GOODYEAR SPECIAL: DICK RIGGS AEOLUS

CDC

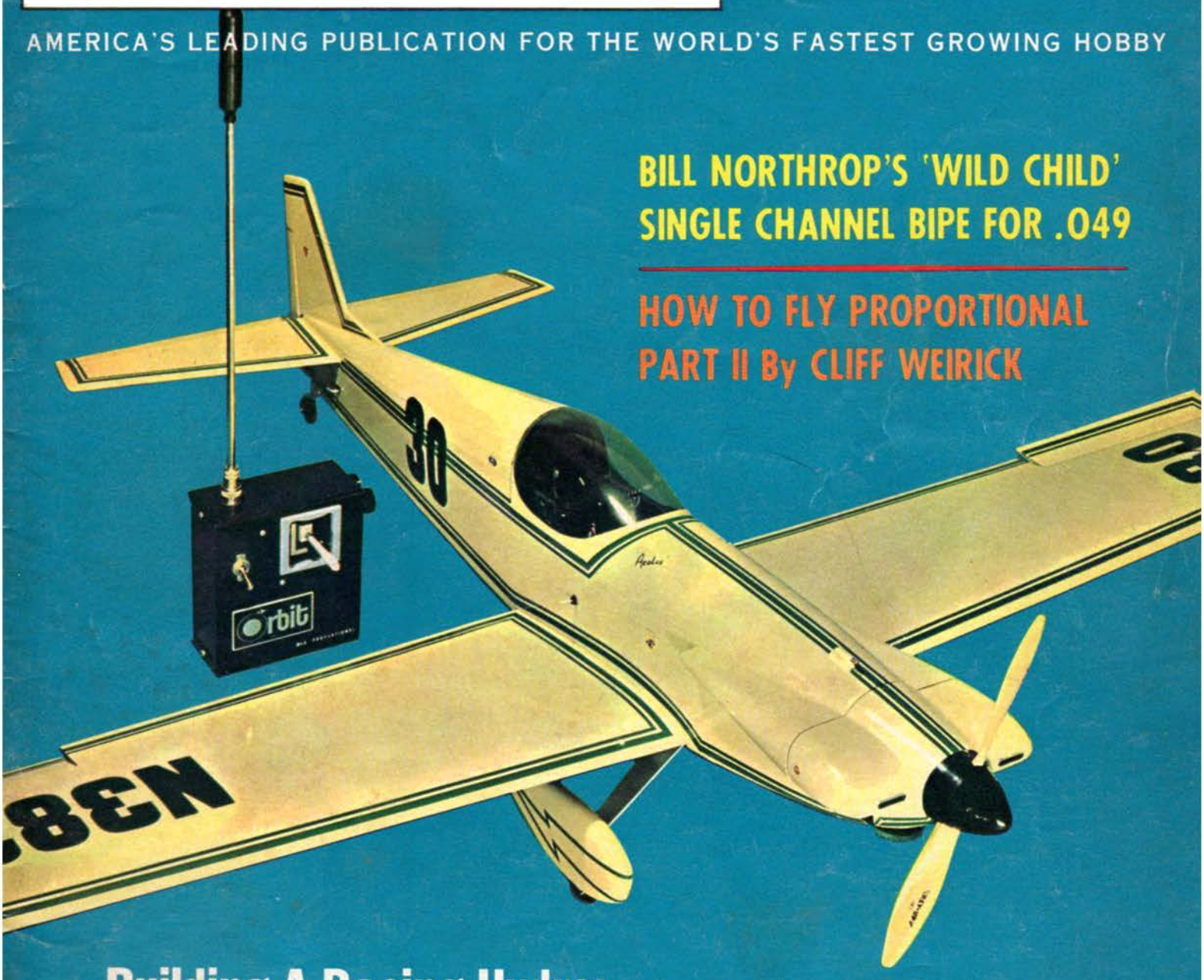
radio control Modeler

MAY 1965 50c

AMERICA'S LEADING PUBLICATION FOR THE WORLD'S FASTEST GROWING HOBBY

BILL NORTHROP'S 'WILD CHILD'
SINGLE CHANNEL BIPE FOR .049

HOW TO FLY PROPORTIONAL
PART II By CLIFF WEIRICK



Building A Racing Hydro:
G.E.M.'s 'CHALLENGER'

BUILD THE RCM TRANSMITTER BY DON MATHES

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 ψηφιοποίησης τους, τον καθαρισμό τους αλλά και να τα μοιράζομαι μαζί σας αφού τα δημοσιοποιώ στο διαδίκτυο (όσα από αυτά επιτρέπεται λόγο 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.

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.(Η.Ε)

Το ψευδώνυμο μου Hlsat.

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

A few words about me.

I am Electronic Engineer and this is my true work job.

From small two things attracted my interest and I dealt with them.

First electricity and secondly the blue sky and the air him.

The model aircraft hobby met him in October 1973.

I love the wooden structures from scratch airplanes and boats.

I started collecting plans, articles, books and anything else that could help the hobby of many years ago.

I have created a very large personal collection of them.

Since 2004 I became involved with the digitization, clean them and to share with you since the public on the internet (as many of them are allowed reason of copyright).

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.

Certainly it is a very long, difficult and tedious task but I believe with the help of all of you to finish in a good but long 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 good construction.

My name is Elijah Efthimiopoulos. (H.E)

My nickname Hlsat.

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

Hlsat * H.E * Plans

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.

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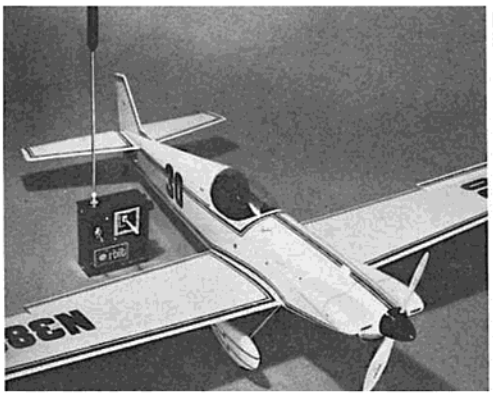
Thanks Elijah from Greece.



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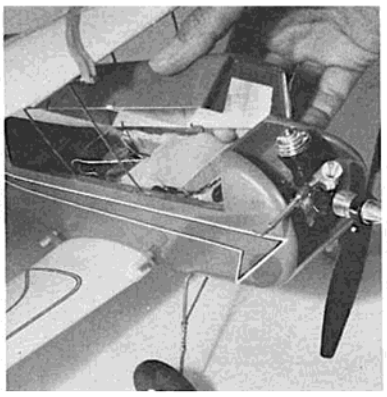

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FEATURES

DEPARTMENTS

COVER

The Aeolus — magnificent Goodyear racer by Dick Riggs featured in this issue. Orbit 3+1 proportional.

Ektachrome by RCM Staff Photographer Gil Duarte

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EDITOR'S MEMO

by DON DEWEY

ONE OF THE MAJOR drawbacks to editing a publication such as RCM is that it is not only difficult, but seemingly impossible at times, to determine just what you, the reader, want to see in this magazine. And, since we are only individuals — active RC'ers engaged in a hobby we enjoy — located in a single geographical area of the country, we often tend to lose perspective on the overall aspect of this sport.

For example, if you were to attend a weekend flying session at a local Southern California field, you would see almost no single channel escapement flying, no single channel pulse proportional airplanes, and a multitude of full house reed and proportional equipment — all of the latter encompassing today's most popular, hot multi designs.

And yet, this is certainly not true of the entire country. Single channel equipment with motorized actuators continue to hold their own in sales . . . pulse equipment for single channel applications is reaching an all-time high in sales . . . magnetic actuators are becoming more and more prevalent . . . several manufacturers are already substantially backordered on complete single channel, dual proportional systems.

We are all guilty, to some degree, of bias and prejudice towards a favorite aspect of our hobby — conditioned, perhaps, by what we see around us in the greatest numbers. We have a tendency to jest about single channel airplanes with escapements and the guy who flies from the local schoolyard or large vacant lot.

And yet most of us started in just that manner.

We recommend to the beginner that he start with multi equipment, since it is more reliable. And, sometimes, we even suggest full house proportional equipment to the beginner.

Assuming, of course, that this beginner has several hundred dollars to spend on a hobby he, as yet, knows very little about.

We say that Galloping Ghost and Kicking Duck and other forms of single channel proportional control are "Mickey Mouse" — they require hours and hours of tinkering with little chance of success.

And a 'tinkerer' shows up at the field with an .09 powered Galloping Ghost ship and puts in flight after flight that is almost on a par with most of the multis around. And we remember that it was 'tinkerers' like this who made this hobby possible.

And so, in wearing our blinders, we do a great injustice to the beginner — and to the sport flier — who couldn't care less about a 70 mile an hour multi that looks like everybody else's model . . . the sport flier who enjoys taking his wife and kids up on a hillside and flying his escapement powered airplane around — maybe even letting his wife push the buttons a few times.

And if that RC'er puts in a few successful flights and goes home with the feeling that he's the greatest pilot in the world, who's to say he is not?

Someone once said about yacht racing that you can have as much fun with a $100 dinghy as you can with a quarter million dollar ocean-going racing yacht.

And that perhaps the amount of fun you can have with a hobby is inversely proportionate to the amount of money you spend.

This is a hobby — a sport where every man has the right to select his own form of pleasure, be it the Class III contest trail, or the thrill of seeing his original design perform for the first time, or watching the first successful flight of a simple proportional system he has designed and built himself.

As a example, Chuck flies a fibreglass and foam 'Candy' design with a popular full-house proportional system. On Sundays he is down at the field flying with the local group of fifty to a hundred other RC'ers. He enjoys his participations in this hobby. On the other hand, I enjoy flying a single channel airplane with escapement, or with a 'Mickey Mouse' flapping rudder and elevator, up on a hillside near my home. Perhaps I only get in five flights to Chuck's fifteen — but who is to say my little .049 ship

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EDITOR'S MEMO

(Continued from Page 6)

with the sun shining through its colored silk wings, catching an occasional thermal, is any less a part of the hobby than the $800 proportional ship that I have sitting on the shelf?

You don't **have** to fly in contests . . . you don't **have** to build a Goodyear racer . . . you don't **have** to buy a proportional system to have fun in R/C. We might recommend a six channel rig to a beginner . . . we might say that single channel escapement flying is a thing of the past . . . we might say that Galloping Ghost is a tinkerer's hobby . . . and in a certain light, each of these statements is partially true. But each of these is part of this hobby — an important part, if you will — and you can have a lot of fun with them without feeling as if you're a "poor cousin" to the sport.

I know, because I do exactly that. And I am sure that there are other hillsides . . . other schoolyards beside my own. You might be surprised at the fun you'd have if you gave them a try.

●

While we're on the subject of having fun with this hobby of radio control, we came across an outstanding guest editorial by Owen Kampen that appeared in the March issue of the Marcs Sparks, publication of the Madison Area Radio Control Society. We'd like to reprint it here:

"Not too many years ago, the prime objective of the R/C modeler was to have his bulky and unreliable equipment work long enough to get a plane off the ground — control it through a few simple maneuvers, and return it in one piece somewhere within a half days walking distance. Not too much thought was given the model itself, which was considered primarily as a vehicle to carry the assorted collection of home built electronics. The piloting was often a question of making as few goofs as possible, and contest winners were usually decided on this basis. While luck played a role, it was less quixotic than trying to hook an invisible thermal.

As equipment improved through miniaturization, sophistication, and reliability, sleek models evolved, taking advantage of the new electronics. And piloting skill reached an all time high. Today, the Sunday flier casually executes maneuvers that were once but a gleam in 'Pappy's' eye. Contest flying has attained such excellence that the impossible appears easy, and winners are determined by a decreasing point spread.

In view of this accelerated progress of R/C flying, one might think utopia has arrived. However, a study of newsletters and model magazines casts some doubts. Everywhere are letters and editorials concerned with the rules, the Junior problem, professionalism, the rules, falling attendances at contests, the rules, etc., etc., etc. Regarding the latter two perennial problems, there would seem to be some cause for concern.

If you would really look around at the activity at an R/C contest, you might be somewhat surprised at the rather casual interest given to flying. Most contestants sat in the hot sun waiting their turn while others flew the pattern — flew the pattern — flew the pattern. A pattern which is, and has been, the subject of thousands of written and spoken words — a subject of unending debate. And how about the spectators (including the future modelers of America), where are they? How long did they stay around to watch the repetition of performances?

Our club has had its greatest success with meets which emphasized novelty events. They were fun for all because of one thing — they were unpredictable and there was an element of surprise and suspense.

In view of this situation, let's take a fresh look at the whole contest situation and how it can be improved for **all** concerned. Let's do this by re-examining the whole contest concept, rather than nit-picking the pieces.

There are precedents to guide us — if we would be guided. When the National Air Races were renewed last fall, the show was highlighted by the aerobatic competition. This was the real life counterpart of our contests, but it had one major difference. A prescribed pattern **was** flown by each contestant, however the payoff was the 'open', or 'freestyle' event in which each pilot created his own flight program. The results were original and spectacular. The interest mounted as each pilot put on a new and **different** display of his abilities.

Here then is a ready made way to break the chain of monotony which now dominates our contests. The advantages are obvious: (1) by considering the pattern as a qualifying round to demonstrate competence, it could then be shortened and simplified through the combining of maneuvers plus the elimination of some (2) part of the contestants total score would be determined by this and low scores would be eliminated from the final event (3) the 'Free Style Event' would at least bring R/C flying into its own and eliminate the present situation where some of the most exciting flying is done **after** the contest (4) spectator interest, contestants and observers alike, would be immensely increased and the selection of winners would be made easier (5) new life would be injected into the hobby and its contests.

As to its practicability — it's already been done, and with resounding success — at last year's 'Detroit Invitational.' The answers are there for all to see.

Is anybody looking?"

●

One of the two feature construction articles this month is Dick Riggs' 'Aeolus' (named after the legendary Greek god of the winds). This is one of the finest Goodyear racers we have seen and should be a top contender in the forthcoming season's pylon events. Whether or not you want to build this ship, and event if you have only a passing interest in the Goodyear event, you'll want to read Dick's article. His analysis and comments concerning this phase of RC reflect a great deal of thought and consideration — we're sure you'll like it.

The other construction article is the 'Wild Child' by Bill Northrop. For the newcomer to this hobby, Bill is a copy boy for a little pulp publication published somewhere in Greenwich Village. The editor of that publication, felt sorry for Willie and gave him a roll-top desk of his own in a musty corner of the office. Our intrepid vendor of paper clips then displayed his true colors and sent an article to a competitive publication — ours. We were saddened by the fact that ol' Bill would treat his benefactor in that fashion, but we had to print the article. The check he sent with the material made it worth our while . . .

Seriously, Bill and I hack away at each other on almost anything, anytime. We disagree on everything. Almost. We're both biplane addicts. Plus one other thing. Although we'll be back at war next month, Bill and I are friends.

But we'll never admit it. Welcome aboard, Willie.

●

One more time . . .

TECH QUERIES

DON MATHES

Questions for TQ should be addressed to the Technical Editor, R/C Modeler Magazine, P.O. Box 487, Sierra Madre, California. Please enclose a stamped, self-addressed envelope for reply.

Q. I am somewhat puzzled by the commercial charges for nicads — none of them seem to have a voltage regulator. According to the charts in the November RCM there are maximum charge voltages recommended.

HANS MARKESTEIN San Bruno, Calif.

A. To the best of my knowledge all of the chargers on the market today are satisfactory for charging nickel cadmium batteries. The simple, transformerless chargers are, in fact, endorsed by the major nickel cadmium manufacturers as being completely satisfactory. Basically, they charge at 10% of the ampere hour capacity for a period of 14-16 hours. It is a good idea not to leave your nicad pack on charger longer than 24 hours.

Q. I am having difficulty wiring my eight channel installation. Can you give me the names of several good books on R/C modeling, both construction and electronic? Also, I plan on using a Torp 45 or Max 40 — which is easier to break-in?

KEN HILL Garden City, Kansas

A. Bill Winter's new RC book, published by Kalmbach Publishing Co., Milwaukee, Wisconsin, is excellent. You might also check the Gernsback Publishing Company list for several other additions to your library — these are available at most major electronic stores or from better bookshops. With regard to the two engines you mentioned — both are excellent, but the Max may break-in a little faster.

Q. I would like to know what type of small spray guns are suitable for spraying butyrate dope. We have had very poor luck with some of the larger types of spray equipment. Are the air brushes suitable for dope?

R. C. ANDERSON Sunnyside, Washington

A. Your problems with the larger spray units are probably due to insufficient air pressure. These larger guns usually require a tank-type compressor inasmuch as at least 60 p.s.i. pressure is needed. I use a type EGA DeVilbiss with a diaphragm type compressor which is more than adequate. The small air brush type gun does not seem to be satisfactory except for small detail work.

Q. I recently purchased an Ecktronics 'Courier' relayless receiver without instructions. Although I have a schematic, I was unable to operate the receiver with a Citizen-Ship TTX tone transmitter. Will this transmitter work with this unit?

ROBERT GOETZ Norwalk, Conn.

A. I suspect your receiver is inoperative since the transmitter you specified should be completely satisfactory for use with this unit.

Q. I am contemplating the purchase of a Min-X Pulsmite 1200 unit but would like to use it with feedback servos and transistor output rather than relay. I would appreciate any information as to someone who has done experimenting along this line.

SCOTT CHRISTENSEN Boulder, Colorado

A. I would suggest that you contact Jack Lemon at Min-X Inc., or Bernie Murphy at Accutrol Engineering, Linthicum, Maryland. Both Jack and Bernie have been working with feedback conversions for this unit to the best of our information.

Q. Members of our club would like to have a fuel formula for mixing our own fuel. Also, what are the best type of hinges for strip ailerons? The mylar units seem to split and crack easily in cold weather whereas nylon seems to make a stiff hinge. We do not like sewn hinges.

JOHN MONTGOMERY Topeka, Kansas

A. For a fuel formula, try 70% methanol, 25% Bakers AA castor oil, and 5% nitromethane. For sport flying, delete the nitro. This is an excellent all-around fuel for the medium and larger mills. Insofar as the hinge problem is concerned, either the wire and brass tubing type or the plywood and dacron line will work quite well. The latter is simply two pieces of 1/32" or 1/16" plywood about 1" long and ½" deep around which the dacron or nylon line is wrapped in a figure eight stitch. The wrapping is then coated with glue. The completed hinge is inserted and glued into a slot into the control surfaces, becoming almost invisible.

Q. I recently completed RCM's DQA 704 and would like your personal opinion as

(Continued on Page 9)

TQ

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to equipment for it. My hobby dealer says the Controlaire Mule transmitter with the Controlaire 5 relayless receiver and an escapement would be highly satisfactory. Another modeler says this is outdated. Yet another RC'er says that the Babcock system wouldn't be right for it. Your advice would be appreciated.

WILLIAM AMEEN Jamestown, N.C.

A. We have, at RCM, used all of the equipment mentioned above. If you live in a sufficiently "CB-isolated" area and do not anticipate any adjacent channel flying, the superregen Controlaire receiver with the Mule tx. will work quite well. A Citizen-Ship SE-2 escapement will fit into this combo nicely. The Babcock BC-21 system with its higher interference immunity will also work quite well and comes pre-wired. In addition, you have kick-up elevator from their escapement. Both are reliable and should work quite well — they have for us.

Q. I have recently started using white glue in modeling to avoid fumes which affect a personal health problem. Would you please tell me if epoxy type fumes are any safer to breathe than butyrate or nitrate dope?

FRED SANDBERG New York, N.Y.

A. Any type of epoxy or polyester should be used under adequately ventilated conditions. Since you apparently have a particular health problem, I would suggest asking your physician's advice on specific chemicals.

Q. Where can I obtain a 500 ohm relay as used in the article on Feedback Proportional for Rudder Only, and for use with a Babcock BC-22 system?

HUBERT ASHBURY Bluefield, Va.

A. This relay can be obtained from the W. S. Deans Co., 8512 E. Gardendale, Downey, California. Price is approximately $4.95.

Q. I have most of the parts necessary to construct a transmitter transverter such as the Ace A3.6CK, but need the cup core transformer. Where can this be obtained?

GERALD WEAKLEY Notchitoches, La.

A. I believe this transformer can be purchased wound and tested from Ace R/C, Box 301, Higginsville, Missouri along with all pertinent data for its use.

Q. I am building a Sterling P-51 for proportional control and would like any information as to the installation of retractable gear.

LEN LESNEFSKY White Plains, N.Y.

A. I suggest that you read Mal Davis' article in a past issue of RCM, illustrating his method of retracting the landing gear from an auxiliary channel on his Bonner Digimite proportional system. You might also contact Hal deBolt at deBolt Model Engineering, Buffalo, N.Y. for information concerning the use of their retractable gear units.

Q. My Citizen-Ship TMS transmitter and ZR-10 receiver is on 27.045. The only other superhet around is a Min-X Powermite 6 on 26.995. At about fifty feet his motor control will actuate my elevator control. Is there any way I can correct this in my receiver by changing antenna length, tuning, etc. My transmitter does not affect his receiver. Also, can I use seven or eight 500 mah nicads pencells for a transmitter power supply? Can I use 225 mah nicads for the receiver if separate from the servo supply?

FRED WIEMER Cumberland, Maryland

A. Little can be done about the adjacent channel interference you are experiencing — apparently a cross-modulation problem inherent with this receiver. Insofar as your transmitter supply is concerned, seven or eight 500 mah nicads are perfectly satisfactory. The 225 mah nicads you mentioned are adequate for the receiver power supply as long as they are isolated from the servo supply. The latter requires either 500 or 600 mah nicads.

Q. Is there any law against using a pulse or ram jet as a source of power for an RC plane? I am building a 1"=1' model of the Lockheed U-2 which has almost equal nose and tail moments. Will this configuration effect the C.G. — will the location of the C.G. as mentioned by Chuck Cunningham in RCM's "RC Design Made Easy" still apply? What airfoil would you suggest I use on this type of model?

DOMINIC ARADIO Buffalo, N.Y.

A. Some states have restrictions against jet engines, California for one. I suggest you check with your local authorities. The formula for arriving at the proper C.G. will not appreciably change with this design. As for the matter of the airfoil, I would suggest using a 2412 or 2415 semi-symmetrical section.

Q. I am building a Blackwell "Snapdragon' to be used with a Cox .09 engine. Radio gear will be a Kraft 3VK relayless receiver, Ace add-on switcher, Bonner Vari-Comp, and 225 mah nicad pack. What kind of a switch should I use, SPST or DPST? If I add motor control will this require a larger battery pack? What kind of multitester would you recommend for RC use? How long should I charge these nicads? At what rate?

JIM GRAY Hyattsville, Maryland

A. Either a SPST or DPST can be used in this installation. Your nicad pack will be all right with the addition of a motor control escapement. Charge these nicads at 20 mah for 14-16 hours. For a multitester, try either an Aristo or Royal — both are good all-around units for the modeler.

Q. Being a beginner in R/C I have come to the conclusion that the more control you have, the better — am I right? Would it be better to invest in a full proportional system rather than buy a single channel unit and then have to buy a larger unit later on?

LARRY GUSTAFSON Ranier, Minn.

A. More controls doesn't necessarily mean it will be easier to fly. The beginner can get into trouble fast with sensitive ailerons. I suggest that you start with rudder, elevator, and motor control — either with reeds or proportional. Let your pocketbook be your guide as to full house proportional or a less expensive reed system.

Q. With regard to your "Feedback Proportional for Rudder Only" article, I want to use the Royal #7 servo instead of the Accutronics unit. How do I hook it up?

GEORGE ZAVADA Lincoln Park, Mich.

A. The Royal #7 is not intended for proportional operation. If you want a motorized rudder actuator for single channel usage, simply hook it up per the instructions included with the Royal servo. However, for proportional operation, a feedback servo must be used.

Q. Can a multi channel reed transmitter be used for single channel? Can multi channel equipment be used for rudder only? Do you feel that an .09 is better to start with than a larger motor and subsequently larger airplane? I don't want to get an assortment of stuff for several size models and end up with everything but what I need.

W. W. MARSHALL New Bloomfield, Mo.

A. Apparently you want to fly the simpler rudder only control and wish to switch to more controls at a later date. With this in mind, you can use your reed system for rudder and/or rudder and throttle control and add servos later on. You might start with a Falcon, Tri-Squire, etc. Suggest, however, that you obtain a .15 or .19 engine so that you can use it with the additional weight you will incur as you add more servos.

Q. Insofar as trimming out my new proportional ship is concerned, I find that the only variable for the C.G. is a whopping 8 ounces of fuel, and this goes from 8 ounces down to zero ounces as the fuel is consumed. Shouldn't the fuel tank be placed on the C.G.?

J. SAM JOHNSON Lake Worth, Florida

A. Placing the fuel tank back on the C.G. would necessitate an extra long fuel line and thus would have serious effects on needle settings as the tank empties. A properly trimmed multi will evidence very little change in flight attitude between a full and empty tank.

SUNDAY FLIER: Ken Willard

If you think full-house proportional for .020's is impossible, you may be in for a surprise . . . Read on, and see what the future holds in store for the Sunday Flier.

Last week this Sunday flier went to heaven. Yessir, heaven. Let me tell you about it.

Maybe some of you figure I should have gone to the other place. I've been told to on a few occasions because of my expressed interest in small airplanes, escapements, and single channel equipment. Like — "Get with it, old boy. Give us some multi channel ideas. Everybody's going over to it!"

Well, I've never really been opposed to servos or multi channel. As I've said many times, small airplanes are my area of interest, and until servos and multi channel equipment are developed which are small enough — and reliable enough, I'd stick with the escapements and single channel receivers.

A couple of years ago the first signs of a breakthrough appeared. We flew a Schoolmaster with Annco servos, a C & S six channel relayless receiver, and a small nicad battery pack. It flew on ½A power, but for real solid performance an .09 was the answer. Things were looking up, though.

And last week — the promised land! Reliable, simultaneous proportional gear in a ½A airplane. And done with single channel equipment, too!

So where was this heaven? Toledo, Ohio — and we went through a h— of a snowstorm to get there.

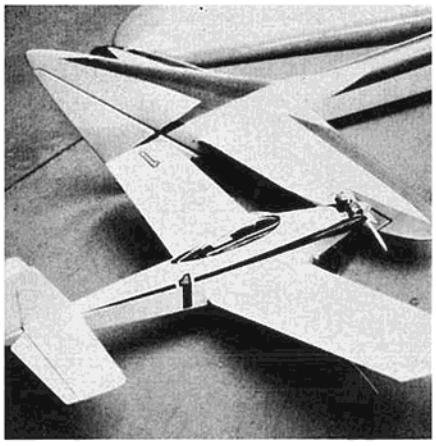
Elsewhere in this magazine you can read about the exotic stuff — all the didiotic and analousy feedpen circulators (uh—maybe that's digital, analog, feedback and circuitry). I'll stick to the Sunday flier's requirement for results, not method.

First let me say that although servo design, weight, operation and reliability have now reached the stage where they are replacing escapements in popularity, there will always be a place for escapements — at least for some time to come. But the single channel servo, and it's companion, the actuator, have come of age. This was completely apparent at the Toledo Weak Signals Club's 11th Annual Midwinter R/C Conference.

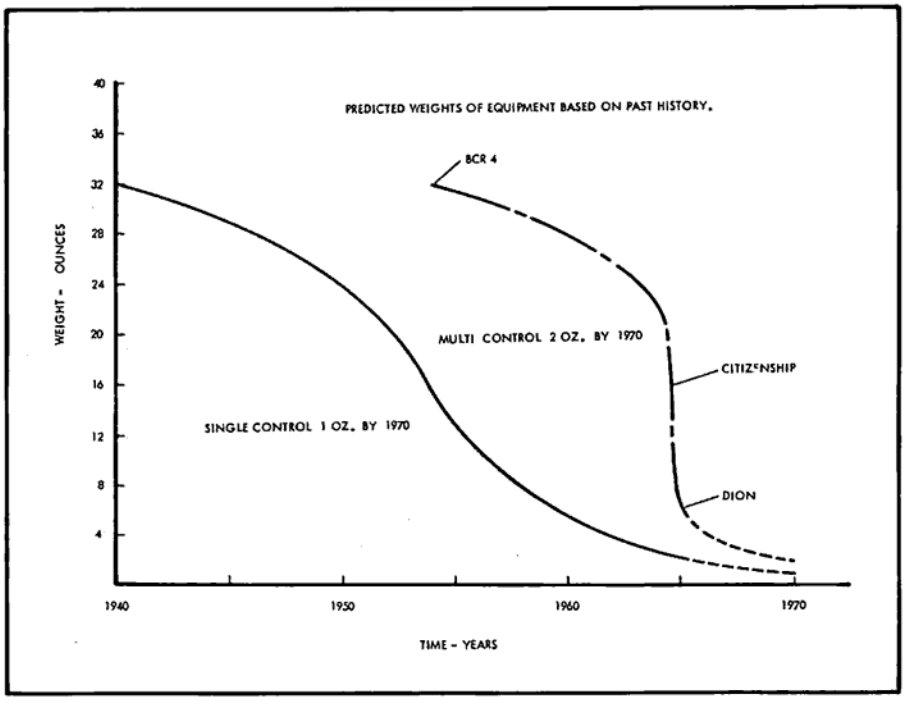
There were some 32 commercial exhibits — and some really beautiful models, but I concentrated on the items which I felt would be of most interest to sport fliers — items which are simple to install, comparatively light in weight, and relatively low cost.

First off, there was the Royal Products servo. Since this single channel servo, with the motor control unit, has already been reviewed in RCM, all that needs to be said here is that the unit has now been out in service

(Continued on Overleaf)



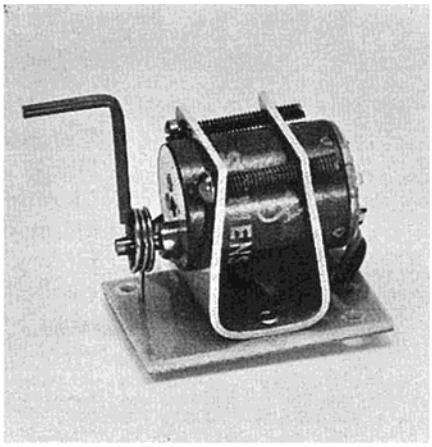
Walt Reissig's 28" Cosmic Wind next to 40" stab of Cream Puff. Proportional control in both.

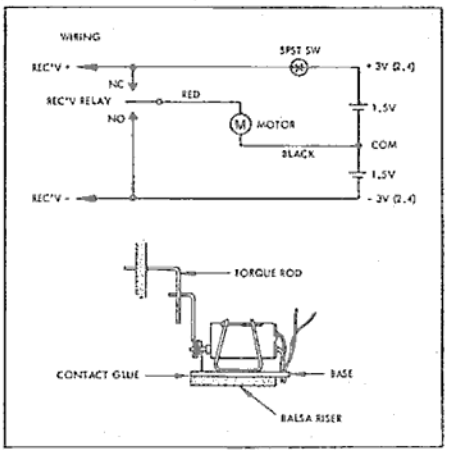


How small is small? A look at the chart will show you the results of miniaturization in equipment design.

SUNDAY FLIER
Continued

Right: the Tomoser PA-1R proportional actuator is excellent for .010 to .049.





with the modelers all over the country, and the glowing reports attest to its highly satisfactory performance. Sure, it would be nice to have elevator, but for rudder only flying, with positionable motor control, this one is hard to beat. Then I looked over the Accutrol Minipulse. This is also competitive in price, and gives proportional rudder with trim motor. Astroguide demonstrated the new magnetic Adams actuator. Real power — enough to control four to five foot models with proportional pulse rudder. Yet, very satisfactory from the weight standpoint if you want to use it in an .02 job.

Babcock's magnetic actuator and the BC-22 system was also on display. It isn't as powerful as the Adams, but when tied in with the 6000 cycle tone of the BC-22 it certainly ignores the mobile citizens' rigs unless the guy is practically right on the field with you. Hard to beat if you like proportional rudder in small ¼A jobs. Incidentally, although not shown at Toledo, Tomoser has come out with a proportional actuator, the PA-1R, weighing ¾ oz, which will control up to .049 jobs. It is competitively priced at $11.95. I've included a photo and wiring diagram for this little unit.

So competition, as always, has brought about a situation where servos and actuators are really coming of age, and the escapement will gradually be relegated to the "special purpose" airplane. But don't overlook that category — in fact, I'll have one for you in the near future.

While at Toledo, I showed some of the modelers a new servo which I just received from Japan. Kinjro Kondo, of Kondo Kagaku, sent it to me for evaluation. He has come up with a servo that does everything the Mark V Babcock escapement can do — gives selective rudder, up and down elevator, and quick blip for a motor control. It looks good, and there was a lot of interest, but I haven't had a chance to test fly it yet. However, it's another strong entry in the rapidly growing servo field. In fact, if we don't watch out, the Japanese servo industry will dominate the market. I was talking with Don Dewey after returning from Toledo, and he gave me a glowing report on the new Sankyo single channel servo from Japan. They're small, lightweight, as fast if not faster than escapements in action, with tremendous power. The rudder servo has two outputs either for flying aileron only, or rudder and steerable nose gear — or if you want to tinker a bit, coupled aileron and rudder. The system has proven excellent in tests to date.

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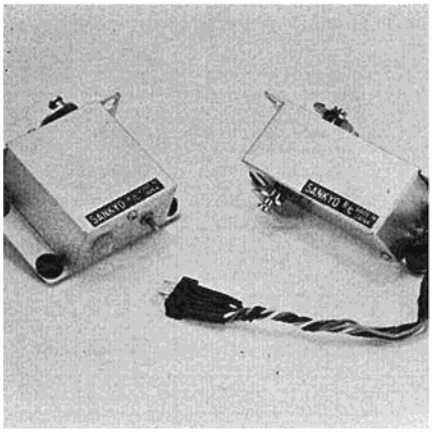
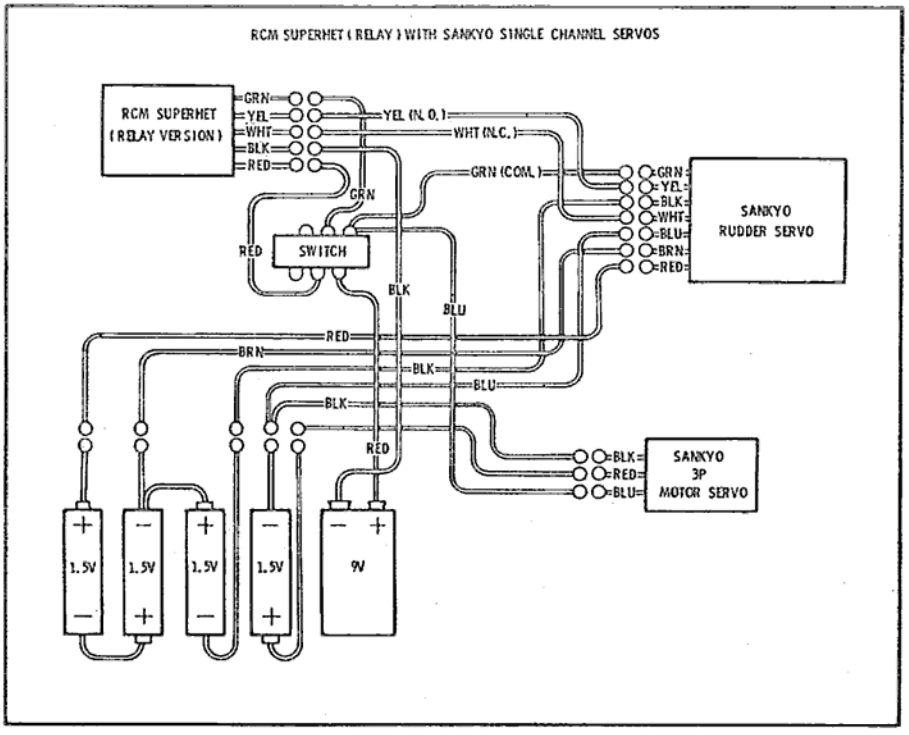


Right: the Sankyo single channel servos provide selective rudder plus three speed motor control.



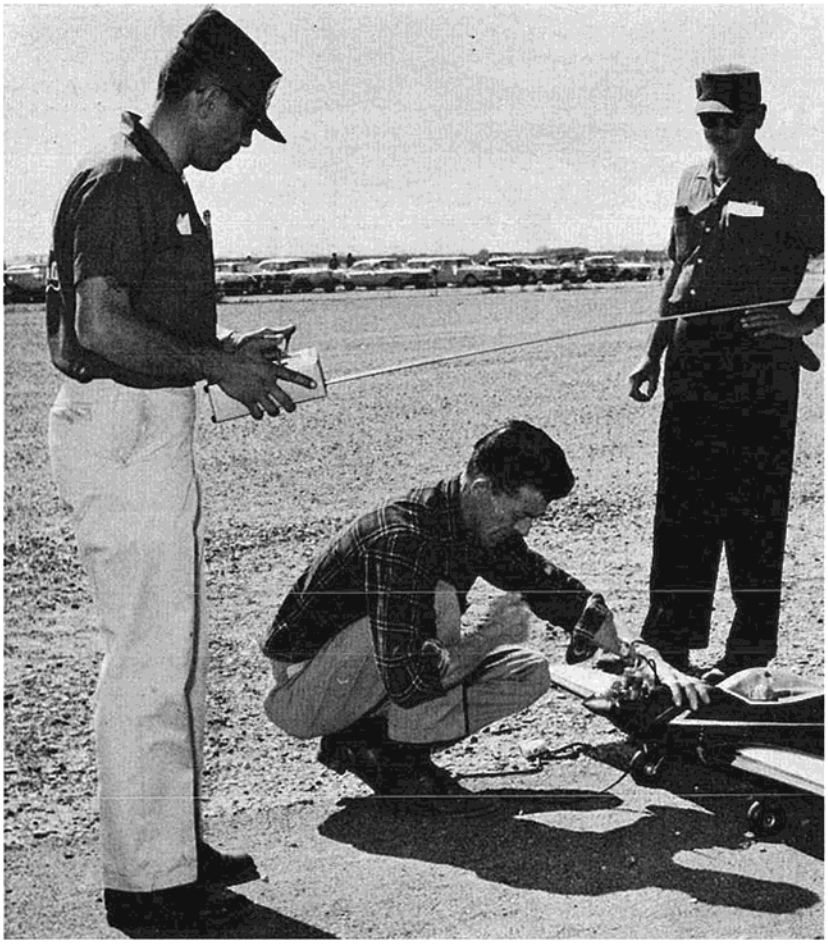
RCM SPECIAL — Part II

An Approach To

FLYING PROPORTIONAL

by Cliff Weirick

Second installment in a three part series on the techniques of flying multi proportional. In this issue, the Nat's Champ describes the Class III maneuvers . . . plus a few contest winning "secrets" . . .



Hi there, sports fans! Here we are again.

I assume that by now you've done all the practicing that I mentioned in Part I of this article. Believe me, anything that I say here will be of little value if you don't throw in that word **'practice'**. Now let's get down to the fine trimming of your airplane. This, in a way, is practice. Every time that you change the trim on your airplane you must go up again and practice some of the maneuvers to see if this particular trim change is aiding or abetting the model's flight characteristics.

First of all, let's trim the model out so that it flies hands off—exactly straight and level with no yaw tendencies. This, in itself, takes quite a bit of air and ground time. Be very careful because this is the ground work that you must lay for all of the trim changes that you will be making in order to literally be able to fly the contest pattern without any corrections.

Now that the model is trimmed out for straight and level flight, let's try some violent up-elevator maneuvers. The idea here is to see if the airplane tends to yaw either to the right or left during these abrupt changes in attitude. If it tracks perfectly through a tight loop, you've got it made! This, however, is a rarity. If it yaws, you must determine whether to correct for this condition with aileron or rudder. Normally this would be corrected with the latter, although speaking from my own experience with the 'Candy' design, I have found that I must use a slight bit of right aileron rather than rudder. The reason for this is simply due to the drag created by the aileron itself.

Now, assuming that the model tracks through these loops, let's try some outside loops. Again, it should track through. If it does not, you are going to have to reach a compromise in your settings as they will vary slightly from those that you use for The inside loops. This may all sound very futile, but with a little effort you will reach a point where it will track perfectly both ways. At this point I might add that for the checking trim

(Continued on Page 13)

The author with F&M proportional system as Jack Blything of Woodcraft prepares the El Tigre for flight. Willie Smith at far right. Photo taken at Southwestern Regionals by Dick Tichenor.

FLYING PROPORTIONAL

(Continued from Page 12)

maneuvers you should head as directly into the wind (or downwind) as you can, since any slight amount of crosswind will automatically cause your airplane to lose its tracking.

Now that your model is trimmed for the inside and outside loops, let's try inverted flight. In the inverted position you should hold a small amount of down elevator — or, if you prefer, — crank in a little bit of down trim so that, once again, the model is flying straight and level. Check your inverted flight for any yaw tendencies. You may have to make a couple of additional trim corrections. Always keep in mind that if you make any trim corrections at all, you must go back and try straight and level flying right side up as well as the inside and outside loops. If it is flying nice and true while inverted, you've just about got the thing whipped. Try a few turns while inverted, taking note as to whether the model tries to steepen up. Watch the latter closely as most designs have a tendency to steepen up in one direction of turn as compared to the other. Personally, I don't worry about this since only a very small portion of the contest pattern requires you to fly inverted. As a result, I am content to simply work a little bit harder during this period.

I am not going to try to tell you which control surface to move during these trim changes since I have yet to see two airplanes, even of the same design, that require the same trim changes. This is something you will have to think about and work out for yourself. One point to keep in mind during the time when you are making trim changes: When you remove the wing to make an aileron correction, and then replace it, be sure you have plugged in the aileron servo. (Willie Smith, take note! — Ed.) I prefer to use either Williams Bros. clevises or DuBro Kwik Links on each surface so that I can make quick changes in trim without having to disassemble the model.

Now let's get into the contest pattern, calling to your attention that anything I may say here is definitely a variable. Any time you fly the pattern you must take into consideration (a) the place you are flying, (b) the condition of the runways (whether they are grass or asphalt), (c) the wind direction and velocity, and (d) the location of the sun in relation to you and the judges. All these things change and your flight pattern should change with them. If it does not, then you are not flying the pattern properly, and if you have good judges they will know this with a resultant downgrading of the score! As I said before — I speak from experience!

Before we get to the first maneuver, I might point out a few things that can help from a psychological point of view. The judges like to see a contestant that at least appears to have self-confidence. You may be scared to death, but don't let them know it! I realize that this is hard to do, but when really bearing down for a contest, it is a good idea to throw caution to the wind. By "throwing caution to the wind" I refer to your concern for your model — **not** to your concern for the safety of the spectators! Unless you have complete confidence in yourself, your radio, and your engine, you might as well give up flying the contest route.

Be completely familiar with your engine. When you set your model down and the judges say "go", you should be able to flip that prop once, or at most, twice, and off she goes. In other words, be ready. There is nothing that kills a flight quicker than a lack of time to perform maneuvers.

Now let's get to the first rule of contest flying — cheat! By cheating, I mean **be a salesman!** After all, that is why you're standing out there — you're trying to sell a product, in this case a model airplane flight, to a panel of judges. To sell this product you've got to use every means at your disposal. I, for one, am always trying to think of a better way to sell any of my flights to those judges.

SUNDAY FLIER

(Continued from Page 11)

Now all of the foregoing developments are highly interesting, but let me tell you about the one demonstration at Toledo that really put me on cloud nine in anticipation. Tom Dion, of Class City Electronics, has come up with a proportional control system that weighs 8-10 ounces (depending on whether you use an extra servo). This includes the battery weight (four pencells), and the whole unit will fit easily into standard ½A kits like the Falcon, Mini Mambo, Schoolmaster or Schoolgirl, etc.!

It's pulse, yes. The surfaces wiggle, yes. Perhaps the centering isn't absolutely perfect. But it does the job — and weighs less than half as much as the nearest commercial competitor that will do the same job. This almost amounts to a "quantum jump," as the scientists and engineers call it. Just for kicks, I drew a rough graph of the progress of both single channel (as we used to know it) and the multi control rigs, and it can be predicted with high confidence that in a few years we'll be flying full proportional control in .010 powered jobs!

Naturally, I have to put in a word of caution. Although Tom Dion and his friends have been "flying the pants off" a Schoolmaster, I'll reserve the right for final approval until after my own experience with the system proves its reliability. But the handwriting is on the wall — full proportional control for ½A is commercially feasible — and as the saying goes, "It's the o-o-n-ly way to fly!"

And that's mainly why I say that last week this Sunday flier went to heaven. But there were some other reasons, too. Like talking with Vic Husak, of the Radio Control Club of Chicago. Vic's new design, the "Cream Puff," is a fantastically beautiful model, both in proportions and appearance. In fact, some chaps from North American Aviation Model Club, in Columbus, said Vic had misnamed the model. "He should have called it 'The Saviour' because everybody who came to look at it gasped and said 'Good Lord!'" Anyway, Vic won the RCM award for the best finish, and the design will undoubtedly do well in competition.

But Vic was talking about it. "I'm not sure it will have enough power to do the vertical eight, but as far as I am concerned, that's just a 'brute force' maneuver that only proves you've got more power than you need so t'heck with it. I'll still have all the fun I want flying the Cream Puff on Sundays!" How about that? Vic's one of us! He's way over on the other side of the spectrum from me in size, but no matter. He still does not want to compromise his principles for the sake of a contest power requirement.

I was so intrigued with the thought that I took a picture of Vic with his model, then another photo with the 40" span tail surface of the Cream Puff alongside Walt Reissig's modified Cosmic Wind with 28" wingspan. Yet

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SUNDAY FLIER

(Continued from Page 12)

both models have full house control!

Between the two extremes there's a happy size for all of us, and an equally wide choice of control systems.

So next month I'll review some of the flying techniques for single servo fans, no matter what size plane you like. And after that, if all goes well, we'll try ½A proportional rudder and elevator together.

Man, it sure looks like an interesting and exciting summer of flying on the way.

PROTO TAXI. This probably seems silly but doing this maneuver correctly, can mean the difference between a 3 or a 5. Remember, lots of contest have been won by a one point difference. (Keep this in mind when doing any of the maneuvers.) Make sure that your model is lined up exactly 180 degrees from the direction from which you are going to take off. Slowly advance your throttle until the model just starts to move, then retard it a little until the model moves slowly but positively toward that line that is 50 feet away from you. Of course, keep it as straight as possible and make very minute and easy corrections if it does turn off course. No judge likes to see violent changes in direction. (This is one of the big advantages that proportional has over reeds.) When you are almost to your 50 foot mark, start to apply your brakes gently being very careful to watch for any yaw tendency in the model due to one brake grabbing before the other. If you do this correctly you can correct with rudder fast enough that no judge in the world would notice it. Now, after you've stopped, release your brake and make a nice smooth turn into the wind. The bigger you can make this turn, the better it looks. Now let's roll straight into the wind for about 10 feet and call "proto taxi complete". Remember your taxiing is not complete until you have completed this last roll 10 feet into the wind. If you have hard judges, they'll note this, so keep it in mind.

TAKE OFF. Apply your throttle smoothly but positively until it is wide open being careful to note any yaw tendency again. Keep her straight down the runway using the rudder gently until the model breaks ground. At this point I normally shift almost completely to ailerons. However, occasionally a little right rudder is required because of high torque and the relatively low speed of the model at this point. As the speed builds up, however, you will be able to disregard the rudder. Control the model slowly with aileron and elevator. Make that lift-off just as smooth and gradual as you possibly can. Don't use any violent rate of climb or go off to the flat but let's see a nice smooth rotation of the model on the landing gear as it achieves flight speed. When it has reached an altitude of 6 feet, the take off is complete. I watch this very closely especially in gusty or windy weather because the model is prone to jump around under these conditions. The sooner that I inform the judges that the take-off is complete, the less noticeable any of these slight jumps of the model will be to them.

STRAIGHT FLIGHT. After take-off, make a broad sweeping right or left turn depending upon the location of the crowd. Do not fly over the spectator area, if at all possible. Bring the model around 360 degrees and turn so that you are lined up directly into the wind before having to fly over the transmitter. This gets you all set up and positioned before you actually start the straight flight. Fly her straight out, smoothly making any necessary corrections until you have reached the 500 foot mark. One little trick of the trade I might mention at this point is that due to an optical illusion, the model will look like its losing altitude as it flies straight away from you. This is what you should strive for. Don't try to fly it as if it were flying level because, in reality, it will be climbing. If the judges are sharp they will already know of this optical illusion.

PROCEDURE TURN. Your first turn should be very gentle and not too steep of a bank, making sure it turns exactly 90 degrees left. Immediately upon rolling out of this 90 degree turn to the left, roll right back to the right for your 270 degree turn to the right. Let me give you a personal hint here. During my straight flight out, I try to pick up a tree or some sort of reference out in the distance to use for my point to start my procedure turn and also to finish the procedure at this same point. Most of the time you will be able to pick something that will do the job quite well. After your turn to the right, you should roll your wings exactly level.

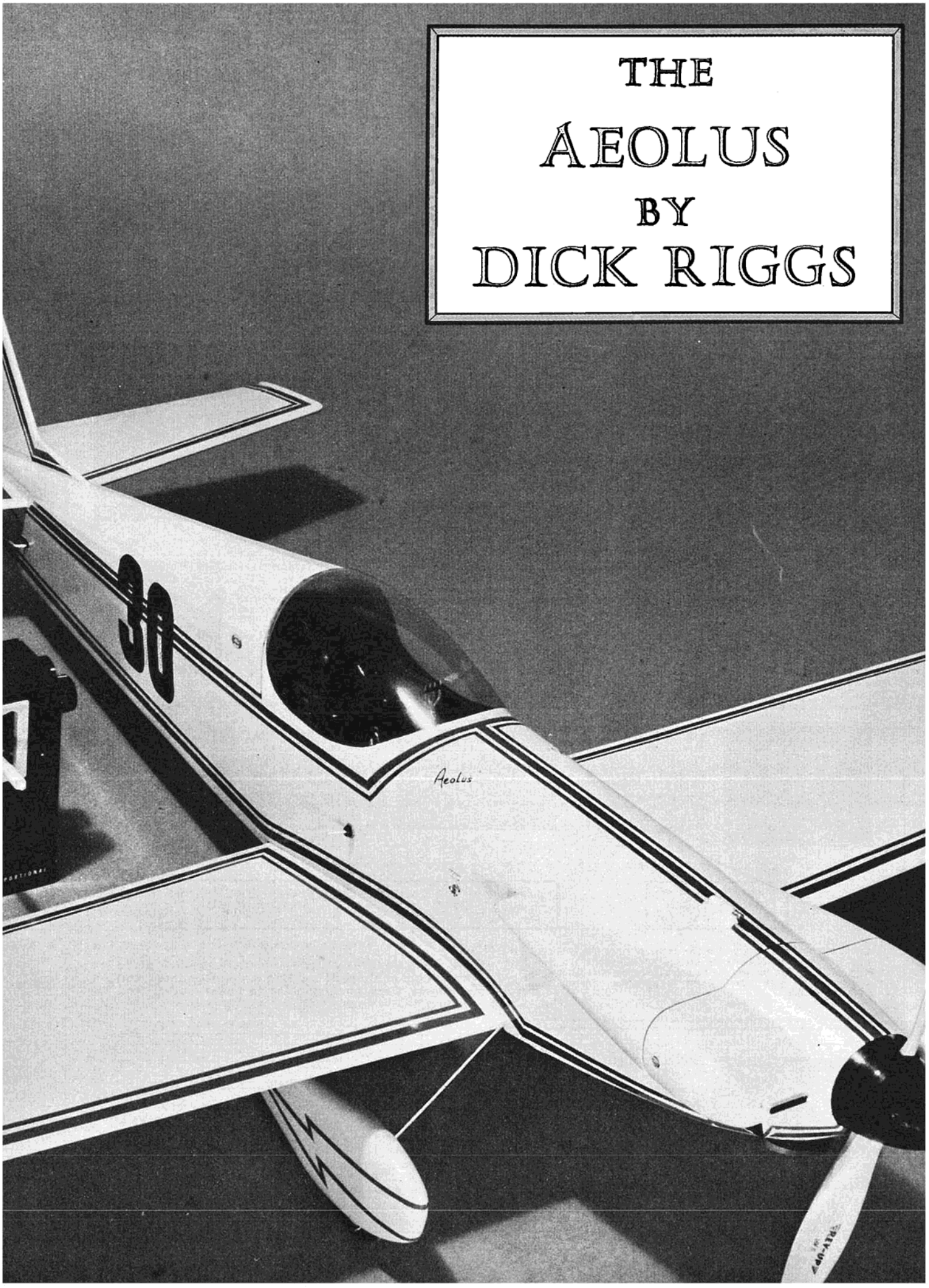
RETURN FLIGHT. As your model comes toward you remember back to the time that it looked like it was losing altitude going away from you. By the same token it should look like it is climbing slightly when it is coming toward you. Bring her right straight back over the transmitter, making any changes that you deem necessary.

FIGURE 8. Start this maneuver with a gentle turn to the left, watching closely the relationship of the model to yourself. If the wind is fairly strong you will have to start your turn with a fairly steep angle of bank. If there is no wind, a gentle bank is usually all that is required. I try to make both halves of the Figure 8 fairly good size because I allow myself more time to make any necessary corrections. Remember as you come around to the 180 degree point of this first half, you should be able to sight directly down the leading edge of your wing. Now, as you come around once again, you may have to change the angle of bank due to wind conditions. Keep in mind that this Figure 8 is always calculated in relationship to the ground and not the flight path of the airplane through the air. At your crossover point, directly over the transmitter, the airplane should be going directly downwind. Don't make a Figure X at the center of this 8. Both halves of this maneuver should be exact circles. When completing the right half, your model should be flying directly downwind as you pass over your transmitter. Now, and only now, do you have the maneuver completed.

TOUCH AND GO. Now let's get lined up for the touch and go. Make your approach to the runway as smoothly as you possibly can, even though, theoretically, you are not being judged at this point. The judging starts for touch and go when the model is 6 feet above the ground. And, of course, make your landing as smooth as possible, trying to hit that circle just as if you were on the final landing. Consider this an extra little bit of practice that you're going to need when the flight is over. After set-down, let the model roll on the ground for a while so that the judges know in their own minds that it is completely unairborne. Now once again smoothly apply power, rotate and make a nice smooth take-off and call "complete" when the model is again 6 feet above the ground.

(To be continued)

THE AEOLUS BY DICK RIGGS



As swift as the lengendary God of the Winds for which it was named, the Aeolus is a truly remarkable pylon racer — and a potential champion for the 1965 Goodyear Event. RCM selects Dick Riggs' low-winger as number one among the current N.M.P.R.A. designs.

The first of the new Goodyear Event ships that I had an opportunity to fly was Jerry Nelson's little Cosmic Wind. This plane actually surprised me by its capabilities, flying much better than one would expect. Subsequently, I watched Jerry fly his Bonzo many times — watching being just as good as flying, in many cases, when trying to evaluate design and performance characteristics. Following these flying sessions in Northern California, I attempted to put down on paper the characteristics I had seen that were desirable for incorporation into a Goodyear Event contender.

Both the Bonzo and Cosmic Wind (Little Toni) were somewhat sensitive in control response — not overly so, but probably a bit more than one would desire. There are several ways to overcome this factor. For instance, the Bonzo has an extremely high roll rate due to the very low aspect ratio. So when designing the Aeolus, a slightly higher aspect ratio was used. The Cosmic Wind has a "fair-to-middling" AR, but still suffered from sensitivity due to the coupled ailerons and rudder. When you go the coupled aileron and rudder route, you must keep the control throw way down, remembering that these pylon ships move along at quite a pace and the controls can be quite sensitive. Elevator response in all of these designs seemed to be perfectly adequate as long as the Center of Gravity is kept well forward. This is due, in part, to the flat bottom wing, and only becomes particularly critical when you approach a stall point.

I do not feel that a symmetrical, or semi-symmetrical airfoil would have any particular advantage for these Goodyear racers, except that you could probably get away with an airplane that is a little less longitudinally stable. In other words, it wouldn't be quite as critical in the C.G. location. The tapered planform of the Aeolus was used not only for the additional structural strength it provides, but to aid in increasing the aspect ratio. This increased AR slows down the roll rate, but at the same time, increases the rolling torque effect of the ailerons. This, then, gives us the desired control response with less variation from high to low speed. In other words, in the glide approach the aileron is still relatively effective due to their excellent generation of torque. Washout was incorporated in the wing to overcome one disadvantage of tapered planforms — they are notoriously laterally unstable as the stall point approaches.

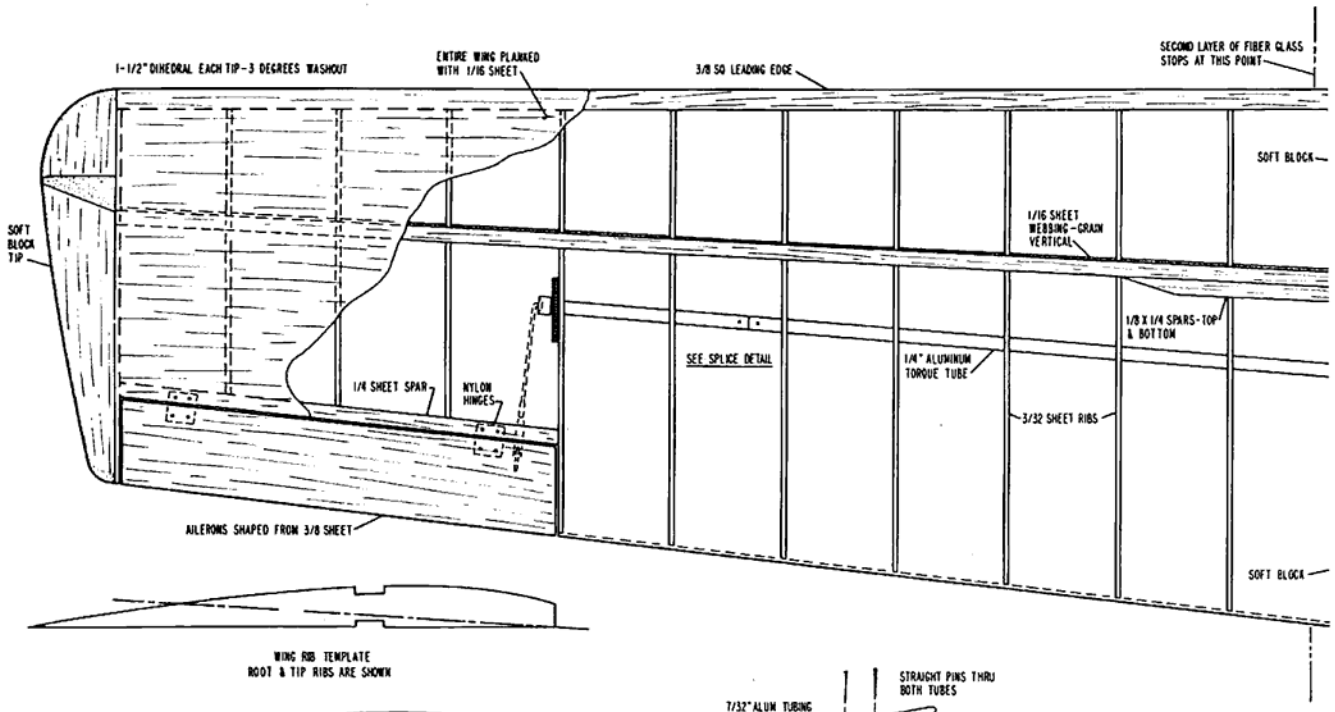
The first test flights on the Aeolus indicated that the CG must be much further forward than one normally uses on a symmetrical, or semi-symmetrical, wing. As it was originally located — at 35% of the chord — it was practically impossible to find the trim condition. In other words, it was either climbing or diving all the time. After the CG was moved forward to approximately 20%, we found a condition that is probably superior to the symmetrical wing. That is, when you set your elevator trim for a normal glide approach, and as the speed increases, the center of pressure travel moves back and accentuates the nose down condition. At the same time, however, the lift generated through the increased speed cancels this factor out, so you end up without having to worry about your elevator trim setting. This same condition was noted in both the Bonzo and Little Toni, so perhaps the flat bottomed airfoil has some advantage for our use in this pylon event.

As I mentioned earlier, both the Bonzo and Cosmic Wind utilized the coupled rudder and aileron configuration, which is more than adequate, but greatly increases the control sensitivity. In order to overcome this one undesirable feature, control throw **must be kept to a minimum.** One distinct advantage to the coupled aileron and rudder set-up is that at low speed on the landing approach, the rudder remains quite effective, approximating the same degree of control in the glide approach as you have at high speed.

The Aeolus is set up with the Orbit 3+1 Proportional system wherein, at high speed, the rudder is de-coupled. I feel that I, personally, prefer this particular arrangement since you don't get the nose pitch down as the airplane rolls into the vertical bank to the pylon. Actually, however, this is no particular problem if you remember to allow an additional ten feet of altitude to complete the turn when using coupled ailerons and elevator. The Aeolus rolls into a vertical bank, and when you pull back on the elevator, it will complete the turn with practically no altitude loss.

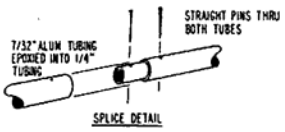
The speed capabilities of these Goodyear Pylon racers are excellent, and with a good .35 or .40, approach 80 m.p.h. in level flight. It is well to remember that at this speed, control response is a critical factor. It is all too easy to overcontrol these ships, and even though it goes against the grain of most modelers, **keep the control throw down to a minimum** on the Aeolus! It is important to remember that these are small airplanes, needing only small surfaces and minimum throw.

The Aeolus weighs five pounds, dead on the nose, when completed. I really feel that a good .25 would fly the airplane quite adequately, and probably with nearly as much speed as an average .35. The original conception of the N.M.P.R.A. event, along with the present rules, specifies a .40 maximum displacement in order to include the greatest possible number of powerplants. There are, in fact, twenty-one different engines that can be used for this event. If you throw in the .29's, this number becomes staggering! So, you pay your money and take your choice of power. A number of prospective Goodyear pilots have wondered why the rules were not set up to include the many idle .45's that are collecting dust on the shelves of most Class III fliers.



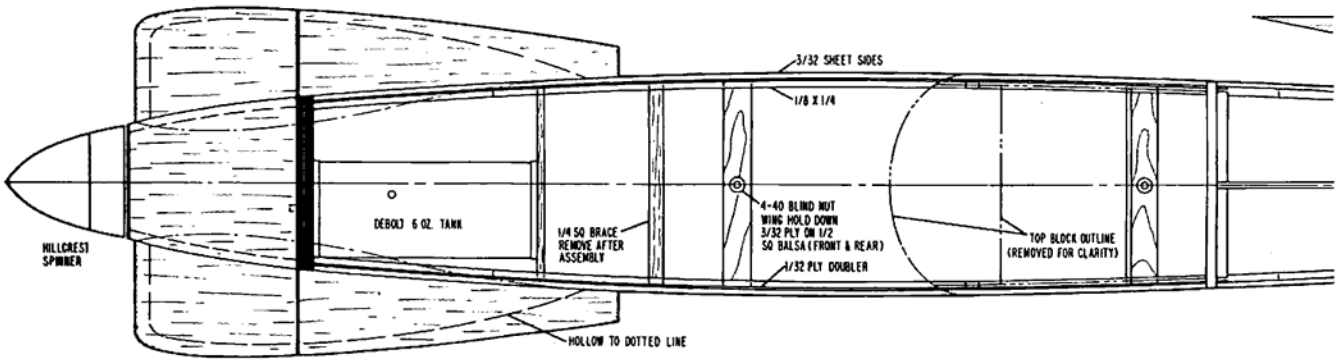
WING RIB TEMPLATE
ROOT & TIP RIBS ARE SHOWN

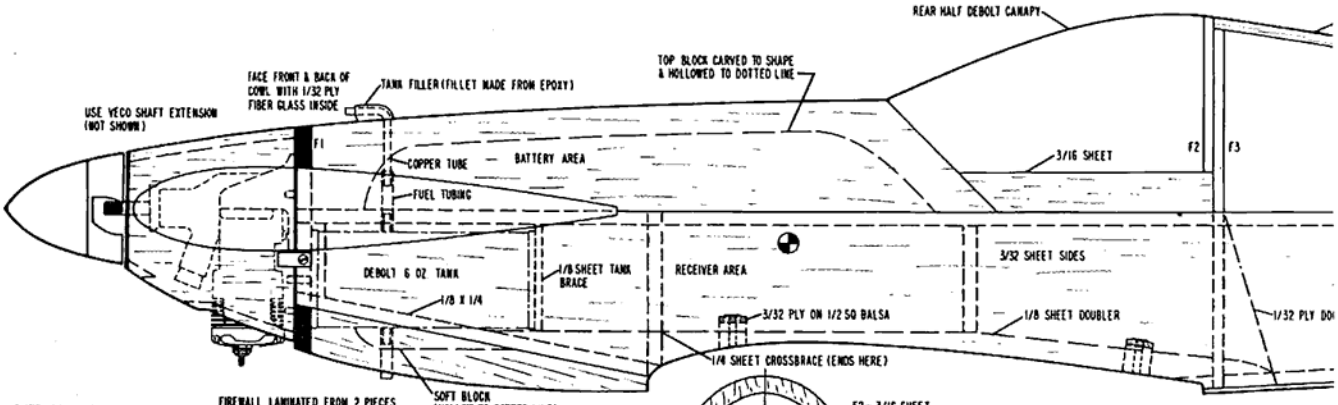
TYPICAL WING SECTION

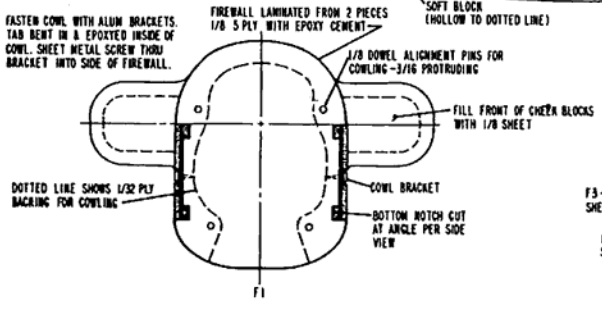


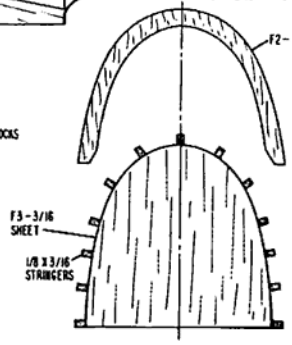
SPLICE DETAIL

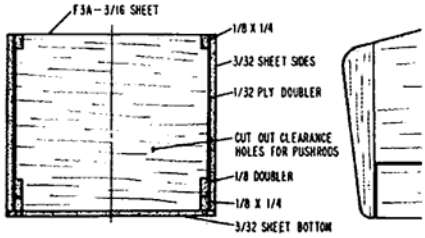
1/8 PLY BUSHING 4 REQD











LAYER OF FIBER GLASS
AT THIS POINT

3/32 PLY RECESSED IN SOFT BLOCK

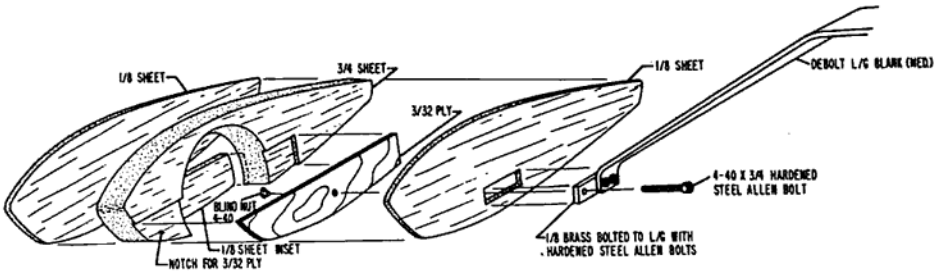
BLIND NUTS (4-40)

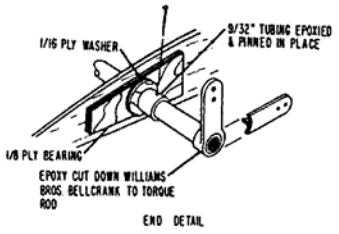
CUT DOWN TOP FLITE BELLCRANK (E-38)

CENTER RIBS 1/4 SHEET

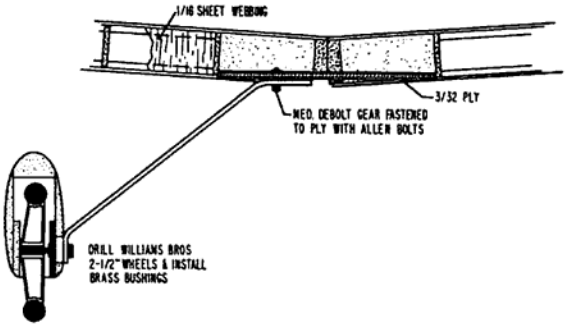
3/32 PLY RECESS IN SOFT BLOCK

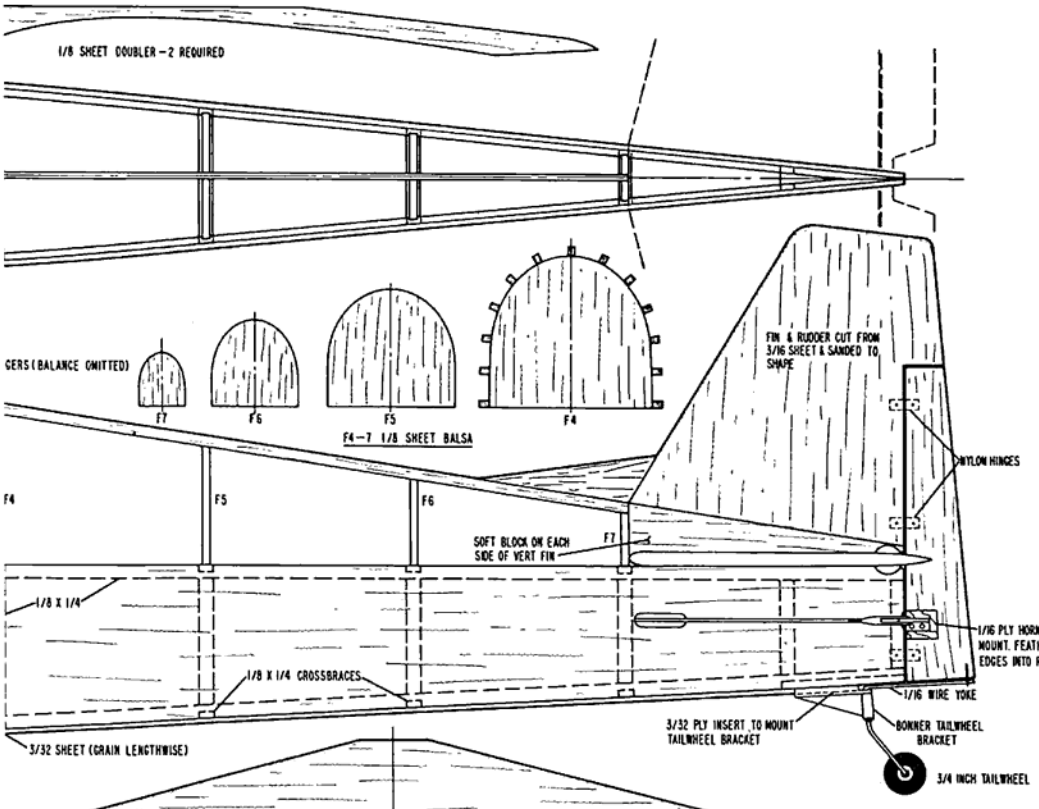
WING HOLD DOWN HOLES FOR 4-40 BOLTS

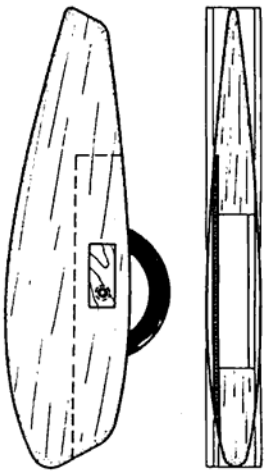




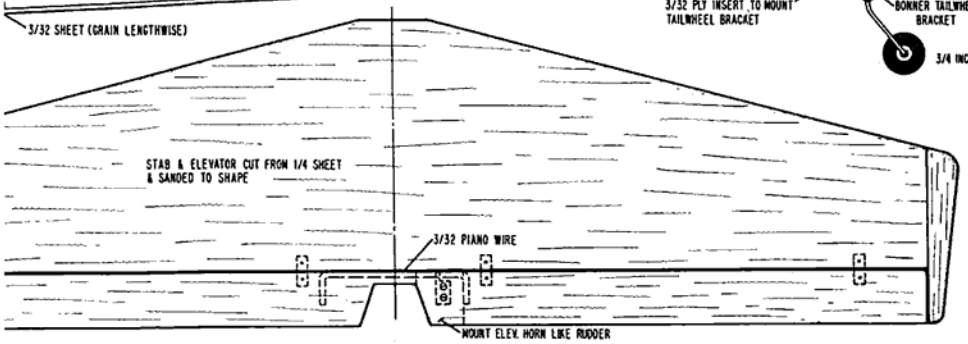
END DETAIL







PROTOTYPE MODEL USED:
K & B 35RC
TATONE MOUNT
ORBIT 3 CHAN PROPORTIONAL



HARDWOOD RAILS MAYBE INSTALLED ALONG FUSELAGE SIDES FOR MOUNTING A PLYWOOD SERVO TRAY. INSTALATION IS LEFT TO BUILDERS CHOICE AS PER EQUIPMENT USED.

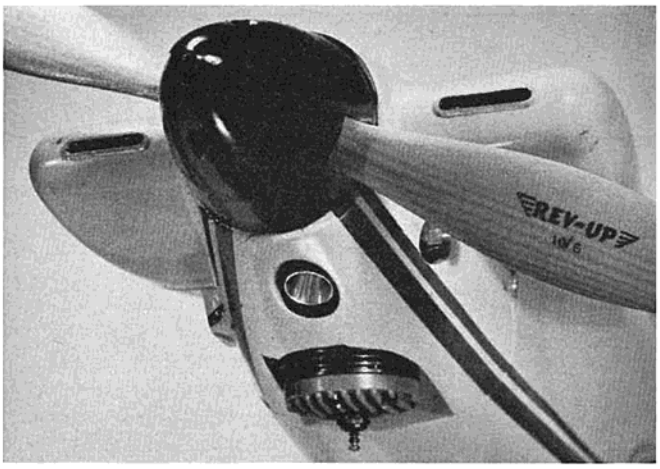
NATIONAL MINIATURE PYLON RACING ASSOCIATION

R/C modeler

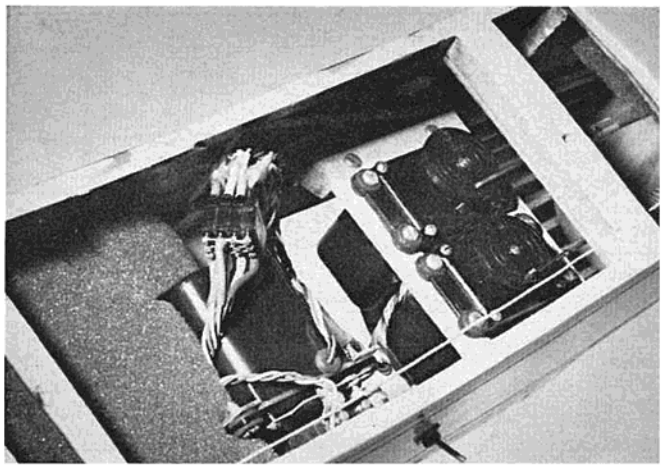
AEOLUS

DESIGNED BY	DICK RIGGS	DRAWN BY	DICK KIDD BARRY HALSTED

0 1 2 3 4 5 6



Clean cowling, thin apple cheeks add to streamlined appearance.



Inside the radio compartment—the Orbit 3+1 proportional.

Limiting this event to a maximum displacement of .40 was done for a purpose. The .45 will not create that much additional speed, while most .35's operate at a higher RPM than the .45's we have used in Class III. For instance, the average K&B .45 on an 11/6 prop will turn right around 10,000 — a good K&B .35 on a 10/6 will turn 13,000. This begins to stir a mighty breeze because your air speed is actually a function of RPM versus pitch. If you have any efficiency in your Goodyear design at all, that .35 powered airplane will run the tail right off a .45 powered job. The major disadvantage, however, in sticking a .45 and 11/6 prop on one of these little airplanes is that the takeoff torque would be fantastic — the plane would probably revolve around the prop before you got airborne! The .45's are lungers, rather than screamers — designed to handle larger and heavier loads. They operate in a higher torque and lower RPM range. So, don't by any means, underestimate the power of the .29 through .40 class — you'll not only have your hands full, but may well be surprised at the speed your model attains.

Since we are discussing torque, you will find that you will have to momentarily hold full right on takeoff with the Aeolus until it starts to gain ground speed. This is to overcome this takeoff torque, and results in the model clearing the ground with the right wing low due to the blast of right. The most effective takeoff procedure is to turn the power on full, hold full right and about half-up elevator. As soon as the wheels clear the ground, let the stick pop back to neutral and it's on its way. There doesn't seem to be any advantage at all to accelerating on the ground. Get it in the air and it will go the fastest, quickest! Your acceleration rate will be higher when your wheels are off the ground.

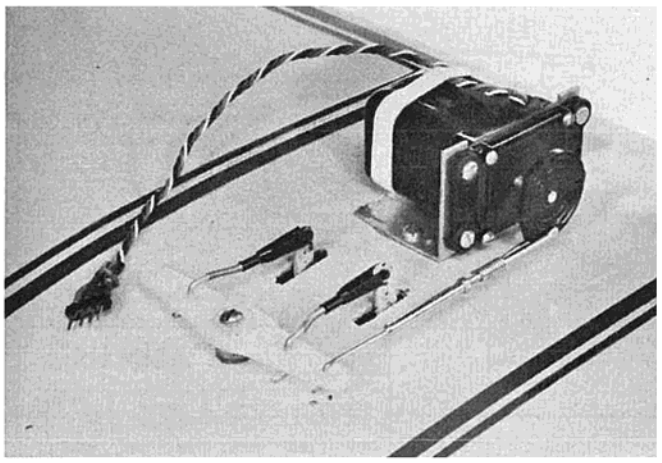
Insofar as the pylon turns are concerned, no one can actually **tell** you how to do it — it's simply a matter of practice. I prefer an altitude that approximates 60 feet. At this height the airplane is visible at all times and you are well above the twenty-five foot minimum altitude specified in the N.M.P.R.A. rules. Let's face it — I'm chicken! At 25 feet above the ground I'm punching controls furiously in order to gain some altitude. In addition, if there are three or four other planes in there at the same time, somebody is going to have to be high, and someone low. Therefore, it wouldn't be a bad idea to practice flying at the various altitudes — say, from thirty feet to one hundred fifty feet.

Construction

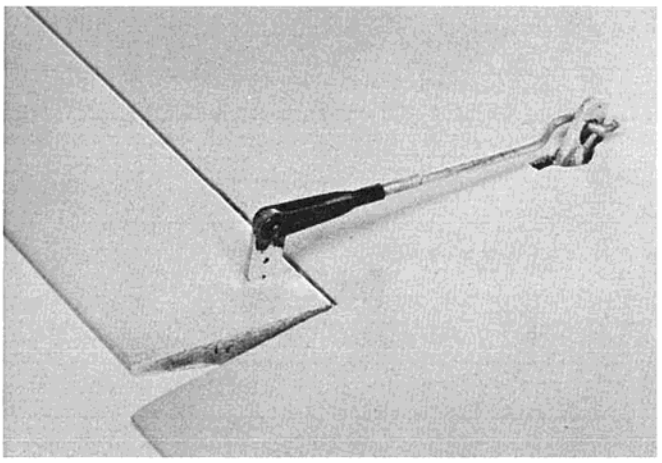
Construction of the Aeolus is strictly straightforward, following almost to a "T" the construction principles involved in almost any good Class III stunt ship. I'm not going to list a whole series of "Glue A to G" type of thing, but rather, give a few general notes on the construction in general. About the only particular deviation is the torque aileron drive which is best explained by studying the plans. The crank arms, themselves, are affixed to the aluminum tubing torque rod. These are single legs of Williams Bros. bell cranks. The other

(Continued on Page **20***)*

Center section of the wing — note aluminum bracket for aileron servo.



A Du-Bro Kwik Link and simple connection from aileron surface to torque tube.



leg, of course, is cut off and the center bearing bored out for a reasonably tight fit over the aluminum tubing. Since this is nylon, it is difficult to find a material that will glue it well. Most epoxy cements will work satisfactorily, but for added insurance I drilled a small hole through the nylon and tubing, then ran a standard modeler's steel pin through the hole, gluing the whole thing with the epoxy. I feel that the torque tube is completely adequate for the very small aileron used on the Aeolus, but would not be recommended for the general Class III stunt ship.

When the entire construction of the prototype was first finished, the total structure weight was 1 pound 6 ounces, complete with landing gear, engine mounts, speed fairings and wheels. I felt that this was indicative of the fact that the airplane could easily be built at the 4½ pound minimum weight requirement. In fact, I felt for a while, that the plane was going to come out too light, so I applied glass cloth and resin to the entire fuselage from the rear of the canopy clear through the nose. Fibreglass was also used in two layers, first a narrow strip, then a wide one, over the center section of the wing. This fibreglassing, alone, added an additional ten ounces, which I now feel is prohibitively dense. I had never before checked the weight of applied fibreglass since I had not used it in such a quantity before. The amount used on the wing is acceptable, but a 2" wide strip from the firewall back would be more than sufficient for the fuselage.

The overall finish of the Aeolus is a minor variation from Jerry Nelson's technique. I used a couple of coats of regular aircraft **nitrate** dope over the bare wood to seal the pores prior to covering. The wing is covered with silk, although silkspan is completely adequate for this type of all-sheet construction. Two more coats of nitrate dope was used to seal the silk. This was followed by spraying on three full flow coats of lacquer base automobile primer. Some caution should be exercised at this point, since this primer is very dense and can build up weight quite rapidly. If you're looking for a super finish, let the plane set for about two weeks before sanding and applying the color finish, although this can be done after a 24 hour waiting period. Be sure to sand **dry,** so that you can see what you're doing without unknowingly sanding all the way through the silk!

All that remains now is to shoot the color — again, with nitrate dope. Jerry uses synthetic enamel (DuPont Dulux is one of the better brands), but this should be allowed to dry for about two weeks before being exposed to fuel. Nitrate dope, in various colors, and in large or small quantities, can be purchased at most airports.

The finish coat on the Aeolus is the fuel-proofer and final gloss. This is Fuller's Plast, technically speaking, a catalyzing varnish. Chemically, it is akin to fibreglass resin in that it utilizes a sulfuric acid catalyst. Mixed in proper proportions and thinned slightly, Plast dries very rapidly, so don't lose any time in spraying. Flow on one wet coat and let it dry for three days. This will give you an extremely high gloss coat plus needed fuel proofing qualities.

Epilogue

As mentioned previously, I use the Orbit 3+1 Proportional system and find it completely convenient insofar as weight and installation procedures are concerned. The minimal battery complement necessary, plus the very lightweight servos and a reasonably small receiver, gives an all up installation weight of only 17 ounces. To the builder, this means you can concentrate on building for more strength without worrying too much about the whole hodgepodge coming out excessively heavy.

In actual flying, I use the 3+1 function whereby the rudder servo is referenced back to neutral at full throttle, preferring to fly without the coupled ailerons and rudder. Nudging the throttle arm just slightly off the full throttle position switches in the rudder servo so that it travels swiftly in conjunction with the ailerons. The coupled aileron installation was kept in mind during the design of the Aeolus, accounting for what appears to be an extremely small rudder. You will recall, however, that the rudder is always in the high speed frame of the propeller, which accounts for its extreme effectivity.

A few notes on the N.M.P.R.A. and the Goodyear event in general might be in order. The response to this new event has been overwhelming. Why? First of all, the models **do** look like airplanes. They are simple to build and use the same construction techniques as used in Class III designs. And, you end up with a real sharp little machine. Another reason for the surge of interest, in my opinion, is that you can use an engine which is much easier to handle than one of those little "hot dog" .15's or .19's, giving you enough power to handle sufficient weight so that you don't have to be a premium indoor-type builder in order to build a featherweight little nothing in order to do a good job of flying. The minimum N.M.P.R.A. weight is set at 4½ pounds — the premium builders who are interested in this event will probably come up with 4½ pound airplanes.

Another attraction of the Goodyear even is that all you really have to do, flight-wise, is to turn left real good! You don't have to worry about squares and inverted flying, or keeping that airplane tracking through insides and outsides, or three consecutive rolls and all that. All you have to do is turn left and keep from hitting the ground. And there are going to be quite a few eyebrows raised in the near future, because for some time to come, it isn't going to be the fastest airplane that wins! Until we all become proficient at this new event, the secret is going to be in the design itself — making it fly well without being excessively touchy. And if you don't believe it, wait until you fly around those pylons at 70 or 80 miles per hour, and have three more planes crowding you and jockeying for position. You're going to be so busy flying — as well as avoiding traffic — that you can't afford to have an airplane that is overly sensitive to control. You have to have a design that enables you to take your eyes off of it for a few seconds, maybe to check a far pylon, or to watch what the character with the yellow job is going to do, or keep one corner of your eye on the red ship who looks like he's going to drop way down in front of you at the next pylon. You definitely **don't** want an airplane that is going to stick its nose toward the ground and go roaring for it the moment you take your eyes off of it. The design has to be one that will track in the groove, doing **what** you want it to do, **when** you tell it to do it.

In other words, the Goodyear event has every indication of being the answer to the long-desired event designed for **everybody.** I sincerely feel that it will be around for quite a while, increasing in popularity as experience is gained. In addition, N.M.P.R.A. officials are already con-

(Continued on Page **34***)*

YOU CAN BUILD . . .

RCM's Single Channel Transmitter

Companion unit to the convertible superhet, RCM's Mighty Mite is easy to construct, small and compact, and delivers a half-watt wallop.

By DON MATHES
RCM Technical Editor

This article will describe the construction of an all transistorized single channel transmitter designed to compliment the RCM Convertible Superhet receiver presented in the April issue. This transmitter has several advantages for the single channel flier — among them, size, output power, plus economy and ease of construction. It utilizes and takes advantage of the low-priced General Electric silcone devices now widely available on the commercial market.

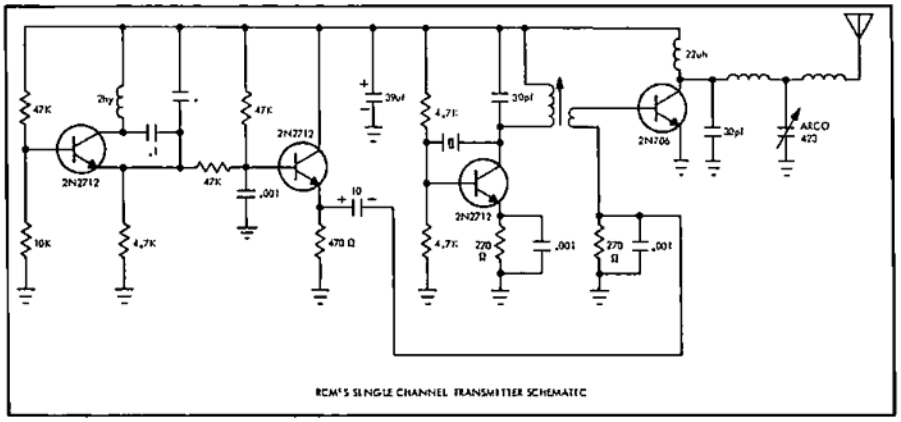
Insofar as a general description is concerned, the oscillator or audio portion of this transmitter, consists of a Colpitts configuration which gives excellent frequency and voltage stability. It can be seen that a tuned circuit in its collector serves to stabilize the audio frequency. The resultant sine wave is taken from this oscillator-emitter and fed by a series resistor to a grounded collector, or so-called "emitter-follower" stage. The latter presents a high input impedance to the oscillator, thus minimizing any load effects on the oscillator.

Audio voltage is extracted from the emitter of the emitter-follower (a low impedance point), and serves to base modulate the transmitter RF section. The RF oscillator is a very straightforward grounded emitter stage with feedback provided by the crystal connected between collector and base.

The collector is tuned by means of tuned circuit L1, and operates a frequency of 27 Mc. This configuration gives excellent frequency stability with respect to collector supply voltage and temperature. Frequency stability, by the way, is well within the .005 percent tolerance allowed by current FCC regulations. The oscillator delivers a minimum of 75 milliwatts of RF power with a 9 volt collector supply.

The transistor used as an RF power amplifier is an RCA 2N706. Several important considerations for this RF power amplifier should be mentioned. The transistor is a natural Class C amplifier because the emitter base contact potential must be overcome before the collector current will flow. A transistor connected as shown in the schematic is automatically biased in the Class C region. Six tenths of a volt must be applied between the base and emitter before collector current begins to flow. A double Pi network in the output provides tuning in this stage along with matching of the antenna. Minimum RF output power with a 9 volt collector supply is approximately .4 watts. The stage is base modulated from the previously described emitter-follower and quite linear modulation is accomplished. Care must be taken, however, to avoid over driving the stage. Such over driving would cause serious negative peak clipping in the RF output with a resultant serious distortion and splatter problem.

Construction is both simple and conventional if the printed circuit



RCM'S SINGLE CHANNEL TRANSMITTER SCHEMATIC

board shown is used by the constructor. All resistors and capacitors are of standard values with the exception of the .1 mylar capacitors. These may be any size capacitors, although this particular board utilizes the ultra miniature type. Conductors L1, L2, L3, and L4 are all specially made wound units, although specifications for these are given if you wish to wind them yourself. L1, for instance, may be commercially available in a 2 henry choke and mounted either on the panel, or on its edge via a bracket on the PC board.

L2 consists of 16 turns of #22 wire on its primary, plus 3 turns of #22 wire on its secondary. L3 and L4 are identical, and consist of 16 turns of #16 wire close wound on a ½" diameter form.

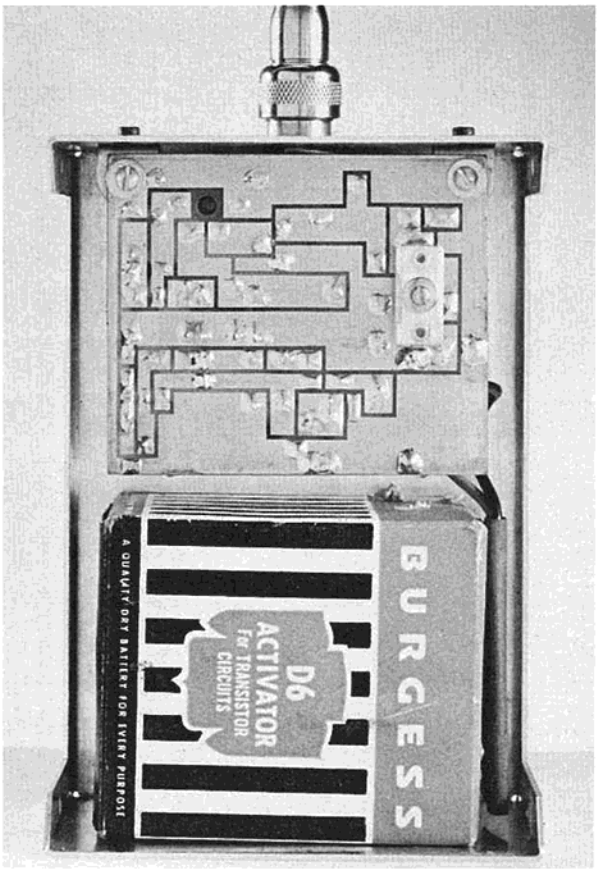
Firing up the transmitter is relatively simple after insuring that all connections have been made and the switch and battery installed. The use of a Field Strength Meter will prove helpful. Tune coil L2 by screwing its slug in until an indication is observed on the FSM. Now tune the air trimmer on the final tank coil for maximum RF output. Follow this step by readjusting coil L1 to be certain that maximum RF output is obtained. Be absolutely certain that when making the final adjustments on L2 the slug is left at the point where the transmitter starts every time the switch is turned on.

There is no tuning, as such, for the audio section. The audio frequency for the RCM transmitter is determined by the tube mylar capacitors and coil L1. Depressing the tone button should produce a clear crisp tone of approximately 600 cycles.

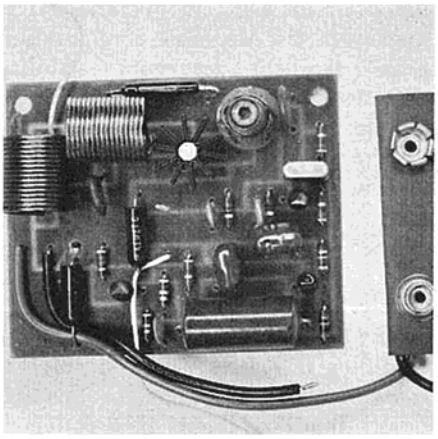
This concludes the two part series covering the construction of R/C Modeler Magazine's Convertible Superhet receiver and single channel transmitter. Properly constructed, both units should provide you with many hours of interference-free and trouble-free operation. Whether you construct these units from the kits that have been made available, or build them from scratch, if you should encounter any difficulty, contact the author c/o RCM.

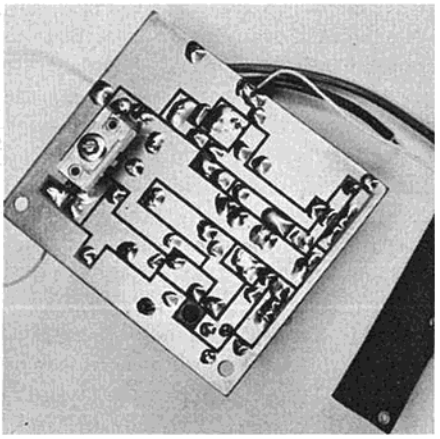
We would also appreciate hearing from you concerning your construction and operation of these units — it will enable us to determine whether or not RCM should present more of this type of electronic construction feature.

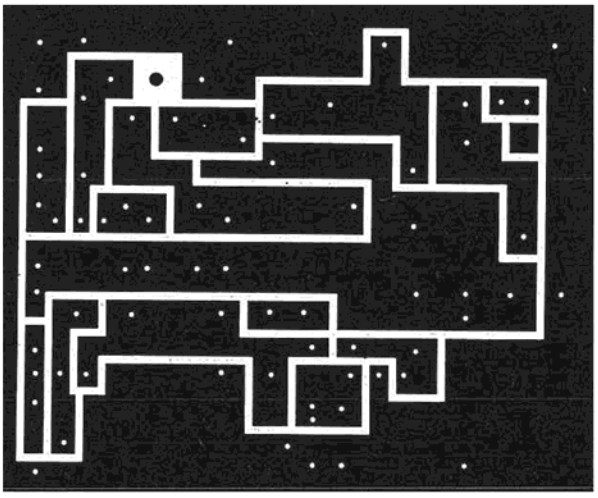
Right: Interior view of transmitter illustrates compact size. Printed circuit board has same dimensions as Burgess D6 9-volt battery. Overall size is just slightly larger than 3" x 5".



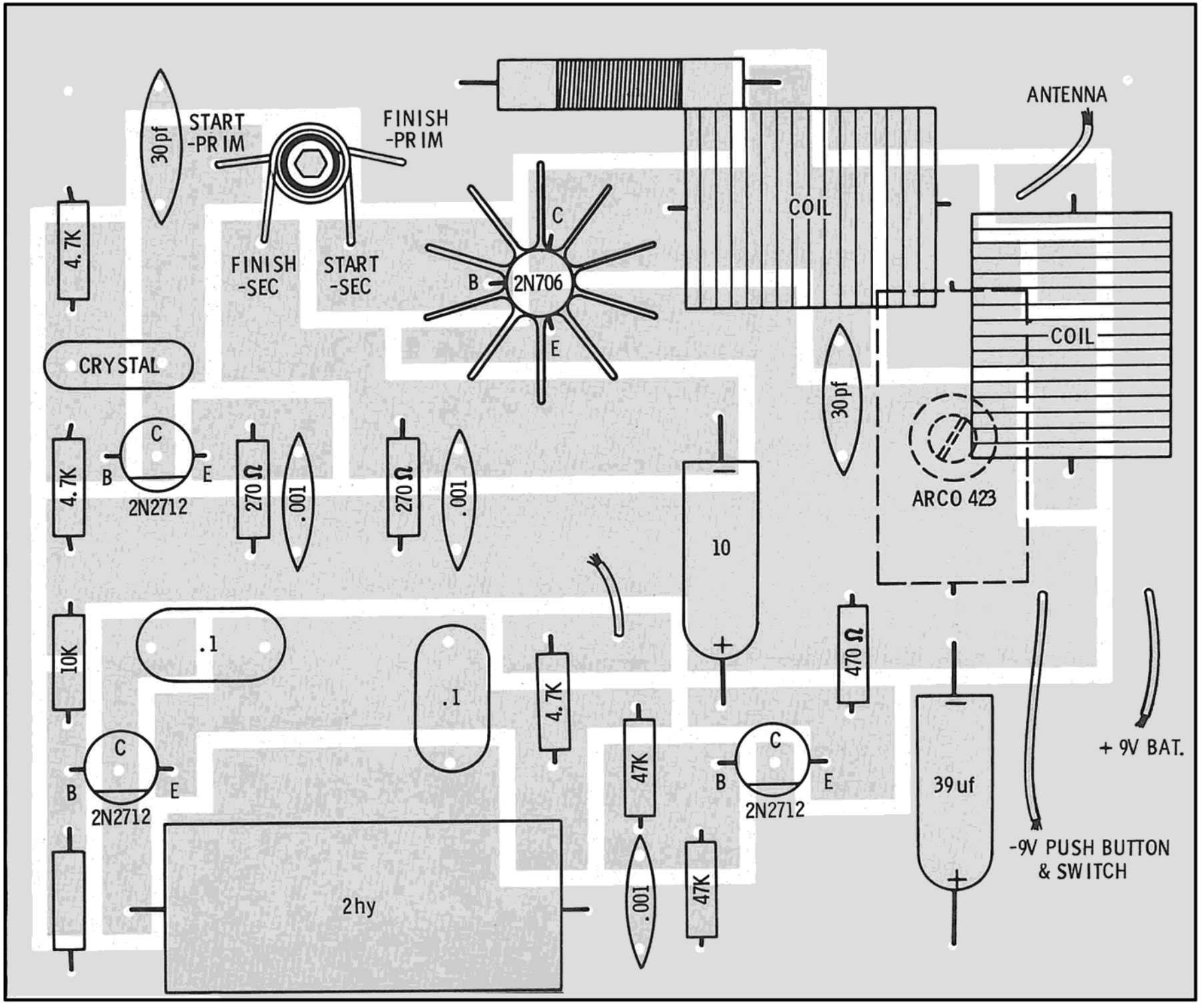
Below: Front and rear view of transmitter printed circuit board. Component layout reference on page 23.

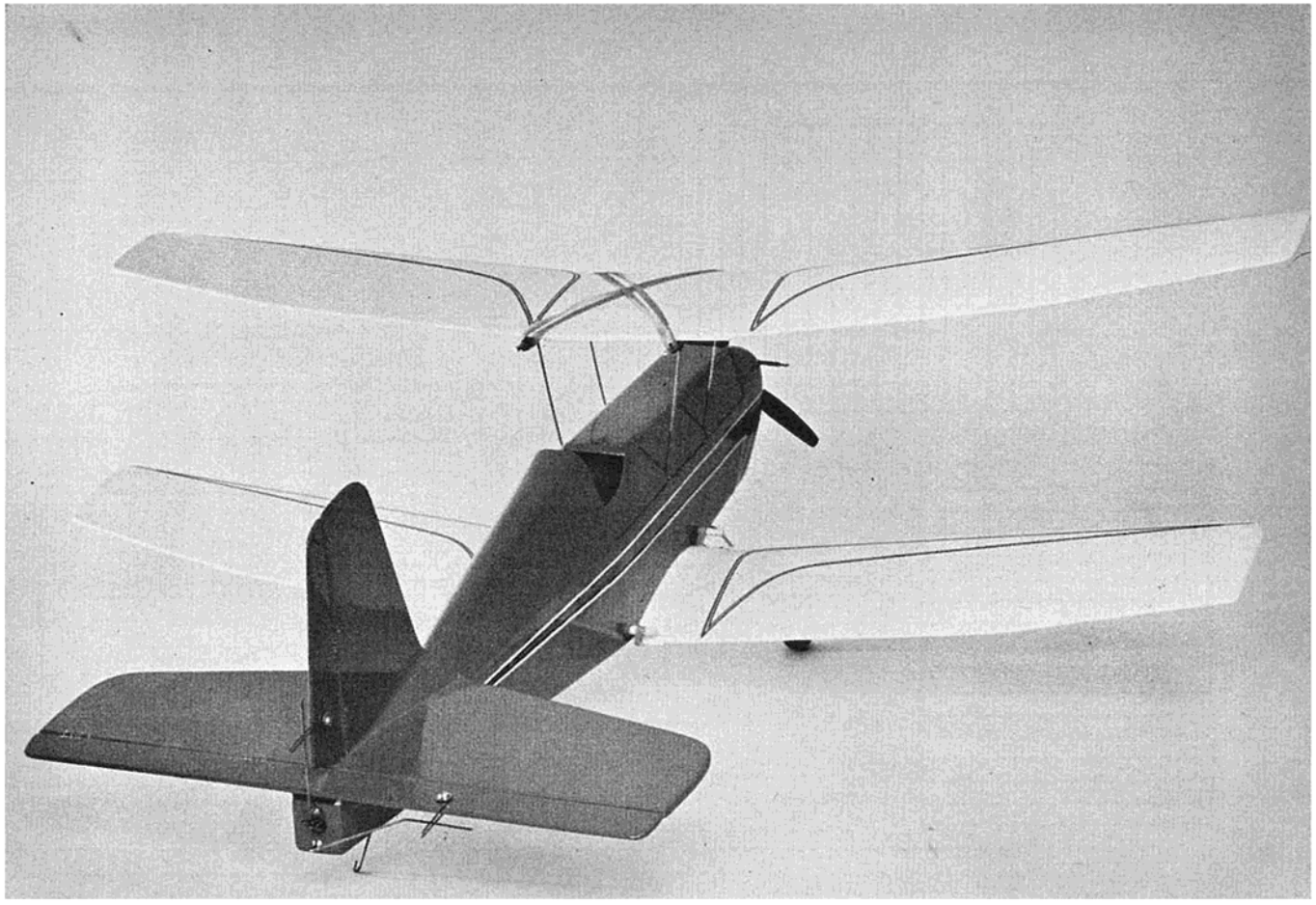






Right: Full-size printed circuit board for the RCM transmitter.


30pf
START -PRIM
FINISH -PRIM
FINISH -SEC
START -SEC
4.7K
CRYSTAL
2N706
C
B
E
COIL
ANTENNA
COIL
30pf
ARCO 423
4.7K
2N2712
270Ω
.001
270Ω
.001
10
10K
.1
.1
4.7K
470Ω
47K
2N2712
39uf
+ 9V BAT.
-9V PUSH BUTTON & SWITCH
2hy
.001
47K



RCM's version of the Wild Child with single channel equipment, later switched to six channels using the Convertible Superhet and Bellamatic servos with RCM amplifiers. Hobbypoxy red and white with black trim.

THE WILD CHILD . . . PLUS SIX

By BILL NORTHROP

Do you know why writers get gray? I'll tell you why writers get gray. Suppos'n you sit down and design a nice little Half-A biplane, you fly it over a period of about three to four years, and it proves to be a durable, stable lively little plane. It's simple to build, will handle single channel with escapement or pulse, and most of all, for the hobbyist deeply involved in multi, it provides a needed change of pace from the 70 m.p.h., 8-pound Fort Knoxes he's usually pushing around.

So what happens? Well, this writer who is about to get gray, scribbles out a story on this little biplane, which one of his friends has dubbed the 'Wild Child.' He tells all about the change of pace bit and how relaxing it is to fly single channel once in a while. He explains how, with the kick-up elevator properly applied, it is possible to make three-point landings (no, not wing tip, rudder tip, and stab tip — just two wheels and a skid!) He tells how, with deft applications of right rudder pulses on a Babcock Compound it is possible to fly around in mad cicles about five feet off the deck and send everybody running for their cars. He goes on to explain how this maneuver prevented a flyaway one day when he used a plug-in antenna connection for ease of transferring the receiver from one plane to another. On this occasion, he luckily realized after the first couple of commands that he had forgotten to make the connection and W.C. was up there with about five inches of antenna. The last key had put the plane in a turn. Fortunately, Wild Child was never in a sweat to get out of a turn, once put in it, so this soon-to-be-gray writer ran after the plane, got within range, and proceeded to fly it in 20 ft. circles, ukie fashion, until the fuel gave out. Needless to say, the antenna has been one-piece since then!

I remember another time when this — oh, I fogot — I was going to explain why writers get gray. Well, this writer fella was sittin' around the house doin' nuttin', as usual, when the phone rings and some nut claiming he's editor of an R/C magazine says he'll make the Wild Child go down in history if the writer will send him the whole business so it can be published. The writer said "fine," and then had a heart attack. (To all you fellas who may be talking to an editor in the near future, don't worry, this wasn't the cause of it.)

To make a long story short (It's too late now, Willie. — Ed.), this writer-type guy put the job off for about three or four months and then finally got on the stick to finish it up and send it to the editor. Just as he was going to mail the article about

Want a rest from that 70 m.p.h. multi?
Try this change-of-pace biplane for single channel.
And if you stretch the bulkheads just slightly . . .

the change-of-pace biplane for single channel, the greying writer gets a phone call. You guessed it! That nutty editor again. Y'know what he's going to do? He's going to create a sensation by putting six-channel in the 'Wild Child' and come up with one of the smallest Half-A multi's to date!

This guy's mad! But, y'know, it sounds intriguing as the devil! The 'Wild Child' isn't exactly a sub-miniature cuty-pie. With a 28" span and about 250 sq. in. of usable wing area, it has hauled a 22½ volt Kraft single, 3 pencells, a 22½ volt hearing aid battery, and a Babcock compound on rudder and kick-up elevator for most of its useful life. Just to prove that wing loading is unimportant, at 23 ounces all up, the wing loading is only 13 oz./sq. ft., but the plane feels like a brick compared to the modern-day so-called vest-pocket sized back-yard R/C flitabouts. I'll take the 'Wild Child's' ruggedness and penetration qualities any day in preference to the superlights. I must concede that with careful attention to weight factors, a Wild Child can be loaded with special multi equipment and still come out at 23 to 24 ounces. Whether you fly it on single, six, or pulse, you'll like the 'Child.'

Construction

Construction is quite simple. The stabilizer, elevator, fin, and rudder are best made from "C" grain balsa. Sig still takes the extra trouble to make this warp-fighting wood available. The stiffeners at the tips of the stab prevent splitting during tail first landing (no comment!).

Bulkhead A on the prototype was perpendicular to the centerline of the fuselage and tapered hardwood blocks were used to obtain the thrust offset. Once the offset was determined, it was incorporated in the drawings. Any minor adjustments can be made with washers.

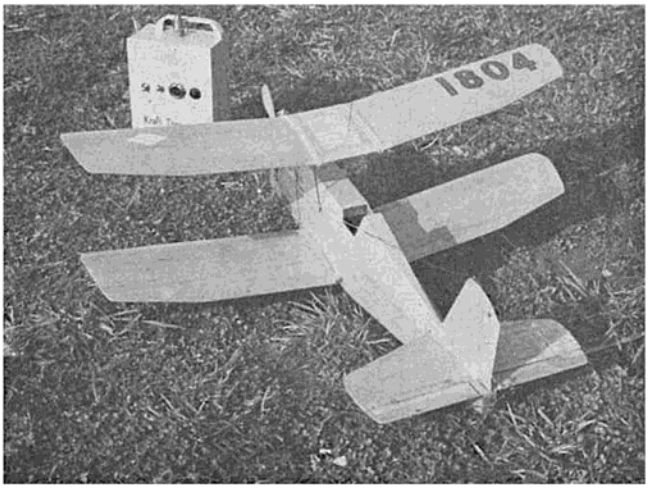
Make up the sides including the vertical grained doublers. Before assembling the sides with the bulkheads, determine whether or not you intend to use Annco or Bellamatic type multi servos for four or six-channel use. If you do, it will be necessary to plan your battery, receiver, servo installation carefully, increasing the width of the bulkheads as necessary to fit your installation. It is possible to install this lightweight multi equipment without altering the plans, although it makes quite a tight compartment in which to work! After the body is assembled using bulkheads A and C, along with the cabane struts, the horizontal grained triplers can be installed.

Build the hatch right on the body by installing pieces of Saran Wrap at the hatch ends to prevent it from becoming a permanent fixture. (You see, the glue will — oh, never mind!) Pin the hatch bulkheads in place. Pin and glue the ⅛" top sheet in place, having tapered the edges to a proper fit. Then pre-taper the bottom edges of the 1/16" slope sides, notch for the cabane struts (put stiffeners in later) and glue in place. Er, ah, Clyde . . . hey! Don't cover up no pins holding those hatch bulkheads in place or you'll be hung up as bad like you left off the Saran Wrap . . . right, pal?

Sew the 3/32" landing gear to the pre-drilled ⅛" ply floor with uninsulated single strand hook-up wire. (J-bolts stick into radios and poke holes in batteries!) This can be done after the finish is applied, making that particular job easier. A liberal fillet of glue around the whole mess

Run for the cars . . . that nut's at it again!

The author's Wild Child . . . going into its 4th year.



will prevent fuel from sneaking under the landing gear and into the fuselage.

The photographs show the R/C installation in the author's prototype, plus the original single channel escapement set-up in the nutty editor's version. The latter W.C. is the one in which six channel was later installed and flown. For single channel applications, .045 wire will do nice as torque since the distance involved is quite short. Bonding wires eliminate "noise" to touch receivers, particularly in escapements that provide metal to metal contact, such as the Babcock Mk II used in the author's prototype.

The wings are rugged and warp-free, and have survived many cartwheels. (Well, they can't all be three point landings!) Cut out four separate wing panels. After the leading edge is installed, but prior to inserting ribs in place, apply two or three coats of sanding sealer to the underside only. This will put just about the right curve in the surfaces.

To complete a panel, glue in all ribs, pinning through from the **top.** Full size ribs are used at the tip. This is **important** — you trim them off later. Now pin the whole mess down flat on your building board. (When I run out of space, these things usually end up getting pinned to the backside of the cellar door. It's smooth, flat, and unoccupied.) Steps for joining panels are shown on the drawings. A wing has never broken, but if and when one does, I don't think it will be through the center section!

To complete the wings, trim the excess lumber from the tip ribs. If instructions were followed, you now have washed out tips on all four panels, and you can't hardly get them no more.

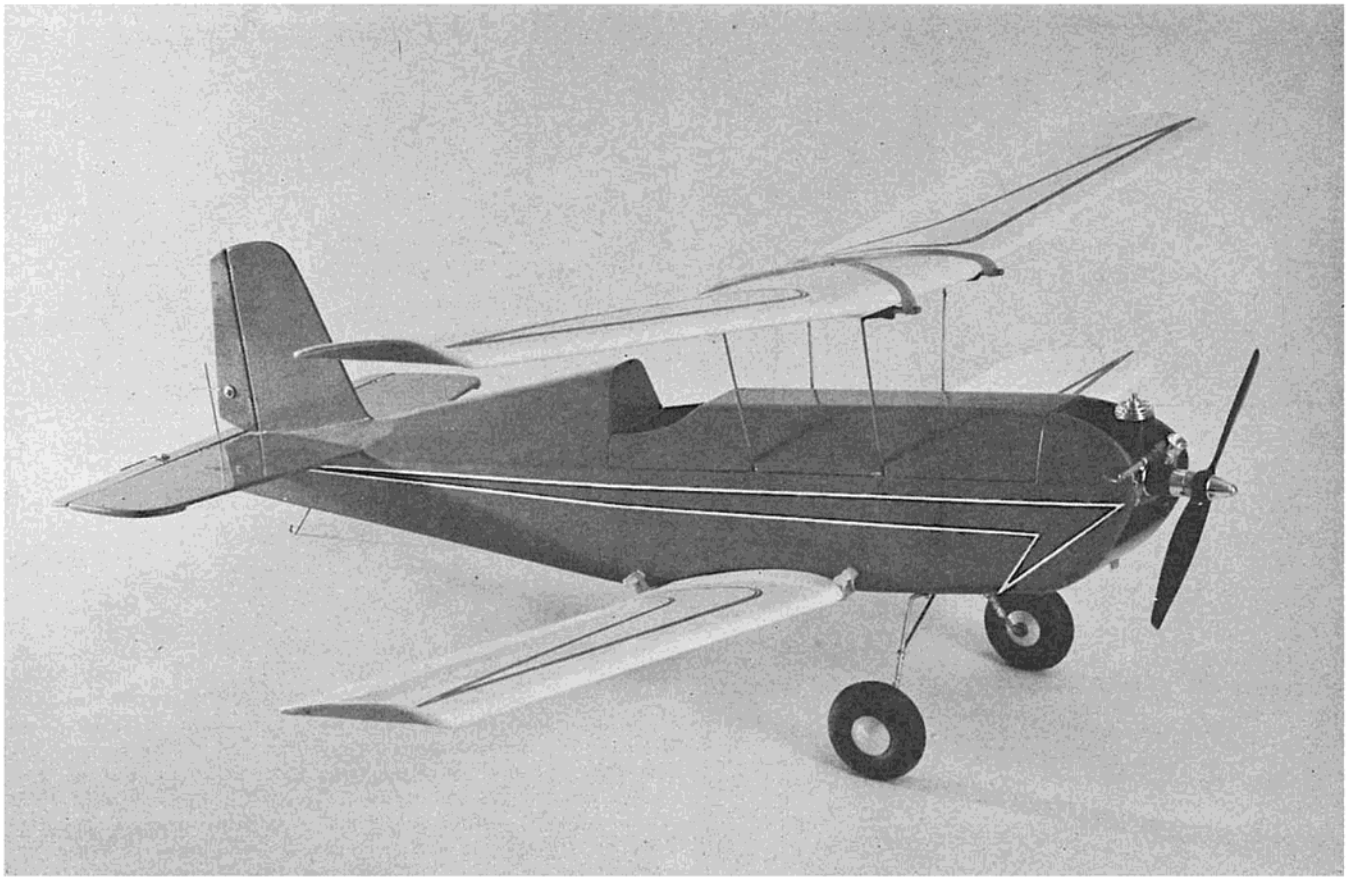
The prototype was finished with three coats of sanding sealer and two coats of clear dope, all butyrate, no trim. RCM's prototype was red, white, and black, all done in HobbyPoxy. (Old Gluey was trying to make me feel bad — I like to look at grain!). Contrary to the results of most articles on small planes, your finished job will probably come out lighter than the original. Besides... I have a reputation to uphold. (Yeah, Willie ...but we won't say what it is. — Ed.) Mine is now using a relayless C.G. Pioneer receiver. (Now called F&M, I believe this was the first commercial relayless receiver. Came out around 1958 or 1959. Mine is a six meter version dating around 1962). However, the all up weight is about the same as I use four pencells in series-parallel for more reliability through added capacity.

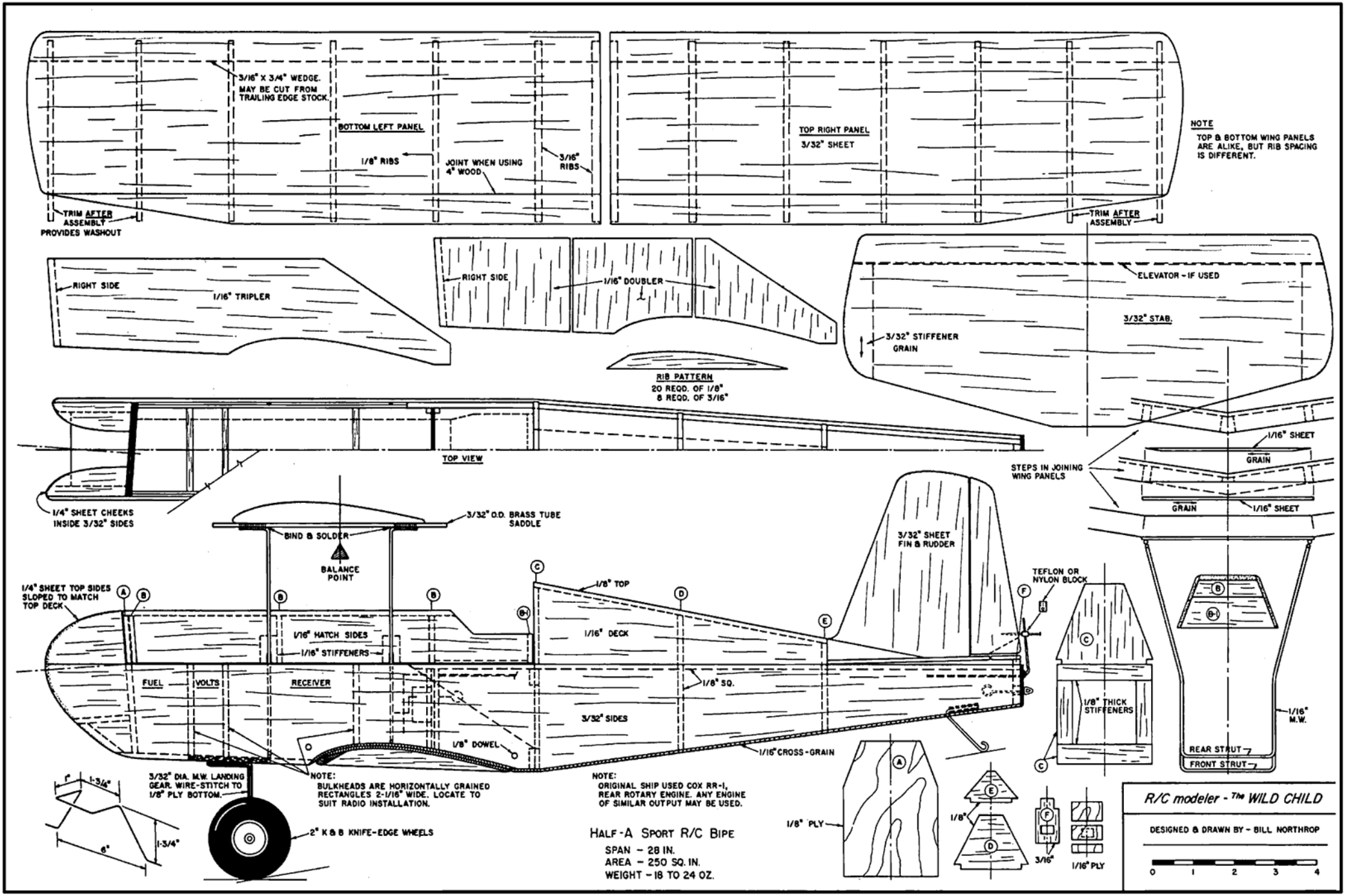
A few words about flying the Wild Child. When you look for a place to grab a-holt of it, you'll realize the highly scientific reason for leaving the bottom surface of the wings uncovered. The perfect grip for hand-launching is by thumb and first two-fingers on the bottom center-section of the bottom wing. It's just about at the C.G.

The best launch for powered flight is a javelin throw straight toward the horizon. When properly trimmed, W.C. will bore on straight and level and will fly right out of sight about six feet off the deck unless you stop it.

The original, with kick-up elevator, will loop from straight flight if it's "on the step." A real "let's-get-out-of-here-that-guy-will-kill-us-all" maneuver begins with a loop at about 25 feet altitude. When W.C. gets on its back, let off the button. The idea now is to play "chicken" with yourself and see how long you can wait before pulling the ship out of what Harold Goldklank calls a "Figure 9." I've pulled out with a foot and a half to spare. Don't try it unless you can hit 3 pulses faster than Matt Dillon can draw on the "meany." (Of course, if you go ape like certain editors I know, and put multi in this thing, forget it — there's too much at stake).

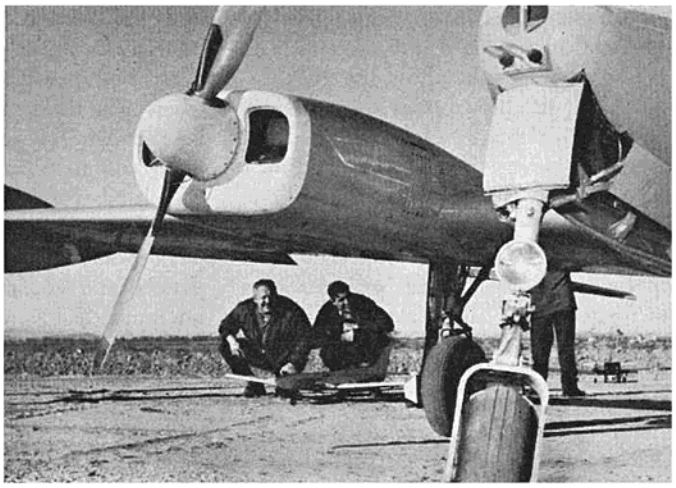
Skoal.

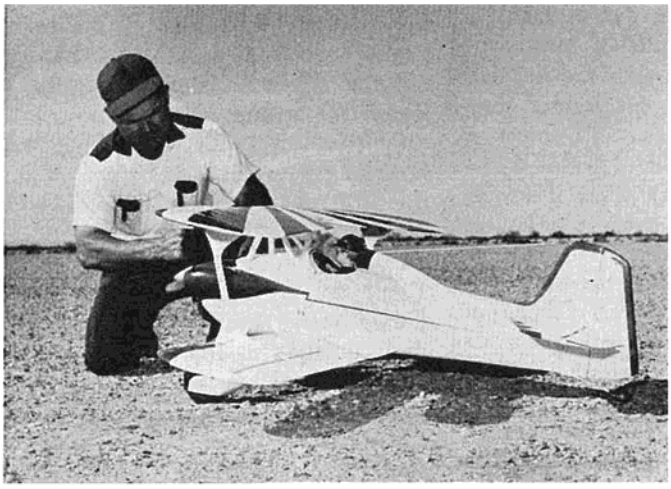


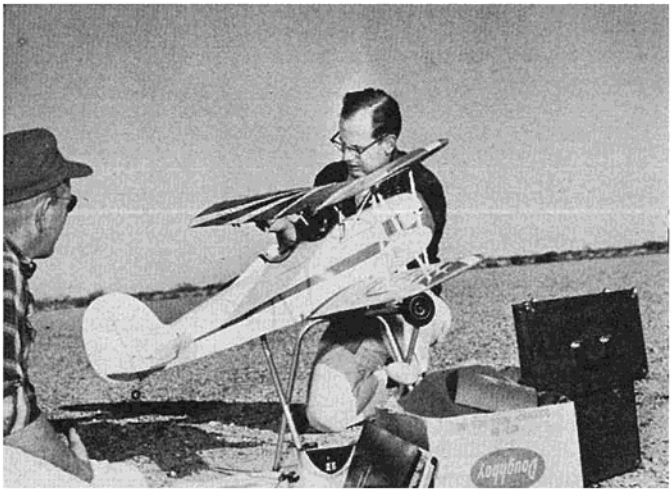

3/16" X 3/4" WEDGE. MAY BE CUT FROM TRAILING EDGE STOCK.
BOTTOM LEFT PANEL
1/8" RIBS
JOINT WHEN USING 4" WOOD
3/16" RIBS
TRIM AFTER ASSEMBLY PROVIDES WASHOUT
TOP RIGHT PANEL
3/32" SHEET
TRIM AFTER ASSEMBLY
NOTE
TOP & BOTTOM WING PANELS ARE ALIKE, BUT RIB SPACING IS DIFFERENT.
RIGHT SIDE
1/16" TRIPLER
RIGHT SIDE
1/16" DOUBLER
RIB PATTERN
20 REQD. OF 1/8"
8 REQD. OF 3/16"
ELEVATOR - IF USED
3/32" STAB.
3/32" STIFFENER GRAIN
TOP VIEW
1/4" SHEET CHEEKS INSIDE 3/32" SIDES
3/32" O.D. BRASS TUBE SADDLE
BIND & SOLDER
BALANCE POINT
STEPS IN JOINING WING PANELS
1/16" SHEET
GRAIN
GRAIN
1/16" SHEET
1/4" SHEET TOP SIDES SLOPED TO MATCH TOP DECK
1/16" HATCH SIDES
1/16" STIFFENERS
1/8" TOP
1/16" DECK
3/32" SHEET FIN & RUDDER
TEFLON OR NYLON BLOCK
FUEL
VOLTS
RECEIVER
1/8" SQ.
3/32" SIDES
1/8" DOWEL
1/16" CROSS-GRAIN
1/8" THICK STIFFENERS
1/16" M.W.
REAR STRUT
FRONT STRUT
3/32" DIA. M.W. LANDING GEAR. WIRE-STITCH TO 1/8" PLY BOTTOM.
1-3/4"
6"
1-3/4"
2" K & B KNIFE-EDGE WHEELS
NOTE:
BULKHEADS ARE HORIZONTALLY GRAINED RECTANGLES 2-1/16" WIDE. LOCATE TO SUIT RADIO INSTALLATION.
NOTE:
ORIGINAL SHIP USED COX RR-1, REAR ROTARY ENGINE. ANY ENGINE OF SIMILAR OUTPUT MAY BE USED.
1/8" PLY
1/8"
3/16"
1/16" PLY
HALF-A SPORT R/C BIPE
SPAN - 28 IN.
AREA - 250 SQ. IN.
WEIGHT - 18 TO 24 OZ.
R/C modeler - The WILD CHILD
DESIGNED & DRAWN BY - BILL NORTHROP
0 1 2 3 4

Southwestern Regionals

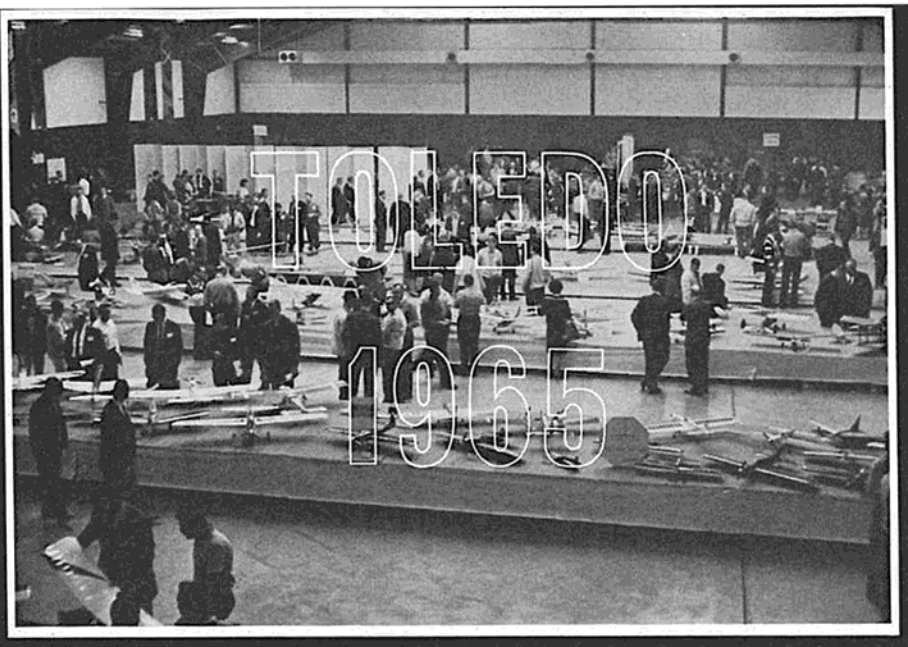
They came by twos . . . they came by fours . . . over thirty full size private aircraft flew in the RC'ers that battled in the five major events at Buckeye, Arizona. An on-the-spot pictorial by RCM's Dick Tichenor.







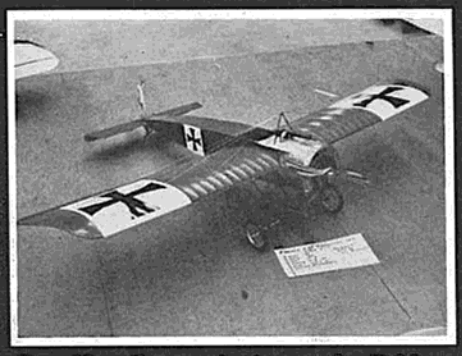
L to R, top to bottom. Phil Breitling and Chuck Boyer with Class III twin entry behind the wing of Chuck's Cessna 310; Glen Cunningham's Little Toot. ¼ size, 57″ span, McCoy .60; Eddie Morgan's magnificent 74″ span scale Me 210. Two Merco .49's. Several demo flights by Ted White proved the 210 flew as good as it looked; Dave Lane of Culver City, California and his scale Great Lakes; Cletus Brown flew his original 215X with own design retractable gear; A popular P-51 by Glen Goodman — scratch built, and included retractable gear, tail wheel and gear doors, flaps, operational lights and canopy.



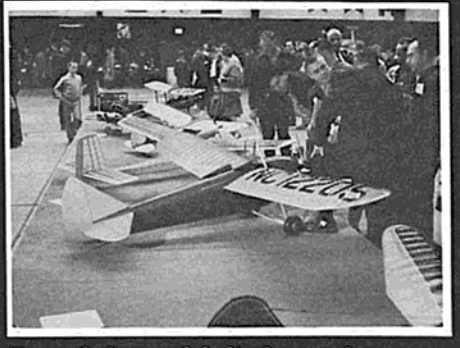
Despite one of the worst storms of the season, RC'ers came by the hundreds to view this R/C spectacular sponsored by the Weak Signals Club. With virtually every manufacturer previewing new equipment for the coming season, it was a modeler's paradise . . .

By CHUCK WAAS

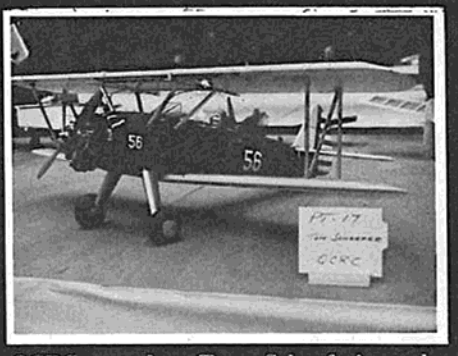
There were models of every kind on display . . . conventional, and unconventional



Jim Moynihans winning scale Fokker E III Eindecker. 68″ span. Min-X 10 and Bellamatics.



Part of the model display, and a magnificent Buhl Pup in the foreground.

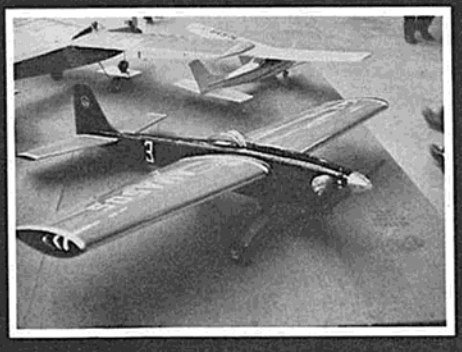


QCRC member Tom Schaefer's scale PT-17. Level of workmanship is obvious.

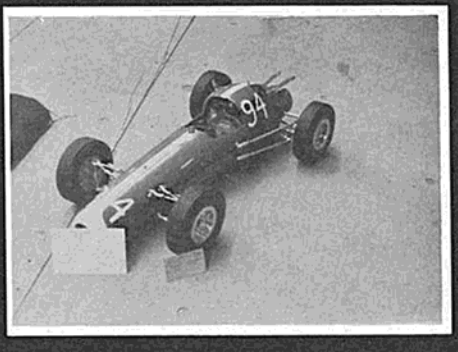
Vic Husak being presented RCM editor's Trophy for 8′ 'Cream Puff' design.

Bob Choronzuk of Chicago's 66″ span Class III entry, the Polaire.

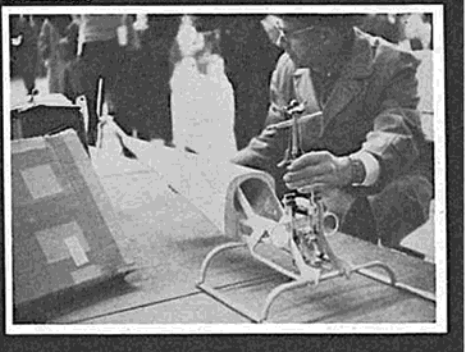
Dayton Works member, Charles Bossi and his Twin Hornet, Coin type fighter-bomber.



RCM's Bernie Murphy entered this Paul Ennis designed Marksman. Hobby-poxy finish. Took second.



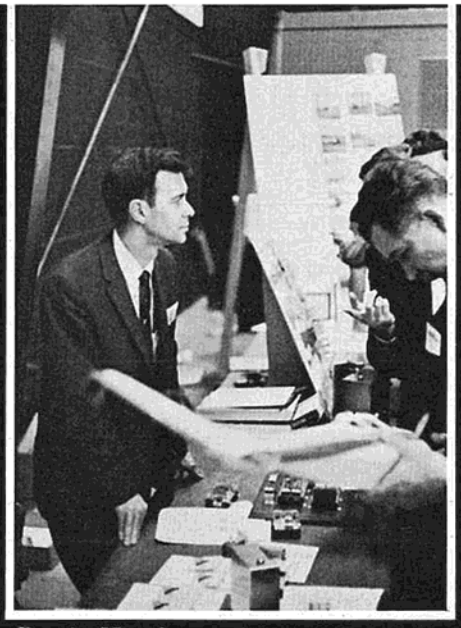
Believe it or not — an O&R compact powered R/C race car!



An example of excellence in design and craftsmanship . . . an R/C helicopter.

Bill O'Brien displaying Babcock Controls line of single channel systems.

Jack Levine — Lee's Hobby Industries.



Bernie Murphy — Accutrol Servos.

Paul Runge of Ace R/C discusses the ever-increasing Ace line of products.

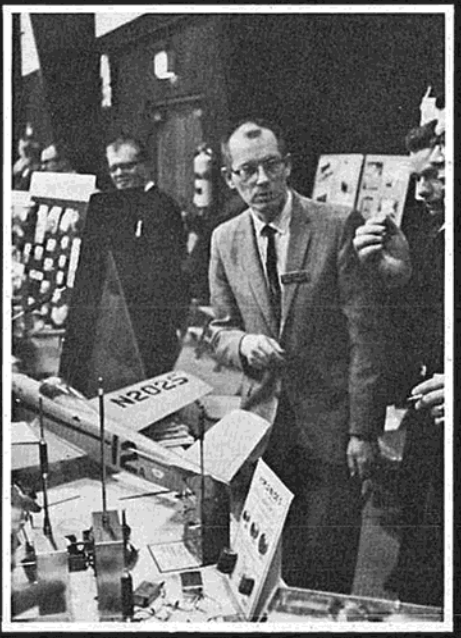
Big Frank — and the Midwest display.

Min-X — a fabulous line.

F&M Electronics display their reed and proportional systems.

Gerry Krause and Bob Elliott with four versions of the Logictrol proportional system.

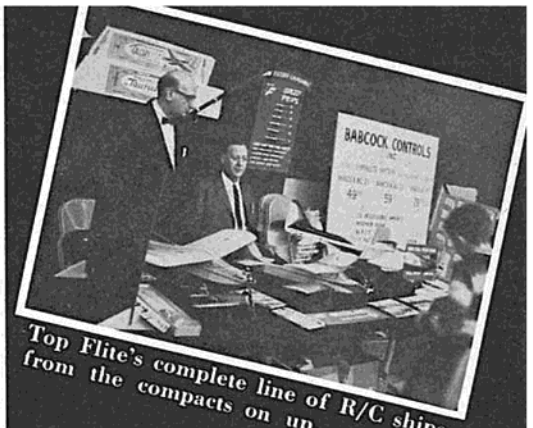
Jack Port — and the Controlaire Exhibit.



World Wide Radio and Jack Josaitis.

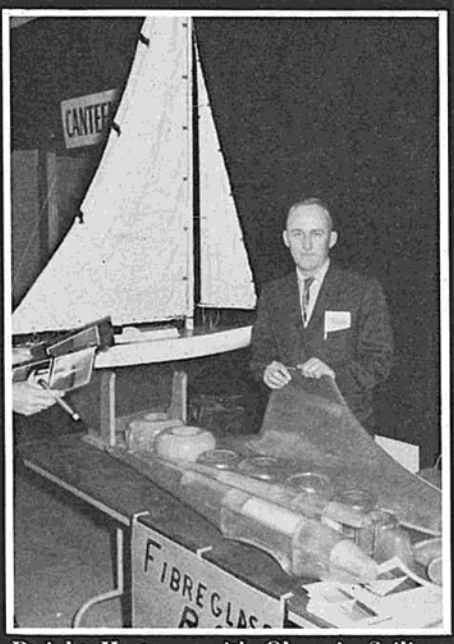
Bev Smith, Hobbypoxy, and Little Toot.

Citizen-Ship's proportional system.

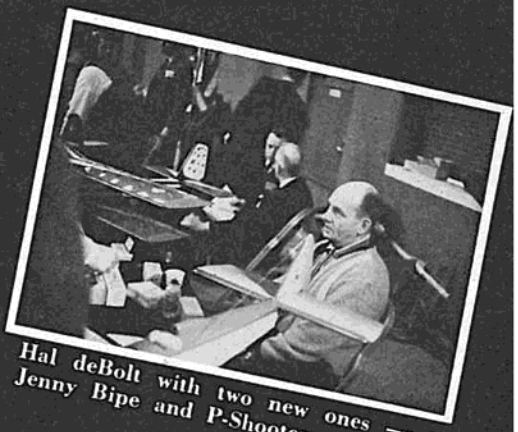


Top Flite's complete line of R/C ships from the compacts on up.

Transatlantic's ready-to-fly R/C ship.

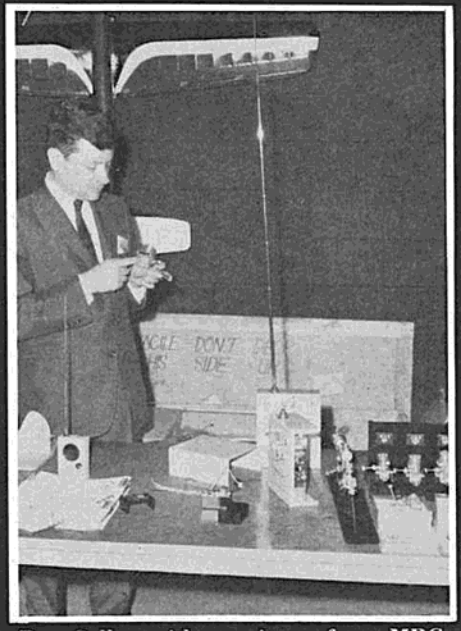


Dwight Hartman with Olympia Sailing sloop.



Hal deBolt with two new ones — a Jenny Bipe and P-Shooter.

And despite the snow they flew big ones . . .

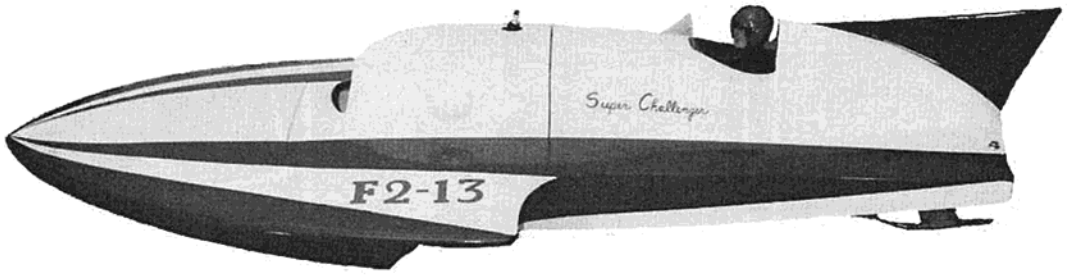


Roy Gelber with new items from MRC-Enya.

Don Brown and Quadruplex proportional kit.

. . . and even the little ones.

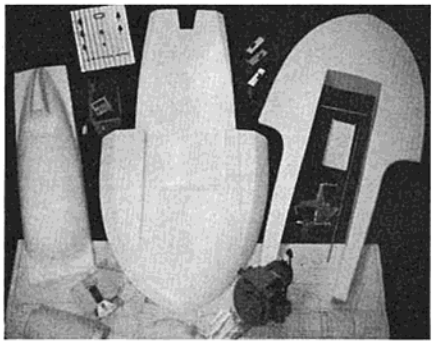
Building The G.E.M. SUPER CHALLENGER



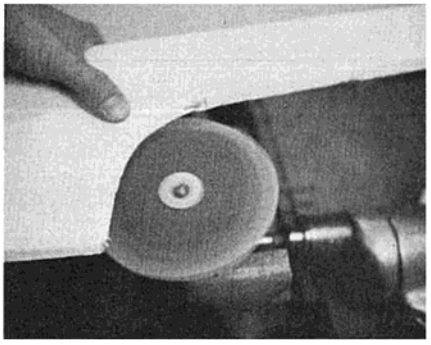
By GARY PREUSSE and EARL MUNDT

A step-by-step "how-to" article for a record smashing hydro

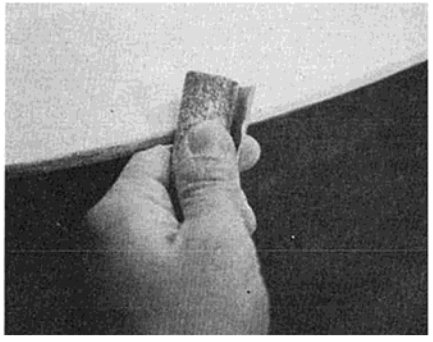
Super Challenger kit by G.E.M. with all necessary equipment to make it perform.



Disc Sander being used to remove the lip on the deck behind each sponson.



Coarse sandpaper is used to roughen the edges of the molded parts before bonding.



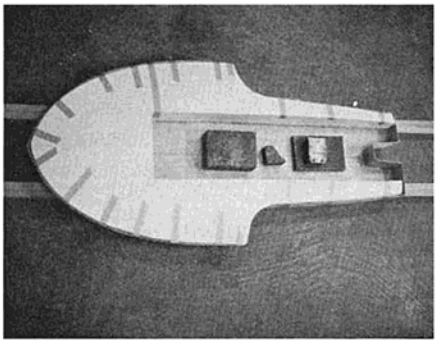
Upon an initial inspection of the fibreglass hull and deck contained in the G.E.M. Challenger Sr. kit, these units appeared to be quite flexible. This is due to the fact that just enough resin is used to wet the glass fibre, allowing a high strength, light-weight and puncture proof hydro. When the deck and hull are bonded together, they form a rigid, welded unit.

Before actual assembly can begin, it will be necessary to remove excess fibreglass from the deck lip to assure a uniform fit without any distortion. A hand file is adequate, but a sanding disc on an electric drill will speed this chore. Carefully remove the lip which hangs from the curved edges behind each step. If the deck sets too high in the hull, trim the engine well a little at a time. It may be necessary to remove approximately 1/16" of material from the top edge of the hull so that the curved edges behind the step may lie flush with both sides of the hull. Check the lip and the bow carefully to insure a proper fit.

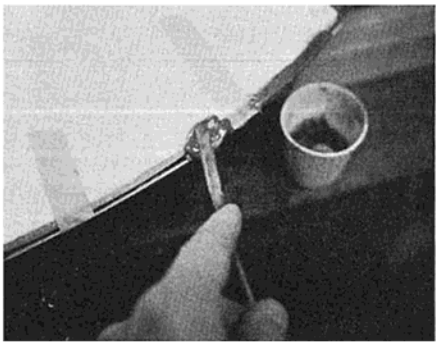
Due to the smoothness of the exterior surface, it is very important to roughen with coarse sandpaper any part that is to be bonded. All of the exterior, which is to be later painted with epoxy, should also be sanded with #200-#400 wet-or-dry paper. The interior surface is purposely left with a rough finish so that you may bond directly to it without the necessity for sanding.

If an O&R engine is to be installed, the engine mount must be mounted before the deck and hull are joined. Using a soft black pencil, mark off the thrust line on the outside of the engine compartment, maintaining a 13-14 degree angle with the bottom

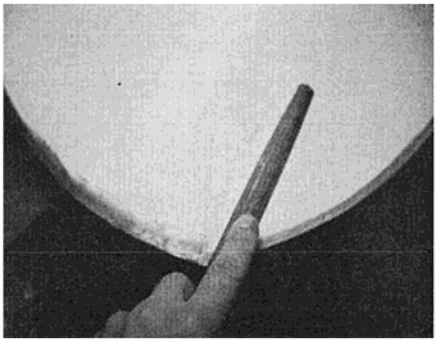
Preparation of the hull before applying putty in the "V-groove."



Actual application of putty in the "V-groove."

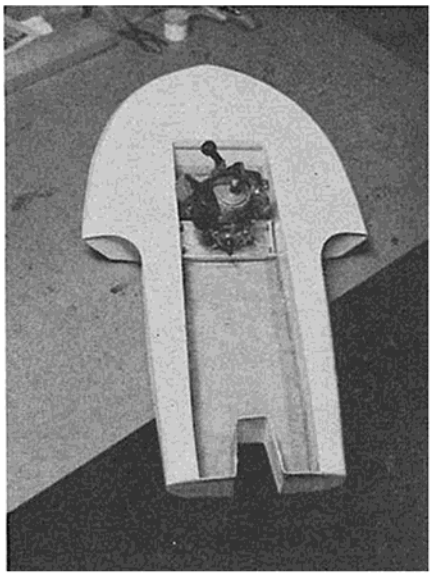


Neatness in applying putty will greatly reduce the chore of finishing the deck edge.



edge. Drill six holes in the engine compartment for the engine mount. Use two triagular pieces of ¼" plywood with T-nuts forced in the proper location to match the engine mount. Assemble the engine mount and the triangular shaped bearers in place to check the fit. Set the deck into the hull and engine into the engine mount to assure that you have mounted them in the proper location. If everything is as it should be, apply resin generously around and over the bearers and T-nuts, but not on the threads of the protruding screws. (A little vaseline on the threads will keep the resin from adhering.)

If you are installing a Tas engine, it does not require the engine mount attached to the sides of the engine compartment, and therefore, the hull and deck are joined first. Do the joining on a level table with the help of two straight 2" x 2"'s about 40" long. Place them parallel under the hull and inside the steps of the boat. Then lay a series of weights in the center of the hull to straighten it out against the 2 x 2's. Roughen both the deck lip and the bottom edge of the engine compartment with coarse sandpaper.



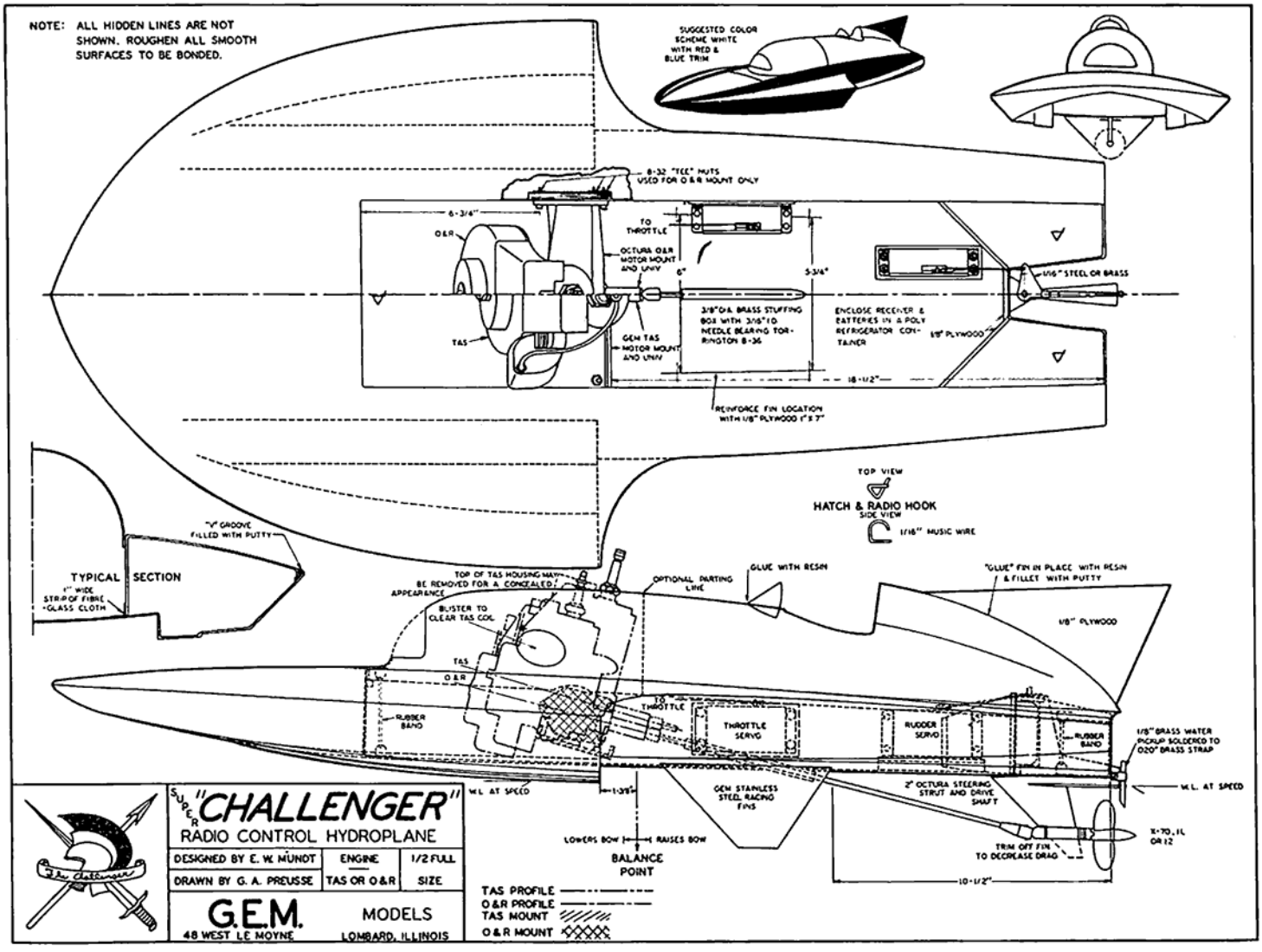
Tas engine and mount shown installed.

Now tape the deck in place with pieces of masking tape every 6" all the way around the boat. Mix only a small amount of putty (approximately 10 drops of hardener to an ounce of putty) at a time because it sets up quite rapidly. With a putty knife, carefully fill in the V-groove between the tape. Any excess putty will have to be filed or sanded away from the white finish of the boat. It is very important to fill-in with putty to the bottom of the groove for a strong bond. When the putty has completely set, the masking tape may be removed and the openings filled-in in the same manner. Join the engine well to the bottom of the boat with a 1" strip of fibreglass cloth and an adequate amount of resin.

Drill the aluminum mount to match your Tas engine and also drill two pair of holes ¼" from the ends of the mount on two-inch centers for 10-32 bolts. Cut two strips of brass ½ x 3 from 1/32 brass for mounting pads and drill two holes for 10-32 bolts also on two-inch centers. Use solder to hold two ¾" bolts on the brass strips.

With the Tas engine mounted on the aluminum mount and the mounting pads in place, set the engine in the proper location. Place two 15° wedges under the mount close to the center and tilt the engine to the rear of the boat. To secure the mounting pads, place a couple of dabs of putty on them and, correspondingly, the

(Continued on Page 34)



CHALLENGER, SR.

(Continued from Page 33)

bottom of the hull. After the putty sets up, carefully remove the engine mount and finish filling in under the pads with putty. Apply a layer of cloth (4" x 3") and resin down each side of the engine compartment, over its respective mounting pad, and over the bottom of the boat. Add another coat of resin and let set at least 24 hours.

Cut a piece of 1/8" plywood for mounting inside the transom to support the steering strut drive unit. Drill the necessary holes through the transom and the plywood panel for attaching the steering strut. Glass the plywood panel in place. Add the transom knees and secure with an appropriate amount of cloth and resin. Cut the necessary holes in the bottom of the boat for the drive shaft to pass through. Slip the shaft into position to check alignment. We recommend the stuffing box be made from a 5" long, 3/8" O.D. piece of Perfect brass tubing with a 3/16" I.D. needle bearing crimped at its center. Remove the shaft and enlarge the hole, if necessary, to clear the stuffing box. Re-install the shaft with the stuffing box in place and check for any binding or deflecting of the shaft.

We highly recommend using G.E.M.'s special stainless steel racing fins on this and all other racing boats to assure turning the boat in a small radius. These fins run through the water at a 45° angle as shown in the illustration. Because they are bolted to the bottom of the hull, and the hull has positive incidence when it is riding on three points, the bases of the fins must be 1/4" closer at the back than they are at the front in order to allow them to be parallel when the boat is riding on three points. This is not a difficult thing to do. All that is required is to draw a line on the bottom of the hull from the center of the strut cutout to the center of the hull at the back of the steps. Using this line as a guide, the fins are easily positioned and mounting holes may be drilled accordingly.

If you desire to add a fin to the fibreglass hatch, it should be cut from 1/8" plywood. Cut the shape you desire and carefully sand it to match the contour of the headrest. (Sand the headrest vigorously to assure a bond between the fin and the hatch.) The fin may be held in place with tape. With an eyedropper, apply some resin to the fin and the headrest and let it set up. Remove the tape and add some fibreglass putty in the form of a fillet. You may use a finger to trowel it out if you keep wetting your finger in thinner in order to keep the putty from adhering. Sand the putty and apply resin to the plywood to seal the surface.

Cut the air intake opening with a saw and sand smooth. Drill a 1/4" hole for the spark plug and use a round file to obtain adequate clearance.

The boat should be carefully sanded to remove any gloss, oil, finger prints, etc., before painting with epoxy paint. The parting lines of your color scheme should be lightly penciled in on the white hull to aid in applying the masking. (Use cellophane tape.) Follow the manufacturer's instructions with the particular brand of epoxy that you purchase. I will re-emphasize that you use epoxy paint **not** butyrate dope. After the paint dries you may rub the boat's finish with fine rubbing compound and apply a coat of paste wax. The hardware and radio may now be reinstalled and your boat is ready for the water.

TRIMMING INSTRUCTIONS

It will be noted that we are showing fins on the right and left-hand side of the boat. This will allow high speed turns to the right or the left without the necessity of throttling down and losing a race. These fins allow the inboard step to remain in the water to give the boat "traction" to resist centrifugal force. The fins may be moved slightly forward or backward to obtain different turning characteristics. Moving the fins forward will cause the boat to turn more tightly.

The trend today is to right-hand pylon racing. With this in mind, the left fin may be left off to reduce drag and increase speed during a race. Just remember to secure the bolts in the hull to plug the holes.

On the plans you will see the running position on the tips of the sponsons and on the aluminum plate of the steering strut. The angle at which the plate lays in relationship to the water will determine how much the boat will rise out on it. By pointing the rear of the plate up, the boat will ride wetter at the rear and pointing it down will raise the back end out of the water.

In your initial running of the Super Challenger, bolt the strut directly to the hull with no shims and balance as shown. If this is your first high speed boat, become familiar with its speed. Then adjust the strut angle and balance point to minimize spray from the sponsons and transom.

Now that you have your boat trimmed and ready for the water — Good Luck and Happy Sailing!

AEOLUS

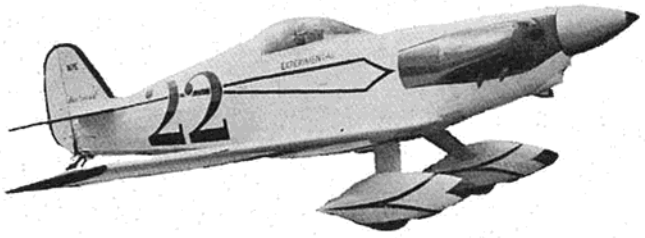
(Continued from Page 20)

templating future additions such as possibly a Bendix and Thompson trophy event. In my own opinion, this event has a greater future than the stunt category, since it encompasses scale and semi-scale, ease of construction, and a chance for every RC'er to enter and compete.

Whether you build the Aeolus, or some other of the Goodyear designs, get out and practice and don't be afraid of entering competition. This is a national fun event designed for **YOU.**

And you'll not only have a chance — you'll enjoy it!

NATIONAL MINIATURE PYLON RACING ASSOCIATION



P.O. BOX 487 • SIERRA MADRE • CALIFORNIA

N.M.P.R.A. ORGANIZATION ESTABLISHED

In this, the first official publication of the National Miniature Pylon Racing Association, we would like to extend a welcome to each and every RC'er to become an active member of the N.M.P.R.A., and to participate in the first event sponsored by this organization, the Goodyear Event.

The N.M.P.R.A., itself, is a non-profit organization with a Board of Directors consisting of six Regional Advisors, and Administrative Director, and a Public Relations Director. For the balance of calendar year 1965, the following officials were established to serve the Association:

Regional Advisors

Jerry Nelson, 8638 Patterson Pass Road, Livermore, California, Regions A, B, E.

Bob Bowen, 3301 Opal Street, Torrance, California, Regions C, D, F, H, I.

Maxey Hester, 7105 Airline, Des Moines, Iowa, Regions G, W.

Ed Kazmirski, 428 Webb Street, Calumet City, Illinois, Regions U, V, N, O, P.

Bernie Murphy, 454 Gayle Drive, Linthicum, Maryland, Regions Q, R, K, L, M, J.

(To be verified), Regions S, T.

Administration

Don Dewey, P.O. Box 487, Sierra Madre, Calif., Administrative Director.

Chuck Waas, P.O. Box 487, Sierra Madre, Calif., Public Relations Director.

At the present time, membership applications are being processed as quickly as possible, and racing numbers being assigned. This number, appearing on each membership card, must be used, and should appear on the upper left and lower right hand wing panel facing toward the left side. The number will be right side up with the model in a left bank. This number must be at least 3" high on the wings. The racing number should also appear on the fuselage sides just aft of the cabin area. Be sure that the complete assigned number is used — this includes the one or two digit number followed, or preceded by a letter.

Your individual registration number should appear on the upper right and lower left wing of your pylon racer, and also in a smaller version on the vertical stabilizer. This number is made up from your AMA number and preceded by the letter "N". The minimum height of the numbers on the wing will be 2". The minimum height of the numbers on the vertical tail surface will be ¼". An alternate method of displaying your registration number would be to delete the racing number from the fuselage sides and place the registration numbers along each side of the fuselage behind the trailing edge of the wing, a minimum height of 1" per letter. The letter "N", plus the last two or three numbers of your AMA license should be used for your registration number. This can be followed by the first letter of your last name, if desired. For example, John Smith has AMA Sporting License AMA 27785. His registration number could be: N785S.

All membership materials are being forwarded to individual members as quickly as they are made available. These include a membership card, copy of the Official NMPRA Rules, Goodyear Event Sanction Applications, and an NMPRA decal. With regard to the sanction applications, a sanction is required for every Goodyear event, regardless of whether or not it is a part of a sanctioned AMA contest. There is a specific reason for this ruling, inasmuch as complete details of every Goodyear race will be maintained at NMPRA headquarters, in order to verify meets, records, etc., and to provide recognition for Goodyear event pilots.

Minutes	Seconds									
	:00	:01	:02	:03	:04	:05	:06	:07	:08	:09
2:30	60.00	59.60	59.21	58.89	58.44	58.06	57.69	57.32	56.96	56.60
2:40	56.25	55.90	55.55	55.21	54.88	54.67	54.22	53.89	53.57	53.25
2:50	52.94	52.63	52.33	52.02	51.72	51.43	51.14	50.85	50.56	40.28
3:00	50.00	49.71	49.45	49.18	48.96	48.65	48.39	48.13	47.84	47.62
3:10	47.37	47.12	46.88	46.63	46.39	46.15	45.92	45.69	45.45	45.23
3:20	45.00	44.78	44.55	44.33	44.12	43.90	43.69	43.48	43.27	43.06
3:30	42.86	42.65	42.45	42.25	42.06	41.86	41.67	41.47	41.28	41.10
3:40	40.91	40.72	40.54	40.36	40.18	40.00	39.82	39.65	39.47	39.30
3:50	39.13	38.96	38.79	38.63	38.46	38.30	38.14	37.97	37.82	37.66
4:00	37.50	37.34	37.19	37.04	36.89	36.73	36.59	36.44	36.29	36.14
4:10	36.00	35.86	35.71	35.57	35.43	35.29	35.16	35.02	34.88	34.75
4:20	34.62	34.48	34.35	34.22	34.09	33.96	33.83	33.71	33.58	33.46
4:30	33.33	33.21	33.09	32.97	32.85	32.73	32.61	32.49	32.37	32.26
4:40	32.14	32.03	31.91	31.80	31.69	31.58	31.47	31.36	31.25	31.14
4:50	31.03	30.93	30.82	30.72	30.61	30.51	30.41	30.30	30.20	30.10

$$\frac{9000}{\text{Sec.}} = \text{M.P.H.}$$

This time table will tell at a glance the exact speed of a pylon racer completing the official 2½ mile N.M.P.R.A. course.

and the Goodyear Event. The Association looks forward to the coming contest season and the pylon races that will be held across the nation. The future of this event is certainly promising. It is contemplated that a possible Bendix and Thompson Trophy Event will be added at the conclusion of the first racing season if NMPRA members want such an event.

It is your organization — help make it a good one by actively participating in the sanctioned events, and by voicing your opinions, suggestions, and criticisms to your Regional Advisor and to the Administrative Director.

Several products which have received wide acceptance from RC'ers building Goodyear ships, and which conform under NMPRA specifications, include Williams Brothers smooth contour type wheels. These narrow wheels are ideal for use with speed fairings, and are available, with or without brakes in sizes from 2¼" diameter to 5¼" diameter. The 2¾" size is the most widely used for Goodyear ships. Price, per pair, on this size is $2.25, or $4.95 with brakes. Specify #SC-2 or SCB-2 (with brakes). Williams Bros. also has available scale racing pilot busts — the 2" scale size is 89c each.

Dwight Hartman, Argenta, Illinois is currently developing a complete kit of the "Li'l Knarf", designed by Jerry Nelson. This will include a fibreglass fuselage, Armalite foam wing core, plus additional kit parts. Estimated production date is June, 1965. Hartman also has available fibreglass wheel pants in various sizes, and priced from $5 to $9 per pair. Write for listing.

Complete plans for currently available Goodyear designs are available as follows: From Nelson Model Products, 8638 Patterson Pass Road, Livermore, Calif. — Bonzo, Little Toni (Cosmic Wind), Li'l Knarf, Rivets, Miss Take, etc. Plans are $3 per set. See their ad in this issue. The Denight Special and Aeolus are available from R/C Modeler Hobby House Plans Service.

Several currently available kits can be modified to create semi-scale Goodyear racers that will conform to NMPRA Rules. These include the Live-Wire Cosmic Wind, Williams Bros. Duck Hawk, and deBolt Jenny. The latter modification is rather remarkable, and is scheduled for presentation in a forthcoming issue of R/C Modeler.

TOP OUT

jerry kleinburg

An Open Letter to the Contest Board — First of Two Parts on the Class I Rules

As promised, this month's column is devoted to an overhaul of the contest rules as applicable to Class I. Recommendations are presented as an "open letter" to Ed Izzo, AMA's Contest Board Chairman, and since it pretty well speaks for itself, I'll not embroider further on the details except to say your support, either to Ed, or to Top Out, or your own Contest Board member, are needed and would help to achieve the necessary action.

An Open Letter To Ed Izzo and the A.M.A. R/C Contest Board

Dear Ed:

I believe you agree it's time to take a thorough look at RC pattern event regulations in order to affirm the parts that are good, change what's necessary, and to generally continue the progress that's been made in recent years. The last two seasons, having provided perhaps more contest and flying experience than has been gained in the last ten, offers a rich opportunity to improve the value of our 'rules' and to have them reflect the practical knowledge accumulated lately. I've noted that the natural desire for change has grown to a point where positive action is called for to update the rules for the 1966 season.

As you know, my own interest is in class I. Although what will be covered here will primarily aim at that segment, it is realized all pattern classes are inter-related and in considering one of them appropriate attention must be given the others. What I'll present here will be a series of items that deserve review together with associated comments and specific rule language for each selected item.

Before going on, Ed, I think it's necessary to lay out the background of the comment you'll read here. Besides being based upon correspondence from all segments of the country, all modelling literature for the last 5 years has been followed as published and reviewed again in reaching the conclusions reflected. In addition, and most importantly, the opinions expressed are a consensus based upon personal field experience gained principally from contests covering a wide geographic area (the most recent include New Orleans Dyna Soarers meet, Dallas Southwest Championships, Houston Space City International, Las Vegas Fourth Annual LVRC, Miami King Orange International, Phoenix Southwestern Regionals, as well as the Dallas Nationals) and, of course, discussions held at these get-togethers. I believe such contacts are sufficient to have gained an insight broad enough to be representative of RC activity generally as it occurs today.

The following comments assume two basic propositions; that the pattern event will continue, and that different classes within the event will be required essentially as they are. Although in conversation is heard the desire for 'something different', nothing of significant difference has been demonstrated to warrant considering other than present basic arrangements. This is not to infer that new events are not developing or desirable. The Goodyear Racer event is a good example of concrete steps being taken to develop an idea and to 'mature' it for national recognition. The point here is that developments of comparable nature aimed at displacing the pattern event has not been noted (which attests to the general acceptance and continued usefulness of pattern) and that it therefore makes good sense to continue to work to strengthen pattern rules through logical improvements based upon our increased experience. It is through this process that rules will continue to best meet field needs and thus provide contest officials with universally accepted administrative tools.

Item 1. **NEW PATTERNS:** Perhaps the greatest desire for change focusses upon the current patterns. While they continue to offer substantial challenge to both fliers and aircraft, some change is called for to improve flight efficiency, spectator interest, and lastly (but not least!) flier interest. Experiments at many contests with special maneuvers and published articles, as well as comments heard at all contests abundantly attest to the desire of fliers and contest officials for the development of new patterns and maneuvers, at least partially. The problem is not so much one of initiating new aerobatics, as it is to continue to provide one pattern **useful to all classes** and to keep it simple and feasible to administer in the contest arena. (After all, judging re-

mains a critical problem with the current 'old' routine.) Care must also be exercised that we don't rationalize some maneuvers away under the guise of change simply because they're tough to do (like touch and go early in the routine) and the high risk or work factor tempts us to make things easier! What this boils down to is that some rearranging is needed, new maneuvers should be added and some deleted, while others should be combined a la Debolt to save time (only up to a point — considering judging limits). A goal of eight minutes total time for class I and nine minutes for class II and III is desirable. To bring about the above recommendations the following rules changes are submitted:

22.8 TIME LIMIT:

A Class I contestant is allotted a total of eight minutes.

A Class II contestant is allotted a total of nine minutes.

A Class III contestant is allotted a total of nine minutes.

22.9 No change

22.10 POINT SYSTEM: (See recommendations for item 8.)

22.11 FLIGHT PATTERN: (General limits — no change)

MANEUVER:

1. Proto Taxi. — no change
2a. Unassisted ROG. — no change
2b. Hand Launch. — no change

3. Straight Flight Climb-out. Fly upwind from take off point to marker approximately 500' away. Judge will announce arrival over marker. (Contest Director may reduce distance in windy weather). Achieve level flight prior to next maneuver.

4. Procedure Turn. — no change

5. Straight Return Flight. — no change

6. & 7. Combined Figure Eight (five points for each). Two figure eights with axis perpendicular to wind and smooth equal circles crossing over above transmitter. The first half consists of an upright eight the second half of an inverted eight with entry made immediately upon completion of upright eight.

8. Touch and Go. — no change

9a. Straight Flight Climb and Rolls. Straight flight climb to desired altitude followed by a horizontal axial roll to the right and then by a horizontal axial roll to the left immediately upon completion of the first roll. An optional 180° turn is permitted prior to rolls. Straight level recovery on same heading as roll entry.

9b. Class I and II planes may substitute barrel rolls in each direction for the above.

10. Wing Over. — no change

11. Immelman Turn. — no change

12. & 13. Combined Loops. (Five points for each half). First half consists of two continuous inside loops. Second half consists of two continuous outside loops performed immediately upon completion of first half and terminated by level half-roll following outside loops. Loops will be smooth, round, equal sized, and all at the same altitude. Straight and level recovery at same altitude as entry.

14. Four Point Roll. — no change

15. Cuban Eight — no change, except name to Horizontal Eight.

16. Tail Slide. — no change

17. Rolling eight. — no change

18. Three Turn True Spin. — no change

19. Vertical Eight. — no change

20. Traffic Pattern. — no change

21. Landing Perfection. — no change

22. Spot Landing. The spot shall consist of a circle 50' in diameter. — no change to remainder.

23. Proto Taxi to Hangar. — no change

Item 2. **BRAKES and STEERING:** The 'reason for being' of class I is to attain maximum performance while retaining simplicity that is **consistant with the state of the art.** Since safety considerations are becoming increasingly important and in view of the need for 'sharper' performance in class I, brakes and steering are appropriate for adoption at this time. There is almost universal agreement among class I contestants for these capabilities, reflecting a maturing regard for positive and safe ground control of their planes and a desire to be compatible with the performance of the other classes. Since these capabilities may be brought about without added actuators the ideal of class I simplicity is not significantly effected to warrant or justify further delay.

22.4.1 Class I — first sentence remains the same, delete the second and third sentences and add: "No auxiliary aerodynamic controls are permitted (flaps, spoilers, etc.); auxiliary non-flight controls are permitted (brakes, steerable wheels, etc.). Trim for the Rudder Control and control for steering is permissible only if obtained with the basic actuator used for Rudder Control — no additional servos, actuators, or powered devices are permitted. Brakes are permitted using any allowed power device." — no change to remainder.

Item 3. **RESERVE PLANES:** The prohibition of a reserve aircraft serves no current useful purpose but instead hinders fuller contest participation. Since travel expenses, along with food and lodging costs are considerable, the insurance of an added plane is desired to assure a reasonable certainty of participation to make the expenses worthwhile. In addition, the added flight risks brought on by use of multiple flight lines offers added justification for liberalizing this rule to allow registry of a second plane in event of incapacity of the first.

1.20 NUMBER OF MODELS — to first sentence add "...and RC pattern..."

Item 4. **MULTIPLE PATTERN ENTRY:** Effort to promote 'cross' activity between the classes is due. Equipment commonness makes this feasible and it is advantageous generally to de-segmentize the event and to encourage a fluidity of flying talent and interest. Previously, when facilities were limited it was necessary to restrict flying to single pattern class entry along with the 'one plane' rule. Now multiple flight lines bring about the ability to allow fliers to compete in more than one pattern class at a contest, at least at local affairs. To assure continuance of the equal time principle for contestants who do not choose multiple entry the procedure of one-flight-per-round for each contestant will continue as in the past. In other words, even though a contestant enters two pattern events (and pays another entry fee) he may only list himself once on the flight list per round. Which class he flies will be his option each time his turn comes up.

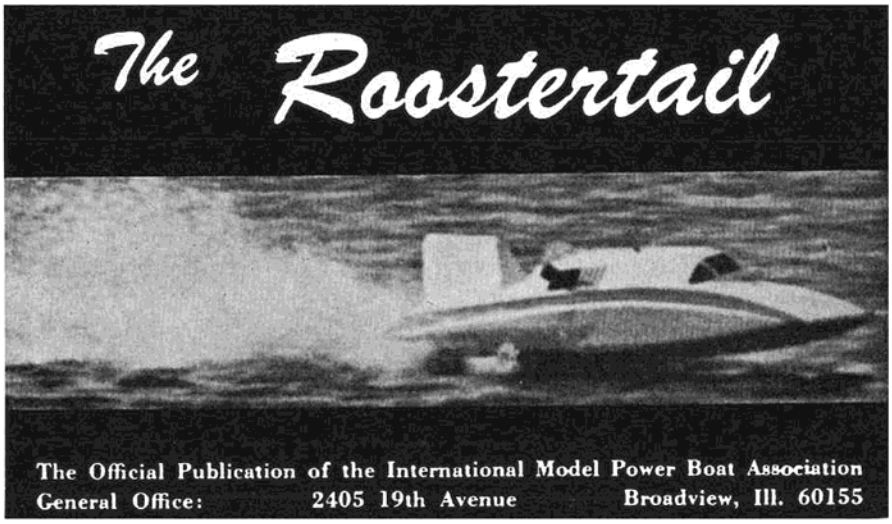
22.5 — change third sentence to read: "Contestant is permitted to enter more than one category listed in paragraph 22.4 in the RC Pattern Event."

— add fourth sentence: "Contestant will be permitted to register a second or reserve plane in an entered event after the first registered plane becomes disabled and cannot be used for further competition for the duration of the contest." — no change to remainder.

22.6 NUMBER OF FLIGHTS: — replace second sentence with: "Contest officials shall make every reasonable effort to insure that all contestants receive opportunity to an equal amount of total Pattern Event flights or attempts. Contestants entering more than one Pattern Event Class will be limited, as are all contestants, to a single flight per round with option each round as to class flown."

22.15 — change third sentence to read: "Contestant shall have his name on list only once at any time and, where entered in more than one pattern class in accord with paragraph 22.5, declare prior to flight which class will be flown for his turn. Names may be moved to..." — no change to remainder.

(To be continued)



Cape Coral, here I come! So the story goes from more and more Mid-West IMPBA members. Letters from around the country indicate that the 16th Annual IMPBA Regatta, to be held on July 3 and 4, 1965, at Cape Coral, Florida, will be the biggest and best yet.

The 16th Annual IMPBA Regatta will include the following events:

Tether Racing, All Classes

R/C Precison: Balloon Busting Course.

R/C Speed: Straight 1/16 Mile
Two Lap Oval ¼ Mile
8 Lap Oval, Multi-Boat — 1 Mile

Ed Kapfus, of the New York M.P.B.A. took a quick trip down to Cape Coral to look over the facilities, and has come away with only the highest praise for the site of this year's Regatta. The picture above, shows Ed on the left with Joe Miller, Jr., of the National Hobby Center, looking over a portion of the 2½ acre Lagoon of the Waltzing Waters. Can't you just picture a pair of hot hydros churning up that smooth lagoon in the Multi-Boat event? How about the perspective you have for multi-racing when you can get up on the terrace and look down at the course. What more could you ask for in a regatta pond?

THE HANDBOOK OF MODEL POWER BOATING, (the new rules book) and the 1965 DIRECTORY are being printed now. They will both be on their way to members about March 31st. All members will receive a copy of the new handbook and the directory free of charge. Also included in the package will be a free decal of the NEW IMPBA EMBLEM. The decal may be applied inside or outside of an opaque surface. As with all water transfer decals, they are NOT FUELPROOF. Protect these as you would on your model. Extra decals are available from the IMPBA General Office, 2405 S. Broadview, Ill. 60155. Price 10c each. Send check, money order or stamps. If you have extended your subscription of R/C Modeler through the IMPBA, and still receive a notice of expiration of your magazine, send the notice to the IMPBA office with your IMPBA No. printed in the margin of the notice, and we will attend to it for you.

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MULTI-BOAT RACING RULES (CONT'D.)

H. Judges and Officials

1. Sufficient officials should be pro-ided: a. one for each entrant to ack laps for that entrant. b. one to nd the visible clock and signal the art of the race. 2. One of the above ıould be designated chief judge whose ıecial duty in addition to that above ıall be: a. to call the entrants to ıe contest pit area. b. to ascertain ansmitter compatibility. c. to initiate ıe race. The race should be initiated by announcement in a standard form as follows: "The match is about to begin. Running shall be to the clockwise. The start line is (so indicate). Operation of transmitters is restricted to (specify). Are there any questions? Are all entrants ready? The gun (or specify) will be your signal to cross the start line. START YOUR ENGINES!" (Port time is now started.) At termination of port time or when all are under way; "Clock time commences, NOW" (Signals clock to start.) 3. To indicate aloud to all contestants or to a contestant in question: a. any necessary information affecting the course of the race in progress. b. any infraction (such as cutting buoys, false start, etc.) and the action or penalty necessary for correction. c. the end of the match: 1) the proclamation of the winner and finishing sequence or time, or 2) the proclamation of "no contest".

I. Definitions

a. In order that all alike may share a common understanding of above terminology, the following definitions apply: PORT TIME — The time interval allowed for the starting and adjustment of engines prior to release of the boat. After release the boat is considered under way. CLOCK TIME — This time is allowed in order that contestants may maneuver so as to be in position to cross the start line as

the instand clock time expires. Clock time begins at the declared expiration of port time with the starting of the visible clock. Clock time expires at the end of the one minute which is signalled by gun by the judges. This signal is the actual start of the race. START LINE — (or lap line) An arbitrary line or line of sight perpendicular to the dimension of the course, either marked by a buoy or buoys or clearly delineated by prominent shore features which line has been designated by the officials to initiate the start of the race and by which laps are counted and completed. LAP — The legitmate completion of one full run around the course starting from the crossing of the start line (lap line) and ending upon the next consecutive crossing of this line. CUTTING A BUOY — (or striking or inside hit) The running of a boat so as to strike or run inside of one or more course marker buoys which, in effect, illegally shortens the legitimate length of the course. The lap upon which such may occur cannot be legitimately completed unless the buoy in question is circled before proceeding. NOTE: Should a buoy be struck from the outside no penalty accrues and circling is not necessary. "RIGHT OR LEFT" RUNNING — A boat is considered to be running to the right when it is circling the course making right hand turns or running clockwise. Running left is of course, the opposite or counterclockwise. "NO CONTEST" OR "SCRATCH" — This term designates the end of a race or the aborting or stopping of a race, with no one declared winner and without prejudice to any participant. Whether a "no contest" counts as heat or a run in a regatta is dependent upon the policy decision of the judges or officials for the regatta. RETRIEVING — This term includes any attempts at recovery, or any other touching or handling of a boat after it has once been released for the race. UNDER WAY—A boat is considered under way just as soon as it has been released by the contestant and proceeds under its own power.

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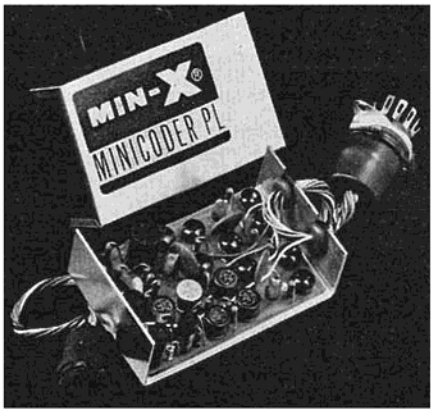
This herewith concludes the "suggested" regulations for Multi-Boat Racing. If there are any comments on the preceding let Mert Mischnick know at the IMPBA General Office.

SHOW CACE'65

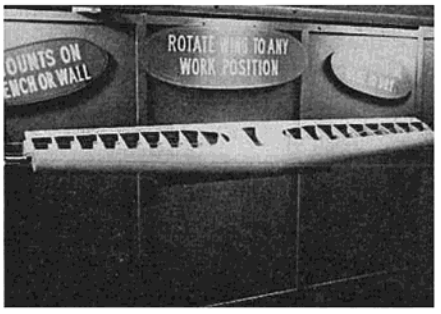
Missing

coder can also be used with other receivers and transmitters, if desired, and when used with appropriate proportional actuators, provides independent simultaneous, proportional control of elevator and rudder, plus engine control and a failsafe feature. Price is $49.95. For further information on these items, **Circle #2 on the Reader Service Card.**



The Logictrol 7 Proportional System, displayed at the Toledo Conference, is a full-house feedback proportional system available in four different configurations. These include a 3 and 4 channel and seven channel version, ranging in price from $349.50 to $525. Both a single and two stick arrangement are available on the "7". For further information, **Circle #3 on the Reader Service Card.**

A-Justo-Jig is one of the finest wing and stab jigs we have seen, and is particularly recommended for use with symmetrical airfoil construction. This unit is fully adjustable to accept wings up to a 6 foot span or slightly larger and is adjustable for dihedral from zero to six degrees in each panel. A wing can be built as one complete unit on the A-Justo-Jig, eliminating one of the major causes of mis-alignment. Recommended by RCM. **Circle #4 on the Reader Service Card.**



The Andy Wright Proportional Control System is a decoder unit designed to provide pulse proportional control of rudder and elevator, plus motor control. This is a decoder unit which can be used with any

BERNIE MURPHY

KITS and PIECES

The Toledo Conference . . .
R/C's "Greatest Show on Earth."

"Neither rain, nor snow nor sleet..." might well have been the theme of the Mid-Winter Conference held in Toledo, for, in spite of reports of "the worst snow storm in history", the crowd was the largest ever. From all directions, by car, train, plane, truck and dog sled, R/C'ers headed for what might be termed "The greatest show on R/C."

If the new items, and the general conversation at Toledo are any indication, this should be a banner year for Radio Control. Simplicity of construction, proportional, and Pylon were the topics of much discussion.

Jim Ellis and Bergan Hardesty of A-justo jig proudly showed their new wing jig. This is the most original approach to this phase of construction that I have seen, and intend to use the A-justo jig when building the VK Cherokee. Both will be covered in detail in a future column. Jim and Bergan won the trophy for the best new construction idea at the show.

Jim Kirkland and Bob Lien of Custom R/C Products displayed their line of "Happy Wings", as well as some unusual accessories. Jim and Bob seemed pretty "happy" also. I was particularly impressed by the lightweight of their Armalite wing cores, and the new contact cement for sheeting that they recommend. One of their unusual accessory items is a hemostat — for those who are building instead of watching Ben Casey, this is a small pair of locking pliers, about the size of tweezers, and looking like a pair of scissors — clear now? Send the boys four bucks and they'll ship you one — if you can't find a use for them, send them to your doctor as payment of his next bill. I think, however, that you will find these to be one of your most useful tools.

Some of the new kits either just released or about to be released included the S Ray and H Ray by Lou Andrews (1-6 ch), Sterling's Mambo Special (1-6 ch), the VK Cherokee (multi), Midwest's Aristo-Cat (cl. II or III), Debolt's Acrobat Bipe and 24 hour assembly P Shooter (multi), and Woodcraft's foam El Tigre kit. Again, simplicity of construction was generally evident. The Andrews kits were outstanding in wood quality. Carl Goldberg showed his little Skylane (reviewed last month). and his popular Sr. Falcon.

Proportional equipment was overwhelming, as reed equipment was conspicuously at a minimum. In the full multi class, systems were demonstrated by such outfits as F&M, Bonner, Controlaire, DeeBee, and E.K. and C and S. E.K. Products, headed by Bob Elliott, a pioneer in digital systems, demonstrated their new Logictrol system. Controlaire, another new entry into the proportional field, showed their digital control, including a flight by Don Lowe of Dayton. Don deserves a big hand, just for braving the weather. Don Brown, (the D and B of DeeBee) unveiled his latest rig,

Carl Goldberg with the C.G. Skylane.

the Quadruplex CL5, a fully transistorized closed loop system (no more wiggle). Don has reduced his transmitter to 7 x 8½ inches. At the next table, Bob Wilkinson and Bill Hobbs of Accutronics showed a full feedback conversion using Accutrol servos for the Quadruplex "21". This conversion included proportional throttle. DeeBee also offered the "21" in kit form, another big step in the propo field.

In the single to triple control classes, we had a chance to operate new controls by Babcock and Min-X. Bill O'Brien of Babcock displayed the new "27" system, giving amazingly accurate control of rudder, elevator and motor, all with the use of escapements. The transmitter automatically sends the right information for a given command, with no button pushing. I managed to talk with Jack Lemon of Min-X about their new version of the popular Pulsmite. Seems as though they have found a way to separate their rate and width information, using a decoder, channeling each to a separate servo. According to Jack, the earlier models can be converted. Glass City showed a ½A multi system (tried to corner one of these cute little rigs — but alas...) along with their larger units.

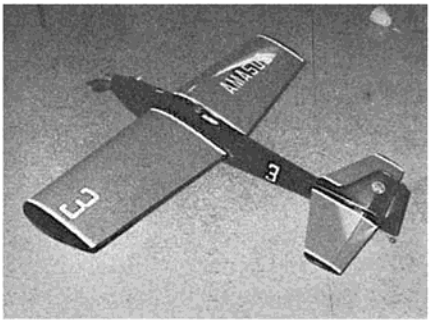
Citizenship displayed their three channel system, while MRC Enya showed their line of imported equipment and engines.

Accessory lines were represented by DuBro, Top Flite, and Royal Prod-

Jim Ellis & Bergen Hardesty with the versatile A-Justo-Jig.

Vern Kriebel with the V.K. Cherokee. Min-X's Bob Schmidt on right.

The Marksman — the author's bid for best finish — took 2nd.



Bud Atkinson with Midwest Aristo-Cat.

ucts. Ace R/C, GM Hobby, World Engines and World Wide Radio covered a vast assortment of equipment. Dwight Hartman proudly displayed his fibreglass wares, including his new Olympia R/C Sailing Sloop.

Boat enthusiasts found the displays by Octura Models and G.E.M. Models of special interest, while everyone found something interesting at Bev Smith's Hobbypoxy table, as Bev demonstrated new uses for Hobbypoxy glue (hope to cover this one later).

Al Kline, of Astroguide, showed an R/C car in 1/25 scale. Slot racing with no slot. Looked like a good pastime for R/C'ers during bad flying weather.

Various types of actuators and servos were shown, including those shown with the various systems. We had a chance to examine Actuators by Babcock, Glass City and DeeBee. Accutrol displayed their Solo and Trio units, and the new Minipulse rudder and motor actuator, along with a nickle cadmium battery rated at 10V. 180 mah for transmitter use. Royal Products displayed their multi servo as well as the popular rudder servo.

R/C'ers toted their prize ships many miles to be a part of the show. Several hundred models were displayed, representing just about every class and type of ship imaginable, as well as quite a few R/C boats and

Don Lowe and Taurus — part of Toledo flying session.

cars. Many hours were spent just looking, for here was truly a vast array of talent.

To the judges, my congratulations, for the task of judging to determine the best in each class was certainly a difficult one, yet was carried off in an exceptionally smooth manner.

Wherever a group of R/C'ers gathered, the conversation eventually turned to a discussion of the Goodyear event and the N.M.P.R.A. This is catching on like a brush fire that is spreading rapidly, for here is an event in which even the sport flier can participate.

It would be impossible to cover all of the information and impressions in a single column, but I have tried to give a brief coverage of two wonderful days in the life of an R/C'er. From time to time I will be elaborating on some of the various equipment that I believe will be of interest. I dare say that anyone leaving the Toledo Conference without the desire to venture into some new phase of R/C, be it equipment, ships or design, just wasn't there. It was a "rilly big shoe".

To the members of the Weak Signals Club, who hosted the conference, a great big THANK YOU on the behalf of every R/Cer, for surely everyone will benefit as a result of these conferences, since they allow the manufacturer and the flier to meet and exchange views.

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Along the construction vein, I have been working on the El Tigre kit by Woodcraft. The kit was ordered by mail, and was shipped promptly, although the U.S. Mail managed to detain delivery for twelve days. The component parts of the kit are really prefab, with all sheet covering cemented to the foam, and requiring a minimum of fitting.

To date, I have glued (white glue) the fuselage turtledeck parts in place, and the nose section bottom block. The wing sections have been butt glued together, as have the stab halves. At this point, all parts have fit as specified, with the wing and stab joints being exceptionally good.

I am building the standard aileron version, and have noticed that the trailing edge tapers to a knife edge. This edge is too thin to withstand any abuse. This condition can be corrected by cutting a strip off of the entire trailing edge, then butt gluing a strip of hard balsa in place for a new trailing edge.

Before next month rolls around, I will finish the El Tigre and report on the rest of the construction, as well as the flying. I have one of the new Dee Bee Quadruplex CL 5 systems on order, and hope to try out the two together.

For the sport and RO fliers, I am working on both of the new Andrews kits, the H Ray and the S Ray, and if I don't soon clean up the balsa chips, my wife says I'll be needing X Ray! Both of these kits are made up of the finest grades of balsa that I have ever seen in any kit. I doubt if I could hand pick the wood any better. The die cutting is exceptionally clean, and the kits include many machined wood parts, and an unusual amount of hardware. Being used to multi designs, I cannot classify the Ray's as beautiful ships, however, they are very cleanly and functionally designed. Although I have not completed either, I am certain that they will prove to be excellent fliers.

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I mentioned earlier that DeeBee displayed their Quadruplex "21" in kit form at Toledo. I had an opportunity to assemble one of these kits several weeks ago, prior to their release. I am not certain whether I was testing DeeBee, or whether they were testing me. The kit was assembled using preliminary hand written instructions, with most of the reference photos not available. The entire system was assembled in a day and a half, and worked perfectly, without a hitch. Tentative plans are to review the "21" kit from a production run. This one will be built by a flier having no experience in equipment building, and any problems encountered will be passed along. Latest word indicates that the kit will also be available with optional feedback servos (servos preassembled).

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Been having a ball with the Goldberg Skylane. I had forgotten just how much skill was required to really make a Rudder Only perform. With a little practice, this ship is surprisingly maneuverable. Incidentally, the total weight of the ship was omitted. Ready to fly weight, with pulse proportional, was 25 ounces. This could be reduced easily to 22 ounces using escapement and relayless equipment, although weight does not appear to have much effect on the flight characteristics of the ship.

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The DCRC Symposium will be held May 15-16 at the Johns Hopkins Applied Physics Lab just north of Washington, D.C. This is another highlight of R/C togetherness. I would urge everyone to plan to attend. Contact John Spaulding, 5803 Ellerbie Street, Lanham, Maryland for information and reservations.

See you at the field . . .