

# TWIN ENGINE MULTI SCALE UC-78

## RADIO CONTROL MODELER

RM

AUGUST 1964

50¢

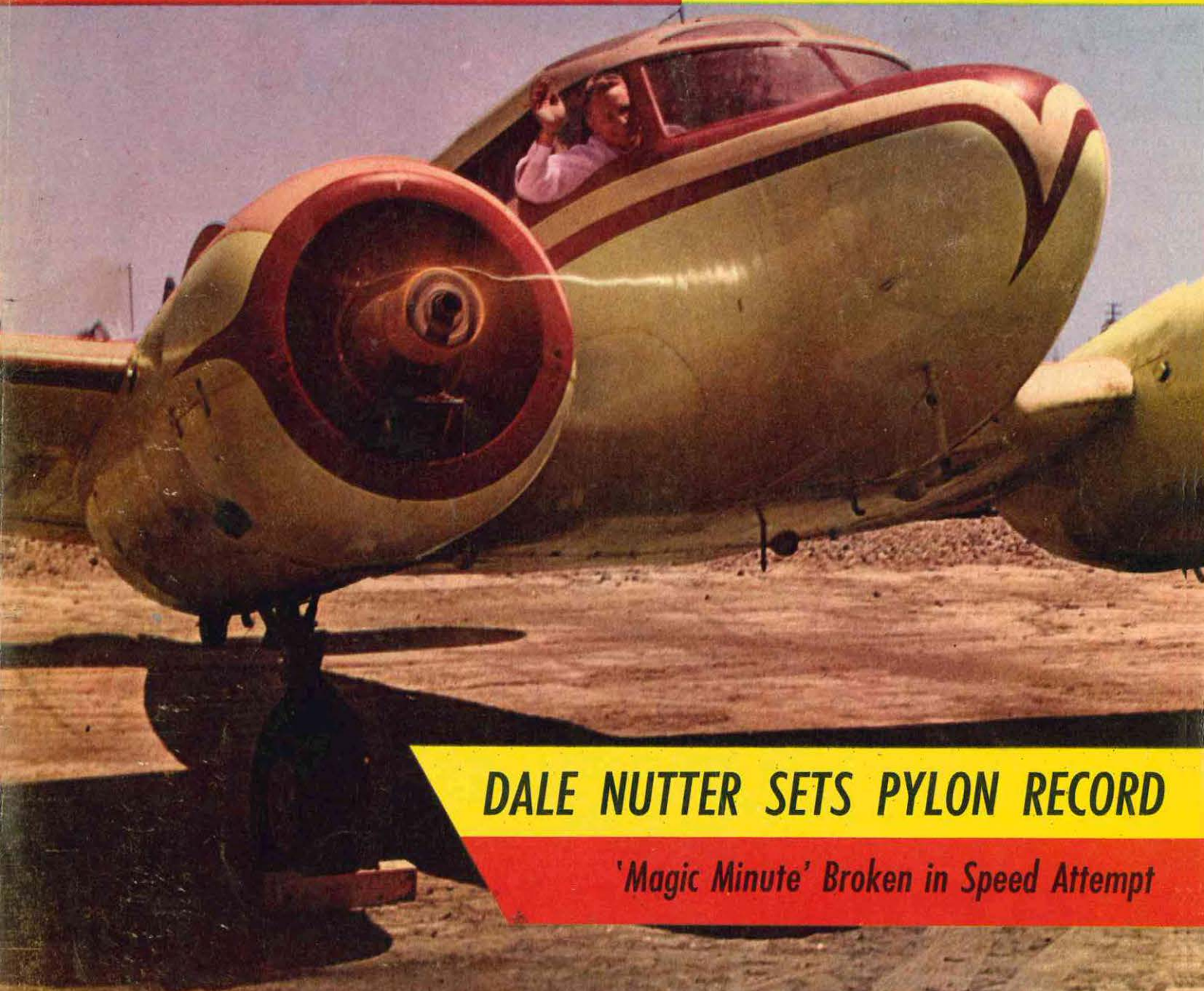
SINGLE CHANNEL R/C GLIDER

### THE GULLIVER

by TED STRADER

UPGRADING THE R/C PATTERN

by RICHARD ALLEN



### DALE NUTTER SETS PYLON RECORD

*'Magic Minute' Broken in Speed Attempt*

## **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](http://www.hippocketaeronautics.com/hpa_plans/index.php)

**James Hatton Blog Free Plans and Articles.**

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

**Vintage & Old-Timer RCM Free Plans.**

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

**Contributors:**

**Scanning by ser001**

**Editing by Hlsat.**

**Thanks Elijah from Greece.**

## Λίγα λόγια για μένα.

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

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

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

Το χόμπι του αερομοντελισμού το πρωτογνώρισα τον Οκτώβριο του 1973.

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

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

Έχω δημιουργήσει μια πολύ μεγάλη προσωπική συλλογή από αυτά.

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

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

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.

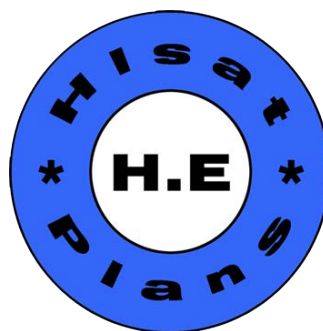
Δεν είναι η μητρική μου γλώσσα γιατί είμαι Έλληνας.

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.

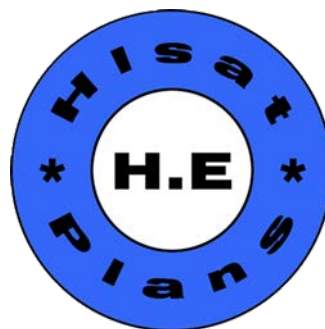
It is not my mother language because I am Greek.

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.





## DEAR RCM:

ADDRESS R/C MODELER MAGAZINE • P.O. Box 457 • Siorro Modro, Collforola

That's a switch?

I enjoy your magazine very much and appreciate your Showcase 64 evaluations. However, in the May issue you give a rating of excellent to the Alco toggle switch — a switch which is lousy, from a company that doesn't back up their product at all! I used one of these things (DPDT) in a single channel Kraft receiver with dual Vari-Comps and motor control escapement. I used it for about two months and then it went intermittent. I wrote a letter to Alco and enclosed the switch... they didn't even return the switch! I wouldn't touch one of these things with a ten foot pole — let alone a \$500 airplane!

Ronald R. Kauffman  
Andover, Connecticut

*Having used Alco SPST switches for quite some time without any difficulty, we felt these units rated a good review. Following receipt of Ron's letter, we took a closer look and ran further tests. Externally, these switches appear to be excellent, and as we mentioned, the single pole units performed quite well. We then turned one of the triple throw units over to our Research Editor who experienced intermittent operation following the sixth flight. Upon taking the Alco switch apart, we wondered why it didn't happen sooner! This is a rocker arm, rather than micro switch, action, and entirely unsuitable to RC operation. Our thanks to Ron for prompting this closer scrutiny.*

Who's irresponsible ?

It's an AM A goof! On page 13 in the March-April issue of RCM, right in the beginning, we refer to irrespon-

sible Contest Board operations. This should have read "irresponsible Citizen's Band operations!" In the original memo the initial CB were used — to the AMA staff this normally means Contest Board! It went out that way in mimeo form to all model aviation press. Ouch! Would appreciate a mention of the error in case someone retains a twisted meaning of our statement. Thanks. Meanwhile, have just enjoyed another good issue of RCM — May just arrived today.

John Worth  
Academy of Model Aeronautics

What to do when looped . . .

You mention you had looping problems with the Wildfire biplane. I happen to have the drawing of the model so I'll make a few comments in regard to the problem. This is, of course, to be regarded as just an opinion. The fuselage nose is too short for the light Cox .09 so the model is extremely tail heavy. Moving equipment forward, also the landing gear, will help a little but not too much. The top wing seems to be set at about 1/2" not 1/4" which you did. An alternate method is to washout the tips. About 5% at each tip. The bottom wing should have about 1/4" washout at each tip. I have a strong opinion that all wings must have slight washout. Of course, in this case, an excessive amount is required in the top wing. The stab is of the flat type — a lifting type may be of help. Add a 1/4" high ribson on top of the stab. Leave the center section flat so it will be easy to attach to the fuselage. "Screaming climb" is also an indication that the engine was set

much too lean for a test flight. It should be very rich, then lightly leaned out flight after flight until full power is reached.

John Zaic Aero  
Models  
Brooklyn, N.Y.

I have found that a heavy wing loading agrees with the Wildfire biplane. The equivalent of a Fox 15 RC, 2 ounce brass tank, 5 E91 pencils and trike gear with 2" wheels requires no trim adjustments as it comes off the plans. (A minimum total weight of 2-1/2 pounds). Throttle control is a must since at high speed it has a 70-80 degree climb angle. This plane does not have the same recovery in a turn as do the usual rudder only jobs and requires opposite rudder to bring it out of a steep turn. It is also very sensitive to the button. With the wheels located slightly ahead of the CG, steering and takeoffs are excellent.

Joe Kuzawinski  
Fayetteville, N.Y.

As you probably know, this ship (the Wildfire biplane) was designed for much heavier equipment than an escapement and lightweight receiver. I have been flying a Wildfire for three years now and have had a barrel of fun. My control is a Bonner SN. Power is Pet .09, the receiver a Citizen Ship superhet. The plane moves, and lives up to its name. Having had trim trouble at first, I found the secret to lie in the *bottom* wing. My trim adjustments are as follows: 6-8 degrees engine downthrust, same right thrust; 3/32" shim under trailing edge of *top*

(Continued on page 3)

wing; about 1/8" between upper leading edge and fuselage of *bottom* wing. I had the same swooping flights — the bottom wing was the cause. I've talked to Al Greer, designer of the plane, and he said that on the original he used a MM motor for proportional rudder. Four medium size batteries were up front, along with a KB .15 engine. If you want some fun with the biplane, use an .09 mill with about rudder throw — you can roll right around the multi's!

Clifford Kell  
Cincinnati, Ohio

Holy smokes! What have you done to my Wildfire? Did you steam all the warps out? This construction will warp and it can be easily steamed out. Then — where's the C.G.? It should be at or *behind* the location shown on the plans. Now — 8 degrees downthrust is good. Up to *y'* positive packing in the stab as required — remember it is a strong force well aft of the CG and acts as a tailplane. Finally — if you still can't get it flying right, get a big box and mail it to me. I will!

Why don't we quit kidding ourselves and trying to sell this (RC) as a hobby to the youngsters — who just aren't interested, and instead, get out and hustle RC as a *sport* for adults. We can compete with golf, motorboating and snipe hunting any day, but we've got to get with it and get our sport out of the "Kiddie Class" in people's minds.

So, enough — write if you get honest work.

Al Greer  
Dayton, Ohio

*We were deluged with letters about the Wildfire — including the one from Al Greer, its designer. We didn't know the ship was so popular! This was our third — the first two were identical in flight characteristics. So putting together the several dozen letters we received, we'll pack up the leading and trailing edges of the upper and lower wings, the leading and trailing edge of the stab, add 32 degrees downthrust to the Fox 59 . . . anything except ship it back to Al — this would just give him another excuse to delay designing another ship as good as his popular Wildfire!*

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*Cover: Gordon Madison. flight test engineer and RCM's Plan Service Editor, waves from the cockpit of his Cessna UC-78. The Bobcat, formerly owned by Madison, provided valuable data for this month's featured construction article.*

# DALE NUTTER SET PYLON RECORD

*'Magic Minute' Sheded At Bakersfield*



# 0:59.7

BAKERSFIELD, Calif.—Highlighting the 1964 LARK Pre-Nat's Open Contest, held here June 14, was Dale Nutter's record-breaking pylon flight of 0:59.7 seconds, shattering the elusive 'magic minute.' The new record was established on the fourth flight, after three attempts with times of 1:10.7, 1:05.0, and 1:06.2.

The delta flown by Nutter was an original designed 'Sidewinder,' with a total area of 745 square inches and an all-up weight of 2 pounds, 12 ounces. Power was a prototype of the new Veco-Lee .19, burning stock Veco #2 Racing Fuel, and swinging a Rev Up 8-6 prop.

The Bakersfield event had AMA sanction and LARK Contest Director Bill Williams has submitted the data to AMA Headquarters in Washington. D.C. for formal recognition as a new

Pylon record.

In addition to establishing a record, the Oklahoma City speed merchant placed first in the Pylon event, followed closely by Zel Ritchie and Bill Williams.

Willie Smith, flying Bonner proportional equipment in his original Torero (RCM 12/63), was the victor in Class 111 Expert. Cliff Weirick and his familiar Candy (RCM 11/63) was second, also with the Bonner Digimite system; Dr. Ralph Brooke, 1963 World Champion, third with his own design and Orbit proportional, and Jerry Pullen, fourth, with the Kraft-Pullen proportional and another Candy.

Class II was won by Don Crow, followed by runners-up Jim Odaino and Duane Shappell.

First place in the Rudder Only event went to Tom Williams. Meade Hal-

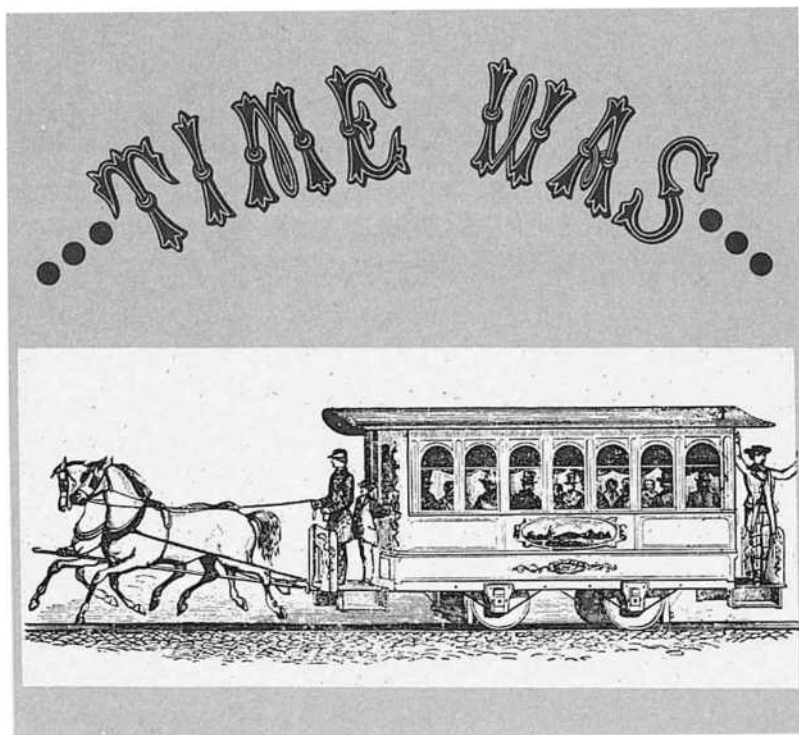
lock was second, flying the popular Nova design. (RCM 12/63). Kenny Parks earned the third position slot.

Seen at the Southern California meet was Eddie 'Mad Man' Morgan and his ever-popular nine foot span Piper Cub — making a parachute drop from 400 feet of altitude. The chute caught a thermal and disappeared up, and out of sight to the east!

Granger Williams, a favorite among scale modelers, was present with a full-house, multi channel Howard Ike — a model that performed like its full-scale prototype!

Congratulations to Dale Nutter on the new pylon record now pending before the A.M.A., and to the LARKS for hosting the contest and officiating at the record-breaking event.

Photos by Dick Tichenor.



. . . when the horse drawn trolley was in style. There was also a time when our own pattern event was up-to-date. Today, it is fast becoming obsolete. We think you'll find the solution in . . .

# Upgrading The R/C Pattern Event

By Richard Allen

The time is now at hand for a major revision and upgrading of the AM A H/C precision aerobatics pattern, especially in Class III. Advancing technology and general levels of (lying skill have made the present pattern far too simple for Class III, even though many of the maneuvers are still impossible for Class I.

My first proposal, therefore, is that Class I, II and III aircraft shall not be forced to compete under the same pattern sequence. There is no good purpose served in forcing Class I planes into awkward attempts to perform maneuvers for which they are aerodynamically unsuited. There are many other maneuvers available with which Class I aircraft can compete without being made to look ridiculous. Competing under Class III rules forces the Class I aircraft to evolve towards being a hot, unstable bomb. This, in turn, forces the beginner out of even

Class I, which should be the easiest class for him to enter. I shall not attempt to propose specific maneuvers for Class I, since my pet peeve as a Rudder-Only Flyer was that it always seemed that Multi-fliers were dictating our maneuvers.

The following, then, shall apply to maneuvers intended for Class III aerobatic competition. Presented first will be the goals, second the principles by which we can attain them, and third, the specific maneuvers recommended.

A good maneuver should have these three characteristics:

1. It should require a high level of pilot skill and aircraft performance to perform it well.
2. It should be easy to judge, even though it may be difficult to perform.
3. It should look good; that is, it should be esthetically pleasing and not just difficult for the sake of being difficult.

We should increase the types of maneuvers required while decreasing the total time allowed to 10 minutes. One way to meet the above goals is through the use of combination maneuvers. These are two maneuvers performed one immediately after the other and in a specific relationship to each other. They are scored separately, with the second maneuver being downgraded if it is not in the proper position with respect to the first. (It's easy for a judge to keep track of the 2 scores by using the fingers on each hand.) Combination maneuvers reduce by nearly 50% the time otherwise required to position the aircraft and perform two maneuvers separately. They also require a higher skill level, thereby helping to reduce the excessively high "luck factor" in present contests. (Our present precision landing and

*(Continued on page 8)*



# EDITOR'S Memo



**Don Dewey**

**DON DEWEY**  
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**Digital Edition by Hlsat**  
**Greece**

A funny thing happened to me on the way to the field today...

One evening this month a group of us descended upon Don Mathe's pad for an evening session of elbow bending and diode dissecting (that's RC slang for gossip), and the conversation eventually turned to classic goofs among the RC fraternity. Bill Dennis, former RCN'er, told about a contest held by that group during which an announcer was describing over the PA system a multi fliers "drunken pilot" exhibition. "That plane's in trouble," he shouted in mock alarm — "the pilot better bail out." Without further ado, the stalwart RC'er triggered a servo and his ship responded by ejecting a miniature pilot complete with parachute. As the crowd applauded, our friend, entranced by the successful parachute drop, watched the descent while his forgotten ship stacked itself neatly into the ground a quarter mile away!

Not to be outdone, Dick Kidd passed on this gem from the recent Southwestern Regionals held at Buckeye, Arizona. Seems that at the beginning of the day, everyone raced for the field to get into the air. The ensuing result was about twelve ships hitting the wild blue simultaneously. Among them were three similarly painted orange colored multi machines. Dick, along with George Walker, RCM's Art Director, noticed one fellow who had just lost radio contact with his ship. George suggested flipping the transmitter switch on and off, inasmuch as dirt sometimes fouls the switch contacts. Following this, our unknown friend once more gained control of his ship, and as the trio of pilots watched, skillfully maneuvered one of the orange ships about the clear, blue Arizona sky. A few moments later, another RC'er walked up and informed the flier that he wasn't flying *anybody's* plane — that his ship had plowed into the terra firma several minutes ago. Recording an expression that could only be described as frantic disbelief, the hero of this narrative attempted to land the plane he was "flying"—the only result being to trigger the servos lying in the remains of his plane a few hundred yards away!

And then there was Bill O'Brien, one of our staff members,

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## EDITOR'S MEMO

*(Continued from page 6)*

who probably has conveniently forgotten the time he raced onto the field, jumped out of his VW bus almost before it had come to a stop, lined up three rudder-only jobs, then hurriedly fired up the first, a Nomad, launched it, and flew for a full three minutes before he discovered that his one and only receiver was still in one of the planes on the ground! Which shows to go you no one's perfect... that is, except for yours truly. Somehow ... I can't seem to remember... any mistakes I've ever made ...

On the more serious side, we have good reason to celebrate this month. This issue marks ROM's entrance into national newsstand distribution with a record-breaking circulation of 61,000 copies. Prior to this, ROM was distributed internationally through hobby shops, by subscription, and on certain selected newsstands. ROM is now available at virtually every local newsstand throughout the U.S., and we are grateful to each and every one of you for making R/C Modeler the largest radio control publication in the world, and the third largest of all model publications.

As another facet of our good fortune this month, we are proud to announce that two of the most well-known and well-liked members of the R/C fraternity have joined the permanent staff of R/C Modeler — Ken Willard and Ted Strader. Ken will be writing a monthly column for beginners and will answer many of the questions we receive each month from the newcomers to RC. Brother Ted, who presents, in this issue, the Gulliver, successor to the ever-popular Nomad, will be pounding out another exclusive monthly stint in his own inimitable, tongue-in-check style. Of Ted, having vacated his former position with another model publication, will also make the scene with most of the major Eastern bashes, so look him up at contests East of the Big Stream.

We've heard so much about the four-headed monster called the 'Builder Of The Model Rule' that it's becoming downright depressing. Quite

frankly, we feel that the basic concept behind this rule is good — and good for the hobby, for part of this hobby is concerned with constructing the models we fly. Primarily, however, this rule is to encourage Junior participation — to encourage the younger modelers to build, and then to fly, their construction projects. However, the radio control portion of the hobby industry is, by its very nature, an **adult** hobby, and populated by **adult** modelers. This is not to infer that there are no younger modelers in RC, or that younger modelers are discouraged from participating — nothing could be farther from the truth. But, by and large, the older modelers comprise 99% of the active RC'ers. That is why this publication, unlike the general model magazines, has been geared to the adult RC'er. And unless you and I — as RC'ers — are treated like adults, with adult rules of the game, those selfsame rules are not going to mean very much to anyone concerned.

For example, rumors are running rampant about the possibility of fiberglass fuselages and extensively prefabricated parts being banned, from active competition. Why? Is it because we purchased the unit rather than making the master mold and turning out our own shells? We don't make our own motors either, or for that matter, the props or wheels or fuel tanks. For the most part, we don't make our own radio gear. Perhaps we should ban these items, too, if purchased commercially. It makes just about as much sense. And what about magnesium speed pans for ukie speed, or aluminum pods for free flights? How about commercially made folding props for rubber jobs? They've all been used in active competition for years. Just how far are we going to go as to what can be used, and what can't? The fiberglass fuselage, the styrofoam wing — these items are here to stay, and will merely be the predecessors to many new materials that will make their appearance in the months and years to come. We predict that one or more fiberglass fuselages

will place among the winners at the Dallas Nationals. Or will these individual competitors flying ability and past building proficiency count for so little that they will be banned from active competition because of their usage of this material? That makes about as much sense as the City Fathers electing to ban automobiles after the turn of the century because the new contraptions didn't eat hay! Progress will have its own way, despite the obstacles thrown in the pathway. And if the rules are obsolete, then we're going to make new ones!

And so it goes for another month. We've been flying the diodes right out of the Digitran system we reviewed for you last month. As you may recall, yours truly stacked it into a concrete wall on takeoff! This single channel system flies well and is completely reliable — and one heck of a lot better than pushing buttons! We've also been racking up some stick time oil the Glass City Multiplex — you'll find an assortment of data on Tom Dion's single channel proportional system in Part III of Simple Proportional.

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# PATTERN EVENT

(Continued from page 5)

spot landing maneuvers are, effectively, "combined maneuvers.")

Let us, for example, require the present inside and outside consecutive loops to be done in combination. If the outsides are done directly above, and tangent to the insides, then the aircraft must, per se, have the ability to do a good vertical eight (which could then be eliminated as a separate maneuver). We can, therefore, replace 3 separate maneuvers with a combination of two requiring little more time than any one would individually.

And what happened to the Split-S? This was a beautiful maneuver eliminated in the interest of saving time. It could be reinstalled as the required approach to the touch and go, scored separately, but with no additional time required. After all, these are aerobatic planes we're flying — not transports.

(Note: The Split-S approach is ideally suited to a long narrow glide path such as formed by a row of trees parallel to the runway. If the possibility of approaching over obstructions exists, making a fast and low approach imprudent, then the Split-S should be eliminated by the Contest Director prior to the meet.)

So much for combination maneuvers.

The wingover, as presently defined, is a Stall Turn. Let's call it that!

The present Immelman is quite simple, but would gain new respect if required to be followed immediately by an Outside Immelman whose roll was directly under the Immelman's roll.

One never goes to a full-scale air show without seeing a slow roll — one of the most beautiful, easy to judge, and yet difficult maneuvers to perform. By all means, let's add it to our list of aerobatics. We need more- smooth and graceful maneuvers to compensate for the present preponderance of sharp and jerky maneuvers.

The rolling loop is another attractive, easily judged maneuver. Picture a large loop — As the plane is vertical, it rolls 180° and goes over the

top in an outside loop. Coming down the other side, it again rolls 180° and completes it as an inside loop. It is judged by how well it follows a truly circular path while rolling at the vertical positions. Some fliers prefer the further complication of an additional roll at the top and bottom, but this destroys much of the grace and beauty of the maneuver.

The first half of the overhead eight should be upright with the last half inverted. The roll to inverted flight should occur at the crossover point — directly above the transmitter. The figure 8 after straight return may be eliminated, since the recommended figure 8 would now be half upright and half inverted.

It's relatively easy to do one respectable Cuban Eight. It would no longer be a gift if 2 consecutive superimposed Cuban Eights were required.

The tail slide should be eliminated since it is a "luck maneuver" in all but calm weather. Some may dispute this, but I believe the attempted tail slides of the 20 Class III finalists at the '63 Nats prove this point. Many contests are now decided by a lucky tail slide. Do we really want our con-

tests decided by 22 relatively easy maneuvers and one that's largely luck.? The luck factor cannot (and probably should not) be entirely eliminated. We can minimize it, however, through our choice of maneuvers which, although difficult, can be performed with some consistency once mastered.

The rolling eight should be eliminated. We can minimize it, however, not more than adequately demonstrated in several maneuvers (present and proposed)

Only one approach to the hangar should be allowed. It's time consuming and pointlessly to taxi back and forth hoping for a lucky stop in that elusive circle.

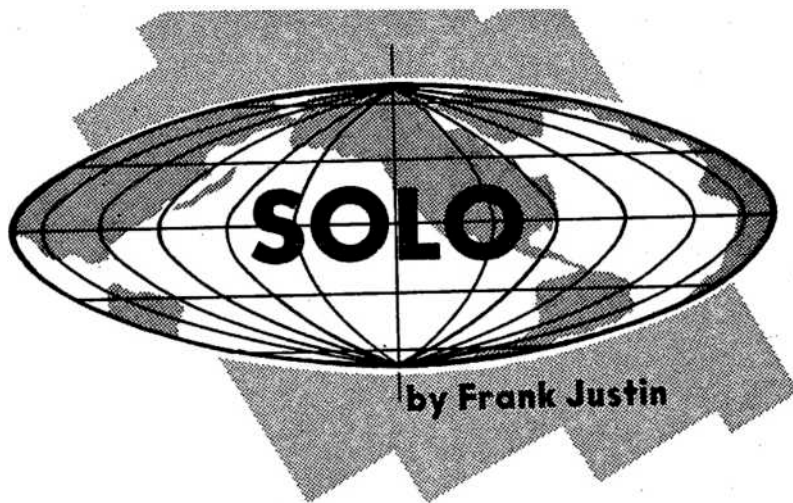
Now let's take a look at the proposed pattern. It's lean and tough — with the fat cut out and some real challenges added. It replaces 23 maneuvers with 22 which, with the two new Combined Maneuvers, should take the time presently required by only 20 maneuvers. The following lists compare the old pattern with the proposed pattern:

## Present

- 1 Proto Taxi
- 2 Unassisted ROG
- 3 Straight Flight
- 4 Procedure Turn
- 5 Straight Return
- 6 Figure Eight
- 7 Touch and Go
- 8 Wing Over
- 9 3 Rolls
- 10 Immelman Turn
- 11 Inside Loops
- 12 4 Point Roll
- 13 3 Outside Loops
- 14 Cuban Eight
- 15 3 Turn Spin
- 16 Inverted Eight
- 17 Rolling Eight
- 18 Tail Slide
- 19 Vertical Eight
- 20 Traffic Approach
- 21 Landing Perfection
- 22 Spot Landing
- 23 ProtoTaxi

## Proposed

- 1 Proto Taxi
- 2 Unassisted ROG
- 3 Straight Flight
- 4 Procedure Turn
- 5 Straight Return
- 6 Split-S
- 7 Touch and Go
- 8 Stall Turn
- 9 3 Rolls
- 10 Double Immelman
- 11 2 1/2 Insides
- 12 2 Outsides
- 13 4 Point Roll
- 14 2 Consecutive Cuban 8's
- 15 3 Turn Spin
- 16 Overhead 8
- 17 Rolling Loop
- 18 Slow Roll
- 19 Traffic Approach
- 20 Landing Perfection
- 21 Spot Landing
- 22 Proto Return (1 approach)



*(Editor's note : Neither this magazine, its staff, its advertisers, or, for that matter, anyone in their right mind, assumes any responsibility for the content of Frank's column. It does have some merit, however, inasmuch as this month's babblings were written on the back of an old Taurus wing and successfully smuggled out of the State Mental Institution.)*

Last month we finished construction on the Zues and now it's time for the (light report. We spent some time checking for vibration and trying to get the Super Tigre to idle properly. The vibration problem was no sweat, but getting a good idle seemed almost impossible. We went through an endless selection of glow plugs, carb settings, and varied fuel mixtures, but never did achieve an idle that could be depended upon to hold for any length of time. We noted that there are quite a few ST 56's showing up on local fields with Veco 45 throttles installed. Owners of these modified mills report a marked improvement over the stock 56 — we'll have to give this a try.

We waited until Sunday morning to make the maiden flight — most of the boys are in attendance on the weekend and it didn't seem right to fly when they weren't around. After all, everyone is entitled to a little amusement, and my flying can be a real funny thing. We fueled up the bird and made a short range check of radio gear, then sent one of the boys out with the transmitter for a distance check — anything to prolong the agony. Finally, with all possible excuses exhausted, it was time to fly.

Plagued by the sick idle, we made the takeoff run from a standing start at full bore. The Zues tracked well without any assistance from me. A couple of light taps of up put the wing positive and off she went as straight as an arrow. I've got a couple of dozen multi ships under my belt, but this was the first time for "hands off" on the first flight. It sure is a good feeling.

But back to flying. We have a gun club neighboring our field and have been asked to refrain from bothering the shooters — on pain, I suppose, of suffering a holey aircraft — so it was time for a turn. A short poke on left aileron produced an immediate response — the right wing went down! Hmm! Let's try that again. Yup, same result. You guessed it — hours of assembly and painting, careful attention to details, and ole round hooks up the ailerons backwards. This is not necessarily fatal, but it might be well to try the elevator and see what goes on in this department. Gee, dad! This one's correct — not a bad average. I've never been a transmitter orientator, so a backward control is no big thing — just fly for effect. However, Don Mathes had a real helpful suggestion — turn the transmitter upside down. Now why don't I think of those things?

We brought the Zues back in, changed the aileron, and got down to the serious business of flying. After eight flights, and depleting the fuel supply, we went home. If you've seen a Taurus fly with a good motor, you know how the Zues performs — there is little appreciable difference. I can recommend this ship to anyone flying

We made a plea a while back for help on how to correct the snap roll tendencies of the Perigee, and have yet to finish reading the mail. Some- in the Taurus class. They should encounter very little difficulty while having a lot of fun.

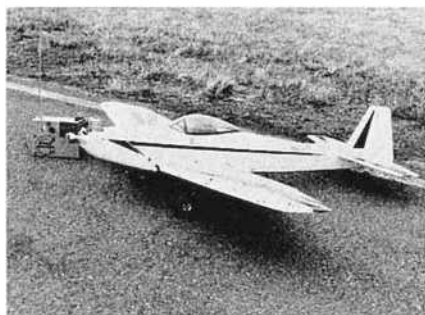
Several of the radio manufacturers have been making noises like they would like us to try out their proportional gear, so the Zues will be refitted with the first one of these rigs in. We'll make a full report to you on just what happens when Joe Non-Factory-Team Blow enters the wonderful world of proportional. This is going to be a real test because yours truly has about three minutes of proportional time, and this was donated by Phil Kraft who prudently got his Stormer to 2000 feet and reduced throttle before allowing me gentle left and right turns. Somehow I got the idea Kraft was practicing to be a golf pro — there's something unnerving about a full grown man whispering in your ear ... day I'll learn to keep my mouth shut — not that the content wasn't good, but rather, that it would be impossible to give space to the many excellent answers we received. This, of course, does not help the man with the problem, so I will give you my formula for instant de-snap rolling. Who knows everything? Why, dad, of course. Who's the father of the Perigee? That's right, Mr. Brett. Solution: We all sit down and write our good friend and patient Champion. For those of you who might have misplaced his address, simply tear off the top of your Perigee, enclose two deBolt retractable gears in a self-addressed envelope, and mail to Balsa Chips, Rolling Route #2, Wilhold, Nebraska. If your heart is pure and you have sent in your FCC form, you can expect an immediate reply.

Keep tuned in to coming issues. We'll be bringing you something on the proportional gambit, soaring for fun and profit, and a good poorman's proportional for rudder, elevator and motor control.



# INTERNATIONAL Circuit

By Cliff Rausin



At a recent RC meet sponsored by VINGTOR (Winged Thor) Club of Oslo, Norway, May 9-10, Stephansen won the Multi event using the popular Dee Bee Quadruplex proportional. Among the most popular ships at the meet was Von Segebaden's famous Mustfire, a configuration which is mathematically and wind-tunnel designed to theoretical perfection, shown in the photo with the designers Space Control system. The lineup of Must- fires, including trike and conventional geared versions, includes Swedish Champion and RCM Editor Per- Axel Eiiasson's ship (first in line) which utilizes the mylar covering shown on the modified Hustler delta in the June-July issue of RCM. The lineup of more conventional ships includes Jens Jensen Citation, a beautifully finished ship powered by a Merco .49 and utilizing Kraft 12 radio gear.

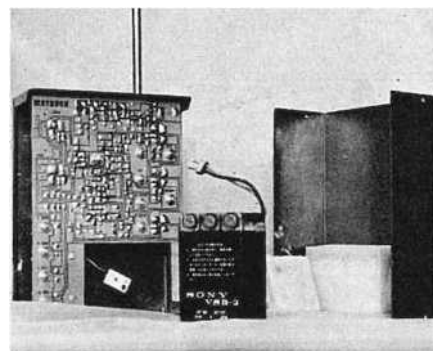
Stationed in Atsugi, Japan, Navy Lt. Graham Hicks forwarded the photograph of himself and Kudo's Tokyo Echo design, the plane complete with black and yellow Hobby- Poxxy finish. Eight channels of an F&M 10 are used for control. Motor in the photo is an Enya 19, but was later replaced by a ST .23 for better

control of the 4% lb. Echo. Servos are the Japanese transistorized MK Special. Photo of Lt. Hicks is by RCM's Japanese Editor, Bill Weaver. The shots of Graham's F&M Matador shows the installation of a Sony VSB-2 6V wet cell for transmitter supply. This unit slips right in and locks in place. The plug on the battery leads were suitably modified. A stereo headphone plug and jack were installed in the front of the F&M for charging. After eight months of operation, the Sony unit has proved completely re-

liable, with no tendency of the fluid- sealer plugs to work loose, or any trace of battery acid inside the case. The Sony unit is made for the miniature, transistorized TV set manufactured by that firm, and retails for \$4.00 in the Navy PX.

The Rolls Royce Rally, held in England on April 15th, marked the first time pylon racing was held in that country. The course consisted of five laps to the mile with an official at each pylon. Eighteen entrants competed, with Chris Olsen and RCS gear the first place winner. On April 12, the Bristol Pylon Race for the Pylon Duster model was held. Despite the

*(Continued on page 11)*



By George Wells

## New Trophies Given In R/C at Nationals

More recognition will be given to R/C contestants at this year's Nationals to be held at Dallas Naval Air Station, July 20-26, according to the Academy of Model Aeronautics, sponsor of the event.

In the past, R/C flyers have been competing all week for the same number of trophies given in some other events run off in one afternoon. Therefore, the Academy has decided to add four new R/C trophy categories for 1964.

**Best Flight** — Awarded for highest score on single flight in Classes I, II, III-Open, and I-Jr.-Sr. According to rules adopted in 1963, best average score of two flights wins event. Highest scoring single flight will now obtain an additional trophy.

**Highest Total Points** — Awarded for highest total points accumulated on all flights during week in Classes I, II, III-Open, and -Jr.-Sr. Trophy is intended to encourage contestants who are proficient, but have only slight chance of winning event. Also, it is intended to encourage continued effort when a high scoring flight is flubbed by a missed maneuver.

**Best Scale Achievement Flight** — Awarded to scale contestant who accomplishes most by flying particular scale configuration. Determination by judges will be value judgement as well as based on points scored in proficiency flight. (Ralph Jackson's B-24 Flight, and Granger Williams' Nieuport flight last year at Los Alamitos are examples of deserving scale flying achievement.)

**Best Average Speed** — Awarded in pylon for the best two-flight average speed. Object is to reward consistency in racing equipment and piloting.

Along with more trophies, there

will be more flights. AMA hopes at least twice as many as in previous years. This will be accomplished by running four simultaneous flight lines. All Citizens Band equipment must be superhet.

The Nats Committee has taken extensive precautions to insure interference-free flying in the four locations. All of the superhet frequencies will be used, and contestants must have all transmitters verified as to frequency accuracy before being eligible to fly.

Frequency verification will be made using highly selective, individual receivers for each s superhet frequency, rather than a single receiver tuned through the band, as in the past. The same equipment will be used for monitoring during flying hours, therefore, all transmitter verification must be done during specified non-flying times.

No "black flag" individual flying will be provided. Transmitters which flunk the test must be corrected before competition. Several R/C manufacturers will have technical service facilities available for those needing them.

AMA admits this procedure will impose an additional burden on the R/C contestants and contest officials alike, but feels it is the only way in which more flights safely can be logged, and feels that contestants valuing their aircraft will appreciate "clean" flying conditions.

Another first for this year's events will be immediate receipt of flight scores by contestants. Judges will make carbon copies of their score sheets, and hand them to the competitor as soon as he completes his flight.

One of the three judges in each group will be rotated after every third flight, so that it is mathematically improbable that the same set of judges will be together for more than three flights. The rotation plan worked out by the committee is said to rival the choreography for some June Taylor dance numbers.

These are some of the reasons why AMA believes the R/C event at this year's Nats will be a giant step forward in establishing an optimum working procedure, and an atmosphere in which everyone may enjoy himself to the utmost.

## INTERNATIONAL CIRCUIT

(Continued from page 10)

continuous rain, Pete Waters was victorious, with RCM Editor Geoff Franklin second. Also on display was the first public showing of the Orbit proportional system which returned to England with Ed Johnson, following his recent visit to the U.S. Still another meet was held at the Duke of Bedford's Woburn Abbey, with twenty-seven top multi fliers competing. First place went to Frank Van de Burge, second to R. Foster, and third to G. Bradley. A dicey meet, according to Geoff Franklin — if you undershot your landing you were in the Duke's lake — if you overshot, you were in his woods!

This is the first monthly column devoted to RC activities outside the U.S. Contributions to the column are from RCM overseas editors and individual modelers, and compiled by RCM's Foreign Editor. Next month, in addition to general news, a complete rundown on Dr. Derek Maypole's phenomenal Constellation 7 proportional system.

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### THE UNGARBLD WORD by Merv Mischnik - President

Why bother to sanction your next regatta? What is the purpose of a sanction anyway? You have run a boat before without a sanction, so why do you need one to go out and run now? A regatta sanction is the basis of all IMPBA activity. Without a doubt, it is the heart of the organization. A sanction is a guarantee to a modeler that the competition will be conducted according to established rules, run on established courses, and the result of the competition will be recognized as official. A sanctioned regatta is the only place a world record may be set. It is an assurance that all rules will be impartially enforced so that every contestant is given a fair opportunity to compete. Sanctions are granted to both Tether and R/C Divisions of the IMPBA and are one more good reason for joining.

In the R/G Division, a peculiar situation exists. In an attempt to satisfy the greatest number of modelers, under varying conditions which exist around the world, the courses are varied and many, yet they do not answer all the problems. There are two sizes of International Ovals, to permit use in small ponds and there is the Straight Sixteenth for speed competition. Five precision courses, one long distance course, called "port to port", and another multi-boat event called the "Gold Cup". That makes a total of nine courses in R/C. Even so, the basic courses do not fit all the conditions

which exist. For instance, there is no beauty event which gives credit to a man for superior craftsmanship. One of the problems here is to get people who are qualified to be judges and to establish standards for judging. There is nothing which permits a man with a large beautiful boat to compete and have any reasonable chance of winning against a man with a specially designed competition model. Perhaps we need yet another type of course. One which could replace the existing precision courses. Something which would give every man a chance to win.

One event of course which attempts to equalize many of the variable factors has been used with some degree of success by the Skippers R/C of Lyons, Illinois. This is a Balloon Busting event! Balloons are only 25 ft. from the start and parallel with the shore so that depth perception and eyesight are not prime factors. The size of the balloon and the size tack on the bow used to break it are the same for all contestants. This means that the man with a big, wide and heavy boat has as much chance to break a balloon as the man with the small narrow boat. We thus eliminate the inequality which occurs when a narrow boat must pass between the same set of fixed markers. As the rules now state, the standard distance between markers is 30 inches. It can easily be seen that a boat with a 5 inch beam has a target to pass through which is 6 times as wide as the boat, while a man with a boat having a 15 inch beam has only a target that is

twice the size of his boat. In balloon busting the width of the boat plays no part. Balloon busting may not be the answer to all of the problems which exist in the precision events, but is a start in the right direction. It is a lot of fun, holds the attention of the judges, other competitors and spectators.

What kind of precision course would you like to see? Why not design a course which is suitable for all sized of boats and all types of individuals, young and old who enjoy competition with their favorite boat? How much should the features incorporated in the boat count toward winning? Should we use some sort of handicap system? If so, how would the handicap be figured?

Since the courses which now exist do not fit all the situations which arise, should it be possible to incorporate some of your own favorite courses in a contest run by your club? Could a sanction be granted for a contest which includes events that are not in the rules book?

I believe that the host club should have the opportunity to run a regatta as it sees fit with a minimum of restrictions and regulations. With this in mind perhaps it may be necessary to amend the Rules of Competition in such a way that only a fixed minimum of events of a regatta must be taken from the official Rules of Competition. This would allow some variation to be introduced by the host club but would still guarantee to the contestant that a certain number of familiar events will be run.

### MORE DATES FOR CONTESTS

New York Model Power Boat Club.

July 19th, NY & Philadelphia — Trophies. August 23rd, NY, Annual Invitational — All Comers Welcome. All running to be held at Rich's Hobbytown, Parsippany, NJ. Record runs sanctioned from May 3 to October 25, 1964.

Mrs. Helen Avery, 4728 4th Ave. Model Yacht Club. June 7th, 12:30 PM — 3 Places — Trophies. July NE, Seattle, Washington, 98105 Seattle 26th, 12:30 PM — 3 to 10 Places, Trophies. August 2nd, 12:30 PM — 3 to 10 Places, Trophies. Sept. 13th, 12:30 PM — 3 Places, Trophies.

Gary A. Preusse, 1504 No. 22nd Ave, Melrose Park, Illinois. Minute Breakers. Invitational, July 25, 26, 10 AM-5 PM — 3 Places. Trophies.

(Continued on page 33)



# 1964 DCRC SYMPOSIUM

by LLOYD SAGER

As predicted, the Seventh Annual DCRC Symposium, held on May 16 - 17, turned out to be an even more notable event than the previous year's seminar. The weekend-long program commenced Friday evening with a social, held in the beautiful new Sheraton Silver Springs Motor Inn, and hosted by Prexy Fremont Davis and members of the DCRC club. Among the notables attending the Symposium were AMA President Maynard Hill, Walt Good, Howard McEntee, Ed Alexander, Lee Schulman, Gil Rose, Sid Axelrod, and many others.

Following the events of Friday night, Saturday morning seemed to come around rather suddenly, and with my mental alarm clock still set for West Coast time, it was like getting up at 4:00 A.M. rather than 7:00! Following breakfast, and accompanied by Frank Schwartz, covering the event for Grid Leaks, we set out for the John Hopkins University Applied Physics Laboratory where Saturday's program was to be held.

The laboratory is situated in beautiful green rolling hills about fifteen miles north of Washington, D.C. The facilities were excellent and provided all the modern conveniences that could be desired. We arrived slightly early in order to set up a display for the new Bonner Digimite. This was the premiere of the newest proportional system to be offered the R/C modeler.

The scheduled lectures were given in the theatre, and attended by a capacity crowd estimated at near the two hundred mark. The speakers had at their disposal movie and slide projection equipment, plenty of blackboard space, and a closed circuit TV system, the latter providing the audience a close-up view of the equipment and frequent oscilloscope traces.

At the opposite extreme of the building, a display room was set up with display tables for the use of manufacturers and individual speakers who wished to exhibit their equipment.

The program began at 9:00 A.M. with preliminary introductions by John Spalding, Symposium Committee Chairman, and welcoming remarks from Maynard Hill and Walt Good.

Six Axelrod, scheduled to kick-off the program with a lecture on propellers for RC use, did not arrive until later in the morning. It seems that not only was Sid's flight late in arriving, but to make things worse, someone mistakenly took his luggage, and it was a couple of hours before Sid could locate the man and make the exchange. This guy was probably just as anxious to find Sid — particularly if he happened to open the suitcase and find all those demonstration props in their various stages of completion!

Other topics on the program included Fiberglass Fuselage and New Modeling Materials by Matty Sullivan a solid state ten-watt peak modulated transmitter by Dave Atterlee a description of the Quadruplex system by Carl Schwab; a description of the Astroguide proportional by Al Kline; the effects and cures for RF interference by Dick Jansson printed circuits and potting compounds for model applications by Fred Muccino; an explanation of digital proportional control by Bob Elliott; and a demonstration of styrofoam wing construction by Bernie Murphy. In addition, Ed Lorenz gave a short report on the AMA-FCC Committee's progress. The talks were conveniently separated by a break which provided an opportunity to view the equipment on display.

Saturday evening was another enjoyable highlight of the weekend, this time in the form of an initiation of all those in attendance into the Remote Knights Of The Air. Grand Knight Fremont Davis conducted the ceremony which included furnishing all prospective members with the appropriate background in aviation and radio history by calling forth famous personalities from the past. These personalities were cleverly and appropriately dressed members of the DCRC club, including Walt Good in the role of Marconi (complete with loose tubes in his transmitter). Carl Schmaedig stole the show with his quick-witted ad libbing. This cleverly prepared initiation even included a special Remote Knights Of The Air song (accompanied by Maynard Hill with his guitar) and a special Fellow handshake.

Sunday was a beautiful day for the flying demonstrations, and a continuation of the excellent weather which was enjoyed during the weekend. The flying site was the runway of a small airport in Fort Meade, with Open flying the order of the morning.

The official flying demonstrations started soon after lunch, with Don Brown putting on a remarkable display of low level passes for the TV camera, using his Dee Bee proportional equipment for control. Walt Good followed Don with a Merco .49 powered Rudder Bug — the Merco complete with effective silencer. Sid Axelrod and Lee Schulman were having a ball flying a Schoolmaster, including a flyaway and subsequent long walk resulting from a switch malfunction. One particular mid-wing model which seems to be fast becoming popular in that area is an outstanding design by Paul Ennis called the Marksman.

All of us who attended this year's Symposium feel that congratulations are in order to the DCRC Club for a job well done. The smooth operation and completeness of the preparations made the event a pleasure for all concerned.

# UC - 78

*Bob Morse and Mearle Hickman's magnificent twin-engine Cessna UC-78 has been in the development stage for over two years. The next few pages represent the combined efforts of many individuals - - - the text and plans are by the authors, the final drawings by George Walker. The full color cover transparency was provided through the courtesy of Gordon Madison. Full-Scale photographs, research data, and authentic factory drawings were furnished by Bill Robinson, Public Relations Director for Cessna Aircraft Corporation. Photographs of the model are by Bud Phillips. The historical preface is by the Editor. R/C Modeler Magazine is proud to take part in the presentation of the UC-78 — one of the finest radio control scale construction articles ever published.*

**By Bob Morse and Mearle Hickman**

Prior to WWII, during the summer of 1938, Cessna Aircraft Corporation began a review of the twin-engine aircraft market. Their investigation disclosed a definite need for a small twin to sell in the \$10-\$30,000 price bracket. With this goal, and certain pre determined specifications in mind, Cessna engineers began the design of their experimental twin. Less than a year later, the Cessna Model T-50 was ready for its first test flights.

The new prototype was a low wing, five passenger model powered by two Jacobs 225 h.p. engines and equipped with Curtiss Reed all-metal, fixed pitch props. A retractable landing gear system was incorporated in the new design, the first since Cessna's CR-3 racer, produced in 1933.

Following the successful maiden flights and subsequent flight test and developmental engineering phases, the CAA granted Cessna approval for full-scale production of the T-50. Production actually began in early 1940, and it was apparent that the T-50 was an immediate success.

Designed as a business personnel transport, it was anticipated that the T-50 would soon see usage as a high speed charter plane for instrument training and major airline router checking for aerial photography, ambulance work and twin engine flight instruction. The cruising speed of the T-50 was 191 m.p.h. with a cruising range of 750-1000 miles. Single engine absolute ceiling was 6300 feet. The T-50 was capable of a short take off run of 520 feet and a landing run of 630 feet. Climb, fully loaded, was 1500 feet per minute. Landing speed was 55 m.p.h.

Construction of the T-50 consisted of a welded fuselage assembly of chrome molybdenum seamless steel tubing, jig built in one piece, with the aft section strengthened for lifting and ground handling. The wing was of wood construction, full cantilever, and continuous from tip to tip. The front wing spar passed through the cabin at the rear edge of the pilots seat, and the rear spar under the rear seat, offering no obstruction to full use of the cabin space. Airfoil utilized was an NACA 23012. Six degrees of dihedral was used. Wing flaps lowered 35 degrees and were directly driven by a single electric motor.

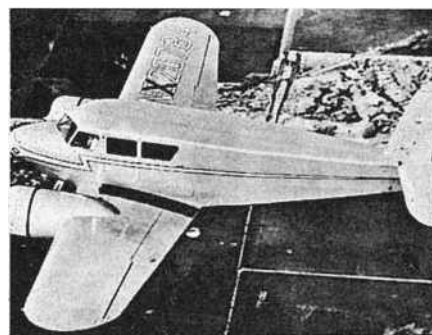
The T-50's retractable gear was operated by an irreversible chain-driven worm operated by a single electric motor, assuring perfect synchronization of both wheels at any point during extension or retraction. Brakes were hydraulic, and toe-operated from the pilots seat. Two 60-gallon aluminum alloy fuel tanks were located between the nacelles and the fuselage. An auxiliary 40-gallon tank was located under the rear seat.

Cessna's commercial T-50 had a wingspan of 41 feet 11 inches and an overall area of 925 square feet. Fuselage length was 32 feet 9 inches with a height of 9 feet 11 inches. Gross weight was 5000 pounds, with an empty weight of 3500 pounds, leaving a useful load capacity of 1500 pounds. Payload was rated at 850 pounds. The spacious cabin area had a volume of 214 cubic feet, and handled 300 pounds of luggage. Wing loading was 16.9 pounds per square foot with a power loading of 10.2 pounds/HP. Service ceiling was 22,000 feet. Gasoline consumption, 28 gallons per hour. Oil capacity was ten gallons.

Available also as an optional ski-plane and photo plane, the Civil Aeronautics Association purchased several of the new twins for use in patrolling airway radio facilities.

As the war in Europe became more and more prominent, it became apparent that the U.S. and Canadian governments would need bomber training planes. The U.S. Army was interested in the remarkable success of the T-50 and ordered 33 ships from Cessna in 1940. As advanced trainers, the Jacobs engines were replaced with 290 h.p. Lycoming R-680-9, nine-cylinder motors. Redesignated the AT-8, the new trainers differed from the commercial T-50's only in their increased power, special radio and military equipment, different cabin top windows, and khaki paint job. All AT-8's were equipped with Sperry hydraulic autopilots.

The Army purchase order was soon followed by an order from the Canadian government for 180 of these aircraft. The Canadian T-50 was designated the Crane I, and was identical to the commercial T-50 with the exception of wooden, fixed-pitch props, radio gear, special interior equipment, and exterior markings. Power for the Crane I was two 245



*The maiden flight of the first T-50 on March 26, 1939. Note "V" windshield converted to a curved unit on production models.*



*The production model of the T-50. Windshield, rear cabin window, vertical tail, and constant speed props the most noticeable changes.*



*A T-50 purchased by the CAA. All T-50's were redesignated UC-78A when taken over by the government during WWII.*



*The AT-8—same as the T-50 except for cabin top windows, equipment, paint job, and 290 H.P. Lycoming engines.*



h.p. Jacobs engines.

By December of 1940, less than six months after receipt of the Army contract, the first AT-8 was delivered to Dayton, Ohio for military flight evaluation. The first Crane I was delivered to the Canadian Air Force one year later, only three months after contract negotiation with Canadian officials. Following the successful tests and evaluations by both governments, Canada responded with additional orders totaling 640 planes. Army officials placed additional orders with a change from the Lycoming powerplants to two Jacobs R-755-9, 245 h.p. engines, standardizing the motors in both the U.S. and Canadian versions. The new Army order designated the T-50 as the AT-17, promptly nicknamed the "Bobcat."

Top speed of the volume production AT-17 Bobcat was 195 m.p.h. with a cruising speed of 175 m.p.h. Gross weight of the AT-17 was 5100 lbs, later increased to 5700 pounds in the AFT-17 A, C, and D versions. Hamilton Standard constant speed props were used on the initial AT-17 order, and Hartzell wooden, fixed pitch blades on the remainder of the series. Additional top cabin windows were installed in this production series. A total of 1140 were built during the war years of 1941 to 1943.

In the latter part of 1942 and early 1943, the original T-50 was again redesignated the UC-78. This new series was used primarily for general transportation and light cargo missions. Gross weight was 5700 pounds. A total of 3356 were built and delivered.

From the original Cessna T-50, 5402 aircraft were built during the period from 1940 to 1943. The AT-17 series was used by the Army Air Force as an advanced trainer. As aircraft developments progressed during the war years, the later model UC-78 series was relegated to simpler tasks. All of the commercial T-50's built were later taken over by the U.S. government and designated as UC-78A's. Other than minor changes in equipment, all AT-17, UC-78, Crane I, and Crane II aircraft were basically alike. Due to a shortage of material for constant speed propellers, wooden fixed-pitch props were used on Models AT-17A, AT-17B, AT-17C, UC-78B, UC-78C, and Crane I, in order that production of these ships would not be delayed.

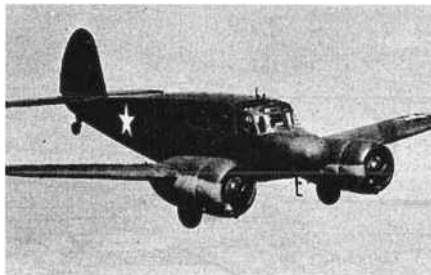
One other experimental version of the T-50 was the Cessna P-7, identical to the T-50 except that it was powered with two 330 h.p. Jacobs engines, and the wings and tail were plywood covered. Only one prototype was produced, the P-7 making its test flight on June 2, 1941.

#### THE MODEL

As you took your first glance at the Bobcat you probably wondered what kind of a nut would spend all that time working on such an "ugly duckling." But if you stay with it long enough, you will feel as we do — "it's so damned ugly that, in real truth, it has a beauty all its own."



*The AT-17 with additional top windows and Jacobs 245 H.P. engines. Volume production model of the T-50.*



*The UC-78 series, used for light cargo and general transportation. Sold for civilian use after WITH.*



*Canadian Crane IPs. Same configuration as the AT-17 series but painted all yellow with Canadian markings.*

The model is an excellent flier with only one major vice — it does like to drink fuel! If you start a UC78 of your own, get a gallon of fuel now!

There is no magic secret in the design of the model. The Cessna engineers took care of these when they designed the full scale T-50 in 1939. The only deviation from scale is the fabric covered wing being replaced by conventional RC wing construction for greater durability, plus the substitution of a modified NACA 2417 airfoil. The ship is extremely stable and responsive, and to date, without vices. We are most emphatic in recommending the use of contra-rotating propellers to cancel the torque effect. With two 35's screaming away, this torque could be a real problem — if not disastrous. Models to date have used K&B 35 R/C mills with the left hand engine equipped with a reverse ported crankshaft (usually available from the manufacturer).

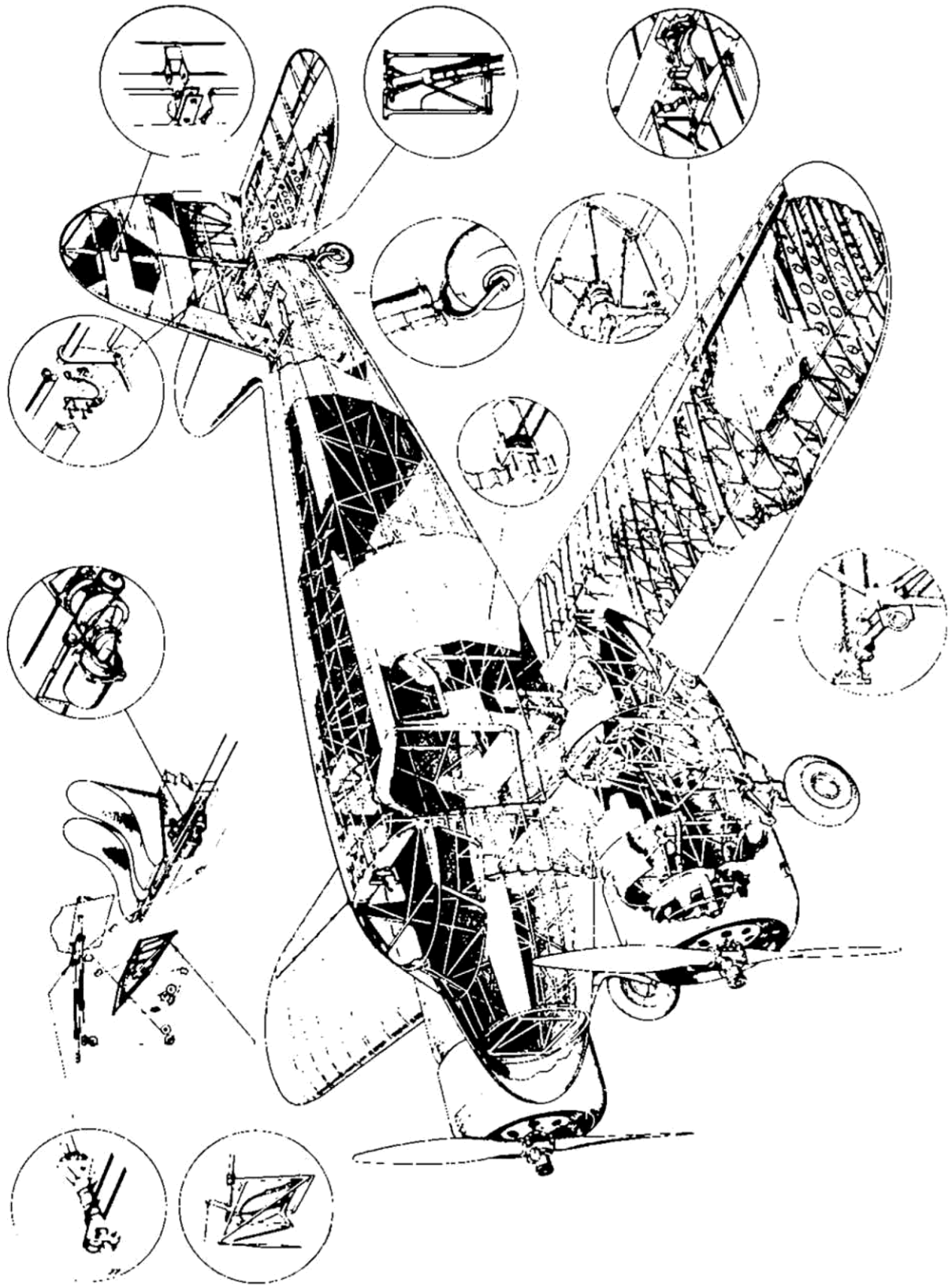
Propellers used were Tornado 10-6, right hand and left hand. Prototypes #3 and #4 are now being built. #1 met its demise at the 1963 Indian City meet in Detroit when the elevator pushrod went out with the engine in high speed! #2 is in mint condition and was recently displayed at the 1964 Fresno, California Open contest. While we do not recommend the Bobcat for the beginner, the average sport multi-flier can fly this ship without any difficulty if he has any degree of faith in his flying ability.

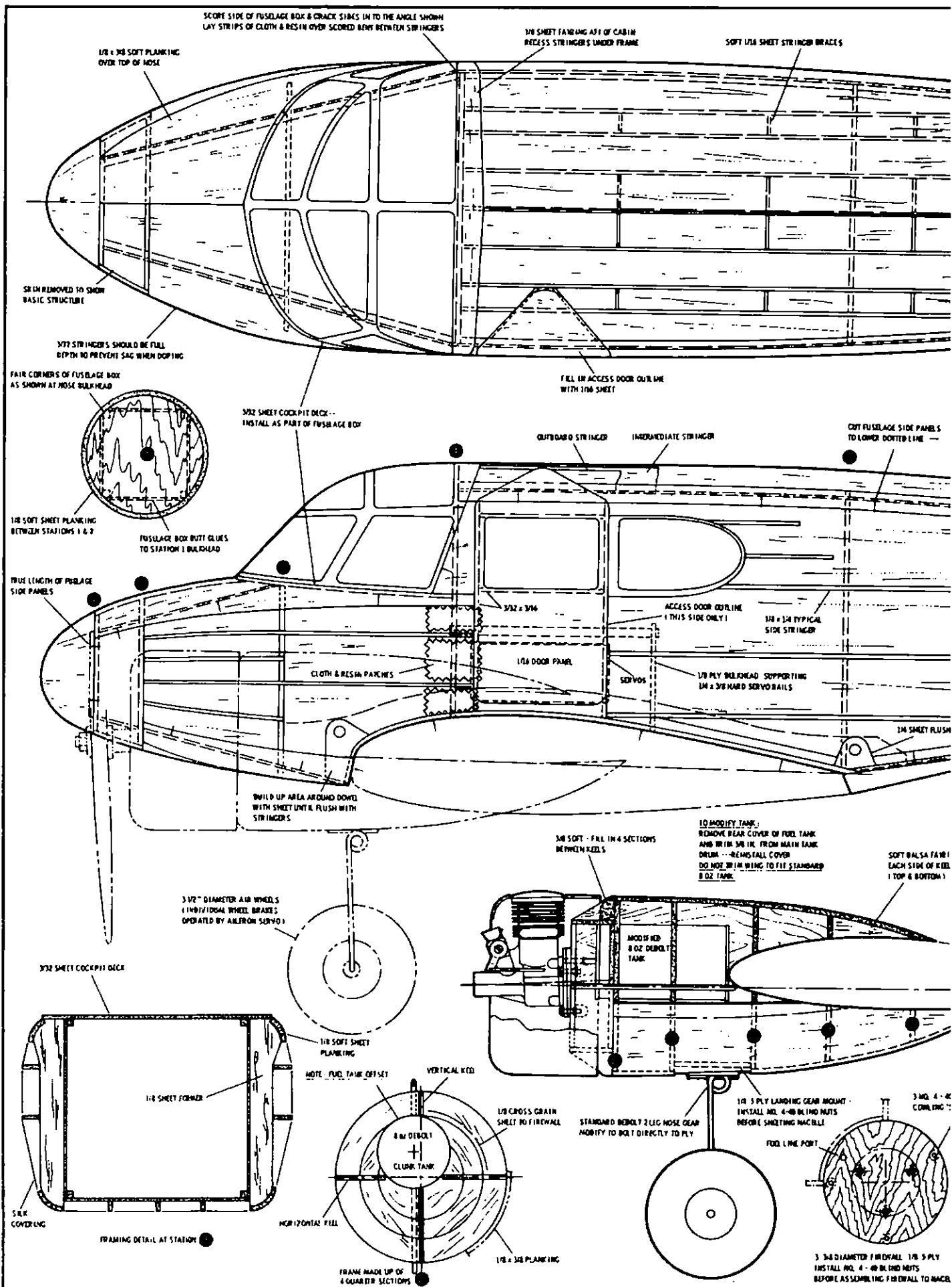
Very few problems are encountered in constructing the model. The fuselage is large, but light. The wing is no more difficult than the average contest multi wing with the exception of the two nacelles that are built-on after the basic structure is finished. DO NOT increase wood thickness anywhere in the model as this is the only area where you can keep the weight down. (Come to think of it, you'd better get some more fuel!).

The eight ounce DeBolt metal clank tanks should have 1/2" trimmed from their length so that they will fit between the firewall and sheeted wing leading edge. DO NOT cut into the leading edge to install standard tanks, as this will seriously weaken the beam strength of the leading edge box structure.

Assembly of the nacelles starts with the installation of the main vertical

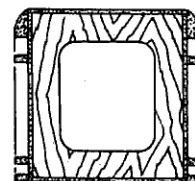
*(Continued on page 23)*



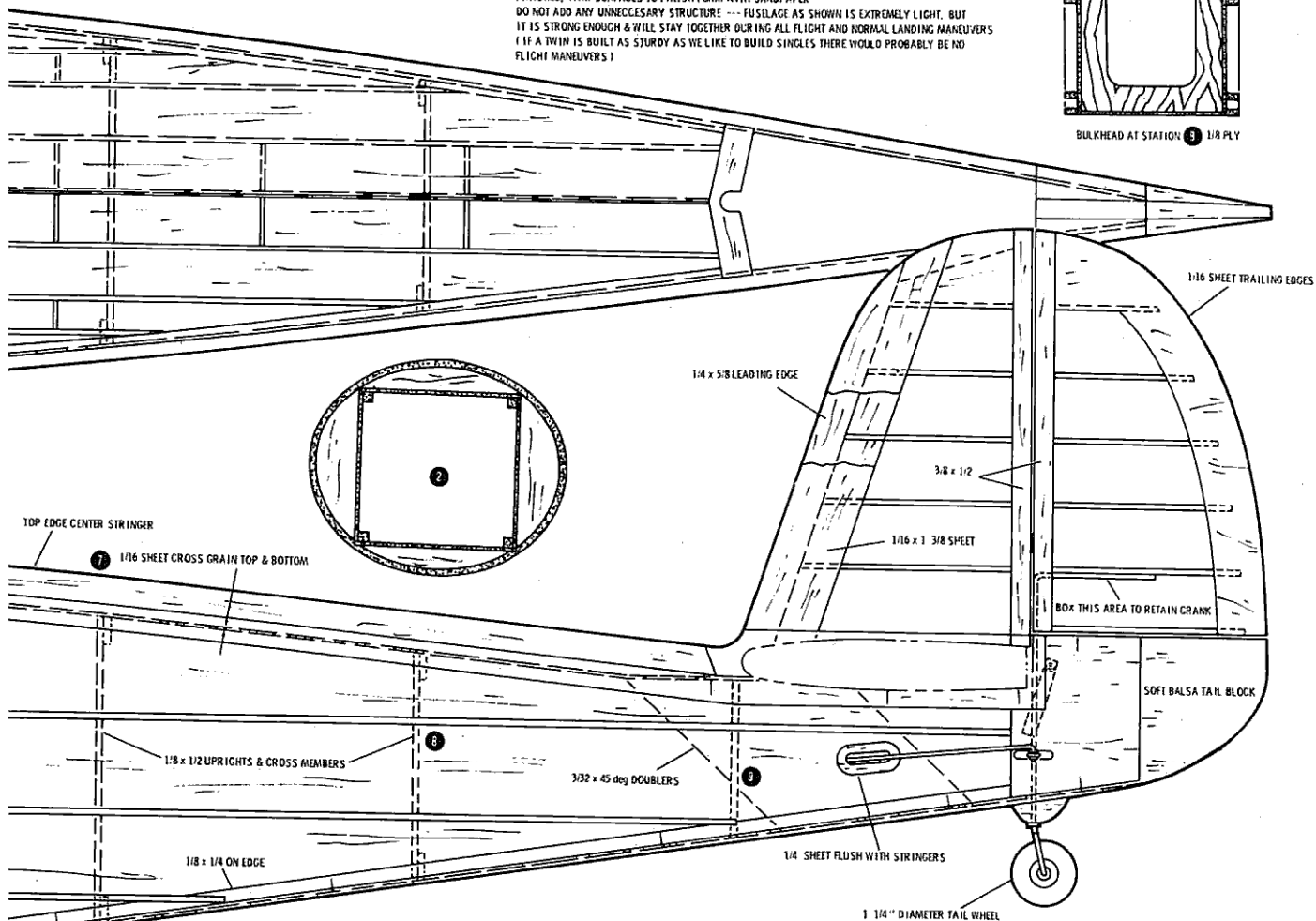


BEFORE COVERING FUSELAGE, RUB ALL STRINGER EDGES.  
RECESSED AREAS OF BALSA SHEET WITH BEESWAX, CRAYON ETC.,  
TO PREVENT SILK FROM STICKING OR PULLING OVER THE EDGES  
OF STRINGERS & SKIN SHEETING

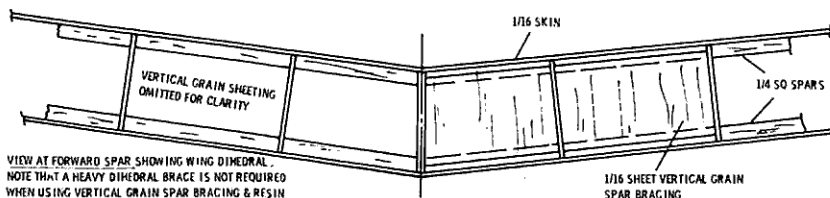
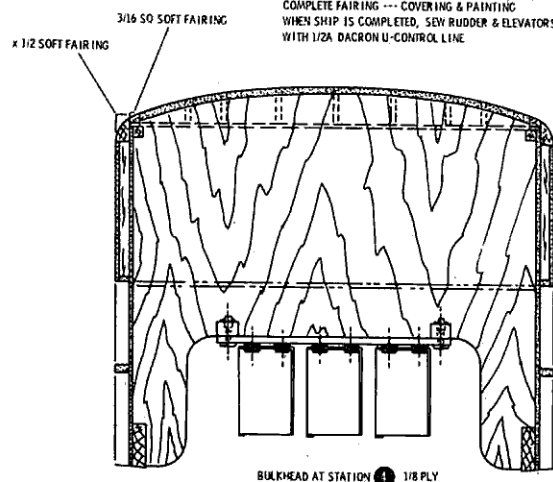
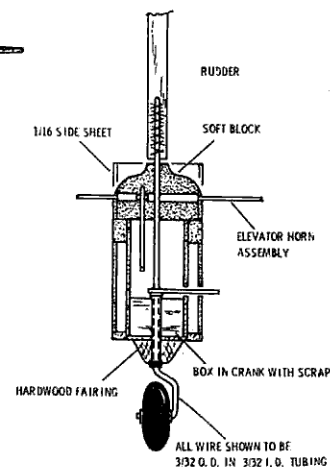
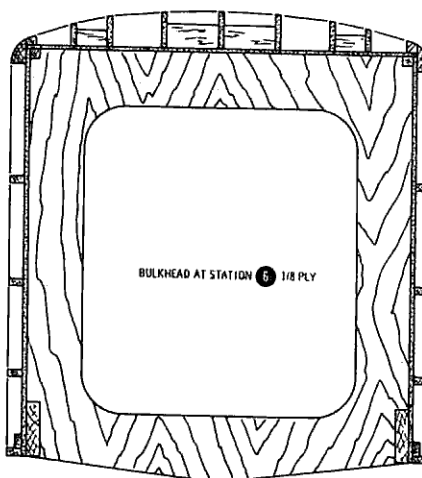
FUSELAGE SIDES & TOP ARE 1/16 SHEET (MEDIUM)  
ADD ACCESS DOOR & SIDE WINDOWS BEFORE ASSEMBLING BASIC FUSELAGE  
AFTER BASIC FUSELAGE IS TOGETHER FROM STATION 4 AFT, CRACK 1/16 SIDES AT STATION  
4 & BOX IN NOSE SECTION. FORMERS & STRINGERS ARE NOW ADDED. WHEN FUSELAGE IS ROUGH  
FINISHED, FAIR SURFACES TO FINISH FORM WITH SANDPAPER  
DO NOT ADD ANY UNNECESSARY STRUCTURE --- FUSELAGE AS SHOWN IS EXTREMELY LIGHT, BUT  
IT IS STRONG ENOUGH & WILL STAY TOGETHER DURING ALL FLIGHT AND NORMAL LANDING MANEUVERS  
(IF A TWIN IS BUILT AS STURDY AS WE LIKE TO BUILD SINGLE'S THERE WOULD PROBABLY BE NO  
FLIGHT MANEUVERS)



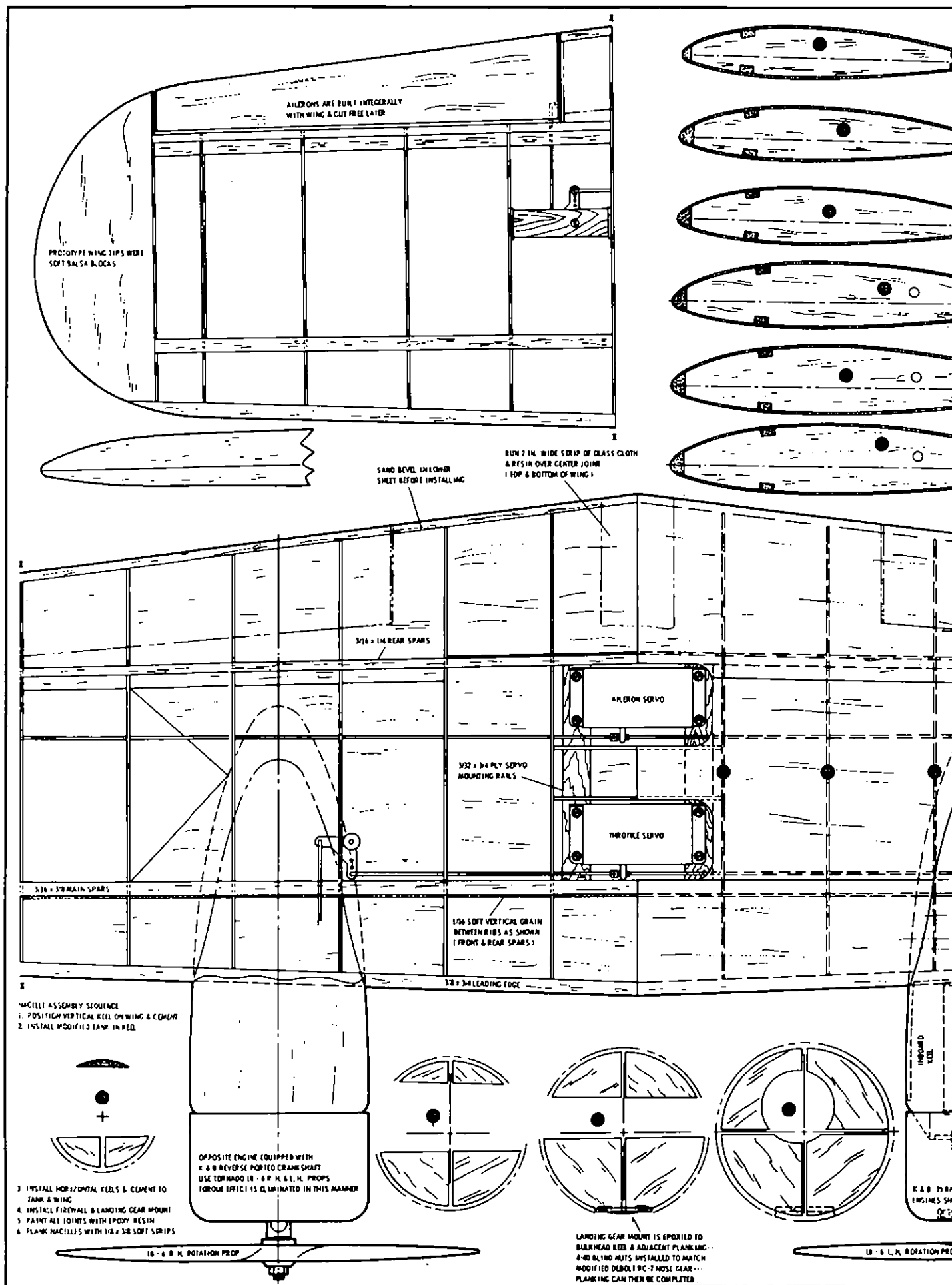
BULKHEAD AT STATION 5 1/8 PLY



INSTALL STABILIZER PERMANENTLY TO FUSELAGE -- INSTALL  
RUDDER & TAIL WHEEL CRANK (NOTCH STAB. SPAR)  
INSTALL FIN & COMPLETE FWD FAIRING --- SEW ELEVATOR CRANK  
TO STAB (NOTE HORN OFFSET) ADD BLOCK BETWEEN STAB SPAR &  
HOLLOW BLOCK FOR ADEQUATE ELEVATOR HORN TRAVEL ---  
COMPLETE FAIRING --- COVERING & PAINTING  
WHEN SHIP IS COMPLETED, SEW RUDDER & ELEVATORS ON  
WITH 1/2A DACRON U-CONTROL LINE



VIEW AT FORWARD SPAR SHOWING WING DIHEDRAL  
NOTE THAT A HEAVY DIHEDRAL BRACE IS NOT REQUIRED  
WHEN USING VERTICAL GRAIN SPAR BRACING & RESIN  
& GLASS CLOTH OVER CENTER JOINT

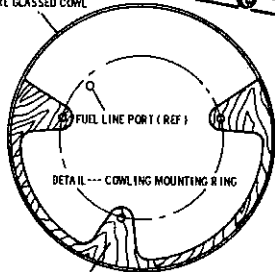


STABILIZER & ELEVATOR RIB SPACING & SKIN SHEETING ARE EXACT SCALE. AREA IS 25% OF EFFECTIVE WING AREA. WITH THE LONG TAIL, MOMENT ARM-HORIZONTAL (PITCH) STABILITY IS EXPECTED TO BE ADEQUATE.

SILVER SOLDER CONTROL HORN TO ELEVATOR CRANK

SEW TUBING SECURELY TO REAR SPAR WITH 1/2" DACRON U-CONTROL THREAD

FIBRE GLASSED COWL

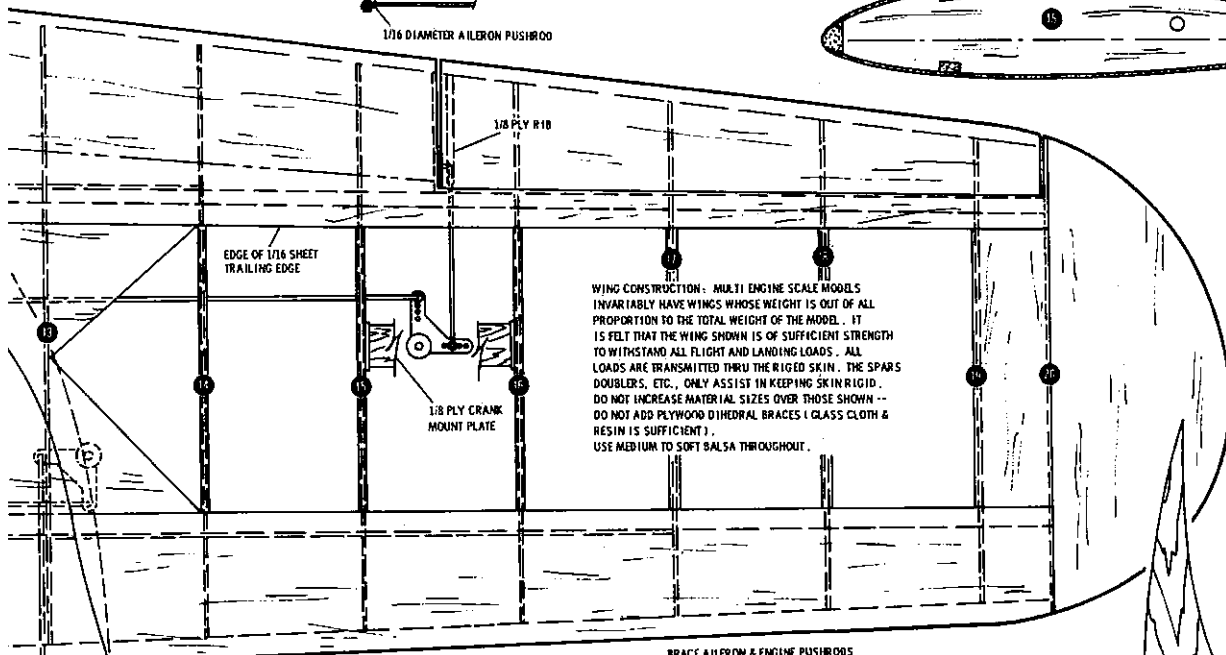
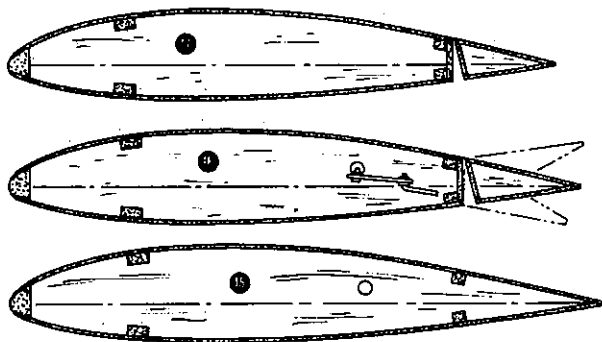
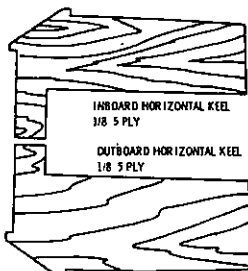


1/8 PLY MOUNTING RING  
RESINED TO I.O. OF COWL

MODIFIED BONNER NYLON  
RUDDER HORN & SCREWS

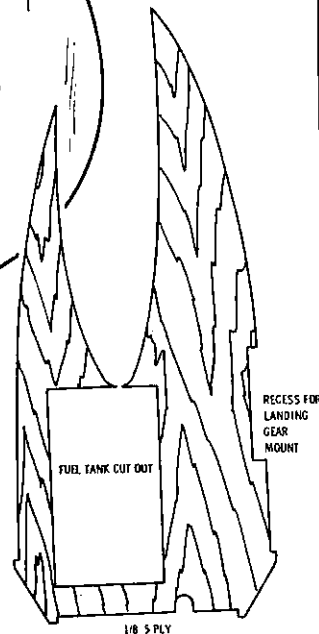
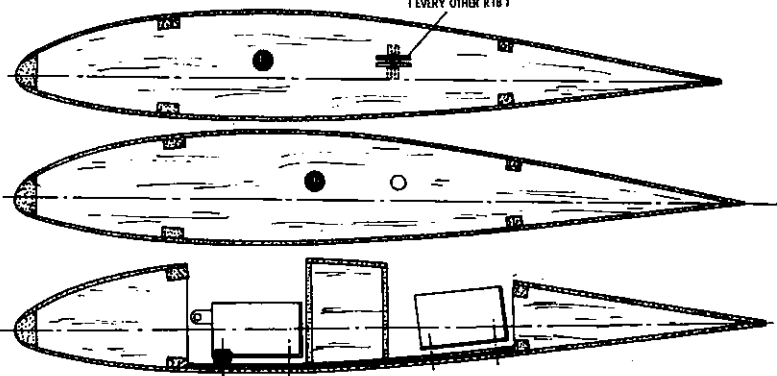


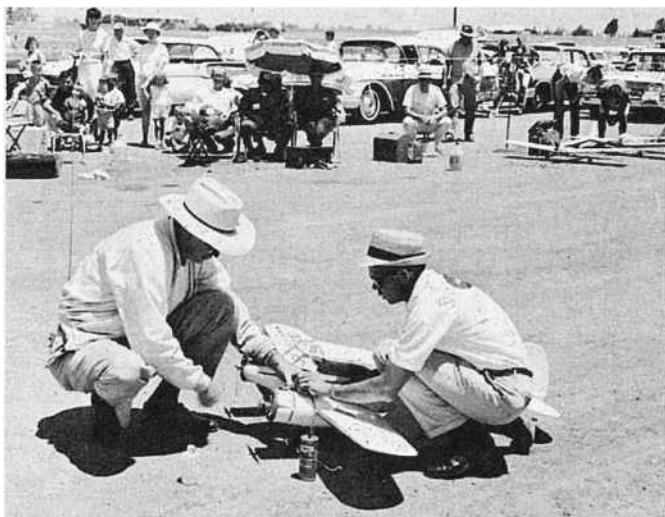
1/16 DIAMETER AILERON PUSHROD



WING CONSTRUCTION: MULTI ENGINE SCALE MODELS INvariably HAVE WINGS WHOSE WEIGHT IS OUT OF ALL PROPORTION TO THE TOTAL WEIGHT OF THE MODEL. IT IS FELT THAT THE WING SHOWN IS OF SUFFICIENT STRENGTH TO WITHSTAND ALL FLIGHT AND LANDING LOADS. ALL LOADS ARE TRANSMITTED THRU THE RIGID SKIN. THE SPARS DOUBLERS, ETC., ONLY ASSIST IN KEEPING SKIN RIGID. DO NOT INCREASE MATERIAL SIZES OVER THOSE SHOWN -- DO NOT ADD PLYWOOD DIHEDRAL BRACES (GLASS CLOTH & RESIN IS SUFFICIENT). USE MEDIUM TO SOFT BALSA THROUGHOUT.

BRACE AILERON & ENGINE PUSHRODS WITH 1/16 SQ HARDWOOD AS SHOWN (EVERY OTHER RIB)





*Port engine starting on second flip at Fresno demonstration. Bob Morse starting while Bob Francis holds.*



*Author holds the UC-78 up for attentive spectator. Note width of fuselage and overall size.*

plywood keel that simply slips over, and is glued to, the sheeted wing structure. The fuel tank is positioned in the vertical keel and then the horizontal plywood keels are cemented in position at each side of the tanks. The nacelle is now ready for the quarter section balsa frames, the plywood firewall (with its blind nuts installed for engine and cowling), and the plywood landing gear mount plate with its blind nuts installed.

When these parts have set, begin the 1/8" 3/8" **soft** balsa planking at the bottom of the nacelles. Plank up each side until you can get back into the landing gear mounting plate to resin coat the interior areas around this plate, being careful not to "blob" resin into the nut threads. Once the resin is in, finish the planking operation.

We would like to assure you that the nacelles are **not** difficult to build — two or three evenings and they will be finished. This is the lightest nacelle structure that we could devise, and they have proven extremely sturdy. So, again, do not add heavy beam mounts or any more plywood than what is shown.

The fuselage is of straightforward construction and no difficulty should be encountered until you come to the cockpit enclosure. The first ship had a meticulously built plywood frame with inset panels of lucite. Number 2 model had a heat-formed plexiglass

unit with painted framing members.

The landing gear that we have used, due to its simplicity, strength, and availability, is the old style deBolt two leg nose gear. We simply bored through the aluminum wire clamping plates and passed three 4-40 bolts through into the blind nuts in the nacelle gear mounting plate.

The engine speed control and aileron bellcranks shown are Top Flite cranks which we strongly recommend because of the positive mounting method provided.

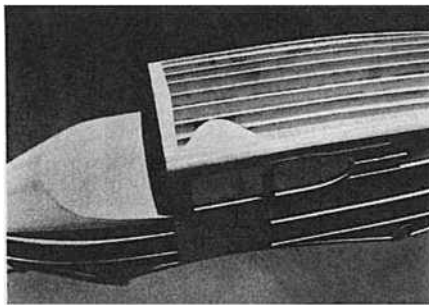
With the wing completed, the fuselage can be built and matched to the wing as you go along. We installed the door paneling and window trim spacers to the fuselage side panels before final assembly. The fuselage sides are built up of 1/16" medium sheet, adding the cabin details as mentioned above, followed by assembling the sides to the plywood frames. Again, **do not** increase your wood sizes. You'll begin to wonder about the 1/16" sheet fuselage box when you start construction, but the entire fuselage is a strong integral unit once the frames and stringers are installed.

Radio equipment used in #1 model was a Min-X 10 channel reed outfit. %" soft balsa pushrods were used to prevent buckling when signaling "up" elevator. A Kraft Custom 10 transmitter and receiver combination was used in prototype #2.

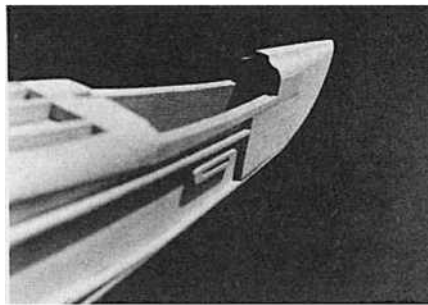
The original aircraft was finished

in Army Corps olive drab with light powder blue on the under sides. The Crane I and II, to the best of our knowledge, were all yellow with Canadian Air Force markings. Our #2 models were finished with the same color scheme shown on the cover shot of the UC-78 in this issue of R/C Modeler. Following WW1I, many of the UC-78's, and their earlier predecessors, the AT-8's and AT-17's, were sold to civilian buyers, as was the plane on this month's cover. Color schemes ran the full gamut of the various purchasers whims, although most of them seemed to maintain a light basic color with darker trim striping.

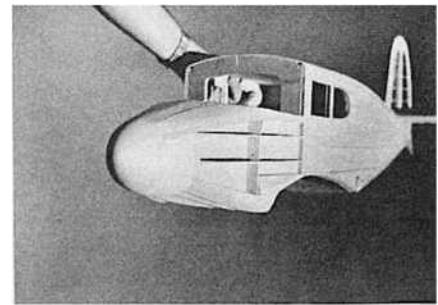
A word or two about the engine cowlings — our first thoughts on this matter centered around metal cowls, but this required some very special tools which were not available to us. In lieu of this, fiberglass was selected for this purpose. A basic pattern of hardwood turned on a lathe was used as the male mold, which in turn, was cast in plaster of paris. A hole was drilled in the casting to allow air to replace the wood pattern when it was withdrawn from the casting. The plaster pattern was coated with releasing agent and the fiberglass cowls were built up inside this pattern. Don't forget to apply a coat or two of resin to the interior of the pattern in order to form a smooth exterior surface before placing fiberglass cloth



*Detail: General cabin structure*



*Detail: Aft section and tail mount*



*Detail: Nose cone and cabin area*

in the pattern. Several layers of resin and cloth will produce a sturdy cowl. After the cowl is removed from the plaster pattern, water sand it and fit with an inside ring of plywood for mounting to the firewall.

inner surface, running down to the bottom of the cowl, then dribbling out the trailing edge. This may appear to be rather primitive, but it does keep the model free from continuous exhausted fuel soakings.

ment regarding the flying of twin engine RC models. He was right — the sound of those twins winding up will really get to you!

In closing, we would like to say again that the flight characteristics of

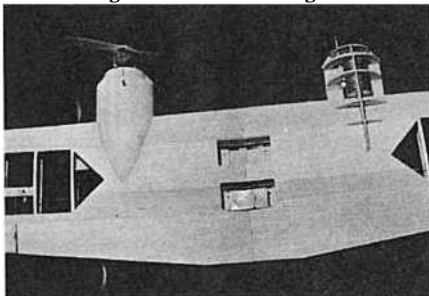


The model stays pretty free of oil when the engines are running. With the exhaust closures such as they are, it is difficult to devise a suitable exhaust extension. We simply let the exhaust blast into the interior of the cowls, the residue collecting on the

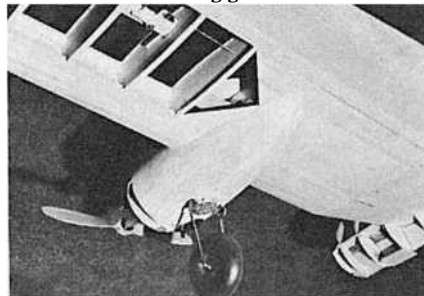
Both Mearle and I would like to thank Cessna Aircraft Corporation for their cooperation in supplying the data necessary to prepare these plans. In addition, our appreciation to Don Parsons of Albuquerque and his ME 210 twin for the words of encourage-

this model are excellent. The ship is extremely stable and easy to fly. In the event one engine quits, simply throttle back enough on the other engine so that the ship is flying straight, and bring her in to a normal touchdown.

*Detail: Wing and servo mounting*



*Detail: DeBolt landing gear mount*



*Detail: Nacelle and engine mounting*



We won't admit to having become a creature of habit — but, it was about the beginning of the flying season three years ago that we blossomed out with a small .020 type R/C sailplane. Looking back to the Spring of '61, I recall that our Nomad took about a week to get ready for the field... so did the Gulliver.

Since '61, we've given much thought to a "new model" of this favorite size fun plane. Any successor would have to be similar where it counted, e.g., performance, size, and ease of construction. It would also have to correct some of the minor weaknesses which we couldn't foresee until after a few thousand modelers gave it the acid test. To complete the "successor", an all-new design would be used.

Gulliver has already rewarded me with all of these attributes. During construction I timed the assembly of the pod and boom. It was completed (though I'm not sure all the cement was dry!) while watching a half hour TV show (...I must admit I don't remember the plot!).

The boom is strong enough to be used during the off-season for batting practice and the pod is equally determined to survive, for it has been introduced to every stone, clump, and stubble at our field. The pictures — with the exception of the pod close-up — were all taken after two days of continuous test glides and flights. It has since become intimate with a scrawny tree — Gulliver winning by a shake-down — and been blown to earth quite undelicately when the wind abruptly shifted 90 degrees at launch and the engine quit.

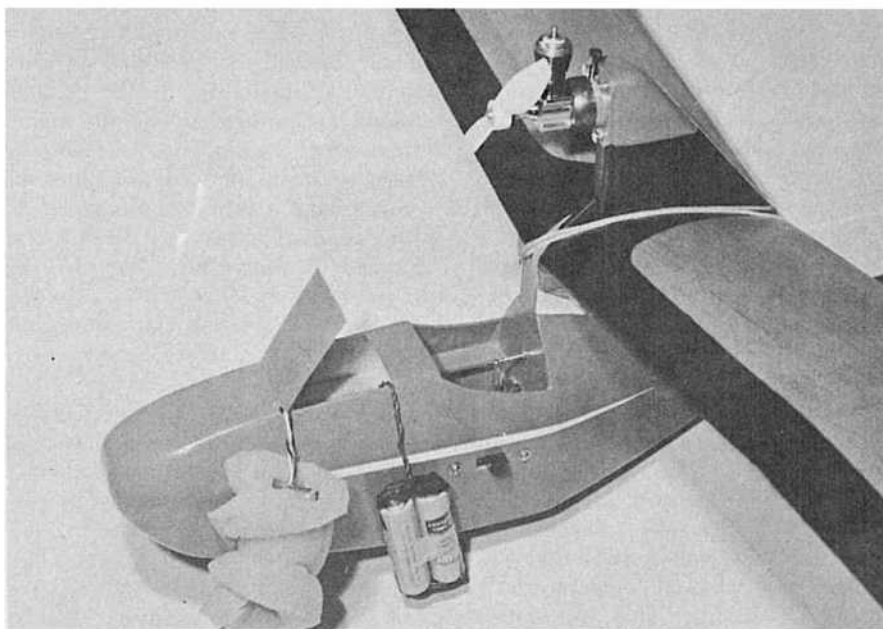
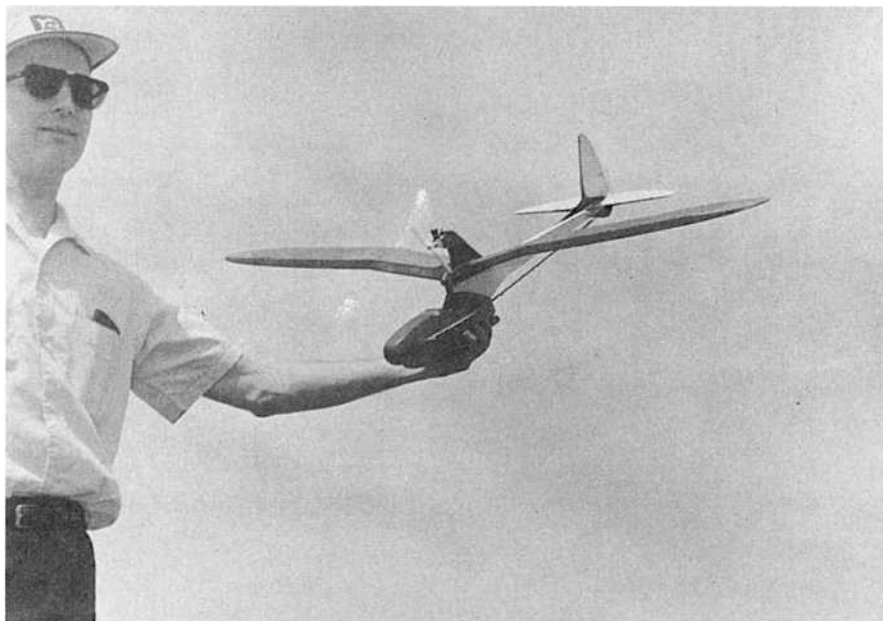
Even with all of this extra beefing, plus a wing which is almost two-thirds sheet covered top and bottom and three unneeded coats of pigmented dope (changed my mind on color schemes too late), the Gulliver weighed in at only ten and one half ounces. Under normal building conditions (Ed's note: "What's that, Uncle Ted?") it should weigh in at nine or nine and a half ounces.

So much for the prelude ... if we don't get building, we can't do any fly in'. How's that for an astute observation?

Construction

Build the boom first by pinning

*(Continued on page 27)*



# GULLIVER

by TED STRADER

*Full Size Special Edition Plan Available*



down one side and cementing 1/8" x 1/2" strip pieces where shown. Drill out the upright strips to accommodate the torque rod. The latter can be installed at this point. Cement the other boom side sheet in place. Be sure that the first 1/8" x 1/2" strip which backs up former #3 is positioned so as to allow 3/32" sheet overhang. Former #3 fills this area when it is cemented in place.

When the boom is dry remove it from the work board and cement former #3 in place. Next, position, cement, and pin the floor piece in place, aligning it with former #3 and the boom. Now install formers #1 and #2, checking each for accuracy. Correct alignment is further assured with the installation of the keyed side pieces. Before cementing pod top and bottom sheeting in place, install your escapement. The linkage can be in the normal manner using a hairpin type bend in the torque rod, or as we show on the plans, by using the parts from a S.E.P. R-0 Control Coupler Kit.

The next step in the fuselage construction is to cement the nose block and wing rest in place, reinforcing as shown. Sand the structure at this point and then cement the dorsal fin piece, rear and pod skids, as shown. If you decide to cover the fuselage with paper, leave the dorsal fin and skids off until finished — then cement them in place before doping the model.

Wing construction for the Gulliver is straightforward. The only difference between a gull of this type and polyhedral is that the outboard panels angle down rather than up.

The center, or inboard, panels are sheet covered top and bottom. Pin down the bottom sheeting, position the spar and ribs, and cement. The center dihedral brace can be cemented to one of the panels at this point. Finish the panel which contains the dihedral brace by covering with the top sheeting so that the splice line of the material occurs toward the trailing edge. When this panel is dry, position it against the opposite inboard panel with the plywood pylon in place. Finish this panel by installing its top sheeting.

Outboard panels are constructed by pinning down the bottom leading and

trailing edge pieces, filling in the bottom root area sheet, and positioning the ribs and spar. If you so desire, construct the outboard panels so that the root area of each is along the edge of your workbench. In this manner the gull angle braces can be cemented in place before the top sheeting is applied.

After this has dried, install the top leading and trailing edge sheets and alter each at the tip where the two pieces join directly above live spar. Fill in the remaining top root area sheeting.

The outboard panels can be blocked up during the joining process when they are attached to the inboard section. We assembled ours in our lap ... it's that easy. We did call upon a few straight pins and a length of masking tape to hold the outboard panels securely against the inboard panels, however. Check each side — as per plan — to make sure both gull angles are the same.

The remaining parts of the pylon and power pod can now be cemented in place and sanded to shape.

The tail is a simple matter of cementing the parts together and checking them periodically for any signs of warps. If you wish, the entire tail assembly can be cemented in place. However, many modelers expressed a desire for a removable tail assembly to cut down fatalities upon landing in less-than-desirable surroundings!

Finishing the Gulliver is a matter of individual taste — ours was finished thusly: Silkspan on the entire fuselage with the exception of the tail, pod skids, and dorsal fin. The wings were covered with silk. Fin, rudder, and stab were left uncovered. To this, we added three coats of clear and then trim. Actually, the fuselage has three unneeded and unwanted coats of pigmented dope because we changed our fickle mind about the color scheme a bit late!

Wing and tail hold-down dowels can be added at this point. Radio equipment can also be installed and the engine mounted.

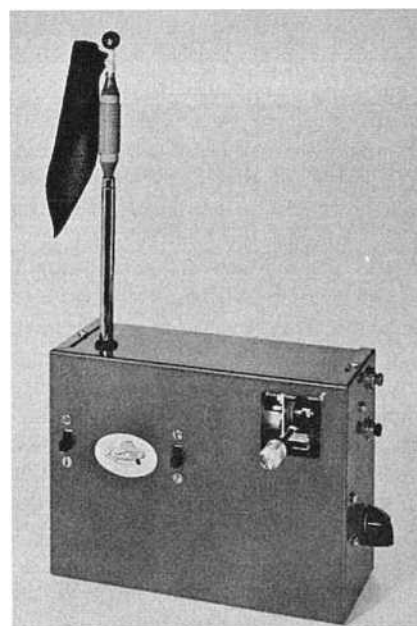
It may be interesting to know that the Gulliver is being ordered around by the same Citizen-Ship LT-3 relay less receiver which was used for the

entire life of the original Nomad. Two Eveready E91 alkaline energizers power the receiver and the Bonner SN escapement. A S.E.P. R-0 Control Coupler makes short and simple work of linking the escapement, torque rod, and rudder together. And, though it isn't necessarily a radio part, the power to get upstairs is supplied by a Pee Wee .020 swinging a 4" diameter 2" pitch prop.

Test glide your Gulliver a few times to make sure the model is warp free and properly balanced. Balance as shown on the plans and you should be rewarded — as we have been — with some fine, trouble-free flying. The engine is mounted flat against the firewall so there are no additional thrust settings to worry about. Now it's just a matter of winding it up and letting 'er go ...

# SIMPLE PROPORTIONAL

## *Final of Three Parts on Simplified Proportional Control*



The Multiplex Master system consists of the Master Pulsmitter (transmitter and pulser unit), Pulsmaster superhet receiver, Master battery pack, and Master Multiplex rudder, elevator, and motor control servo pack. In addition, we received a separate Master proportional servo which plugs into the master servo pack for coupled ailerons. The separate servos were also shipped so that they might be evaluated along with the single servo pack.

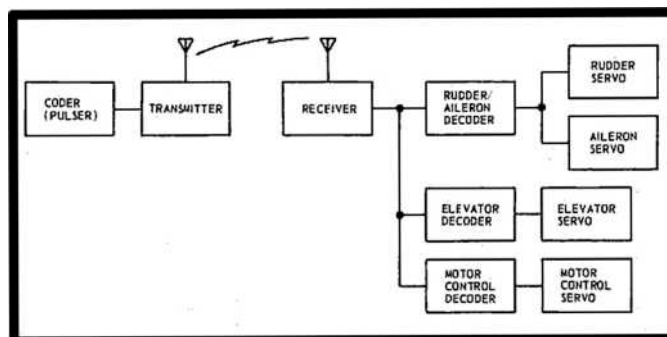
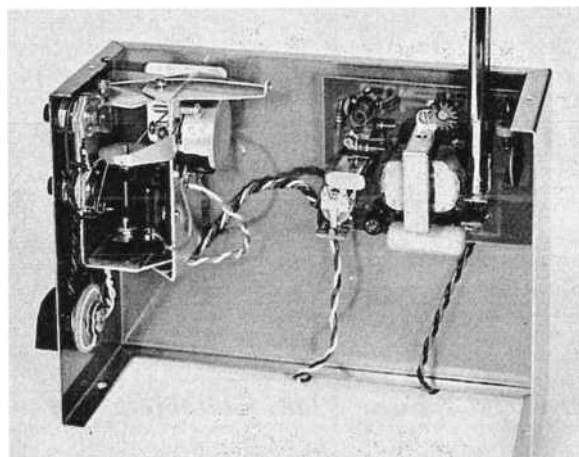
Starting with the Pulsmitter, the design is the result of Tom Dion's ten years of experience in single and multi proportional RC. It is a pulsing transmitter of a very simple and proven design, providing linear, non-interacting pulse composition that will not vary regardless of temperature or battery conditions. The transmitter section is all-transistorized and utilizes

For the final installment in this three-part series on simplified proportional control, we selected a commercially available single channel system for evaluation and discussion. The system chosen was the Multiplex Master, a simple, dual-simultaneous proportional system manufactured by Tom Dion of Glass City Model Electronics, Toledo, Ohio. Our decision to present the Glass City system was not an arbitrary one, but rather, was based on numerous reports we have received from Multiplex owners attesting to its performance and reliability.

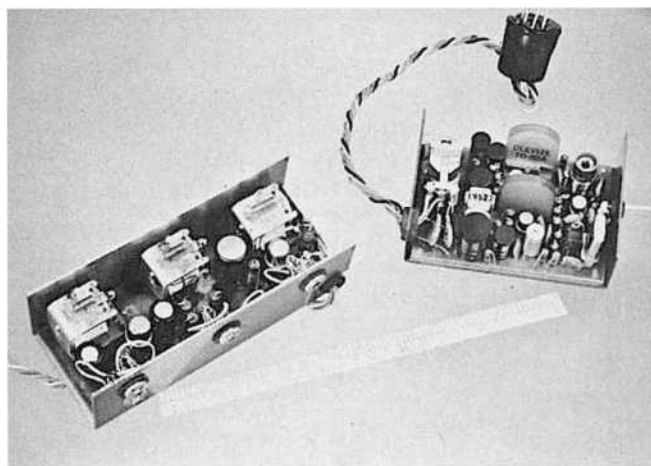
The Glass City unit is a pulse system based on the inductive kick theory, and offers simultaneous proportional control of rudder and elevator plus trimmable motor. Provision is made for coupling the aileron and rudder for an additional control function.

an externally loaded antenna for maximum radiated power with minimum input. Using a single 9V Burgess D6 battery, the transmitter drew 30 mills with tone off. Drain was 38 mills when the tone was keyed. The pulser is of mechanical design, using a 6V screw terminal lantern battery for power. A single pot is coupled with a Mighty Midget motor and circular wiper assembly to code the radio signal for control functions. A separate pot is provided for elevator trim. Two buttons, signal ON, and OFF, operate the throttle control trim servo.

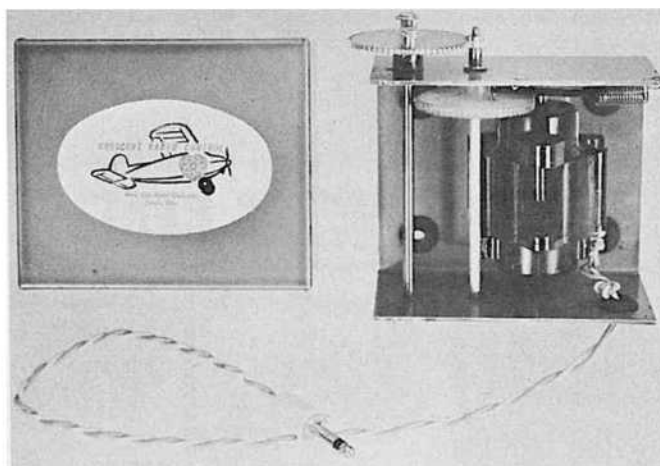
As stated in the instruction manual accompanying the Multiplex system, some erratic performance on the part of the pulser was experienced until the wiper contact was seated on the split plate. Less than a half-hour of continuous pulser operation was required for this break-in period.



*Inside Glass City's Pulsmitter. 9V and 6V batteries used. Block diagram shows functions of system.*



*Superhet receiver and master decoder used with individual servos.*



*Glass City servo with 49:1 gear ratio. Good centering and power characteristics.*

The Master Multiplex multiple proportional servo pack consists of three Mighty Midget pulse servos and the electronic circuitry for the decoder, all in a single servo pack. The Master Decoder, containing the decoder circuitry alone, is used when the individual servos are used rather than the servo pack of three servos. With the Master Decoder, and separate servos, the Multiplex installation can be geared to almost any type of RC aircraft without worrying about the larger size of the master servo pack. Servos may be added or taken away from the Master Decoder without changing its operation. In other words, the RC'er can start with sim- add motor control, followed by elevator, and finally work up to a Class III system by using all functions including coupled ailerons.

The single servo pack of three servos measured  $3\frac{7}{8}'' \times 3'' \times 1\frac{7}{8}''$ , with an all-up weight, including relays, circuitry, and case, of 10 ounces. Battery drain was 320 MA RMS. Servo gearing was 49:1.

Two models of the individual servos were tested, with the smaller of the two shown in the photographs, being provided with current Multiplex systems. Although both units were excellent and employ the same servo principles, the newer servo showed an approximate increase in power of 20%. The Master Decoder used with the separate servos is a self-contained decoding unit that sorts out coded information from the pulser and applies it to the proper servo. Size is  $3\frac{5}{8}'' \times 1\frac{1}{2}'' \times 1\frac{1}{4}''$ . Weight is  $4\frac{1}{4}''$  ounces. Battery drain is 40 mills for the decoder, and 150 mills

RMS for each servo.

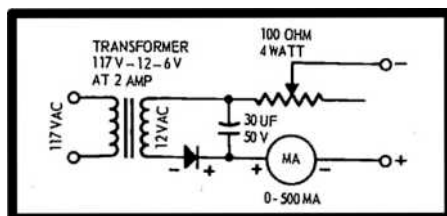
The superhet receiver furnished with the system proved extremely reliable and satisfactory for pulse operation. Utilizing Clevite Transmitters, examination of the unit disclosed that it had been modified by effective relay hardening and effective noise, suppression. Size was  $1'' \times 1\frac{3}{4}'' \times 2\frac{1}{2}''$ , with a weight of 2  $\frac{1}{2}$  ounces. Battery- requirement was 6 volts, and provided as part of the Master Battery Pack. Current drain was 9 mill idle, 50 mill on signal.

The Master Battery pack contains four 1200 mah sealed rechargeable nickle cadmium batteries plus four E91 Alkaline energizers for receiver operation. Size of the battery is  $3\frac{7}{8}'' \times 3'' \times 1\frac{7}{8}''$ . Weight is 10 ounces.

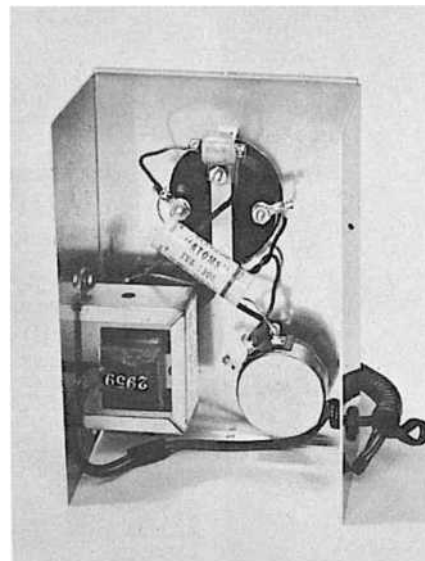
*(Continued on page 30)*



*Left: Charger made from schematic- charges from 100 to 500 MAH.*



*Right: Interior shows simple construction.*



Ninety minutes of flying time was available between charges.

As received, the Glass City proportional system is completely wired and cabled. All that is necessary to operate the unit is to plug in the receiver and battery plugs and flip the two switches. The unit operated perfectly with no adjustments. Although the manufacturers manual contained specific instructions as to the installation, and recommendations as to suitable type aircraft, we assumed that many individuals would not pay attention to these recommendations, and subsequently proceed on their own. For this reason, we gave this system to two of our Consumer Research Editors, and deliberately withheld the instruction manual from them. Neither individual had flown any form of proportional control before and no assistance was rendered to them. Within two days a well-worn Sterling Rudder Bird, formerly equipped with six channel reed system, was airborne. Almost every rule in the manual was violated insofar as installation was concerned. With an OS .19 up front, the Rudder Bird performed completely satisfactorily and with no difficulties experienced. Many local fliers tried their hand at the unit and none experienced any difficulty whatsoever.

Following this acid test, the Multiplex system was installed in a DeBolt Jenny and further tests conducted. Performance was smooth and excellent in all respects. Power from the Mighty Midget servos was ample for all but the most violent maneuvers. Used as a rudder-only system, the decoder and individual rudder servo was installed in a Ted Strader designed Gypsy glider. Formerly using a single channel servo, the glider showed a definite tendency to yaw — this was completely corrected by the infinite variation of control available from the Glass City unit and the rudder only flights proved exceptional. In all tests, the dither, or waggle, of the flight surfaces was barely apparent except at the slowest pulse rates.

In order that the individual flier may achieve maximum results from this system, several notes are in order, first, as with all pulse systems, push- rods. control linkages and control surface movement must be absolutely

free. Binding of any kind will definitely limit performance. Any drag or bind in the control linkage will destroy the linear control response and cause the controls 4.0 "hunt" in operation.

Although the manufacturer recommends either 1/4" dowel or 1/4" square balsa for pushrods, we definitely recommend the latter. Keepers should be bent to make a very light contact with the servos, checking to make sure that the keepers themselves do not cause binding. Support must be given to pushrods that exceed 24" in length. For a first ship for this pulse proportional system, the manufacturer recommends the Live Wire Champion, and we concur in this recommendation. If you have had any multi-channel experience, a DeBolt Jenny is also recommended, although a more high- performance type aircraft. Do not hesitate to start with rudder-only on this system and build up to full-house control as you gain experience. No matter how far you want to go, this system will work with you, as with certain simple modifications, it has been used in Taurus, Viscount, and Interceptor designs for high-performance contest type work. An excellent Class 11 design for the experienced flier would be the Aristo-Cat, recently featured in another model publication.

The elevator trim control used with the Multiplex system is a most Useful feature. Set for slight up trim, the model climbs out beautifully on takeoff. Feeding in down trim, when airborne, can hold the model inverted "hands off." Trimming in a little up, along with retarding the throttle, and you will experience some of the smoothest landings you have ever made.

The photographs and schematic of the nicad charger shown are for the unit recommended in the Glass City Manual, and as constructed by the editor. If you do not have a variable rate charger, this unit will charge the Master Battery Pack at 120 mills for the recommended 18 hours. The charger, as shown, is not suitable for other applications where a much lower rate is required, unless it is modified appropriately. Parts for the charger consist of 1-wire wound Clarostat A58-100 ohm 3-4 watt pot (\$2.00); 1-Shurite 8312Z 0-500 ma D.C. Meter (\$2.90); and 1 P-2959 Merit 115V 60 cycle 12.6V 2Amp transformer

(\$3.36); plus case and assorted hardware.

As a summary, the Separate servo Multiplex Master system, with super- het receiver, is priced at \$224.95. The superregen set is \$196.95. The Multiplex Master with the "three-in-one" servo pack is \$199.95 for the super- het version, and \$174.95 for the superregen version. Aileron servo is \$11.95 additional. Several comments from local fliers included — "it has to be seen to be believed," and "too bad the present full house quad proportionals don't work this well." The secret to the reliable, consistent performance of the Glass City unit seems to be in its simple design — the lack of complexity that characterizes the more exotic systems. We have flown this system under every possible condition and it worked — and worked well. It is the culmination of several years of research into intermediate, single channel pulse systems, incorporating many of the ingenious and practical aspects of the so-called "Mickey Mouse" systems, while rejecting the impractical or complex aspects of these units. It was selected for this final of three parts as the culmination of all of the ideas presented for simple proportional, and as an item of evaluation and review, is recommended as a reliable, everyday unit for proportional flying — a system designed for the sport flier, bringing simple proportional control into the financial and practical reach of almost every RC'er.



# REGATTA



The 1964 version of the Pirates Model Boat Club Annual Contest, held at Legg Lake, Whittier Narrows Recreation Area, in Southern California, Memorial Day weekend, was highlighted by exceptional weather and unmatched facilities. Seventy-four contestants entered the two day affair, and competed in five events: Electric Precision Steering; Gas Precision Steering; Class A Speed, Three Laps for 0.40 and under; Class B Speed, 3 Laps for 0.41 and over; and Open Class Speed Obstacle.

Competing on dead calm water, Jim Gale. (Modelers) ran to 1st place in the Precision Electric event, while Duane Shappell (RCL/Orange County) captured 2nd, and Dick Carey (Pirates) took 3rd.

In the Obstacle competition, Bill McCallister (SFMYC) entered the winners circle with a perfect score and a time of 40.55. Howard Reed (FAST) was 2nd with a time of 41.2. while Carl Leno (Pirates) completed the winning trio with 12.5. Both Reed and Leno racked up perfect scores.

In the Class A 3 Lap Speed event, Howard Reed moved up to first place with a winning time of 61.7, Jim Gale followed with a time of 76.1, while Bill McCallister clocked 78.8.

Bob McCallister (SFMYC) won the top slot in the Class B Speed event with a time of 65.9, followed by Nofi Fraumeni (Pirates) with 71.05, and Jim Whitlatch (Modelers) with 73.0.

The Gas Precision event saw a changing of places of the winning trio in the Precision Electric heats, as Dick Carey took 1st, Jim Gale 2nd, and Duane Shappell, 3rd.

Highlight of the Annual event was the newly organized Multiple Boat Racing event. Under current rules, competition is divided between Class A (under 0.40 cu. in), and Class B (over 0.40 cu. in). Entries were

limited to one boat per contestant in each class. At least three boats were used in each heat. Rules specified that each boat was to run in two heats, each heat to be run in a counterclockwise direction around the outside of the buoys. When all contestants signified their readiness to start, the signal was given to start engines. Three minutes was allowed for starting, with the signal for the start of the race occurring one minute after the first boat was launched. During this period of time, the boats milled about at half throttle and to the left of the starting line, waiting for the countdown. As the thirty second countdown was completed, the boats crossed the starting line together at full bore.

For all concerned, contestants and spectators alike the sight of several boats rounding the buoys together at speeds approximating thirty miles per hour, was more than enough excitement! Add to this the several boat to boat collision, and you have a basic idea of this exciting new concept of multiple boat racing. Although there are several minor problems to solve and certain rules revisions to be made, this is the event to watch — the highlight of any RC boat meet, and an event we feel certain will serve to increase the popularity of R/C boating in the seasons ahead.

R/C boaters in the Midwest are starting to get their boats on the water. Many new craft have been built over the winter season and are making their maiden runs. The first few weeks of the new season usually show's up all sorts of mechanical and electrical problems ... loose set screws, weak solder connections, low batteries, plugged fuel lines, etc., but as the season wears on, reliability increases. A number of the RC boat skippers in

this region have acquired superhet equipment and are looking forward to multiple racing- following the International Regatta on July 4th at St. Louis, Mo.

The Minute Breakers Third Annual Regatta has been set for July 25-26 at Lombard Lagoon, Lombard, Illinois. Trophies will be awarded for first through third place. Events include .00 to .29 cu. in. Two Lap Speed, a 20 ft. Giant Slalom, and a Speed, .30 to .65 cu. in. Two Lap Speed, .66 to 3.05 cu. in. Two Lap Six Lap Multiple Boat race. All running will be done on the 1/8 mile International Oval and an enlarged Slalom course. Multiple boat race procedure will utilize the three minute start followed by a one minute countdown. Six laps will be completed in each heat. JMPBA course rules will apply at the Third Annual. Multiple Boat Special Rules will take precedence over IMPBA course rules in case of conflict.

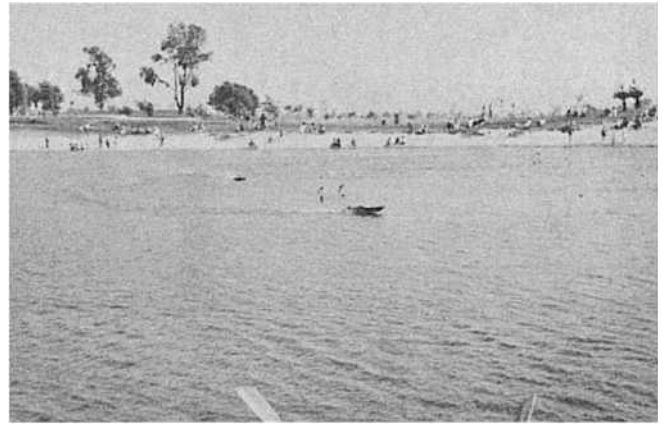
Have you ever tried to determine your boats speed on a measured course at your favorite running pond or lake? If you have, then you have some idea of what a problem it can be. Bob Guilfoyle, Redwood Valley, California, had the same problem and decided to do something about it. Bob's answer is based on the principle of parallel lines, choosing 110 yards, or 1/16 mile for easy calculation. If a line could be drawn on tire shore near the waters edge, and a pair of parallel lines 110 yards apart, and perpendicular to this reference line, projected into the water, a measured 1/16 mile course would result.

Since this is impractical to accomplish, lines of sight can be substituted

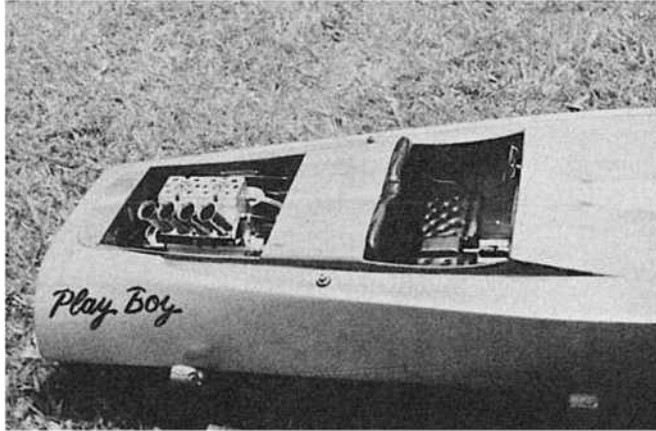
*(Continued on page 33)*



*Part of the pit area at Pirate's meet.*



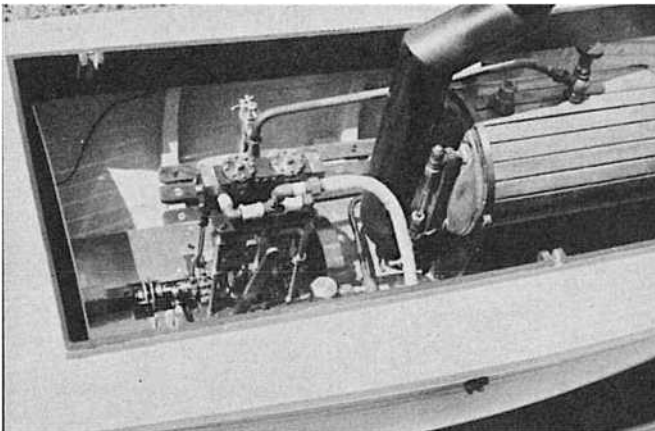
*Rounding the buoys during multiple boat races.*



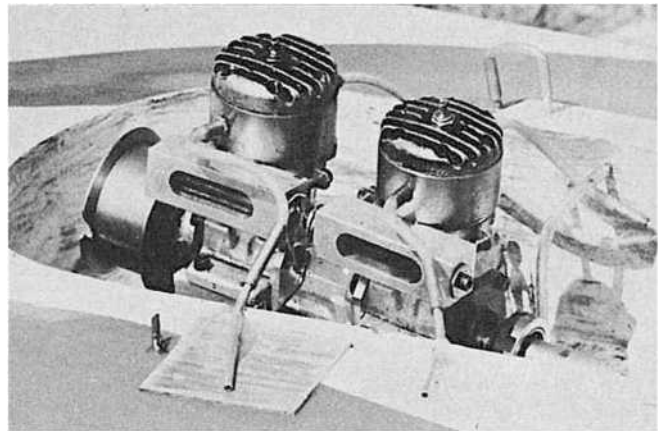
*The Play Boy - complete with gold flake paint.*



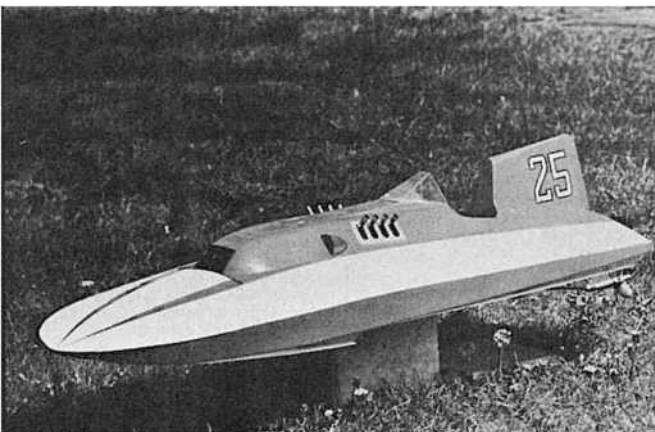
*One of the finest i've seen.*



*Boiler room of this magnificent ship.*



*Sum Newman's twin McCoy 60 for 43" hydro.*

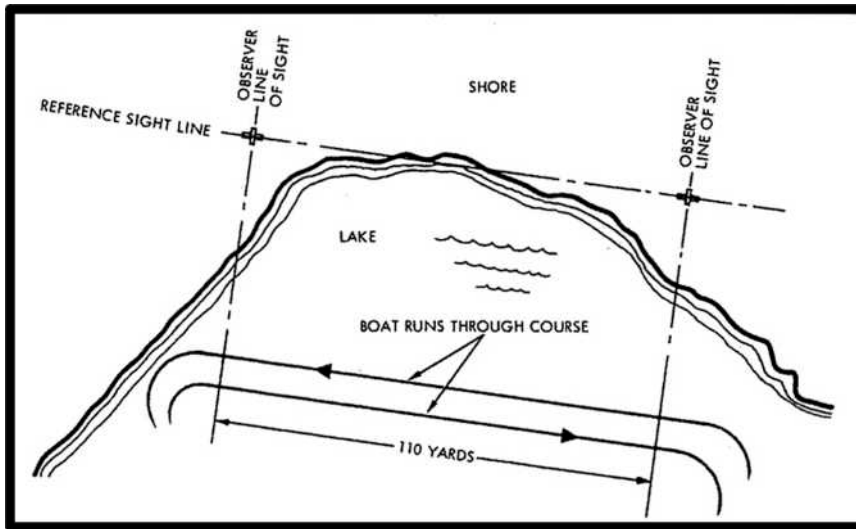
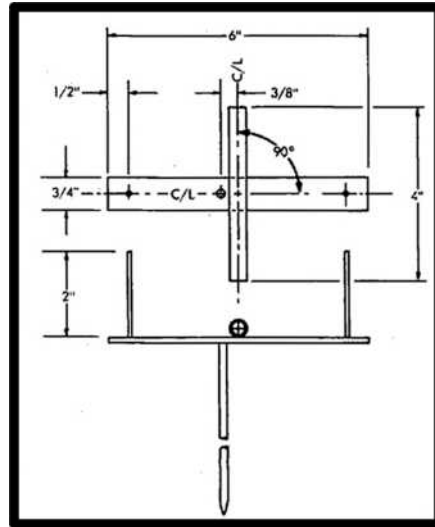


*Don Susdaml's II HK with O&R compact, on, glow.*



*Gil Fruga's Long Beach Pilot Boat.*

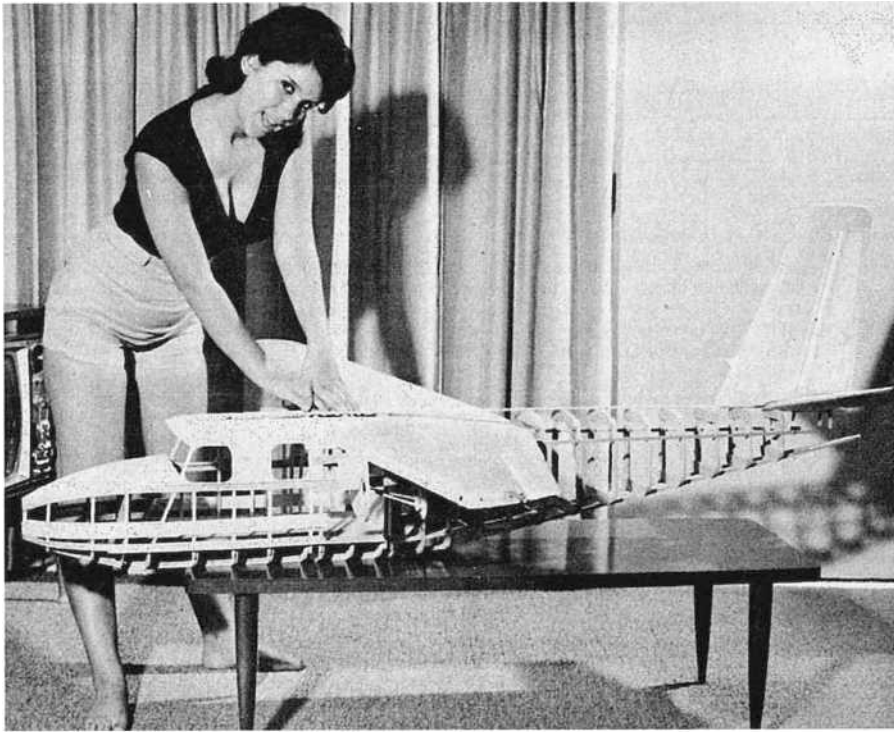
Two units, as shown in drawing A, are set 110 yards apart and on a line approximately parallel to the shore. Each unit is then sighted in on the other by means of lining up the opposing unit with the two pins on the unit you are sighting from. This establishes a straight line on shore with the "bar" of each unit parallel to this line. The sighting tubes of each unit are, therefore, parallel, 110 yards apart, and at a perpendicular to the reference line. By sighting through the "tubes", two people are thus able to clock the speed of the boat as it passes through the "course" and through their line of sight. As the boat enters the line of sight at the start of the course, that observer drops his arm. The other observer simultaneously starts a stop watch. As the boat passes through the line of sight of the second observer, he stops the watch. By referring to the Time-Speed table, you can judge the speed of the boat with fair accuracy. For more accurate timing, two runs should be made — left to right, then right to left. The average of the two runs will give a speed accuracy within one-half mile per hour.



### Time-Speed Table

Time/Seconds	Speed/MPH
15 .....	15
14 .....	16.2
13 .....	17.6
12 .....	18.75
11 .....	20.45
10 4/5 .....	20.8
103/5 .....	21.2
102/5 .....	21.6
10 1/5 .....	22.05
10 .....	22.5
9 4/5 .....	22.95
93/5 .....	23.45
92/5 .....	23.9
91/5 .....	24.45
9 .....	25.00
8 4/5 .....	25.5
83/5 .....	26.2
82/5 .....	26.8
81/5 .....	27.45
8 .....	28.05
7 4/5 .....	28.8
73/5 .....	29.6
72/5 .....	30.4
71/5 .....	31.2
7 .....	32.19
6 4/5 .....	33.1
63/5 .....	34.1
62/5 .....	35.2
61/5 .....	36.3

Trophies to be awarded to 1st and 2nd place winners in each event.



Editor's Choice in Models — Dick Tichenor's Aero Commander, of course!

# FLY-IN

## CONTEST DATA CLUB NEWS

### Cliff Weirick and his Candy

(RCM Nov. '63) swept top honors in both the Triple-A Cal-Western Meet and 4th Annual Fresno Radio Modelers Open. The combination of Weirick, the Candy, and the Bonner Digimite proportional system has proven to be an unbeatable trio in major Western meets, and may well be the winning combination at the Dallas Nationals.

Second place at the Cal-Western affair, held at Los Angeles Model Airport, was captured by Jerry Pullen, designer of the Kraft-Pullen proportional systems, flying a Stormer and proportional gear. Third place saw a tie between Willie Smith with his Torero (RCM Dec. '63) and Bonner Digimite, and Zel Ritchie with his Phantom and Orbit proportional. Phil Kraft was fourth with his new Kwik-Fli design and Kraft proportional.

Although both Class I and II events were rather poorly attended, the former event was won by O. Olonso,

and the latter by Jim Odaino. The Special Event, a Pony Express, was won by Jerry Pullen, Doug Spreng, and Jack Byers, the winning trio among the five competing teams.

An interesting sidelight of the meet was sixteen year old Roger Sharp, member of the Valley Fliers, who demonstrated remarkable ability in Class III. Flying a Veco-Lee .45 powered Taurus with F&M equipment, Roger has been in modeling for only three years, coming to RC from U-Control. With his present proficiency as an example of his determination, Roger may well be the up-and-coming young man to watch.

**Second place honors** at the Memorial Day weekend Fresno Open, was taken by Willie Smith, again using the Torero-Bonner proportional combination, while Bob Doell took third with Kraft's Kwik-Fli design.

One of the highlights of the Fresno affair was Ed Von Adalung's victory in Novice Class III. Flying a Navajo,

Ed displayed a quality of flying that was truly outstanding — and this member of the East Bay Radio Controllers is 74 years young!

Another keynote of the Fresno Open was a public demonstration of Bob Morse's magnificent twin-engine Cessna UC-78 (RCM Aug. '64). Powered by two K&B .35's, and controlled by a Kraft Custom 10, the big twin was not flown until later that week, due to engine idling difficulties. Nevertheless, spectator interest in the spectacular scale Bobcat made it the hit of the meet.

**While on the subject** of contests, the LARK newsletter reports on how to attend two contests being held on the same date but a hundred miles apart. LARK President Zel Ritchie (also President of the Southern California Council of Radio Control Clubs) merely loaded his model in his Cessna and landed on El Mirage Dry Lake to compete in the SCRCC Contest. After several flights, he again loaded his Phantom in the Cessna and flew to Van Nuys Airport. After a short drive, he was flying in the Valley Flyers meet at L.A. Model Airport. Final score: Zel won 2nd place at El Mirage and 3rd place at Sepulveda in Class III!

**The Tri-Valley RC Club** of South Bend Indiana, held its first Annual Class III Multi Contest on Sunday, May 31, with Les Fruh first in the Expert category, Curt Dimberg second, Jim Grier third, Carl Barnes fourth, and Bob Schultz fifth. Competition in the Expert Class III was sharply keen, as evidenced by a total point spread between the first five places of only 5%! In the Novice category, the first five positions went to Dave Lundholm, Marvin Doucey, Hugo Mosquera, Aldon Annis, and Joseph Zajac. As an example of the quality of flying from the Chicago area, nine of the above ten awards were to fliers from this city.

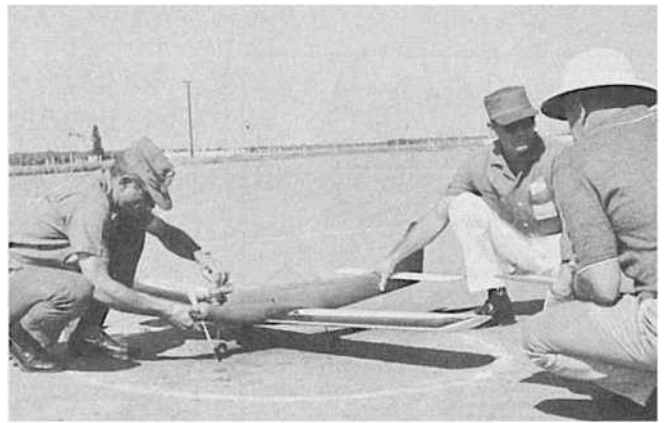
Although only a one-day affair, almost a thousand spectators attended the Memorial Day weekend event sponsored by the South Bend RC group. CD for the event was Jim Hoffer.

Another event is scheduled for July 19, and is confined to Class I, Rud-

*(Continued on page 37)*



*Willie, 3rd at L.A., 2nd at Fresno, 1st at Bakersfield.*



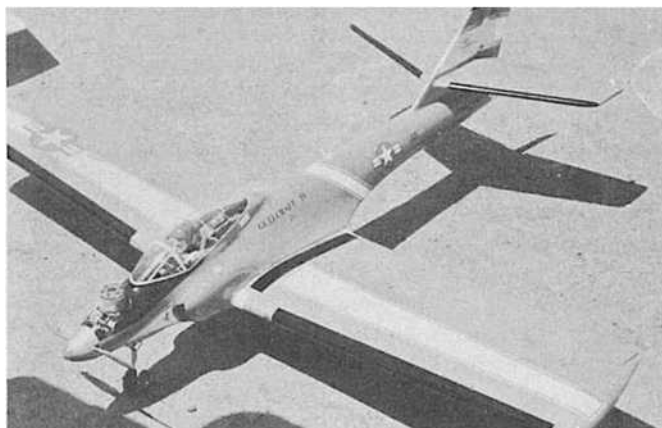
*Weirick, 1st at L.A., and Fresno, 2nd at Bakersfield.*



*Ed Von Adelung -novice win at Fresno.*



*Roger Sharpe -on his way up.*



*George Dirkson's Gullcraft IV at Fresno.*



*Les Fruh -a win at South Bend.*



*Curtis Dimherg -a Tri-valley second.*



*Chicago's Jim Grier -an expert third.*

# SHOWCASE'64

**Min-X Proportional** — The forthcoming proportional offering from Min-X will feature four fully proportional channels, with trim, and one auxiliary channel operating a SPDT relay. The 3" x 6 1/2" x 8 1/2" transmitter operates from a single 9V supply and will be available in both single and four-stick versions. Input to final RF amp. is 400 MW. Transmitter pots are stationary, eliminating wire fatigue. The receiver will be offered in two models, the first a modular unit with all stages, including servos and amplifiers, in one package. The second receiver separates these functions. Servos will use transistor amplifiers with Micro-Mo motors and will operate from the same 4.8V supply as the receiver. A silicon input transistor will be used in the input stage to reduce servo drift with temperature. The single unit receiver measures 1 3/4" y 2 5/8" x 8 1/2". Production model single stick transmitters will have a lever for motor control instead of the knob shown in the picture. Aileron and rudder trim knobs on the face of the transmitter will be replaced with nylon gear type trim controls, as on the four-stick version. **Circle #1 on the Reader Service Card.**



**Idle-X R/C Formula** fuel is one of several new items for RC'ers from Midwest Products. Custom blended for RC mills, the new fuel has plenty of castor oil with no synthetics added. A special detergent has been incorporated for removing carbon, thus prolonging both the life and performance of the engine. We have used and tested Idle-X and find that it has idle characteristics superior to any fuel we have previously tried, while providing maximum power at the top end of the RPM scale. Price is \$5.50 per gallon, or \$1.65 per quart.

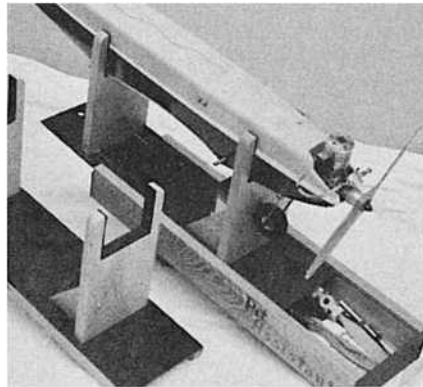
Also from Midwest are packaged Vibration Proof Engine Mounting Screws in 4-40 x 1 1/8" size. These screws are designed for engine installations and incorporate a special nylon insert to keep your mill locked securely in place. Torque reduction of

subsequent installation cycles proved insignificant. This torque value will be retained through as many as 200 or more installations, meaning that the same screws can be used over and over again. Nuts, washers, and screws are plated. We have tested these units and found them to be as advertised and completely satisfactory. A second size, 6-32 x 1 1/4" is also available. Price of either package is 45\*. **Circle #2 on the Reader Service Card.**

New 2-Volt 18 Amp/Hour Acid Cell Batteries are now available in limited quantities for \$4.95 from GM Hobby Specialties. Weight of the unit is 2 pounds 14 ounces in dry form. Size is 7" x 4" x 1 1/2". Recommended usage: starting battery for engines or, when hooked in multiples, for powering larger electric boats. **Circle #3 on the Reader Service Card.**



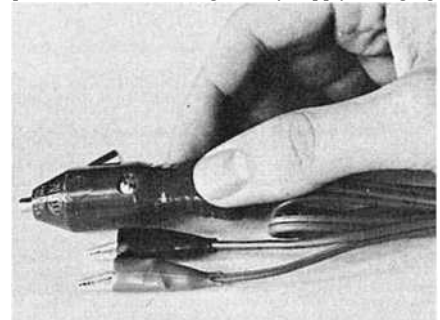
**Pre-Assembled RC Wing Sections** are available from Meinke Model Engineering for most of the popular RC designs and for the new fiberglass fuselages of various manufacture. We have reviewed the Taurus type wing and have found it to be of the highest quality workmanship and excellent in all



respects. In addition to this design, Meinke offers Candy, Viscount, Stormer, and Orion type wings, in addition to two Clark Y sections. All wings are supplied as jig built precision units, with full balsa skin sheeting, silk covered, and with three coats of butyrate dope applied. All materials, plus

instructions, for joining wing halves are supplied. Recent additions to the Meinke line include an excellent Pit Assistant with built-in storage drawer, well-designed and machined wheel brakes, and locking motor mounts for most popular RC engines. All items have been reviewed by RCM and found to be excellent, and as advertised. For a catalog sheet on all items, **Circle #4 on the Reader Service Card.**

**Custom Built Mobile Chargers** are among the new additions to the Spacetrone line. These miniaturized units are designed to plug into a standard auto cigarette lighter for charging from one to eight cells in series, or one to four cells in series, depending upon whether you have a 12 or 6 volt auto battery supply. Charging rates from 0 to 300 MA. These \$2.95 units are set according to your specifications concerning battery supply, charging



current or MAH capacity, and battery pack voltage. Spacetrone chargers have been reviewed by RCM and are highly recommended. Spacetrone also announces their all-transistorized, high power, 9V single channel **Cougar I Transmitter**. A **Double-Ended Output**, transistorized and encapsulated, for use with single ended relay less receivers has also been made available. 250 MAH encapsulated nicad battery packs round out this very complete single channel line. **Circle #5 on the Reader Service Card.**

A **Relay less Amplifier** for the Hillcrest or Bellamatic servo has been designed and built by the Oklahoma Radio Control Society (TORKS) as a project to raise funds for their 1964 contest and flying site improvement. This amplifier is for reed type receivers and has proved to be exceptionally reliable when used with the Hillcrest or Bellamatic units. Two of these servos will operate quite reliably from a single pair of reeds, a very desirable feature for twin engine aircraft. For example, one engine can be started, idled back, and the other started with its throttle wide open. They will re-synchronize again at either extreme high or low speeds. Amplifier is set up for a 5-cell battery pack, using 1.2 to 1.5 V bias. Color coding is the same as on Bonner servos. Price of the assembled amplifier is \$10. Amplifier and servo- is \$14.95. Amplifier kit is \$8.00. Orders should

be sent directly to Jim Hadley, Treasurer, TORKS, P.O. Box 12507, Oklahoma City, Oklahoma. For further information only, **Circle # on the Reader Service Card.**

**The Omega 60**, a 60 inch span, tapered wing rudder only design has been kitted and added to the Aero Models line. Designed for use with six or four channel servos, the Omega can be flown by the beginner with simple escapement rudder only. Area is 525 inches, and recommended engine size is .15 to .25 RCM reviewed the original kit by Models prior to its addition to the Aero Models line, and found the design considerations to be excellent, the quality of prefabrication fair, and the quality of the materials fair to good. For further information, **Circle # 7 on the Reader Service Card.**



**Complete Radio Control Systems** are now available to the newcomer to radio control through Konac Radio Control Systems. Realizing the need for a complete package for beginners, Bob Johnson of Konac is making available a Single Channel Economy System and a Single Channel Master System, in either kit form, or built-up, depending on your choice. Control air radio gear is used in both, and all equipment in both packages are standard reliable items. All items are completely compatible, hardware is included, and the Konac price reflects a package savings to the purchaser. For the Konac Systems catalog, enclose 25c and **Circle #8 on the Reader Service Card.**

**Tatone Instant Pitch Propellers** are a new item from a well-known manufacturer. Available in a 10" diameter size for .19 to .35, and 11" for .35 to .60 mills, the pitch of the Tatone props are adjustable by micro settings from 0 to 45 degrees. Pitch settings are marked, and when clicked into place and locked down, the blades are unable to turn or vibrate loose. Tips are marked for accurately reducing the prop diameter, if a smaller blade is desired. No measuring or rebalancing is necessary. Price is \$1.95 for the complete unit. Replacement blades are 65¢ each. RCM reviewed and recommended. **Circle #9 on the Reader Service Card.**

**The Regulus**, a high wing monoplane for multi channel training, is one of the finest radio control kits we have seen. A Kato design, The Regulus is one of several imported R/C designs from Royal Products, Denver, Colorado. All parts are pre-cut, labeled with identification numbers, and packaged as units, i.e., bulkheads, wing ribs, etc. Prefabrication is more extensive than any domestic or foreign kit we have seen. Materials are uniformly excellent.

All hardware, gear, linkages, fuel tank, and accessories are included. Price is \$20 for the deluxe kit. Our kit was purchased across the counter from North El Monte Hobby and proved to be one of the most outstanding kits we have ever had the pleasure of reviewing. For further information on this, and other kits in the Royal line, **Circle #10 on the Reader Service Card.**

**Skiglas** has entered the fiberglass RC fuselage market by introducing their Glasquire, Fiasco, Yellowtail I, and Yellow-tail II. The Glasquire and Fiasco are designed to accept a standard Tri-Squire wing and stab, while the larger Yellowtail duo is designed for a Taurus type wing, as the Top Flite Taurus wing kit, or Meinke Model Engineerings pre-built Taurus type wing section. All models are glass-smooth and primed, ready for painting with either dope, lacquer, enamel, or epoxy finish. Firewalls are integrally mounted. Servo rails are supplied for the Yellowtail, but the installation is left to the individual builder. All models are priced under \$20. RCM has examined all models and find them to be among the lightest, strongest, and smoothest fiberglass units we have seen. We recommend them for your consideration. The manufacturer states that all models are available for shipment the same day order is received. **Circle #11 on the Reader Service Card.**

The **Veron Fairey Huntsman** is one of several new items for RC boat fans. This is a 42" scale model of plywood and hardwood construction, and completely prefabricated. Kit includes chrome plated fittings, special rudder unit and tube. Ideal for single or multi with the ED 3.5cc Sea Otter, Webra Bully II, Taplin Twin, or O&R Compact for power. Electric power plant could be the Taycol Double Supermarine Special. Kit with fittings is available from Westee Hobby Imports for \$29.95. **Circle #12 on the Reader Service Card.**



Lee's Hobby Industries fills a need in the model boat phase with hand turned, **solid brass stanchions**. Threaded at the base for secure mounting, they are available in 1", 1 1/4" or 1 1/2" lengths. Body diameter is 1/8" Threaded standard 4-40

by 1/4" ball 1/8" round drilled with 3/64" hole. **\$6.00 per dozen. Circle #13 on Reader Service Card.**

**Heavy duty green neoprene tubing** for model boat water hoses, or for fuel line for large glow engines, is available in 1/8" ID (1/4" OD) from G.E.M. Models. Price is 15c per foot. RCM reviewed and recommended. G.E.M. also has a limited number of surplus 2/5 H.P. ball-bearing

electric motors, drawing 24 amps, 24V, at 10,000 RMP 4 1/8" long, 2 3/8" diameter, they weight 2 1/4" lbs., and have powered 5 out of 8 winners of IMPBA records for electric speed boats. These, motors may also be used for airplane engine starters as they run well on 6 or 12V. Price: **\$6.00**. A matching steel universal joint to fit a 3/16" shaft is \$2.95. **Circle #14 on the Reader Service Card.**

## FLY-IN

*(Continued from, page 34)*

der Only, in order to encourage younger fliers and more of the sport fliers in this category, to take part in competitive flying.

**We are sorry to note** that one of our favorite editors of club publications, Bob Bates of the Lincoln Sky Knights, has retired after three years of pounding out the Clanking Armor. The job of editing an HC club publication is not an easy one, but Bob met the task and has earned a hearty "well done." It has been a pleasure to have been associated with him.

**The eighteen month old Squadron Escarole** of Yonkers, New York is comprised of all ages and sizes of members. But here the dissimilarity ends, for the one thing this group has in common is that each and every member flies either a Tauri or Taurus! Of the fifty-five members, twenty braved the brisk spring weather for the accompanying photograph submitted by John J. Curtin, club secretary. Both multi-channel reed and proportional systems are used by the Yonkers group for their Top Flite models.

**Following the release of the Raider 10** kit by Blackwell Models, numerous requests were received for information concerning the modification of this design for proportional control. According to Robinson Blackwell, testing of the Raider on proportional radio has been completed, and the model is entirely satisfactory without any modification. All flying was done with the linkages hooked into the lower hole of the Bonner horns for the least sensitive control response. This proved about right for training flights, and until the proportional response became second nature. Ailerons proved to be a trifle slow and moving the linkage up to the second hole on the horn provided immediate response.



**Greece City Xanthi by Night**



**Old City Xanthi Street**



**Old City Xanthi House**



**Xanthi Central Square**



**Xanthi Lake Vistinida**



**Xanthi River Nestos**



**Xanthi Old House M.Xatzidakis**

