'ers. Legally speaking, I can't understand how an event which is not flown in local or area contests at all, can be the only event to be flown at the Nationals meet. Further, I do not believe that sending an FAI R/C team overseas each year is the sole and particular aim of the representative AMA-R/C dues payer. A couple of years ago we didn't even know what FAI was. Now, quite suddenly there is nothing else!

I propose that the solution to the problem behind these examples, is an independent R/C branch of AMA. Let's have our own leadership, our own budget, and most of all, an organization which is representative in its decisions!

Jack Dunn, Marietta, Georgia

While, as mentioned, this recent an-

nouncement came as a surprise to a great many modelers, it is, in this writer's opinion another hiatus in the continuing breakdown of the AMA structure. The AMA, on the other hand, will counter with the fact that Academy membership is at an all time high. But the question I put forth to the AMA officialdom is simply this: Have you ever considered why AMA membership is at an all time high? It is not due to outstanding qualities of leadership and management on the part of the Academy organization. It is not due to the inoculation of a commercial publication, with its vested business interests and lubricity of "home office" editorials. It is due to the fact that the sport of model aviation is growing in popular appeal, and any single organization with sole insuring and licensing franchise, would grow with it. In plain and simple words, the modeler has no other choice — **he has no other place to go.** And although the overall membership of the Academy has grown to an unprecedented high in 1968, it still lags far behind the overall growth of just one phase of model aviation — radio control. With an excess of 50% of the total membership of the Academy coming from the ranks of R/C enthusiasts, the total number of R/C'ers that are AMA members comprises only a very small fraction of the total number of R/C'ers active in this country.

The editorial comment in the March, 1968 issue of American Aircraft Modeler, under the column title of "Straight and Level" carries the antithesis of current AMA actions. And, although it was a pleasure to have a brief respite from the usual nostalgic yearnings of a return to the good old days of "bamboo and Bunsen burners," this editorial was a carefully worded smoke screen which attempted to absolve the AMA from blame in their continuing process of inaction and inability to perform their fundamental objectives. The antithesis we mentioned, comes in the eleventh paragraph of that article: "AMA Headquarters does not dictate. It can't under its democratically constituted organization." This, in theory, makes a nice sounding political slogan. Unfortunately, in actual practice, the exact opposite is true. As an example, since the Executive Council is responsible for naming the events that are conducted at the National Model Airplane Championships each year, how much democratic representation was involved in the Executive Council's decision to replace an AMA pattern event with the FAI team trials? How many FAI pattern events were flown in the last twelve months in AMA sanctioned contests throughout the country? If this is truly a "democratically constituted organization" what percentage of the rank and file members of the Academy are represented by the decision for the FAI eliminations at the Nationals? Despite the Executive Directors weak defense that precedents have been set for holding such an event at the Nationals, when did the membership vote to either rescind the AMA ruling that says only AMA events will be held at the Nationals, or ultimately, vote to make the FAI pattern an official AMA event?

Returning once again to the current editorial in the official AMA publication,

(Continued on Page 10)

SUNDAY FLIER

KEN WILLARD

THE weather must have been bad all over for the past month or so. I can usually tell, because the mail gets heavy during periods of inclement weather. Seems like if you can't get out and fly, you sit down and write about it! And that's great. It's about time I edited this column again instead of writing it. After all, it's your column, you Sunday Fliers.

But do me one favor, will you? If you want a reply, enclose a stamped, self-addressed envelope. It does two things — saves me time and cuts down the cost of running this column. When there are an average of 75 to 100 letters a month, the postage bill starts to mount up. However, whether you want an answer or not, keep the letters coming, and I'll publish those that seem to be of the most general interest, and try to answer the rest.

There are some very good ones this month, so let's take a look at a few.

From England comes a letter written by Derek Walton, who does some writing for the British magazines. Like me, he's a flying boat enthusiast, and here's what he has to say about hull design — particularly step location:

Dear Ken,

I read with interest your experiences when experimenting with the step position on model flying boats in the January 1968 R/C Modeler.

In Britain, any article you pick up on the design of flying boats prior to 1940, insists that the step must be in front of the CG for success. But, they also insist that only sponsons must be used, and not tip floats. I was really bitten by the flying boat bug, and eat, drink and sleep them! So, I have carried out a number of experiments, not only on flying models, but using a screw driven tethered hydroplane for closer studies. My own findings are that as long as certain rules are obeyed, the rearward step is a better bet because of the shorter takeoff room. You answered part of the problem yourself when you say the nose should be held high, but my findings are that it is the forehull, and in particular, the section immediately in front of the step, which was most important. I suspect your experiments were performed on a Hydrohoney or similar hull which has a low profile, and so the difference in the angle between the datum and the forehull would be small. When you moved the step back the nose would have dropped. Probably to the extent that the fore part of the hull was not at a negative angle of attack, so that it would never climb onto the step, unaided. If however, we ensure that the fore part of the hull has

a positive angle of attack, it will always climb onto the step. Also, by moving the step back we make it carry more weight so that the new vent carries less, and, therefore, does not have to dig so deeply to provide its lift, reducing the drag and shortening its take-off run. My own findings also show that the afterbody should be swept upwards, say to the stall angle of the wing, in order to allow the model to rotate about the step at the instant of take-off. I also mount my wing at 0° and the tail at -2° or -3°, which means I have the equivalent of the pilot pulling back on the stick, keeping the nose high for take-off. It also means I come in for a nose high landing, lessening the chance of digging in.

At the moment I am experimenting with a semi-scale Dornier Wal, 36" span, using the QZ, designed specifically to fly in confined spaces. It can turn on a sixpence without dropping its nose, and will takeoff in about 30 feet, and I am flying it in a puddle in a marshy field!

Keep up the good work but don't produce too many .15 sized models! We all admire you for your .049 sized models where you must have done more to popularize this size of model than all the other designers put together.

Yours faithfully,
Derek Walton

Next summer I'll accommodate you, Derek, with a couple of small jobs — the ½A powered Bushman, and the .020 powered (for auxiliary purposes only) Slope-master, a new slope soarer that is in the (Continued on Page 7)

Yves Van Gompel with O.S. Max. .19 powered Top Dawg. Kraft KP4B propo on REM.



process of being tested, and, perhaps, after that another flying boat that will be suitable for either ½A or .09, depending on what gear you install.

From the other side of the world — New South Wales, Australia (at least that's the way I think it reads) — Capt. C. W. Peake comes up with some very interesting thoughts on single channel, glitches, and turbulence.

Dear Ken,

Maybe this writing to magazines is a bug like modeling itself. I have just sent off a batch of stuff to your Fearless Leader, and now here I am writing to you.

What prompted this was the letter from Barry Bowerman, published in January RCM, and your remarks on the relationship between single channel and galloping ghost. One of my earliest impressions of full house proportional was that the circuitry was much more akin to single channel pulse than to reeds. The basic principle of X-channel proportion is the same as G.G., though of course pulse rates are much higher and the circuitry more complex. In other words, the line of development of full proportional was via pulse proportional, and reeds were something of an offshoot (which served its purpose very well, all the same).

The term "channels" as applied to proportional is something of a misnomer, since all the information from transmitter to receiver goes via a "single channel." This is why interference on proportional frequently appears as unwanted control movement. The audio channels of the reed gear were

COMING . . .

Ken Willard's
.10 powered biplane

THE CLASSMATE

Designed for the
Sunday Flier

NEXT MONTH IN RCM

largely "self-filtering," and interference, except for vibration problems, appeared as loss of contact and hence no control movement.

Personally, I rather regret the fact that most manufacturers seem to be dispersing with the "fail-safe" concept. I have been flying a Bonner Digimite 8 for nearly three years, and have continued to fly in conditions which grounded the non-failsafe outfits.

While on the subject of unwanted control movements, I feel that some flyers tend to blame their equipment for "glitches" which are actually atmospheric turbulence. Some types of turbulence produce motion which is very difficult to distinguish from intermittent control movement. In this regard, it is interesting to note that in a full size aircraft, at the completion of a steep turn or a loop, it is not uncommon to "hit your own slipstream." The turbulent wake of an aircraft remains active for a surprisingly long period, and any time an aircraft passes through a point where it (or another air-

SUNDAY FLIER

(Continued from Page 6)

craft) has been a short time before, there is a brief period of "bumps." There have been instances where light aircraft have encountered serious problems in maintaining control when passing through an area where a large jet has been some time before. I have no doubt that the wake of a model remains active quite long enough for that model or another to encounter it.

What all this boils down to is that if the super duper full house propo guy looks down his nose at G.G., just tell him he's still on single channel anyhow!

With that thought I'll leave you. Regards,
Charles Peake

And how about that, all you sophisticated single channel flyers? Maybe I'd better stop saying that single channel is the cheapest way to fly!

Seems like about one third of the letters I get are from young fellows in their teens who are just getting started in R/C, and that's great with me. This sport of ours is fun, but it's also educational, plus the fact that it teaches you patience — sometimes the hard way. Here's a nice letter I received from Jim LaBarge in Tempe, Arizona.

Dear Mr. Willard,

I've been reading the Sunday Flier for about a year now and I think your idea of small planes is great. I've built the Schoolmaster and the Schoolgirl but I didn't have much flying on either. You see there was that warp that reappeared, well that's enough of that. I thought I'd tell you something about myself. For a start I'm 16 and have flown U-Control for about 7 years and I've flown in local contests. I've just recently organized a new model club at my high school. Our name is sort of original "The Flying Chargers." You see our school's team name is the Chargers. I enjoy using the small Cox engines because they are not only dependable but economical. I've got one old time Thimble Drome ringed .15 that was built by the Cameron Bros. It runs great and I'm thinking of building the Headmaster, the plans are already enlarged from the magazine article. Would that .15 work on it? It took me about a year to finally learn how to fly with that dad blasted escapement. . . . I finally did and I've decided to convert my Mule to galloping ghost. I am in the process of trying to finish the first Midwest Cessna 150 to come into the hobby shop here. What a plane! That brings up my question for you. How does one go about trimming a model especially one like Mr. Krieser's Skyhawk in the January issue? Masking tape never has worked for me, I can't get it to curve! I'm going to enclose an envelope complete with stamp so please tell me how you guys do it. With all the sunny weather we have here in this part of Arizona one would think there would be more R/C activity around here. There are about 5 or 6 older men in Tempe but I haven't seen them in months. I enjoy your construction article on the Headmaster, and your column, so hurry up and do the article on the Classmate. Thank you very much for your time. Meanwhile "Curse you, Red Baron" yea, I'm another one of Snoopy's fans.

Sincerely,

James W. LaBarge (Jim)

President, FLYING CHARGERS

Here's what I told Jim. "The only way to find out if an engine has enough power to fly a model is to put it in and try it. Within reason, that is." Then, with regard to the problem of putting trim on a model, I told Jim I have the same problem with masking tape, so now I use MonoKote. I cut out the trim pattern I want, peel off the backing, and carefully lay it in place (the MonoKote, not the backing!), then use the backing for a pattern to cut out another piece just opposite to the first, and it goes on the other side. Easiest way I know of to trim a model!

Recently I wrote a piece about mounting the stab on the underside of the fuselage. This prompted the following letter from Jim McKeown of Sidney, New York.

Dear Ken,

I find your article "Sunday Flier" most interesting. I have been reading it for about two years and feel that the boys who get out for a "giggle" on a week-end can really have a ball.

I recently returned from England where I took up radio modeling about 4 years ago. To my amazement I discovered that escapement flying here in New York is virtually non-existent. I have been having reasonable success with escapement flying here and noted your recent comment concerning the mounting of the tailplane under the fuselage.

With rudder only, models with this configuration appear to be easier to stunt. I have in fact, on very rare occasions, been able to get a 3 or 4 turn spin with this configuration but with the fin and tailplane mounted above the fuselage could not.

Your comments concerning such rudder-only spins and what model characteristics affect this property would be greatly appreciated.

Yours faithfully,

James E. McKeown

Jim is right. Escapement flying is gradually being overtaken by progress. A couple of years ago I made an informal survey, and it appeared then that escapements were still controlling about half the R/C models then flying — but I wonder what the percentage would be now. Undoubtedly, a lot less.

As for his remarks about stunting, and spins with rudder only, you can make a model spin even though it only has rudder control, and regardless of whether the stab is below or on top of the fuselage. Just trim the model so the CG is further back than usual — say around the 40% point of the chord. It will make the model touchy to fly, true, but when you give it rudder it'll spin. Just be sure you have a big enough rudder to pull it out of the spin when you want to!

I'd like to mention something that bothers me, and it should bother you, if your club is guilty. I get lots of club newsletters — and please keep them coming, all of you. Some of them are very, very good — but some of them are pretty bad. Not from the standpoint of what the guys are writing about, because that's always of interest. But the English and spelling! No wonder some of the women say "They must be toy airplanes — only children would write that way about them!" Next time, how about having one of your buddies proof read for you?

In contrast, some modelers have good

cause for using English which may not be the way we'd write it — such as this letter by Marcel Van Gompel from Belgium, which I find utterly delightful. And I am so thankful he wrote in English, because I can't read French. Further, I can assure Marcel that if I ever attempted to answer him by writing in French, the result would be disastrous! And hasn't he got a good looking son, Yves. Also how about that Top Dawg, with a .19 up front!

Dear Mr. Willard,

Bravo, for your "Top Dawg."

At the first time that I had see this in R/C Modeler Magazine, I had built one exactly same that the plan. This first one was powered by a Graupner Taifun Sprint 1,78 cc. engine and I had installed a Min-X relayless G.G. system.

From the first test, it fly very good.

In past August, I have build a second model. For this, I have reinforced the fuselage sides, the stab and the fin (balsa plywood 3 mm.) — O.S. Max .19 RC engine — prop 9/6 — Kraft KP4B proportional system with 3 servos only. The model weigh 1,750 Kg.

It fly very fast but very good and his gliding is also fast and good. I consider that it is a very nice model. My son Yves, 12 years old, fly with this and he is very enjoyed.

You will find, in annex, a photo of this last model.

Many thanks and sincerely,

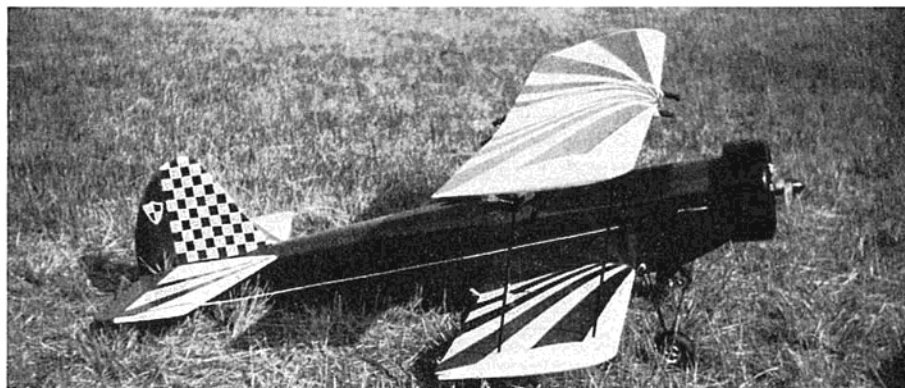
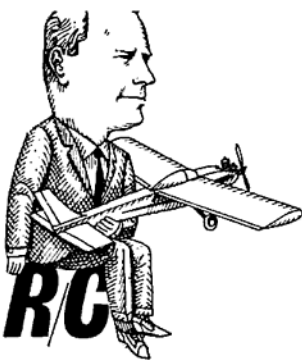
Marcel Van Gompel

Well, I've run out of space, so some of the letters will have to wait until next time. But keep them coming. They're grate!

Next month, the Classmate gets out of school.



CUNNINGHAM ON RC



Hank Neuman's "Showoff" with ring cowl and tag board covered wings. Beautiful!

SPRING is sprouting out around the country and so are all of the new ships that have been 'a-building throughout the past winter. Now is as good a time as any to take another look at one of the most important features—the balance point of your ship. An aircraft that is not properly balanced will not live up to its flying promise. If it is tail heavy it will be hard to fly, prone to stalls, and difficult to land. The control surfaces will be much more sensitive and difficult to handle, and the over all flying of the aircraft will suffer. If the plane is too nose heavy then it becomes a real job to get the nose up and to keep it up. The control surfaces, mainly the elevator, will have to do too much work, and will put a great load on the servo.

Those of you newer fliers will wonder how to tell if your ship is nose heavy or tail heavy. If it is a kit you can tell by checking the balance of your ship against that point shown on the plans. Be sure and do all of the balancing with the fuel tank empty. This is generally known as the "dry" condition. If the ship does not balance prop-

erly then you can change it by shifting the batteries or the servos if they have not been permanently installed. If you cannot shift things around then you can work out the balance by inserting pieces of lead at the nose or tail. The best source of lead is at a plumbing supply house. You can buy $\frac{1}{8}$ " thin sheet lead by the pound. Another source for small weights are fish sinkers. If you are installing lead, be sure that it is fastened securely to the structure!

One of the most overlooked factors in balancing is the static balance of the wing. Always take the time to check this out on a new aircraft. If one wing tip is heavier than the other it will cause the aircraft to turn in the direction of the heavy wing. With the landing gear and servo installed, hold the wing between your fingers and see if one panel is heavier. If it is, you can correct it in several ways. You can add a coat of dope to the light wing panel; you can add weights to the light panel; or, alternately, you can remove some of the tip material from the heavy panel. A very simple way of adding weight to the light panel is

to screw medium sized flat head wood screws into the wing tip block from the underside. If you're a perfectionist, you can sink these into the wood and fill and finish over them.

Even though you may have checked your aircraft against the plans and found it almost perfect, the flying characteristics may still indicate that it is out of balance. Let's take a look at it in flight. Is the tail low, and does it assume a tail-low attitude at landing speed? Chances are it is tail heavy. When you throttle back from high throttle does your ship climb? Again, tail heavy. If your ship dives when changing from high to low throttle it is a sign of a nose heavy condition. In this day of proportional it is easy to trim out a nose or tail heavy set up by simply rolling in a little trim to the elevator stick. But, the basic unbalance is still there. A nose heavy ship may also require a large amount of down elevator when flying inverted. If you have to hold a lot of down at the same time you are moving other controls you have a greater chance for pilot error in your maneuver.

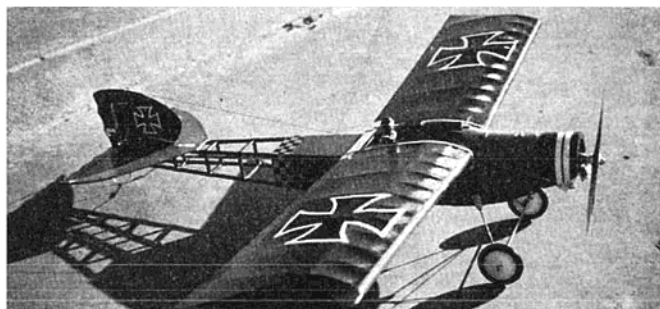
If you are designing your own ship then you may have a problem in deciding where the ship should balance. Let's look at this from the beginning of the basic design. If you are using an airfoil made popular in some kit model such as the Kwik-Fli or the Taurus, then work out the balance point to the same place on the airfoil as the original aircraft. If you are working with an unknown airfoil then start with a balance point of about 35%. There is no need to go into a lengthy discussion of static margin and a stable and unstable condition—just keep in mind that working within limits of 30% to 40% balance point will give you a good flying aircraft. I think that you will have most luck if you keep the balance forward though, between 30% and 35%.

This percentage figure means something more than just a point on the root airfoil. It means that 35% of the wing area should be ahead of the point and 65% of the wing area should be behind the point. This is pretty simple to locate on an aircraft with a rectangular planform, but how about a tapered wing?

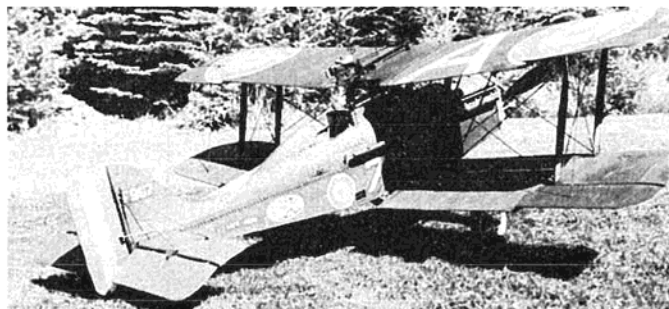
Figures 1 through 4 gives you a simple look at finding the correct balance point for any type of wing planform. If you follow this line of thought you can set up the correct balance point for any wing. A lot of fliers like to design their own fuselage around an existing wing. You can do this without fear of getting the balance point all goofed up.

(Continued on Page 9)

"Flugenghoster" by Jerry Edwards. Enya .09, Min-X and Rand complete the package.



Beautifully detailed S.E. 5A built by Fred Muller, from scale plans by Bob Holman.



Some months ago we started the policy of a question and answer portion of each monthly article. We have deviated from this plan several times, but we will be returning to this format when there are a batch of questions that we feel are in the general interest of a majority of our readers.

The first question is a two part one, but I think both parts have a lot of interest. . .

Q. My wife helps me with cutting out foam wings. The wing panels invariably have a sag towards the center. We don't seem to be pulling the wire too fast. Do you have this problem?

A. Yep! I can think of two answers, the first is to get a new wife, but since that one won't sit too well with the girls, the solution is to pause as you come around the leading edge. If you both go too fast around the curve of the leading edge the wire will drag in the center of the panel and transcribe a much smaller radius. This will cause quite a bit of sway in the leading edge. If you are both counting together, then when you get to the leading edge, slow down the pace, and call off the last section in small increments. When you get to the center of the leading edge curve pause and be sure that the wire was caught up. Then continue on around the lower portion of the airfoil. Leave the full cut out core within its shell until it has cooled. This prevents it from warping.

Q. I've been using cardboard to cover my foam wings, but have not found a good type. The wings seem to come out heavy, and on a hard lading wind up with crease marks in them.

A. I think that cardboard covered foam wings are a bit heavier than balsa. A lot can be done to hold down this excess weight. I have checked with some of my wings and find that a completed wing with servo and landing gear installed weighs in at 2.5#. This is not too bad. I have a kit Kwik-Fli wing that weighs in at 2.5#, also, all ready to fly, and this completed aircraft weighs 6#-10 oz. The best cardboard that I have found to use is called "Railroad Board" and comes in sheets 28" x 40". It sells for 39 cents per sheet. On smaller ships you can use a 2 ply bristol board available at most stores selling artists or school supplies. You have to be careful in finishing off a cardboard covered wing just as you do a balsa covered wing. You can paint it with dope, but if you do be sure and spray on the dope. If you brush it on it may penetrate the cardboard and dissolve the foam core.

The next question was one that I got via the long distance telephone. The modeler was really in a stew and called me to get the home address of a prominent radio manufacturer. The real question that he had was . . .

Q. What do I do to change my transmitter and receiver batteries? I've lost my cord that goes from the wall to the transmitter.

A. If you're in this boat, or simply want an extra cord, get on down to your friendly radio and tee-vee store and buy a

"cheater cord". This is the power cord for a TV set and is equipped with a plug in end to protect all well meaning do-it-yourself "boob tube" repair men. This is the same cord that most of the proportional gear people use for a charging cord. At least this type of cord has been used on the larger sets. With the new midgets coming in I don't know if they will use the same type cords or not.

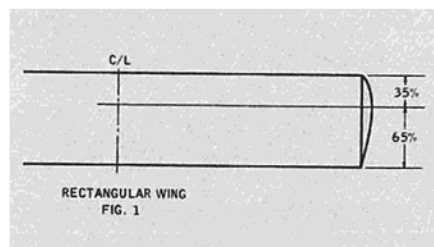
This next question I have been asked in several forms, at least a hundred times. . .

Q. I want to get started in R/C. I'd like to build a PT-19 with a .35 engine. Can this be flown with a Rand GG system?

A. This is really stretching the system just a bit. This type of control is great if you stay within the limitations of this kind of gear. It was designed to fly small aircraft and the muscle of the servo isn't really enough for a large model. You would be better off to stay within the range of the .19 and down ships.

Speaking of the Galloping Ghost, I received a sample of some of the new goodies that Rand is putting out. The best thing is two actuator mounting boards. One is for a single Rand actuator and the other, strangely enough, is for a double actuator set-up. This mounting system allows for vibration absorption thru the use of rubber grommets. The other items are several different sizes of screws for engine mounting, and a servo mounting tape with a sticky surface on both sides. I've tried this method of putting in servos and have found it to be good. It is even possible to attach a servo where one was not intended to be, such as flap servo put up on top of a wing rather than recessed into the wing. All in all, this line of new items is a fine addition to an already long list of good products.

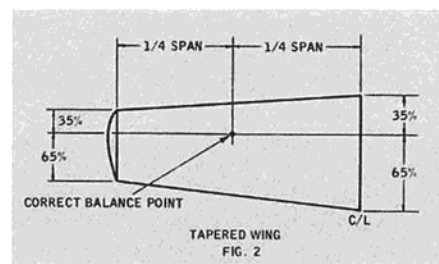
Those of you who have been lucky enough to see some of the new miniature sets have been able to realize just how rapidly our sport has been advancing, and how lucky we are to be the beneficiary of the advances in technology. The new rigs are going to make possible a 6 pound and under pattern ship for everyone, and will let you get all of the radio that you need into a Goodyear Racer. Believe me, they are small! In chopping down the size, most of them have been made even better than they were before. In most lines the servo cases, as well as the receiver cases, are molded from very strong plastic, able to survive much more abuse than the metal cased radios of today. The biggest problem that I can foresee with these small sets is in finding them after they are installed in the innards of your ship! The space left around kind a shakes you up! Balancing of the ship may be just a little bit harder since we have been used to having some weight of radio gear to work with, but I'll settle for this problem.



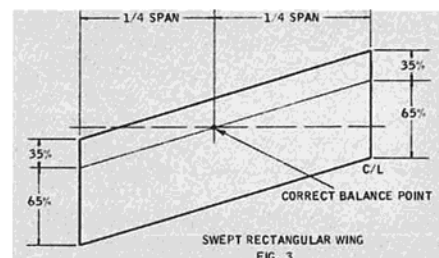
RECTANGULAR WING
FIG. 1

Aside to old Bilk Northrup, of that east coast balsa book. Thanks for the tip on the "lefty" flying on a right handed stick box. You know, you're right, and if you won't tell the radio the plugs are plugged into different servos, I won't tell the Coast Guard to shoot you down on the next altitude record attempt.

I've read a number of favorable comments on the Austrian HP61, and when

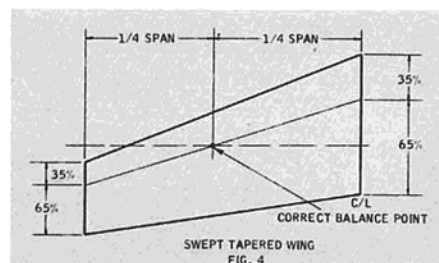


TAPERED WING
FIG. 2



SWEPT RECTANGULAR WING
FIG. 3

Don said that he was sending one down for flight evaluation I was overjoyed. Then he told me that it was just a loaner, and it had to be shipped back in a couple of days! When it arrived we put it on the test block at Ed Alexanders, and found out quickly that it would run out any engine that had ever rested on the test stand! We tried it with Dukes fuel, and Cox Red Can. Both runs were fantastic! In fact, my



SWEPT TAPERED WING
FIG. 4

ears hurt the remainder of that day. I'd conned Dan Carey into flight testing the engine in his eight pound well flown El Tigre, so the engine was turned over to Dan for installation.

No luck, it was too long to fit in. We then took a long style Tatone mount, cut away a good bit of the back plate of the mount and bolted the engine to this. Engine and mount were then installed in one of my old ships, a 800 sq. inch, 8 1/2 # low winger, lovingly called the "Garbage Fly". Even routing out some of the cowlings and the firewall was necessary to accommodate the rear throttle of the H. P. 61. It was finally installed, and the weather gave us a break by turning out a reasonable Sunday early in February.

When we fired it up there wasn't a doubt in anyone's mind that a real Stud was on the loose. We had had some trouble setting the idle to get a good transition from low to high, so we carried it down to the runway, still giving out at full bore, and with-

out a muffler. I nodded to Ed, he released it, and wow! Like, man, it was gone! The first flight made a believer of me in a hurry. It lugged that biggish ship all over the sky at breakneck speed. On the second flight, I decided to see just how much pull it had, so after a take-off run of about fifty feet, I pulled it off the ground and pointed the nose straight up. And that's just where it went! It climbed out without a miss or a sag with the nose pointed right up at the clouds.

This is really some engine! It has some points that I don't like, namely, the exhaust is on the left side of the engine rather than the right as we are accustomed to; the needle valve is hard to reach; and it is impossible to choke, mounted in the normal position, since the intake opening is aimed somewhere at the bottom of the cowl. The throttle set up seems to be more difficult than is necessary and I'd like to see this engine equipped with a Kavan Carburetor. It lacks an exhaust baffle, but with the muffler this is not necessary. We felt that the muffler robbed a bit too much of the power, but even with the muffler installed, it had more power than any other engine we had ever seen, including all of the larger .60, .61 and .74 smoke eaters. For an overweight scale ship or a large biplane, this engine would be a must. A Big John with this kind of power would be something to see. All in all, this is quite an engine and one that is going to make its mark very strongly in future R/C flying and engine design.

Until next month, keep 'em flying!

Bob Minick's retract gear F-51. Hard to tell from full scale.



we were subjected to a lengthy tirade directed against members of the hobby industry and "the older modeler . . . who keeps a strangle hold on the competition picture". This was all leading up to, and in summation of, the fact that the Navy is unhappy with the small amount of younger entries at the Nationals. And the Navy's prime consideration for sponsoring the Nationals is their recruiting program — the attempt to interest boys and young men in Naval Aviation. Speaking only for the radio control segment of model aviation, we can say without qualification, that this is an adult sport and hobby, and will become even more so in years to come as the adult public becomes aware of its potential for recreation, pleasure and competition.

Perhaps it is truly time to "separate the men from the boys." Perhaps the Academy of Model Aeronautics, and its spokesmen, would be much happier if the "hard-core middle-aged specialist hobbyist", as described in that recent editorial, would completely withdraw from the Academy and concentrate its efforts on a National R/C organization. This would allow the Academy to devote its efforts entirely to promoting modeling among the junior members. I wonder, though, just how long the Academy would last on only 40% of its current budget?

On the other hand, if current National modeling activities does not meet with the Navy's recruiting requirement, why not investigate other areas of sponsorship? As an example, over a year and a half ago, R/CM began some preliminary studies and initial discussions concerning the possibility of Air Force sponsorship of the Nationals. When this was mentioned to the Academy, it was met with a casual "not interested".

What it appears to boil down to, is that the Washington officialdom spends a great deal of their time, and our money, preparing supplemental bulletins of absolution for official AMA actions, while the "Council of Elders" sorts out their personal interests and convinces one another that they are, after all, really in the best interest of the majority. If this is truly the democratic form of government described by Mr. Winter, one wonders wherein lies the franchise of power. In a democracy, it lies with the people — the majority of the people.

And like the man said, "Nobody ain't asked me nuthin' of late."

In a recent issue of R/C Modeler Magazine, the Sunday Flier column contained a statement concerning an expected 45% increase in the cost of balsa wood. This statement was erroneously reported and no such increase is pending or expected. What will occur will be a 12 to 15% increase in the price of balsa wood, due to an increase in the prices from the Ecuadorian mills, plus the 14.2% in the minimum wage among U. S. employees. Added to this the increase of social security costs, U. S. balsa manufacturers anticipate a 12 to 15% increase in the cost of balsa. This increase contains no profit, but is merely to keep pace with the increased costs that they are currently experiencing.

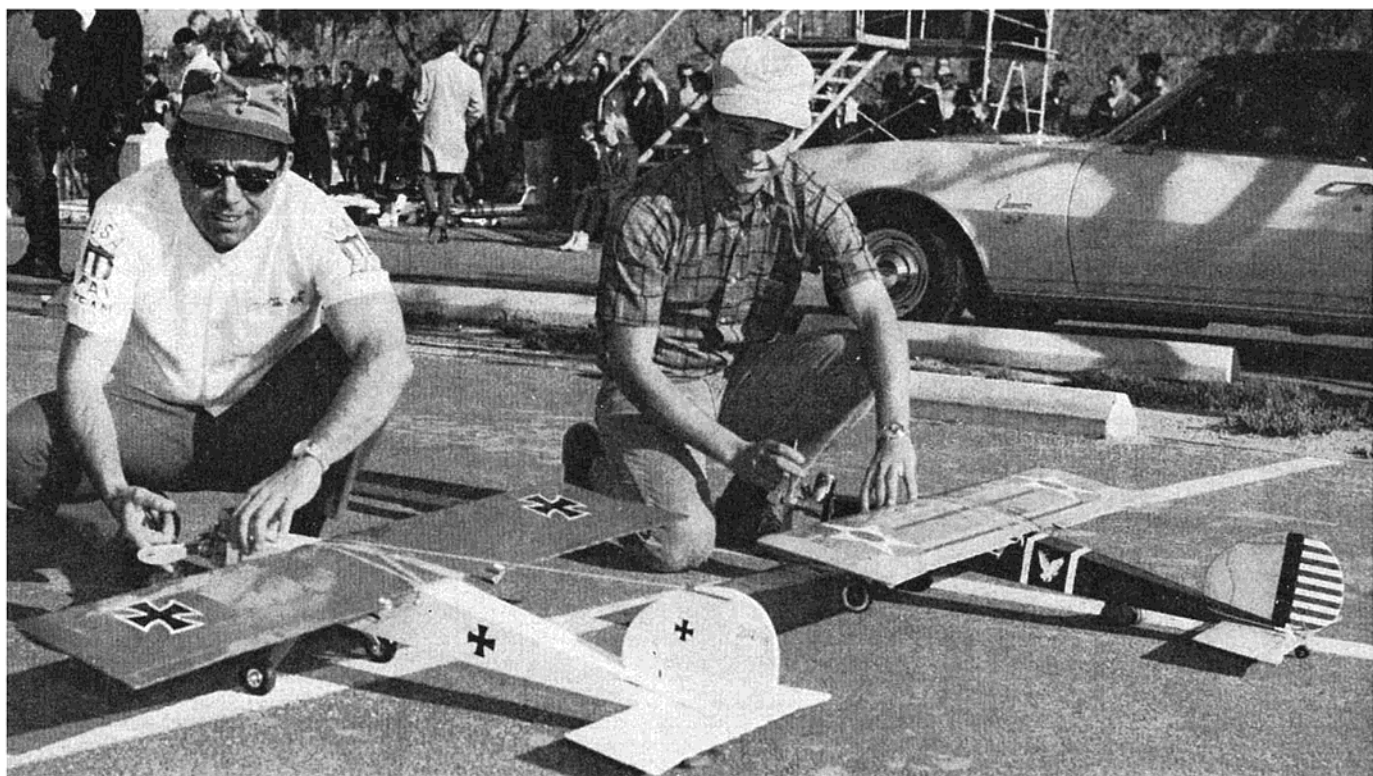


RCM CONSTRUCTION FEATURE

Cliff Weirick and Larry
Leonard with 'Das Liddle
Stik's' at Universal Studios.

Das Liddle Stik

By Larry Leonard



ALMOST two years ago, Phil Kraft, threw caution to the winds, his french curve in the trash, sophistication to the side, and beauty of line someplace that hasn't even been discovered yet! The end result of his labors (?) was the Ugly Stik. As could be expected, after a quick (or is it kwik?) glance at this project of a proficient modeler, the Ugly Stik was an immediate success. Not only was it a fine flying machine, but it could be built very kwikly (naturally) and it is of the category often described as "it's so ugly that it's cute!" Jim Jensen then produced one of his beautiful kits of this airplane and its success was assured.

Larry Leonard, proprietor of a local hobby shop and a very active flyer, and Bud Anders, (both of the Valley Flyers R/C Club) built and flew the Ugly Stik and both liked the airplane very much. Then the idea came to them that this ship might be even more fun if it were to be reduced in size. They, then, would have a more compact airplane, which would, hopefully, provide even more fun. These two intrepid modelers decided that a 25 per cent reduction in size would provide a nice, small air-

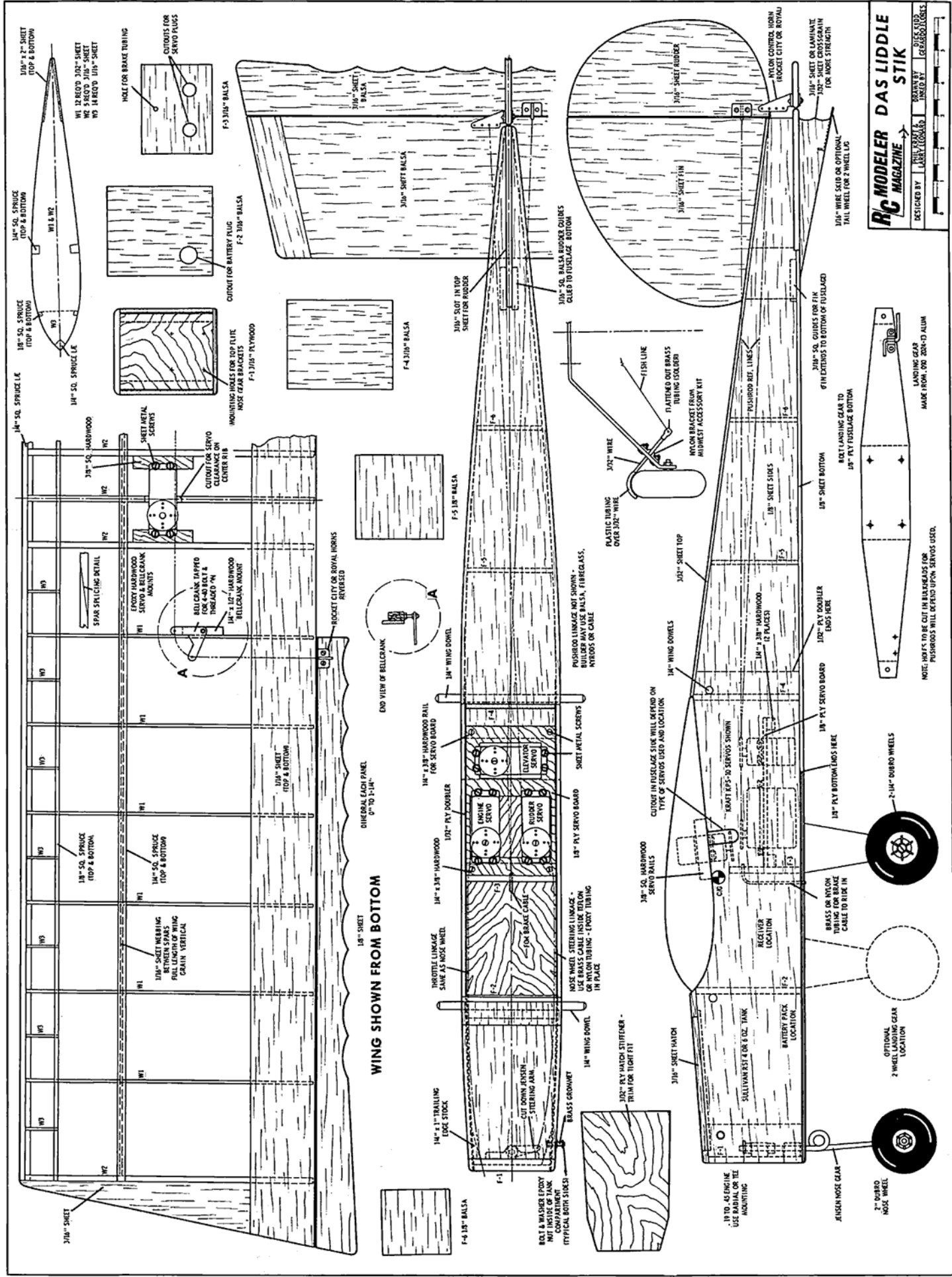
plane with enough wing area remaining to keep it airborne. Here serendipity entered into the picture. With much acumen, the plans were reduced to $\frac{3}{4}$ size, the structure was modified to fit the reduced size of the airplane, and the elevator was slightly increased in area to provide the proper response. Now hear this, fellow modelers. When a wing is reduced to $\frac{3}{4}$ of its original size, there remains only $\frac{9}{16}$ of its original area. Ergo, the reference to serendipity. The airplane, never having been schooled in mathematics flew like a dream. It ignored its high wing loading and even retained the glide. True, more than $\frac{1}{8}$ of an inch movement either way of the ailerons would produce angular accelerations of an unbelievable magnitude, but the sophisticated solution to this problem was finally derived, lengthen the aileron horns.

While cutting out the parts for the first "Liddle Stik," Larry Leonard decided that it was almost as easy to cut out six models as it was to cut out one. As a result of this logic, the original sextet was built by Larry, Bob Golden, Dick Adams, Mike Bainum, Jim Boylan, and the Valley Flyers answer

to Harold Goldklank — Les Kesner — all members of the Valley Flyers. The equipment utilized has ranged from six channel reeds to full house proportional, although there is no reason why this would not make a good GG ship. Considerable success has been recorded by each airplane insofar as qualifying as a real fun aircraft.

The Liddle Stik has been flown as a tail dragger, or trike geared; without dihedral; with ailerons, without ailerons; and even without a working receiver (need I say whose?). It has been powered by a variety of engines ranging from .19's to — would you believe a Supertigre .56? It has been fitted with almost every type of radio equipment imaginable and most rigs will fit with a little planning. Larry's prototype sports a Supertigre .35 in the nose, four channels of a Kraft KP6B inside, and weighs about $3\frac{1}{2}$ pounds dry!

The airplane is a fast, smooth flier, and although it was designed primarily as a sport ship, it will do both full AMA and FAI patterns with no strain. I've also seen it put through virtually every free style maneuver there is and it does them all!



*Build it as a tail dragger, or trike geared;
without dihedral; with ailerons, without
ailerons; six channels or full house;
.19's to .45's.*

The ship snap rolls particularly well, and it will do nice, tight loops with a full snap at the top mighty fast. The vertical capability seems endless due to the light weight and the .35 in the nose, and it will climb out of sight in a hurry. As a tail dragger, it tracks well if one remembers not to slam the throttle wide open on take off, and the landings and taxi-back's are as good as any molded ship can do.

All in all, it seems that this experiment in smallifying an existing design has been most successful. So successful, in fact, that Larry is now kitting this ship for local consumption. This experiment also gives a good indication that there is still a lot of fun left in this hobby, for Larry Leonard is fast becoming a noteworthy contender in Class 3 Expert events. This can be attested to by his eighth place finish at last year's FAI finals and his fifth place finish at Los Alamos Nationals. Pattern flying may be great, and there is no denying the skill that is required to fly the pattern well, but there is always a time and place for just plain sport flying.

CONSTRUCTION

If you are one of the many hundreds of modelers who have built one of the full size Ugly Stiks, then there will be little need to read the following brief construction note. This miniature version follows exactly the same construction procedure as did its larger counterpart. Only the balsa sizes and overall dimensions are changed. Unlike the

great majority of contest type aircraft, if you are a beginner, don't go away! The larger version was an excellent full house trainer, and the Liddle Stik is no exception. Don't, however, make the mistake of putting a .45 at the nose, ala Cliff Weirick and expect it to be a docile trainer. It won't be! With a .19 engine, however, it will fly quite well and provide you with a great many hours of flying pleasure while, at the same time, you learn to become proficient at the art of flying full house proportional.

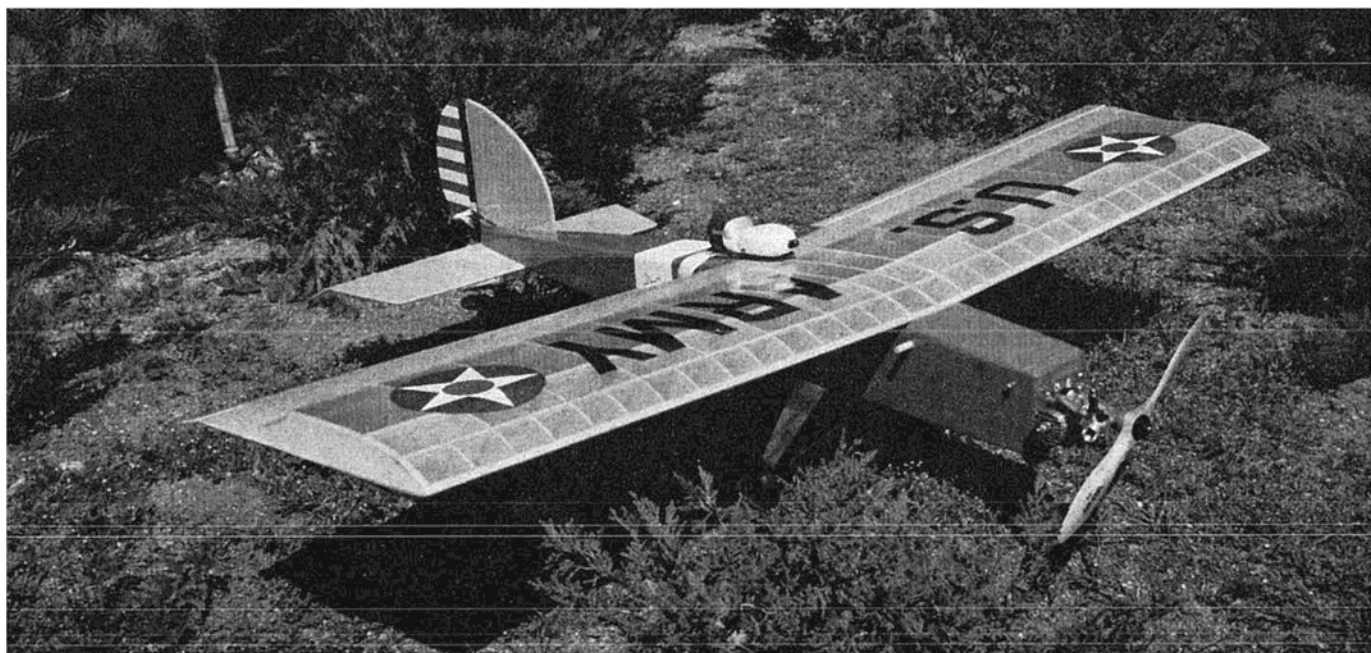
Before commencing construction of this model, decide whether you are going to build the trike geared version, or the tail dragger. Next, decide which engine you are going to use. Anything in the range of from .19 to .35 is within the realm of reason. Below or above these two categories, however, you are on your own! Construction notes here will be limited to "handy hints," since the overall construction of this model is simplicity itself.

Begin construction by cutting out all the parts that are to be used in the airplane. This includes all fuselage parts, wing ribs and spars, sheet tail surfaces, etc. Lay the plywood fuselage bottom down on a flat working surface and butt glue the balsa fuselage bottom to it. Mark the positions of all formers and glue them in place using Titebond glue at all former locations with the exception of F-1. F-1 should be glued in place with Epoxy glue. While the fuselage formers and bottom sheeting is drying,

assemble the stabilizer tips to the stabilizer proper. When completed pin the stabilizer down and butt glue it to the rear of the fuselage bottom. When the fuselage formers have dried, apply Titebond glue to the bottom of the fuselage side, bottom sheets, bulkhead and stabilizer. Spread Epoxy on the fuselage sides in F-1 bulkhead where the sides join that bulkhead. Now pin the sides in place. Clamp the sides to F-1 bulkhead, epoxy and insert and glue in place the trailing edge stock firewall braces. Glue on the top back fuselage sheet and glue the fin into position. Glue on the top front fuselage piece and bevel the rear edge to match the contour of the wing cutout. Glue the hatch stop to the inside of the hatch at the front end.

When building the wing, decide whether you will build a flat wing or a wing with a minimum amount of dihedral. For all you doubting Thomases, a wing without any dihedral whatsoever glides just as well as a wing with a small amount of dihedral, and is a hell of a lot easier to build. The air foil of this wing is such that the wing can be built on a flat surface, and does not require a special jig such as a full symmetrical wing would require. Be sure to use a spruce leading edge and spruce bars as called out on the plans. This adds considerably to the overall weight of the wing. Also, before adding the top main spar, cut, and glue $\frac{1}{16}$ " webbing in place in each bay for the full

(Continued on Page 17)



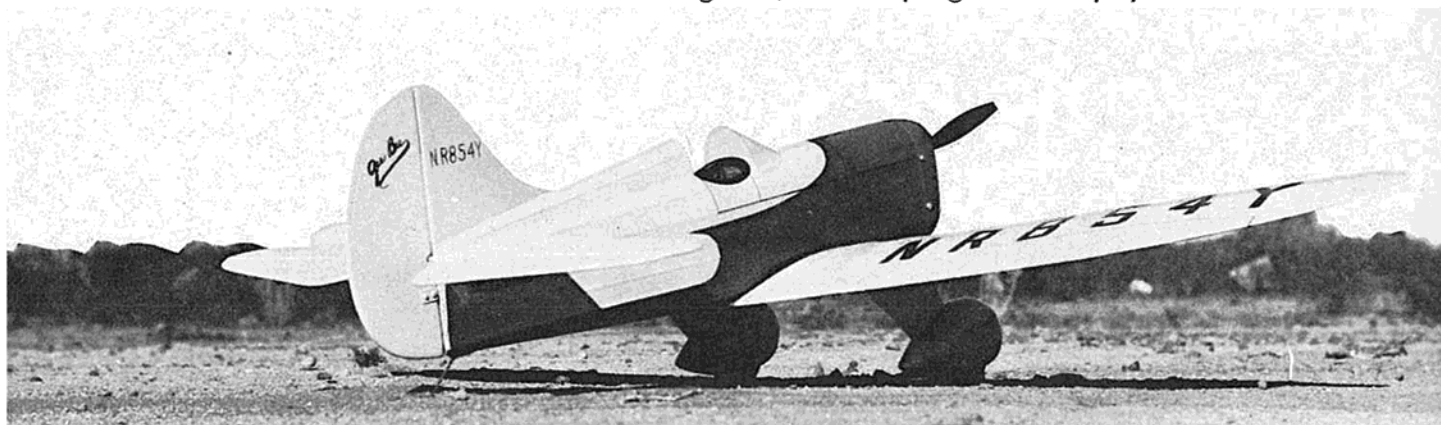
GEE BEE SPORTSTER

By Don Srull



RCM CONSTRUCTION FEATURE

This 1½" to the foot, 37½" span single channel scale model of the famous Gee Bee Model D Sportster is a snappy machine on a TEE DEE .049. Designed for Galloping Ghost equipment.



FOR the past several years, I have been flying a couple of .049 powered sport-racing GG airplanes. As they become oil-soaked and ready for retirement, I began thinking about a replacement. It still had to be a compact, racy ship — preferably one which would fit the Midwest/RCM Air Races Class A requirements. But I also wanted the new ship to look a little more like a real airplane than the previous balsa boxes. The Shoestring, Bonzo, and most of the other famous Goodyear racers had been much used recently, so I held out for something a little different. I found it in the Profile Publication #51, "The Gee Bee Racers." The Model D Sportster detailed there is a snappy machine and provides the basis for a beautiful little single channel ship.

The prototype quickly jelled as a 1½" to the foot, 37½" span model, ideally suited for the newer light weight GG systems like the RAND GG PAK, or miniature pulse equipment like the Airtrol RE-1 Digipulse. While the airplane probably could be flown on pulse rudder only, I would recommend rudder & elevator control systems, especially with the hotter engines. The airplane will fly nicely on a Cox Golden Bee or a Medallion .049; it is a scorcher (and a lot more fun?) with a Tee Dee .049 or .051.

First a few words about the real Model D Sportster. The Model D was designed in 1930 by Granville Brothers Aircraft Inc. of Boston, Mass. and intended as a relatively low cost and docile sporting machine. As fliers of that period were prone to do, however, they often made minor modifications to their Sportsters and used them for racing. These machines can be recognized by their "Restricted" class registration

number prefix NR instead of the usual NC designation. The standard Model D had a 25 foot span and sported a 110 hp American Cirrus engine which gave it a 145 MPH top speed and 125 MPH cruising speed.

In the interest of improving single channel performance, a few minor deviations from scale were made in the model. These included a slight increase in dihedral and enlarged horizontal tail area. Aside from this, the prototype was pretty close to scale and modeled after a specific sportster shown in the Profile Publication. The color scheme chosen was cream and brown, trimmed in the traditional Gee Bee manner.

If you're ready, we'll fill you in on some of the building wrinkles which should simplify the construction phase. Although the model is pretty straight forward construction-wise it does employ a little more built-up structure than normally found in this size model. We also used nylon bolts to hold on the wings instead of those greasy ugly-bands. The results are more than worth the slight additional effort. If you insist, you can easily substitute the usual dowel and rubber band system. One further suggestion — the performance of these little ships is affected seriously by their wing loading. For this reason, use the lightest wood you can lay your hands on for all components except as indicated on the plan. Try to keep the all up weight below 20 ounces. The prototype weighed in at about 17 ounces, and with a TEE DEE .051 its performance was just less than spectacular.

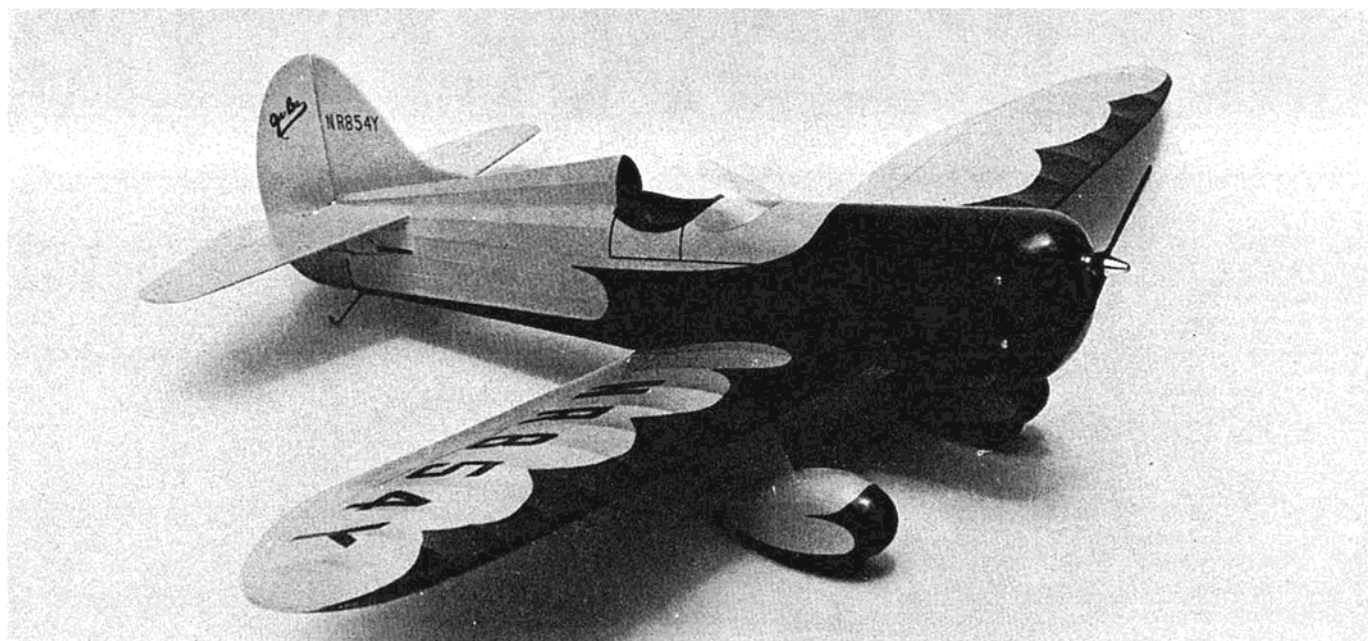
Before starting construction, decide on what equipment and engine you will be using, and lay out the installation accordingly. Next, cut out all the parts.

WING

Build the wing first, since it will be used in building the fuselage. Assemble both spars over the plan, including the plywood dihedral braces, and when dry drill the ⅜" holes in the front spar for the landing gear mounting clips. Next build one half of the wing by pinning down the spars in position (the other ends will be sticking up off the work bench), the bottom trailing edge strip, and block up the leading edge ⅛" in place. Glue in the ribs, the tip pieces and finally the top trailing edge strip. When this is well dried, simply rotate the wing center section down onto the plan and complete it. Repeat this process to complete the remaining panel. Finally, sheet the wing center section, making sure the 1¼" holes in the hardwood mounting blocks are carried thru the top sheeting. Bend the two landing gear legs from ⅜" piano wire and bolt onto the wing spars with the metal clips and 2-56 bolts. Finish sanding the wing and set aside to cure while the fuselage is being built.

FUSELAGE

Build the left fuselage half over the plan, excluding the forward ¼" sheeting and the ¼" x ⅛" hardwood stringers. Before the ¼" sheet wing cradle pieces are added, trim them to exactly fit the top of the wing center section. When dry remove the left side from the plan and complete the right side. Now it's time to fit the wing — a little extra care in this operation will assure a well aligned and sturdy airplane. Temporarily fit the wing to the fuselage, trimming as necessary to get a perfect fit. Now epoxy the ⅜" plywood wing mounting plates in the fuselage. When dry mark the mounting plate where the nylon bolt will pass through. Remove the wing and



drill each plate with a $\frac{7}{32}$ " hole. Now, assemble the wing to the fuselage with the two nylon bolts and 8-32 nuts bearing on the wing mounting plates. When you are sure everything is lined up perfectly, lay a bead of epoxy around the base of each nut. You can now add the fuel tank, the prototype used a #12 Perfect metal rectangular tank, cut down in width to fit the fuselage. This gives 7 or 8 minutes run to the TEE DEE .051. A #6 $\frac{3}{4}$ ounce tank will easily fit without modification and will give 3 or 4 minutes run. Now you can glue on the plywood firewall (don't forget the blind nuts for the Tatone mount), sheet the forward section and add the $\frac{1}{16}$ " x $\frac{1}{8}$ " spruce stringers. Finally install your servo.

We built the cowl by the well known HobbyPoxy Easy Does It method, and found it to be a snap. First carve a slightly

undersize balsa form and use two layers of Easy Does It or light weight fiberglass. Temporarily mount the engine to determine the exact position of the cooling inlet, needle valve, and cooling exhaust holes. GEE BEE

TAIL SURFACES

Cut the tail surfaces from straight, medium to light weight sheet and sand smooth. No need to try for an airfoil shape, just round the corners. Don't hinge the surfaces together yet, this will be done after covering and assembly.

COVERING AND ASSEMBLY

Give the whole airplane two or three coats of thin dope and sand smooth. The tail surfaces can now be covered with jap tissue and the fuselage and wings with either heavy silkspan or Silron. About the only problem you should watch out

for is in covering the rear fuselage immediately behind the headrest. Since there is a slight concave surface formed by the second stringer, the covering will tend to pull away from and bridge this stringer as the covering shrinks. This will be especially true if you cover the fuselage with Silron. To prevent this, give these stringers 2 or 3 extra coats of dope prior to covering, and use a mixture of half dope-half glue to secure the covering, (which should be applied wet here) to these stringers.

Apply two coats of thin dope to everything and when dry, sand. Next epoxy the fin and horizontal stabilizer to the fuselage, making sure they are lined up perfectly. Finally add the rudder and elevator surfaces with your favorite invisible-type hinges and you are ready for the final paint job. Whatever finish you select, try to keep it as light as possible. The finish I have used with good success is as follows: Two coats of sanding sealer brushed on everything, including the cowl; when dry sand almost completely off. Next spray on two very thin coats of base color, in this case cream or white. Let this dry well before masking off the trim areas. Again spray two very light coats of dark trim color—just enough to cover. Now add any detail stuff like names, registration numbers, etc., with India ink, dope, tissue or decals. When these are dry, spray on a final coat of clear dope to seal the finish and add a little gloss.

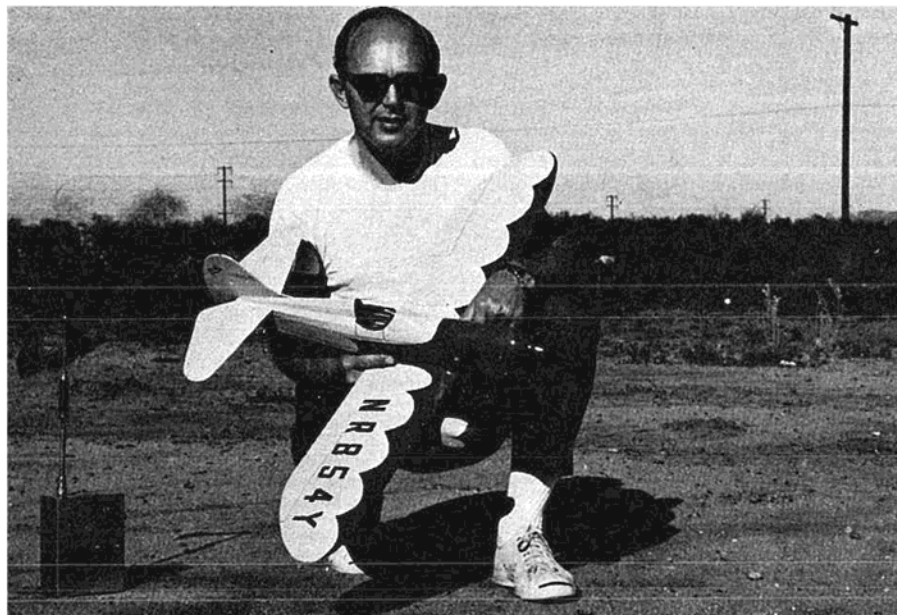
Install the equipment and add the windshield, combing, headrest and other details that may suit your fancy. To help you in these finishing touches I would recommend the Profile Publication mentioned previously as a reference.

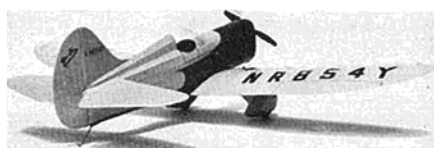
FLYING

Prior to any test flying check for proper alignment of all surfaces. Also make sure the C. G. is within the limits shown on the plans. A little more toward the nose wouldn't hurt, but don't try to fly with the C. G. further aft than shown. On the original, the first flights were attempted (due to an error on the part of yours truly)

(Continued on Page 17)

The author with Gee Bee Model D and Min-X Galloping Ghost equipment. Rand Pak used.





GEE-BEE

(Continued from Page 15)

with the C. G. almost $\frac{3}{4}$ " further back than shown. It was a wild, vicious, power stalling monster! Luckily, I got it back in one piece, though slightly bent. A one ounce lead weight bolted to the firewall turned it into a well behaved, though very fast, little racer. For the very first flights, you may want to leave off the cowl until you get used to starting and adjusting the inverted engine. Unless you fly off of a fairly smooth concrete strip, the optional scale wheel pants should also be left off since they will tend to "trip" on grass or rough surfaces.

Since the airplane is very responsive in pitch, limit the elevator throw to $+\frac{3}{8}$ " or less by whatever means is most convenient. Even though the rudder is very large, rapid and precise turning control will require that you have at least $+\frac{3}{4}$ " on this surface. In the initial flights, have the engine running full out. With a good head of speed the Sportster will respond briskly. On the other hand, trying to lug the little racer around nose high with too little power can lead to a complete loss of directional control and the almost inevitable power stalls and spins. By the same token, when the engine quits, keep a fairly fast approach glide and don't flair out until almost touch-down. Even though the Sportster has a fairly low wing loading, its thin wing and general clean lines make it want to fly and glide fast. Once you get used to this characteristic, you will find it easy to handle either burning up a pylon course on the deck, or stunting at safer altitudes. Good luck, and happy racing!

LIST OF MATERIALS

Lightweight balsa unless otherwise noted.

WING

Two $\frac{1}{16}$ " x 3" x 36"
One $\frac{1}{4}$ " x 3" x 8"
Two $\frac{1}{8}$ " x $\frac{1}{2}$ " x 36" Hard Balsa (Spars)
One $\frac{1}{4}$ " x $\frac{1}{4}$ " x 36"
One $\frac{1}{16}$ " x 3" x 8" Plywood

TAIL

One $\frac{1}{8}$ " x 3" x 36"

FUSELAGE

Four $\frac{1}{8}$ " x $\frac{1}{4}$ " x 36"
Two $\frac{1}{8}$ " x $\frac{1}{8}$ " x 36"
Five $\frac{1}{16}$ " x $\frac{1}{8}$ " x 36" Spruce
One $\frac{1}{8}$ " x 3" x 36"
One $\frac{1}{16}$ " x 4" x 36"
One $\frac{1}{4}$ " x 1" x 10"
One $\frac{1}{8}$ " x 2 $\frac{1}{2}$ " x 4" Plywood
One $\frac{3}{32}$ " x 2 $\frac{1}{2}$ " x 4 $\frac{1}{2}$ " Plywood
One $\frac{1}{4}$ " x $\frac{1}{4}$ " x 4" Spruce or Maple
One $\frac{3}{8}$ " x $\frac{3}{8}$ " x 1" Spruce or Maple

MISC.

$\frac{3}{32}$ " Dia. Piano Wire
Two 8-32 Nylon Bolts
Six 2-56 x $\frac{1}{2}$ " Machine Screws
Nylon Hinges



Das Liddle Stik

(Continued from Page 13)

length of the wing. Although many of the prototypes did not include this feature, it does add considerable strength to the wing with very little weight addition.

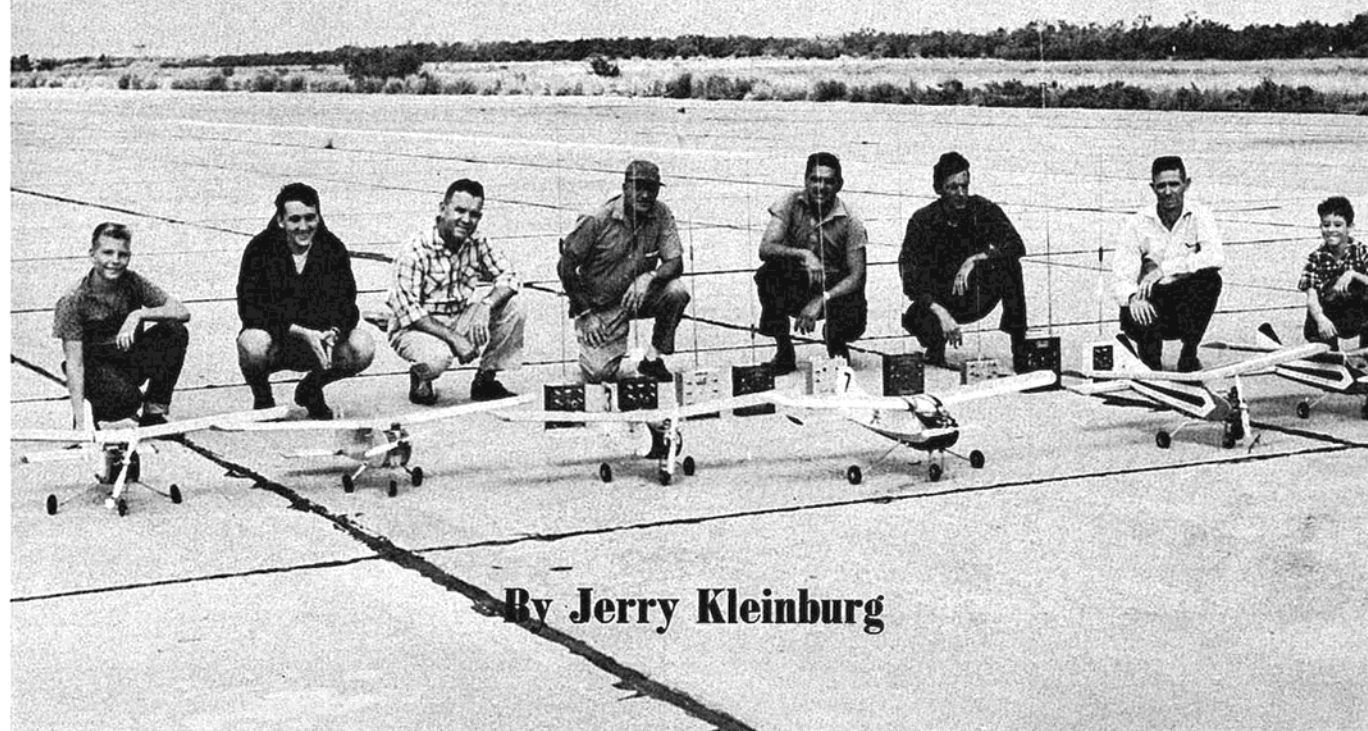
When the wing is completely dry, remove from the building board and glue in the bottom secondary spar. Glue bellcrank mounts into position. Design your servo rails or servo platform, to fit the type of radio system you are going to use. When the wing is sanded to completion, cover the bottom of the wing first then add the bellcrank pivot screws and nuts. To prevent the heads of the screws from rotating inside the covered wing, cover the screw heads with glue before covering the top side of the wing.

From the mechanical standpoint, the trike geared prototype shown in the photographs used Top Flite landing gear brackets, and a cut down Jensen nose wheel tiller. The nose gear, itself, is a Jensen nose gear which allows you to make the right angle bend for the axle at any location you so desire. Any type of engine mounting plate may be used, and a Tatone steerable nose gear mount can be used to simplify the installation. Again, the prototype in the photographs used a set of Midwest T-Mounts. A Sullivan 4 ounce RST fuel tank was used, which is more than adequate for flight duration. Extra long Royal Products control horns with backing plates were used on the ailerons to cut down the amount of aileron throw. Be sure to install these horns on the ailerons backwards, which permit a proper amount of differential action. Standard control horns with backing plates are used on the rudder and elevator. This aircraft is perfectly capable of flying without ailerons, if sufficient dihedral is used. On the other hand, the rudder can be glued permanently in place and only the ailerons and elevator used, if you so desire.

It is not necessary to cover the fuselage at all unless you so desire. Again, referring to the prototype shown in the photographs, the fuselage was covered with red Super Mono-Kote. The wing, and empennage were covered with an experimental roll of the yellow transparent Super MonoKote. This provided a beautiful aircraft, with a superb finish which was both durable and lasting.

We do not hesitate to recommend this aircraft to you regardless of your flying proficiency. As a closing thought consider this: the original Ugly Stik was a miniature aircraft as it was not a model of anything in the air at that time. Would that then make the Liddle Stik a scale model of the Ugly Stik? If so, just think of what flying scale has come to.

THE SEPARATOR SYSTEM



By Jerry Kleinburg

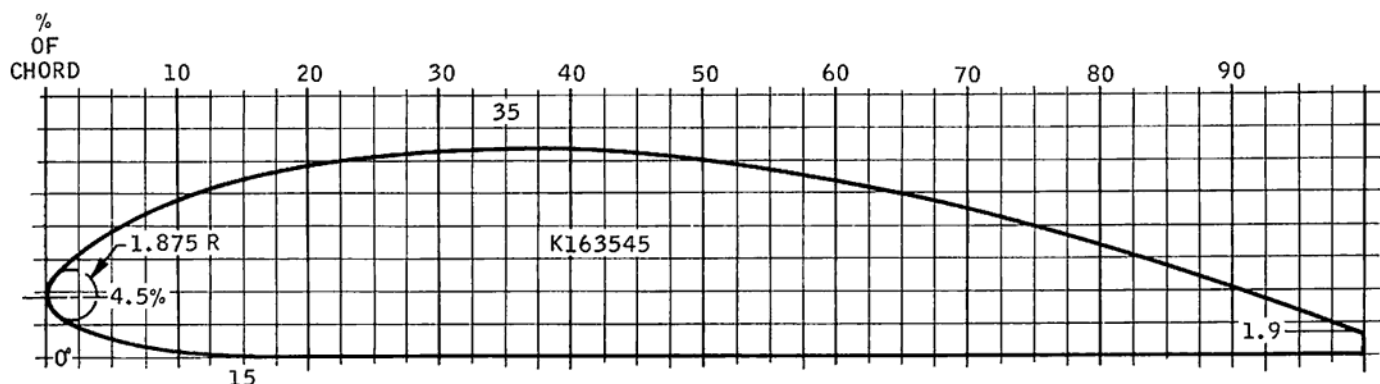
A rudder-only line-up graces a Texas runway in 1965. Separators on the left dominated contest scenes.

A LEAN, hard running Indian—with poised tomahawk—symbolizes the singular purpose of the SEPARATOR, the popular long lived rudder-only model. The grim Indian is often seen on the sides of these durable planes and this “strictly business” figure seems to sum up the intent of Ben Harr and Charley Barron, the two San Antonio, Texas, RCers, who established the basic configuration of the SEPARATOR over ten years ago. Since then the model has continually proven functional in all its sizes and its success is reflected in the hundreds of copies built, the logging of thousands of flying hours, and scores of

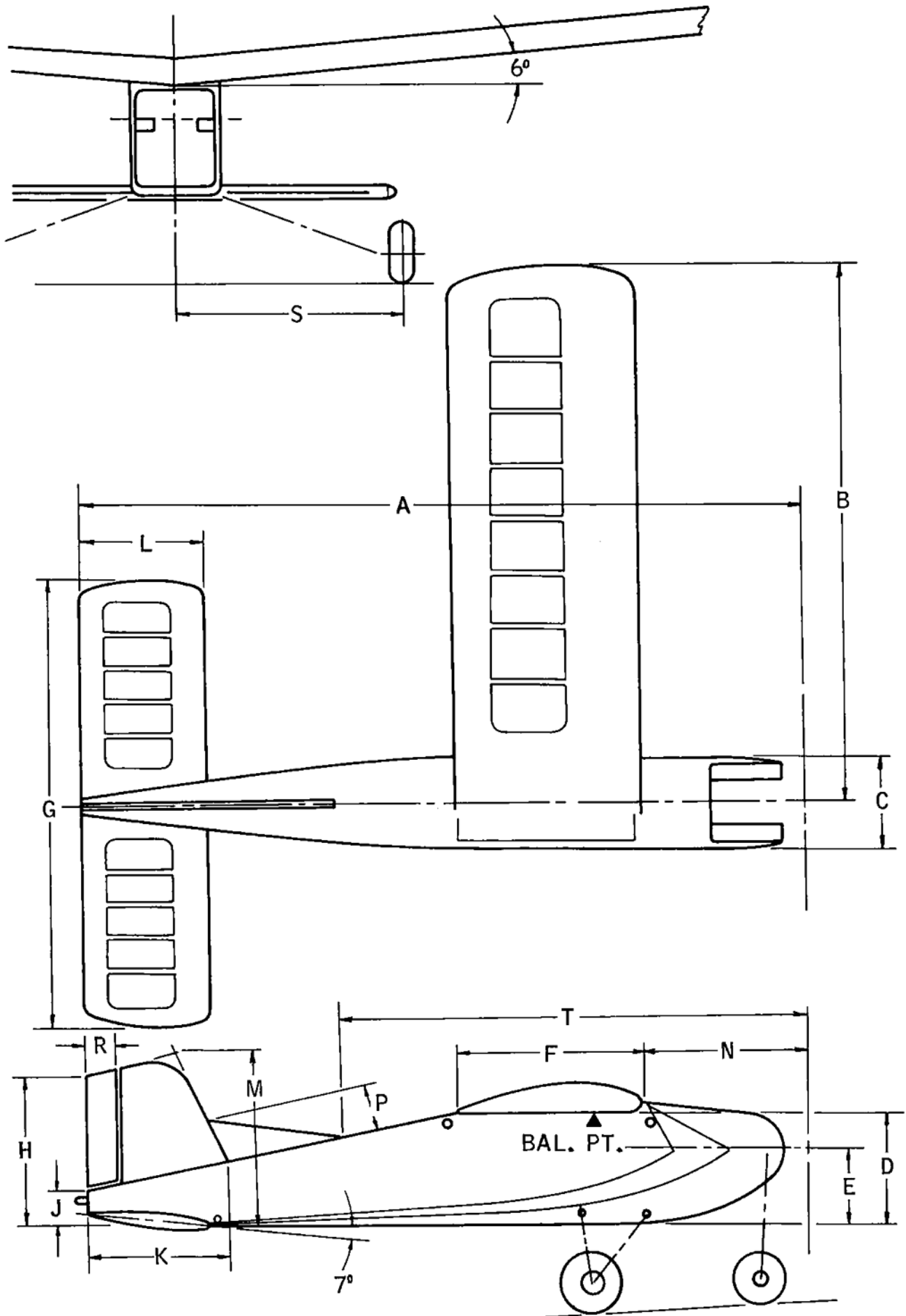
trophies SEPARATOR pilots have collected. Considering it's a non-kit ship that has never been published (except for Jim Houston's special 24" micro version seen in American Modeler several years ago) the SEPARATOR's record is especially notable. Included here in tabulated form are several sizes currently being flown. The 6 foot Super and the 9 foot Giant aren't shown since they've been placed among the treasury of memories where tube receivers with 4 oz. relays along with ground-based transmitters keep such aerial Cadillacs company. . . .

The SEPARATOR, as evolved, is not

another airframe design, but is one that embodies a force arrangement and trim system intended to satisfy the particular flight requirements of rudder-only planes. Specifically, the competition sizes—the 48 and 60 inch varieties—have quick pitch reaction while retaining penetration qualities in winds to a stiff 35 mph. However, they loop readily in calm wind or in hot muggy air when the pressure-altitude reads 6000 feet and more. Control and aerobatic ability is achieved through use of an original 16% wing section (designed about 5 years ago) and a trim arrangement that includes:



SEPARATOR TYPICAL WING SECTION: SEPARATOR - 16%



SEPARATOR SPECS.

WING SPAN	28"	38"	42"	48"	60"
A	18	24	27	32-1/4	38-1/2
B	14	19	21	24	30
C	3	3	3-1/2	4	4
D	3-1/2	4	4-1/2	5	5-1/2
E	2	2-1/2	3	3-1/2	3-3/4
F	5	7	7-1/2	8-1/4	10
G	12	15	18	20	24
H	4	5	6-1/4	6-3/4	7-3/4
J	1	1-1/8	1-1/4	1-1/2	2-1/8
K	3-3/4	5	5-1/2	6	7-1/4
L	3-1/4	4-1/2	5	5-1/2	6-1/2
M	4-1/4	5-3/4	6-1/8	7-3/4	9-1/4
N	4	5	5-3/4	7-1/4	9
P	1	1-1/8	1-1/4	2	2-1/2
R	3/4	7/8	1	1-1/4	1-1/2
S	6	7	9	10	12
T	12	16	18	21	25-1/2
ENGINE SIZE	.020-.049	.15	.19	.35	.45-.61

ALL DIMENSIONS IN INCHES



I wish you wouldn't keep referring to my Separator as being "Jerry-built!"

1. A 25% CG location.
2. As much as 9° decalage — with -7° on the horiz. stab and 2° on the wing.
3. Up to 5° engine upthrust.

These values result in a "medium" trimmed Class I aircraft when compared with Milt Boone's "light" trimmed CHARGER and Jackie Gardner's "heavy" trimmed PENETRATOR. An important consideration is an adequate wing loading to satisfy maneuvering factors and to give the flight a sufficient measure of grace. For this reason **not less than a 25 oz. wing loading per sq. foot is sought.** (Somehow, Chuck Cunningham's formula — The Secret, R/CM Mar. 1966 — doesn't compute here. Like the bumble bee, the SEPARATOR just flies on. . . .) Significantly, engine power must be high to handle the weight and provide enough excess power to produce a controlled positive pitch force vector induced by the upward angling of the engine.

This then, is the SEPARATOR SYSTEM — a short tail moment, moderate nose moment, a large decalage angle (see Zaic's Circular Airflow Theory), a "flying" fuselage (that's a reason for the fuselage's extra width and height and its square cross-section), high power loading and upthrust, and a thick, late breaking wing section to carry a high wing loading. Surprisingly, the contest sizes easily make good trainers and sport planes since stability is high — just take it easy with the power and use minimum rudder throw. With its large capacity and versatility, any radio system may be used; they've all been used successfully in the SEPARATOR.



"Butch" Houston literally grew up flying Separators. This one still using ancient Tone-E receiver and transmitter.

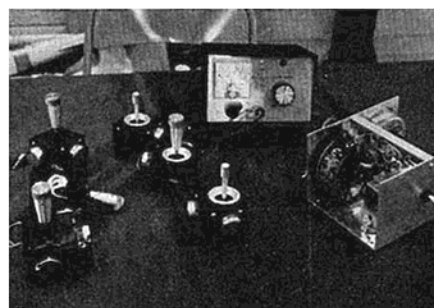




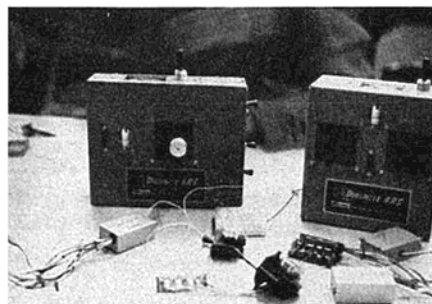
Ace R/C adds the Marks Versapulse and Delta Specialties radio to their line.



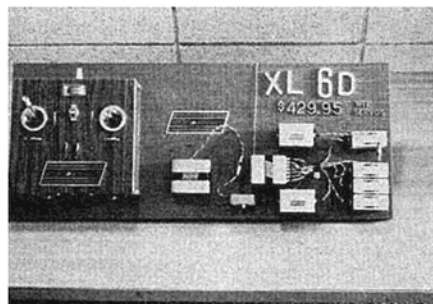
Rand line of GG actuators and mounts. Watch for bomb drop mechanism —



R/C Development's stick assemblies and full wave charger.



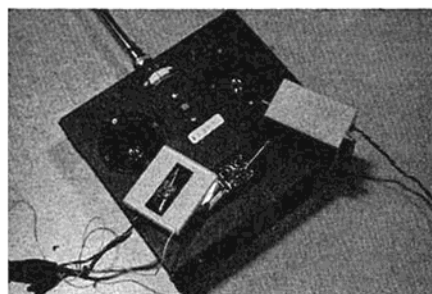
Bonner Specialties latest 4RS and 6RS (single stick).



Micro-Avionics XL6D with unique servo mounting.



Logictrol's little Rx and display servo for new III Mini system.



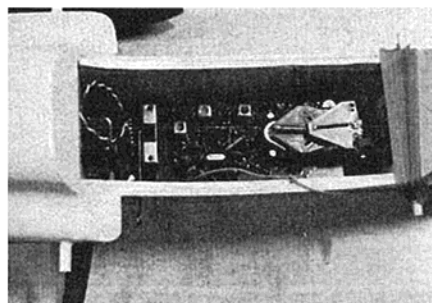
New PCS with capacitor servos. Excellent sticks.



Airtrol — the little ones! New miniature systems.



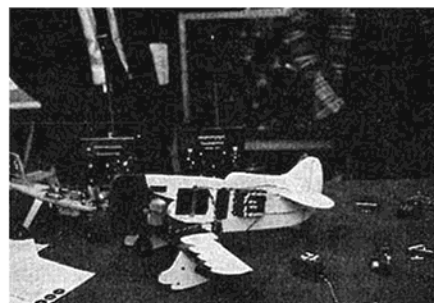
Bonitron booth displayed new pulse propo systems.



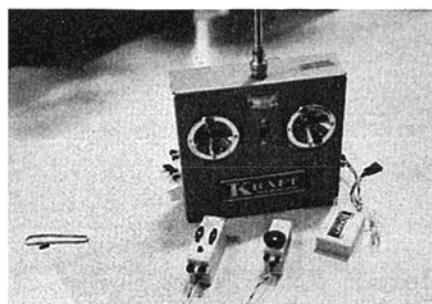
Hallco's 103 single unit GG installation.



Heathkit provided an exciting, working display.



Citizen-Ship's new propo systems with major servo design changes.



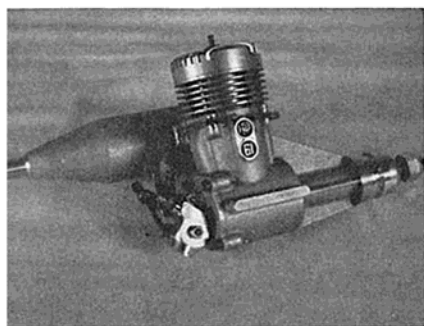
Kraft KP4 with (L to R) KPS9, KPS 10 servos and receiver.



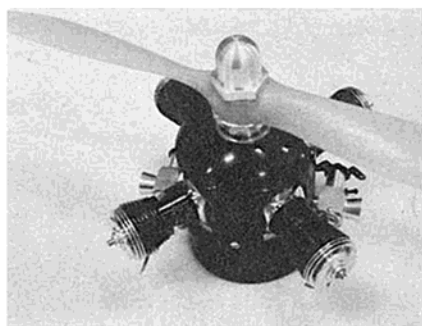
Min-X has also gone mini — Astromite.



The Orbit proportional system — both the new and the old.



The fabulous Austrian HP-61 from Performance Aero Products.



Ametek XA904 four-cylinder .61. Also a two-cylinder .30.



Wankel engine prototype from Johannes Graupner.



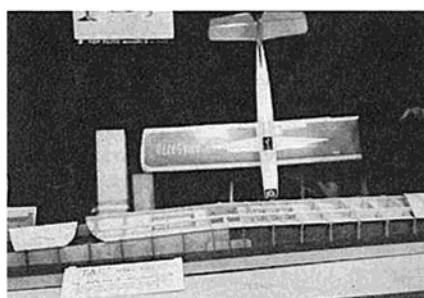
A close look at the Bantam twin.



Paul Martin looks happy about the new VK Nieuport kit.



Sterling Models' latest kit — a Fokker D VII.



Top Flite's T.A.C. jig now a wing jig for Kwik-Fli III kit.



DuBro's entry into the ARF field — Aero Commander 100.



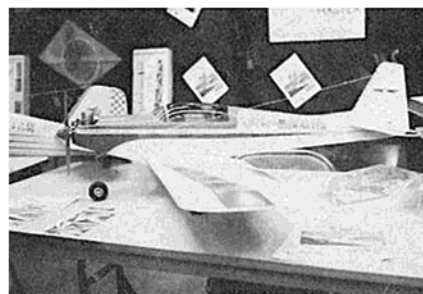
Hal deBolt and his latest Cobra II.



Another ARF — Penford Plastic's Piper Skycycle.



Vic's Custom Models Phantom — fibre-glass and foam.



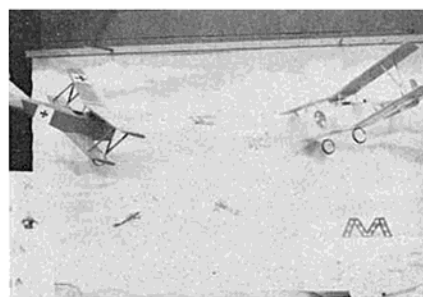
Lou Andrews' latest — Trainer Master — due this summer.



Lanier's new Mustang looks good! Always a crowd.



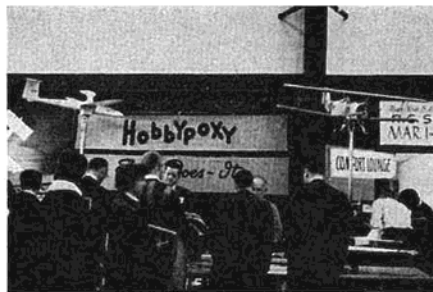
Lazott's ARF biplane — the Tango. ABS sheet, beautifully finished.



Midwest's 'easy biplane' kits. Published in RCM.



Aristo-Craft's display of kits, radio equipment and accessories for the RC'er.



You only had to ask how the HobbyPoxy display models got their beautiful finish!



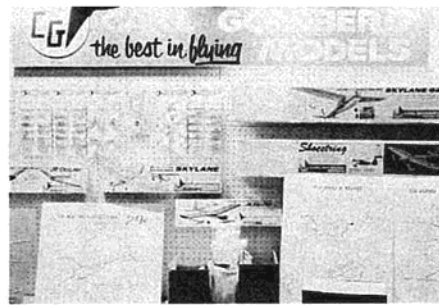
A blurred Jerry Kleinburg capturing interest at the A-Justo-Jig display.



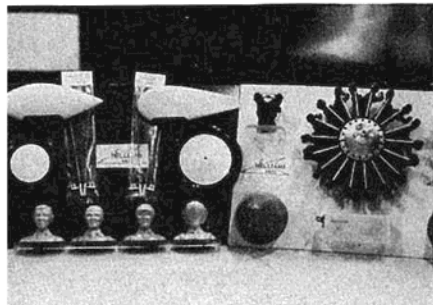
This was as close as we could get to the Royal kits of the RCM Classic!



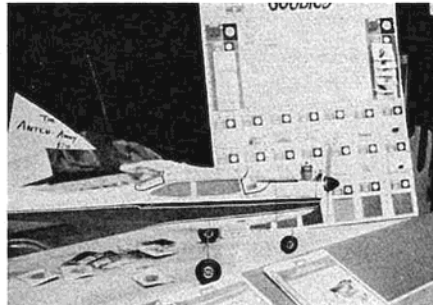
Fred Angel, left, heading up Angel Mini-Flite display.



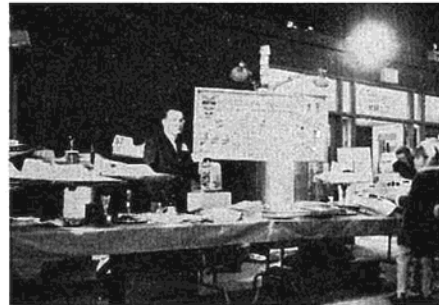
Carl Goldberg's display of kits and new accessories.



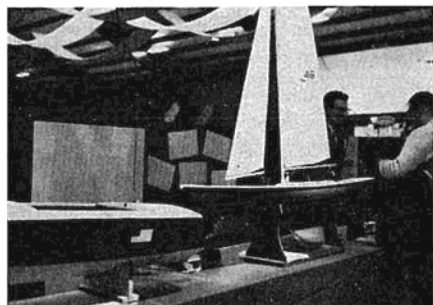
Williams Bros. — note new radial engine, civilian pilot, & larger spinners.



More-Crafts "Goodies" included many new, exciting, and needed accessories.



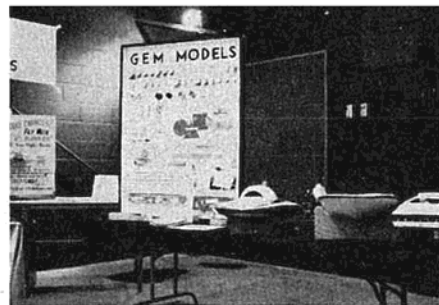
Octura's boating display attracted the avid R/C boat enthusiasts.



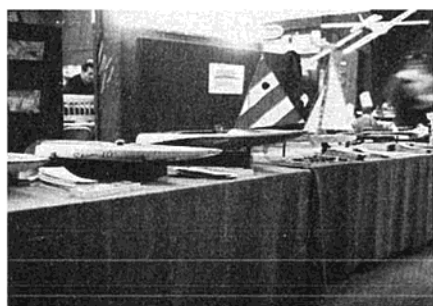
The One-Design Boat display included both power and sail craft.



Professional displays included such items as movies, slides, etc.



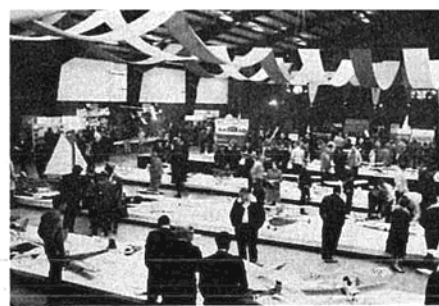
G.E.M. Models display included popular kits and boating accessories.



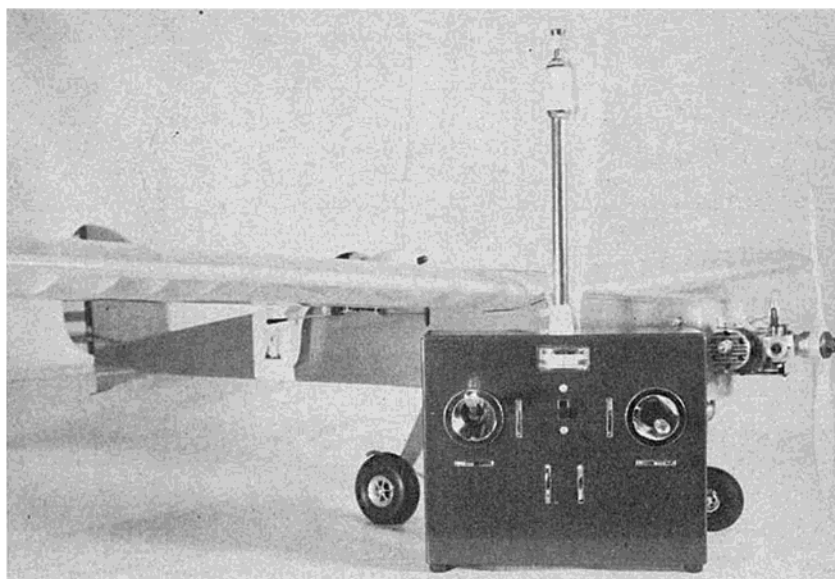
The Dumas booth with their line of fine R/C boat kits.



A portion of the display area with many outstanding models.



9:30 A.M. Sunday — and the hall is already beginning to fill up!



THE RCM CLASSIC

By Ed Thompson

RCM Technical Editor

PART II: TRANSMITTER PC BOARD

PREFACE

BY now most of you have "sized up" the Classic and decided whether you want to build it or not. If you have decided to build it you can start immediately. If you are undecided I would suggest that you obtain every issue as the system progresses. Past experience indicates that back copies of the articles will be scarce and hard to obtain. I tried to get the parts list in the last issue but didn't quite make it because I had to do further research on some of the part numbers. I am sure I'll get a few "gripy" letters about it before this issue is out — so to my "gripy" friends I offer the following: My apologies for your inconvenience. That is not exactly what I'd like to say but I've adopted a new policy of "be

nice," at least temporarily! While I am being nice let me add a few items that may save some of you a postage stamp.

1. It is not possible to print all of the P.C. boards used in the system in one issue so money can be saved by making only one negative.
2. I am not going to count the teeth on all of the servo gears so I can tell you the gear reduction of every servo used with the system.
3. I won't be able to make up a package of advance information because one of you can't wait until the articles are finished.
4. I don't have the time to list a substitute part for all the parts used.

Those are a few items based on previous mail. I'll think of more for future issues.

Here's a few items for you "good guys":

1. I'll answer as many inquiries as possible. Previously I was receiving more than 200 letters a month, during peak mail periods, and I couldn't possibly answer them all. I will normally try to answer the most "humble" letters first. Don't start your letter off by listing your college degrees or how much of an expert you are in electronics — those type letters are always answered last or not at all. The reason for this is simple — the author of that type letter doesn't need help nearly as much as the beginner who will be answered first every time. Self-addressed post cards get preferential treatment also.
2. I will look forward to your letters on how your system is progressing and print all the photos you send in, that I possibly can. I welcome any constructive criticism/comments about the articles. I would appreciate it if you don't ask for a reply to those type letters. If you have a question, please send it in a separate letter.
3. The articles will be presented as quickly as possible.

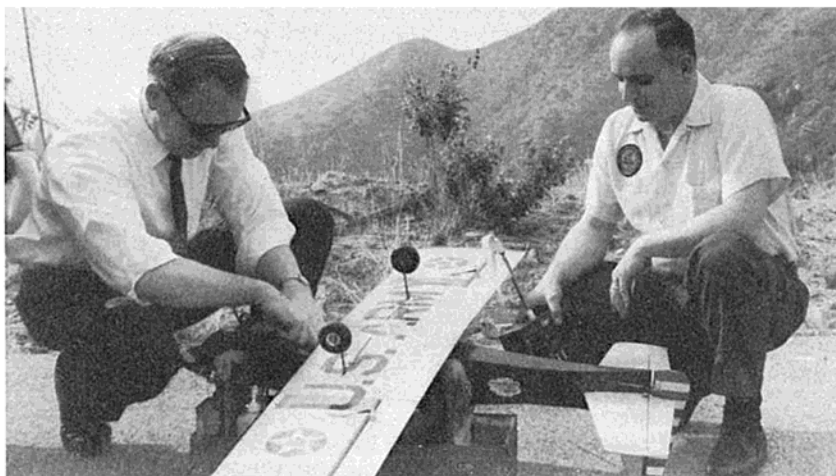
There is not much new to report on the system since last month. There are a few more prototypes flying and you may have seen one or heard some reports by now. I received a pair of Kraft sticks and a set of the Orbit mini-servo mechanics recently and work is under way to incorporate these items into the system.

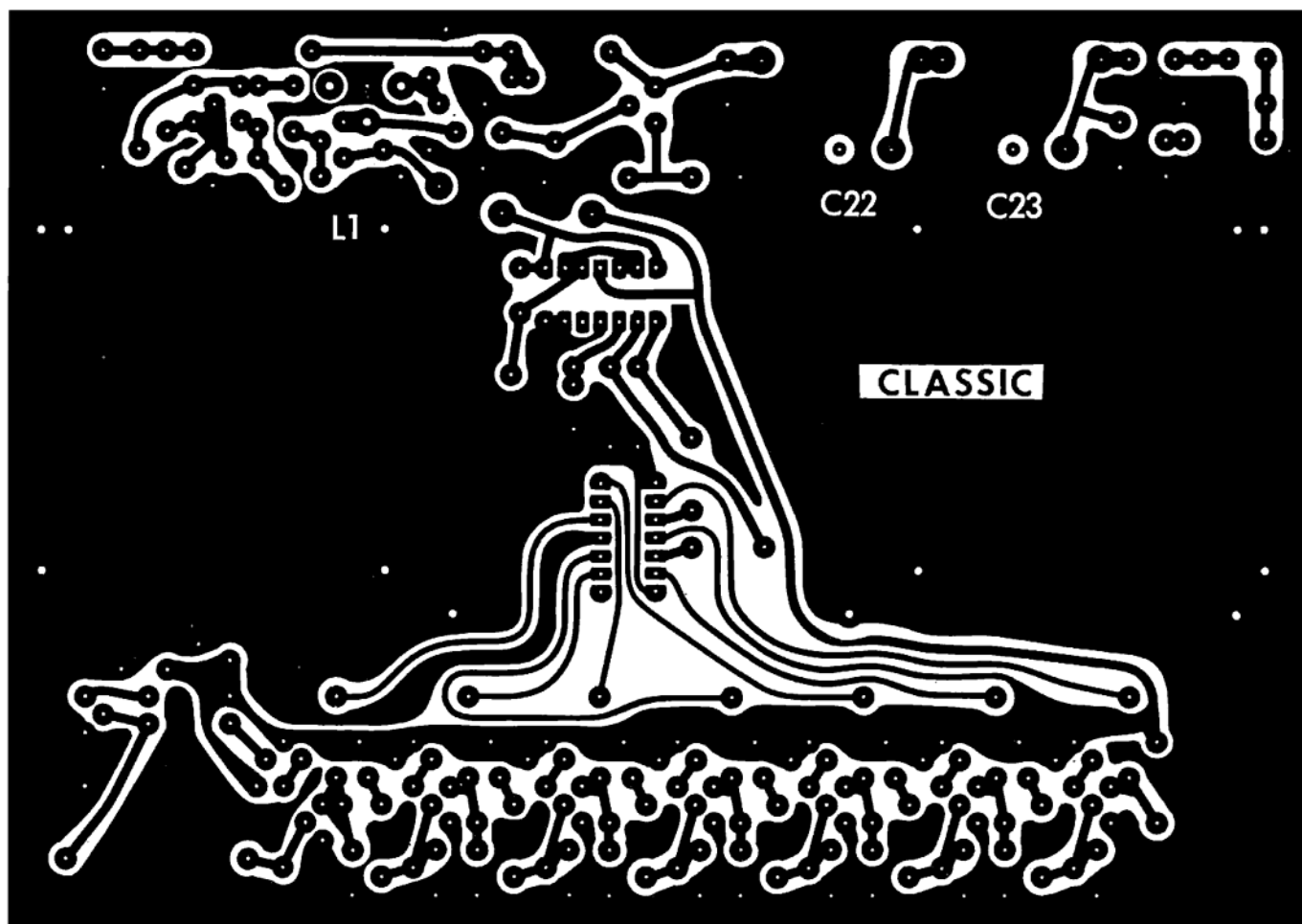
I made an in-flight range test on the system using a poorly trimmed 56" high winger and couldn't get the model back due to high winds. After losing sight of the model I "cranked in" full right rudder and up elevator and turned the transmitter off. I had full control of the model until I lost sight of it. The model spiraled in approximately 2½ miles away. Aside from the obvious flying lesson I learned, the experience will give you an idea of what kind of range to expect from the Classic. The receiver used for the range test had a full control sensitivity of 2.5-3.0 micro volts. I have since increased the sensitivity to 1.5-2.0 uv and this version will be presented.

The servo amplifier for the Bonner servo is now complete and requires only minor P.C. board changes and re-evaluation. The prototype amplifier operated the servo opposite of the "DRF" marked on the servo case and I hope this can be corrected without extensive changes.

NOTES

The best advice I can give to builders of the Classic is to follow the instructions carefully and don't substitute any parts. Be painstakingly neat and use common sense. Most of you who build the system will be of above-average intelligence (most modelers are) so I won't give you the "idiot treatment". Among other things I won't tell you when to solder or not to solder a connection unless it's for a specific reason. If you get into trouble seek the assistance of your "Local Einstein". If he can't help you write down your problem (be specific) and send me a self-addressed post card. Use a small tipped soldering iron of approximately 25W and good quality resin core solder — I recommend "Ersin-Multicore". Treat every solder joint with respect. Be confident that you are building a properly-designed system using quality parts — a system that took over a year to develop and was designed for you — not a





Transmitter PC board shown full size for reproduction by Classic scratch builders.

borrowed system. If you have any doubts about your ability to reproduce the system I would advise you not to build the Classic.

Preliminary to Step by Step Instructions:

Note: Some or all of these steps will not be necessary if you purchase the items ready to use and can be skipped.

- () Prepare and give the PC board a quality control check for clean etching and drill all component mounting holes with a #65 drill. Drill the hole under L1 with a #27 drill. Drill holes under C22 and C23 with a #17 drill. Some of the component mounting holes will have to be enlarged slightly as you build—this can be done using a pin vise and a drill of appropriate size during construction.
- () Determine which stick assembly you will use and drill the PC board mounting holes as shown on the 6 channel construction overlay. The mounting holes are marked M and B—for Micro or Bonner. Drill four #24 holes for the Micro or two #33 for the Bonner. For the 3 channel version a motor control pot bracket is mounted to the upper left Bonner hole and the hole labeled MC directly under it on the left side of the PC board. If applicable, drill the holes with a #33 drill. During Xmtr assembly, left handers can reverse bend the motor control pot lever slot on the right side of the case and mount the bracket on the right side of the PC board.

Step by Step PC Board Assembly

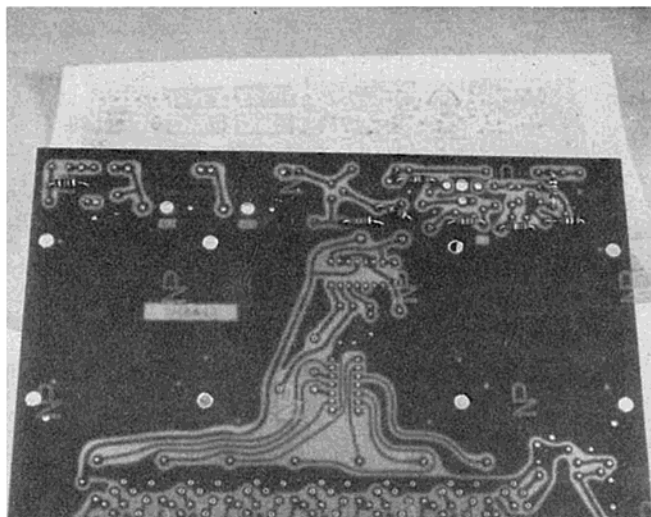
Refer to the 6 channel construction overlay for building the Rf portion of the transmitter. The Rf portion includes everything along the top of the board down to, but not including, the I.C. MC717P.

- () Mount one 10K resistor (Br, Glk, Or).
- () Mount one 22K resistor (red, red, or).
- () Mount one 150 ohm resistor (br. grn, br).
- () Mount one 2.2K resistor (rd, rd, rd).
- () Mount one 100 ohm resistor (br, blk, br).
- () Mount one 47 ohm resistor (yel, vio, blk).
- () Mount one 4.7 ohm resistor (yel, vio, gold. (Below Q10))
- () Mount one 4.7K resistor (yel, vio, red). (Upper left hand corner)
- () Mount three 12 uhy RFC's.
- () Mount one 1N34 germanium diode with color bands toward center of PC board as shown on overlay.
- () Mount four .1 ufd disc capacitors.
- () Mount two .01 ufd disc capacitors.
- () Mount one 16 Pf disc capacitor.
- () Mount one 10 Pf disc capacitor.
- () Mount the 27 disc capacitor adjacent to the 10 Pf previously mounted.
- () Mount the 27 Pf disc capacitor at the upper left-hand side of the PC board.
- () Mount two 100 Pf disc capacitors.
- () Mount one 50 Pf disc capacitor.
- () Mount the crystal allowing $\frac{3}{32}$ " clearance between its bottom and the PC

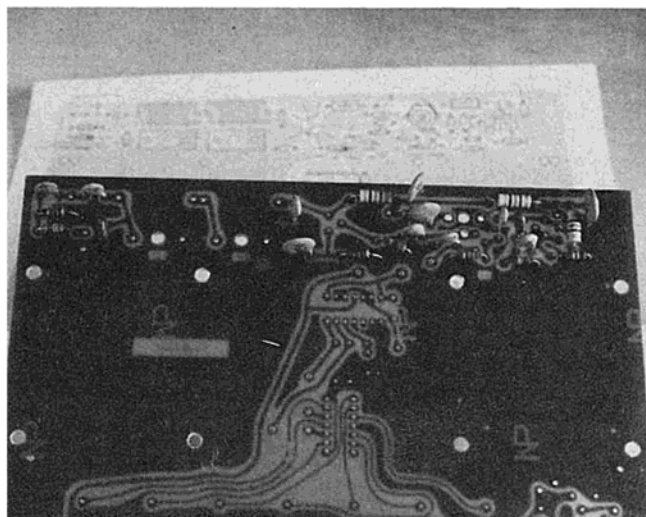
board.

- () Mount two plastic transistors (Q8 & Q9 M400 or 2N4124). Insure that the flat side is as shown on the construction overlay.
- () Mount one metal transistor-Q10 SL151 (M-7819) or 2N3553. Insure that the leads are in the correct holes by referring them to the tab on the case.
- () Install the heat sink over Q10.
- () Wind the slug-tuned coil form with 12½ turns of #24 enameled wire tapped at 3¼ turns as follows: (refer to the overlay and photo).
 - a. Clip one of the four mounting lugs from the bottom of the coil form and position it in front of you as shown on the construction overlay. Identify the remaining three mounting lugs with their assigned numbers.
 - b. Scrape $\frac{3}{16}$ " enamel from one end of the #24 enameled wire, tin with solder, and connect it to lug 1 with a single wrap. **DO NOT SOLDER YET.**
 - c. Wind the wire in a counter-clockwise direction for three turns. Keep the turns close spaced starting at the bottom end of the coil form.
 - d. Continue winding ¼ turn to lug 2. Scrape the enamel from $\frac{3}{16}$ " of the wire, tin and pass under lug 2 and solder in place.
 - e. Continue winding 9¼ turns for a total of 12½ turns ending at lug 3. Clip the wire allowing $\frac{3}{16}$ ". Scrape $\frac{3}{16}$ " tin and connect with a single wrap.

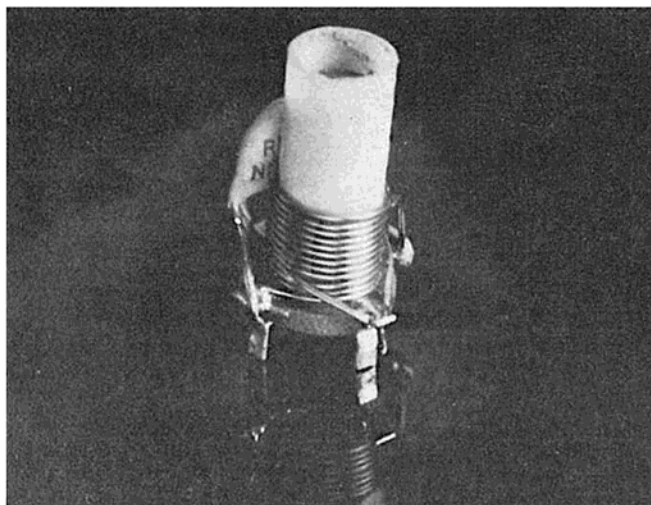
STEP BY STEP PHOTOS: CONSTRUCTING THE RF SECTION



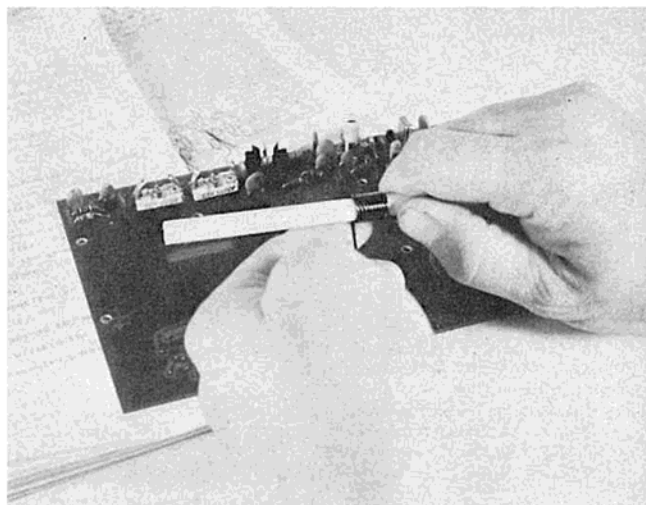
Resistors installed in RF section.



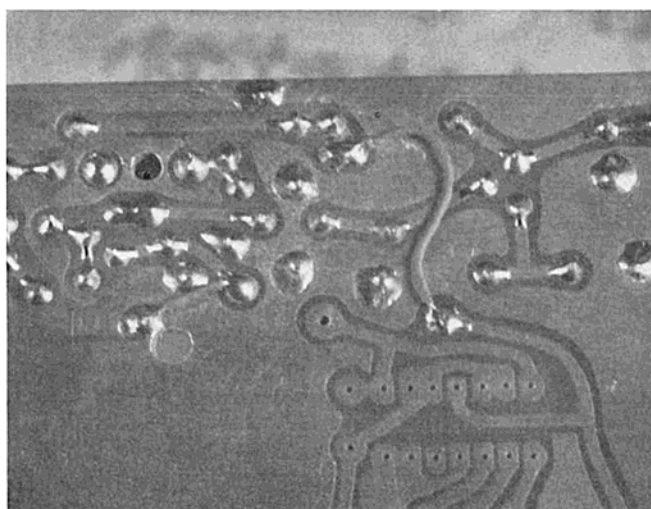
Resistors, capacitors, RFC's and diode installed in RF section.



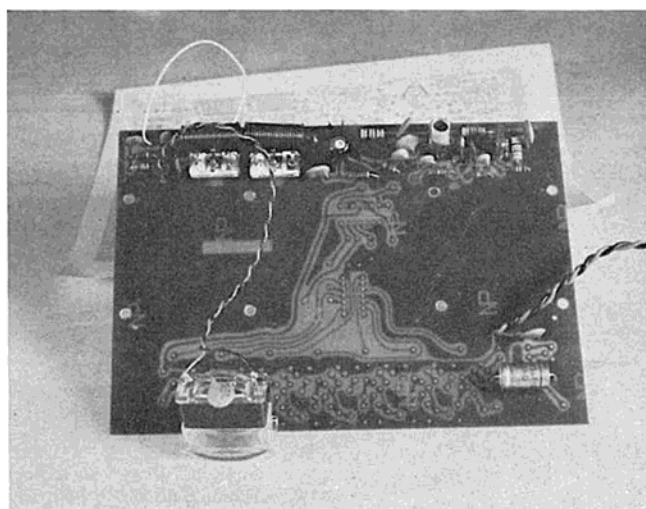
L1 with 27 PF.



Winding L2 and L3. Note installation of variable trimmer capacitors.



Jumpers used for RF section testing.



PC board ready for RF section testing after #47 lamp added.

PARTS LIST "CLASSIC" TRANSMITTER

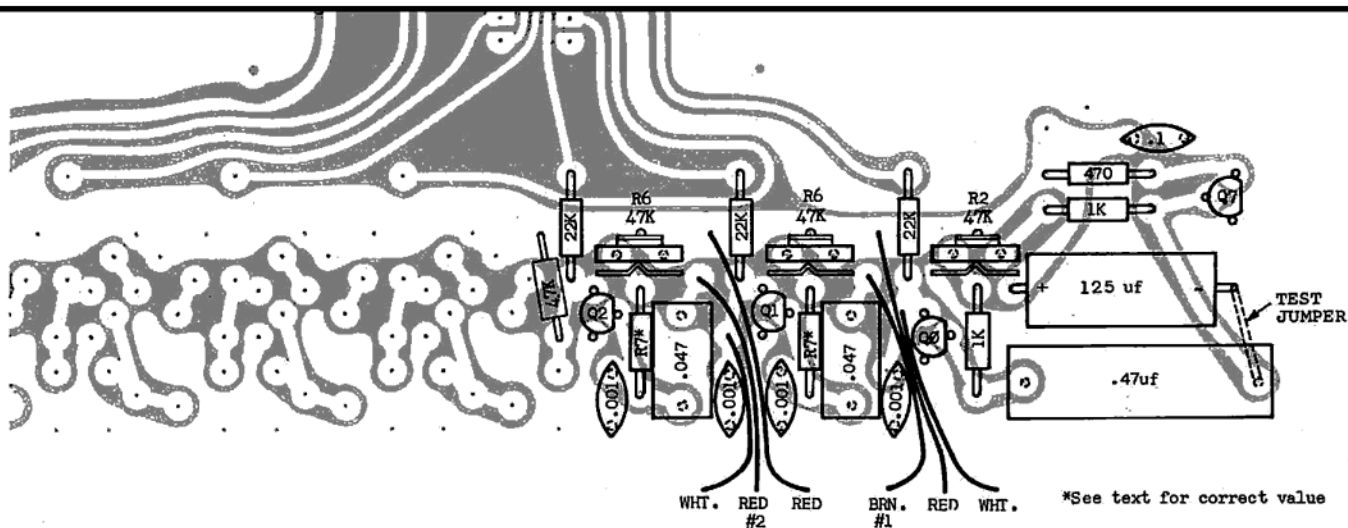
ITEM	DESCRIPTION	PART #	MFG. OR SOURCE
C1	.47uf Mylar Cap 5%	75F6R5-474	G.E.
C2, C3	.001uf Disc. Cap	801-000-X5F0-102K	Erie
C4, C5, C6	.047uf Mylar Cap 5%	75F1R5-473	G.E.
C7, C8	.005uf Disc. Cap	C023B101E502M	Sprague
C9, C14, C16	.1uf Disc. Ceramic	C052B100G104Z	Sprague
C19, C20, C27			
C10	125uf 16V Electrolytic	C436AR/E125	Amperex
C11	16pf Disc.	CM16NPO	RMC
C12	10pf Disc.	40C7-10PD	Sprague
C13, C15, C26	27pf Disc.	851-000-C0G0-270J	Erie
C17, C25	.01uf Disc.	C069B160E103M	Sprague
C18, C21	100pf Disc.	C028B102E101M	Sprague
C22, C23	7-100pf Trimmer Cap	#423	Elmenco
C24	50pf Disc. Ceramic	801-000-U2J0-500J	Erie
R1	470 ohm, 1/4 W, 10% Res.		IRC
R2, R6	47K Trimmer Res.	E086BC47K	Amperex
R3, R4	1K 1/4 W, 10% Res.		IRC
*R5	5K Linear Taper Potentiometer	SEE BELOW	
R7	100K 1/4 W, 10% Res. (Micro Stick)		IRC
	150K 1/4 W, 10% Res. (Bonner Stick)		
	130K 1/4 W, 10% Res. (Aux)		
R8, R13	22K 1/4 W, 10% Res.		IRC
R9, R20	4.7K 1/4 W, 10% Res.		IRC
R10, R11, R12, R16	2.2K 1/4 W, 10% Res.		IRC
R14	10K 1/4 W, 10% Res.		IRC
R15	150 ohm, 1/4 W, 10% Res.		IRC
R17	100 ohm, 1/4 W, 10% Res.		IRC
R18	47 ohm, 1/4 W, 10% Res.		IRC
R19	4.7 ohm, 1/4 W, 10% Res.		IRC
IC1	Dual 4-Input Gate	MC71P	Motorola
IC2	Quad 2-Input Gate	MC717P	Motorola
Q, Q1, Q2	Transistor NPN	2N4124 or M400	Motorola
Q3, Q4, Q5			Royal
Q6, Q8, Q9			
Q7	Unijunction	2N4871	Motorola
Q10	RF Power Trans. NPN	2N3553 or SL151(M-7819)	Motorola
		3640-47-2	Royal
RFC1, RFC2, RFC3	12uhy RF Choke		CTC
L1	12 1/2 T #24 TAP 3 1/4 T on 1/4" Form 2173-3-3		CTC
L2, L3	20T #18 Enameled Wire 5/16" ID		Royal
Crystal	27MHZ Crystal 3rd O.T. Fundamental		Royal
D1	Germanium Diode	1N34	Amperex
M1	0-1 MA Meter		Royal
Miscellaneous Parts (All available from Royal Electronics)			
4.7K, 1/4 W Test Resistor			
Heat Sink			
Bonner Stick Assembly with PC Support Posts			
Micro Stick Assembly			
DPDT Slide Switch			
#57 Test Lamp			
Auxiliary Pot Mounting Bracket			
Antenna C/L			
Auxiliary Pot Levers (Micro Silver W/Set Screw for Micro Stick version.) (Orbit White Press Fit for Bonner Stick version.)			
Charging Jack Female Chassis Mount			
Charging Plug Male Cable Type			
Rechargeable Battery Pack			
8.75V Nominal (7 Cell 600 MA)			
PC Board 1/16" Epoxy			
Throttle Pot Mount/PC Support (2 & 3 Channel)			
Case Feet			
Transmitter Case			
Hook-up Wire #20			
Black 16"			
Red 16"			
Hook-up Wire #26			
Red 8"			
White 8"			
Black 8"			
Brown 8"			
Orange 8"			
Yellow 8"			
Green 8"			
Blue 8"			
Boldfaced electronic part numbers usage and/or amount depends upon number of channels desired — see schematic and text.			
*The control pots (R5) should be of the following types:			
Bonner Stick and Aux. — CTS AW-5000, 10% with a 1 1/2" shaft length (measured from bus hing). Shaft length may vary with different distributors and will have to be cut to proper length.			
Micro Stick — Clarostat 53C35000, 10%. This pot has the proper shaft length			
Royal will offer the CTS AW-5000 with proper shaft length.			
Complete designer approved kit or individual parts available from Royal Electronics.			

(Do not solder).

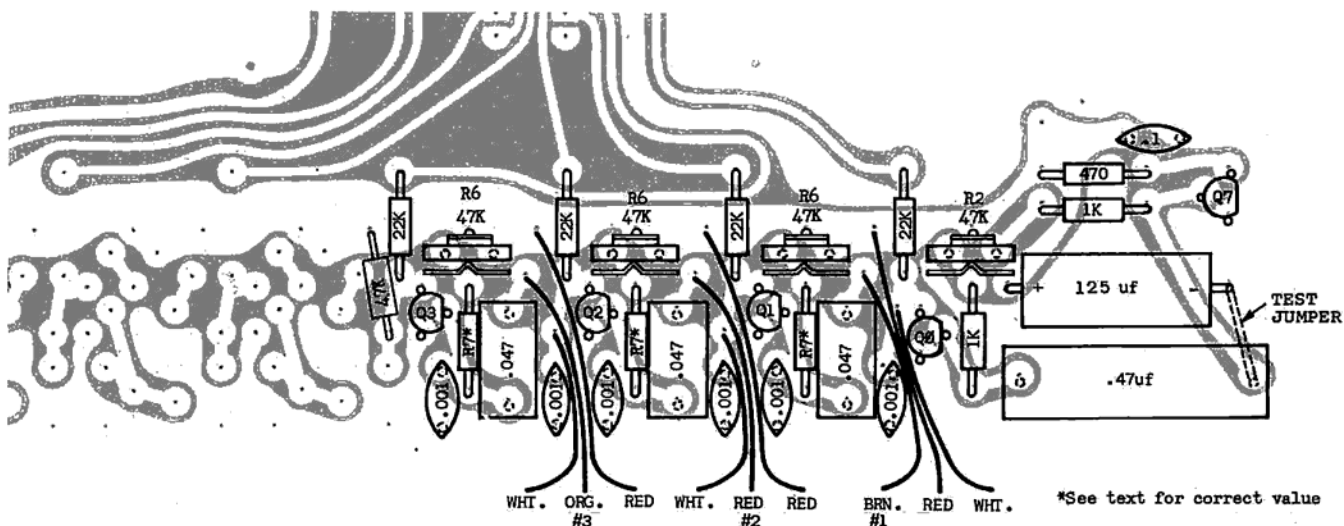
- Connect a 27 Pf disc capacitor to lugs 1 and 3 as shown on the construction overlay and solder both the capacitor leads and coil wire in place.
- Coat the coil winding lightly with clear dope, insert the three lugs into the PC board and solder in place, with the bottom of the coil form flush with the PC board.
- Clip four 1" pieces of lead wire from two of the .047 ufd mylar capacitors.
- Bend the mounting lugs of the variable trimmer capacitors inward to approximately a 45° angle. Pass each of the 1" leads through the eyelets at each end of the two capacitors, extending the wire through the hole in the mounting lugs. Allow 1/2" wire to extend from front of the capacitor and solder the wire to the mounting lugs. Do not solder the wire to the eyelets.
- Insert the two capacitors face down into their mounting holes and solder in place allowing sufficient clearance for tuning later. The outer capacitor plate lug (the one directly under the tuning screwhead) should be connected to the ground land.
- Wind L2 and L3 — 20 turns #18 enameled wire — on a 5/16" form (dowel etc.). Close wind approximately 21 turns, unwind excess from each end and straighten for mounting leads. Scrape the ends, tin, mount and solder in place allowing 1/32" clearance from PC board.
- Install 8" black and red battery wires and twist them together. These wires are #20 and larger than the normal #26 hookup wire. They are marked "to switch" on overlay, this heavy wire is used only for power wiring.
- Install the 8" white antenna wire.
- Install the 8" black and red meter wires and twist them together.
- Install a 1 1/4" red jumper from the positive battery land to the 100 ohm resistor as shown on the construction overlay.
- Install a temporary jumper from the emitter of Q9 to ground. The emitter of Q9 is normally connected to pins 8 & 14 of the MC717P IC for modulation as shown on the overlay. For now connect the end of this jumper going to the IC to the ground land as shown by the short jumper labeled "test jumper" in the RF section.
- Install the .1 ufd disc capacitor adjacent to where the battery wires are connected to the PC board.
- Install the 125 ufd electrolytic capacitor as shown on the construction overlay. Observe polarity.
- Connect a .1 ufd disc capacitor across the meter terminals.
- Connect the red and black meter wires to the meter terminals.
- Clean the copper side of the assembled portion of the board with dope thinner and a stiff brush.

Electrical Check of RF Section

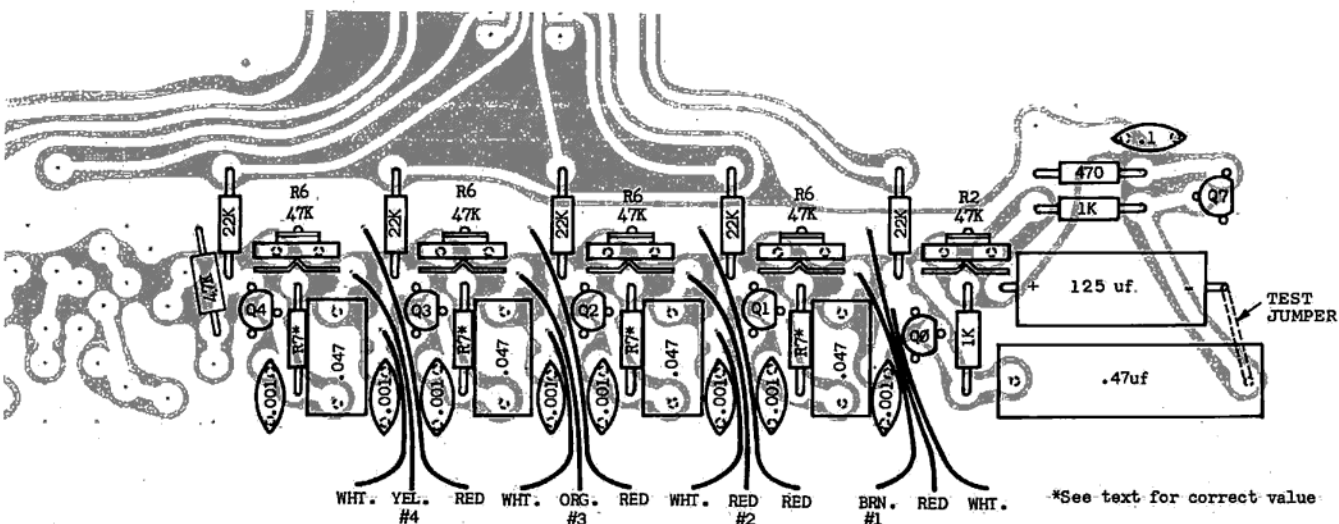
- Measure the resistance between the red and black battery leads, observing polarity. The reading should be approximately 30K.
- Solder the white antenna lead to the center terminal of the #47 lamp.
- Solder a 3/4" piece of resistor lead remnant to the #47 lamp metal shell. If the



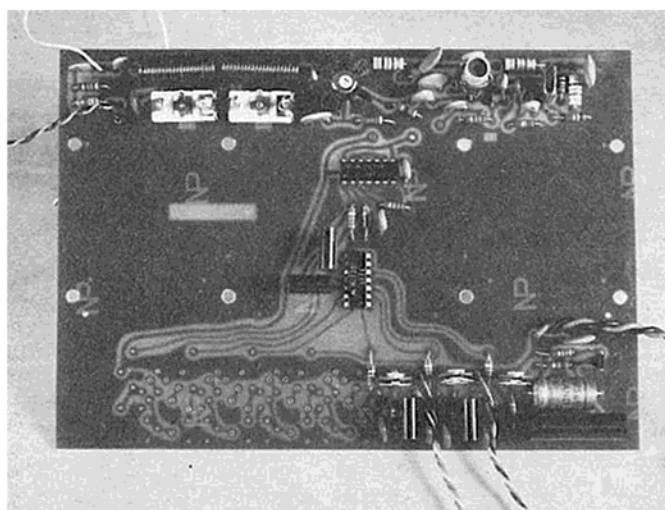
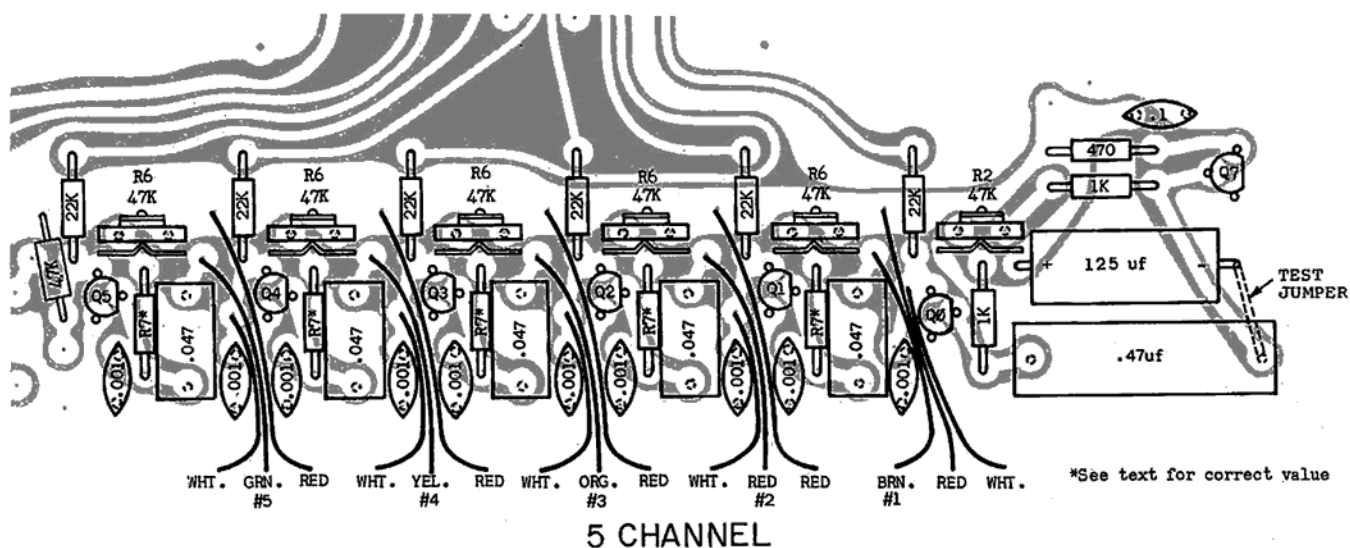
2 CHANNEL



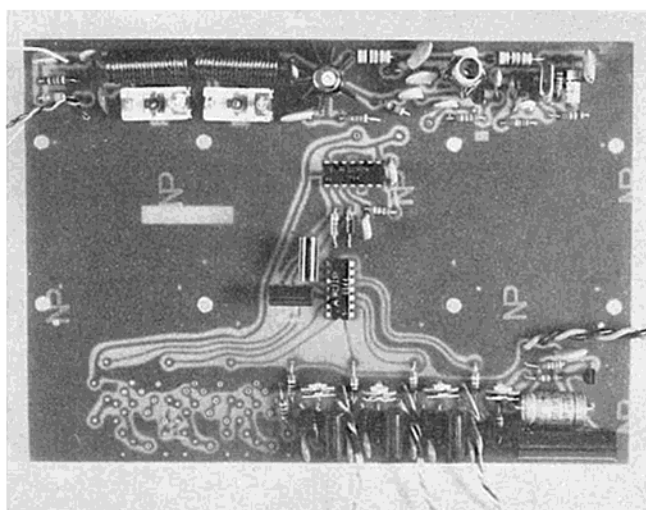
3 CHANNEL



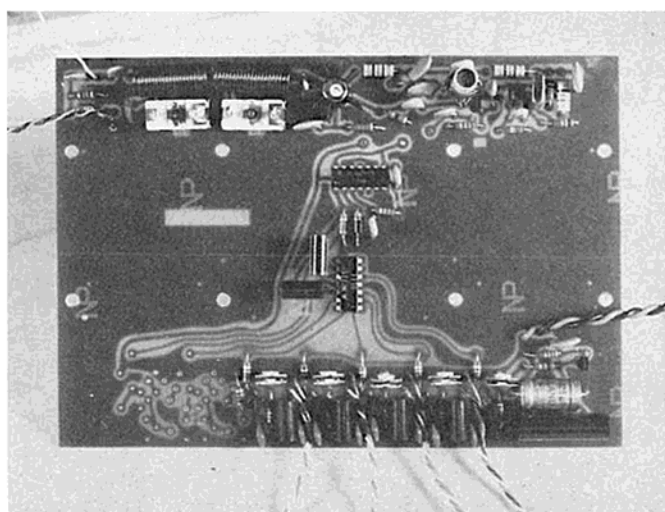
4 CHANNEL



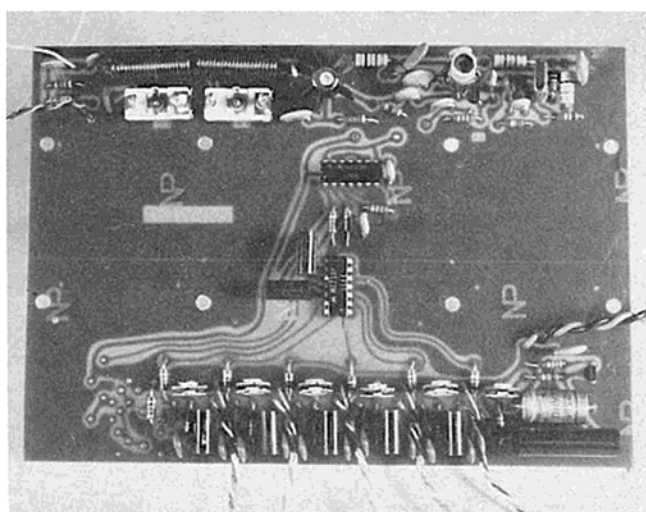
Two channel PC board.



Three channel PC board.

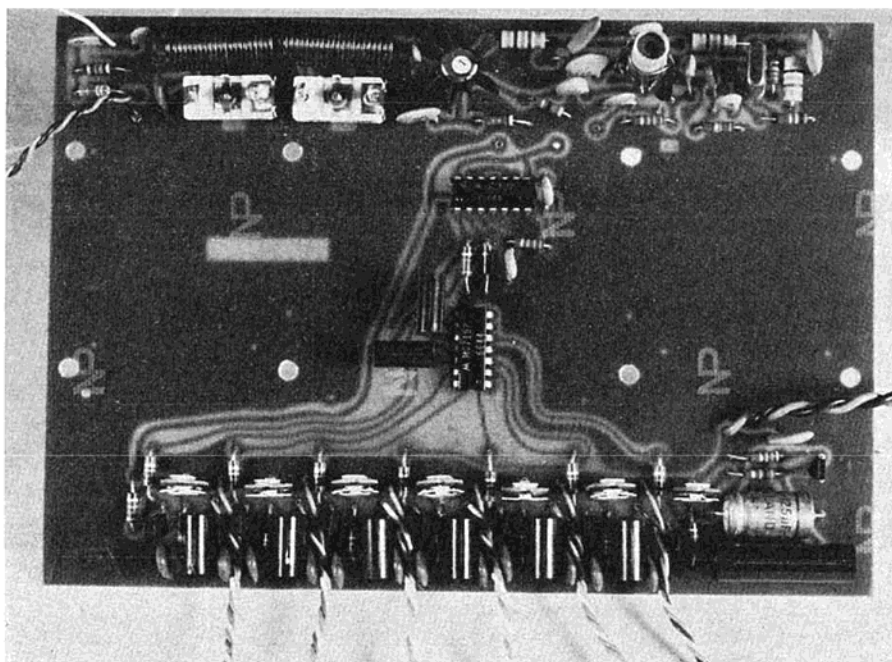


Four channel PC board.

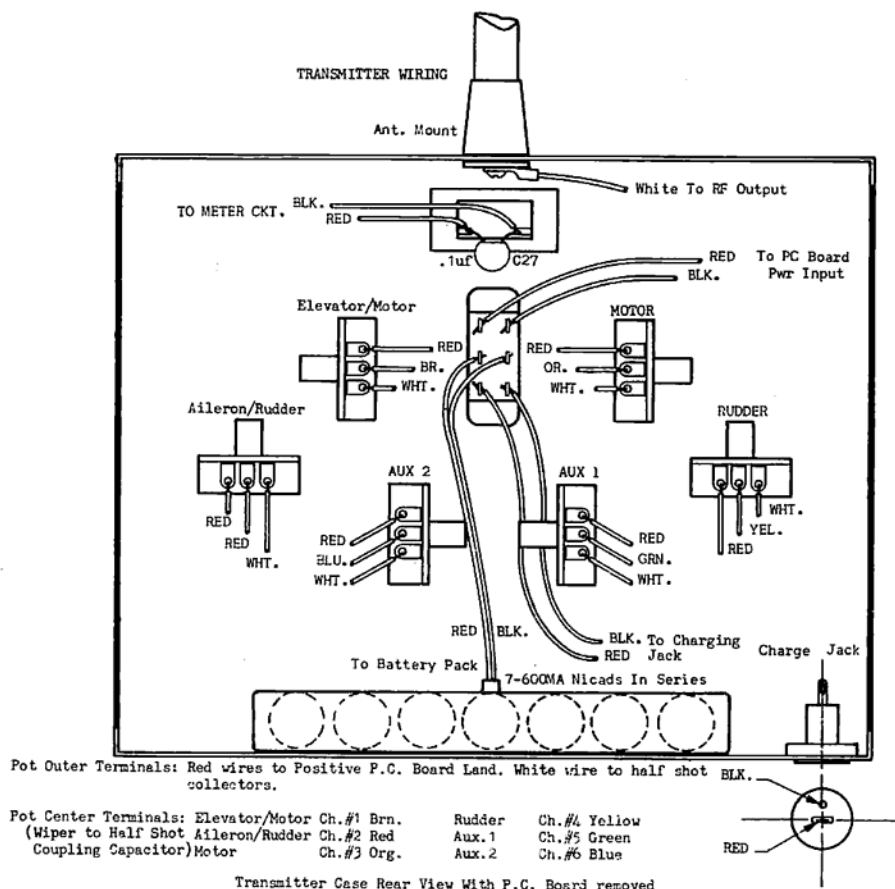


Five channel PC board.

**DON'T MISS THE JUNE ISSUE OF R/C MODELER MAGAZINE
PART III OF THE RCM CLASSIC BY ED THOMPSON**



Six channel PC board.



lamp has an aluminum shell the lead can be soldered to the existing solder bead. Solder the other end of the lead to one of the variable capacitor lugs connected to the ground land so as to support the lamp.

- () Adjust the slug in L1 so it is approximately half way in the windings.
- () Lightly tighten the adjusting screws of both variable capacitors.
- () Clean the area, of the work bench,

under and around the PC board of all foreign material.

- () Connect the black lead of a 20K ohm/volt multimeter to the ground land of the transmitter.
- () Place a 4.7K resistor in the red meter lead at the probe tip. All voltage readings will be D.C. and will be taken with a 4.7K resistor in series with the probe. The free end of the resistor will be used for circuit contact.

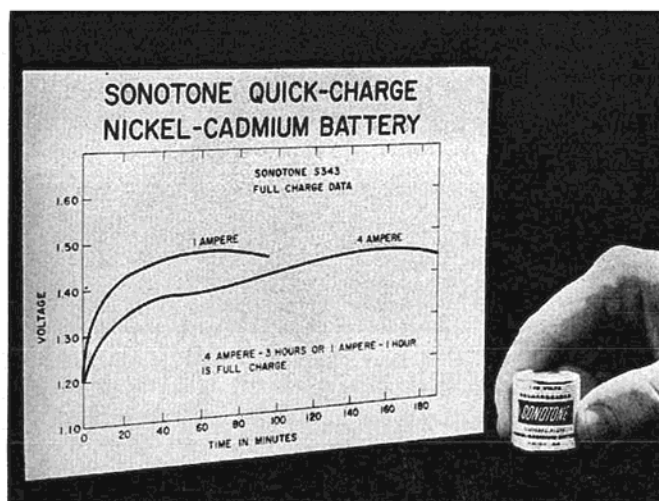
- () Apply 9 volts to the battery leads observing polarity. If you do not have a 9V source, wire the battery pack now.
- () Measure the voltage at lug 1 of coil L1. The meter should read 4-6V.
- () Tune the slug of L1 for peak voltage (approximately 6V). The lamp should be glowing slightly and the output meter should be reading approximately 1/4 scale or more. If the output meter is reading downward from zero reverse the leads at the meter terminals.
- () Adjust C22 for maximum lamp brilliance. The lamp should glow brightly and the meter should read approximately .8 full scale.
- () Measure the other voltages shown in the RF section. They should be within +- 20%. Swap the leads at the meter to measure the negative voltage reading at the base of Q10.
- () Remove the test meter leads, temporarily discard the 4.7K resistor and disconnect the red battery lead from the power supply.
- () Place the multimeter on a milliamp scale higher than 100 and connect it in series with the red battery lead and positive terminal of the power supply. The meter should read approximately 150 M.A.
- () Remove the power supply and place the multimeter aside.
- () Remove the lamp and output meter and place them aside.
- () Remove the positive 9V jumper.
- () Remove the jumper from Q9's emitter to ground.

The Rf portion of the PC board is now complete.

The following steps, detail the encoder section assembly. A separate encoder construction overlay is shown for 2, 3, 4, 5 & 6 channel versions. Select the appropriate one and follow it. The encoder section is along the bottom of the PC board up to but not including the Ic MC719P.

- () Install one 470 ohm resistor (yel, vio, brn).
- () Install two 1K resistors (br, blk, rd).
- () Install the 22K resistors, as shown on the overlay (rd, rd, or).
- () Install the resistors indicated by the asterisk, as shown on the overlay. The value of these resistors depend upon the mechanical throw of the stick used. Select the proper value as follows:
 1. Bonner stick = 150K (br, grn, yel).
 2. Micro stick = 100K (br, blk, yel).
 3. Auxilliary or motor control (with 3 channels) = 130K (br, or, yel).
- () See the transmitter wiring diagram for channel designations.
- () Mount the 4-7K (yel, vio, rd) resistor as shown on the overlay.
- () Install the 47K variable trimmer resistors as shown on the overlay.
- () Mount the .47 ufd mylar capacitor.
- () Mount the .047 ufd mylar capacitors as shown on the overlay.
- () Mount the .001 ufd disc ceramic capacitors, as shown on the overlay.
- () Mount UJT Q7 (2N4871). Flat side of Q7 should be as shown on overlay.
- () Mount remaining transistors (M400 or 2N4124) as shown on overlay. Flat side of these transistors should be as shown.

(Continued on Page 34)



SHOP & FIELD

PRODUCT NEWS

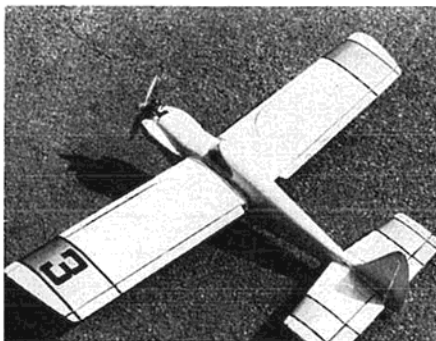
The Sonotone Corporation, Elmsford, New York 10523 recently demonstrated a sealed, rechargeable nickel-cadmium battery cell that is capable of taking a quick charge. There is no exotic charging circuit, no auxiliary electrode or diode protection device used in this new quick charge nickel-cadmium battery. Yet it can be fully charged in one hour or charged to a sufficient capacity, in a matter of minutes. Unlike many fast charged battery systems being introduced, the Sonotone quick charge battery is self sustaining. It is also capable of accepting overcharge. For example, at the one hour rate, the cell can be overcharged for days. At the slower three hour rate, the cell can be left on overcharge for a long period of time. Maintaining all the fine characteristics of the rechargeable nickel-cadmium battery, the new Sonotone quick charge unit also operates at a constant discharge voltage for unduplicated surge power and offers hundreds of recharges.

Lafayette Radio Electronics Corp., 111 Jericho Turnpike, Syosset, Long Island, New York 11791 announces its new 132 page 1968 Spring Catalog, No. 683, equipment illustrated and described. Now available free upon request. Write to Lafayette at P.O. Box 10, Dept. PR.

Rand, Inc., 8909 Hubbell Avenue, Detroit, Michigan 48228 has released several new mounting accessories. The first unit is a single actuator mounting kit, priced at 75c, which makes it easy to install Rand Actuators. Everything you need is in the kit; mounting plate, grommets, eyelets and screws. The cutout is dimensioned for the exact clearance needed for the actuator frame. Just drop in the actuator. This unit is recommended for maximum protection from vibration. It can be used with all Rand actuators. Price is 75c per unit. The Rand double actuator kit, priced at 95c is designed for use with the Dual Pak, or any two Rand actuators. When both actuators are seated, the movement of one rudder plate will not interfere with the other. Rand's servo mounting screw kit is a "convenience package" for mounting screws. It includes screws, grommets and eyelets. The rubber grommet is extra flexible for maximum vibration isolation. The stand-off

eyelet allows the screw to be tightened without crushing the grommet. 8 sets for 60c. Rand's new vinyl double coated mounting tape is $\frac{1}{2}$ " wide by $\frac{1}{16}$ " thick. This tape is designed for instant and positive mounting of any variety of items. The "one step" mounting tape means no special tools, no drying time, and no clean-up. This is a closed cell vinyl that will not discolor or soak up fuel. 36" of the mounting tape costs 75c. The last item from Rand is a package of engine mounting screws, available in number 4 by $\frac{1}{2}$ " and number 6 by $\frac{3}{4}$ ". This is an easy way to mount engines, these screws having the extra strength and shape required for the job. The pan head spreads the load and case hardening provides the extra strength. Price for either number 4 or number 6 is 12 for 35c.

Penford Plastic Corporation, 135 Water Street, Prospect, Ohio, 43342 is in production on their new almost-ready-to-fly aircraft for the sport flyer. This new aircraft, the Bruiser, priced at \$34.95, is a semi-scale Goodyear type racer with a fuselage molded from lightweight ABS sheet. The wing and stab provided with the kit are the popular Midwest foam wing and stab. Also included in the kit are a pair of molded wheel paints, dural aluminum gear, molded cowling, fire wall molded in place with proper offset built in, elevator and rudder, celluloid cabin material and all necessary mounting screws. Designed for .049 to .15 engines, this appears to be an excellent model and one that will be the subject of a review in a forthcoming issue of R/C Modeler Magazine.



Halcyon Santa Barbara, Box 64, Goleta, California 93071 is producing two sets of scale instruments. These are photographic reproductions of real aircraft instruments printed with civilian aviation white or military buff, (phosphorescent) markings, your choice. Mounted "under glass" in your pylon racing ship, the texture and depth

of these instruments is good enough to where you can bet somebody will ask if the needles really move. This is a first in a forthcoming line of super scale items for RC'ers from Halcyon. For prices and information on the line, write to the manufacturer.

Phillips Custom Models, P.O. Box 4544, Saticoy Branch, Ventura, California 93003, announces a new kit of the Snipe Glider. This new RC glider is designed for both slope soaring or power pod. The kit features all pre-cut parts and is quick and easy to build. The Snipe will take any RC system, either large or small, proportional or Galloping Ghost, and is designed for rudder and elevator operation. Wing span is 76 inches, fuselage is 36 inches long. Order direct from Phillips Custom Models. Dealer inquiries are invited.

The Angel Mini-Flite Company, Box 437, Fitchburg, Massachusetts, announces their new Do-It-Yourself Hobby Bench, designed to accommodate every phase of modeling. The Hobby Bench features a $\frac{3}{4}$ " thick, 25" wide, 54" long, solid, tempered, wood composition top which is virtually warp proof. The extra large storage cabinet is 15" wide, 24" deep, and 30 $\frac{1}{2}$ " high. It is made of solid, clear Ponderosa pine, and has been factory milled with exclusive Double-Lok corners for strength, appearance, and ease of assembly. The cabinet comes with an adjustable shelf, deep hide away drawer, plus a fully assembled $\frac{3}{4}$ " thick raised panel door of solid pine. A large balsa and paint storage shelf attaches to the reinforced legs to permit flat storage of Balsa sheets. The entire unit has been prefabricated and sanded to permit assembly in less than 20 minutes with a screwdriver and hammer. All hardware is included — nails, screws, magnetic catch, knob, concealed hinges, nylon drawer slides, etc. The Hobby Bench Model BH-1, is available at all leading hobby dealers for \$54.95 . . . about the price of a good model. Direct orders may be placed with Angel Mini-Flite Company.

Aero Publishers, Inc., Fallbrook, California 92028, has produced a new dimension in education in their recent publication, "Aircraft Markings of the World, 1912-1967." In this latest Harleyford book, aircraft markings of over 160 countries of the world are colorfully pictured and are used to reflect world-wide changes that have taken place over the past 50 years. The book is written by Bruce Robertson, the most authoritative aviation historian in Great Britain. Robertson has compiled data as to the correct size, shape and proportions of the markings, shown by many dimensioned drawings, photographs, and descrip-

(Continued on Page 34)

PRODUCT NEWS

(Continued from Page 33)

tions, including instructions for 1944 "Invasion Stripes" and "Suez Stripes." Every aspect and facet of markings is covered — air ambulance markings, mission silhouettes, pages of 1914-1918 war squadron markings, camouflage, schemes, and more. A unique feature is a war aircraft marking chronology from 1912-mid-1957, giving precise dates of marking changes. National aircraft markings, covering over 50 years, are presented in full color. A world map, index, and the chronology complete this beautifully bound and printed book, a valuable addition to any book shelf, and a perfect reference work for RC Modelers. Available at book stores and direct from Aero Publishers for \$11.75.

Sterling Models, Sterling Building, Belfield Avenue and Wister Streets, Philadelphia, Pennsylvania, 19144, recently introduced their new kit of the Fokker D-7, a super detailed 58½" span scale design for full house radio control. Following in the footsteps of Sterling's popular Spearman PT-17, Sterling has produced this kit with great precision and amazing fidelity to scale — in fact there is no deviation from scale in the outlined shape from the full-sized plane. Even the rib spacing and the wings and tail, the fuselage construction and



springer spacing, the distinctive Fokker style plywood leaving edge covering on the wings is faithfully reproduced. This kit complete with accurately die cut and/or shaped balsa and plywood parts, maple spars, formed 3/16" wire landing gear, formed 1/8" wire center strips, detailed scale plastic Mercedes engine, and Spandau machine guns, steel cowl, hardware pack including screws, nuts, washers, blind nuts, clamps, special 1/4-20 nylon screws and hardwood wing mounting nuts, giant decals, two full sized plans, nylon horns and special nylon push rods for ailerons, elevator, rudder and throttle controls, etc. Price of Sterling's new kit is \$39.95.

The W.S. Deans Company, 8512 East Gardendale, Downey, California is now in production on their new Dual Control Proportional package. The unit consists of a receiver, Servos, batteries and transmitter,



plus an auxiliary control box. In use, the student operates the auxiliary and the experienced flyer operates the transmitter. With the transfer switch lever held down, the student controls the model. Anytime the instructor feels it is necessary, he may assume control instantly by releasing the lever. With this new "Buddy box," a flyer with little or no experience, can, with the help of a flying friend, learn to fly his new model in a very relaxed manner. His learning time will be cut down because he will be able to concentrate more on flying and less on the possibilities of crashing. This dual control box system is available with any new Deans system at an extra \$30.00 for the dual stick model or \$45.00 for the single stick model.

Midwest Products Company, 400 South Indiana Street, Hobart, Indiana 46342, has produced a line of die cut pressure sensitive license numbers. These will be available in 3" size in black, white, red and yellow. 2" and 1" sizes will be available at a later date. The material is mylar coated with a special adhesive which acts the same as regular pressure sensitive material, but in addition, it cures in 24 hours for a permanent bond. These numbers are fuel proof, fade proof, and will not crack or peel. Retail price is 15c per numeral which is in line with any decal of the same size and quality. One of the biggest features of this new line of license numbers, is the fact that the numbers can be purchased individually and not as a set. This will be a blessing in disguise to those modelers who have AMA numbers like 4441! These new license numbers are now available from your Midwest dealer.

The deBolt Model Engineering Company, 3833 Harlem Road, Buffalo, New York 14215, has produced the Live Wire Cobra — a new deBolt kit that combines scale appearance plus winning performance. The Cobra is the best in RC performance plus an RC scale version of the famous Bell P-39 Airacobra. Designed around the new powerful medium sized engines, the Cobra offers exciting performance. It's compact size lowers the flying weight allowing a lighter wing loading and a higher power loading. The result is greater stability and instant maneuverability. Any of the .292.40 engines will handle the Cobra easily. Contest performance comes with the .40 to .50 engines. Choice of RC gear is broad also — any of the modern equipment will suit it fine. This really complete kit has all the parts finished ready for assembly. Modern design has reduced the required number of parts making the Cobra a joy to assemble. The finished machine parts in this kit include shaped plywood forward fuselage sides, shaped balsa aft fuselage sides, shaped "forming" balsa top fuselage skins, all bulkheads shaped and drilled, shaped wing fillets, shaped wing skins, notched and tapered web spars, shaped ailerons, shaped one piece cowl, plus the usual prefabrication in the bits and pieces of hardwood required. Wing span on the Cobra is 58" with an overall wing area of 630 square inches. Flying weight is 5¼ pounds. A complete kit, available from your dealer is \$34.95.



RCM CLASSIC

(Continued from Page 32)

Note: Refer to the six channel overlay to assemble the pulse forming and modulating portions of the PC board. This is the portion between the encoder and RF section.

- () Mount three each 2.2K resistors (rd, rd, rd).
- () Mount two .005 ufd disc ceramic capacitors.
- () Mount the IC MC 719P flush with the PC board. Insure that the alignment "dimple" is as shown on the overlay.
- () Mount the IC MC717P flush with the PC board. Insure that the alignment "dimple" is as shown on the overlay.
- () Mount two .047 mylar capacitors.
- () Strip the insulation 1/4", tin and install all red control wires, as shown on the overlay.
- () Strip the insulation 1/4", tin and install all white control wires, as shown on the overlay.
- () Strip the insulation 1/4", tin and install all remaining control wires, as shown on the overlay.
- () Route control wires as shown on overlay and twist into sets of 3.
- () Clean the copper side of the PC board of all resin and foreign material with dope thinner, using a stiff brush.

Electrical check of completed PC board.

- () Measure the resistance between the red and black battery wires. Insure that no contact exists between adjacent control wires. The resistance should measure approximately 1200 ohms.

The PC assembly is now complete.

Final tuning and alignment will be accomplished after final assembly.



An appropriate award. Norm Rhodes, popular E. Texas RCer, hugs Shreveport Best Sportsman Award. Figure is south end of north bound stallion . . .



RCM Contributing Editor Joe Bridi and P47-N—two firsts!



Dan Lutz's .35 powered Piper J95—2nd in scale points.

The First Fernando Valley Flyers

SCALE RALLYE

Attracting Southern California R/C Scale buffs, ground judging was based on fidelity to 3-view drawings (no cockpit), workmanship, and realism from 15-20 feet. Emphasis on flying!

RCM photos by Dick Sonheim.



Nate Rambo's second place Chipmunk. Excellent detail and flying characteristics.



Frank Capan's Morane Saulnier, powered by Enya .45. Logictrol propo.



A Sperry Messenger by Dave Lane. Enya .60 and two dummy cylinder heads.



Dick Hamilton's 3rd place P-51 Mustang. S.T. 60 RV.



An ever popular Pietenpol Air Camper. Dick Adams used Kraft KP4, Max .40.



Mark Graham's Morane Saulnier. Kraft proportional equipment.



Woody Woodward's Fairchild 24R and Don Butman's Travelair 2000, under construction.



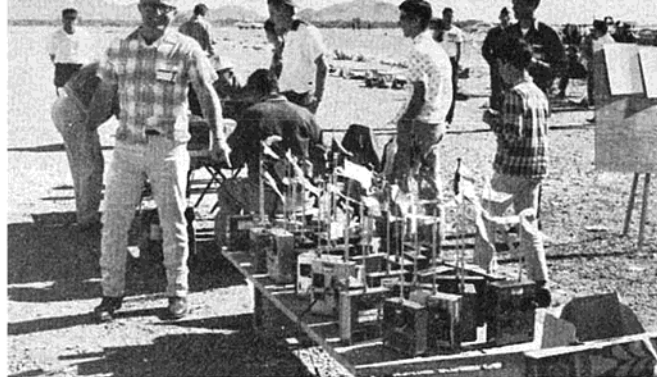
Loretta Hall flying a Cessna Skylane with Veco .45 power.



Don Bakers unusual Nieuport 11C triplane. Veco .61 and Bonner 4RS.



Part of the vast number of contestants and spectators, viewed from the pattern pit area. New AMA pattern offers challenge.



Gerald Krause of E.K. Products, counting Red Box's, and looking very happy about finding many in attendance!

18th Annual Southwestern Regional Championships

Buckeye, Arizona, Desert Classic hosts western states top pattern and scale fliers. Ted White and Phil Kraft first and second in Class C Expert. AMA Prexy Cliff Weirick tied with Larry Leonard for third slot. Joe Bridi and P47-N top combo in scale. RCM photos by Joe Bridi.



Randy Mytar's scale entry. Jack Stafford's Comanche kit flew well once the landing gear problem was solved.



Bill Hollenbach and Rex O'Conner's joint venture — a Hunter F-6. Model was built in 5 weeks time and had first flight at regionals!



Line up of scale entrants. Bill Hollenbach's F-6, Nate Rambo's Chipmunk, Randy Mytar's Comanche, and Joe Bridi's Thunderbolt.



Bill Saldowski goes through pattern as Larry Leonard calls maneuvers. Bill placed 5th in Class C Expert.



Jim Witt flying as Harry Gould of the B.I.R.D.'s club calls.



Phil Kraft flying as Bill Bennett of Las Vegas calls. Phil 2nd in C Expert, but 1st in Fly-Off for Grand Champion.



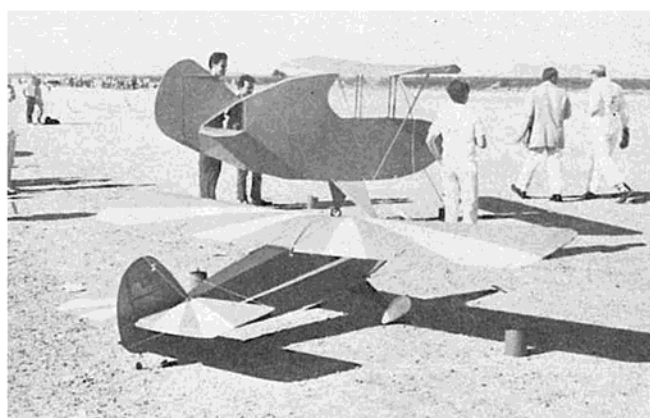
Phil Kraft and Bill Bennett returning to pit area after flight.



A.M.A. President Cliff Weirick readies his model for flight. Cliff placed 3rd in Regionals.



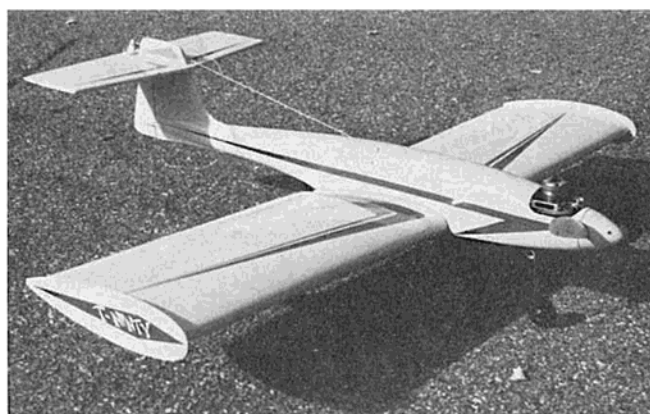
Sun Fli 3, Class C Expert entry by Joseph Bridi. To be presented in R/C Modeler Magazine.



Winchell Poge's 24 sq. ft. original uses an Enya .60 with 14-6 Top Flite prop. Flew very well! 15 pounds.



Air Force Major Morris McKenna with ST .23 original T-Ninty. RCM Classic propo system. RCM's Jerry Kleinburg in foreground.



Close-up of Major McKenna's T-Ninty. Foam and fiberglass original. Learned techniques from RCM articles.



JERRY KLEINBURG



Pete Worchester treats customer to peek at R/C goodies. Typical beginner reaction . . . Pete's shop is lone Honolulu model center. R/C ready-to-fly's popular item.

It cannot be said elimination of the radio control C Pattern Event from the forthcoming Olathe Nats didn't come as a surprise. This degree of breakdown just wasn't expected this soon. According to John Worth, the Executive Council voted in January to limit pattern flying at the annual national contest to FAI team selection only. The news was carried in a single terse sentence in AMA release no. 12. The vote, in effect, closed the door on many R/Cers who look forward each year to the Nats as an opportunity to rub elbows and to measure their flying talent with R/C notables across the country. Now they may be on-lookers — if they wish — from a hundred yards away. . . .

While the propriety of the decision — if not its outright legality — is highly questionable, it's clear that recent events have created an early test of the new ABC rules — along with AMA's resolve to keep the Nats "open".

Both were found wanting.

Full recital of the dreary tale makes for poor reading but the essence involves Navy disaffection with the Nats, bringing on a reduction of their logistic support, which in turn caused a quick passing of the problem to the Executive Council who then elected — not without dissent — to take what appeared to be the easiest and quickest way out.

While it's not possible to follow here the mental process of the E. C. in arriving at their decision, there were some obvious questions that undoubtedly occurred:

1. Would C Pattern draw contestants and have popular support in view of its untested and untried status?

2. Would the membership volunteer to undertake the personal cost and time to run an AMA pattern event, especially where an organized group such as the NMPRA was not available to take on the coordination, organizing, and administrative burden of an event whose popularity was questionable?

3. In having ABC at the Nats, would the giving of Executive Council sanction and recognition in this direct way be wise in view of ABC's illegality since the Contest Board improperly by-passed the E. C. in making these rules in the first place? (Members may be interested to know AMA procedure requires Executive Council approval of Contest Board rules action where established events are eliminated. This hasn't happened in the case of the recently pub-

lished ABC rules.)

4. Aside from the recognition problem, would the Executive Council become encumbered with the onus of the Contest Board's steam roller tactics that improperly forced creation of an event without first having it tested for the usual one year provisional period?

5. More importantly, does leadership support exist for the ABC pattern in light of the withdrawal of the AMA President and his R/C Contest Board Chairman from participation, support, and enthusiasm for the AMA pattern event?

In addition, one other item might also have occurred to the Executive Council: Since the R/C Contest Board also usurped the E. C.'s authority by trying to dictate the C Pattern would be a Nats event — when it is clearly an E. C. function to name Nats events — why not take this opportunity to discourage any further such intrusions and abrogations of E. C. prerogatives?

Of course the Executive Council didn't come away without stubbing its collective toe also, despite the dissenting opinions. The only legal events for our Nationals are official AMA events. FAI events are not official Nats events despite the comment of John Worth that the precedent of having FAI events take place at previous Nats makes the E. C. decision valid. This explanation is not sufficient. Despite such wishful thinking and the tendency "to make things up" to suit the problem of the moment, the fact of previous "rule bending" does not justify total replacement of any AMA event by a similar FAI creation. Certainly not without due process. (At this point, the legend of the camel who eventually took over his master's tent and started by only putting one small foot inside, is obviously an object lesson that applies here. . . .)

The Executive Council also demonstrates a short memory when it appears to forget the numerous rejections given attempts to adopt international rules for AMA use. This E. C. move may thus be interpreted as a slick try by the few FAI proponents who have continued their advocacy, to trap an unwary membership into a procedural tangle that would back them into an unwilling tie-up. A direct confrontation on such a question is in order if an honest and forthright result is really wanted.

In summing up the record of both the Executive Council and the RC Contest Board in this latest mish-mash, as well as

their efforts in the recent past, the conclusion drawn is that at best the record shows a "clumsy" fumbling of AMA business brought about by a gross weakness of procedural order or logic. In other words, we hear their noise but there's no sense to it . . .

Reaction to the loss of AMA pattern for this year's Nats may be slow since those who are affected most are least organized or vocal in response to this sort of thing. But it's not too late to voice disapproval in order to have the Executive Council reverse itself and to set this matter straight by cancelling the illegal ABC pattern rule action of the Contest Board. All that's needed is enough vigor and voices to be heard at AMA. At a time when national modeling may not be practical in view of the Viet Nam situation, it seems highly inappropriate to be primarily concerned with selection of an international team. Talk about putting the cart before the horse . . .

Besides, more important matters are at stake since AMA needs to know where members stand if backbone is to develop toward independence from governmental influence and subsidy of the Nats — an opinion being privately nourished in headquarters these days. Extreme silence, at this point, from members may be seen in Washington as the high sign to retreat away from such worthwhile labors. If this unfortunately happens we may expect a continuing diet of noise and nonsense . . .



CON-TRAILS

The contest season is quickly shaping up and promises to be a full one despite rules problems. Thanks to Al Signorino's efforts a new approach to contest coordination is being tried for mid-country meets which will help alleviate the duplication and overlap experienced in previous years. AMA hopes to adopt similar measures for other areas soon and Al deserves credit for stimulating the action. As for the Nats, the latest word on the dates — as we write in January — is that 3 through 9 August have been selected. The 3rd and 4th, being a weekend are scheduled to have the usual closing air show and open house which has little or no modeling. Registration will be done on the 3rd and 4th during this time with competition set to start Monday the 5th. Exact schedules, it's assumed, will be released in March or April.

Here are a few added affairs worth knowing about:

● MEXICO CITY (April 11-14) — FAI pattern and a THOMPSON TROPHY RACE. A solid gold tray and 1000 pesos (\$80) will go to the race winner, with 750 and 500 pesos going to 2nd and 3rd place. Race rules allow any aircraft with extra

(Continued on Page 39)

TOP OUT

(Continued from Page 38)

points for scale, 3 hp maximum engine power, and no design limitations. The race will be for 30 laps over a 15 kilometer distance. This ought to be interesting, and besides, it's a worthwhile visit. Contact: Francisco Gallegos, Niza 81, Mexico 6, D.F.

● **IRIS INVITATIONAL** (May 25-26) — The South Carolina Radio Aircraft Modelers will award 14 trophies in classifications including Best Finish, Most Inventive Design, Open Pylon, Goodyear, Le Mans Pylon, and to the contestant traveling furthest to attend. A banquet is set for Saturday night where door prizes will add to the spice. This is the second Iris Invitational for the east coast organization headed by Cecil Boyd. Contact: Chas. Johnson, P. O. Box 621, Sumpter, S. C.

● **PARCC Fly-For-Fun** (May 26) — This is the kick-off contest of the newly formed R/C association. Events will include relay races, bomb drop, limbo, etc., and will be held at the Rockland County R/C Club field. The PARCC (Palisades Assn. of R/C Clubs) consists of 4 clubs so far — Westchester Radio Air Modelers (WRAMS), Baychester R/C Club, Rockland County R/C Club, and North Jersey R/C Club. Executive coordinator is Andy Medwid, 16 Woodfield Terrace, Tarrytown, N. J. Contest contact: Art Byers, 72 Daisy Farms Dr., New Rochelle, N. Y.

● **FAI SEAPLANE RECORD TRIALS** (May 4-5) — A sanctioned R/C record trial meet for seaplane duration and closed course distances at York, Pa. A fun-fly with a 5 and 10 lap pylon race along with a quickest take-off-to-landing event included will also be held. Pre-registration is required on record trial entries; FAI stamps will be available at the meet. Contact: Red Gunning, 2303 Medford Ave., Ann Arbor, Mich.

● **PENSACOLA 5 FLAGS FIESTA CONTEST** (June 15-16) — The Pensacola Aeromodelers 6th annual meet held in conjunction with the Pensacola Festival, a Mardi Gras-like city celebration. Ron Chidgey ad-

vises that a "full boat" of events will be held — AB, CN, CE pattern, Goodyear, and Scale — with an added attraction of a CARRIER event in recognition of the training given Navy pilots at Pensacola. Tail hooks will be provided for the event. . . . A scheduled air show complete with Blue Angels gives promise of broad appeal while Pensacola hospitality draws wide R/C participation. Contact: Capt. Russ Verbael, 219 N. Madison, Pensacola, Fla.

● **HOUSTON ANNUAL** (June 8-9) — A full slate of pattern and scale will be flown at this 4th annual contest. Scale will include a jet aircraft classification where "Doc" Martin will have an opportunity to perform with the latest version of his F-111B. Contact: Don Williams, 1535 Waverly Ave., Houston, Tex.

Results of a couple of contests have been received and show interesting details. John Garabedian reports on the San Gabriel Valley 100 Lap Open Pylon which was won by Walt Findlay flying a Kwik-Fli-Merco-Kraft combination. Complete details were:

100 LAP SEMI-FINAL

Chuck Hayes — 28:57.7; Kwik-Fli-Enya-Kraft

Walt Findlay — 30:34.6; Kwik-Fli-Merco-Kraft

Glen Henley — 36:36.3; Original

Bror Faber — 38:36.0; Debonaire-Enya-Orbit

25 LAP FINAL

Walt Findlay — 6:14.9

Chuck Hayes — 6:22.0 (2 cuts, 27 laps)

Glen Henley — 6:35.7

Bror Faber — 6:59.3

The Shreveport Sharks 1st Annual drew 20 fliers from 4 states and despite a bit of rain, wind and interference, competition was spirited with this outcome:

Cl. III E — Cal Scully, Don Downing, John Dougherty

Cl. IIIN — Mal Trosclair, Gary Pannell, Jake Shirer

Cl. II — Bill Feldschau, J. D. Alexander, Carroll Adkins

Cl. I — Buddy Brammer, Dick Dixon, Mills Rogers

Sportsmanship Award — Norm Rhodes

THE MAIL BAGGE

● **HAWAII.** Jan Sakert assesses the use of plastic R/C planes used in the islands in his latest letter and found some interesting indicators of the impact the new breed is having upon the hobby. About 20% fly the multi variety at present in the Hawaii R/C Club. Jan recently tried a Lanier Thunderball, found it "remarkably" good. Checking the hobby outlet (Pete's Modelcraft) where Pete Worcester keeps tab on trends, Jan found that response to Testor's Skyhawk has been favorable. However, so far, such sales haven't shown the customer necessarily stays with R/C once having bought the simple outfit. . . . While it's too soon to generalize on the effect of simple ready-to-flies, it isn't felt any fault is in the product itself. Staying in R/C depends as much upon proper "orientation" as on anything else, and the lone-flying beginner who cannot somehow survive the orientation period on his own will evaporate from the R/C scene as many have done before. The simple prescription, involving aid by an R/C club or an experienced flier, changes the survival rate dramatically — it always has. Despite a small statistical improvement in "survival" brought on by the good ready-

to-fly planes, beginners still need guidance — that essential ingredient!

● **ITALY.** From Ettore Gatelli of the Euratom R/C Club in Ispra, we hear of the hydro contest held at Lugano, Switzerland. A reduced pattern was used although many of the pontoon planes were capable of the full FAI pattern, Ettore reports. Seven nations participated, performance levels were high with a touchy touch-and-go between marker buoys a requirement of the flight program.

● **ONTARIO.** The entire R/C population in the area of Deseronto is Leo Edwards and his buddy K. Christina of Batawa. Each owns a fleet of operating planes and a variety of gear to partially make up for additional fliers. The equipment of the two RCers covers the full spectrum from single to propo and comes from four different manufacturers. . . . It's a sort of R/C Eden — if their wives don't read about all that equipment now. . . .

● **NEW YORK.** Snow up in Mattituck got Erich Zwenkel recalling the summer flying he does on his lunch hour. Erich works for J. Parker Wickham at Mattituck Airbase, Inc. and in a recent letter told of the occasional chance he gets to share the 2000 foot runway with local air traffic. Erich and a cooperating Aerona C-3 driver tried formation flying and consequently an excellent opportunity developed to obtain the pilot's air recognition reactions involved in sharing airspace with an R/C model. Since a smooth flying R/C model greatly resembles a real airplane far away, Erich explains, a hazard exists in the pilot not realizing just how close the model really is. However, an R/C model maneuvering gives itself away due to its peculiar turning radius and other rate of attitude change appearances that pilots quickly recognize. The lesson, nevertheless is to avoid flying in any kind of congested airspace and to only undertake experiments such as Erich's under carefully controlled and planned conditions.

● **KANSAS.** Jim Mowrey of the Hi-Plains RCers sent along the darndest ding-dong gadget seen in a long time. An R/C accessory, it was made by his wife, Beryl, and it appears she's created a "must" for every RCer who strives to have all the basic commodities necessary to sustain plane and pilot at the R/C strip. This particular affair — you name it — is a little knitted hat that acts as an engine cover and is strung together, ala mittens, with two knitted sleeves that slip over the prop blades and act as protectors for that device while also anchoring the engine "cover." Giving the whole affair a ridiculously original air are the tassel and face decorations which give comic life to the really practical conversation piece. Women especially find it hilarious and "cute" . . . Lettering on the prop sleeves top it all and may spell out initials, nickname, club affiliation, or — as on ours — even the name of a column. Beryl, Jim assures, will be happy to custom make them for readers in any color combination and engine size with lettering to suit. Just contact Beryl at RR 2, Box 56, Kinsey, Kansas 67547. The tab for TOP OUT readers is only \$4, and comedy aside, it's a darn practical affair — thing!

THE NEWSLETTER ROUTE

— **TAILSPINS** — (Cordova Model Masters, Calif.) Phil Heller added a postscript



SoRaMoCC trophy winners. Front: Denning, Butcher, Mettraugh. Mertes, Lyons, Campana, Fleet, standing. Sault Ste. Marie club honored Campana with special award for GLITCH N/L. (Pic by Barbara Fleet.)

to the January issue he sent us that suggested a possible R/C N/L Editor's Association to aid with the ins and outs of the newsletter art. We checked with several editors around the country and the response was immediate and favorable. At this stage the idea hasn't fully developed and other editors are encouraged to suggest their thoughts in the matter. We like the idea and hope to see it develop for the benefit and use of all editors. . . . Phil's address is: 2558 Las Casas Way, Rancho Cordova, Calif. 95670.



Shreveport 1st Annual winners lineup — Shirer, Alexander, Trosclair, Downing, Rhodes, Adkins, and Feldschau in back. Brammer, Scully, Dixon, Pannell, and Dougherty up front.

— **GLITCH** — (SoRaMoCC, Ontario) "Thought provoking" is the way Nino Campana describes Holger Lundhill's article on the factors influencing trim of R/C models. We believe most readers will agree. Presented here is the portion of the article dealing with thrust and torque.

"Thrustline—here things get a little more complicated because of the torque reaction. The most obvious is that downthrust gives the same effect as adding weight to the nose but proportional to the thrust we get from the prop. As an example, our plane is flying with the engine idling, then we open the throttle; at first we have relatively little thrust because, due to the slow speed of the plane, the prop blades are working at a high angle of attack, and a great deal of our power is lost in drag. However, as the speed increases, the prop becomes more efficient and the thrust increases until we reach the speed where our particular prop/engine combination develops the greatest thrust. From here on thrust decreases until we reach the speed where thrust equals drag of the plane. Now we close the throttle down to idle and the prop blades work at a negative angle of attack and we have reverse thrust until the plane slows down to correspond with the prop speed.

"Another factor often overlooked is that sidethrust to the right also adds a downthrust effect due to the fact that the blade moving upward (with its drag acting as a downward force) has a slightly longer moment arm to the balance point. This force is proportional to engine torque.

"The important thing here is to remember the way thrust-offset changes its effect with speed and power, and if you fly inverted, it works in an opposite manner, i.e. — when inverted, downthrust becomes up-

thrust, and right thrust becomes left thrust.

"Now a word about that old devil Engine Torque (and this should start a few arguments): **THE BIGGEST PROBLEMS HERE COME FROM TRYING TO CURE A DISEASE THAT DOESN'T EXIST.** First of all, it takes only 5 to 10 oz. of thrust to keep a 5 lb. plane flying (a clean design even less). Allowing for 10 oz. of thrust and a poor choice of props, we still need only about 3 oz./in. of torque in normal flight; in other words not even enough to counteract the weight of a side-mounted engine.

"So where do the problems come from? Well, we are using engines that CAN develop a substantial torque. A .35, for instance, puts out about 40 oz./in. This corresponds to adding a weight of half pound to the wing 5 inches from the center, so if we allow the engine to do that while airborne at low speeds, we have troubles. (I know—I've picked up the pieces!) First we must remember that the engine does not develop the torque unless the prop offers that much resistance (Newton's law). Secondly, the prop offers that much resistance only when it is partly or completely stalled, and thus creating more drag than thrust. That means we have a torque problem only when we let the engine deliver more power than the prop can convert to thrust at that given forward speed. Now if we have downthrust, we compound our troubles due to the fact that the blade passing through the top of the circle has a longer moment arm to the yaw center than the blade at the bottom, thus adding a yaw effect. To a certain extent, adding side thrust can cancel out this yaw effect, but the side offset acts proportional to prop thrust, whereas the yaw effect from the downthrust is proportional to prop drag, so at best it is a poor compromise.

"Another serious drawback when using an offset thrust line is the change in the angle of attack of the prop blade during rotation. That is—with down thrust, the smallest angle of attack occurs at the top of the circle, and the greatest angle at the bottom, thus cutting down the efficiency of the prop (adding extra torque) and the continuous changing of load on the prop blade, causes a constant flexing of the blade. This is not only a possible cause for (prop) fatigue but it also causes vibration. Ever had vibration problems in the air that didn't show up in a ground test?" Holger Lundhill. SoMoRaCC—Jan. 1968.

The November editorial by D. D. regarding RCM's product quality policy, saw reaction among newsletters. Here are a couple quoted to represent both sides of the issue, because as in most endeavors opinions are bound to vary. These editorials portray the "poles" on this particular thought provoker. . . .

— **AERONAUT'S CHATTER** — (Eugene, Ore. R/C Aeronauts, Inc.)

"This editor would like to discuss Don Dewey's editorial in the November RCM. Don's basic premise for publication of a model magazine appears to be ". . . a responsibility to the reader to call a spade a spade." He is of course referring to product evaluation in lieu of the normal magazine fare.

"Such uncompromising character is normally reserved only for the very wealthy or

the very poor. The rest of us are forced to "make a profit" in order to eat—is this bad? The writer thinks not, as profit is the reward in a competitive society.

"Competition is the key word—as everyone knows, the model press receives and writes about almost every new product well before it is in the hands of the public. If we are to let Don Dewey decide for us about the qualities of a product before we ever see or use it, what does this do to the competitive market?

"His concern for the modeler who has wasted his money on poorly designed merchandise that should not have been placed on the market is admirable; however, concern does not in my opinion justify making RCM judge and jury.

"I would suggest that the basic premise for a publication should be 'a responsibility to the stockholders to provide 'a return on their equity in an ethical manner.' A publisher always has the option of refusing to accept advertising of a 'bad product.' A publisher is not responsible to manufacturers or to readers as judge and jury, nor should he want to be in a competitive society. This does not mean that all 'Consumer Buying Guides' are wrong and out of place. It does mean that an editor or publisher is out of place to berate manufacturers for withdrawing advertising because of bad reviews. The manufacturer is merely exercising his option in a competitive market and this is not wrong or evil practices by the manufacturer.

"Truth is not black and white; it is subjective and many hues colors would better describe a 'good product.' I will not base a purchase decision on RCM's judgment." — Roger Breedlove, Editor.

— **RAMM TALK** — (Radio Modelers of Montgomery, Ala.)

"Have you ever placed your head on a chopping block and watched the ax about to fall? Well, I truly think that not any of us can say we have had this experience. But, I do know of one person who came close—Don Dewey of 'Radio Control Modeler'—or should I say 'Mr. R.C.M.' himself.

"This editorial is in reference to the fine article written by Mr. Dewey in the November '67 issue under the 'Editor's Memo.' In this day of explosive advertising, sales promotions, fast trends and fads, the life of any magazine is its advertising sales. I think that we, the readers of R.C.M. do not realize what Mr. Dewey did for us—the prospective buyers.

"As all of us know, most of the items and equipment that we buy was the result of some form of advertising. I think I can speak for the members of our Club, and others readers of R.C.M., in saying we must express our appreciation for Don's stand on honest and proven facts about products on the market.

"These days, it is very unusual to see a supplier who is truly interested in the customer and his needs. There are, however, many manufacturers and companies who are only interested in making sales. I believe Don's article will give us a refreshing look at products and other articles written and advertised in R.C.M. This new approach will benefit the 'new-comer' to the R.C. field as well as the 'old pro's.'

"Thanks, Don, for sticking your neck out for us, as well as for your publication." — Bob Land, RAMM President.

TOP OUT

(Continued from Page 40)

— MEMPHIS MONITOR — (Memphis R/C Club)

We welcome L. T. "Buddy" Hord and the new quarterly N/L, MEMPHIS MONITOR, with its "staff": Millie Amps and Orville E. Poxie. Welcome too, to K. K. "Mac" McClure, the MRCC president for 1968 along with Gus Rivalto, and Harold Fanning who fill the other club officer posts. Don Jenkins is the Activities Director and showed his talent in a "Monkey Business" piece in the 1st Qtr. 1968 issue that adds a new chapter to "Da Box," the continuing saga on the subject of field boxes. Buddy Hord's efforts also shone forth in "Vital Statistics" thusly:

"The Memphis RC Club meets every fourth Monday of each month at the White Station Library, 5094 Poplar Ave., except of course in the months that have more than one 4th Monday, in which case we all get confused and just don't meet at all!"

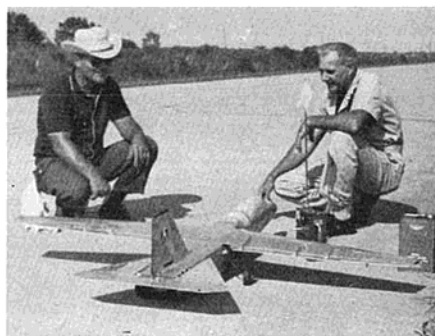
While figgerin' that out we also noted the wedding bells item announcing that Bobby Wood and Miss Pat Wagner started a new RC team. . . . Considering the tradition of the Valley Flyers, we're prompted to ask what club post the new Mrs. Wood will fill? Many happy flying hours, Bob and Pat. . . .

— CORKS NEWS — (Central Ohio Radio Kontrol Soc.)

"The RC field is far ahead of currently deployed military systems in actual use of micro-circuits. Much of this is due to the 3 to 10 year military procurement cycle, as contrasted to the 3 to 6 month cycle for design, breadboard, test, evaluate, and market for commercial RC gear. The modes of failure, design principles, and the number of ways to go wrong are nearly identical, however. Similarly, the vibration environment, the necessity to make components work as a system, etc., are not only excellent educational factors, but in a very frustrating, competitive, and collective way contribute to a considerable Gross National Product!" — Ray Stahl, Editor.

Very interesting, Ray. Yes, a crash can cost . . .

Barbara Montgomery shows under view of Martin's jet proto-type of scale F111B. Note flying stab trims which operate in flight. Unique metal construction.



"Doc" Martin (r.) and twin jet. Latest version has flying stab, weighs 13 pounds. Flown successfully. Will be seen at Houston meet June 8-9.



Nicely done P-61C Black Widow by Don Williams, Houston R/C. MonoKoted, 2 45's. Span 76", 11 1/4 lbs., Micro-Avionics. Operating flaps worked well, wiped out when Don left a flap disconnected!

— IMPERIAL ACES — (Pueblo, Colo.)

Our special appreciations go to Joan Alyea who edits this newsletter. Her grasp and unusual understanding of RC is in evidence each issue. As an example of feminine perception into RC foibles, here are a few of Joan's definitions taken from the latest issue which were concocted for MMW's (Mystified Modelers' Wives):

ENGINE: a fuel-drinking hunk of metal that makes more noise than the neighbor's kids, goes on front of plane.

PROP: the little stick at the front of the engine that doubles for a meat slicer.

SERVO: those little boxes with wires on them that won't fit inside the way they are supposed to.

FUSELAGE: the long part of the airplane that holds the stuff.

WING: the thing that keeps the fuselage in the air. You aren't supposed to set things on it.

RUDDER: the thing on the rear they spend the most time trying to get on straight and then claim it has not a bit effect on the flying!

STAB: next to the rudder, and hard to get on, too.

DOPE: not what it sounds like . . . it's paint that smells up the house.

FIBERGLASS: stuff that smells worse than dope.

CELASTIC: supposed to hold the plane together in spite of what the builder does to it.

PUSHROD: the thing inside that breaks, making things inoperable — usually happens in the air!

— The AIRFOIL — (Central Kentucky RC Club, Inc.)

New officers were the order of business for the CKRCCers with Carl Russel, Art

Morgan, and Harold Downing picking up the reins as president, VP, and sec-treasurer respectively. Of special importance was the creation of a new official position which other clubs will find interesting. A permanent Corresponding Secretary post was established to provide a long term communication tie-in with AMA and other information links. Few clubs currently have such a job, at least not officially. It's a practical step however which gives permanence and substance to a club's administrative business. Harold Lemay, operator of Joyner's Bicycle Shop in Lexington, was elected to the important position. Harold Downing at 1128 Claridge Dr., Lexington, Ky. 40504, is also editor of the AIRFOIL.

LAST ROUND

RC pixies are always at it. We mentioned Don Jenkins and his Monkey Business item a while back as an example. Another whose work is often an RCM feature is Loren Dietrich, who as Walt and Wagger provides a sharp variety of construction humor. Always concerned with an RCer's outlook, Walt and Wagger have come up with an "official" RCM excuse list (1968 edition) which we're happy to pitch to you. (OK, W&W, the batter is ready. . . .)

"Since many persons are now experienced RCers, it has been noticed that a certain 'sameness' has been creeping into the excuses and apologies heard on the flying fields around the world. As a public service, we hereby present a number of new and unused reasons for equipment malfunctions and dunderhead flying miscalculations. They are guaranteed to be plausible, suitable, capable of evoking sympathy from a crowd, and absolutely will not smell in hot weather!"

"I always make the first flight without the antenna; it's a sort of range check."

"Actually, the reason the wing came off was because of the rubber shortage when I built the ship last summer."

"I think it's our patriotic duty to get the last volt out of a battery that way, don't you? I mean, with materials being in short supply and all?"

"When you've been in aviation as long as I have, you know that the maneuver was originally done just that way. Isn't that interesting?"

"The law of averages would indicate that I would have missed that pole on takeoff. I hit it head-on. That's control, man!"

"Sorry, my old war wound caused my knee to buckle just as I walked past your aircraft. That's all right; it broke my fall nicely."

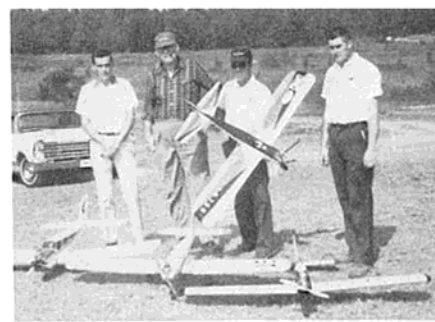
"I certainly had no intention of flying over the crowd; however the earth rotated suddenly and they moved right under the ship!"

"I know it lost the contest for me, but that rich mixture is worth it in the long run. Reduction in engine wear, you know. . . ."

"No, that certainly was not my transmitter on that frequency. . . I never use frequencies!"

"It's not that it won't start, sonny. This is called break-in time."

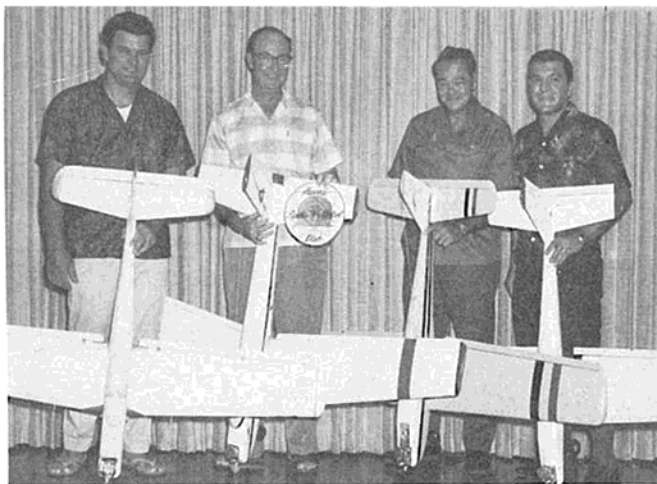
"Sometimes they do that. These high-snortch transistors are very sensitive to clouds."



Left: Knitted cover "thing" product of Beryl Mowery, Kan. Hi-Plains R/C Club, protects prop, engine. Great conversation piece. TOP OUT Jr. restrains contest bird. Cover available, see column. **Center:** W.W. "Ace" Trotti and Snoopy outfit. Does battle with Lanier Pursuit. A 9' Taylorcraft in the works for Iris Invitational due May 25-26. **Right:** SCRAM brass — Johnson, Trotti, Boyd, and Bradham show R/C outfits. Club will host 2nd Iris Invitational May 25-26.



Rancho Cordova Modelmasters and impressive R/C fleet. Bob McGill is 1968 President. California Club has broad array of planes, equipment. Has an active flying program.



Lanier quartet, Partika, Barnes, Fuchsberger, and Sakert, reflect growing popularity of full-house plastics. Hawaiian touch reflected in shirts, footwear.



Above, left: Why R/C boating is popular in Hawaii . . . Ideal weather, island influence. R/C outing draws admiring crowds. attentive helpers. (Sakert photo.) Top, center: R/C population of Deseronto, Ontario area. Leo Edwards (in white) and K. Christina show fleet including Mis-Behave, Skylark 56 and C.G. Skylane. Above, center: Kaneohe Bay scene. Commander Chuck Carpenter and son Dennis and R/C duo. An OS-40 powers Chuck's Quik-Silver while Sr. Falcon sports a 60. Pair are active Hawaii R/C team. Above, right: Phil Heller and Upset. Digitrio-4 and Merco. Phil edits TAILSPIN, N/L of Cordova Modelmasters.

Send your photos and club news to TOP OUT, 2512 W. Craig Place, San Antonio, Texas 78201



LAZY ALAN

RCM CONSTRUCTION FEATURE

By J. Alan Boyer

WITH the opportunity given me by Don Dewey, I can now share the enjoyment of boating with others. The idea behind this tugboat began with a small picture of the Long Beach tug, and ended in a model that has provided hour upon hour of pleasure to me, as well as being an item of interest to those who have stood by and watched. The idea was to build a model that would be completely different and unique in comparison to the models I have built or seen, and to give performance that would be challenging and would incorporate realistic operation.

The ability of a real tugboat to maneuver is probably one of the most fascinating sights in the harbors. To make a model accomplish the same maneuvers was achieved by using twin screws instead of the normal single drive unit used on the real tugs. With two motors you can run forward on one shaft while reversing the other, which will enable the boat to spin on a dime. The rudder is used for normal turns. This will allow you to dock and work your model tug the same as its full size counterpart. This alone, in my estimation, is worth the work involved.

I can't explain the feeling nor the shakiness that gripped me the first day I launched the "Lazy Alan". The day was clear and a little windy, and when I saw it bobbing on the ripples of the lake (which were slow-

ly becoming waves) I was ready to pull it out! However, I stuck with it and when I gave it full speed she cut through the waves and never bounced again.

As I tried different maneuvers, I discovered that the boat would not tip, even if you deliberately attempted to do so. I credit this to the fact that I used a twelve volt aircraft battery to power the two motors, along with the twenty-one pounds of weight, which I placed as near to the bottom as possible. (The inside of the hull is braced with a one-quarter-inch plywood base.) This weight added realism, as the design of the hull requires sufficient weight to let the boat ride at the waterline.

The importance of variable speeds is not to be taken lightly, for it helps greatly in maneuvering. It will enable you to move slowly through the water when docking, or sailing in shallow or rocky water; to cruise in small ponds or narrow streams; and really move in large ponds or lakes. You will find that, with sufficient power, the stern of the boat will drop almost to the deck line and churn the water, which is a beautiful sight to behold.

To achieve multiple speeds I found that a slot racing handle suited the purpose exactly. Five ohms of resistance was exactly right to provide speeds from full to a perfect slow speed, providing your motors draw the same amperes under load as the

two Pittman 12V motors I used.

However, if you intend to use all those controls you must think of multi-channel equipment. I used a Citizenship ten-channel reed unit, although six channels will suffice if you do a little "Rube Goldberg" work on the reversing and speed controls. To fully appreciate the ability of a boat to "perform", you should have as many channels as possible. The hull of the "Lazy Alan" has plenty of room for this equipment. The results will create great excitement and the spectators will stand in disbelief as you dock as precisely as an old sea captain with salt water in his veins!

A detailed step by step method of assembly would not be feasible, as each of us has his own ways of constructing a model. However, to help make your work easier, I have given information on the assembly sequence, combined with hints as to details and additions which will help make the completed model more realistic. As this boat requires many fittings and since the pieces used to assemble them were so varied, and in some cases quite odd, I will explain what I used and how I used them. You can then follow my ideas and add or use ideas of your own, as many different items will suffice to do the job. I built the original model forty-eight inches long, which makes the scale to the real tug about five to eight. I will base all sizes to



5. SUSTAINING VALUE

THE JOURNAL OF THE

A
UNIVERSITY OF CALIFORNIA

2010

CUT & GLUE Balsa SWEEP IN PLACE.
DECK IS PLACED WITH BALSWOOD LATH.

MAKES TWO HALVES FROM BALSAM OR MYRTLEWOOD. NOTION AT DEC. & MARTINE TO
ACCOMP. COIN'S. MOONIES AT BOTTOM OF EACH BUSHES ARE FOR THE FEET.

Abstract

ON THE TWO SIDE BURNERS ALSO PLACE AN
MELT & BURNER ON PLATE SIDE WITH
A THERMISTOR CONTACT CENTER. NOTE ONLY
ONE BURNER SIDE'S COMPLETLY BURNING
WELL. NOW PLANE HARDWOOD IS BEING
BURNED WELL INSIDE OF MELT AS BURNER

this scale, however, you may build to any proportionate size by making size changes in ratio to the plans.

Begin the construction by making bulkheads, deck and waterline chines, and the keel chine out of hard balsa or plywood. Notice that the keel chine extends outward to form a hinge for the rudder. Notch all pieces where they interlock until they fit smoothly. Now assemble those pieces, making sure they line up correctly. Glue thoroughly, and follow by putting a coat of glue on the edges of all bulkheads and all chines. This pre-gluing step is important in obtaining a good bond during planking of the hull. Now using strip balsa, start at the front and angle the planking to the bow. Pre-wetting each piece will help splitting the balsa strips. Be sure to put only one plank on each side at a time, since an over balance of planks on one side can cause the hull to twist badly. Cut solid blocks to the rough shape of the rope drains and glue in place, leaving enough wood for sanding when you shape the hull. Now run balsa strips lengthwise between the two rope drains. The strips will have to overlay each other slightly at the rear rope deck in order to conform to the curve of the upper part of the hull.

Sand the hull until its shape is smooth and even. Use a block sander and stroke across the planks two ways to completely eliminate low spots. Now fiberglass the hull completely to insure total strength. For those who prefer not to fiberglass, I have an alternate method which works equally well. Using fiberglass cloth only, and substituting Ambroid glue, (a quart does the job), brush a coat of glue on the hull and while wet, spread the cloth on top of the glue as it sets. Brush a coat of glue immediately on top of the cloth. This coat bonds with the still tacky first coat, bonding the cloth firmly to the hull. Brush at least three or four more coats of glue on the hull after the first two have thoroughly dried. When the glue dries hard, (which takes several days) brush seven coats of full strength automobile lacquer surface coat, preferably white, on to the hull. Make sure the surfacer you buy is as thick as cream. Don't be afraid to brush it on thick! Sand smooth, and let set for at least a week before final finishing. This allows the surfacer to soak in and shrink slightly. A good rule to follow when sanding the hull is "when you think you are finished sanding, you're only half finished". Follow this rule and your finish will be equal to the best.

Cut out the top part of the bulkheads from the upper left and right rail tops at a ninety degree angle to the deck line. Cut out a balsa deck and glue in place, leaving a hole $\frac{1}{4}$ " smaller than the size of the main cabin. Make an access hole behind the cabin and save the piece you cut out so you can make a deck hatch. The latter will enable you to adjust the rudder or use the rear space for servos, batteries or linkages.

Now, using epoxy cement or a good contact cement, such as Weldwood, you can assemble the side bumpers to the hull. Many things can be used for the bumpers, but I found the best to be automobile fan belts. They have the correct shape, will not crack when bent hard around the stern, and are tough enough not to dent or break

when bumped. You will notice that one of the bumpers travels completely around the hull slightly below the deck line so that, at the stern, it fits around where the two slopes of the hull meet. The other travels from the bow to the number six bulkhead.

Epoxy the hardwood prop shaft supports to the hull as shown. Drill holes for the shaft supports as shown. Then drill the holes for the shafts and install the brass tubing into the hull. Build a trough around the tubing on the inside of the hull and pack with epoxy putty to prevent leading and vibration. Be sure you drill the hole so that the tubing is above the waterline. If you don't you must use a stuffing box to prevent water from leaking in.

Paint the hull and plank the deck with basswood strips. Don't forget the rear deck hatch. Glue on the hardwood railings and make the rope drain deck by inlaying basswood to form a checker pattern.

You are now ready to start the cabin. Make the three cabins out of balsa wood sheet and plank the front of the main cabin as shown. Cover all surfaces with silkspan and clear dope. A good paint preparation is a spray coat of the same automobile surface paint I recommended for the hull. Cut out holes for portholes in all the cabins, not forgetting the wheelhouse windows and doors. The main cabin doors are $\frac{1}{8}$ " balsa cut out and the edges rounded. Paint the doors and glue on after the cabin is painted, using Perfect T pins as hinges and handles. The main cabin roof is balsa sheet which extends one half inch beyond the cabin walls. The wheelhouse cabin and rear cabin roofs extend one quarter inch, and are $\frac{1}{4}$ " thick, beveled on the edges. The wheelhouse cabin roof has a $\frac{1}{16}$ " balsa piece on top of the level. The main cabin portholes are plastic curtain rings glued on with epoxy. The wheelhouse portholes are brass door cups, normally used for sliding doors, with the backs cut off. The upper rear cabin portholes are $\frac{1}{2}$ " brass cups.

The stack is made by cutting three ovals to shape. Glue $\frac{1}{4}$ " strips at four equal points on the ovals and fill in with more strips. Sand smooth, put on silk-span, and prime as you did the cabin. The cap of the stack is $\frac{1}{4}$ " balsa beveled in the same fashion as the cabin roofs. Two $\frac{3}{8}$ " pieces of tubing act as smoke exhausts. Two plastic golf tees serve as air horns and are located at the top of the stack. Staples glued into the stack after painting serve as steps. Two small searchlights mount on the front and rear of the stack cap.



Now that you have completed the actual construction you should start detailing. Some details are best put on as you go along but this is entirely up to you. Details are the backbone of this boat. Each

detail you add will add interest and perfection to your finished model. The secret with detailing is to know when you have enough. There is a multitude of odds and ends you can find which will serve the purpose in making fittings. However, I will tell you only what I used to make each fitting and how I used them to make each individual piece.

I'll start with the fittings and fine details which will be placed onto the hull. First of all, and probably the most important pieces as well as the most difficult to fabricate, will be the bow rope bumper and the ten side rope bumpers. Instead of using hemp rope, I found a better material in quarter inch nylon rope used on real boats and cabin cruisers. This rope is stronger, easier to work and interweave, and will not get soggy with water.

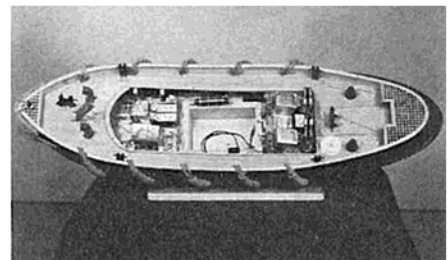
Start by taking a piece of rope and measuring from a point on the deck along the railing to a point on the lower side bumper which runs three-quarter the length of the hull. Cut the rope to twice this length and add two inches for trimming. Double the rope in two and tie the loose ends together temporarily. When you buy the nylon rope be sure they give you a plastic threader which enables you to weave the rope.

Start by threading the end of a second piece of rope through both strands of rope to form a loop which will eventually go from the deck to just below the railing. Now continue to loop the second rope around and around the doubled up piece until you are about two and one half inches from the tip. Now thread again through the double rope and cut off the excess at the top and bottom of the woven rope so that only about one quarter to one half inch of rope extends. Also cut off one of the strands from below the loops. These ends should now be singed with a match until they



form a ball which fits against the rope through which it is woven, or in the case of the extending piece which attaches to the outside of the hull, to prevent unraveling.

Now, using J bolts, hook and fasten the looped end to the deck and then wire the remaining end to the rubber bumper. I prefer wiring in order to prevent ripping pieces off when you bump a rock or other obstacle. If you hit too hard only the wire breaks.





This is easy to replace and also makes it possible to remove the rope bumpers in order to wax and clean the hull periodically.

Now, as to the bow rope bumper, I am not sure what to tell you, as I really don't remember how I did it. All I can say is to weave it like a potholder, and instead of continuing to loop with one strand, start at the bottom with one strand and loop on down through again, weaving through the rope with the plastic tip instead of over and under, allowing the ends to hang down. Start another piece up and down, letting both ends hang as before. Continue until you have woven the complete bumper. Tie the hanging strands together so they can't slip out, fray the ends out, trim to shape, and end up by singeing the ends with a match. Install two pieces of rope so they protrude out the sides.

To fasten the bumper on the hull, drill two holes in the hull, one in each side about where bulkhead number one would be. Fill in with half-inch grommets and insert the rope through the hole. Secure with epoxy. Tie the bumper to the bow grating bitt which will, in turn, keep the bumper from slipping down.

As to the fittings, such as the bitts, davots and vent pipes, these fittings are made with brass tubing, washers and sheet metal. Make four mooring bitts using quarter inch tubing. Drill a one eighth inch hole at a point near the top and solder a piece of one eighth tubing as the plans indicate. Solder the washers on tops of bitt and on extending arms. Also solder a smaller nail or brass rivet to the tops to seal the tube. Make all bitts in the same manner following the plans. Notice that some bitts have sheet metal triangle braces and pieces which fit between the centers of the tubing. Notice also that the bow deck bitt has a piece extending at a ninety degree angle to the main piece which only goes up to the rear tube and not through it. The vent pipe is made by soldering two different sizes of tubing together and soldering a large flat head rivet in the larger tube.

The capstans put you on your own. I used the plug end of a Pylon Fuel bulb with pulley screwed to the top.

Davots are two pieces of one eighth tubing filled with nonhardened steel so the tubing won't kink when you bend it. Solder three washers as indicated on plan. Solder a small eyelet to the upper end of the davots.

Water pipe was an ideal material for the ventilators. Use one copper elbow and a piece of plain copper pipe for the upright. Solder one piece in the bottom of the elbow. Flange an end of the pipe, cut it off at the bottom of the flange, and solder to the upper end of the elbow. Make a matched set of three and install.

Four upright water pipes mount on the main cabin, two on each side, as shown. Washers and small pieces of the next size of tubing make the detail. Miniature air vents can be purchased at most hardware stores. One vent goes as shown on the left side of the cabin only. Another is mounted on the left rear of the main cabin. Add a piece of copper tubing to form the arched pipe, on both sides. An oil pan from a plastic car kit makes an excellent electrical box with music wire used for the metal conduit cable. One goes on the left front and right side of the main cabin.

Make the front and rear steps by soldering strip brass together, simulating grating. Also, make two steps for each side of the wheelhouse, positioned below the doors.

The railing was made from tubing with two holes drilled through, music wire soldered through the holes, and B-Bs soldered on top. Epoxy the tubes to the top deck of the main cabin to form the railing. Before gluing, contact cement sandpaper to the flooring to give you a non-skid surface. Leave an opening at the front steps and at the rear steps and stretch a small chain across these openings.

Epoxy davots in place at the angle shown on the plans. Carve a piece of balsa to the shape of a lifeboat, cover the top with canvas and put two eyelets at each end. Rig with string and pulleys made from a small piece of dowel drilled to resemble blocks. Permanently mount the lifeboat on two individual stands.

The foremast is made by soldering three different sizes of tubing into each other at the points where the lights are located. The stern mast is made of four separate sizes. Glue $\frac{1}{16}$ " fiber washers at points and glue a piece of fine wire up each side of the mast, securing to the fiber washers only. These wires are to be hooked up for lights later on. Make sure the two wires extend below the mast so that they extend into the cabin when the mast is installed. Drill holes into the spots designated for the masts and epoxy the masts into place. Using thread, string the mast guide wires. The foremast gets strung to both running lights and to each side of the rear wheelhouse roof. The rear mast is strung to both sides of the main cabin. The radio antenna strings run from the top of the foremast to the rear mast. The block and tackle for the flag stretches from midway up the mast to the railing and ties at the rear of the railing.

To add a final bit of excitement to your boat, light it up. When you run your boat late into the evening there are no words which can tell the feeling you will have when you see it. It is truly a beautiful sight to behold, as the lights reflect into the wake of your boat.

Now to installing the lights. First, light up the cabin with three lights, equally spaced, then run another light up into the wheelhouse. Green is a good color for this light. The main cabin gets two running lights located on the upper front of the sides. Running lights are also located on top of the wheelhouse and are mounted in a small box type mounting. Mast lights are pea lamps soldered onto the two wires which you already ran up the sides of the mast. "Steal" a search light out of a Tyco HO searchlight car and wire it into the system. All my lights are 12 volt bulbs

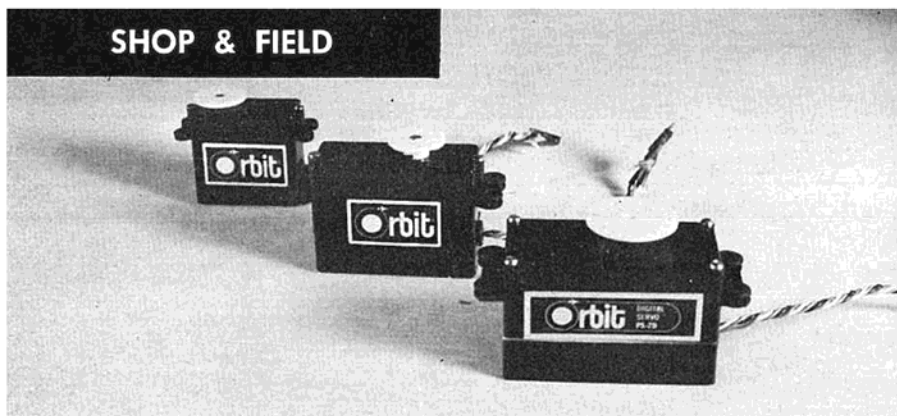
hooked into my system which is run by the aircraft battery I used to power the motors. A two prong plug can be glued into place on the main cabin with the male end in the hull so when the cabin is set on the hull, the lights will be connected.

Although I discussed the operational qualities of the boat and what I used to accomplish them, I feel I should go into some of the parts I did not cover. I don't know what you will use to power and control your boat, but what I have said before, and what I can tell you now, may help you in your decision and installation. For those who are new to boating, this information will be of great help — for you old timers, you may get new ideas which you can incorporate with your own ideas if you wish.

Make a rudder by cutting a piece of sheet metal, work a small bend into the rear edge to fit around music wire and solder to the wire firmly. Insert the rudder into the shaft which is already in the boat. Epoxy the fitting to the bottom of the keel extension to accept the lower end of the rudder shaft. Insert the prop shaft in the tube you epoxied into the hull. Two inch, twin bladed, nylon propellers served my purpose exactly. These, however, depend on the motors you will use. If you use gas you will have to redesign, although I feel gas engines are not really practical in a boat of this type.

Now as to the radio equipment which I used. For the benefit of the novices, I'll explain how I obtain each operation. Using ten-channels was ideal, although twelve would have been better, as you will see. Of course, one reed servo uses two channels, therefore I had five servos. One servo gave me self-neutralizing rudder control, the second multi speeds (using the slot car control mentioned previously), while a third gave me forward and reverse of one motor and the fourth, control of the second motor. These two servos can be operated simultaneously to accomplish a quick turn or to spin around in one spot. I used two Tru-Scale tru-train relays to each motor for forward and reverse. Using 3V to power the relays in one direction of the servo and by using two small relay blades, would turn one relay on or the servo in the other direction. These relays are capable of taking the fairly high amp drain of the motor. The relays engaged by the servo simply turned the main relays on or off. In other words, in the left position, the arm forced one blade closed, turning on the forward relay, while the other blade was open. To the right, the opposite occurs. The fifth servo is self-neutralizing. One direction operates a sequence relay to turn the Tru-Scale relays off as an emergency procedure. I used an American Flyer sequence reverse unit to accomplish this. It works off of 12V and is quite a positive control. The other direction was for the horn, both ways again are just simple relay blades which work when pressed together by the servo arm. The horn is a full size boat air horn which is worked by a small air compressor concealed in the bow of the boat. You can purchase one of these at most good boat stores. Now, if you should have twelve channels available, a good idea I feel, would be to have the

(Continued on Page 48)



The three sizes of Orbit servos.

RCM PRODUCT REPORT: THE ORBIT 6-12 IC

NOT more than a dozen years ago, the modeler was lucky if he could get his equipment working properly, and even more fortunate if he could get his radio controlled model plane up in the air and back down in one piece!

At this same point in history, a guy by the name of Bob Dunham, was busy making reed radios in the back of his hobby shop, for himself and his friends. These forerunners of the first Orbit radios worked so well that it wasn't long before the word got around, and Bob was flooded with requests for this equipment. It wasn't long before Bob gave up his hobby shop and organized Orbit Electronics in 1956 to produce his radio control systems.

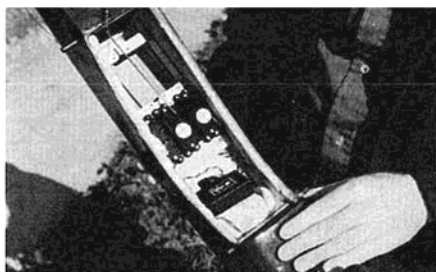
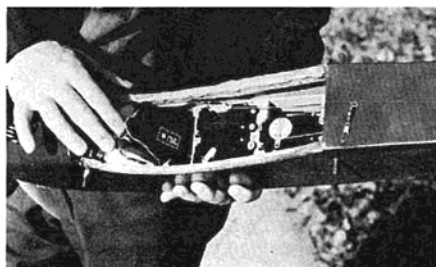
Orbit's reed radios soon gained a reputation for performance and reliability and in the following years the "black boxes" spread across the country and were seen at virtually every model flying field around the world. Bob Dunham, himself, won the Nationals in 1957, 1958 and 1959, and Orbit radios were used by the first place winners of five consecutive FAI World Championships.

As proportional control was introduced to the R/C world, Orbit produced their first Analog Control System. During the following years when Orbit was producing this system, they also developed a good reliable servo. The basic servo mechanism was then incorporated into the new digital equipment released in 1965. The Orbit servo proved its reliability and subsequently has been used by a great many other radio manufacturers.

Today, with reliability and performance of the digital proportional control systems at a peak, a new generation in model radio control equipment has made its appearance — miniaturization. We received one of the new Orbit radios for evaluation and testing, and the first thing that catches your eye is the small size of the receiver (2 $\frac{3}{16}$ " by 1 $\frac{1}{2}$ " by 1 $\frac{1}{4}$ "), and the new small servos. The airborne weight of the new unit is less than one pound. At this writing this is the smallest servo being produced with a wheel and double rack, and yet maintains the same type of construction and basic mechanisms as the larger standard Orbit servo. Tests show that the new servo also has the same 4 to 4 $\frac{1}{2}$ pound thrust as the larger servo.

The new radio is being manufactured in a 6-12 version, and will be referred to as the

6-12 IC. The transmitter is similar in size to the present 6-12 unit, and continues to use the Orbit ball joint type control sticks with electronic trims. This type of stick arrangement has worked very well, and we expect to see other manufacturers develop this type of stick assembly for their equipment.



As can be seen in the photographs, the Orbit type servos are easily mounted. Orbit is planning a servo mounting unit similar to the one used on the standard servo. Three servos can be mounted side by side in the fuselage in less than 2 $\frac{3}{4}$ ". The receiver takes less than half the space of previous Orbit receivers. It is recommended that the receiver be wrapped in a case of $\frac{1}{4}$ " latex foam, bound with masking tape, and placed in a plastic bag. Properly mounted, the receiver and servos will survive most crashes.

Before flying any new radio, R/C/M recommends that you bench fly your proportional system for several hours and recycle the re-chargeable batteries at least once before flying. The chances of components and battery failure are far greater during the first few hours of use than at any other time.

To test the new Orbit radio, we used a small model with a 48 inch wing that had been flying with an Orbit 7-14. This model

LAZY ALAN

(Continued from Page 47)

other motor controlled by a separate speed control. This would increase your ability to maneuver the boat twofold. Another small hint — if you do use a slot car speed control, a small fan hooked up to circulate the air around it would be a wise decision, as they do get quite hot when used at low speeds for any length of time. Situate the fan directly below the control so the air will be circulated up and over it. It may save you a smoking boat! A tug should smoke, but out of the stack, not the hull!

Well, there it is, the boat, the details and the controls. If I have missed anything to help you, I'm sorry, but I build slightly haphazardly and on impulse. So use your impulses, be a little haphazard, and enjoy it to the greatest extremes. There is nothing as satisfying as a job with which you yourself are satisfied. Enjoy your finished product as much as I have enjoyed mine and your fun and thrills in the operations will be endless.

I hope you will share this project with me and I wish you my best.



was a well worn Digifli, designed by Ed Thompson, which appeared in a back issue of R/C/M. The three new servos were mounted in the fuselage, in less space than two of the standard servos (see photos). The weight of the model was reduced by one-half pound with the new rig.

The most important features a modeler is looking for in radio equipment is quality and reliability. Over the years, Orbit has produced top quality equipment and the new Orbit Mini-Radio is no exception. R/C/M does not hesitate to recommend this system.

In addition, R/C/M has also tested a new "Mini-Mini" servo that Orbit will release later in the year. This small proportional servo is even smaller than many of the single channel servos on the market. Even more amazing is the three pounds of thrust of this little mechanism. Orbit expects to have an 8 ounce radio on the market in the not too distant future. (See chart for servo comparison).

There it is . . . a look at the present and future. Start building your mini-models for the new era of mini-radios.

Balsa Corporation of America's

COVERITE

A remarkable new covering material that is easily ironed-on; has a built-in "filler coat"; possesses remarkable strength; and can be finished with a minimum amount of time and materials.

As mentioned in the March Shop & Field, the two most significant areas of interest in R/C development, at present, are those of the new miniature digital proportional systems, and the innovations and progress taking place in the realm of aircraft covering and finishing.

In the latter category, Coverite is a new exclusive fabric especially woven to specifications for use by modelers on model airplanes and boats. Basically, Coverite is an adhesive backed, heat shrinkable material that is many times stronger than the customary silk and synthetic blend materials normally used in covering applications. Its primary advantages are its strength-to-weight ratio, ease of application, and ease of finishing, resulting in an extremely strong aircraft that can be finished with a minimum amount of time and materials.

The process for finishing with Coverite is simply to smooth sand and dust (preferably with a tack cloth) your framework to be covered. One coat of dope may be applied if desired. Then, cut a section of Coverite from the 22" x 40" sheet without removing the backing sheet that protects the adhesive from premature contact. The section of material should be approximately one inch larger around the perimeter than the area to be covered. Now, separate approximately two inches of fabric from the backing paper. Fold the latter over, leaving the adhesive coated material exposed. Assuming you are covering a wing, start at the center section, and with the exposed material (adhesive side down), stick the Coverite to the surface with your fingers. Reach under the material, holding the folded backing paper and pull toward the wing tip. In one smooth motion, you transfer the fabric from the backing paper onto your model. Adjust and smooth the material to the surface, working it around the leading and trailing edges, and tips.

Now, set your household iron at the "wool" setting. Allow to heat to the proper temperature, then cut a strip of Coverite approximately $\frac{1}{2}$ " wide by 5" long, remove the backing paper, and hold the test strip by the ends with the fabric side toward the iron. If the temperature is correct, you will notice a shrinking of the test strip. If it is beneath the recommended temperature, no shrinkage will occur. Alternately, if the iron is too hot, melting of the fabric will occur.

Once you have adjusted the iron for the proper temperature, seal all the edges of the structure contacted by the Coverite. Trim off excess material, allowing $\frac{1}{4}$ " overhang

all the way around. Iron the balance of the surface, sealing and drawing it tight in one operation as you move the iron gently and lightly across the surface. All wrinkles will disappear as you iron.

It is recommended that on wings and stabs you cover the lower surface first. Trim the overhang even with the perimeter of the structure, then cover the other side of the panel. On this side, allow a $\frac{1}{4}$ " overlap to the underside.

For fuselages, we recommend that you use two pieces of material, each covering one side and overlapping the top and bottom centerline of the fuselage by $\frac{1}{4}$ ". Control surfaces can be covered with one piece, overlapping the final side by $\frac{1}{4}$ ".

All of the above described procedures actually take a lot less time to accomplish than they do to describe. When completed, the most remarkable features of Coverite are immediately apparent: The obvious strength of the covered structure, and the fact that the adhesive backing has filled the pores of the material. As a matter of fact, if you're covering a glider, no additional fillers or paint would be required, unless desired! For a spectacular glider finish, try mixing HobbyPox Clear according to the manufacturer's directions. Allow to stand overnight. The next morning, mix a proportion of analine dye powder, in the color of your choice (obtainable at chemical supply houses) in HobbyPox thinner until the dye is completely dissolved. Add to the HobbyPox Clear. Repeat until the desired density is obtained. Mix thoroughly, then put the HobbyPox in the oven at 200 degrees F. for thirty minutes. Remove from the oven and spray on your covered aircraft. The resultant transparent color is beautiful to behold, and the described preparation process will enable the paint to tack dry almost immediately, thus eliminating the dust pick-up problem so often encountered with the normally slow drying HobbyPox material. Beautiful "candy" colors can be obtained by this process with some experimentation.

For a "quickie" powered aircraft finish, AeroGloss color can be sprayed directly on Coverite without any undercoating of clear dope, or other fillers. A finer finish can be obtained by using normal filler-finish coating processes.

Virtually all normal model finishes can be used on Coverite. AeroGloss dope was found to be incompatible with Coverite in a majority of tests conducted in the Southern California area. AeroGloss is not a butyrate dope, but a nitro-cellulose material with certain fuel resistant additives.



Take-off scene at Lake Lugano, Switzerland hydro contest. Ettore Gatelli, Ispra, Italy reports excellent flying.

Aerogloss in standard aerosol cans were applied by RCM in various other regions of the U.S. and found to be completely compatible with Coverite.

Other uses for Coverite include wing center section reinforcement by using laminations of the material instead of the more conventional fiberglass and resin. Boat hulls can also be covered with this material. Patching a punctured or torn area of Coverite is easier than with any conventional material, due to the adhesive material on the fabric. All that is necessary is to clean off all foreign matter and oil from the affected area. Next, cut a piece of Coverite larger than the hole to be repaired, remove the backing paper, and apply. Heat seal all edges and iron the surface. After the patch is tight and sealed, duplicate the original finish with matching paints.

Coverite is heavier than conventional silk and synthetic fabrics due to the weave and adhesive, however the strength-to-weight ratio is outstanding, and the elimination of the many coats of filler required on conventional materials balances out the overall weight.

Coverite has been tested, and is approved and recommended by R/CM.

Availability: Coverite, \$2.95 per 22" x 40" sheet. Manufactured by Balsa Corporation of America, Command Master Division of Sterling Models, Belfield & Wister Streets, Philadelphia, Pennsylvania 19144. Available at your dealers.

Hawaii R/C Club beginner Av. Ord. 2/C Chuck Penning. VECO 19 and C.G. Falcon. Newcomers still do best with standards and experienced help.





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