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Kit comes with the spring centering Protrol dual stick assembly so that you have a self-centering snappy action on the box.

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The new, all new, Quadruplex Mark II is still priced way under the other comparably advertised proportional systems. Set consists of transmitter with nicad batteries, receiver with nicad batteries, 3 surface servos 1 motor control servo.

THE NEW SUPER-HET DEE BEE QUADRUPLEX MODEL #21

ENDORSED FOR QUALITY AND PERFORMANCE BY LEES.

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This makes full house proportional practical in an entirely new field of smaller aircraft designs such as Goldberg's Falcon and Skylark.

The servos with this set is the modified version of the Bellematic servo with its Micro Mo Motor providing a direct pulse servo system that virtually eliminates control surface dither. The ingenious self-contained torsion spring gives the system its superior infinite resolution. The Bellematic slip clutch is also modified to take heavy air loads, yet provides protection against pinion damage.

The superhet front end was developed and test flown over an entire flying season. This final version of the Quadruplex receiver overcomes the problems usually encountered in combining the superheterodyne R. F. section with multi-channel simultaneous proportional tone separation. The receiver is transistorized throughout and is powered by the same 4.8 Volt pack that is used for servo operation. Solid state servo amplifiers are employed to drive rudder, aileron, and elevator servos. Temperature immunity has been achieved through conservative design, and high quality components.

The transmitter, drastically reduced in size, features sealed new 4 amp. hour nicads. Batteries are charged through a front panel charge jack. Control is via single control stick for rudder, aileron and elevator. Engine advance and retard buttons are used for trimmable throttle position. Trim is provided for aileron and elevator by two knobs on the front panel. One interesting feature is that trim knob position does not affect servo position at extreme extension. This means, in effect, that if an airplane is set up for properly sized inside and outside loops at full elevator position, this end position will not be changed by adjusting for proper neutral stick position trim.

The entire system is furnished pre-wired. Elevator and rudder servos are mounted on the servo amplifier card that measures 2¾ by 5 inches. Receiver dimension 2¼ by 1⅞ by 3⅜ inches. Aileron and motor control servos plug into the servo card. On-off switch is also premounted on the servo card. Total airborne system weight 21 ounces.

SUPER HET 27 MC. CHANNEL

TOTAL SYSTEM CHARGES **479.00**

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Both models are fully tunable.

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27 MC ___ **19.95**

6 METER__ **24.95**

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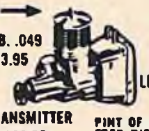

K.B. .049 $3.95

ESCAPEMENT $7.95 AND LEE'S RECEIVER 12.95

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SOLO

by Frank Justin

Although unintentional, I have been giving Hal deBolt a hard time in the last few issues — first with snap-rolling Perigee's, and then by folding the wing on my Jenny. Harold, do not despair — what happens to me might not happen to a good modeler!

Mr. deBolt has a few things to say about the Perigee: keep it light, light, light! Most important, do **not** balance the ship anywhere except where shown on the plans. The Jenny wing I built was for R.O.W., and was a quickie job which probably did not get either enough dope or time to dry. However, I must report that of the half-dozen Jenny's flying at our local field not one modeler neglected to sheet the wing full length. The Jenny is a real buy, though — takes everything from one to ten channels and from .19 to .56 mills. Builds fast, flies well.

Got a call from an old friend, Clarence Muncie. Clarence is President of the Harbor Slope Soaring Society. This club operates out of Costa Mesa and gained a measure of publicity recently when an ocean-going Tern spent several weekends flying formation with their R/C gliders. Clarence asked me to bring my movies of my own trials and tribulations in flying Drones. Everyone seems to get a kick out of this experience of mine — maybe it will entertain you.

About six years ago I was prowling around in the local war surplus store and ran across several large crates marked Aerial Target, OQ-14. Anything that pertains to air gets the old curiosity in gear. We got the owner to pry the top off, and lo and behold, two cylinder, two cycle, fourteen H.P., eleven foot wingspread, one hundred and thirty pounds of ready-to-fly R/C! Well, almost ready.

Next, the price. The surplus man was sure the only thing of value was the motor, as only a nut would try to fly it, so $100 was the tab. Even this sounded high to an old swapper like yours truly, so we settled the deal by trading his machine for a go-kart I'd inherited.

When we got the bird home, uncrated, and all of the parts tacked on in the appropriate places, it began to look like a severe case of instant crash. The wing loading figured out to six-and-a-half pounds per square foot. There was no landing gear (you were supposed to shoot them down, not fly them for sport) and the weight of one would increase the wing loading. The radio was five channel — two for rudder (self centering), two for fully trimmable elevator, and one

(Continued on page 36)

FRANK JUSTIN

Frank couldn't resist it . . . several large crates marked Aerial Target, OQ-14. Read what happens when a dyed-in-the-wool RC'er gets hold of a flyable, surplus radio-controlled target Drone. You won't forget it . . . and neither will El Mirage!

R/C modeler

NOVEMBER, 1964
VOL. 1, NO. 12

CONTENTS

COVER: Author Dan McLain's young daughter presents a pretty picture as she displays the Gnat and Might, this month's featured .010 biplane and R.O. proportional transmitter pulser.

MONTHLY FEATURES

R/C MODELER is published monthly by the R/C Modeler Corporation, 49 S. Baldwin Ave., Sierra Madre, Calif. Printed in the U.S.A. Second Class Postage paid at Sierra Madre Calif. SUBSCRIPTION RATES: Annual (12 issues), U.S. and possessions: $5.50; 2 years, $10.00. Canada: 1 year, $6.00. All other countries: 1 Year, $6.50. Payment from all countries must be in U.S. funds. Changes of address must be sent to R/C Modeler as well as to the local Postmaster to insure forwarding. Send old address with the new. Canadian circulation P.O. Box 3005, Vancouver, B.C.

EDITORS MEMO

By DON DEWEY

THIS THANKSGIVING EDITION marks the twelfth published issue of RCM, and thus our first anniversary. Rather than celebrate this milestone, we are saddened by the recent passing of three well-known and well-loved members of the modeling fraternity — Cal Smith, P. E. Norman, and Paul Del Gatto.

Cal Smith was a renowned artist, designer, and writer. He will be remembered as the Editor of Flying Models during 1947-1948, and for his magnificent cover paintings for American Modeler. Most of all, he will be remembered as Cal Smith, the man and the modeler. The kind of guy everyone was proud to know.

Percival Edward Norman, known to his myriad friends as "P.E.", died following his collapse at Epsom Downs, England, his favorite flying site. P.E., perhaps, will be best remembered for his extensive work with ducted fan models. A little known fact, however, was that he was one of the first modelers to use pendulum control, back in 1927. One of Norman's design was the streamlined "Ants Pants", a model that characterized the designers magnificent craftsmanship. This free flight model was powered by hand-crafted engines of P.E.'s own design, while later versions carried early radio control equipment. P. E. Norman's creative mind and skilled hands extended beyond the modeling field, creating carved ivories which were exhibited at the Royal Academy, and hand made violins and violas. P. E. Norman left behind a heritage of skill and craftsmanship which will remain as a challenge and inspiration to all.

Paul Del Gatto was a modeler, designer, and member of the hobby industry. He was also a personal friend. We are reading the October-November issue of Flying Models when we came across Paul's construction article for the Champion, a single channel model for rudder-only. We had scheduled this design for publication in RCM, when Paul remembered that he had previously promised it to Don McGovern at FM. As we were reading the article, the phone rang. The call was from Ted Strader notifying us that Paul had passed away. Paul Del Gatto, a personal friend and business associate. A man we talked to on the phone a couple of times a month. A modeler.

At this Thanksgiving season, the loss of Cal, P.E., and Paul reminds us of the passing of Jim Walker. As many of you know, this magazine was dedicated to the memory of Big Jim. This issue is dedicated to Cal Smith, P. E. Norman, and Paul Del Gatto — three of his friends who have gone home.

The first twelve issues — Volume 1 — of RCM is past history. You have made this publication a success, growing from 48 pages and a circulation of 7,000 copies to 64 pages and a circulation of 63,000. Next month we begin Volume 2 and the first step of a planned expansion program, increasing the number of pages to 72. In the next, and succeeding issues, you will see several new "firsts" in model publications, plus some very exciting items for R/C never before attempted or presented by the model press. In addition, the first R/C Modeler Annual will make its appearance sometime after the first of the year — a valuable reference handbook of plans, articles, and data sheets that will be more than just a rehash of old ideas and concepts.

It's going to be a good year. A year for going forward with a hobby that will grow beyond all preconceived limitations. Stay with it.

Peace.

TOKYO ECHO

BY AZUMA KUDO

During the past ten years I have designed about 100 RC models, almost all of which were single channel planes. To some, it is a source of amazement that anyone could construct this many without losing interest. But, being charmed with the conciseness and simplicity of form in single channel RC, I am working with it continuously in order to obtain the best possible performance.

The Tokyo Echo has been designed for single channel equipment employing only the aileron, instead of the rudder, for control. This departure from normal single channel practice came about when it appeared that aileron-only control seemed to correct many of the faults of rudder-only systems. Although the latter has been used with relative success on high wing, low wing, biplanes, and scale models, it is definitely limited in its scope of control.

In the case of low wing models, it is virtually impossible to obtain adequate control-power even if we made a minimum dihedral of more than ten degrees. Furthermore, in the case of scale models, it is a decisive weakness that single channel RC has been stuck in the mud in its development. On the other hand, multi-channel has made excellent progress, both at home and abroad, with the help of good designs and improved RC equipment. Today, with multi-control, even complexly designed scale models are capable of performing stunts similar to their full-scale counterparts. Therefore, with the idea of enlarging the scope and repertory of single channel, we present an aileron only, low wing design with a small dihedral angle — the Tokyo Echo.

We will say at the outset that this ship is not designed as a first model for beginners. The RC'er with a reasonable degree of single channel experience, however, will find an entirely new challenge and flight experience in this design. As you know, multi aircraft fly smoothly because we can use such controls as elevator and trim in addition to the aileron function. Without these additional controls, the multi craft would not fly smoothly. It is, therefore, necessary to note the characteristics of aileron-only control, its limitations, and the design measures necessary to compensate for the lack of other control functions.

As mentioned, the main advantages for aileron-only control is that this system can be used for scale models, providing adequate control action without deviating from scale dihedral. On low wing single channel designs, smooth maneuvers can be performed, eliminating many of the undesirable characteristics of rudder-only control. Again, an exaggerated amount of dihedral is not necessary, as it would be in the case of rudder-only configurations.

The tendency of many multi ships to drop their nose in aileron turns, requiring up elevator to maintain altitude, can be overcome in single channel aileron-only by altering other forces in the airplane. For example, using a longer tail moment and moving the CG forward achieve this purpose. In this design, the CG is at 28%, with wing incidence at plus 2 degrees.

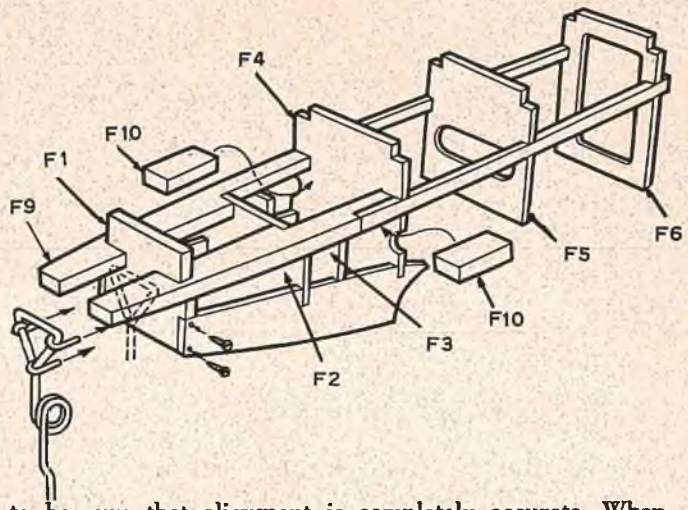
A small model, one designed for engines in the .09 and smaller class, is not adequate for wind penetration. Since the .09 to .15 class is the most popular for single channel, here in Japan, I decided on a .15 size engine for the Tokyo Echo. This, then, fixed the size of the airplane. The airfoil is fully symmetrical, 18% thick, with the maximum camber point located 25% from the leading edge. The airfoil is, perhaps, the singularly most important item for aileron-only control. A thick section is advantageous for controlling the speed of the model. Since the drag of the airfoil goes up as the square of the speed increases, the Tokyo Echo will not pick up speed when the nose drops. This design also has a very mild stall. The airfoil, itself, is based on U-control airfoil observations, with a straight line on the rearward section of the airfoil to keep the aileron action as effective as possible. This results in a constant speed airplane with effective control in all altitudes. Glide characteristics of the wing is as effective as a Clark-Y section.

The tail moment arm is 2.6 chords, measured from the center of pressure or CG. The stabilizing area is 25% of the wing area. The long tail moment results in excellent longitudinal stability, but creates a slower dive recovery. It is for this reason that all stunts should be executed at a reasonably high altitude. In addition, turns should be pulsed and kept open to prevent dropping the nose in turns — particularly when close to the ground!

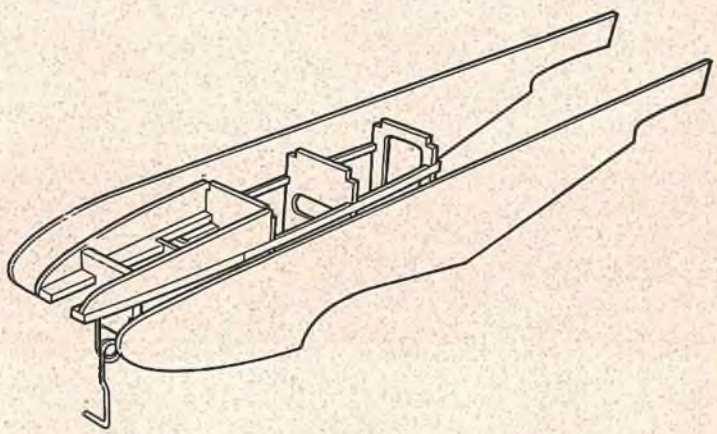
With 10 degrees of aileron movement the flight is smooth. With 15 degrees of movement stunts can be easily performed. The aileron throw is the same for up and down. Dihedral is five degrees, which is adequate both for control response and stability. The CG location is not critical but should be within ¼" of the location shown on the plans. Side and downthrust, two and three degrees respectively, may be varied for the particular airplane in order to obtain straight and level flight. The author has constructed and tested five Tokyo Echo prototypes, and each weighed three pounds four ounces.

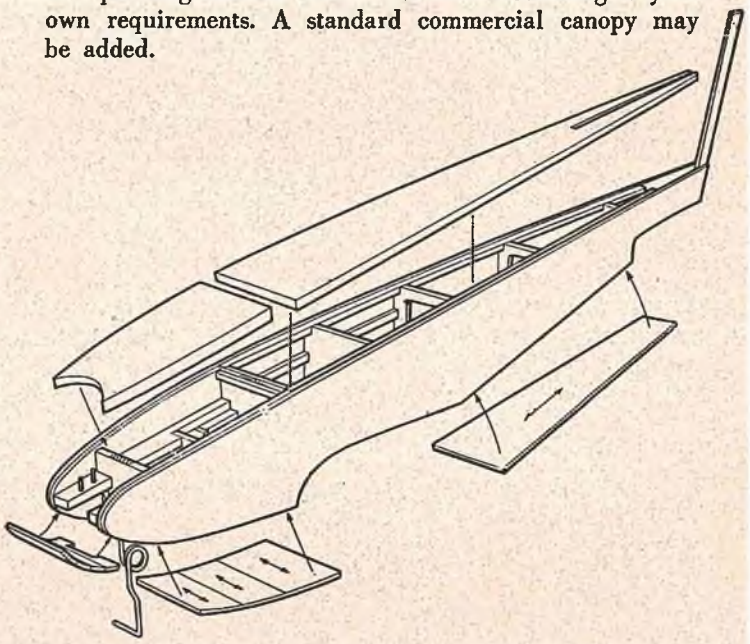
Construction

Construction procedures are quite standard and the experienced modeler should encounter little difficulty in duplicating the Tokyo Echo. Begin the fuselage construction by joining the motor bearers to their extension longerons with white glue. Form the coil-sprung nose gear and attach to the firewall with J-bolts. Assemble bearers and parts F1 through F10. Check this assembly with a triangle

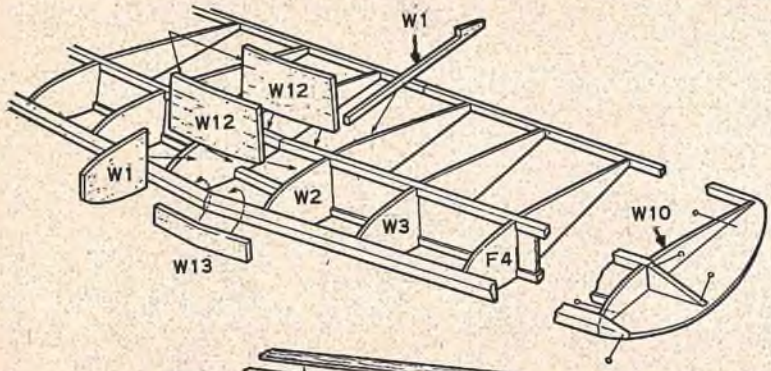


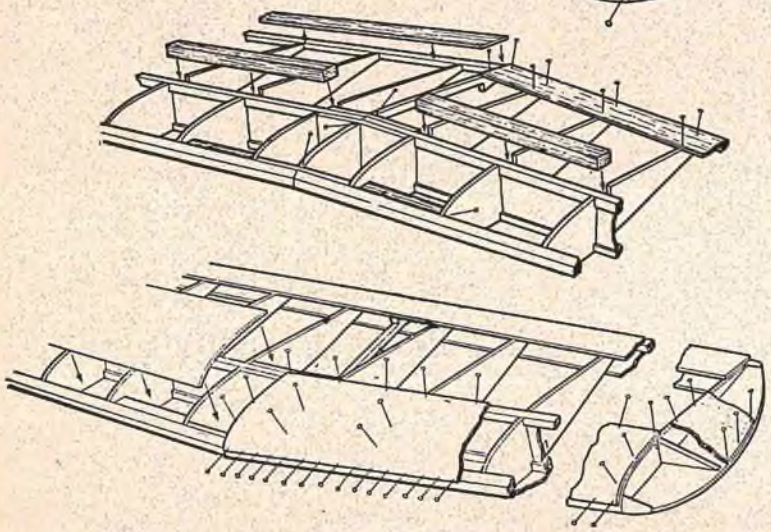
to be sure that alignment is completely accurate. When thoroughly dry, add the doublers on top of the motor mounts, followed by the fuselage sides. Add lower nose doubler blocks, rear longerons, rear cross-braces, and rudder post. Add all lower sheeting plus front and rear top blocks. Before sheeting the nose area, be sure to install blind nuts or mounting lock-plates for your particular choice of engine. Add wing and stabilizer fairing strips, fin and dorsal, then sand well. The heavy sectioned rear longerons will enable you to sand the Tokyo Echo to a pleasing contour. Cover and finish according to your own requirements. A standard commercial canopy may be added.

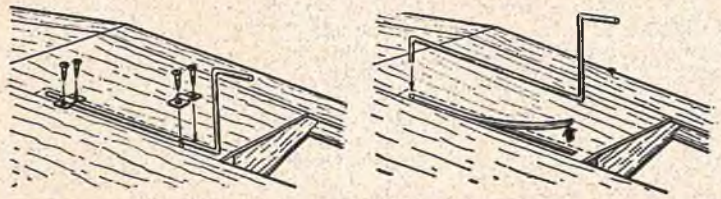




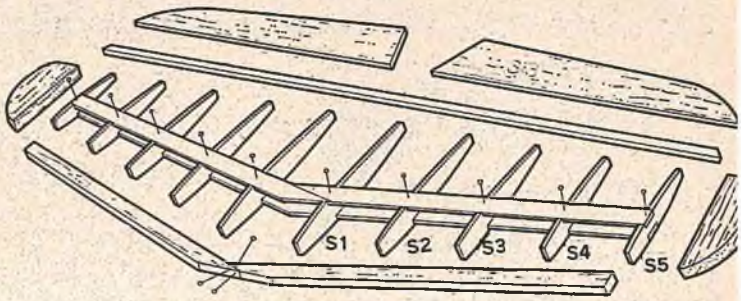
Wing construction is conventional, and a jig may be constructed for its assembly, or a Magna-Jig employed. Do not omit the vertical grain webbing between the two main spars — they add immeasurable strength and rigidity to the structure. Small commercial landing gear clamps can be used to secure the main landing gear in the gear slots, in much the same fashion as standard multi practice. A standard single channel servo (Royal Products Catalog #7) is used for aileron control. A simple V bend can be made in the aileron linkage for adjustment purposes, or one of the standard adjustable multi linkages employed. Be certain that ailerons are not reversed and that the throw is equal, both up and down. It is recommended that you start with ten degrees of movement, increasing to a maximum of fifteen degrees as experience is gained with aileron-only control.

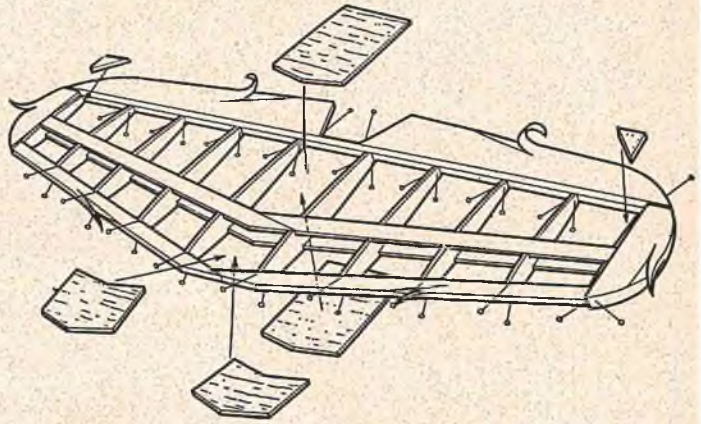


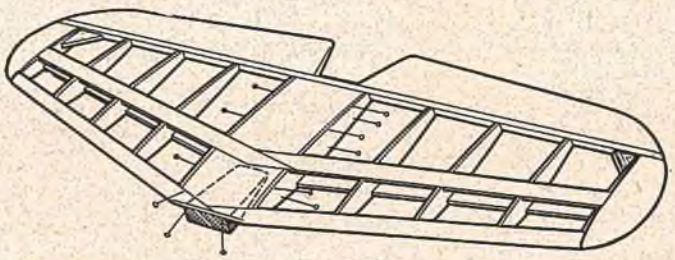




Stabilizer construction is begun by joining the two halves of both the top and bottom spars. Place the ribs in place on the bottom spar, then add the top unit. Add leading and trailing edges, tips, elevator area, and top and bottom sheeting.







Equipment installation

The Enya .15 R/C engine shown can be coupled to a two or three position escapement, although there is adequate room for the three-position single channel motor servo that is a companion unit to the aileron servo employed. (Royal Products Catalog #7A). If these two servos are used, the battery complement will consist of three pencells plus the 9V transistor battery used with many of today's superhet single channel receivers. Wrap the battery pack securely and encase the receiver loosely in foam rubber. Relocate equipment as necessary to obtain the desired CG point.

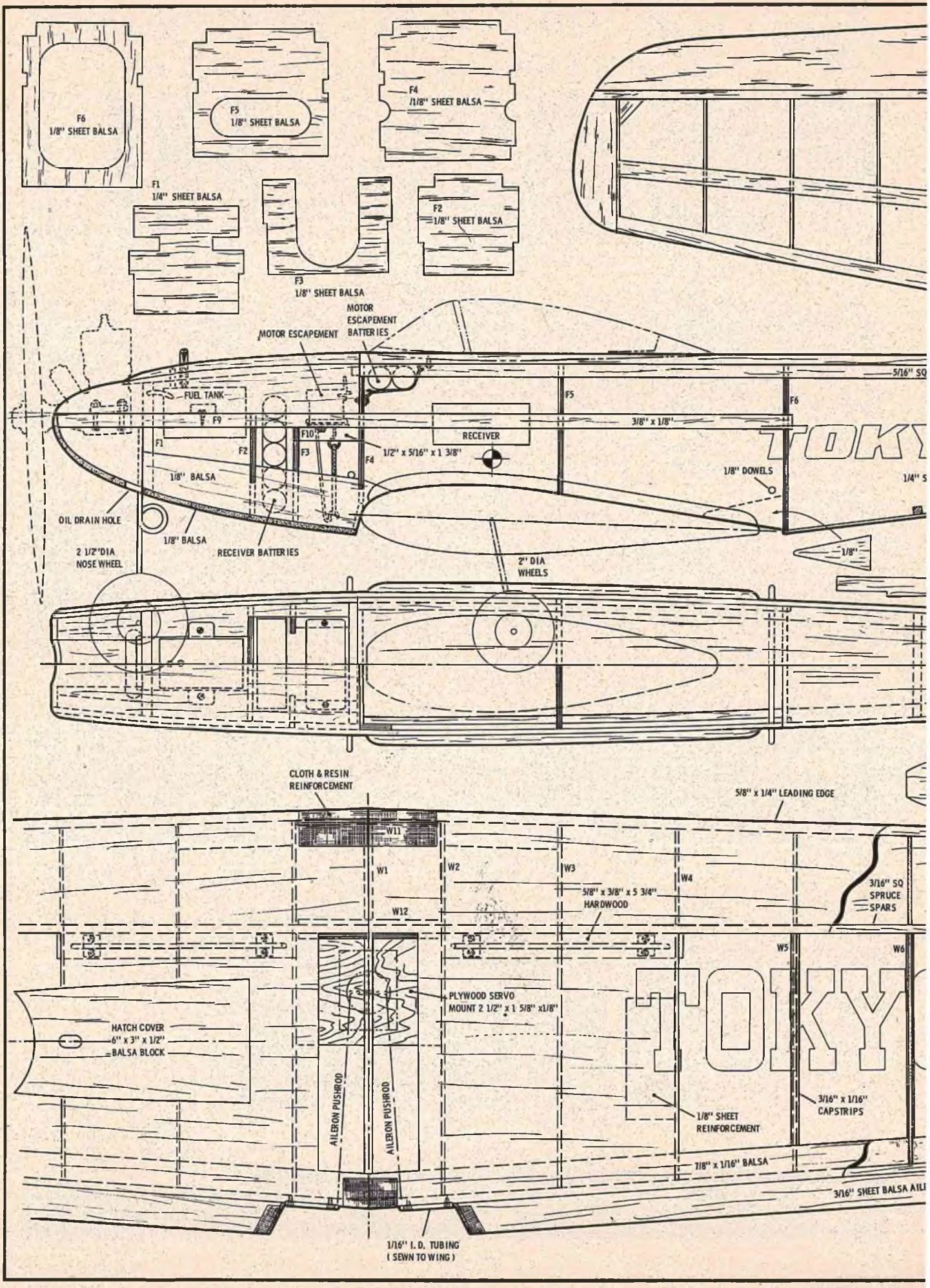
Finishing

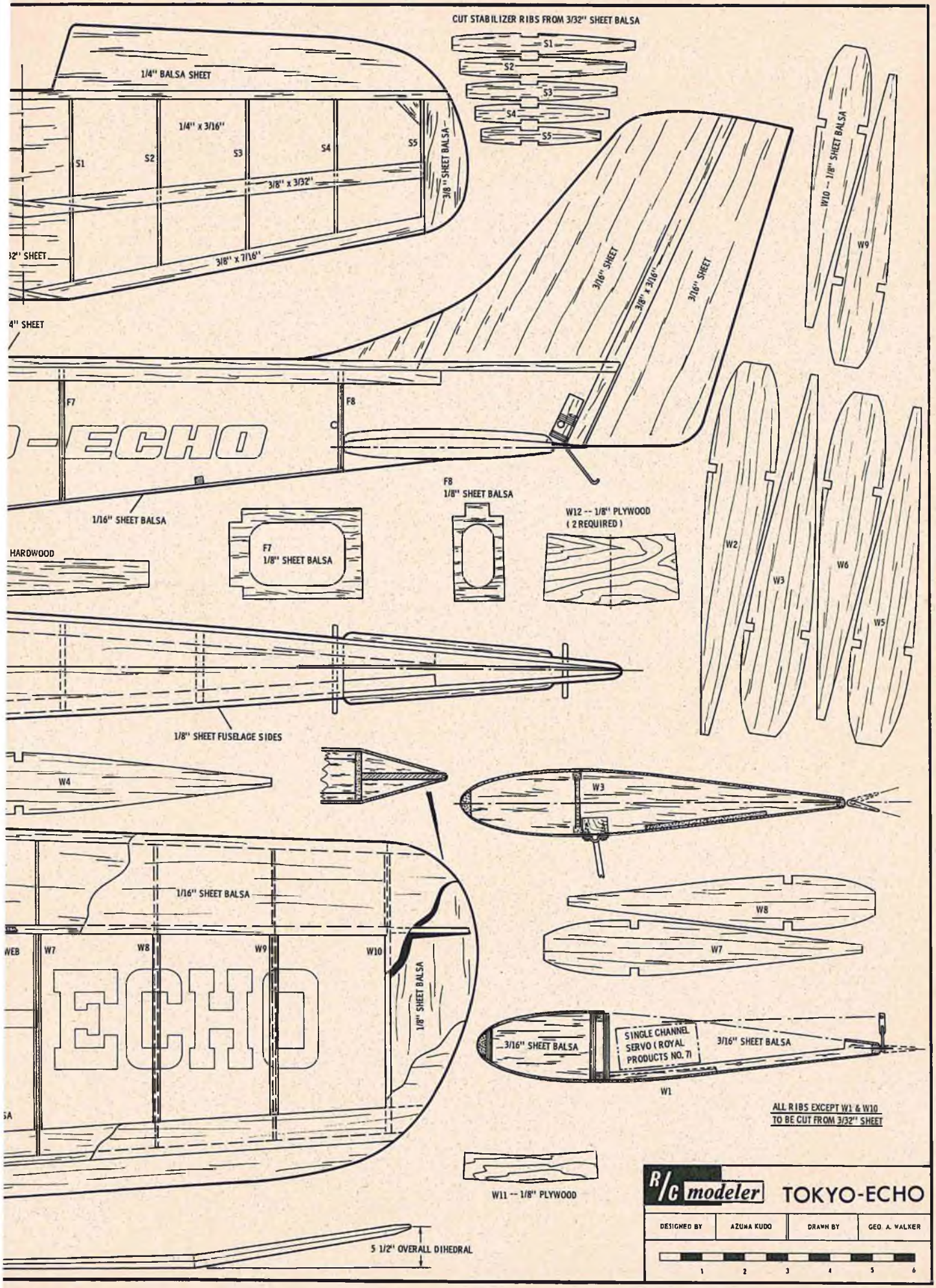
Silk or Silron can be used to cover the entire model. The prototypes used colored silk followed by several applications of clear butyrate. After fine sanding, apply several coats of colored dope to the fuselage, fin, and rudder area, followed by colored trim on the wing and stab.

Flying

Straight Flight

Without signal the plane will fly in a large counterclockwise circle, and with a slight pulsing, will fly straight. Adjust and trim for this feature.


F6
1/8" SHEET BALSA
F5
1/8" SHEET BALSA
F4
/1/8" SHEET BALSA
F1
1/4" SHEET BALSA
F3
1/8" SHEET BALSA
F2
1/8" SHEET BALSA
MOTOR ESCAPEMENT
MOTOR ESCAPEMENT BATTERIES
5/16" SQ
FUEL TANK
F9
F10
F1
F2
F3
F4
F5
F6
3/8" x 1/8"
RECEIVER
1/2" x 5/16" x 1 3/8"
1/8" BALSA
1/8" DOWELS
1/4" S
OIL DRAIN HOLE
1/8" BALSA
2 1/2"DIA NOSE WHEEL
RECEIVER BATTERIES
2" DIA WHEELS
1/8"
CLOTH & RESIN REINFORCEMENT
5/8" x 1/4" LEADING EDGE
W11
W1
W2
W3
W4
W12
5/8" x 3/8" x 5 3/4" HARDWOOD
3/16" SQ SPRUCE SPARS
W5
W6
PLYWOOD SERVO MOUNT 2 1/2" x 1 5/8" x1/8"
HATCH COVER 6" x 3" x 1/2" BALSA BLOCK
AILERON PUSHROD
AILERON PUSHROD
1/8" SHEET REINFORCEMENT
3/16" x 1/16" CAPSTRIPS
7/8" x 1/16" BALSA
3/16" SHEET BALSA AILE
1/16" I.D. TUBING (SEWN TO WING)


CUT STABILIZER RIBS FROM 3/32" SHEET BALSA
S1
S2
S3
S4
S5
1/4" BALSA SHEET
1/4" x 3/16"
3/8" x 3/32"
3/8" x 7/16"
3/8" SHEET BALSA
3/8" SHEET
3/16" SHEET
W10 -- 1/8" SHEET BALSA
W9
F7
F8
1/16" SHEET BALSA
F8
1/8" SHEET BALSA
F7
1/8" SHEET BALSA
W12 -- 1/8" PLYWOOD
(2 REQUIRED)
HARDWOOD
W2
W3
W6
W5
1/8" SHEET FUSELAGE SIDES
W4
W3
1/16" SHEET BALSA
WEB
W7
W8
W9
W10
1/8" SHEET BALSA
W8
W7
3/16" SHEET BALSA
SINGLE CHANNEL SERVO (ROYAL PRODUCTS NO. 71
3/16" SHEET BALSA
W1
ALL RIBS EXCEPT W1 & W10 TO BE CUT FROM 3/32" SHEET
W11 -- 1/8" PLYWOOD
5 1/2" OVERALL DIHEDRAL
R/C modeler
TOKYO-ECHO
DESIGNED BY
AZUMA KUDO
DRAWN BY
GEO. A. WALKER
1
2
3
4
5
6

The author and a Tokyo Echo prototype. A new standard in single channel performance with aileron-only control. Has been flown 6-channel with slight modification.

Circling

Bank the plane either to the right or left approximately twenty degrees. To regain level flight, apply opposite control until the Tokyo Echo resumes a level attitude. You **must** reverse the control if the plane loses height while turning. It is impossible to make a small circle without banking. You should keep in mind the minimum size of the circle that is possible before losing altitude.

Barrel Roll

This is the favorite stunt of the Tokyo Echo — how you can assemble and adjust your model for this stunt is the barometer of your skill. Key your motor control servo for high speed and obtain sufficient altitude before commencing this maneuver. Fly dead against the wind and then signal either right or left, allowing the plane to gradually bank and fall. Just before the model faces directly toward the ground, release the signal. The Tokyo Echo will regain speed and recover to level flight, regaining altitude in the direction of the wing. This much is the preliminary demonstration. Next, give a right or left command and hold — the plane will go into a large roll. To regain level flight, release the signal before the model is completely level. A slower roll may be more pleasing when conducted in the direction of the wind.

Split-S

The preliminary action of the slow roll is, in itself, a Split-S movement. Considering that the nose is raised, and the motor in high speed following the stunt, apply control either to the right or left. If you experience any difficulty due to the inherent stability of this design, correct with one or more of the following adjustments:

(a) increase the power from a .15 to a .19.
(b) adjust angle of wing incidence.
(c) move the center of gravity rearward a maximum of ¼".

After applying any of the aforementioned adjustments you may note some minor difficulties in level flight, or a tendency for the nose to raise in a slightly strong wind.

Immelmann Turn

Apply either left or right along the current of the wind and reverse the rudder just before the nose starts to drop. The plane will gain speed gradually, and when it reaches the summit, direct it into a semi-circle, then regain level flight in the direction of the wind.

Cuban Eight

This can be described as two Immelman turns connected together. Be certain to gain enough power at the end of the first turn or the second one may end in just an upward pitch!

Wingover

In practice and in order, you may copy standard rudder only procedures for this maneuver.

Spiral Dive

Be certain to gain enough altitude before commencing this maneuver. Three turns are made at a time.

Conclusion

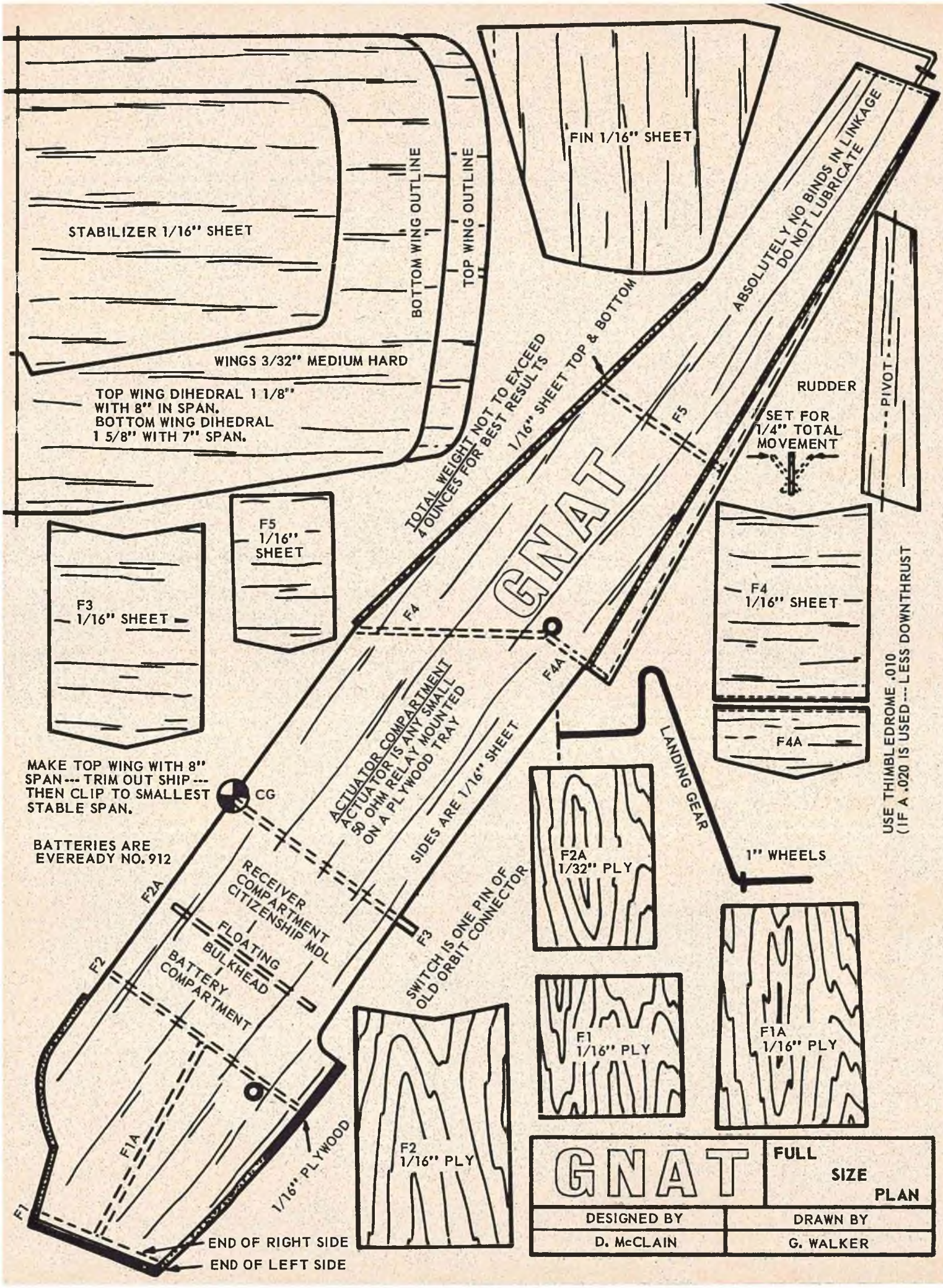
Here, then, is the Tokyo Echo — a proven aileron-only design for single channel. When you have completed the model and flown it a few times, you will, I am sure, have gained a whole new outlook on the future of single channel R/C aircraft. It will be a challenge, and a new experience you will thoroughly enjoy. The current image of the large, boxy, cumbersome, and overpowered single channel ship that wallows through maneuvers will become a thing of the past as you progress from the Tokyo Echo to new aileron only designs of your own.

The Tokyo Echo has also been flown as a six channel multi ship, simply by extending the wingspan one rib section and lengthening the tail moment by two inches. Too, the Tokyo Echo has been flown as a twin-engine single channel ship by adding small auxiliary rudders about one-third the size of the main rudder and located on the stabilizer directly behind each engine of the twin configuration. The torque of the engine, when one engine stops, is counteracted by the fact that these auxiliary rudders are offset twenty degrees and that the right engine is run in a clockwise fashion.

The author will appreciate your comments and inquiries on this design. Simply address your correspondence to Azuma Kudo, c/o R/C Modeler Magazine, P.O. Box 487, Sierra Madre, California. ■

the GNAT

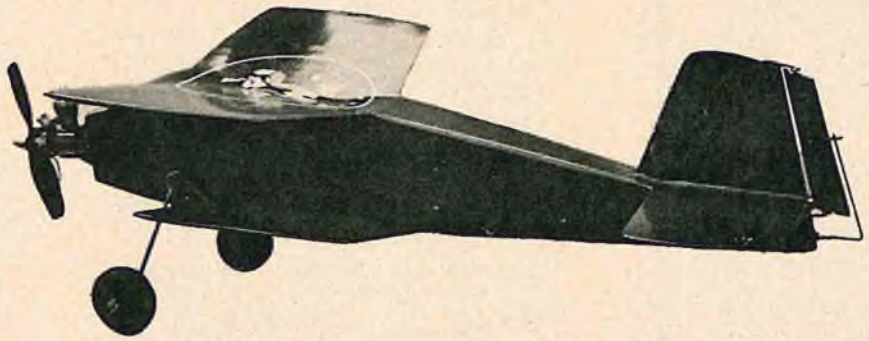
By Dan McClain


STABILIZER 1/16" SHEET
BOTTOM WING OUTLINE
TOP WING OUTLINE
FIN 1/16" SHEET
WINGS 3/32" MEDIUM HARD
TOP WING DIHEDRAL 1 1/8" WITH 8" IN SPAN.
BOTTOM WING DIHEDRAL 1 5/8" WITH 7" SPAN.
TOTAL WEIGHT NOT TO EXCEED 4 OUNCES FOR BEST RESULTS
1/16" SHEET TOP & BOTTOM
ABSOLUTELY NO BINDS IN LINKAGE DO NOT LUBRICATE
RUDDER
PIVOT
SET FOR 1/4" TOTAL MOVEMENT
F5
F5 1/16" SHEET
F3 1/16" SHEET
GNAT
F4
F4 1/16" SHEET
F4A
USE THIMBLEDROME .010 (IF A .020 IS USED --- LESS DOWNTHRUST
MAKE TOP WING WITH 8" SPAN --- TRIM OUT SHIP --- THEN CLIP TO SMALLEST STABLE SPAN.
CG
ACTUATOR COMPARTMENT ACTUATOR IS ANY SMALL 50 OHM RELAY MOUNTED ON A PLYWOOD TRAY
SIDES ARE 1/16" SHEET
LANDING GEAR
1" WHEELS
BATTERIES ARE EVEREADY NO. 912
F2A
F2A 1/32" PLY
RECEIVER COMPARTMENT CITIZENSHIP MDL
FLOATING BULKHEAD
BATTERY COMPARTMENT
F2
F3
SWITCH IS ONE PIN OF OLD ORBIT CONNECTOR
F1 1/16" PLY
F1A 1/16" PLY
F1A
F1
1/16" PLYWOOD
F2 1/16" PLY
END OF RIGHT SIDE
END OF LEFT SIDE
GNAT
FULL SIZE PLAN
DESIGNED BY
D. McCLAIN
DRAWN BY
G. WALKER

FULL SIZE PLANS FOR

The World's Smallest Biplane

7½" Span for .010's and Proportional Rudder



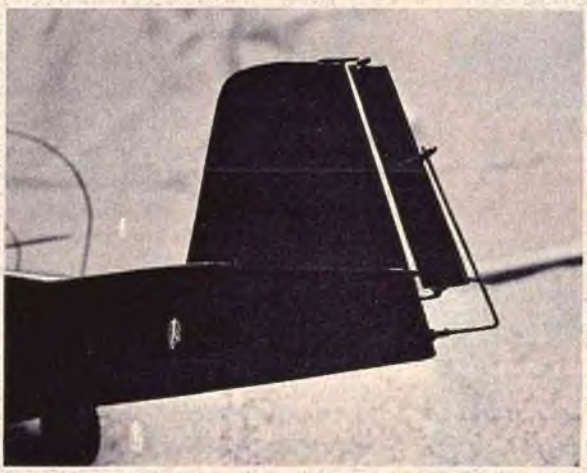
Put down your fly swatters boys! This Gnat is an R/C bomb. Although pocket size, the 'lil bug will show you a hot time with its proportional rudder.

The Gnat was designed almost as a joke for a club contest given by the Valley Forge Signal Seekers, Inc., this past May. A prize was to be awarded for the smallest R/C ship on the field. I knew full well that the unpredictable could happen and the winning ship would be at least a clipped wing "School Boy", or someone just might try to duplicate Ken Willards efforts and clip his ¼A down to that fantastic eight inch span. My way was clear. If I wanted to guarantee myself at least one win this year I had to start with an eight inch span and clip down from there.

Many, many sketches and drawings later, the Gnat was born. The deep dihedral stagger wing bipe was designed with the intent that it be stable, light, and easy to build.

Building time is short. The first ship was ready for its finish after a few construction hours. The next day saw it ready for test gliding. With a minor incidence change, the little ship settled into a rather decent but very fast glide path. I added weight to simulate the receiver, battery and control linkage weight, then tried again. Same glide, just a little faster. The next question was, how would it respond to power-on flight? I ran a tank of fuel through the Tee Dee .010 and timed it very carefully. I figured the next tank had only about thirty seconds left and I launched the tiny ship into a strong breeze. The irate insect turned on its side and proceeded to inscribe thirty foot diameter circles at about eighty miles an hour (well, it seemed like eighty miles an hour)! Less than two minutes later it was lost out of sight in the clouds high overhead.

Number Two was built the following week-end, and the R/C equipment was installed. With the contest only a week away I didn't want to risk another powered flight, so I did a lot of controlled gliding. I used a miniature transmitter, compatible in size with the Gnat (3 x 4 x 5 inches), designed and built by my close friend, Ed Hejna. Number Two was a bit heavier and I found myself throwing it like a baseball in order to get altitude for



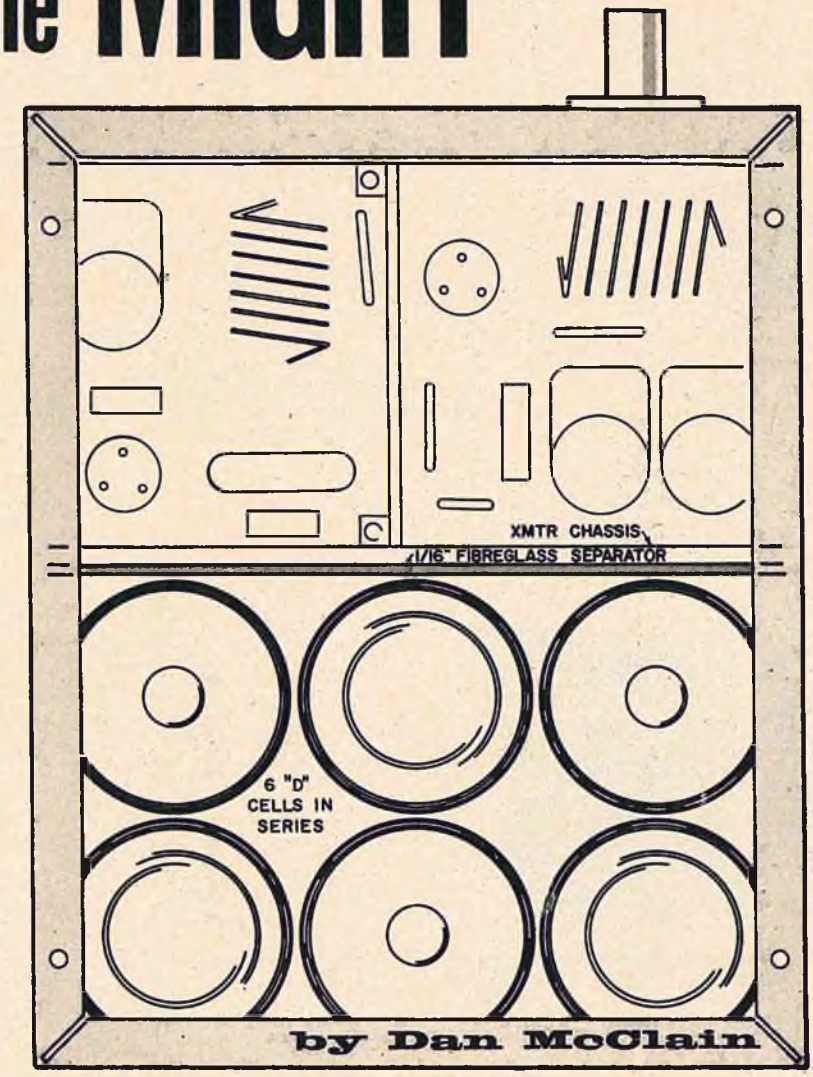
some 'stick time'. The 1/4 inch total rudder movement seemed sufficient to turn the ship in its fast glide. So, when my arm developed its 'Charley horse' I decided to pack it away for the next weekend.

There was quite a stir at the contest when I showed the Gnat for the first time. All the flying stopped as I filled and primed the .010 for its first flight. The crowd gathered as the engine ran up to peak RPM's. I asked to have someone launch it for me and jabbed it into the CD's hand. (I knew Ken Miller to be a good dart shooter) — "Just chuck it like a dart, Ken." The tiny ship shot forward, then up, and stalled in the face of the 25 MPH breeze, but kept plugging away dancing on its tail. The rudder response was good and I could handle the wind with little difficulty. More down thrust, or a set of wheels to create some low drag, would solve the problem. The engine died finally, the ship stalled and almost fell to the ground. Not too spectacular a flight but sufficient to win the event. The landing gear and wheels added to the all up weight, but straightened out the powered flight. The GNAT will snap roll on full rudder and bends corners like a hot rod. Smooth, stable and FAST best describe it. How far down have I clipped the wings? I'm down to 7½ inches and still trimming. How about you?

There are no special building instructions. Just apply your usual good building techniques and **keep it light.** Check incidence and alignment carefully and be sure the rudder and associated linkage is 100% free of binds and as light as possible. A Hobbypoxy finish is recommended to eliminate warping.

Good Luck, and, take a youngster flying with you next time.

The MIGHT



Shown full size in its Bud AU-1028 cabinet. BNC antenna connector.

Ed Hejna's all-transistorized rudder-only proportional transmitter measures 3" x 4" x 5"

A meticulous modeler takes a long time to build an R/C ship. When that time lengthens into a year, (or more) then it's time to either give up the hobby or start building smaller models.

Ed's ships have become smaller and smaller, until finally, he could carry them to the field in a small shopping bag! The biggest bulk of the field gear was his old ground-based transmitter and the awkward add-on pulser box. Although the big transmitter was a perfectly acceptable piece of equipment in 1960, somehow it just didn't go with Ed's tiny models! He got a lot of kidding about the incongruity of size between the airplanes and the equipment and decided to do something about it. Transistors were becoming available that could deliver some power at R/C frequencies and this spurred him to design the simple two transistor R.F. section.

Printed circuit boards, too, were hard to come by, so the oscillator and amplifier were "hard wired" to rivets set into a fiberglass board measuring 2" wide and 4" long. A phase-shift

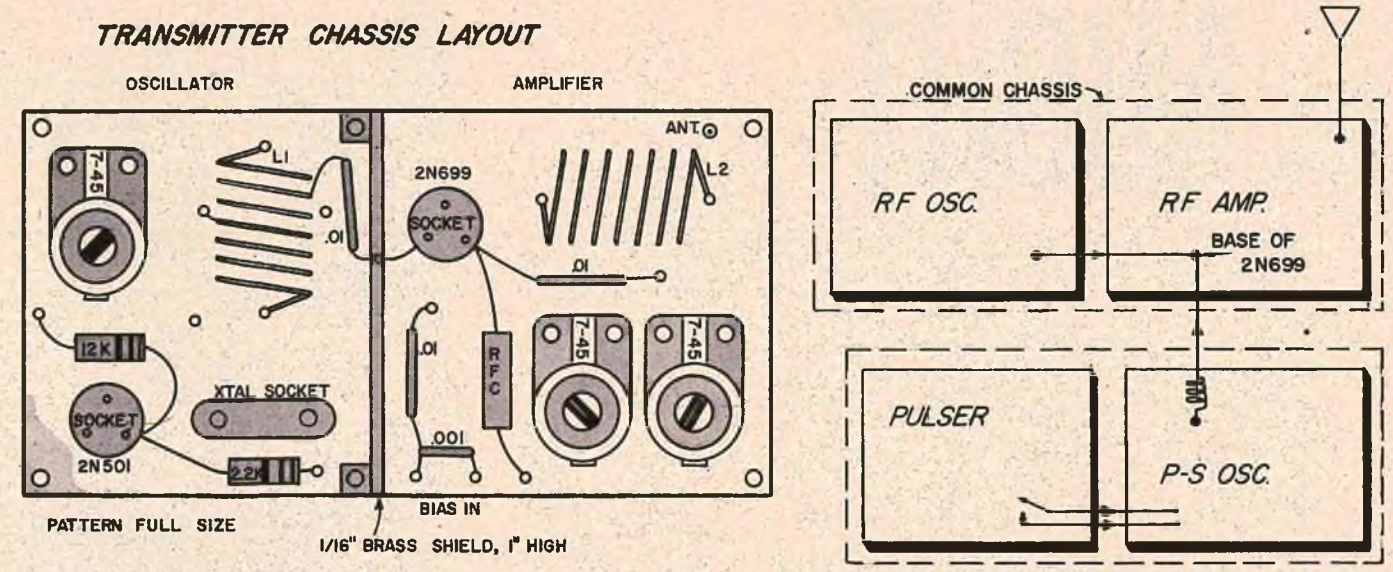
ELECTRONICS

The Might

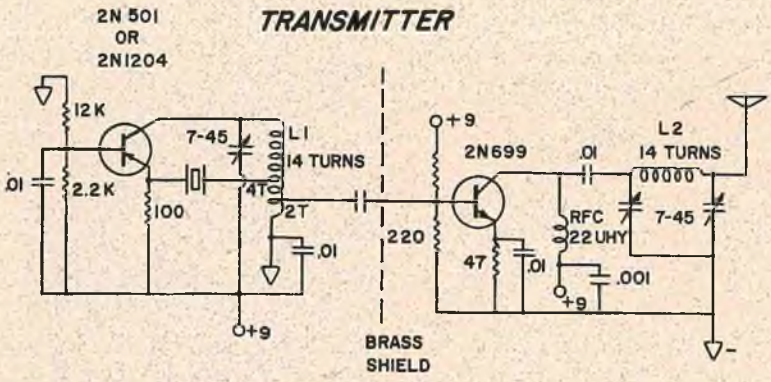
Relay Check Meter

Nicads: Part II

Product Report



Chassis of .1/16" X 2" X 4" fibreglass board. Some components located underside of chassis. Layout not critical as to parts placement, although it's best to have a shield between stages. Eyelets used for terminal connections.



XTAL IS 3RD HARMONIC, 27.255 MC.
L1- 14 TURNS # 3003 MINIDUCTOR, TAPPED AT 4 TURNS FROM COLD END FOR XTAL, AND AT 2 TURNS FOR THE COUPLING CAPACITOR
L2- 14 TURNS # 3003 MINIDUCTOR
22 UHY RFC IS LOW RESISTANCE DELEVAN # 1537-44
2N 699 COLLECTOR DRAWS ABOUT 25 MA. AT 9-10 V.
IT MAY BE NECESSARY TO ADD ABOUT 50 MMF TO FINAL 7-45 TRIMMER FOR TUNE UP.

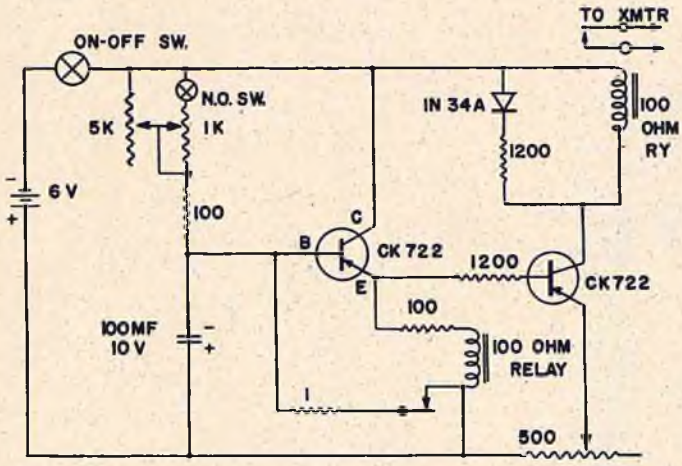
oscillator and amplifier were built on a similar size board and used to base modulate the R.F. amplifier.

At this point Ed became obsessed with the idea of jamming the whole mess into a 3" x 4" x 5" box. The Ketchledge pulser appeared early in 1961 and proved to be quite the best at that time. The modulator board was redesigned to include the pulser, the phase shift oscillator, and the amplifier. The new board and the R.F. section were placed back to back and mounted in the top half of the small box. There was just enough room left to squeeze in the rate pot and the width gimbal. The bottom half of the box was filled with six D size cells carefully insulated from the metal case.

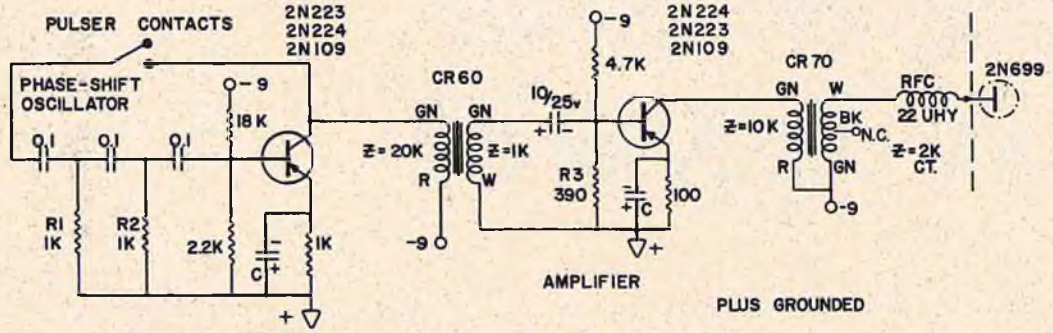
At first the R.F. output was only fair, and there was trouble loading an oversized whip antenna. Ed solved the problem by making the first center loaded whip I have ever seen used in R/C. The output increased substantially, and the antenna loaded well. The "Might" was ready for field tests!

Power and range were sufficient to fly his Pioneer receiver O.O.S. without skipping one beat in the pulse train. The "Might" had proved its worth! Today, the tiny transmitter is still a conversation piece, and still functions dependably. The design, admittedly, could be improved upon — we offer it as it is, in its original form.

KETCHLEDGE PULSER

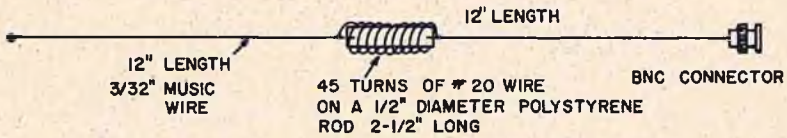


MODULATOR

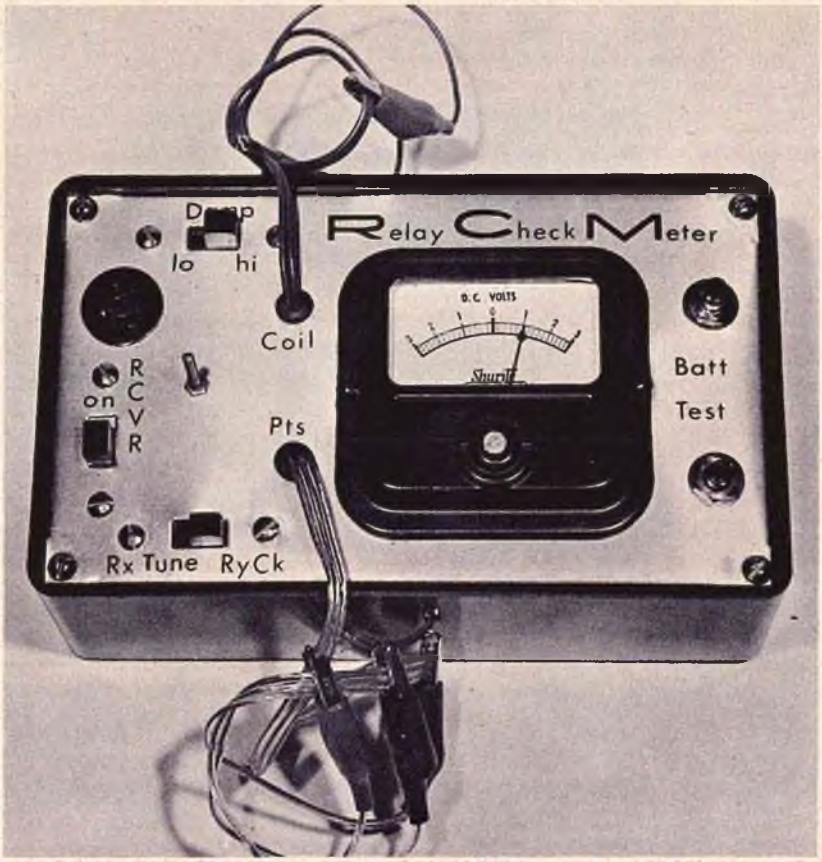


ADJUST R1, & R2 TO GIVE CLEAN 400-500 CY. SINE WAVE UNDER LOAD
"C" CAN BE 10 MF OR MORE, AT 6 VOLTS TOLERANCE OR MORE
VARYING R3 CONTROLS PERCENT OF MODULATION
THE 10/25v COULD BE MADE LARGER

ANTENNA CONSTRUCTION



BNC FILLED WITH EPOXY RESIN TO RETAIN WIRE
LOADING COIL CAN HAVE TURNS REMOVED TO RESONATE ANTENNA AT 27.255 MC.
ALLOW 1/2" EXTRA ON WIRE LENGTH TO INSERT INTO POLY ROD & BNC
TOTAL ANTENNA LENGTH FROM TOP OF BNC 26.5"



RCMeter showing a slight short in circuitry. Culprit was one alligator clip biting through the insulation of another lead in the Pts wires — indicates necessity of leaving instrument with Function Transfer Sw at Rx Tune position during periods of inactivity.

RELAY CHECK METER

by Ted Strader

The urge to "take a crack" at "nervous arcee" (frequently referred to by the more sedate and experienced proponents of the art as Simple Pulse Proportional) overcomes an ever increasing segment of our R/C population. When this feeling begins to consume your every thought, there is precious little to do except, perhaps, take a cure or . . . "take the crack!!"

It might appear to some who have just taken their first shaky steps in the direction of Simple Pulse Proportional that we are making light of a serious problem. This form of the R/C Art if far from simple to a beginner — regardless of his past experience in other phases of the hobby.

Overnight, the new devotee finds himself in the company of a host of militant electro and mechanical strangers. First there's a Pulse Box... a cadence clicking contraption that calls the shots for the rest of this mutinous crew. On the other end of the chain of command is a Servo or Actuator which seems to go out of its mind trying to obey the commands sent out from Pulse Box GHQ. Somewhere in between the Chief and the Brave is an interpreter called a Relay Receiver which actually breaks down and unscrambles a preponderance of electronic gobbledeegook and passes it on to the "troops" through the receiver's drill sergeant called a relay. (If this doesn't get me shot at dawn, nothing will!!)

It is this good natured (soft soap may help here!!) drill sergeant suffering from a slight case of tonal laryngitis, compounded by an acute muscle spasm of the central nervous spring which is the object of our discussion!

The relay will usually take any single command from the receiver without batting an eyelash . . . though it may be somewhat out of adjustment. It isn't until an actuator is wired to the relay's contacts that we see all is not well in paradise!

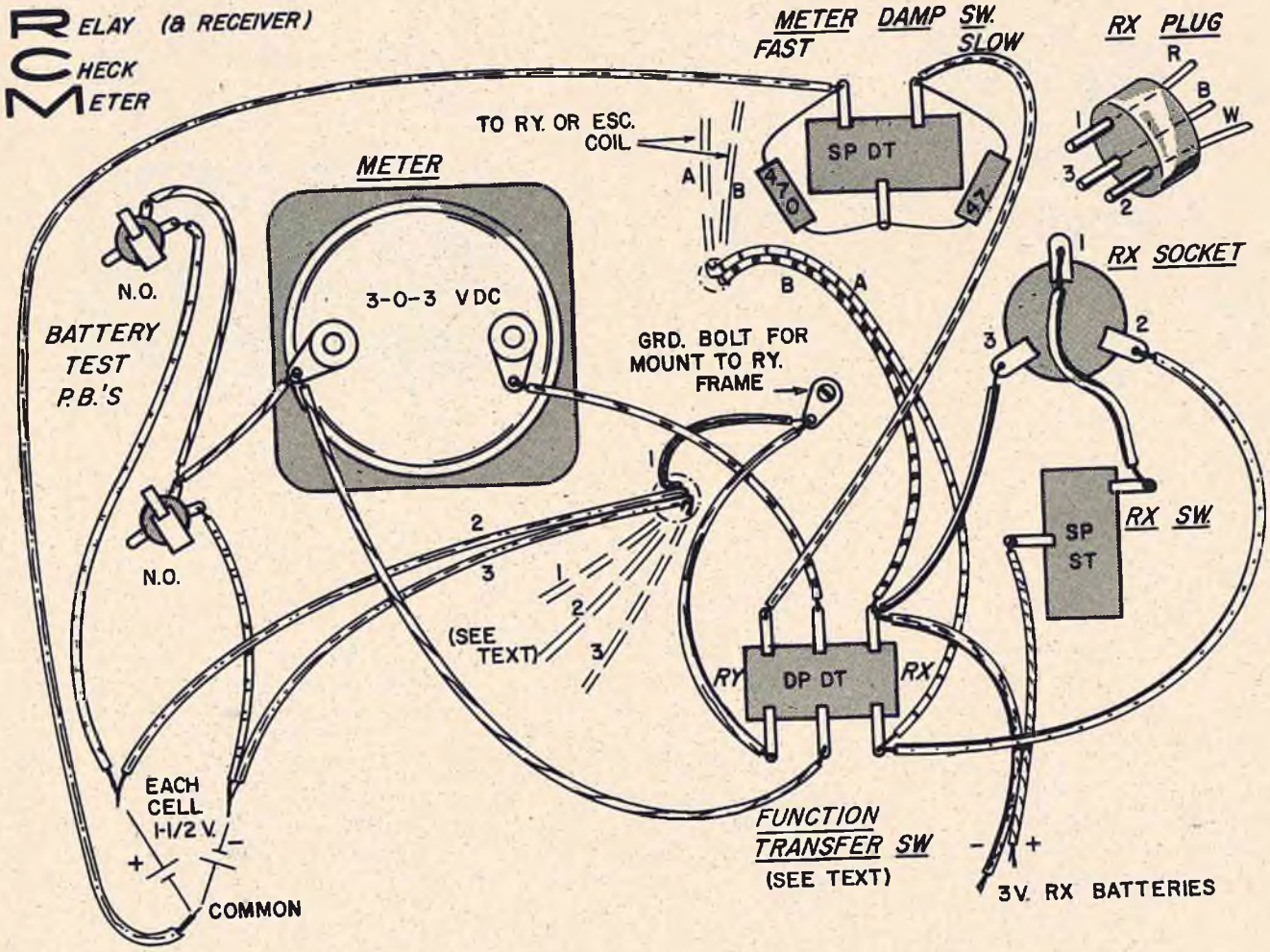
Discounting the effects of static from any motor on most all receivers — which is something we are taking up in "From the Ground Up" — let's assume here that our only problem in an unbalanced relay, and go on from there.

The most noticeable effects of an unbalanced relay appears in the inability to center the actuator during operation — or — get as much of one control as you get of another, e.g., more Right swing than Left or vice versa and a definite off-center effect although the Pulse Box is definitely in center.

The inexperienced modeler is justifiably baffled by such off-centered effects when his eyes and ears tell him the relay is clicking back and forth in harmony with the signals being sent out. In this instance your eyes and ears are only telling you part of the story. Perhaps a very brief and slightly technical explanation will help clarify the problems surrounding the relay . . . then we can get down to building the meter to augment our eyes and ears.

We're concerned with two relay functions . . . Pull-In and Drop-Out. With our Pulse Box in neutral, we want to effect an equal amount of relay contact "time" and "pressure". Once we've accomplished this it is reasonable to assume that all other variations of control commands sent from the Pulse Box will be followed faithfully by the relay.

To "Pull-In", the relay coil must first build a magnetic field which then must overcome the mass of the relay armature and the physical resistance of the armature return spring. "Drop-Out", on the other hand, is the result of the disappearance of the magnetic field and the influence of the spring



upon the armature's mass ... in that order ... and, while the average modeler "couldn't care less", there must be a balance between these two situations in order for the Pulse R/Cer to realize the successful relay operation he seeks.

Because the "Pull-In" depends upon the amount of current supplied by an individual receiver to the coil of a relay, and that this amount varies — however slightly — even between receivers of the same manufacture, the only way a relay can be properly checked is while it is a part of the receiver circuit. It is for this reason that we included a receiver hook-up circuit within the Relay Check Meter cabinet rather than add strain to the circuit and batteries in your plane during an extended period of testing.

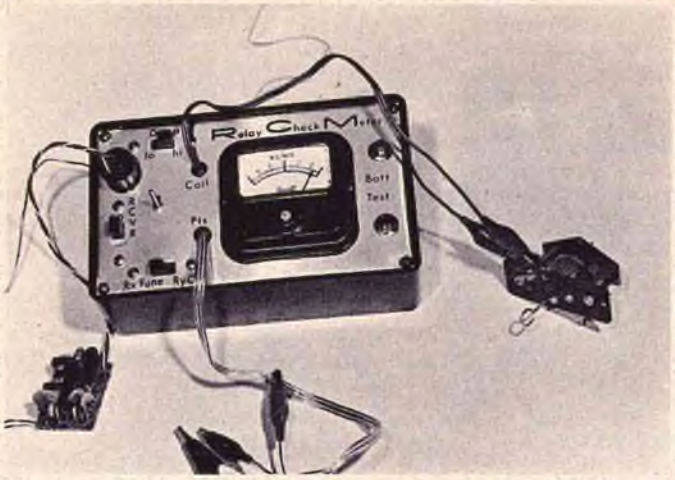
As a fringe benefit, you'll find this little gadget a constant bench companion for testing and tuning receivers!

In its present form, the Relay Check Meter is designed to be able to check a relay whether it is attached to the receiver chassis or is a separate item as in the case of exploring the possibility of an addition to a relayless receiver. When testing one attached to a receiver chassis, all three Pts. leads are used. The one grounded to the Grd. Bolt (schematic) is attached to the armature contact either via the relay frame or in the case of an insulated armature contact, where it connects to a lug on the relay's insulated contact board. The other two leads connect to each of the stationary contacts. If a relay is positioned on the Relay Mount Grd. Bolt on the RCM's panel, only the two stationary contact leads are used as the relay armature is already connected to the test circuit (except in the case of an isolated armature contact).

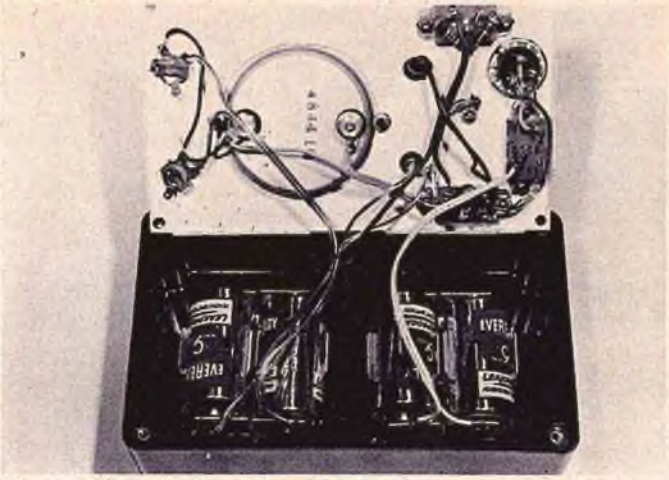
A point to remember when testing a relay-type receiver in the plane which may have an actuator attached: Remove the actuator's batteries during relay check!

To describe the Relay Check Meter's operation, let's create a situation which finds us with a relayless receiver plugged in and a relay screwed on to the Grd. Bolt Attach Pts. leads as outlined. Attach Coil leads to relay's coil winding lugs. Position Function Switch to Ry. Ck. Damp Sw to Hi. RCVR Sw to On.

Now we're ready to begin transmitting signals from the Pulse Box. Adjust the Pulse Box to send fastest pulse and observe the 3-0-3 meter. With Pulser in neutral, the 3-0-3 meter should center with only a slight deflection on either side. Switch Damp Sw to Lo and meter needle should travel even less from side to side. If your Pulse Box is sending out an equal



RCMeter being used to tune relayless receiver. Coil leads to escapement coil. Pts leads not used. Receiver tuned for maximum meter deflection.



RCMeter's innards. Two sets of batteries housed within instrument. All wiring point to point. Leads pass through instrument cover via rubber grommets.

On-Off signal length and the relay is deflecting the meter more to one side than the other, then the tension spring of the relay will have to be adjusted **VERY SLIGHTLY.** Make minor adjustments and observe the results. Never increase or decrease the spring tension excessively at any one time.

In lieu of a cut and dried chronology of construction steps, we prefer to spend this space explaining what each component accomplishes, as we feel certain you should have no difficulty following the exploded drawing to a sucessful construction conclusion.

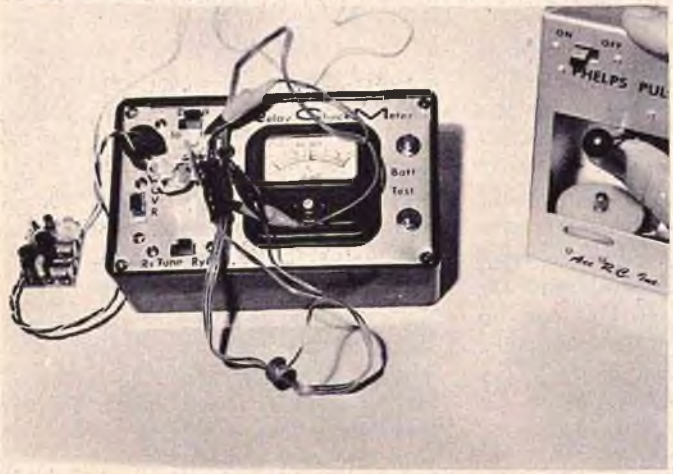
. So, let's take the parts and explain how they make up the whole.

METER: This is a Zero Centering 3-0-3 vdc Shurite, Type 950, stock number 91032. By substituting this for the motor of an actuator we will use later, we are able to see the effects of an unbalanced relay via the meter's needle as it emulates "right" and "left" movement. When we pulse a meter as we are doing to this one, there is bound to be "over-travel" of the needle. Therefore we use only 1½ volts on either side so as not to damage the meter by constant and excessive over-travel. To restrict the extreme travel of the meter needle even further we use two stages of additional —

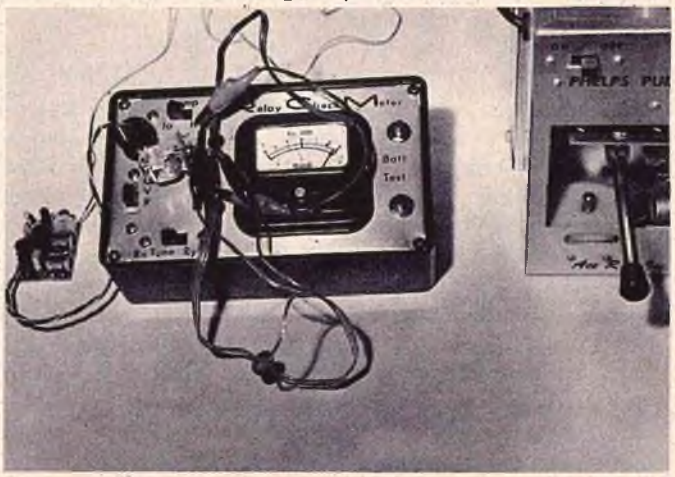
DAMPing: Even using one half the voltage our 3-0-3 vdc meter can handle, the deflection — under slow pulse rate — is sometimes too great for the eye to follow. The Meter Damp Sw (SPDT) had two resistors soldered as shown. When the switch is at Lo (SLOW) the 470 ohm resistor is in the circuit exerting the most resistance in the system, allowing the least amount of voltage and restricting the extreme movement of the needle the most. With the DAMP Sw at Hi (FAST) the 470 ohm is then in the circuit. This allows (normally) a greater deflection; but, the fast pulse of the Pulse Box cuts down the extent of needle deflection so that the 3-0-3 meter seems to operate over about the same range as when the DAMP Sw is at Lo and the system being pulsed slow. (If this all seems like Martian hieroglyphics, let the

(Continued on page 48)

RCMeter indicating relay's armature balance. Pulse width equal On and Off. Rate highest. Note meter deflecting slightly off to one side, indicating relay needs only slight adjustment.



Similar to first photo except that relay is being used during receiver tune. Note pulse box is off. Solid signal being sent via Trx push button. Function Transfer Sw at Rx Tune — Pts leads having no function in this test.



NICKEL-CADMIUM RECHARGEABLE BATTERIES

Second of two parts in a comprehensive reference on nickel-cadmium rechargeable batteries for R/C usage.

As mentioned in Part I of this two part series, Nicad cells are hermetically sealed in nickel-plated steel cases. They can be charged or discharged in any position and do not require the addition of water or electrolyte. Thus, the need for physical maintenance is eliminated. With a proper amount of care, Nicad batteries will not only insure the RC'er a greater degree of overall reliability, but provide continuous service at far less cost per flight than alkaline or carbon-zinc units.

Proper handling of Nicads are a must. For example, care must be exercised to avoid short-circuiting the Nicad pack. These batteries are characterized by exceedingly low internal resistance and will discharge at extremely high current levels when shorted, resulting in high temperatures and subsequent cell damage. One common area for this occurence is the use of a male plug on the nicad pack — the prongs of the plug short out against a receiver case, etc., and the damage is done.

To obtain optimum life and performance from you Nicad pack, care should be taken to keep the external temperature around it as cool as possible. It should not be shelved in the sun or allowed to remain near heat producing components. A Nicad battery has a normal temperature rise of 20 degrees F when orvercharged, so maximum performance will be obtained in ambients from 60 to 80°F. Based on these facts, it is quite conceivable that a temporary failure could occur in temperature extremes — failures that appear to be inexplicable and, more often than not, blamed on the radio system. As an example, let's assume that your ship is on the flight line, an asphalt strip, and the outside temperature is 100 degrees. If the model has remained in this position for some time, it is possible that the temperature inside the plane, and in the area of the battery pack is ten to twenty degrees hotter. This, then, raises the operating temperature for your Nicad pack to 120 degrees. If the pack is in an overcharged condition, an additional temperature rise of twenty degrees is added — a grand total of 140 degrees F as opposed to an optimum operating temperature of 60 to 80 degrees!

Insofar as charging is concerned, constant **current** charging at the ten-hour rate is recommended. Charging at this rate at room temperature will bring the cells, or battery pack, to a fully charged sate in a period of fourteen to sixteen hours. The final charge voltage at the end of the 14 to 16 hour period will be from 1.45 to 1.5 volts per cell. Charging at rates in excess of ten hour rate, and/or constant voltage charging is definitely not recommended. All Nicad sealed cells can be floated, or trickle charged, to maintain a fully charged condition.

Cells utilized as a battery should be charged and discharged as a unit in order to retain electrical balance of the individual units. If a pack is made up of cells which have been inactive for a period of time, charge the battery at the regular recommended rate prior to discharging — a practice which will equalize the cells and avoid damage.

Charging and discharging cells connected in parallel is not recommended.

As an individual cell, or pack, is repeatedly charged and discharged, a white powdery deposit may appear in the seal area. This is a carbonate formation and is harmless to the battery and other radio components.

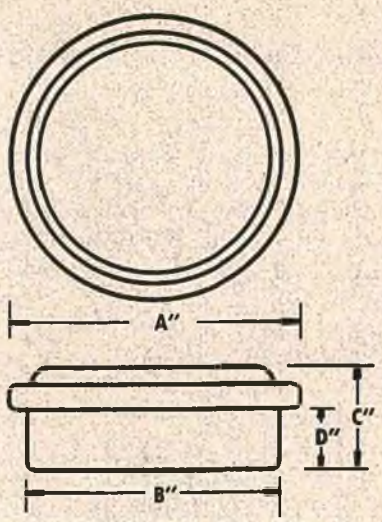
For our use in R/C, connections to individual cells, or packs, should be soldered. If pressure connections are used, care should be taken to see that uniform pressure is maintained and that all contacts are kept scrupulously clean.

DATA

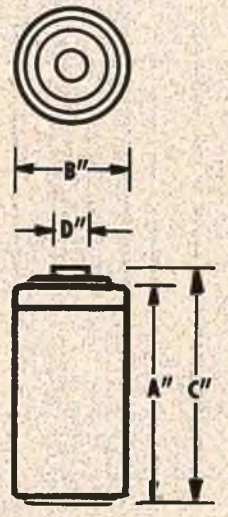
The following data applies to Gould Nicad cells. Only those units that are generally applicable to R/C operations have been selected and does not represent the entire line of rechargeable nickel-cadmium cells available from the manufacturer. In general, Nicads are available as individual sealed cells from 0.20 to .500 ampere hour capacity. Sealed cell button type batteries, or nicad packs as we know them, are available in capacities from 100 mAH to 500 mAH and in voltages from 2.4 to 12.0 volts. Batteries are

also available in higher voltages and other configurations on special order. Sealed cell button type battery packs have resistance welded inter-cell connecting cups, and are furnished with "form fitting" plastic insulation sleeve or with smooth side Tenite jacket. Flexible solder lugs are standard on these packs.

Cylindrical sealed cells are available in capacities from .5 to 4.0 ampere hour capacity and may be connected in series for increased voltages. To date, the largest cylindrical cells utilized in airborne R/C systems have been the 1.8 ampere hour capacity cell — used primarily for high-drain pulse proportional systems.



1. INDIVIDUAL SEALED CELLS



2. CYLINDRICAL SEALED CELLS

NICAD DATA AND SPECIFICATION SHEETS FOR R/C USAGE

Individual Sealed Cells	MODEL 100B	225BH	500BH
Service Capacity — 10 Hour Rate	100 mAH	225 mAH	500 mAH
Recommended Charge — 14 Hours	10 ma	22 ma	50 ma
Trickle Charge Rate	1.0 ma	2.2 ma	5.0 ma
Maximum Charge Voltage	1.5 volts	1.5volts	1.5volts
Operating Temperature			
Charge	32 −115 F	32 −115 F	32 −115 F
Discharge	− 5 −115 F	− 5 −115 F	− 5 −115 F
Storage Temperature	−40 −140 F	−40 −140 F	−40 −140 F
*Charge Retention — Stored at 70 deg. F.			
1 Month	75%	75%	75%
3 Months	70%	70%	70%
6 Months	60%	60%	60%
Cell Weight	0.28 oz.	0.57 oz.	1.15 oz
Dimensions			
A	.984"	.984"	1.340"
B	.906"	.906"	1.252"
C	.240"	.339"	.374"
D	.122"	.228"	.248"
**Internal Resistance	1.0 Ohms	0.57 Ohms	
***Internal Impedance — Fully Charged Cell	60CPS/.180 Ohms	60CPS/.090 Ohms	

*Charge retention: Higher temperature will decrease charge retention during storage. Charge prior to use for full capacity.

**Internal Resistance: Initial load voltage for high rate discharge equals open circuit voltage (1.33 volts), minus load current times internal resistance.

***Internal Impedance: For semi-discharged cells impedance increases approximately 20%. For fully discharged cells impedance increase value shown by a factor of 3.

Physical dimensions shown do not include plus or minus tolerance in thousandths.

NICAD DATA AND SPECIFICATION SHEETS FOR R/C USAGE

Sealed Cell Button Type Batteries (Refer to individual cell data for electrical characteristics)

First section of Battery Type number refers to battery voltage, last section refers to Cell type. Example: 4.8V/100B designates 4.8 volt pack composed of 100B (100mAH) button cells.

Battery Type	Number of Cells	Height (inches)	Diameter (inches)	Weight (ounces)
2.4V/100B	2	.505	1.004	.58
3.6V/100B	3	.750	1.004	.86
4.8/100B	4	.995	1.004	1.15
6.0V/100B	5	1.240	1.004	1.43
7.2V/100B	6	1.485	1.004	1.72
8.4V/100B	7	1.730	1.004	2.01
9.6V/100B	8	1.975	1.004	2.57
2.4V/225BH	2	.717	1.004	.92
3.6V/225BH	3	1.068	1.004	1.39
4.8V/225BH	4	1.419	1.004	1.86
6.0V/225BH	5	1.770	1.004	2.32
7.2V/225BH	6	2.121	1.004	2.79
8.4V/225BH	7	2.472	1.004	3.25
9.6V/225BH	8	2.823	1.004	4.72
2.4V/500BH	2	.791	1.361	1.85
3.6V/500BH	3	1.179	1.361	2.79
4.8V/500BH	4	1.567	1.361	3.72
6.0V/500BH	5	1.955	1.361	4.65
7.2V/500BH	6	2.343	1.361	5.58
8.4V/500BH	7	2.731	1.361	6.52
9.6V/500BH	8	3.119	1.361	7.45

NICAD DATA AND SPECIFICATION SHEETS FOR R/C USAGE

Cylindrical Type Nicad Cells	500SC	600SC	750SC	1.2SC	1.8SC
Service Capacity — 1 Hour Rate	.5 AH	.6 AH	.750 AH	1.2 AH	1.8 AH
Recommended Charge — 14 Hours	.050 amperes	.060 amperes	.075 amperes	.120 amperes	.180 amperes
Trickle Charge Rate — Continuous	.005 amperes	.006 amperes	.007 amperes	.012 amperes	.018 amperes
Maximum Charge Voltage	1.5 volts	1.5 volts	1.5 volts	1.5 volts	1.5 volts
Operating Temperature					
Charge	0 − 115F	0 − 115F	0 − 115F	0 − 115F	0 − 115F
Discharge	−40 −140F	−20 −120F	−20 −120F	−40 −140F	−20 −120F
Storage Temperature	−40 −120F	−40 −120F	−40 −120F	−40 −120F	−40 −120F
*Charge Retention — Store at 70 Deg. F.					
1 Month	75%	75%	75%	75%	75%
3 Months	50%	50%	50%	50%	50%
6 Months	15%	15%	15%	15%	15%
Cell Weight	0.77 ounces	0.76 ounces	1.12 ounces	1.6 ounces	2.44 ounces
**Internal Resistance	.025 Ohms			.0150 Ohms	
***Internal Impedance—Fully Charged Cell	60CPS/ .0200 Ohms			60CPS/ .012 Ohms	
Dimensions					
A		1.920"	0.910"	1.672"	1.885"
B	1.952"	1.960"	0.977"	.893"	1.027"
C		0.171"	.250"	1.842"	1.942"
D	.557"	0.616"	1.027"	.222"	.250"

*Charge retention: Higher temperature will decrease charge retention during storage. Charge prior to use for full capacity.

**Internal Resistance: Initial load voltage for high rate discharge equals open circuit voltage (1.33 volts), minus load current times internal resistance.

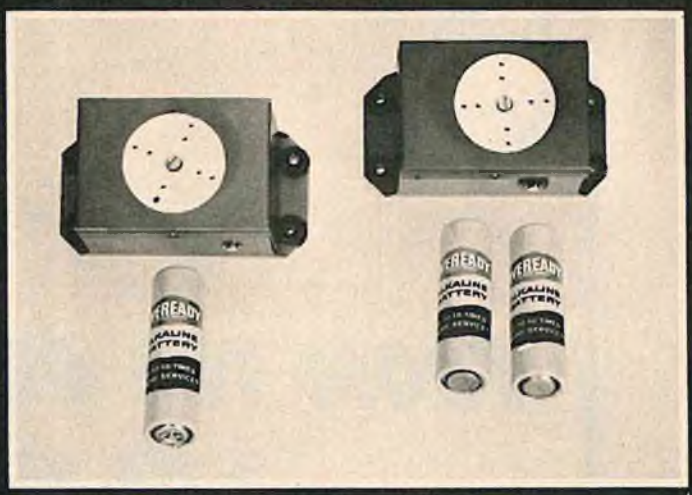
***Internal Impedance: For semi-discharged cells impedance increases approximately 20%. For fully discharged cells impedance increases approximately 50%.

Note: Physical dimensions do not include plus or minus tolerance in thousands.

RCM PRODUCT REPORT:

Royal

SINGLE CHANNEL SERVO



The motorized rudder and motor control actuators imported by the Royal Products Company of Denver, have a unique distinction among single channel servos. In brief, they work! To the newcomer to radio control this may not come as a startling revelation — to the more seasoned single channel devotee who has borne the brunt of many futile attempts by R/C manufacturers to produce a workable unit of this kind, it is something of a miracle.

The concept of utilizing a motorized device to operate the rudder and motor functions in a Class I aircraft is not new — several of today's leading manufacturers have, at one time or another, attempted to replace the crude and sometimes reliable escapement. Such attempts generally resulted in only partial success. The ultimate goal of a three-position compound actuator that (a) could equal or exceed the escapement in speed, (b) would hold its command position without overriding, (c) was more powerful than its rubber-driven cousin, (d) was small in physical size and light in weight, (e) required a small battery complement with a corresponding low battery drain, and (f) that could be operated with either superregen or superhet receivers without the necessity for a suppression circuit resembling an electronic jungle, was never commercially realized until the introduction of the Royal servo.

Some of the earlier domestic single channel servos did realize one or two of the basic prerequisites for a device of this type, but in all cases their shortcomings severely outweighed their somewhat more dubious merits.

The Royal #7 Rudder Servo and #7 Motor Control Servo has accomplished all of these desirable traits without exception. And, although the Royal Products Company introduced these new units with a minimum of ballyhoo, we felt like playing a couple of choruses of fanfare for them ourselves, after trying a few of the first production models.

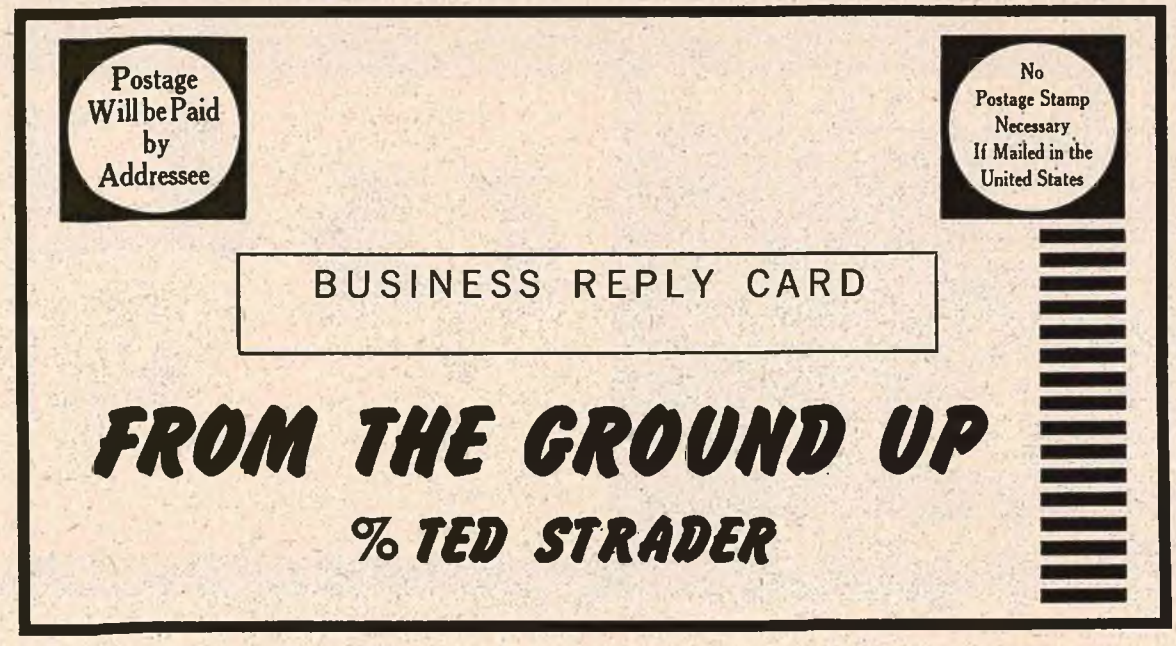
First of all, these Japanese manufactured units are quite small — measuring 1⅞" x 1⅜" x 1". The weight of each is only two ounces. Two pencells are required for the rudder unit with one additional alkaline energizer necessary for the three position motor control actuator. With an extremely low battery drain, these servos are substantially faster and more powerful than conventional escapements. Control is positive with absolutely no tendency to override position. The output of the servo is a rotating nylon disc which features eight positions for torque rod attachment, making servo locating and mounting a matter of choice rather than necessity. Inside the Royal servo is a powerful, low-drain industrial type motor which is completely encapsulated. A very unique and novel combination of gear reduction and cam output is utilized which results in absolutely no end play. All interior parts are constructed of non-metallic material. The latter feature enabled our tests to be conducted with a variety of relay type superregen and superheterodyne receivers with no necessity for an arc suppression circuit.

We have flight tested both servos in ships ranging in size from .049 to .35 with absolutely no failures or difficulties encountered. At no time were we unable to obtain a given command. In all cases the servos operated to complete perfection and with exceptional reliability.

An excellent case history reference for these units can be illustrated by a relative newcomer to R/C who purchased both servos at a local hobbyshop while one of RCM's editors was present. This modeler bought an .049 shoulder wing kit of popular design, an .049 engine with throttle control, and a single channel relay receiver. Following up this individual's progress was both enlightening and encouraging. To date, and with very little assistance from other, more experienced fliers, this RC'er has completed over one hundred successful flights with this equipment combination.

It is our consensus of opinion, and seemingly that of the majority of the users of these actuators, that this new Japanese import has succeeded where its domestic and foreign predecessors have failed. The Royal Single Channel Servo is an excellent buy at its price of $14.45, and is unquestionably a high-quality, and consistently reliable addition to the single channel segment of radio control.

Recommended by RCM.



From big bipes to mini-ghost, t.e.s. ("totals every ship") is still with us . . . since it won go away, you might as well read it.

I think we struck a nerve with that arc suppressor circuit in the September issue! Mail from modelers who have been able to tame their once-maverick receivers into docile workhorses have been pouring in . . . and we're delighted! On the other side of the coin, mail from those who couldn't make it work has also been arriving — as we expected. You may recall I reported that the configuration outlined had worked beautifully on three receivers and failed on a fourth. The whole plan behind presenting the one we did was not to lull anyone into a false sense of security, but rather to stimulate some thinking on your part. The same mail also included other variations of suppressors which we present in this issue and urge you to try.

One of the most gratifying letters was from Jim Kneidel of Erie, Pa., for whom our brain child would absolutely NOT work! He tried several variations and component values with no success . . . now he's gotten to the point where he won't give up! Like the Medium said during a seance when the table began to rise—"That's the spirit!"

It might shore up your confidence to know that Jim has another flying combination he relies upon quite heavily. It's a well worn Aero-Dynamic (old friend John Zaic's masterpiece) with an F&M Saturn operating a Du-Ac. He didn't mention the engine, but the ship has a 2 ounce tank which has been filled to the tune of 3 gallons of fuel as of the middle of August! Sounds unbelievable, doesn't it? What's even harder to take is consuming one gallon of fuel in one week! This boy likes to fly!

You might be interested in the sketch he sent of a nylon rear bearing he uses where his torque rod leaves the fuselage. This arrangement is long wearing and allows for some mounting discrepancies of the Du-Ac or any other type actuator. Thanks, Jim. Now who else has a clever idea to share with the rest of us pea patch pilots?

Just as a reminder, feel free to write me, c/o Box 2555, Schenectady, N.Y. 12309.

An open letter to Stu Richmond and David Sapiro of the New England Radio Control Modelers: Definitely want to receive each copy of your club paper Relay Chatter. Put my name on your list . . . and this goes for all club papers — so, editors, let us hear from you!

Also wish to thank NERCM's Contest Director, Pete Reed for sending us the dope on their 11th Annual New England R/C Championships. Sorry I wasn't able to attend, but business took me to Syracuse that weekend. I was fortunate to be able to rely upon one of our local modelers, Len Savastio, who is also an excellent photographer and did attend. Len brought back several good shots which we will be using in coming months.

Weather plagued both the "Orange Meet" and the '64 Annual Hobo Meet in Syracuse, N.Y. I got drenched, along with a surprisingly large number of R/C stalwarts who tried to ignore the inclement climate in hopes it would "go away."

Saturday's flying was excellent, though naturally restricted by the weather. In fact, it could be termed superb. With all due respects to all the pilots and their efforts, undoubtedly the most spectacular flights were those involving three scale ships—two

antique bipes and a four-engined B-24 Liberator bomber. Ralph Jackson must have logged almost 45 minutes of air times, captivating the crowd with his aerobatic SE-5. As if this wasn't enough, he held the entire field in complete awe with a precision demonstration of his 4-engined Liberator, which ROG'd, circled the field at least a dozen times, executed precision maneuvers including barrel rolls, then came in for a perfect landing with all four engines still screaming! We'll have a series of pics on this in an upcoming column.

The other crowd pleaser was Dr. Gordon Gallagher's true scale flights with his equally accurate scale Avro. This beautiful behemoth uses a Fox .59, ACL proportional radio, and goes together at the field like the full size ship. As you can see from the photos, all wing panels come off — they are actually held in place by flying wires! It's also interesting to note that Gordon doesn't carry it to the flight line ... he lets it go there on its own!!

Watching this ship in flight was an experience. Not that it did any fancy maneuvers, for it flew so slowly that one almost imagined it was full-size and not a model. Takeoffs and landings were slow, smooth, precise, and gentle as a lamb.

Although I wasn't privileged to attend the Sunday session due to prior commitments, Bill Kenyon of the ARCS (Aero Radio Club of Syracuse) was kind enough to fill us in on the remaining details.

Who sez you have to think big to get ahead? E. W. Gerhardt of Basking Ridge, N.J. proves you can have a ball thinking small (though he thinks small in a big way)! E. W. submitted some very interesting sketches of a few of his ideas which we have included in this month's treatise. The Galloping Ghost setup he outlines has been used in both a Minnie Mambo and a Junior Falcon with good results. Servo power is supplied by a 4:1 Micro Mo motor with a slight bit of resistance in the circuit to slow down the action. As is, the 4:1 is a mite fast, and E.W. feels that if he can round up a 15:1 TO-3 Micro Mo he will have the perfect combination. In the meantime, however, he's apparently not letting any grass grow under his ship from inactivity.

According to the author, the most time spent getting a system such as he outlines working properly is confined to the centering spring arrangement. This requires a bit of tinkering. Once adjusted, it fills the bill for those who like to get the most from their tiny ships. Battery life is about one hour's flying time. The arc suppressors are also the work of Mr. Gerhardt ... or at least he has found them successful. Nuff sed! You may wish to copy them down in your own private fact book for later use.

On many occasions over the years we have been asked by prospective G-G'ers if we thought the Go-Ac or even a simple M-M motor G-G system would operate in a .35-powered ship. Our stock answer is (or always was) NO, although by trial and error with a combination of larger batteries and smaller surfaces (rudder and elevator) it might be possible. In all modesty, we've felt that this unit was pretty much restricted to .19 size and smaller. I also stated emphatically that the Whirlwind would make a lousy GG ship — it has since become the flagship of most GG flyers; that my 49" P-51 would probably be hard to man-

Build up, Fill Up, Rev Up, Line Up, Tail Up ... Dr. Gallagher and giant Avro.

age with more than a .19 — the Dart boys have flown theirs for at least three years on a K&B .45 — plus a whole list of amazingly inaccurate predictions. (Actually I'm 97% correct, 3% of the time.) As you've probably guessed, I've done it again!

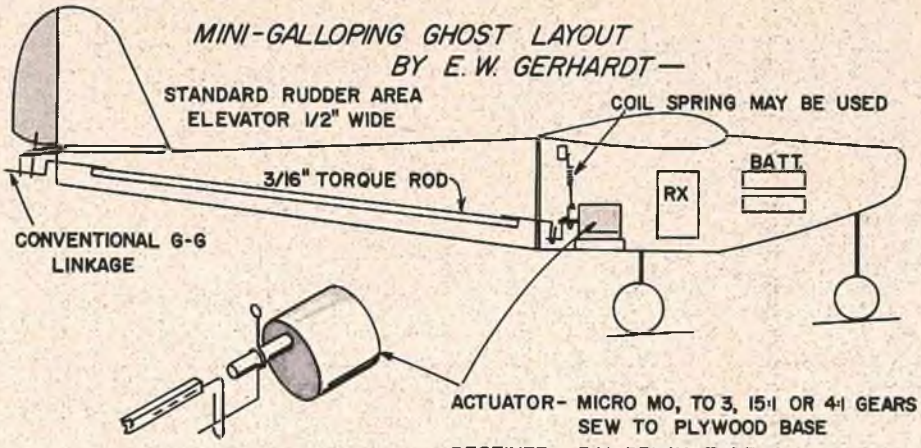
The last vestige of hope drained away about a week ago when a modeler a few miles down the road made a trip to my diggins to tell me that he'd seen one member of another modeling group who had scaled up an Esquire, powered it with a .35, and was G-Ging it with you know what! I couldn't help myself . . . I got carried away . . . my case comes up next week!

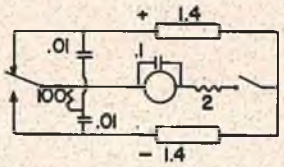
This choice bit of news probably wouldn't have hit so close to home if I hadn't received a letter that same morning from a modeler in Canada asking when the Scorpion would be ready and that he'd been having great success flying a Whirlwind on G-G! It was just one of those days. For those interested, we're working on the magazine plans for the Scorpion story and it will be in print pronto — as pronto as the Editors decree. At this writing, we've completed a year of tests on the new Go-Ac for those who like muscle in their servos and would like to toy with .35 size G-G bombs as well as the smaller ones. This one has the necessary steam with minimum battery drain.

You probably read about it in last month's RCM, but just in case you missed that issue, I'd like to pass along some quick observations based upon actually operating Babcock's newest R/C rig called the BC-21. This is a relayless unit for escapement (and simple pulse) on 27 mc with a tone frequency of 6000 cps! Up there the blare is really rare! It gives the effect of superhet safety on superregen. When the rig arrived it was tuned to a gnats whisker as I knew it would be. To make sure nothing had happened in shipment, I installed batteries and fired it up. Perfect!

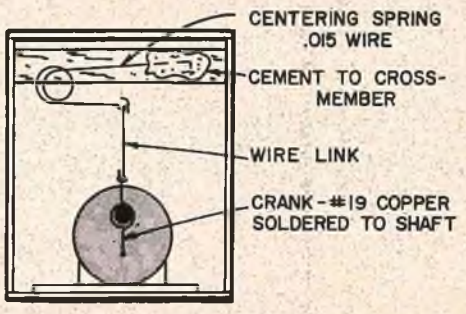
Then it got the regular tesT. Transmitter and receiver were completely detuned so that nothing was operating. In less than 30 seconds the whole system was back in perfect tune. (I thought you'd be interested so I investigated — it'll pulse to about 50 cps!! — smoooth!)

MINI-GALLOPING GHOST LAYOUT BY E. W. GERHARDT —

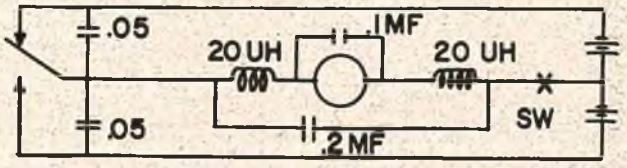




ACTUATOR- MICRO MO, TO 3, 15:1 OR 4:1 GEARS SEW TO PLYWOOD BASE
RECEIVER- 3 V. RELAY TYPE
BATTERIES- 2 PENCELLS FOR RX
2 500 MAH NICADS FOR ACT'R



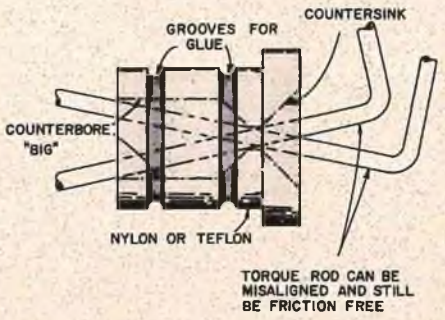
GERHARDT'S ARC SUPPRESSOR USED WITH SUPERHET RCVR



We'll all mourn the passing of one of modeldom's best known and respect modelers — Paul Del Gatto — who passed away recently from a heart attack. The hobby loses a devoted modeler, and I, like so many, have lost a friend.

That about wraps it up for this session. We'll be hanging around the same old pile of balsa dust and exhausted electrons next month. In the meantime, why not drop a line and fill us in on what's so special in your hangar. Pics and facts are always welcome.

JIM KNEIDEL'S TORQUE ROD BEARING TECHNIQUE —



INTERNATIONAL Circuit

By Cliff Rausin

IRELAND

The Ulster R/C championships, held at Tomebridge Airfield, June 26 and 27, was met by variable weather, including gusts up to 20 m.p.h. Entrants in the Ulster meet were from Dublin, Belfast, Derry, and also from across the water in England. In multi, David Reade of the Rolls Royce club of England was first with 1649.3, flying an original design utilizing deBolt Interceptor surfaces. Power was supplied by a Merco 49, radio an Orbit 10.

Second place was Ireland's Bertie Troy (Ulster MAC), 1254 points, flying a Harry Brooks designed Soraco. Super Tigre .56, F&M Matador/Midas, 7¼ pounds. Extremely fast, maneuverable ship.

Third place was captured by Roger Hargreaves of the English club with 1008.3 points. Roger's ship, a Taurus, sported a McCoy 60 and Orbit 10 radio.

The Intermediate category requires the use of single channel radio equipment, with any application, such as cascaded escapements, proportional, etc. First in this event was Ken Boyde (Ulster MAC) with a Veron Robot, Grundig radio, and an Elmic Commander escapement. Power was a Taifun 2.49. Second place was taken by Jock Parker with an original design ship for Galloping Ghost, while the third slot was filled by John McGalliard with an original biplane, home made radio equipment, and another Elmic escapement.

In the Single category for rudder only, Ken Boyde, Ian Reid, and John McGalliard, all of the Ulster group, took the first three positions, respectively. Elmic escapements were used exclusively.

We were fortunate to obtain these details on the Ulster MAC Championships — Johnnie Carroll, RCM's Editor in Ireland, ran out of runway on takeoff and was thus able to watch the rest of the meet!

(Continued on page 44)

Ken Boyde's winning Robot.

John McGalliard's old biplane.

CLIFF RAUSIN

Even with his trench coat he makes a poor Chet Huntley. But wherever the action, you can be sure Cliff and RCM's foreign staff will be there. Unfortunately, so will InterPol.

FLY-IN

International Circuit Fly-In Comment

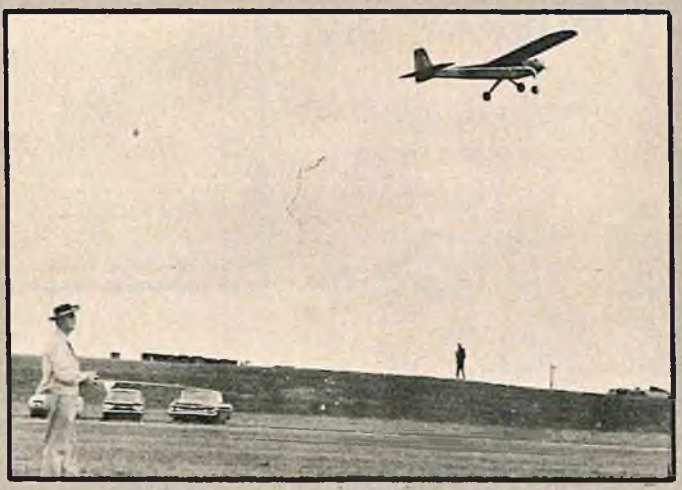
FLY-IN

Hill's original design—88" span, Merco .49 engine, Sampey gear. 4½ pounds of fuel!

Maynard Hill Breaks World Duration Record

Tops Russian Mark With 8 Hours, 52 Minutes, 25 Seconds

AMA President Hill sets new world duration record in Silver Spring, Md. on third attempt to beat Russian held mark.



Dick Weathers fires up his scale Ercoupe, 1st in Scale at Heart of America meet. Chuck Peers assists. Center, Leonard McCoy with electric fuel pump. Rt., Bud Atkinson and Aristo-Cat off on official flight. 50,000 spectators attended Heart of America Contest. Photos by Leo Gellhaus.

Winners at KCRC contest. Top row, Jensen, Slater, Reed. Bottom row, Van Zant, Peer, Hines. Rt., Mike Laboi, 13 year old 2nd place Class III Novice winner with Tourus-Orbit-Veco combo. Photos by Jack Albrecht.

Joe and Mike Petersen of Teays Valley RC Club — an all father and son group. Two scaled-down Pegasus's.

Northern Connecticut RC Club, Windsor Locks, Conn. An active club with weekly flying activities.

SOLO

(Continued from page 4)

channel to pop a parachute and shut down the motor. The battery pack was a monster. They were all easily obtainable dry cells. A full set set me back $14! The proper transmitter for this rig turned out to be big enough to have its own trailer and 24 volts to boot! Inasmuch as this gear operater around 70 mc, we built our own transmitter and got the frequency down on a ham band. With this chore completed, plus building a small trike gear from tubing, we were getting close to the time when we must fly.

At this point, I attempted to get an idea from people in the know as to what I might expect in flying the ship. Much unsolicited comment was available from ex-Navy men in the area who had spent many rounds of ammo trying to knock one down in gunnery practice.

Radioplane was the builder of this ship and since they were a local company, I gave them a call to find out how to go about it. I can appreciate the fact that they do not have much time for non-profit bearing goofballs, and under the circumstances, they were very good to me. They not only gave me a general idea of how the bird operated, but threw in a manual for good measure. Or good luck. Their chief test pilot, a Mr. McCoy, also bet me 100 to 1 (and I could name the medium of exchange), that I would never get one in the air!

The day finally came. I had completed all the testing that one could do in one's back yard. We'd run the engine (you've never been hit in the finger until you try one of these babies), tested the radio gear, loaded the camera, and alerted my insurance company. The agent was kind enough to add an endorsement to my homeowners policy for only $11. I suppose it really wasn't playing the game square when I described it as a model airplane...

Metropolitan Los Angeles didn't hold too much appeal as a likely flying site, but just over the hill was a perfect dry lake — El Mirage — that would do nicely. It is not too far from Palmdale and Edwards AFB, so I decided not to put my name on this one. If we lost control and it took off for the military, they might assume it had homing pigeon instincts and had finally made it back!

One does not start a project of this type without the word getting around. When we left for the desert it was a real caravan — five cars, three of them pulling trailers. The plan was to stay the night and fly the first thing in the morning. Some twenty men, women, and children were involved, and we had a rare time around the fire that night. (Ed. — Oh?) Although cold at night, the desert warms quickly as soon as the sun is up, so an active troupe was making final adjustments in the wee hours. A distance check was made — O.K.... engine runup — O.K.... children locked in the cars... cameras set to roll...

All that remained was for me to nod my head. Much as I would have liked to at that moment, I couldn't disappoint all those people after a ninety mile drive. Or could I?

They let it go and it accelerated rapidly... starts to drifts slightly left... gave a touch of right correction and the left wing went down fast... it two-wheels for about ten yards... better let it take its own head... one hundred yards and no tendency to lift even with constant short beeps of up... two hundred yards left to either lift off or abort... a longer shot of up and hold... it leaps into the air at a 45 degree angle ...a hundred feet up and a full stall ...and a plunge into the lake bed in less time than you can read this sentence.

You don't repair this one with white glue! We were done for. Somehow it never occured to me that I might spend my time with conventional R/C. When that thing plowed in, I made up my mind that we would fly one or else!

It takes five more trips and six airplanes to satisfy me, so be back next month and learn how the mysterious craters appeared on El Mirage.

COMMENT

by George Wells

AMA Adopts Electronics as Membership Processing Goes IBM

Indiantown Gap. Pa. probably would like to remain in its quaint little Pennsylvania Dutch obscurity from national pressures. But it cannot. The Blue Mountain Buzz Bombs R/C Club has seen to that. This is the outfit which runs one of the oldest "fly-for-fun" R/C events in the country.

The annual Labor Day weekend affair started back in the early '50's at Selinsgrove, Pa., and has been growing, growing, growing. This year's event attracted more than 200 enthusiasts, and it seemed that most were flying. An average of four aircraft were in the air all the time. This number often increased to five and six with a capability of eight! The only spot that left any air to breathe were the short flight lines on 51 and 54 mc.

It was with grim determination that the fly-for-funners started their engines and prepared to take-off into the aerial dodge-em. Some of the most hardened contest fliers, oft recorded as being somewhat disparaging toward fly-for-funners, appeared with old airplanes and wearing hard hats! Fortunately, few airplanes were lost — pilots kept track of which ship was theirs and the Buzz Bombs did a good job of pre-checking frequencies.

Once you were attuned to this zesty new approach to fly-for-fun, it was pretty thrilling — a few of the participants may never go back to "pink tea" contest flying. All of which leads to the definite conclusion that things in R/C are changing, changing, changing.

The most dramatic example of this at the Gap was the "official" bull session. As with most events of this sort,

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Circle No. 109 on Reader Service Card

Circle No. 110 on Reader Service Card

COMMENT

(Continued from page 37)

R/C'ers go more to talk than to fly. It is the big, end-of-the-summer event where the entire East Coast can get together and swap crash stories, technical data, and present gripes and ideas for improving things in general. With the Woodland Motor Court management as our witness, the bull session broke up **before** midnight! And to add sorrow to shame, the beer keg was not even floating in the ice barrel!

What was wrong? How come the session didn't run until 4 a.m. or better as in the "old" days? Simple. Things have changed. It used to be that there were all kinds of problems associated with a successful day's flying. Capricious equipment demanded constant attention, and even the most finicky fliers found it difficult to keep ahead of the gremlins. Thus, the bull sessions were loaded with deep conversational items such as how to repair reed banks, the latest way to spring-load a Mighty Midget servo, vibration problems, range problems with hand-held transmitters, battery problems, and so on.

Now everything seems to be factory made. Now, everything seems to work quite reliably most of the time. Now, all you have to do between flying sessions is plug in the factory-built charger. Now, there isn't much to

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Circle No. 111 on Reader Service Card

The Roostertail

The Official Publication of the International Model Power Boat Association
General Office: 2405 19th Avenue Broadview, Ill. 60155

REGATTA

Roostertail Regatta

The 15th Annual IMPBA Regatta has come and gone from Forest Park in St. Louis, Missouri. Neither the hot and muggy weather nor an hour of heavy rain could dampen the spirits of the contestants. In the R/C area the International Oval, Straight 1/16th, and the Big "C" Precision courses were in the water at all times. This gave contestants the opportunity to run any event at any time on either day. Competition in the Precision Course was rough inasmuch as perfect scores were turned in by Frank Toth, Ray Paulikas, and Mert Mischnick.

The Straight 1/16th Mile was timed more accurately than in the past by using a system built by Will Kleypas of St. Louis. Kleypas devised a method for running the Straight 1/16th in which a manually operated switch at the starting line would start a stopwatch, making an audible beep at the judging table. A second switch at the end of the course would stop the watch and make another beep. The timers could then use these audible tones to start and stop additional watches. This is a simple solenoid activated device that still relies on the observer at the finish line for the exact instant to start or stop timing. We are looking for a completely automatic system. If anyone has any ideas along this line, please contact the IMPBA General Office.

Reverend F. Zimmerman of Amboy, Illinois took the beautiful HIAA High Point Trophy by taking four first places! These included the ¼ mile oval, and straight 1/16th mile with a White Heat 60 powered by a ST .56. In the large class, Fr. Zimmerman captured the ¼ mile oval and the straight 1/16th run with a White Heat V and O&R Compact. Congratulations to Father for an excellent showing.

The banquet and annual meeting was held Saturday evening, July 4th. The big buffet dinner pleased the palate of all who attended. Following the banquet, merchandise presentations were made from the generous contributions of hobby industry manufacturers. Trudy Perzentka, four year old daughter of the chief of Octura Models, drew the winning numbers from a fish bowl. Those holding matching stubs were given their choice of prizes displayed on the huge banquet table. Contributions were received from the Ambroid Company, America's Hobby Center, Bonner Specialties, Burgess Battery Company, Citizenship Radio Corp., Cox Mfg. Co., Dumas Products, Dynamic Models Inc., Fleet Line Marine, G.E.M. Models, Grid Leaks, Grish Bros., Hawk Model Co., Micro-Mo Electronics, Octura Models, Pactra Chemical Corp., Pittman Electric Co., Sig Mfg. Co., Sterling Models, World Engines Inc., X-Acto, Inc. Many thanks to all of these manufacturers.

In addition to the numerous prizes, trophies were donated by the Hobby Industry Association of America Inc., Octura Models (Chicago), Bob's Hobby Shop (St. Louis), Tinkertown Hobby Shop (St. Louis), Astro Hobby Shop (St. Louis), and Charlie's Hobby Shop (St. Louis).

(Continued on page 48)

REGATTA

RC'er turned scuba diver — Earl Mundt diving for Marianne Preusse's Catalina.

Five events were featured at the Minute Breakers' Third Annual Invitational R/C Regatta, July 25-26, at Lombard, Illinois. In the exciting multiple boat races. Don Sussland edged our Mert Mischnick for first place with a White Heat X powered by an O & R Compact and F&M radio gear. Mert's contender was a White Heat Three Point with the O & R powerplant and Controlaire equipment. Third place honors went to Roy Miller with a G.E.M. Challenger II. Super Tigre .60, and Controlaire equipment.

In the two lap, Class A, B, and C combined (.00 to .29), James Miller captured top honors with a Berkeley Cobra, Cameron .19, and Orbit 4-channel. Winning time was 1:15.4. Second place went to Lee Pender with a G.E.M. Challenger Jr., Super Tigre .29, and Oribt 4, the clock stopping for Lee at 1:18.4. The third slot was filled by Bob Voelker with a White Heat 30, Johnson .29, and home-built proportional gear. Time was 1:28.7.

In the two-lap Class D and E Combined for .30 to .65 displacement, Father Zimmerman had the winning combination with a White Heat 60, Super Tigre .60, and Orbit 10, with a time of 44.3. Close behind him was Gene Milasius with a Challenger II and a time of 45.8. Third position was taken by George Kartochville and another Challenger II. Both second and third position winners used the popular Super Tigre .60 and Orbit combination.

In the two-lap Class F affair for .66 to 3.05, all three winners used the O & R Compact, with Don Susslands' White Heat X racking up a winning time of 45.9. Mert Mischnick was second with a White Heat Three Point

Minute Breakers 3rd Annual winners: L to R: Don Sussland, Mert Mischnick, Roy Miller.

Gary A. Preusse with Challenger Jr. after Straight 1/16 mile Class D2 record.

Jack Petersen with green and white Challenger — bounced end over end and continued to run.

Don Sussland checks out Petersen's Challenger prior to spectacular run.

Two more firsts for Lee Pender of Minute Breakers. Challenger Jr.

Jack Petersen second in .30-.65 c.i. ¼ Mile Oval at Tri-City

Al Sanders of Aurora, Illinois prepares a fibreglass White Heat X for run.

Marianne Preusse with her pink and white Marauder.

and a time of 49.4. Third was Harold McGowen with a White Heat V and 55.1.

In the Slalom, Scott Jordan's original design, powered by a Cameron .15 was first with a winning time of 1:10.7. Second place was won by Marianne Preusse with a G.E.M. Marauder, Cameron .19 and Citizenship 8 with a time of 1.22.1. Ruth Mischnick was third with a White Heat Three Point, O & R Compact, Controlaire 10.

For the first time in several years, the IMPBA Regatta, held at St. Louis, Mo., July 4-5, was marked by cool weather. On the not-so-cool side was the competition. Mert Mischnick of the Skippers R/C Club captured first place in the straight 1/16 mile ABC event with his .29 powered Challenger Jr. hydro. A record for the straight sixteenth mile was established for Class D2 by Gary Preusse and another Challenger Jr powered by a Super Tigre .40. Marianne Preusse, of the Minute Breakers R/C Club, captured three firsts at the Regatta.

G.E.M. Models should be quite proud of their line of fibre-glass kits, inasmuch as the majority of the winners in the .00 to .29 and .30 to .65 CI displacement speed events used these designs. In the larger displacement category, Whit Heats were predominant.

And for a record of another sort, we'll turn back the clock to last Spring. Gary and Marianne Preusse were testing Marianne's electric powered Sterling Catalina in the old stone quarry pond used by the Skippers' RC Club. In the midst of a turn, the Catalina — somewhat overpowered — rolled over on its side and sank. A sighting was made at the time and two police scuba divers were hired to locate the sunken craft. After two hours of constant searching, the boat was given up for lost.

During the recent winter months, Earl Mundt became an experienced scuba diver and decided to have a look for the boat during the spring thaw. Approximating the location of the lost boat, Earl dropped a weight attached to a 12′ cord to the bottom, then swam in an increasing arc until he reached the end of the rope. Surfacing, Earl commented that visibility in the murky water was about twelve inches! The weight was moved ten feet in toward shore, and Mundt once again dove to the bottom. A few minutes later, returned to the surface with the boat —

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INTERNATIONAL CIRCUIT

(Continued from page 33)

HOLLAND

Just in case you don't believe there's any RC activity in the land of wooden shoes and picturesque windmills, take a look at the eight-and-a-half foot span glider held aloft by Willy van Dorp. With no power assist and an all-up weight of nine pounds, it takes a hefty flip of the wrist to get this ship airborne! Willy and his wife also fly a 58" span, seven pound bipe labeled the Flying Fool. This model, somewhat diminutive by comparison, uses eight channels of an F&M Matador, and is powered by an Enya .45.

Seen fueling up a Fox .15 powered Delta is Windy Kreulen, well-known member of the international R/C set. Holding the Kraft transmitter is Jan van Vliet, Dutch champion, and definitely a flier to watch at next year's Internat's.

ENGLAND

Geoff Franklin, RCM's man in Great Britain, was first at the Wigsly Rally and second at the Bristol Annual with his scale Spitfire and Orbit two-stick proportional. Geoff, we understand, is trying to squelch the rumors that he flies the new Orbit rig because his brother Maurice works at the Orbit California plant . . . couldn't possibly have anything to do with that . . .

According to Franklin the new proportional system is excellent, but feels that the servo rotation should provide an increase of power as rotation increases, rather than a maximum amount at the start with a subsequent decrease. According to Geoff, this would be an improvement for aileron control inasmuch as it is presently difficult to apply a small amount of movement and hold that position.

The recent Aeromodeler Trophy meet had a rather poor attendance of only twelve entrants. Chris Olsen was 1st, Steward Foster second, and Geoff Franklin, third. The H. J. Nicholls designed Allegro flown by Franklin at the Aeromodeller Trophy affair sported retractable gear on all three wheels. Seven and a half pounds on reeds.

Top selling engine in GB at present is the new Merco .61 — light and powerful with an excellent throttle arrangement.

GERMANY

The swept winged machine held by an unidentified German RC'er is an interesting departure from the usual run-of-the-mill design. This particular ship is built with fixed wing and stab—no rubber bands or Dzus fasteners. Power is a Merco .49.

Radio gear is of original design. Model performed well at a demonstration given in France by a group of Dutch, German and Belgian RC'ers.

JAPAN

Just about one of the wildest (and friendliest) places to fly these days is Japan. For example, notice the normal attire of Bill Weaver posing with his Mustang just prior to his return to the U.S.!

Bill posed Saito and Oki and an unidentified friend with a magnificent scale Zero. This outstanding piece of craftsmanship is powered by a K & B .45 and Space Control proportional system. Lest we forget, Weaver's P-51 started out as a Sterling kit, finished off with aluminum enamel, and boasts retractable gear a la Shellenbaum design. Power is an O.S. .50. Radio is Space Control.

ON THE SHELF

Circular Airflow and Model Aircraft— *by Frank Zaic, Model Aeronautic Publications, 152 pps, $3.00.*

Frank Zaic's new book, in the author's own words, is in many ways a peculiar book. It is very likely the first one to analyze the model's flight in its entire flight range, and in an analytical range that is not covered by any existing text. We'll go one step further and say that this treatise is a significant contribution to the field of model aeronautics and a tribute to its author. Available from Model Aeronautic Publications, Box 135, Northridge, Calif.

Radio Control Handbook — *Timely Publications, 32 pps, $0.50.*

Owing to the initial success of the first edition of Timely Publications' R/C Handbook, this popular manual has been revised and updated, and should be of interest to many modelers who are planning to enter the field of Radio Control. Included are plans for several Rudder-Only designs, including contest, sport, training, and scale types. Other features included how to get started in radio, equipment to buy, and how to fly. Available from Timely Publications, Box 31, Halesite, N.Y.

Westee Hobby Imports Catalog — *Westee Hobby Imports, $0.50.*

The all new Westee Catalog covers the latest imports in engines, domestic engines, marine engines, drive accessories, marine drives, hand and small power tools, R/C and building accessories. Also included are coversion tables for cubic inches to centimeters, helpful hints for starting diesels, etc. Price is 50¢ which is refundable with first order of $5 or more to Westee. Available from Westee Hobby Imports, 5808 W. Chicago Ave., Chicago 51, Illinois.

(Continued from page 26)

RCMeter explain it during actual operation.) You will find that you will wish to use both Hi and Lo during all pulse extremes for a complete relay check. The meter is sufficiently damped to allow this without damage.

BATTERY TEST P.B.'s: These are not entirely necessary except that they allow you to keep a running check of the two 1½ volt cells that deflect the meter. If one or the other should drop in voltage, the relay tests would not be accurate. Battery tests are done with Pts. leads disconnected from any relay or escapement, Function Transfer Sw at RyCk and DAMP Sw first in Lo (least deflection) and then in Hi (most deflection). Do not depress both Battery Test P.B.'s simultaneously.

FUNCTION TRANSFER SW: This switch merely transfers the 3-0-3 vdc meter from the duties of indicating pulse to being a receiver tuning meter or simple volt meter.

When positioned at Rx Tune, a receiver plugged into the RCVR socket and RCVR Sw ON can be tuned to frequency. Either attaching the two coil leads to an escapement or a 50 or 100 ohm relay coil completes the circuit. Turn transmitter on and adjust receiver slug until the 3-0-3 vdc meter deflects as far as possible in one or the other directions toward 3 volts.

When Relay Check Meter is not in use it is a good idea to leave Function Transfer Sw at the Rx Tune position. Then if the Pts. leads should accidentally come together they won't drain the test batteries.

To use the 3-0-3 vdc meter simply as a volt meter, turn RCVR Sw off, Function Transfer Sw to Rx tune and use Coil leads as test probes. Polarity of Coil leads is not important as meter can deflect in either direction.

RCVR SOCKET: We've shown this wired to accept the majority of 3 volt relayless receivers. It can be altered to accept 9 volt or any other type receiver.

COIL LEADS: These are used when testing a relay on the face of the test meter or tuning a receiver with a relay or escapement. They attach to the coil of the relay or escapement. They are not used when testing the relay in a relay-type receiver. They are also used as voltage test probes as previously outlined.

PTS. LEADS (1, 2, & 3 on Schematic): Used as outlined in text.

Though this may look like a fancy toy — and you may find yourself checking relays just for the fun of it — it will prove to be a valuable instrument for many uses. Have fun!

(Continued from page 39)

The annual business meeting of the IMPBA was called to order at 9:30 P.M. with President Mert Mischnick presiding. Directors present included Bill LeFeber, John Zwack, Cy Crites, and Pete Yanczer, each of whom was introduced and joined the President at the speakers table. The function of each Director was explained as he came to the speakers table.

The reorganization of the IMPBA was explained in detail with all due emphasis given to the effort to improve communications among the membership. Questions from the floor were read and answered. Three motions were made and seconded along with the nomination of four new officers. These motions and nominations will be sent to the general membership for their approval or disapproval.

Jim Scott of St. Louis volunteered to compile a roster of IMPBA members on the basis of State and City, thereby providing each individual with a personal IMPBA Directory.

A question from the floor asked for a status report of IMPBA equipment and was subsequently answered in detail. Action has been initiated to investigate the possibility of incorporation for the IMPBA. Additional action was initiated to investigate liability insurance for all IMPBA members.

New records established at the Beloit, Wisconsin meet, held August 16th:

1/16th Mile Straight

Scott Jordan	(A-3) Oak Lawn	0:20.7
Scott Jordan	(B-1) Oak Lawn	0:20.8
Jim Miller	(B-1) Milwaukee	0:17.1
Frank Toth	(D-1) CMPBC	0:11.5
Gary Preusse	(D-2) MBI	0:09.9

¼ Mile Oval

Jim Miller	(B-1) Milwaukee	1:26.7
Gary Preusse	(D-2) MBI	0:50.7
Mert Mischnick	(F-2) Skippers	0:44.5

New records established at the Racine, Wisconsin meet August 29:

¼ Mile Oval

F. Toth	(C-1) CMPBC	0:59.7
Lee Pender	(C-2) Chicago	0:53.0

COMMENT

(Continued from page 38)

keep the bull session going after midnight. So what? Well, if you are nostalgic, this indicates the end of an era. If you are simply getting old, this is an advancement toward a decent night's sleep.

Things are changing as a result of electronic advancement all around us. Take TV, which next to wives, is the greatest single deterrent to model building known to man. Then there are the infra-red ovens which cook the frozen hamburgers in the drive-in joints where one is forced to eat on the turnpikes on the way to a contest. Yuk! You can't even take your car to a garage and have the mechanic tell you your carburetor needs cleaning without first having a fancy electronic "analyzer" treatment.

Now, from the Academy of Model Aeronautics comes the word that automatic data processing is going to take over membership processing. AMA says that the incorporation of such a system will substantially improve membership processing without additional cost. The present system — the faithful old hand method coupled with a trusted, but rusty, addressograph machine — will be relegated to more mundane mailings such as press releases, promotions, solicitations, etc. The IBM system allows for all sorts of helpful information about membership categories to be put on the tape, so that special mailings may be easily made to Junior members, or R/C members, and so on.

By not having stacks of addressograph plates filed in AMA headquarters, considerable space will be saved, the organization says. And, when the current building is torn down a year or so from now, there will be less furniture to move.

So what does this mean to the ordinary member? Just this. It is quite likely your membership or renewal will be handled promptly, and will

(Continued on page 50)

NOW IS THE TIME TO SEND A FRIEND OR RELATIVE A TWO YEAR OR ONE YEAR CHRISTMAS GIFT SUBSCRIPTION TO R/C MODELER MAGAZINE — A GIFT HE'LL RECEIVE AND ENJOY EACH MONTH OF THE YEAR, KEEPING HIM UP-TO-DATE ON EVERY ASPECT OF HIS FAVORITE HOBBY. SEND YOUR GIFT SUBSCRIPTION ORDER TODAY — A GIFT CARD WILL BE SENT IN YOUR NAME IN TIME FOR THE CHRISTMAS SEASON.

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COMMENT

(Continued from page 49)

not get lost in the January crush when one-third of all memberships are processed. This will eliminate one of the best scapegoats for griping around income tax time. How does the AMA expect members to get all steamed up if their new membership cards come back promptly?

The worst part of all is that this new-fangled machine is just liable to eliminate one employee from AMA headquarters. This one employee most certainly will be an attractive young girl, because all the girls working at headquarters are attractive. Headquarters, on the other hand, will try to explain this travesty to the membership by pointing out how much money will be saved on this person's salary, and that probably no one will be dismissed because the person replaced by the machine will be shifted to another job which is vacant.

This feeble explantation will not suffice those who visit headquarters from time to time. What we need in this world is more pretty girls, not more machines that work all the time. We need a little more room for human error.

It's a shame. A dad-burned, transistorized shame.

GIVE THE UNITED WAY

• This youngster represents the millions who receive help each year from the agencies and services of the United Campaign. He is a symbol of their hope, their need, their gratitude. And he serves to remind us of the work that is yet to be done in every community: of homeless children who crave love, of the elderly who seek dignity and fulfillment, of crippled and handicapped people who simply want a chance to help themselves, of families that need guidance, of the distressed who want friendship, of the thousands of sick who must be healed. When you think about it, the United Way poster boy is really our conscience. One gift works many wonders.

SHOWCASE '64

Fibreglass fuselage for Nat's winning 'Candy' — Cliff Weirick has commissioned GlasKraft in Santa Ana Calif. to produce his Nationals winning 'Candy' fuselage in fibreglass. Expertly engineered, the GlasKraft fuselage weighs 2¾ ounces complete. Servo boards are installed within the fuselaye with 4-40 blind nuts spaced for Bonner Transmites (unless otherwise specified by customer). Each fuselage is painted with first quality aircraft enamel in a choice of red, yellow, dark blue, cream, or white. Birch motor mounts are bonded to the fuselage and adaptable for engines from .45 to .60. A fibreglass firewall is also internally bonded and cut to accept the neck of a standard 8 or 12 ounce clunk tank. A vertical fin is an integral part of the fuselage. Full size wing ribs, wing, stab and rudder are shown on the plans furnished with each fuselage. Complete construction details in the 11/63 issue of RCM. Money-back guarantee on each GlasKraft unit. Price: $24.50 F.O.B. Santa Ana, California. Tested and recommended by RCM. **Circle #1 on the Reader Service Card.**

Midwest Lil Tri-Squire — Midwest Products Company, manufacturers of the popular Tri-Squire kit have announced the release of the Lil Tri-Squire for .049 to .09 engines. Span is 40 inches, length 27½ inches. Price $5.95. **Circle #2 on the Reader Service Card.**

CG Senior Falcon — Following on the heels of the popular Falcon 56 and Junior Falcon is the new Senior Falcon from Carl Goldberg. With a span of 69 inches, length of 53 inches, and area of 810 square inches, and an all up weight of 6¼ pounds, the newest member of the Falcon line was designed for both competition and reed or proportional training. According to Bill Dennis who reviewed this kit for RCM, this is a strong model, easy-to-build and fly — one the average modeler can take to the field and fly successfully, then bring back home at the end of the day in two pieces — wing plus fuselage and tail assembly. Excellent prefabrication and die-cutting. Very simple to construct. Well-detailed plans. Engineered for simplicity and strength, and with the average flyer in mind. Although omitted on the plans, the C.G. should be located 4¾" back from wing L.E. Price $19.95. Tested and recommended by RCM. **Circle #3 on the Reader Service Card.**

Schuco-Hegi SB-7 R/C Scale Glider — Featuring a styrofoam fuselage, the Model SB-7 is based on the original drawings of the full size sailplane designed and built by members of the Brunswick Technical College Flying Club in Germany. This is a scale design whose performance on 4-6 channel radio equipment will equal the full size prototype. This is a 90½" span model with 490 square inches of area. A deluxe kit, most of the tedious work is eliminated by extensive prefabrication. The foam fuselage is recessed for power pack, receiver, plus ample area for two servos for rudder and elevator control. Although no parts are furnished for a power pod, the SB-7 can be flown with .049 assist. Price $21.00. Enclose 10¢ for an R/C glider catalog from Willoughby Enterprises, and **Circle #4 on the Reader Service Card.**

Beach Comber Kitted by Veco — Veco Products Corp. has put Jim Kirkland's 1963 Nationals and King Orange Internats winning Beach Comber into custom kit form. Production engineered by Clarence Lee, the new kit contains all R/C grade pre-shaped hatch blocks, 4 inch wide wing balsa, full-length die-cut fuselage sides, planking, formed and notched leading and trailing edges, and machined oak motor mounts for perfect alignment. The hardware package includes formed landing gear, steerable nose gear, complete servo linkages and elevator and aileron control horns. The exceptionally well-detailed plans show complete installation for three separate R/C equipment options. Accompanying in-

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Circle No. 123 on Reader Service Page

Circle No. 124 on Reader Service Page

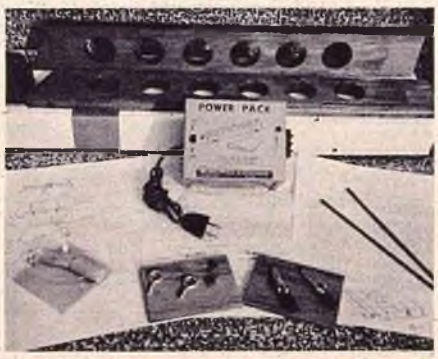
Circle No. 125 on Reader Service Page

SHOWCASE '64

(Continued from page 53)

structions cover the installation of a variety of servos, receivers, and mechanical linkages. Span 64½ inches, area 780 square inches, weighs 6 pounds. Price: $29.95. **Circle #5 on the Reader Service Card.**

Foam Core Wing Kits and Hotline Wing Cutter — Meinke Model Engineering of Florida, manufacturers of high quality preassembled RC wings, have released their newest addition to an outstanding line of RC products in the form of foam core wing kits. Pre-cut and cored from top quality foam, each kit is complete with 1/16" balsa covering material, gear mounts, ailerons, pre-cut spars, plus complete instructions. Wing sections are available in Taurus, Candy, Viscount, Stormer, and Orion types. For those who prefer to design and construct their own foam core wings, Meinke has released their Hotline Wing Cutter, Plywood Wing Templates, Hotline Power Pack designed expressly for their Wing Cutting Bow, plus Nichrome Elements, plus preformed plastic wing tips. The Foam Wing Kits are $16.95 each. Hotline Wing Cutter Bow, $9.95; Wing Ribs, $1.95 per set; Power Pack, $17.95, replacement nichrome elements, $2.29 per pair. All of these items have been tested and are recommended by RCM. Details on the construction of foam core wings can be found in recent issues of both Grid Leaks and American Modeler magazines. **Circle #6 on the Reader Service Card.**



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(Act of October 23, 1962; Section 4369, Title 39, United States Code)

1. Date of Filing: September 15, 1964.
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A. Total no. copies printed (net press run)	27,863	62,586
B. Paid circulation		
1. To term subscribers by mail, carrier or by other means	1,980	3,460
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C. Free distribution (including samples) by mail, carrier delivery, or by other means	560	614
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CHARLES W. WAAS, Managing Editor

When you respond to an advertisement, please say that you saw it in R/C Modeler. The advertiser appreciates this information and RCM appreciates your loyalty.

REGATTA

(Continued from page 42)

the entire recovery taking a total of 13 minutes.

The water was drained from the Sterling Catalina, and much to the surprise of all concerned, the motor and servo, while in need of oil, were otherwise in good condition. The nickel cadmium batteries were flushed with distilled water and new electrolite was added. The receiver, secure in its poly-refrigerator container, was still in operating condition with only a couple of ounces of water around it. The rust and corrosion was removed, and the reeds, tube, and two capacitors replaced.

The end of the story? After twelve months of sitting on the bottom of the pond, this same radio was used by Gary at the IMPBA Regatta in St. Louis to set a new world's record in Class D2.

As for Marianne — she is replacing the few soggy planks in the Catalina, and hopes to try again for a world's record in the electric class!

Gary Preusse of the Minute Breakers established two new world records in Class D-2 by capturing both the straight 1/16th mile and the ¼ mile oval at the Tri-City Radio Controllers Annual Invitational Regatta held at Riverside Lagoon, Beloit, Wisconsin, Sunday, August 16th.

Plauged by an accidental full-speed crash of his fibreglass Challenger Jr. into one of two steel pipes protruding from the middle of the course, damage was minor and Preusse went on to capture the two new IMPBA marks with the same hydro.

Mert Mischnick was first in the ¼ Mile Oval (over .30) with 44.5, Lee Pender was victorious in both the ¼ Mile Oval and Straight 1/16th Mile for under .30 displacement. Don Sussland captured top billing in the Straight 1/16th mile for .30 and over.

This year, in lieu of the zoo duck pond, Racine's Wing & Hull R/C Club held their Annual Invitational regatta in an old stone quarry at Aqualand in Racine. Final tallying of the scores for the ¼ Mile Oval saw Lee Pender

first in the .00-.29 class, Father Zimmerman tops in the .30-.65 displacement, and Don Sussland champion of the large displacement .66 to 3.05 cubic inch class. In the ¼ Mile Oval for Electric Speed, Marianne Preusse was first with a time of 1:29.42. Marianne was also first in the Gas Slalom, winning out over Jim Miller and Frank Toth, second and third respectively. Frank Toth captured the Electric Slalom with a time of 1:38.7.

The photo of Jay Brandon, new head of Dumas Boats, shows him putting the finishing touches on Dumas' PT 109, the first of a new series of kits released by that company. The new PT 109 was chosen by Dumas because of its smooth lines, fast hull, and its unique and outstanding record during WW II. The kit is engineered for .15 cu. in. mills and R/C equipment. Frames are of ⅛" plywood. Decks are pre-notched and planking is of 3/32" balsa. 33" length with a beam of 9". Dumas presently produces over 20 wood model boat kits, ranging from a 36" Chris Craft Cabin Cruiser to 12" motor boats for the Junior Modeler. Recent additions to the Dumas line include the PT 109 and thre hydroplanes.

One of the leading R/C manufacturers in this country would like to hear from R/C boat enthusiasts who would possibly be interested in a two-channel superhet feedback proportional system specifically designed for R/C boat operation. The proposed system would provide proportional steering trimmable motor and would retail for approximately $150! For further details when available, drop a card or note to R/C Modeler, Regatta, P.O. Box 487, Sierra Madre, California. We will forward each one on to the manufacturer in question.

RC MARKET PLACE

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COMPLETE Space Control System in excellent condition. Reworked by Orbit. $400 or best offer. Gary Patterson, 401 East 12th, Grand Island, Nebraska.

GLASS CITY Multiplex. New. Cost $225 plus full nicads $30. Take all $175. • G. G. Elsasser, Port Ludlow, Washington.

FOR SALE: Slightly used Sampey 404 unit. Reasonable. Donald Miller, 606 Eden Street, Plaquemine, La.

MARK V Space Control. New. Displaced by a late model proportional rig. Never crashed. 27.195. $350. Bob Green, 12153 E. Dakota, Aurora, Colorado 80010.

DEE BEE Quadruplex MK-II, S/N 377 complete with charger and sealed nicads throughout. On 6 meters. $275. John Martin, P.O. Box 948, Ashland, Kentucky. Phone 324-5189 (days) or 325-4323 (nite).

UP TO 50% trade-in allowance on used radio control units for a new single or multi channel unit in most popular makes. Send 70¢ for a complete 120 page catalog listing all types of planes, radio units, and accessories (refundable with first order). Listing of used equipment sent free upon request. Phil-Nick Hobby Supply, P.O. Box 84, Oaks Corners, New York.

FIBREGLASS R/C fuselages, Beachcomber type, Balsa wing, tail. $69.50. Kits available. 10¢ for details. Model Engineering, Box 8803, Tampa, Fla.

and an oversize, high-tensile steel shaft. The hardened Meehanite piston delivers long engine life and a remarkably short break-in period. An aluminum con rod and ground steel wrist pins with brass pads are employed, as in the familiar Veco .45. The essentially square design has a 0.634 bore and a 0.633 stroke. Idle is from 2,000 to 14,000 RPM. Price: $24.95. **Circle #8 on the Reader Service Card.**

6-Volt 1.2 Amp Hour NiCad Pack — RM Electronic Company, distributors in the hobby industry for Gould National Batteries, has produced a 6-volt nicad pack utilizing the cylindrical, 1.2 amp nicad cells. This pack is tapped at 1.2 and 2.4 volts, and color coded to match popular transistorized multi servos. The individual cells are contained in a square, high-impact polystyrene plastic case. An amphenol socket comes prewired to the pack with two matching plugs included, one for installation and the other for use with a charger. Although slightly heavier and larger than conventional multi battery packs, it will provide 2½ times the flying (or sailing) time of a conventional 500 mah 6 volt pack. It is also ideally suited for pulse proportional systems such as Dee Bee, Glass City, etc. Tested and recommended by RCM. Price: $27.95. Prewired matching charger, $7.75. **Circle #9 on the Reader Service Card.**

THE SUNDAY FLYER
by KEN WILLARD

will be resumed in the December issue following the completion of a new R/C design for the sport flier.

WATCH FOR IT!