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September • October

THIRTY-FIVE CENTS

GRID LEAKS

R/C
DATA
SERVICE

VOLUME 3, NUMBER 10

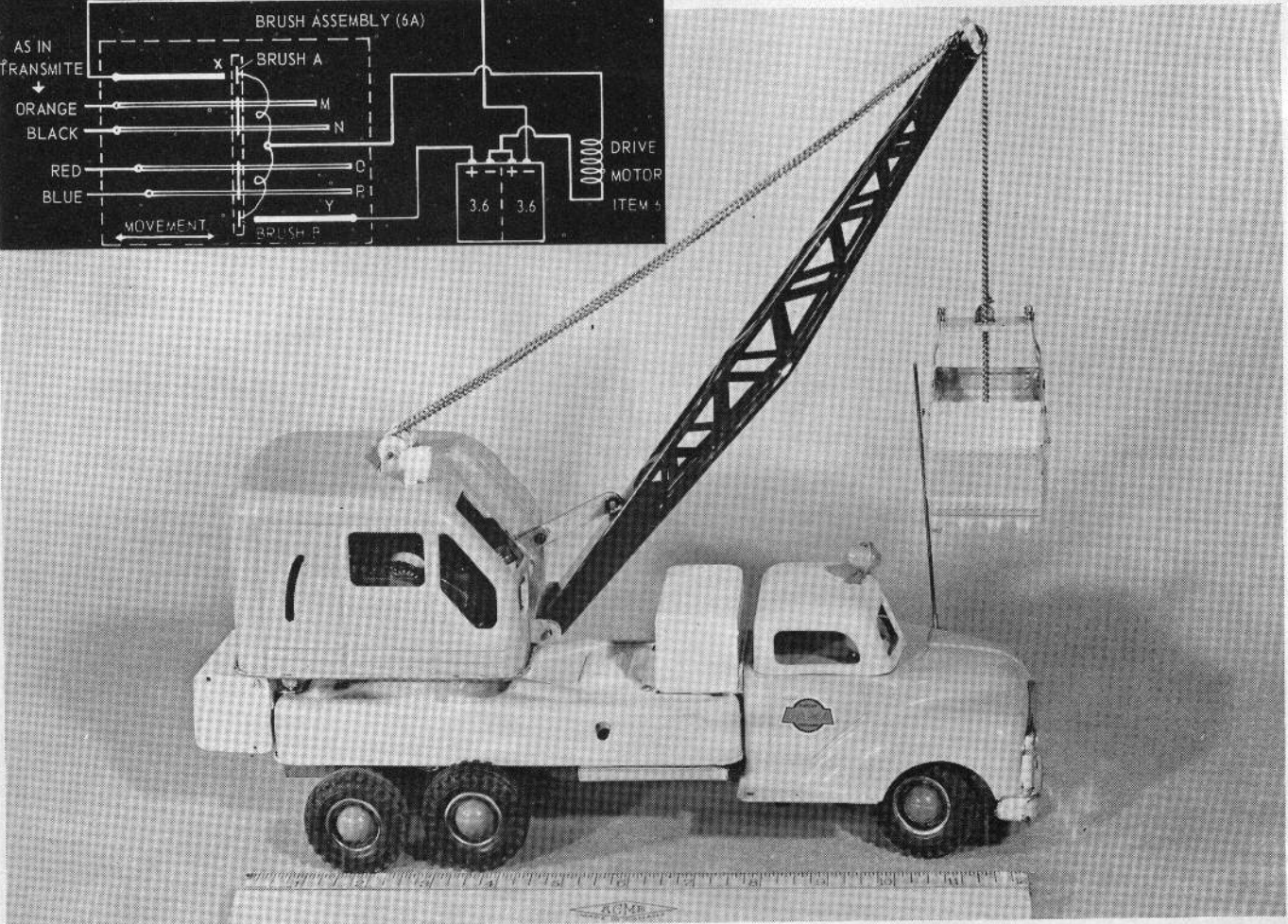
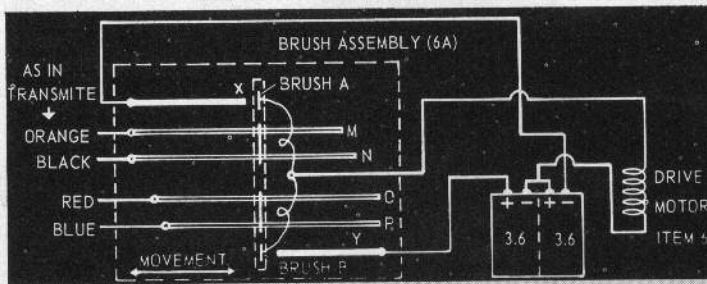
SPECIAL!

World Radio Control Championships—First published results and pictures from the great International Contest concluded on August 19. An on-the-spot prepared exclusively for Grid Leaks by Jack Josaitus who accompanied the U.S. team to England — See pages 8 and 9.



Tom Brett Won Fly-Off Flight for the United States at the R/C World Championships.

PAT PATTERSON'S FABULOUS CLAMSHELL CRANE • GLIDING AND SLOPE SOARING IN ENGLAND • PULSE-BLIP FOR INTERMEDIATE • THOSE 3V RECEIVERS



German-made Gama Crane is typical of "toy" projects suited to R/C.

R/C CLAMSHELL CRANE

By J. D. PATERSON

(Publisher's Note—This project comes to us from Egypt. J. D. Paterson is with the UN forces there and, while originally from Canada, finds R/C an excellent pursuit. The project is unique and, while this exact toy may not be available in all places, the principles applied by Mr. Paterson can easily be adapted to other vehicles.)

CANADIAN WINTERS effectively halt the flying of radio-control aircraft. Last winter I invested my hobby spare time in the development of this radio-controlled clam-shell crane. The project was a rewarding one—and a most unusual one, you will agree—despite some unexpectedly tough problems.

The crane is a German-made (Gama) toy, and turned out to be none too large for the gear I crammed into it. First of all, it carries an eight-channel home-made receiver and other gear which gives right and left steering, forward-stop-reverse; the bucket can be raised and lowered. And the cab rotates in either direction.

Steering is performed by a Transmite trimmable servo, but all the other servos are home-made—the servo amplifiers being made up from useful information extracted from GRID LEAKS. Servo and propelling power is supplied from Deac nicads. These can be seen in the white box behind the truck cab, and at the rear end. (I tell everybody that they are reserve fuel tanks!)

Receiver is a copy of a Bramco of three years or so ago. I am using 2N44's plus a IAG4. The servo amplifiers are a copy of Bonner Transmites, circuitwise, except that I have used 2N243's and 2N538's for transistors.

Pictures may not shown clearly that the crane carries five electric motors. In addition to the Transmite for steering, there is a geared-up Mighty Midget which switches forward-stop-

reverse to the Japanese motor used for propulsion. Up in the cab another Japanese motor is employed to raise and lower the bucket. The fifth motor is another Mighty Midget, which rotates the cab through 360 degrees in either direction. Power for these motors in the cab is brought up through a disc-brush setup having three contacts.

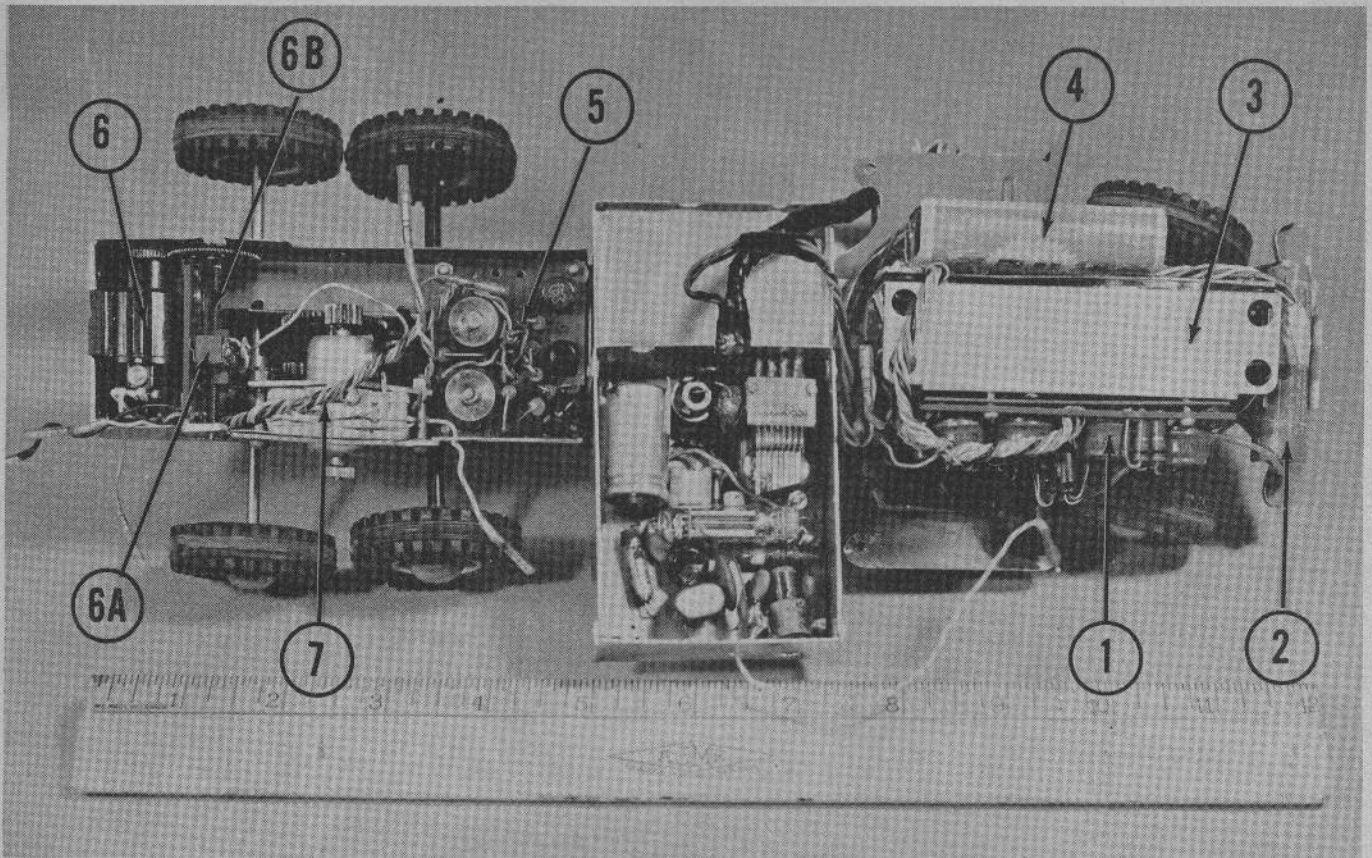
Although the basic wiring setup was adhered to, some modifications did have to be made, because my servo amplifiers were home-made. Referring to the photos, item 6 is a Mighty Midget which carried brush wipers (6A) along screws (6B). These wipers perform two jobs. One set is the ones normally used in the Transmite circuit. The others switched the drive motor, item 7. (See circuit illustration.) The color codes for these wires correspond to those of the Transmite servos.

Brushes A and B are wired with a jumper and make contact only with the strips marked X and Y. (Shown in neutral position.) Strips marked M, N, O and P correspond to those in the trimmable Transmite. The only other thing peculiar to the crane wiring is that the green wire (external) found in the Transmite runs from each servo amplifier (item 1). This meant that I had to transfer three wires from the fixed base of the truck to the rotating cabin. This was accomplished with a circular three-circuit panel and brush assembly (10) which, unfortunately, is not too clear in the picture.

While this is not a detailed construction project as presented, the project can be easily duplicated by anyone having practical experience in R/C.

Many toys—tanks, tractors, trucks, for example—can be equipped for R/C. They can't crack up, give you something to do at the workbench when the airplanes don't need repairs. The kiddies, be they seven or 70, will be fascinated with them.

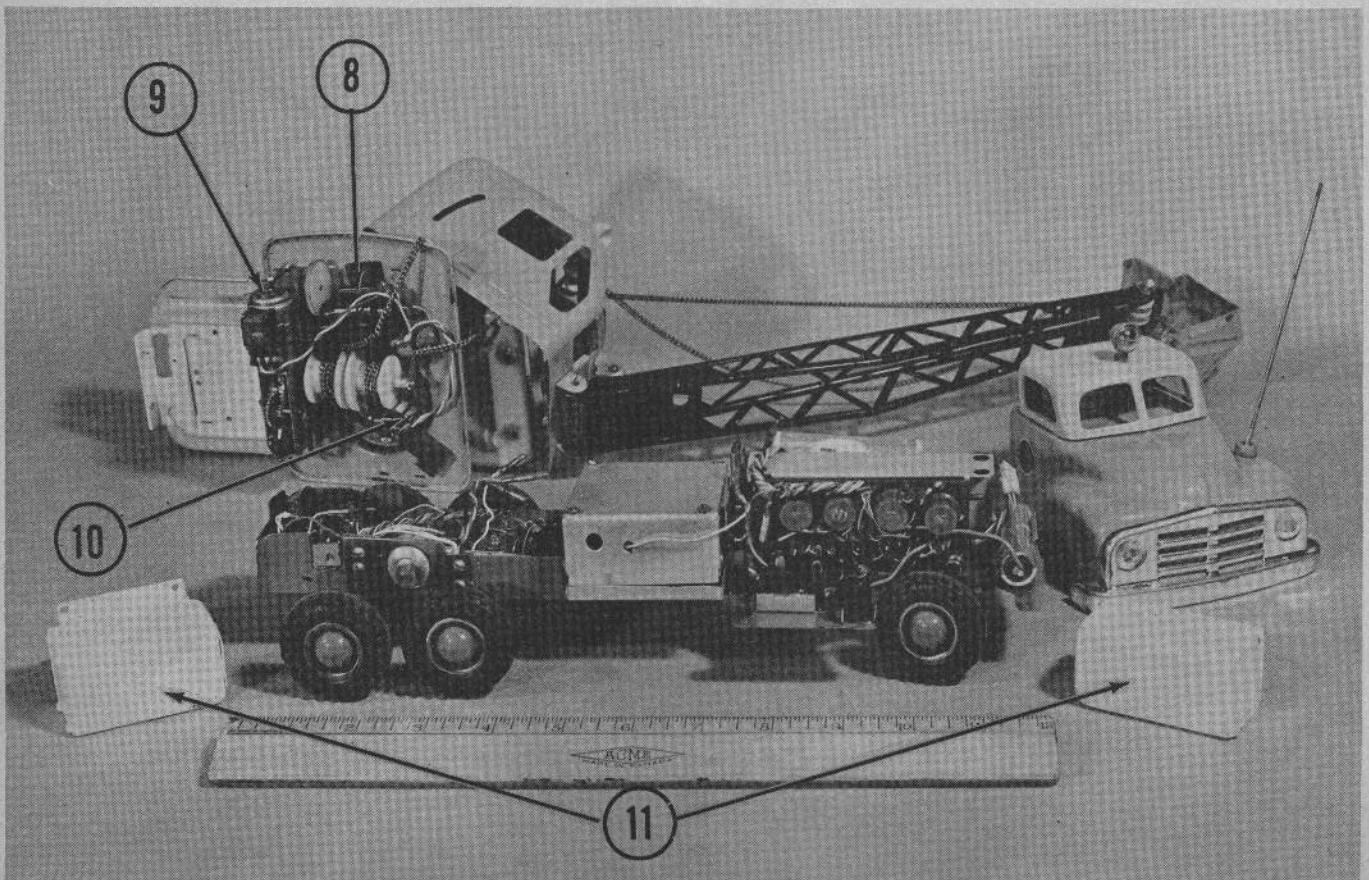
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1—2-in-1 H.M. servo amplifier, one-half for cabin rotating motor, other half for bucket motor. 2—1.5v filament battery. 3—Transmitter for steering. 4—30v HT. 5—H.M. amplifier to drive electric motor (item 6). 6—Mighty Midget with worm-driven wipers to switch drive motor (item 7). 6A—Brush assembly. 6B—Screw on which brush assembly travels. 7—Drive motor giving forward and reverse, neutral

or stop, all switched by P.C. wiper board.

8—Cabin rotating motor. 9—Bucket control motor. 10—Brush pick-off's from servo amplifiers (item 1). 11—Old IF cans trimmed down to take Deac nicads. One provides servo power, the other drive-motor power (item 7).



ULTIMAX

- All-transistorized proportional system
- No relays No pulsing
- Dual-prop possibilities
- Small and light
- For small aircraft
- Fail-Safe

(Publisher's Note—This is an experimental circuit and not a proven one. Much experimentation is going on in this country, and therefore we are sharing this circuit from France to help advance the art. It should be noted that the maximum top cycles per second allowable by FCC is 4,000. This circuit can be adapted to fit.)

By FRANCIS R. PLESSIER Captain, F.A.F.

ULTIMAX is a proportional system without pulsing, all transistorized, without relays, light and simple. It has not been flight tested due to poor weather and it will fly first on rudder-only, plus engine, then on dual. Tests seem to be very satisfactory. It is designed for small multi planes (4 ft. wing span, 3 lbs. weight).

The circuit is the result of a few ideas put together. First, after having built a Dual-Prop Marcytone receiver, it is logical to work on a low-voltage, all-transistorized receiver. It is rather easy, with something looking like a TR 4.5 receiver in the front end, filters and a power transistor (2N 321) in place of the relay. Such a receiver is interesting, but then came a second idea.

If we plot the current intensity in the coil of the servo (here a Southwestern MACTU-ATOR, but a SAGE would be better) versus frequency, we have a curve plotted in full, with the peak around 4000 cps. This would be the left coil, hence the Left order. If we use a non-proportional system, the Right order must be quite separated, about 6000 cps for instance. This is easy.

Let us suppose that the frequency "Right Order" is about 5000, hence the dotted line which is quite mixed with the other. If the frequency is 5000, we will have 160 MA in the right coil, hence a full "Right" order. Now, let us suppose further, that the frequency of the modulation is variable between 4000 and 5000 (with a stick, or a pot).

If we have 4000 cps it is full Left (A).

In B we have about 140 ma in the left coil and 20 in the right, hence a half Left order. In C, the two currents are identical, hence

it is straight flight; in D, it is half Right and, in E, full Right.

We have a continuous proportional order between Left and Right—two more filters, two more transistors and another actuator and we have Up and Down.

It is, in fact, a "discriminator" circuit, but without any feedback from the servo. Main problem is that the current is limited; we have to use an actuator without much torque, and the planes have to be small. This is not so important as the weight and size of such a receiver are very small too (1 x 2 x 3 in. and 3 1/2 ozs.).

The modulation also is used to keep a relay closed for fail safe and engine control, as usually a loss of modulation will bring the control to neutral and send the current to the engine escapement, switching from high to low speed. The engine is cut after five seconds of loss of modulation—it is the time used by the engine to burn out the fuel of a 2-inch long neoprene tube.

Let us have a look at the schematic. The front end is a super-regenerative circuit "borrowed" from a C.G. receiver. L.F. amplification is common, but the 20,000 pf capacitors are CR 60. At the end is a 200-ohm low impedance relay which is always on (as long as modulation is on) except in case of modulation, which gives fail/safe and engine control in the usual way.

The L.F. modulation (4000 to 5000 cps) is taken before the third transformer and goes to the usual transistor and filter circuit. Filters are smaller than the Marcytone ones: 4-mm diameter, 25 mm long; for the tubular dust core (1/8th and 1 inch about) with 500 to 600 turns of wire. The total diameter is 10 mm (3/8 in.). Instead of a relay, the first transistor switches off a second transistor (2N 321). The current of each 2N 321 is separately adjusted to give about 160 mil in a coil of a Southwestern actuator by a 10,000-ohm adjustable resistor.

This schematic is used to have two batteries in order to separate the circuits: 4.5 volts for the receiver and six volts (nickle

cadium cells) for power. You can see that the six volts comes through the "hot" contact of the relay, hence in case of loss of modulation, the relays come open and the controls come back to neutral.

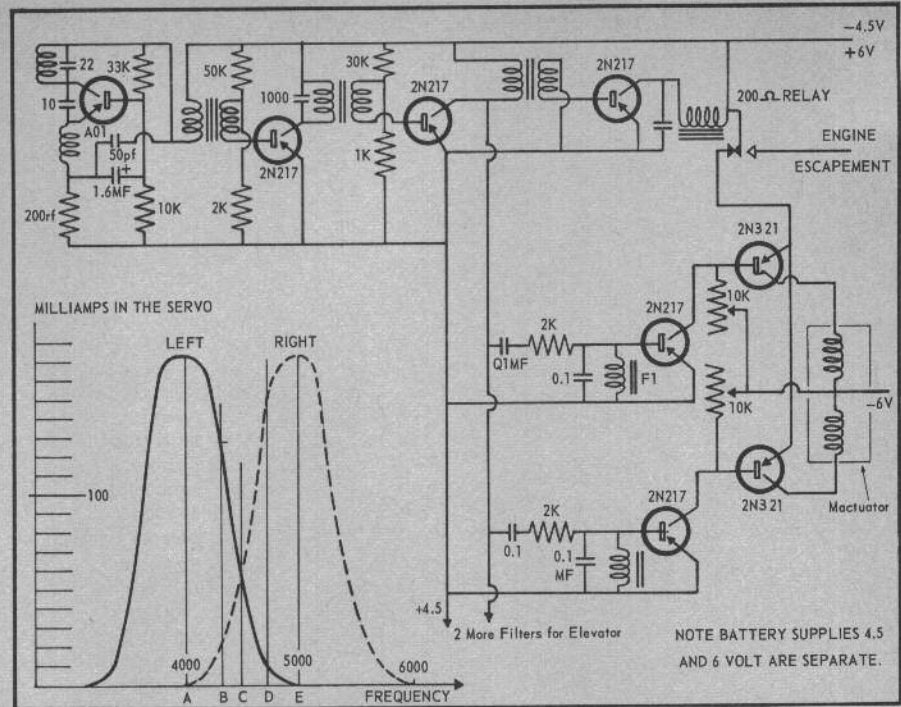
When the modulation (which is not necessary a sine wave) is adjusted between 5000 and 4000 cps, the current in each coil of the actuator goes from zero to 160 ma in one and 160 to zero in the other in a very progressive manner, hence the torque on the rudder linkage. Actually, if there is no centering spring, this does not give a smooth continuous displacement of the rudder, but as torque is progressive, in flight the air loads will be sufficient to give a very proportional control.

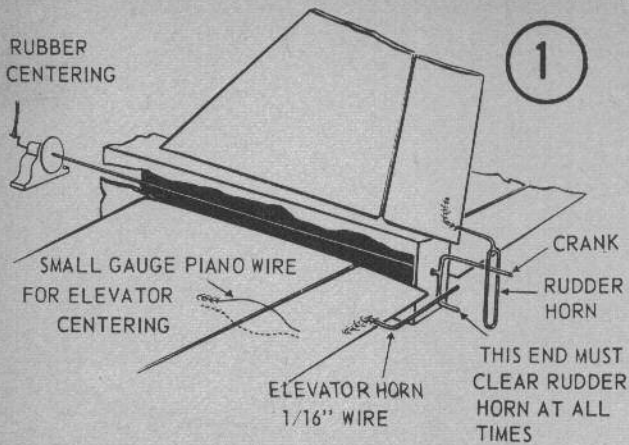
This is the actual state of the system, but two other filters can be added for elevator, giving proportional elevator. In this way you can have a true dual proportional receiver, rather small and light. A problem is that the torque of the magnet-type actuators is much smaller than motor-driven ones, but the latter need complex feedback systems, with extra pots, transistors, a.s.o. . . . I intend to fly it in a 45-inch span job, with an .09 Torp as power and a 2 1/2-pounds maximum gross.

The transmitter is very simple. The usual Marcytone transmitter can be used, but with a control box housing a stick mounted on two 60-degree pots, plus two pots for trim (normal adjustment of the frequency, stick neutral, in the middle of the two frequencies used—here, 4500 cps). A multivibrator type of oscillator can be used. Mine utilizes small filters to smooth out the square angles of the square wave produced, plus an adjustable amplifier to have 100 per cent modulation.

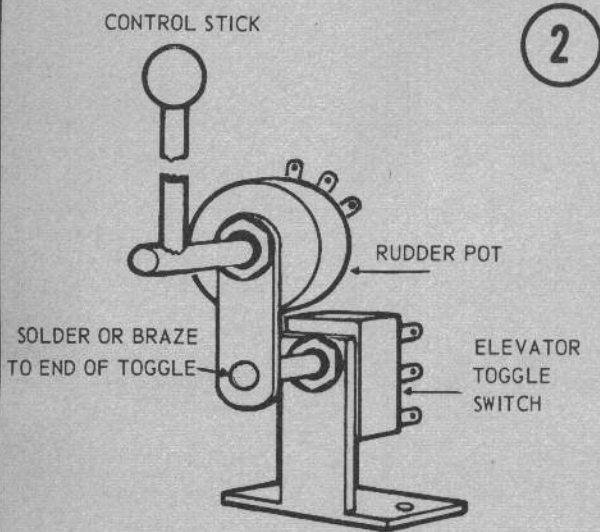
I should be very glad if these ideas prove useful to readers to GRID LEAKS. I think it is a simple approach to a light-weight dual-proportional system, and I would be glad to hear from anybody working on it, and to exchange info and data.

Captain Francis R. Plessier, F.A.F.
Bretigny S et O
France

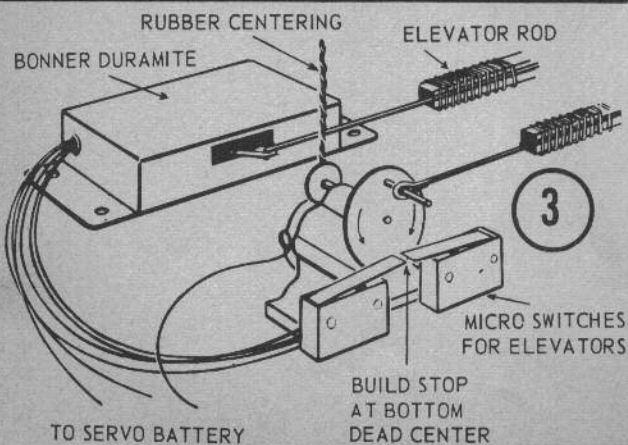




Reprinted from DC/RC Newsletter (Pulseblip)



PULSE BLIP SYSTEM FOR INTERMEDIATE



Editor's Note—George Wells is a prominent member of the DC/RC group. It has been our pleasure to talk with him on several occasions at AMA Headquarters about Model Aviation and, of course, radio control. Inasmuch as Intermediate, or Class II, has had such an uncertain development to date, it was your editor's thought that Wells' interesting comments in the DC/RC Newsletter would prove timely for GL as well.

DO YOU WANT TO GET AWAY from the frailties of "Galloping Ghost," and put some real guts into your down-elevator? Do you want to do outside loops, inverted flight, insides as tight as knotholes with single-channel equipment? Well, you can either ring out your ship within an ounce of folding the wing with either of the methods described here. Both are relatively simple and inexpensive compared with more sophisticated intermediate systems such as McEntee's.

To start you need a rudder or Galloping Ghost ship which has lots of power and a strong nose section. Reliable equipment is the key to successful intermediate flying because there are less built-in fail-safe features than in rudder-only and multi. The Kraft single-channel receiver suits all requirements here; however, my work has been with the ACE T.R. 4.5.

The basic theory in pulse-blip systems is that your control system will feature a proportionally pulsed rudder and a bang-bang elevator. Essentially, you are flying rudder-only except when you give blips of down- or up-elevator. The elevator action might be likened to real flying. When you are giving blips of elevator, your rudder cycles through the extreme positions and returns to neutral.

This may give you a little unwanted rudder in loops, but can be compensated for by a little unwanted rudder while blipping. The following system was flown successfully by Tommy McGraw. It can easily be adapted to the layout of most proportional rudder ships simply by installing a new torque rod and some added control horns. (See Fig. 1.)

The control box must be modified slightly so that fore and aft movement of the stick actuates a toggle-type switch similar to those used for control levers on reed transmitters. I used a modified double-pole, double-throw, center-off, non-locking switch purchased at Kenyon Electronics. The switch replaces the signal-on and signal-off buttons on the control box which are used for motor control. Signal off should produce up elevator if a fail-safe is not used. (See Fig. 2.)

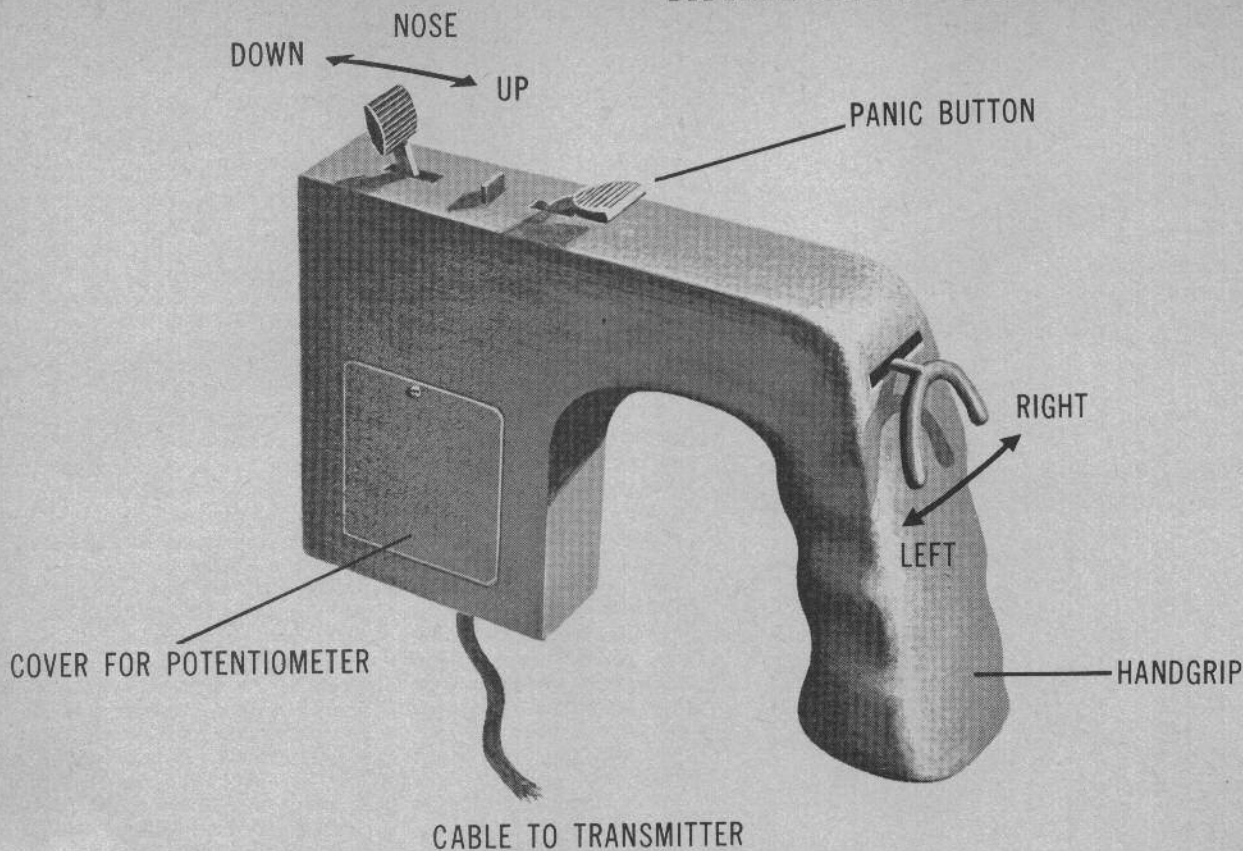
If the airplane is trimmed properly for level flight upwind, calm-day flying can be rudder-only, with an occasional blip of up for trim when flying downwind. Maneuvers are accomplished from a straight and level attitude by giving longer blips to the elevator. Rarely will it be necessary to hold a solid signal for a long duration, therefore, a circuit which detects presence or absence of signal can be used for fail-safe and motor control, but using a longer time delay. Engine speed can be changed in flight without producing a loop if the airplane is flying at a slow airspeed. I used down-elevator for motor control, and when it was desired to change engine speed from high to low, I simply pulled the airplane into a shallow stall and applied the down elevator which straightened out the airplane and changed the engine speed at the same time. Moving from low to high is no problem. A pulse-rate detector can be used for motor control without affecting the elevator, but does not provide fail-safe.

The second system was flown with some variation in a Smog Hog for about two years. It has the advantage of more power for the elevator, needed in eight-pound airplanes, and the Bonner Duramite has a built-in elevator trim which eliminates many small blips. The Micro switches used to actuate the Duramite proved to be very rugged, and the guarantee of 1000 switchings is a gross under-estimate by the manufacturer. They are available at Electronic Wholesalers at about \$1.25 each. The lever arm can be made from small diameter music wire, or light spring bronze or steel. The switches are wired into the Duramite circuit exactly as you would hook it up to a pair of relays in a reed receiver. (See Fig. 3.)

It might be worthwhile to mention a couple of systems which didn't work, or which were so complex as to be self-defeating. The above system was followed by an electronic method of getting elevator by switching from an intermediate pulse rate to a high pulse rate for up and a low pulse rate for down. The high and low pulse rates actuated two separate rate circuits (Ketchledge, DCRC Newsletter, Aug., 1960, reprinted from NJRCC Newsletter). This eliminated rudder interaction when driving the Duramite, which encouraged me to try coupled ailerons, which was too much. The pulse rate circuits enabled better flying, but in retrospect it seems that the expense and trouble of installing this delicate circuitry would be better spent in building McEntee's system.

I also tried the Greenwood system (DCRC Newsletter, July, 1961, reprinted from NJRCC Newsletter). This worked amazingly well on the bench, but the vibration set up by the K&B .45 prevented good contact of the wiper arm in the airplane. All manner of shock mounting and increase of tension on the wiper failed to produce a really reliable system.

HANDGRIP CONTROL BOX



GLIDING and SLOPE SOARING in ENGLAND

(From the M.A.R.S. Pulse, of Montreal, Can.)

UPON HIS RETURN FROM a vacation in England, the editor of the M.A.R.S. Pulse, a club paper produced in Montreal, published a report of interesting radio-controlled gliding and soaring activity based upon an interview with Bob Copland, of the Northern Heights club.

An ex-Wakefielder (one of his flights was timed by your editor at Bendix, N.J. in 1939), Copland is widely known for beautifully designed and built model aircraft of the streamlined variety. Several members of the Northern Heights group took summer courses in full-scale gliding and Bob himself holds a Silver C. What could be more natural than a strong R/C glider interest in this club?

Slope-soaring gliders is their specialty and, apparently, when they are not gliding the big ones they are gliding the little ones! The small ones, Copland reported, often fly faster than the big soarers and, because the models make use of smaller patches of rising air they can out soar the full-size machines under marginal conditions.

Recently completed by the Northern Heights lads is an eight-foot sailplane with which they hoped to attack the world endurance record for R/C gliders. Although these events transpired nearly a year ago, the outcome is not known—presumably the project is a continuing one.

With an estimated speed of 35 to 46 mph the eight-foot glider has a wing loading of 12 ounces. To experienced fliers this speed for a glider, especially of such light loading, may seem high.

Copland claims, however, that this high flying speed is necessary for adequate penetration during the course of a full day's flying. The receiver, a six-channel affair, is a club design. The M.A.R.S. Pulse editor says that, by American standards, it is somewhat unusual. It is a six-reed relayless vacuum-tube design with plug-in transistor amplifiers to drive the servos. It is stated that the vacuum-tube circuit is very reliable and that battery weight is no problem with this type of a model because a considerable amount of ballast would have to be carried in the nose—and this can be batteries.

Five-channels yield left and right rudder which are self-neutralizing, up and down elevator trim and a panic button which returns all controls to neutral simultaneously.

Servos are made from re-wound Mighty Midgets which draw only 60 milliamps, described as being well within the capabilities of the Mullard OC71 transistors employed in the servo amplifiers. The Pulse editor describes the servos as being excellently made, with polished and reworked

gearing and drum-type commutators. Gear ratios are about 60 to 1 for the elevators and 10 to 1 on the rudder.

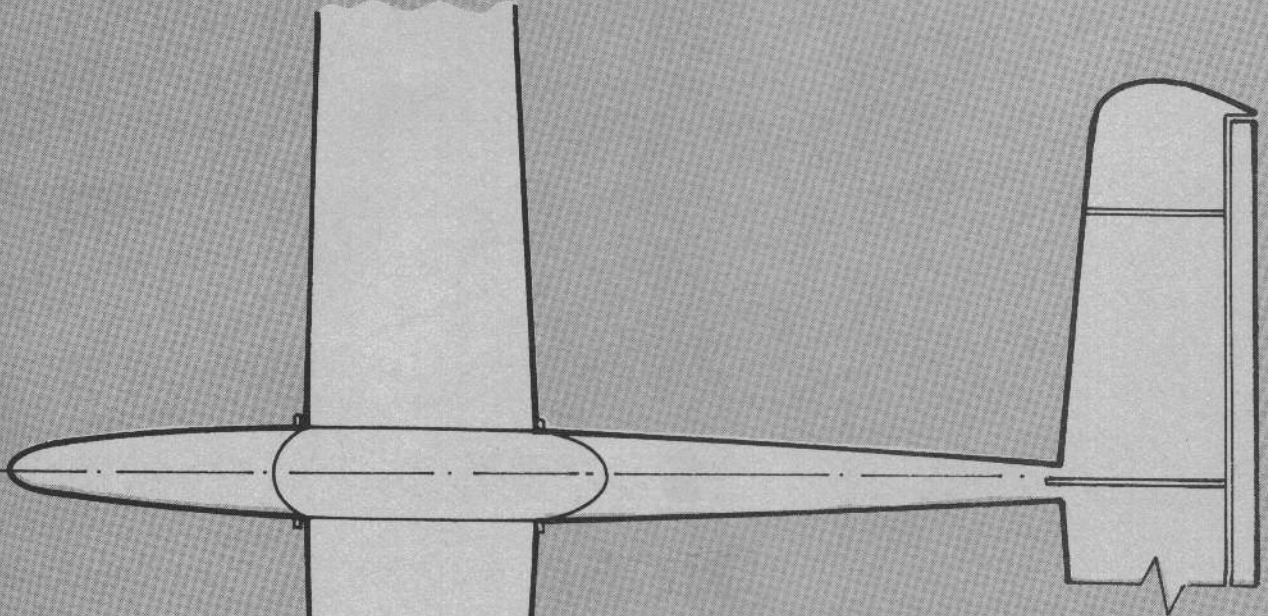
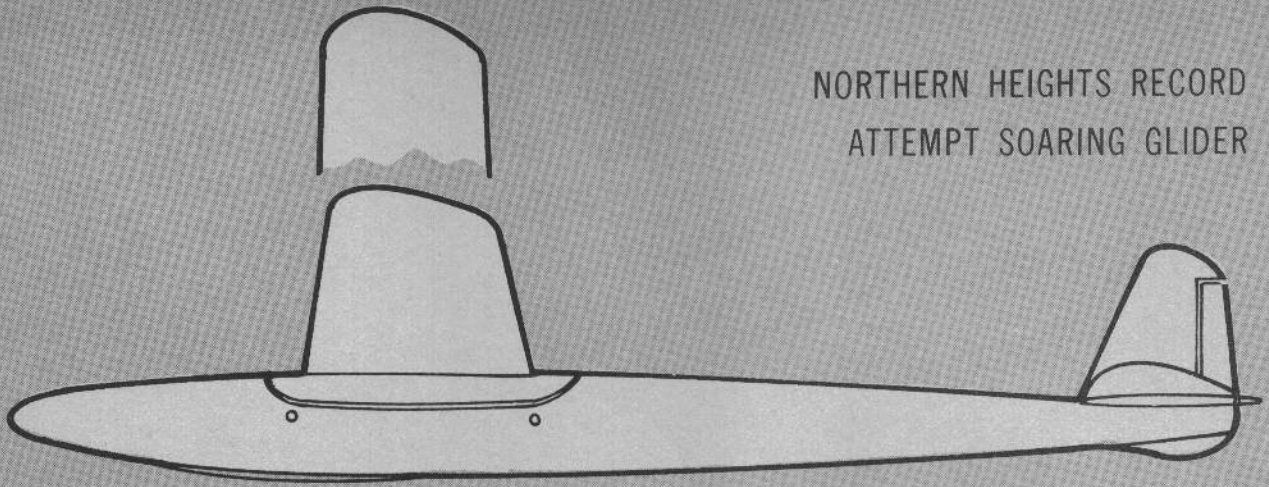
A straight taper and straight dihedral distinguish the wing, which is held on by rubber bands which run across the fuselage over the wing saddle. To preserve a smooth contour, the bands are recessed in grooves cut in the saddle. Vertical tail area is augmented by two small fins outboard on the stabilizer.

A unique control box is used. It is designed to be held in the right hand, so that the thumb can operate a specially shaped handle which serves as a left-right lever switch. The trim switch and panic button are worked by the left hand.

The reporting editor comments that it is doubtful if a stunt flier could use this type of control box, but points out that on the glider, rudder is used occasionally and the elevators only infrequently—the panic button, hardly ever! The idea behind the box was to allow long flying periods without fatigue, but the box would be capable of immediate operation when necessary without the chance of confusing the controls.

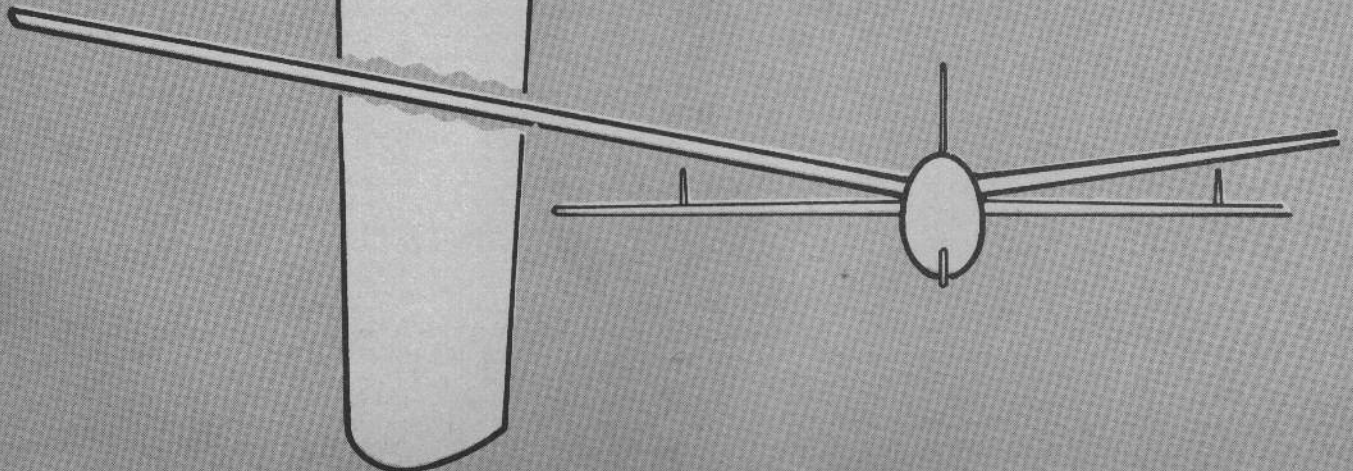
The Pulse article winds up with a Copland quote, "It is very comfortable to hold when you are lying flat on your back on a nice sunny day."

NORTHERN HEIGHTS RECORD
ATTEMPT SOARING GLIDER



SPECIFICATIONS

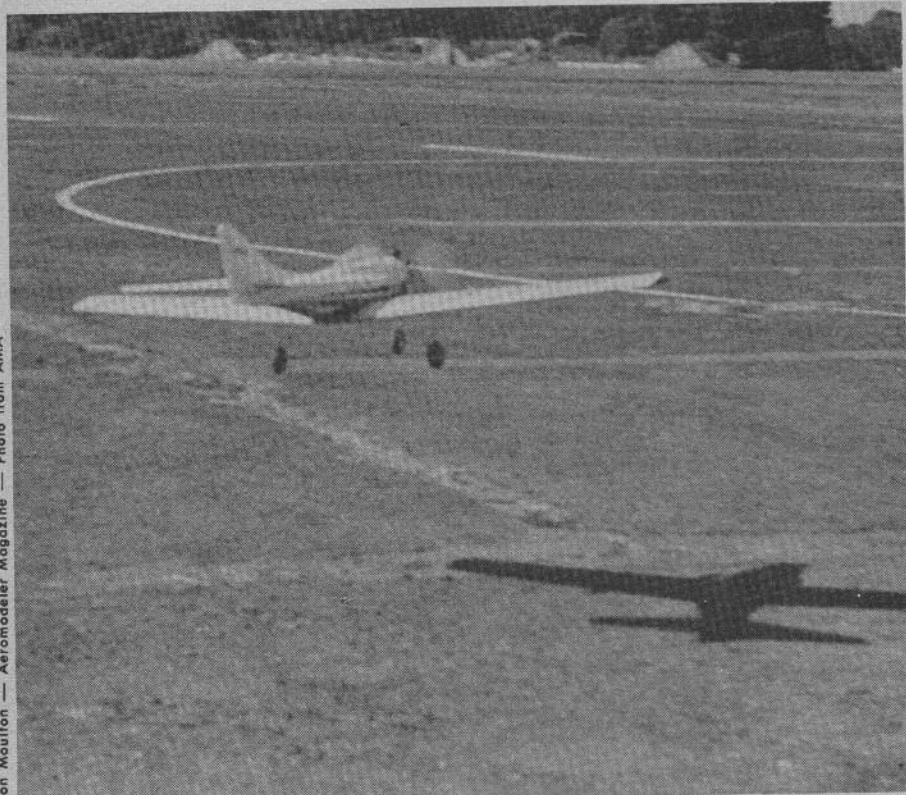
SPAN 8 FT.
WING LOADING 12 OZ. SQ. FT.
FLYING SPEED 35-46 MPH



1962 WORLD CHAMPIONSHIPS FOR R/C

First published results and pictures from the great R/C Contest

Ron Moulton — Aeromodeler Magazine — Photo from AMA



Tom Brett's Perigree heads for the center of the circle.

TOM BRETT, U.S.A., WINS TIE-BREAKING FLY OFF! BRITAIN AND U.S. TIE FOR FIRST! ENGLAND TAKES BEST TEAM!

Behind this story . . . To score this beat, on-the-spot GRID LEAKS reporter Jack Josaitis air mailed his notes to Bill Winter on Long Island and his negatives to Witt Holloway in New York. While publisher Runge held the presses in Missouri, the pix were developed and Jack's notes organized and lay-out made all within 24 hours.

In a sudden-death fly-off with Harry Brooks of Great Britain, Tom Brett of Detroit flew his Orbit-equipped, K&B 45-powered Nimbus "Perigree" to a clean but hard-won individual win for the United States. On their fourth and tie-breaking flights Brooks scored 1288 points and Brett 1496.

Despite the good showing of Don Brown who took fifth place and Willis Robinson, named to the U.S. team after Doug Spreng found it impossible to go to Europe, and who flew a new model with 30 minutes total air time to ninth place, Great Britain won the Best Team award.

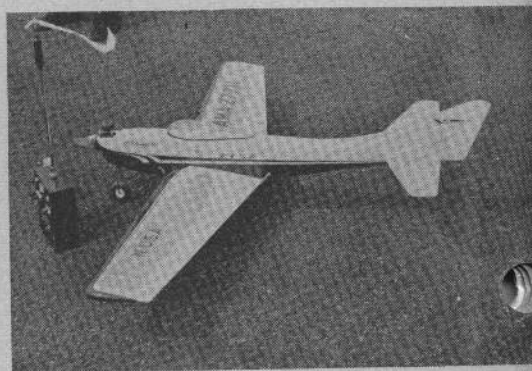
Best two out of three totals of 2749.6 points for Chris Olsen the "Upgrar" man, 2931.2 for Brooks, and 2628.6 for F. Van den Bergh, considered the top Britisher, the English team demonstrated surprising consistency. The three Englishmen finished two, three and four.

Thus, Britain and the U.S. monopolized the top five places. The United States captured second in Team, Germany third, Belgium fourth, and Italy fifth.

Some 13 countries, including Soviet Russia which did not place, attended the August 17 to 19 World Championships for R/C held at R.A.F. Kenley, Surrey—approximately 25 miles south of greater London. Japan and Russia fielded two-man teams, Norway and South Africa one-man teams, the others had full three-man teams. Thirty-two pilots flew.



Tom Brett won fly-off flight for the U. S.



Bretts' Perigree, Winner of The King's Cup.

For the two practice days, Wednesday and Thursday, the weather was typically British—gusty, mixed rain and sunshine, mostly cloudy and about 60 degrees. Each three-man team was allotted 45 minutes practice time, countries with less than three men, 30 minutes. Flying order was determined by drawing lots. By American standards the first competition day, Friday, was cold, with winds estimated by your GRID LEAKS reporter as high as 25-30 mph—which the British regard as completely flyable.

Saturday, the second day of competition, was almost completely sunny with moderate breezes of 10 to 15 mph. Sunday was clear and less windy.

"As I write," reported Jack Josaitis, "the contest is lead by Brooks of England. He is doing a good job, yet is regarded by the English not in a class with Frank Van den Bergh. Right now he is plagued with problems.

"With a couple of maneuvers to go on his first flight, Frank did a vertical dive into the grass while attempting a spin. Since he has no spare model, he stayed up most of the night and put it back together. Bob Dunham helped check out the radio, and a slide switch (pressure contact) was found to be his trouble. On his second flight on the same maneuver he recovered too close to the ground, lost flying speed and stalled out.

"The American team," continues Jack's report, "has done well with Don Brown holding top score on the first day. He had a good score going for him Saturday, but ran out of gas with three maneuvers to go. Brett did better on Saturday, but still not good enough to give America the lead. Sunday is strictly a battle for the King of the Belgians Cup and the Best Team award also now looks like a British victory.

"Brown must better 1627 points on his last flight, and Brett 1535 to beat Brooks. The best single flight score at this point is Brooks with 1507.6, so the boys have to go some.

"Brown just flew and the engine quit during the tailslide (best one we saw). He is out of the running. Brett is our last hope. Now Van den Bergh completes his last flight—finally got past the spii. maneuver.

"Tension mounts as Tom Brett puts up his "Perigree" and he succeeds in bettering Brooks' total of 2931.2 with 2933. But there



Winning British team, L to R: H. Brooks, S. Uwins, F. Van den Bergh, C. Olsen.

Ron Moulton — Aeromodeler Magazine — Photo from AMA

Ron Moulton — Aeromodeler Magazine — Photo from AMA



Don Brown flew shoulder wing on Multiplex proportional.



Willis Robinson had only 30 min. air time on 9th-place model!

must be a fly-off, even though Brett is 1.8 points ahead. FAI rules state that there must be a difference of at least 2% between first- and second-place scores.

"A possible upset could come from Chris Olsen, yet to fly, but he must do close to 1700 points to beat Brett. He does not!

"Fly-off position is determined by a flip of the coin. Brooks is first and gets only 1288. Brett scores 1496 and takes the King of the Belgians Cup.

"It looks as though Brett and Brooks are to be considered as co-world champs because of the 2% rule and the best I can gather from the officials is that the fly-off determines who takes the King of the Belgians cup."

Highlights:

Of the 24 Americans attending—including several from the armed forces in Europe, 14 came from California, including Bob and Carl Dunham, Howard Bonner, Jerry Nelson, Bob Elliot, Frank Hoover, W. S. Deans, Ray Downs . . . although the overall calibre of flying, in the opinions of people connected directly with the event, rose considerably over Zurich in 1960, it was felt that the standard of flying set by Kazmirski and Dunham was not equalled this year . . . the meet was dominated by the Orion influence; America radios and servos almost entirely.

The Russians deserve credit. They made almost everything on their models except the engines. The two pilots, A. A. Arler and P. M. Velichkovsky, were pleasant. Neither spoke English, but did understand German and one of their mechanics understood a little English.

Their models were generally underpowered and were at a great disadvantage in the wind—most maneuvers were unrecognizable. Everyone seemed to be pulling for them and all felt quite bad that they were not able to do better. . . .

Brett's model spanned 60.9 in., with 570 sq. in. of wing area. Fitted with an Orbit superhet, it weighed 5¼ pounds, sported a nifty two-tone blue color scheme. . . . Bothered by fuel and radio problems, Russians took home two Merco 49's, one donated by Monte Malherbe of South Africa who removed it from his Stormer. Orions have flown in Russia and the name Kazmirski is not unknown. . . . Harry Brook's model spanned 69 inches, weighed 7½ pound with McCoy 60 and F&M Hercules Midas

radio (Johnson Automix throttle). Bob Dunham pitted for Monte Malherbe who flew Flat-top Stormer with full-span ailerons. . . . Don Brown impressed all with his smooth flying on his own Multiplex proportional radio and DeeBee servos. "May be thin edge of wedge for proportional," opined Ron Moulton of the *Aeromodeler*.

KING OF THE BELGIANS CUP

1. Tie: Tom Brett USA
- Harry Brooks Great Britain
3. C. Olsen Great Britain
4. F. Van Den Bergh Great Britain
5. D. Brown USA
6. Bosch Germany
7. M. Malherbe South Africa
8. G. Samann Germany
9. W. Robinson USA
10. C. Teuwen Belgium

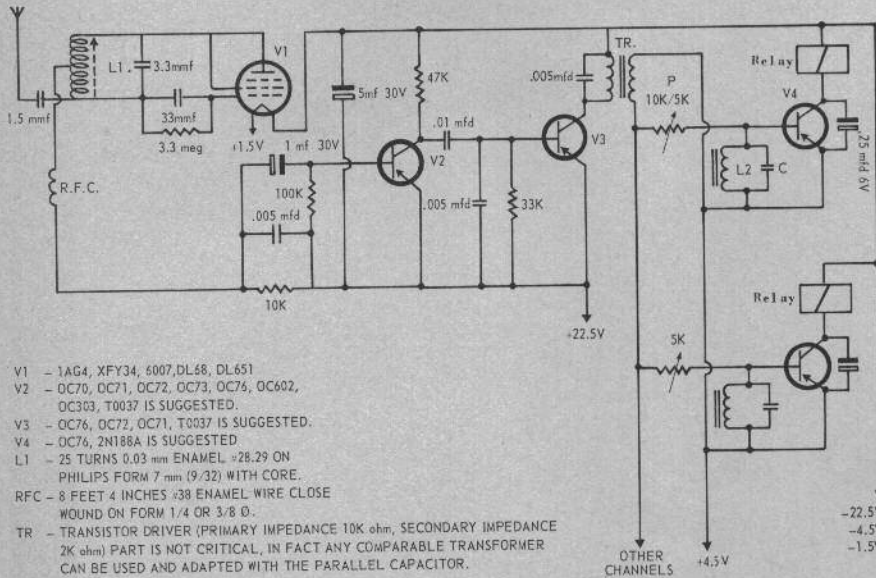
(Editor's Note—Tom Brett, by winning the fly-off, was awarded the King of the Belgians Cup. GI information has Robinson in 7th, but official results communicated to AMA, and confirmed by Ron Moulton, list him 9th; 6th, 8th, and 10th places not confirmed by press time.)

Best Team:

1. Great Britain
2. USA
3. Germany
4. Belgium
5. Italy

(Third, fourth, and fifth team places as indicated by Jack Josaitis' personal box score.)

THREE TUBE-TRANSISTOR RECEIVER CIRCUITS



- V1 - 1AG4, XFY34, 6007, DL68, DL651
- V2 - OC70, OC71, OC72, OC73, OC76, OC602, OC303, T0037 IS SUGGESTED.
- V3 - OC76, OC72, OC71, T0037 IS SUGGESTED.
- V4 - OC76, 2N188A IS SUGGESTED
- L1 - 25 TURNS 0.02 mm ENAMEL #28-29 ON PHILIPS FORM 7 mm (9/32) WITH CORE.
- RFC - 8 FEET 4 INCHES #38 ENAMEL WIRE CLOSE WOUND ON FORM 1/4 OR 3/8 D.
- TR - TRANSISTOR DRIVER (PRIMARY IMPEDANCE 10K ohm, SECONDARY IMPEDANCE 2K ohm) PART IS NOT CRITICAL, IN FACT ANY COMPARABLE TRANSFORMER CAN BE USED AND ADAPTED WITH THE PARALLEL CAPACITOR.

The Continental (Above)

L2 is wound on Ferrite-Ferroxcube 3B or 4B cores, outer diameter 4.1 mm, inner diameter 2 mm, one-inch long. (Wound Marcy filters could be used with cps already selected.) A form is made of cardboard and wound with 0.25-mm enamelled Number 30 wire. Relays are 130-ohm Siemens but Gem or Deans of 100 ohms should do just as well.

Table for Winding the Audio Filters

Turns	Frequency
1200	1000 Plus
1200	1900 Minus
900	2400
700	3000
550	3500
450	4200

WHILE THERE IS a tremendous interest in 3-volt receivers, some users are finding them a little finicky, since they do require an understanding. One of the prime complaints is that most makes do like something better than pencils, which have a high internal resistance. This is not the fault of the receivers and the answers are easy. Use either alkaline energizers or nicads (latter at 3.6-v if this does not exceed manufacturer's recommendation).

Interest in the tube-transistor receiver is far from dead. While the 3-v receiver is ideal for ultra small models (1/8A) the extra B-battery in the tube receiver is not normally a handicap, in anything larger, nor are the separate actuator batteries. So here are three tube-transistor circuits.

Left is E. D. Pelsmacher's Continental (from Belgium), a multi expandable type which is quite popular in Europe (D. Lambert design).

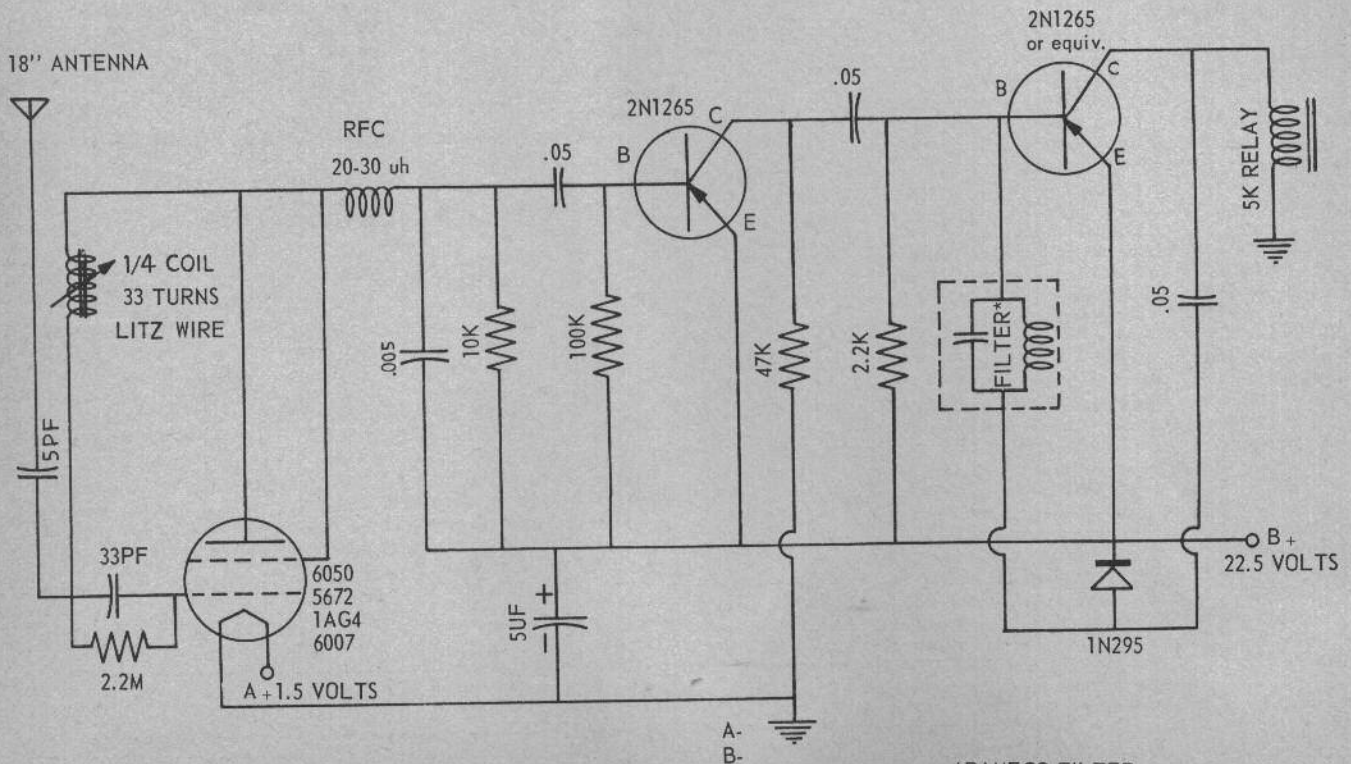
Below is a receiver by Edward Pagel who is on Okinawa.

On the opposite page is what we are forced to label the "Mystery Receiver" since its designer is temporarily unknown.

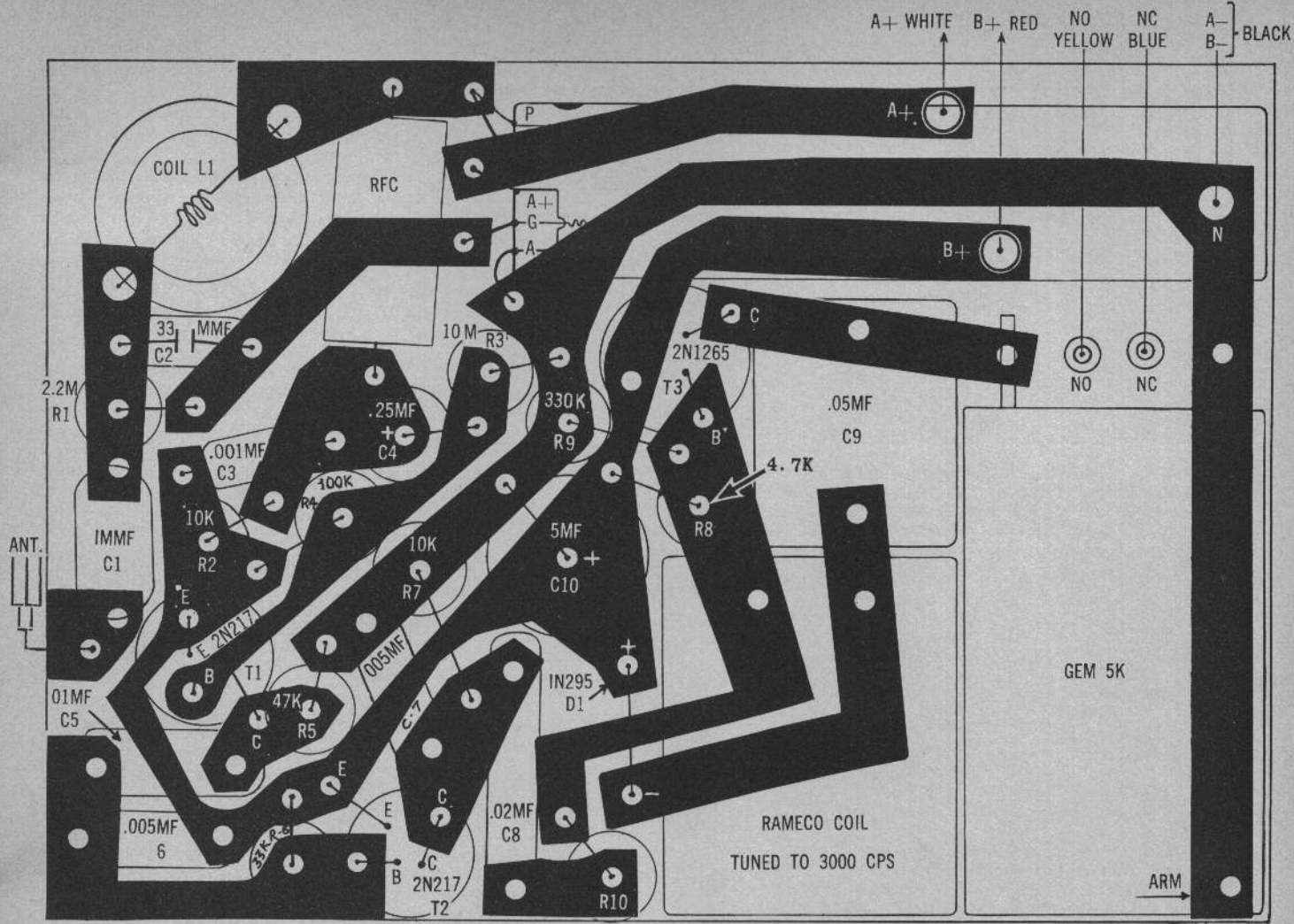
So this article covers different approaches by three designers from widely separated parts of the globe.

Pagel (Below)

Utilizing the extremely low audio power required for Rameco filter operation, this circuit minimizes hard-to-get components, such as electrolytics and transformers, yet is stable, reliable and has good range. Proven circuitry combines with a simple, easy-to-build receiver which is sharply selective to the filter frequency selected. Fight tested AOK. Nothing new but saves on components. It works only with Rameco filter but seems quite tolerant of transistors. A 6050 tube was used but receiver should work with others listed on schematic.



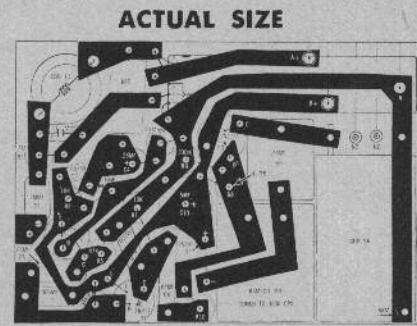
*RAMECO FILTER CHANNEL 4 to 8



"Mystery" Receiver

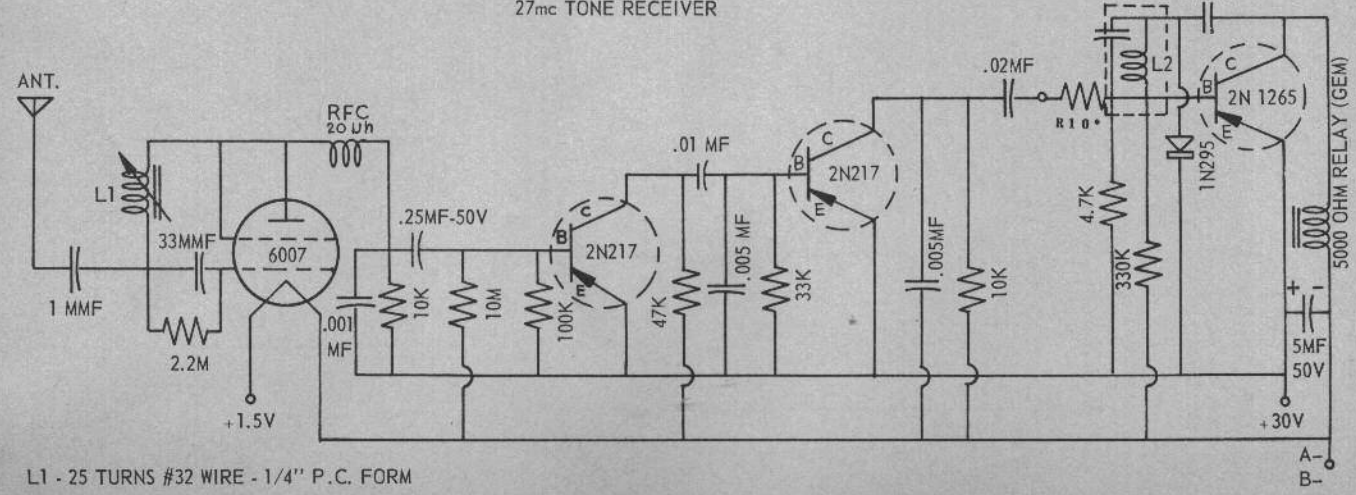
This is a 27-mc tone receiver with a printed circuit. Unfortunately, and with a red face, we cannot give appropriate credit for the excellently done art and drawing, because, during the confusion of our recent move to new quarters the designer's letter which accompanied the drawings was misplaced. If the GRID LEAKS reader who sent it to us will make himself known we'll make mention in a future issue and give credit where due.

This printed-circuit version of yet another selective audio receiver uses the popular Rameco filters manufactured by Ray Megirian. For convenience we have reproduced the printed board twice, once in actual size (right) and, just above, twice actual size with all possible call-outs included. The schematic is reproduced below. With this information the enterprising home-builder should be able to construct a useful receiver.



27mc TONE RECEIVER

TUNED CIRCUIT 3000CPS



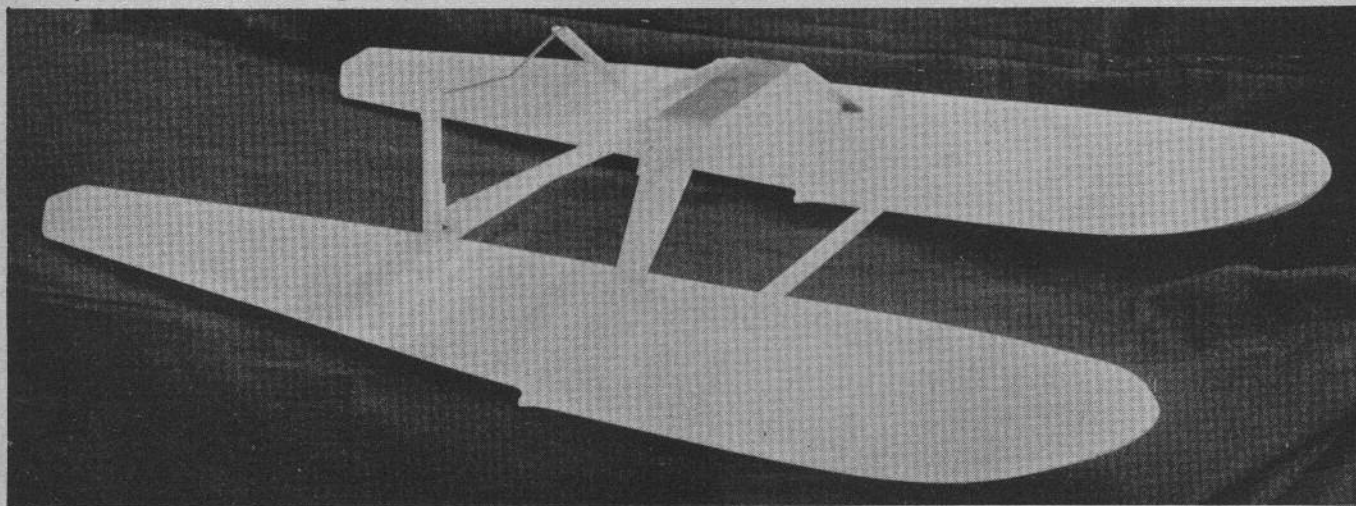
L1 - 25 TURNS #32 WIRE - 1/4" P.C. FORM

* Select from 10K to 100K to suit the circuit.



what's NEW

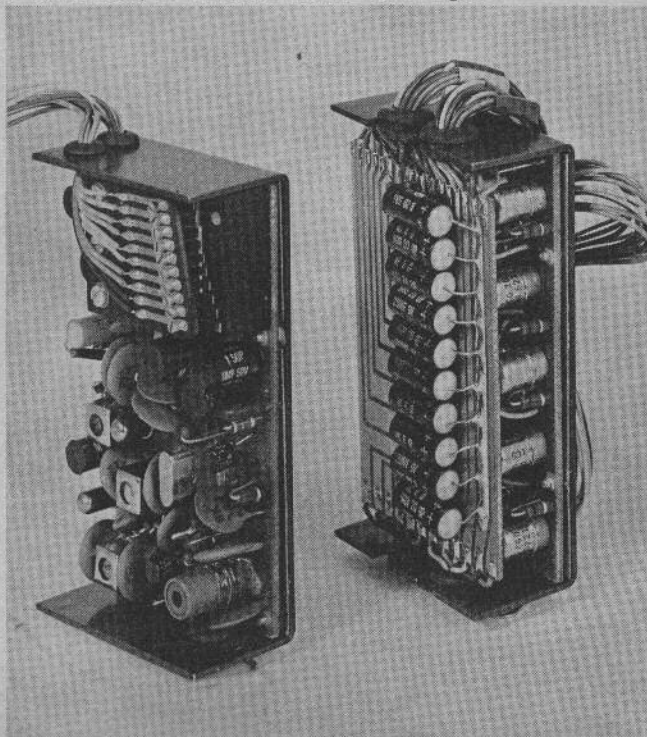
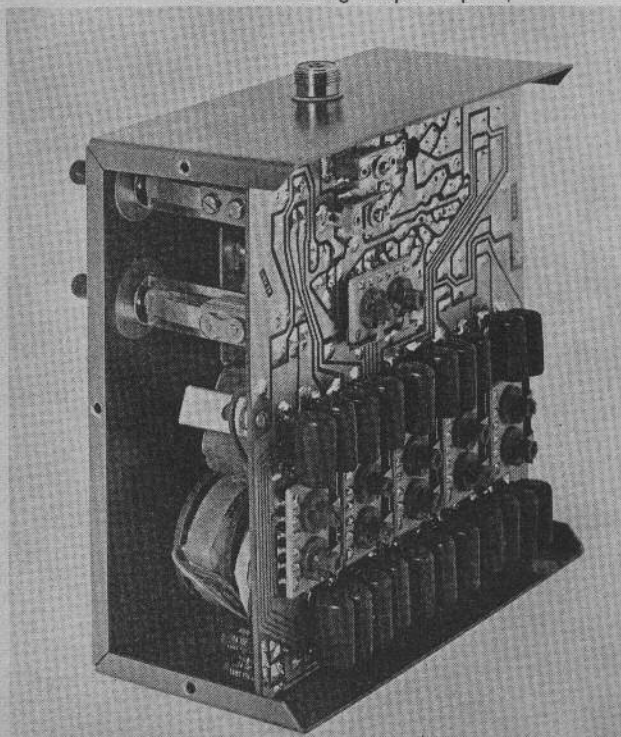
NEW Fibreglass Float Kit—For R/C Multi Channel Aircraft
 Kit contains; Molded fibreglass hull floats, Debolt gear, all balsa, spruce, plywood, wire and hardware for completing. Full size plans and assembly instructions. 29½ in. long. Completed weight—20 oz. No



.....
 epoxy resin included. Will work on most R/C planes from about 4 ft. to 6 ft. in span. Photo shows one that has been built to fit a Sonic Cruiser ship. Most modelers can adapt the gear to their own shipOnly 14.95

.....

NEW Pics, (with covers removed) showing the Super New Kraft all transistor—10 channel transmitter (below left). And its outstanding companion piece, the Kraft—10 channel—double deck, all transistor receiver (below right).



Photos Courtesy of Ed Lorenz

FLASH NEWS ITEMS

PARTS FOR MAC-TONE RECEIVER

The Mac-Tone receiver by Howard McEntee as detailed in the July and August issues of American Modeller, has created a lot of interest from all over. Although we are not presenting a kit on this at the present time, we do have most of the components available for the unit in this catalog. To enable you to spot them quickly, here is a brief run down on most of them except capacitors and resistors.

Johnson JE102T Transformer	\$2.95
RCA type 10 uhy RFC45
CTC LST, white core, coil form only85
Ferroxcube cup cores, with bobbin and nut and bolt, for winding your own AFC	1.50
Raytheon 1AG4	3.95
6007	1.95
Pkg. 10—SE33 eyelets10
Synthane 2 x 2 7/8 base, plain10
Epoxi Resin 2 x 2 7/8, plain25

FLASH NEWS ITEMS

ACE TRANSVERTER KIT.

With only 3.6 volts in, this power converter puts out 135 volts at 30MA, which will cover almost all existing transmitters on the market today. Want to convert your battery hungry transmitter in time for next season to the economy of operation with only three inexpensive Nicads and never have to worry about replacing batteries again? The ACE TRANSVERTER KIT makes this change economically feasible. Complete kit includes epoxi printed circuit board, wiring diagram, two power transistors, four silicon diodes, and complete instructions. You can't go wrong with this low priced ACE TC-3.6 KIT. Only \$13.95.

NEW 7 PRONG PLUG AND SOCKET FROM G & M.

Here is a G & M IMPORT that is the perfect answer for a round pin 7 prong plug and socket. This unit features a flat plug and has round pins for a tight fit, comes complete with seven color coded wires of flexible hook-up, to fit almost any R/C installation. A real best buy at only \$.95. Order GM7P.

KRAFT SERVO AMPLIFIER KIT.

IT'S HERE IN TIME FOR YOU TO CHANGE OVER THIS WINTER FOR NEXT SPRING'S FLYING. Have you been wanting to go relayless but have delayed changing your Bonner duramites over because of the high cost? Now with the new KRAFT AMPLIFIER KIT it is quite easy to do it yourself. The Kraft amplifier converts your existing duramites to either neutralizing or trimable, depending on their hook-up, and give you sure fire reliable and dependable relayless type of operation. Fit inside of your existing duramite servo case. Complete kit of all components required including epoxi circuit board. Order KASK, only \$13.95.

THE NEW C300 NICAD CHARGER KIT.

THE GYRO CHARGER has been a very popular item. Now it is being kitted by ACE R/C by exclusive arrangement with GYRO, and is available only from ACE R/C. Kit features the highest quality of components to allow charging of virtually any Nicad or set of Nicads in use today. Comes complete with meter and full instructions on how to wire up this ultra simple, yet very dependable, utility unit. Charging rate is variable from 10MA to two amps. **SOON!**

FLASH NEWS ITEMS

NEW GERNSBACK LIBRARY BOOK.

"HINTS AND KINKS FOR RADIO, TV AND AUDIO," features 280 ways to make your hobby more fun. 280 ingenious ways to use paper clips, cork screws, tape, drinking straws, grommets, tooth paste caps and hundreds of other likely and unlikely articles to make your R/C hobby easier and more enjoyable. Carefully selected from Radio and Electronics magazine. The book is edited by Martin Clifford, and has many hints that are useful for the hobbyist. Order Gernsback Library No. 103, 128 pages, only \$2.35.

NEW FROM DU BRO, four split coupling sleeves for .062 to .078 wire, catalog No. CS-20, 20 cents. Four No. 2/56 blind mounting nuts, catalog No. BN-256, 20 cents.

FOUR BLIND MOUNTING NUTS thread size 4/40, catalog No. BN-440, 20 cents. Two solderless quick keepers, fit 1/16 inch wire, and provide the end keeper for elevator and rudder hook-ups, catalog No. KE-25, per package 25 cents.

ALSO FROM DU BRO comes the announcement of a TRIM BAR, which is double sided, and which will provide the fine trim required on the control linkage surfaces. Soon to be released, order Trim Bar, only \$1.49.

NEW GERNSBACK LIBRARY BOOK

FUN WITH RADIO-CONTROLLED MODELS
By E. L. Safford, Gernsback #106, \$3.20

Author Safford takes you on a learn by building journey into model electronics. By careful step-by-step reading and doing, you will become proficient in little time. Teaches you the theory by practice—you build models of relays, escapements and transmitters and receivers—these are simple devices but you get the broad background you need to use today's most up to date equipment. You build them and find out why they do what they're supposed to. Goes into R/C for boats and cars as well as airplanes. Fully illustrated and simply diagrammed for ease of construction. The book gives an excellent background of material for the beginner and advanced. Order Gernsback #106 at \$3.20.

Carl Goldberg's great new "Falcon" kit—Now available at your Dealers and at ACE R/C, Higginsville, Missouri.

CARL GOLDBERG

NEW! FALCON

SINGLE TO SIX CHANNEL

FOR .09-.15-.19 ENGINES

\$9.95
Kit G 15

THE BIRD THAT OBEYS YOUR R/C COMMAND!

FALCON FEATURES

- Longer tail moment arm - much smoother flying.
- Coil-sprung nose gear - coil flush with bottom.
- Formed main landing gear.
- Shaped and notched Leading and Trailing Edges.
- Cleanly die-cut ribs, fuse sides, formers, etc.
- Semi-symmetrical wing section.
- New simple "Symmet-TRU" wing construction.
- Tough Butyrate canopy.
- Complete full size plans, step-by-step, etc.

SPAN 56"
LENGTH 43"
AREA 558 Sq. In.
WEIGHT 3 1/4 lbs.
(With 6 Chan. Eqmpt.)

The Simplest, Sound, Attractive Airplane For Beginners, Rudder-Only, or Multi-Training.

If you're just getting into R/C, or moving along into Multi, see the functional, rugged, smooth new Carl Goldberg FALCON! Every designelement engineered to make the simplest, sound, attractive airplane. No unnecessary gadgetry or required skills. Builds

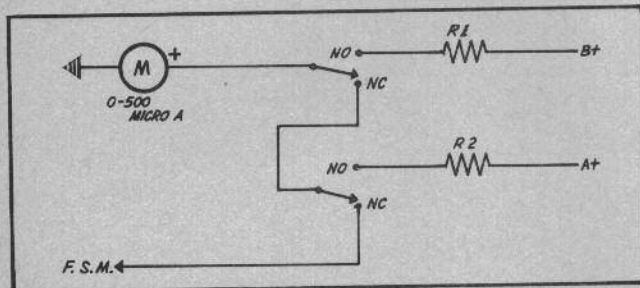
up quickly - in half the usual time. And in the air, what smooth response to your commands - you'll soon be an expert flyer! Check the features, and see your dealer now for the value-packed FALCON kit, at the unusually low price of \$9.95.

BITS AND PIECES

EDITOR'S NOTE—Many readers have indicated that this feature has a practical usefulness that transcends the casual interest value. Do you have a tip that might help your fellow R/Cer? Sketches or drawings should be drawn as completely and neatly as possible. The "cleaner" and more detailed your "copy" is, the better the job GL can do in putting across your idea. Material should be sent direct to Grid Leaks (Bits and Pieces Dept.), Box 301, Higginsville, Mo.

METERING AND MONITORING A TRANSMITTER

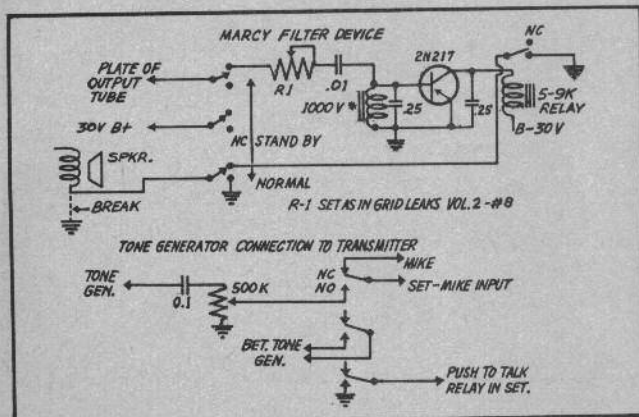
by R. S. Greenberg—Omaha, Nebraska



■ Here is a method of metering and monitoring a transmitter, particularly the Kraft. If the printed circuit board is moved from the front panel to the top, there is room for a 2-in.-square meter and two small SPDT switches (pushbutton). R_1 and R_2 are found by the usual $E = I \times R$ formula minus the meter resistance. The field strength meter is built in with a small piece of piano wire extending from the top of the case. Thus it does not "rob" power from the transmitter. With no button depressed, the field strength meter is on and acts as a monitor.

CB SIGNAL DEVICE

by R. S. Greenberg—Omaha, Nebraska



■ This is an adaptation of the Marcy tone system for use as a signal device for C.B. voice communications. It does not respond to static, voice or ignition noise. The data for winding the Toroid tone filter can be found in GRID LEAKS Vol. 2, #8. It can be made on a printed circuit board of 1 x 2½ in. which will fit easily in almost all C.B. sets. One word of warning: do not depress the call or signal button while the sets own signaling receiver is on. The peaks from the modulator tend to short out the .01 condenser and make a mess of things.

FREQUENCY FLAGS—COURTESY ON THE FLYING FIELD

by Dale Willoughby

■ Early in 1960, Bob Elliott and Bob Bennett, both members of Radio Control League, Orange County, Calif., proposed that some means of identifying the transmission frequency be used for R/C flyers. At that time, due to lack of superhet receivers in use and the fact that transmitters on a certain frequency sometimes "hit" other superregen receivers on the field, the idea was shelved.

Recently, with the tremendous growth in the use of superhet receivers and the necessity for positive frequency control, both at contests and for sport flying, it became a necessity to refine the original idea. Therefore at the April meeting of RCL, Bob Elliott again proposed that all members of RCL adopt the following system of using a colored flag affixed to the end of the transmitter antenna according to the following color scheme:

Channel	Frequency in MC	Frequency Flag Color
1	26.995	brown
2	27.045	red
3	27.095	orange
4	27.145	yellow
5	27.195	green
6	all superregen receivers	blue
7	6 meter band (50-54 mc)	white, with frequency in black numbers

The proposal was immediately adopted by the members of RCL, OC. As originally presented, the use of different shapes was proposed; however, later discussions and tests revealed that the shape was immaterial as long as the flag was at least five inches hoist width and 6 inches fly length. Because the pennant shaped flag lends itself also as a wind indicator, most of the active R/C flyers in Southern California are using this shape flag.

Nate Rambo, after adoption of Bob's proposal by the Valley Flyers Model Airplane Club, told me that these frequency flags attached to the transmitter are among the most important field courtesy devices ever devised, and will eliminate considerable confusion at large contests. Don Crow, LARKS president, indicated that the LARKS had also voted to use frequency flags.

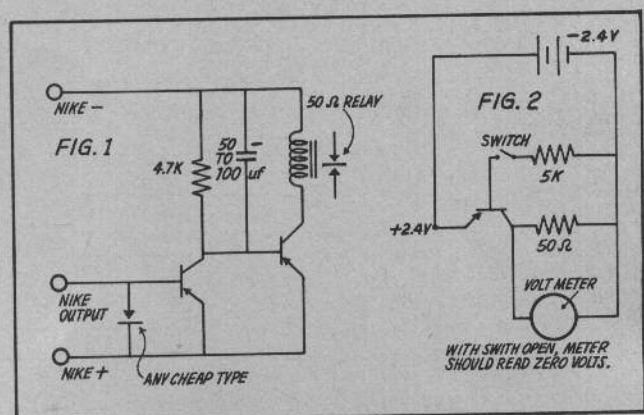
With such wide acceptance by R/C flyers in the Southern California area, indicating courtesy in action, Bob Elliott then outlined his proposal at the DC/RC Symposium in May. Although this was not new to DC/RC members, it was decided that RCL/OC and DC/RC jointly sponsor a change in AMA rules to make the use of frequency flags mandatory at AMA-sanctioned contests.

Additionally, several R/C manufacturers, including Phil Kraft, have indicated that they plan to furnish free a frequency flag with each matched transmitter/superhet receiver sold.

I feel that Bob Bennett, now in Denver, and particularly Bob Elliott, deserve much credit for advocating the use of frequency flags as a matter of courtesy on the R/C flying field.

RUDDER ONLY SUPERHET—by Bob Givens

(from DC/RC Newsletter)



■ Wouldn't it be nice if everyone with rudder-only could fly superhet! All you need is a Nike converter and this simple circuit (Fig. 1). Several of these were breadboarded to find repeatability with no problems, but the same Nike was used throughout. Use transistors with current gain around 100. To measure gain, see

BITS AND PIECES

Fig. 2. If the voltmeter in Fig. 2 reads two volts, or greater, the gain is OK. I used the 31-cent ones from Lafayette's bargain page. They run from 40 to 130 gain. I have a few available to local Club members.

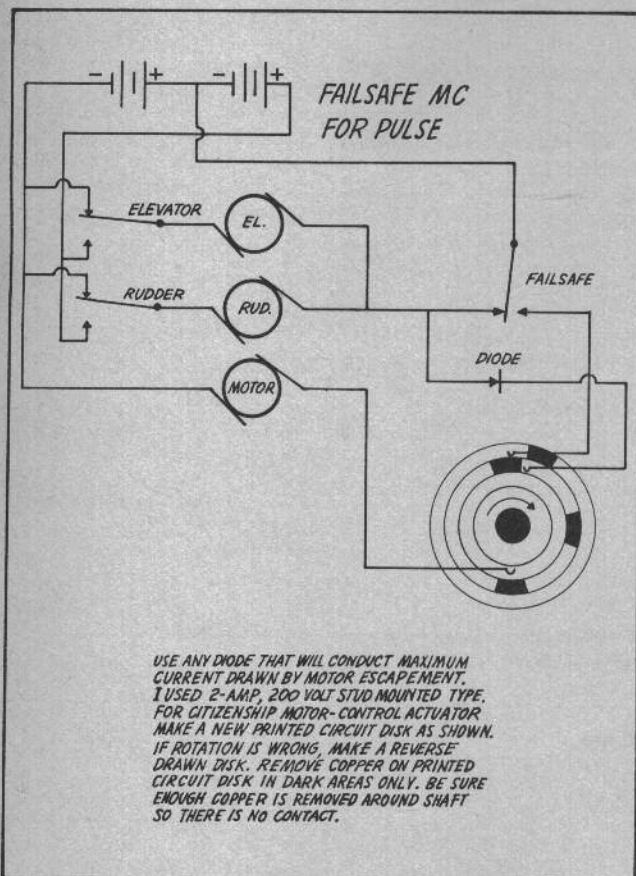
KNIFE EDGE WHEELS FOR GRASS

by W. C. Northrop—Newark, Del.

Thin knife-edge wheels, such as K & B, roll right through the grass rather than getting tripped up in it. Our field is cut like an average lawn, and while the multi jobs are nosing up or flipping on their backs, my little 26-in. Stinker comes in smooth and fast, flares out about a foot above the ground, makes a three-point landing and rolls to a stop in about four to five feet with the tail never leaving the ground (just hit flip-up elevator and hold it till the plane stops).

FAIL SAFE MOTOR FOR PULSE SYSTEMS

by Roy A. Carter—Winchester, Va.

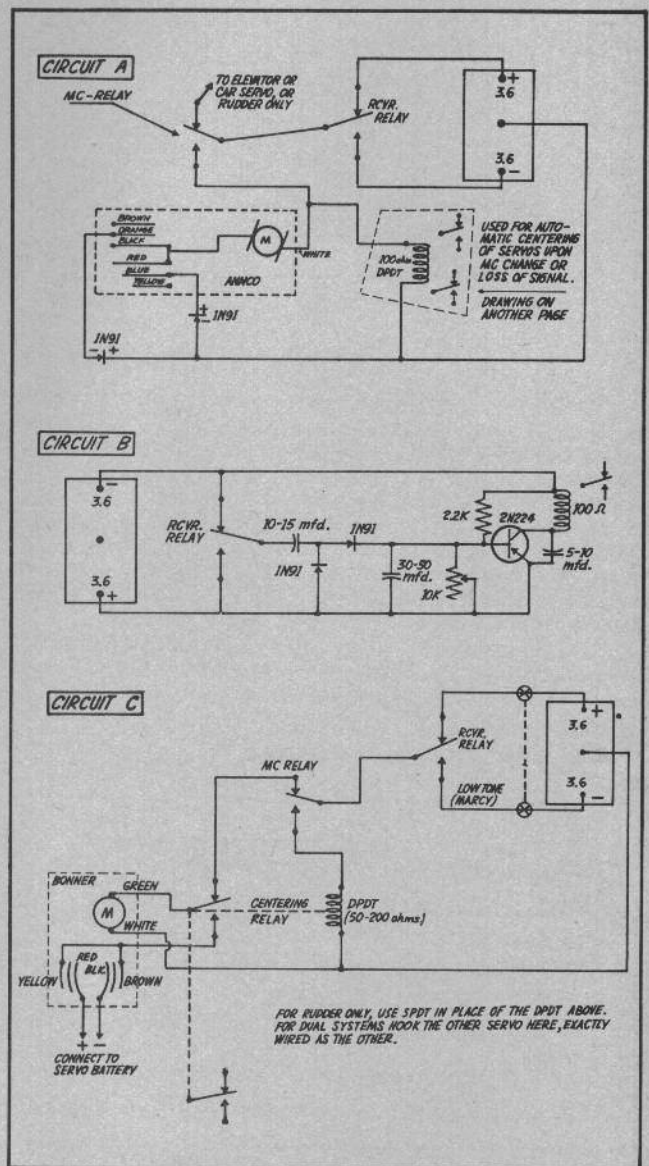


I am enclosing a circuit for a fail-safe motor circuit for a TTPW or similar system. It will work with other systems.

The servo I used is a Citizenship, but it works with any one. Make a new printed-circuit switching plate as shown on the drawing. Etch out the dark part. It is apparent how to wire it from here. With this system, any time the motor relay goes to fail-safe, the servo goes to slow-speed position. To change speed, all you have to do is interrupt the pulsing for an instant and the servo will advance one step. Mine is set up with three positions. It goes from slow to high, then to medium and then to slow. You must use the diode as I indicate so that the rudder and elevator servo do not get power through the switch contacts on the motor servo while it is changing position.

THREE MOTOR CONTROL CIRCUITS

by W. R. Hatton—Vevay, Ind.



All these circuits worked fine when hooked to my Marcy Twin Simul installed in a Sonic Cruiser.

Circuit A uses any multi-type servo, such as Anco, Bonner, etc. It has been used for some time and works perfectly. The color coding of wires to the printed-circuit board in the servo is identical in the Anco (which I use) and the Bonner. The only addition is the 1N91 diodes. It works as trimmable, so motor goes to low speed on full signal, or loss of signal or carrier.

Circuit B is the MC circuit that I have been using with the Anco servo and Marcy Twin Simul. It is also identical to the one in Vol. 2, No. 7 GRID LEAKS by Marcy Inkmann, except this uses only the servo batteries, which are six nicads in my plane.

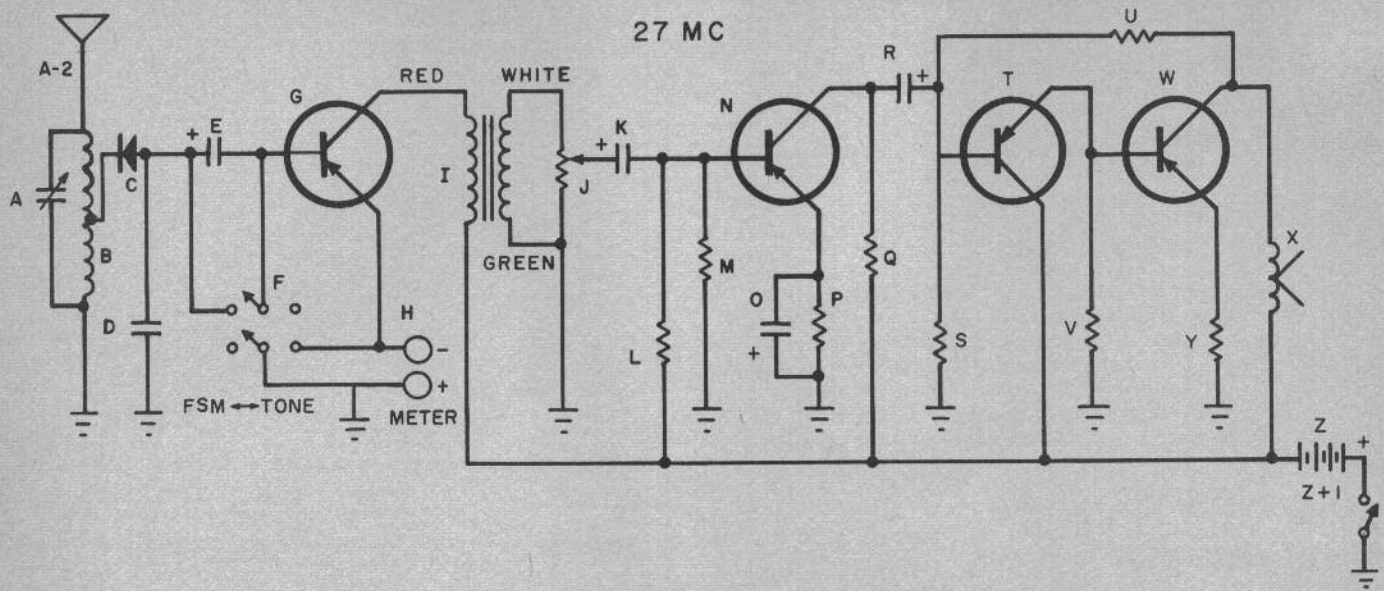
The transistor can be any type, as long as plate milliwatts is not exceeded. The 10K variable is replaced by a fixed resistor when the time constant is set, also the bias resistor (2.2K) may be changed for relays of different resistances (50 to 200). I wind my own 100 ohm, by taking wire off the 5K units and rewinding with #40 wire.

Circuit C is useful with Bonner or Anco servos for proportional when they are to be centered on signal for motor control, etc.

(I have been using Texas 2N1373, 75 and 77 transistors in my Marcy Receiver, with fine results—little higher ratings.)

(Continued on next page)

... Continued



- A-2 ANT.-MUSIC WIRE IN JACK
 A-1 6"X5"X4" ALUMINUM BOX-BUD CU2107A
 A 4-30MMF TRIMMER
 B 9 TURNS NO.18 SPACE 1/2" TAP 5th TURN FROM $\frac{1}{2}$
 C DIODE IN34, ETC. 1/2" DIAM.
 D FROM ABOUT 10MMF TO 22MMF OR SO
 E FROM ABOUT .04MF TO 10MF OR SO
 F DPDT SWITCH
 G MOST ANY PNP TRANSISTOR (EXPERIMENT)
 H METER JACKS
 I CR60, LT41A, ETC.
 J ANY OLD VOLUME CONTROL W/SWITCH
 K 5MF TO 25MF OR 50 ELECTROLYTIC
 L FROM ABOUT 47K TO 50K
 M AROUND 10K OR 12K

- N MOST ANY PNP TRANSISTOR
 O FROM ABOUT 25MF TO 100MF ELECTROLYTIC
 P 1K RESISTOR
 Q 4.7K
 R FROM ABOUT 5MF TO 25MF ELECTROLYTIC
 S FROM ABOUT 5K TO 6.8K
 T MOST ANY PNP TRANSISTOR
 U FROM 50K TO 100K (EXPERIMENT)
 V AROUND 235 TO 270 Ω (EXPERIMENT)
 W MOST ANY POWER TRANSISTOR (2N301, 2N176, 2N255)
 X 45 Ω INTERCOM SPKR. (QUAM 4" 5A07)
 Y ABOUT 1 Ω
 Z 6V LANTERN BATTERY (LASTS FOREVER)
 Z+I SWITCH ON VOLUME CONTROL

HINT - AN OLD TRANSISTOR HEARING AID MAY CONTAIN G, N, T, AND I.
 HINT - AN OLD GRID LEAKS MONITOR MAY CONTAIN I, A, B, C, D, AND G.

JUNK BOX MONITOR

By GRIFF BRACKETT

Pad your bird when the hawks fly and detour Prangsville with a hawky talk tattle box. Also handy for observing chronic tuning wonders who didn't know you were on the same—prang!

Four of these boxes have been built using a variety of parts and operate well. For a neat job buy the box indicated, carve a hole in the front toward the top and fill with grill cloth and speaker. Mount the volume control, switch and meter jacks below the speaker and an antenna jack on top. Lay the battery in the bottom for ballast and cut a piece of linen board to mount on the back of the speaker with standoff washers. The board also helps hold the battery.

Mount A, B, I, and socket for G; and temporarily mount C, D, and E, on the top left portion of the board. Stick the wires through like a printed circuit and wire up everything including the battery. Connect headphones to the white and green (secondary of I) and turn on a transmitter. Tune for the tone and substitute transistors, also, if available, parts C, D, and E, for the loudest tone. Mount loosely and wire up J, K, L, M, socket for N, O, P, and Q. Place the phones from the collector of N to -6 volts and experiment for best results. Similarly hook up R, S, socket for T, U, V, W, X, and Y. Turn the switch on and watch the speaker cone while you turn it off. The cone will move quite visibly, but not a great deal please. Now experiment with U and V for most gain and low drain.

Insulate the battery, case it up, drill a hole for tuning, and turn it on when you fly.

BITS AND PIECES

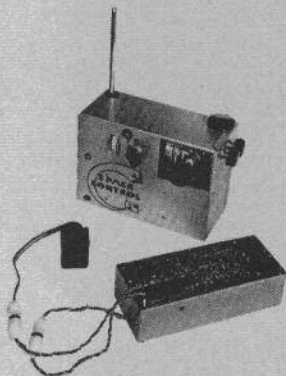
Readers Write!!

HAROLD (PAPPY)

DeBOLT WRITES

HIS THOUGHTS ON

"SPACE CONTROL" . . .



What the man is talking about. The fact that he had no wiring to do, or shock-mounting to accomplish, seems not to have displeased him!

You ask my opinion of Space Control, and this recalls that I once wrote you about what I thought proportional should be. In short, I felt that we needed a positive neutral as with reeds, some proportional near center and the rest did not matter much as long as the proportional was sensitive enough to follow the stick exactly and every time in the same manner. I believe I said that if I could have this I would be happy. So, I have S-C and am happy!

Of course, I have a bit more than I asked for with everything simultaneous and fully proportional. Also, the packaging of the unit and its features (mechanical) have a lot to be said for them. It is nice to be able to bolt the rig into the model, hook up the pushrods and be ready to go. No wiring or shock mounting saves a lot of time!

I can't say that S-C is the ultimate as nothing ever really is, but it sure is one big step in the right direction and has no weakness that I have been able to find. I have had a few problems with it mostly created by "learning the hard way." After all, I never used anything similar to it before. All problems have always been solved and usually the trouble is traced to me. Now that I have learned I can say that any sort of trouble is extremely rare. I want to be extremely frank, hence the mention of the above. I know this: the rig can and does work perfectly and is reliable; if by chance it should not, there is an answer to the problem and Ritchie will provide that answer if given a chance.

Flying . . . I must say that it is "different" from reeds, there is very little that is done the same. First, it is extremely easy to fly, and it is much easier to learn the fundamentals than with reeds. This I believe is because of the positive, sensitive control action. I learned with relatively "hot" models. All flying has been in low-wing types. I imagine if one was to put it into a "trainer" type you would find some real arm-chair relaxation. Even in the low wings I can not recall a single mishap because of control action. What you believe you need in a particular instance seems to be right and, of course, this type of control gives you exactly what you ask for when you want it. For instance, with reeds you sometimes get in a spot where you know that a bit of this or that would be just right and yet when you try to get what is needed you have too much or too little.

The clue to learning with S-C is to convince yourself that control action is positive and to realize that our models require very little control movement for anything except stunts. The temptation is to overcontrol—the answer is to sort of freeze the stick at neutral and force yourself to apply only a bit of control-stick movement at a time and to watch the model closely for reaction as you do it. You quickly learn that this small movement is enough and that the system is positive and reliable. After a few flights this comes natural and your actions become automatic. With experience you soon combine lateral control with the longitudinal so that your turns and corrections become truly smooth and proportional. I think the thing I like most is the ability to put the model exactly where you want it, when you want it there and with comparatively no effort. This is a great help for all normal flying and I guess it comes pretty close to full scale. I know that my landings improved 100% from the first flight. On the first flight with the S-C in a Pursuit I made 13 touch-and-go's in a row and on a control-line circle for a landing strip!

Using it for contest flying is another story. I found that all ground maneuvers came much easier right off the bat. Touch-and-go's were always a problem for me; with S-C they are a lead-pipe cinch; same for spot landings. Air maneuvers have been more of a problem. Any single maneuver was learned with comparatively little practice. However, consecutive maneuvers created problems. I found that I could complete the first one perfectly and then the rest tended to deteriorate. After a while I determined that most of this was due to model trim. With S-C you seem to unconsciously compensate for small alignment problems in the model by varying the neutral location of the stick, such a small movement does the trick. This seems to create problems in the consecutive maneuvers where there are changes in speed. The answer has been to trim the model exactly as you would with reeds until it flies flat and straight with hands off. After this had been learned (took most of the summer!) the contest schedule was as easy to do as with reeds, in some cases easier. For instance, spins. You never have to worry about simultaneous; if you don't have that you don't have a model either! If the whole flight was judged instead of just the maneuvers I believe it would be vastly superior to reeds or any other system. However, reed flying has progressed so close to perfection as far as maneuvers are concerned it is difficult to improve upon it by the use of any other system including S-C.

I have found that inverted flying comes much easier. I am now equally at home whether upright or inverted. As a matter of fact I find myself flying inverted and thinking nothing of it. There is nothing I would do upright that I would not feel at ease doing inverted. Some of this may be due to the model as the one I now use flies hands off inverted just as it does upright. What does help is to be able to ease in that slight amount of correction, or corrections, and hold it for as long as necessary.—Harold deBolt, Buffalo, N.Y.

Something on your mind? Then why not say it? This department is tooled up for processing opinions, ideas, suggestions and, ahem, crucial thinking. Let's fill that mail bag!

ORION TRICKS

FROM THE BAG

OF DAVID BALES . . .

I have enjoyed the recent articles in GRID LEAKS, and especially like the reports on the new Kraft 10-channel equipment. At present I have my Citizenship Eight gear in an Orion with good results so far. The Orion is a kit job, but modified with a larger fin area on the rudder, and a symmetrical airfoil on the stab instead of the original diamond shape.

This seems to cure the landing problem that I had noticed with other Orions and, also, it still seems to be responsive with very smooth maneuvers. Maybe it is the pilot, but I don't think so.

My next job will be a Stormer and then work will start on a scale job for the Nats (Just gone by—Editor).—David Bales, Bloomington, Ind.

BOB BATES—LIKES K3VK . . .

Thought you might be interested in a report on the flights to date using my proportional servo and pulser. (Bob Bates' servo and pulser were in Vol. 3, No. 9—Editor.) All flights were made in a Wildfire powered originally by an OS .15 and now by a Super Tigre .09 diesel. The diesel is fitted with a home-made intake throttle and has more power than the .15.

All flights have been a success with no more than hard landings to date. The system works very well and has a number of non-believers interested in pulse.

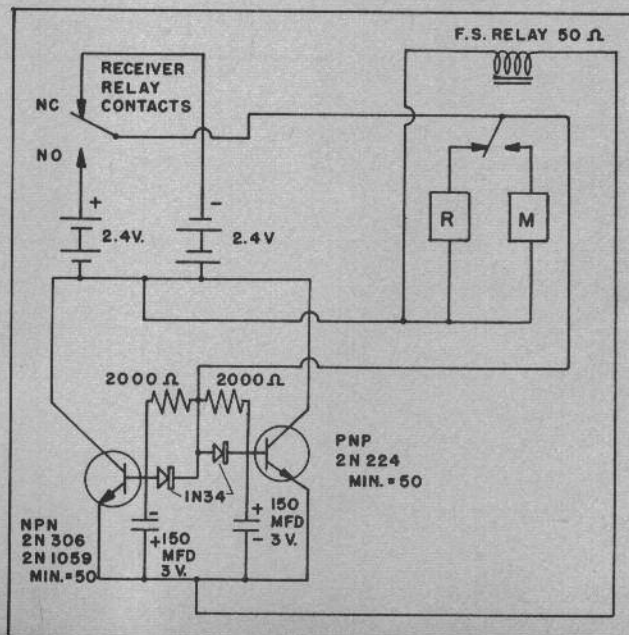
You may be interested in my receiver. It is a modified version of the new Kraft K3VK relayless. I worked backwards and added a relay. The relay is a 100-ohm Jem with a 5 mfd. electrolytic capacitor across the coil terminals which is connected in place of the escapement. I use two .5 electrolytic capacitors across the relay points for arc suppression. Range and selectivity is the best of any receiver I have seen.—Bob Bates

FRED SHEPLAVY AGREES WITH B.B. (ABOVE)

AND ADDS P.O.D. WITH SKETCH! . . .

I already have one K3VK assembled and find it an excellent unit. In ground checking I have only a 1/20-volt drop in output at 500 yards. Ace has scored again!

I would like to include a P.O.D. circuit that I have had considerable success with. The circuit was developed by Donald Bird, of Dumas, Tex. When I first "breadboarded" mine, it fitted very nicely into a 1 1/2 x 2 1/4 x 1 1/16-in. (inside dimensions) plastic box. It appears to me that developing a printed circuit board should not be too difficult.—Fred A. Sheplavy, Albert Lea, Minn.



(Continued on next page)

... Continued

FRANK STOKES OPINION— PROPORTIONAL—THE ULTIMATE!

I wish to congratulate you on the fine work you people are doing on GRID LEAKS. I was especially pleased with the article in your March-April issue about "troubleshooting tone receivers." There is a lot of information given which is hard or impossible to find anywhere else.

My special thanks to Dale Springsted whose practical approach gives so much to people who want to go a little deeper into the fascinating R/C electronics. With all this fine reed-equipment coming out now, I hope that you folks will have the time to keep an eye on developments in proportional which, in my opinion, in one way or another, sometime in the future, will be the ultimate method of R/C control.—Frank Stokes, Ottawa, Ontario, Can.

BOB GAEDE ON ACTUATORS FOR 1/2 A . . .

We flew our 1/8A just about a month ago and I was surprised that the actuator I rigged did so well. I am using the magnet and clapper from a Babcock compound hooked with Dacron thread to the rudder.

Receiver is a C & S 501 relayless and total plane weight ready to fly is 5¾ ounces. Believe it or not, the actuator mentioned has enough "steam" to put the ship into consecutive loops! The actuator idea is not new—I stole it from Bill Northrup, only he used the relay armature direct of a TR 4.5 (only 40 ma current).

Another idea I have used is to rig Stan Johns actuator with a very light rubber band for 1/8A rudder. This would allow use of relayless receiver. Also, it cuts drain to practically nothing, as batteries are used only on one side of rudder.—Bob Gaede, Md.

ELECTRONS GO DOWN . . . AND AROUND? ?

Just a suggestion for future issues of GRID LEAKS. I believe an article every three to six months completely covering the operation and function of every component in a common single-channel RX would benefit many readers; RX's such as the 4.5, Kraft single, etc., expanding into multi-channel sets. The type article I suggest is what I call "electron flow" which traces the incoming signal completely through the receiver showing changes in wave shapes and voltages. Each component should be explained. For example:

Bi-pass filter C2 . . . passes RF signal to ground.
Blocking capacitor C3 . . . keeps B and DC voltage off coil L1 and blocks RF from entering power supply.

If I were qualified I would be glad to furnish such an article for possible publication. I feel this type article every now and then would do more for newcomers than any other item. This type info as far as I know is not obtainable in any book.

Robert E. Parfeis, Major, USAF

ELUSIVE ACTUATOR

Several items . . . caught my eye along with your request for some opinions from readers.

Jim Show's series on proportional R.O. has been terrific; certainly one of the best things yet to appear during my all too short acquaintance with GRID LEAKS. My only objection is that the material had to be presented over a period of seven months. I wish you could have devoted a whole issue to it!


I agree with Mr. Shows that the lack of a suitable actuator is a bad situation . . . it's my feeling that the unavailability of a good commercial unit is the reason that pulse proportional has not really caught on. Or has it?
Jay Boyer, Bloomfield, N.J.

Readers Write!

ALSO in Mailbag . . . Gypsy Moth by E. NOWAC Span 68"—Wt. 7-8 lbs. on .45 to .60 Engine. Pic by Fred A. Sheplavy



Grid Leaks



At Play

The last two months have been filled with items that would be of more than passing interest, we will discuss just a few of them.

The 1962 Nationals at Glenview are history. A stay of relatively a short time gives one only fleeting--and possibly incorrectly assumed--impressions. We arrived Thursday and left early Sunday. During this brief stay we gleaned many things from conversations and observations. Our primary interest, of course, was in the R/C event.

More fliers than ever were registered and more than ever participated. As a rule the event went smoothly--although any contest of this size will develop hitches.

For the benefit of the GL readers who did not attend, here are the unofficial results as pulled from the score boards.

Class I (Jr-Sr) 1st Wm. Wischer, 2nd David Johnson, 3rd Ronald Bossi
(Open) 1st Ross Preston, Harrison Morgan, Bernard Williams

Class II--Don Dickerson 71.66, 2nd Max Boal 53.33, 3rd Tom Dion 46.33.

Class III-- 1st Ed Kasmirski "Taurus", 10 channel.
2nd Jerry Nelson, "Sultan", 10 channel.
3rd Zel Ritchie, "Sultan", proportional.

Class III Trends--3 finalists had proportional, all had Trike gear, most had full span ailerons. Veco .45's predominant. DeBolt had a retractable gear.

Pylon--1st Keith Storey, 2nd Jerry Wagner, 3rd Garry Nelson.

Scale--1st Robert Poell with Douglas A26, 2nd Joe Martin XB472, 3rd Phil Breitling P-38. Multi engine jobs on the upswing here--even an original trimotor design by Chuck Boyer. Unlike previous NATS most entrants were able to fly their beautiful ships.

R/C is not only drawing more contestants each year but also is the most popular event at the NATS as far as spectators are concerned. All who had a finger in the pie as far as supervising and running of this affair, should be extended a hearty "thank you" from every modeller, since not only do the NATS involve the contestants themselves directly, but the impact is felt even by the sport fliers who do not compete.

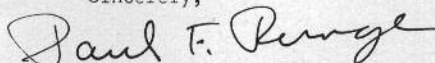
One of the side-lights of the NATS were the first meetings of a new organization--the Radio Control Association of America. Spear headed by Tom Williams of Oklahoma, this group had been getting charter members from all over the country and officially organized themselves into a cohesive group in a series of meetings. Ernest Kratzet of Detroit was elected president, and Tom Williams was officially appointed as chairman of the executive group.

The RCAA has as its purpose the furtherance of R/C through an organization of the people who are most interested in R/C within the existing structure of the Academy of Model Aeronautics (AMA). Their existence is justified in that they hope to take some of the load of R/C off of the headquarters staff of AMA, to promote clearer rules, and uniform interpretation of the rules.

There is precedent of organizations within the AMA which assist the AMA. Two notable ones are the Indoor Society, and FAI Free Flight. Just as these units function as a part of, and within the structure of, the AMA, so does the RCAA state its intent.

These lines have been too brief to cover many of the things we'd like to have. We cannot close, however, without thanking those of you who took the time and trouble to write about the new look of Grid Leaks. We welcome your additional comments as GL looks for new horizons to expand into.

Sincerely,



Publisher

Ace R/C, Inc.

BOX 301
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GRID LEAKS

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