

Volume 5 • Number 5

# GRID PEAKS

R/C  
DATA  
SERVICE

®

**& MODEL AIRCRAFT WORLD**

## IN THIS ISSUE

•  
Hi-Lo Transmitter: How to modify existing units for use with the interference-resistant Phelps receivers—an illustrated how-to-do-it article

•  
Beauties of Proportional: A pioneer argues the superiority of such control in single-channel

•  
Annual Directory of Equipment: 7 pages of facts

SEPTEMBER-OCTOBER • 35 CENTS

**FLASH!**  
**MAYNARD HILL**  
**SETS WORLD**  
**R/C DURATION**  
**RECORD OF**  
**8 HRS. 52 MIN.**  
**25 SECONDS**  
•  
**SEE PAGE 30**  
**FOR DETAILS**



Photos by Fremont Davis

DON CLARK LAUNCHES MODEL ON ITS SUCCESSFUL ATTEMPT TO BREAK RUSSIAN-HELD RECORD.  
INSERT: HILL ADJUSTS NEEDLE VALVE.

**8th YEAR OF SERVICE TO THE R/C MODELER**

A Radio Control Publication for Beginner & Advanced Modeler

# AHC HAS 'EM ALL!

# Radio Control

ORDER-BY-MAIL FROM AHC

**FOX 59 RC**

REG. \$39.95

THE ONLY MOTOR YOU CAN BUY AND FLY WITHOUT BREAKING! EXCLUSIVE CARBURATION MAINTAINS PROPER LOW SPEED MIXTURE AT ALL TIMES

80RE-907  
STROKE-806  
DISP-59  
WT-11.0oz

ORDER BY - MAIL FROM AMERICA'S HOBBY CENTER, 146 GL West 22nd. St. N.Y., N.Y. 10011

## SPECIAL BONUS OFFERS

Get all these AHC 'EXTRAS'

**FREE!** OF EXTRA COST WITH EVERY RECEIVER

**FREE!** OF EXTRA COST WITH EVERY TRANSMITTER

ONE RADIO CONTROL NAME PLATE, 64 PAGE DIGIT TO RADIO CONTROL BOOK ONE CLEAR PLASTIC HINGED PARTS BOX, 8 "D" HARDWARE NUTS, BOLTS & SPACNETT TUBING... VERY HANDY.

**FREE!** SOLDERING IRON PENNANT

ORDER BOTH RECEIVER & TRANSMITTER AT THE SAME TIME & YOU GET EVERYTHING LISTED ABOVE, PLUS A FREE SOLDERING IRON... SORRY NO BONUS WITH EQUIPMENT ALREADY SAID. PRICES FREE FREQUENTLY PENNANT WITH EVERY TRANSMITTER

### SENSATIONAL VALUE

HERE'S A RED HOT AHC OFFER \$53.58 SAVE... ON THIS \$128.53 R/C DELUXE OUTFIT

## Astro Pee Wee

RELAYLESS RADIO CONTROL OUTFIT

OUTFIT... ALL ASSEMBLED READY-TO-OPERATE

COMPLETE OUTFIT \$24.88

SUPER VALUE

ALL TRANSISTORIZED

BRAND NEW "ASTRO" OUTFIT

RECEIVER: SUPER SENSITIVE V. RELAYLESS...  
TRANSMITTER: USES INEXPENSIVE PENNELL...  
\*COMPACT SIZE ONLY 4 3/8" x 2 5/8" x 3 3/8"  
\*SEALED NO TUNING NECESSARY MICRO KEYING SWITCH \*COLLAPSIBLE ANTENNA \*TOGGLE SW.

F&M ELECTRONICS PIONEER 27 1/4 MC RECEIVER

18.95

F&M ELECTRONICS ECHO 27 1/4 MC TONE TRANS.

29.95

## SPECIAL OFFER!

# ALL-TRANSISTOR R/C OUTFIT

WHILE - THEY - LAST!

Ready-To-Operate COMPLETE ASSEMBLED Verified \$55.00 OUTFIT

**\$39.95** Less Batteries

CITIZEN BAND THE WORLD'S FINEST TONE EQUIPMENT OPERATES ANY MODEL BOATS, CARS & PLANES - From 1/4 A. to the Very Largest

TRANSMITTER: MEASURES ONLY 1 1/2" x 1 1/2" x 1 1/2" NO REDUCTION OF RF SIGNAL WITH MODULATION...  
RECEIVER: SUPER REGENERATIVE RELAYLESS...  
ANTENNA: PRINTED CIRCUIT CHASSIS...  
FREE: OF EXTRA COST WITH THIS RADIO CONTROL COMBINATION

HERE'S WHAT YOU GET!

ASTRO ASSEMBLED RECEIVER...  
ASTRO ASSEMBLED TRANS...  
R/C KRACKERJACK AIRPLANE...  
BONNER RE VARICOMP...  
ANTENNA ON ESCAPEMENT...  
EARPHONE, SWITCH, PLUG, ETC...  
YARD SILK COVERING...  
RED KUMBA TANK...  
10 WOOD PROPELLER...  
ESCAPEMENT RUBBER...  
FOAM RUBBER...  
R/C HOOKUP WIRE...  
TUNING WAND...  
R/C BOOK...  
TOTAL VALUE \$128.53 HURRY! QUANTITIES ARE LIMITED! ORDER NOW!

## SMASH!

THIS \$80.00 R/C OUTFIT AT 1/2 PRICE

SINGLE CHANNEL ASTRO 33

ALL TRANSISTOR TONE R/C OUTFIT

NO OTHER SET...

NOT EVEN THE POPULAR \$80.00 OUTFIT CAN MATCH THIS SET FOR PERFORMANCE OR RANGE.

RECEIVER ONLY \$12.88 TRANSMITTER ONLY \$14.88 AS SHOWN ABOVE

ACE KRAFT K3VK TONE RECEIVER KIT

99.95

MONITOR by ASTRO TONE

DESIGNED ESPECIALLY AS A TONE MONITOR

3 TRANSISTORS  
2 INCH SPEAKER  
VOLUME CONTROL  
SUPER REGENERATIVE CIRCUIT  
MINI ANTENNA  
9 V BATTERY  
1 1/2" x 1 1/2" x 1 1/2"

CHECK ANY TONE TRANSMITTER FOR INTERFERENCE. POWER OUTPUT TUNING \$17.00

149.95

OTARION TONE REC' VR

MODEL #021

SALE 19.95

AHC LIST \$24.95

CONTROLAIRE 5 RECEIVER

7.95 KIT

REG. \$14.98

13.95 ASSEMBLED SALE!

REG. \$18.99

SINGLE CHANNEL RELAYLESS 3 V. TONE-SIZE 1 1/2" x 1 1/2" x 1 1/2" 7/8" x 1 1/2" x 1 1/2" MORE COMPONENTS THAN MOST RELAYLESS RECEIVERS WHICH RESULTS IN MORE RANGE...

OTARION TONE REC' VR

MODEL #021

SALE 19.95

AHC LIST \$24.95

ASTRO 33

ALL TRANSISTOR TONE R/C OUTFIT

NO OTHER SET...

NOT EVEN THE POPULAR \$80.00 OUTFIT CAN MATCH THIS SET FOR PERFORMANCE OR RANGE.

RECEIVER \$39.88

TRANSMITTER \$19.95

COMPLETE OUTFIT (LESS BATTERIES) \$59.83

90 DAY GUARANTEE

## SAVE \$60.00

MULTI-CHANNEL RELAYLESS SYSTEMS

ZR-10 RECEIVER

TEN CHANNEL SELECTIVE...  
SUPERB RELAYLESS...  
MULTI SIMULTANEOUS RECD BANK...  
RECEIVER...  
IMPROVED SENSITIVITY...  
AVAILABLE FREQUENCY...  
26.950 MC 27.145 MC...  
27.045 MC 27.195 MC...  
27.000 MC 27.200 MC...  
MEASURES 2 1/8" x 3 1/4" x 1 1/2"

79.95

TMS TRANSMITTER

COMPACTIZED HIGH POWER...  
MULTI SIMULTANEOUS FOR RECD OPERATION...  
OUTPUT EQUIVALENT TUBE TRANSMITTER...  
ABSOLUTE TONE STABILITY TO 140CF...  
USES ONE 9 VOLT BATTERY...  
COLLAPSES BUILT EXTERNALLY LOADED ANTENNA...  
LIGHT WEIGHT 3 1/2" x 2 1/2" x 3 1/4"...  
MEASURES 8 1/4" x 5 1/2" x 3 1/4"...  
AVAILABLE FREQUENCY: 26.950-27.045-27.000-27.145-27.195-27.255 MC

119.95

JR. SKYLARK 4.95

J3 PIPER CUB 9.95

RUDDERBIRD 11.95

MISS WORLD'S FAIR 3.95

R/C RASCAL 2.95

L'I'L SPIRIT 3.95

JENNY 14.95

OTARION TONE REC' VR

MODEL #021

SALE 19.95

AHC LIST \$24.95

ASTRO 33

ALL TRANSISTOR TONE R/C OUTFIT

NO OTHER SET...

NOT EVEN THE POPULAR \$80.00 OUTFIT CAN MATCH THIS SET FOR PERFORMANCE OR RANGE.

RECEIVER \$39.88

TRANSMITTER \$19.95

COMPLETE OUTFIT (LESS BATTERIES) \$59.83

90 DAY GUARANTEE

an unbeatable R/C TOTAL RETAIL VALUE \$199.99

Combination that Challenges ANY COMPARISON

SPECIAL OFFER! ON SERVO MADE FOR THE ABOVE

REG. \$25.95 TRANSISTORIZED SERVO

19.88

LINEAR OUTPUT 5/8" TOTAL TRAVEL IN 1 SECOND OPERATES FROM 1/4" TO 1/2" BATTERY REQUIRED

1988

MADE IN U.S.A.

139.95

FULLY GUARANTEED

UNI-CHARGER 10.98

NICAD BATTERY PACK 10.95

FIELD STRENGTH METER 9.95

INSTRUMENTS 1.75 EACH

PENCELL BATTERY BOX 2.54

MA METER \$2.75

NICAD PENCILS \$2.09

BUTTON CELL \$2.25

OTARION TONE REC' VR

MODEL #021

SALE 19.95

AHC LIST \$24.95

ASTRO 33

ALL TRANSISTOR TONE R/C OUTFIT

NO OTHER SET...

NOT EVEN THE POPULAR \$80.00 OUTFIT CAN MATCH THIS SET FOR PERFORMANCE OR RANGE.

RECEIVER \$39.88

TRANSMITTER \$19.95

COMPLETE OUTFIT (LESS BATTERIES) \$59.83

90 DAY GUARANTEE

an unbeatable R/C TOTAL RETAIL VALUE \$199.99

Combination that Challenges ANY COMPARISON

SPECIAL OFFER! ON SERVO MADE FOR THE ABOVE

REG. \$25.95 TRANSISTORIZED SERVO

19.88

LINEAR OUTPUT 5/8" TOTAL TRAVEL IN 1 SECOND OPERATES FROM 1/4" TO 1/2" BATTERY REQUIRED

1988

MADE IN U.S.A.

139.95

FULLY GUARANTEED

UNI-CHARGER 10.98

NICAD BATTERY PACK 10.95

FIELD STRENGTH METER 9.95

INSTRUMENTS 1.75 EACH

PENCELL BATTERY BOX 2.54

MA METER \$2.75

NICAD PENCILS \$2.09

BUTTON CELL \$2.25

OTARION TONE REC' VR

MODEL #021

SALE 19.95

AHC LIST \$24.95

ASTRO 33

ALL TRANSISTOR TONE R/C OUTFIT

NO OTHER SET...

NOT EVEN THE POPULAR \$80.00 OUTFIT CAN MATCH THIS SET FOR PERFORMANCE OR RANGE.

RECEIVER \$39.88

TRANSMITTER \$19.95

COMPLETE OUTFIT (LESS BATTERIES) \$59.83

90 DAY GUARANTEE

an unbeatable R/C TOTAL RETAIL VALUE \$199.99

Combination that Challenges ANY COMPARISON

SPECIAL OFFER! ON SERVO MADE FOR THE ABOVE

REG. \$25.95 TRANSISTORIZED SERVO

19.88

LINEAR OUTPUT 5/8" TOTAL TRAVEL IN 1 SECOND OPERATES FROM 1/4" TO 1/2" BATTERY REQUIRED

1988

MADE IN U.S.A.

139.95

FULLY GUARANTEED

R/C FITTING ACCESSORIES PARTS

E11 NYLON TAIL WHEEL BRKT. 20¢  
E12 NYLON CONT. HORN ASSY. 25¢  
E13 NYLON ALLE-ROTOR NINGES 75¢  
E14 PHENOLIC MATERIAL (4) 25¢  
E15 RETAINER PLATES (4) 25¢  
E16 L/C CLAMP 50¢  
E17 1/8" FITTING THERM. 15¢  
E18 3/4" 3-BOLT SET OF 4 25¢  
E19 3/4" 4-BOLT SET OF 4 25¢  
E20 3/4" 4-BOLT SET OF 4 25¢  
E21 3/4" 4-BOLT SET OF 4 25¢  
E22 STEERABLE GEAR 75¢  
E23 RETAINING COLLARS 30¢  
E24 75" LING COLLARS 30¢  
E25 NYLON ALLE-ROTOR NINGES 75¢  
E26 3" FUEL PROOF CORD... 70¢  
E27 4" FUEL PROOF CORD... 70¢  
E28 4" FUEL PROOF CORD... 70¢  
E29 4" FUEL PROOF CORD... 70¢  
E30 4" FUEL PROOF CORD... 70¢  
E31 4" FUEL PROOF CORD... 70¢  
E32 4" FUEL PROOF CORD... 70¢  
E33 4" FUEL PROOF CORD... 70¢  
E34 4" FUEL PROOF CORD... 70¢  
E35 4" FUEL PROOF CORD... 70¢  
E36 4" FUEL PROOF CORD... 70¢  
E37 4" FUEL PROOF CORD... 70¢  
E38 4" FUEL PROOF CORD... 70¢  
E39 4" FUEL PROOF CORD... 70¢  
E40 4" FUEL PROOF CORD... 70¢  
E41 4" FUEL PROOF CORD... 70¢  
E42 4" FUEL PROOF CORD... 70¢

AMERICA'S HOBBY CENTER, 146 GL West 22nd St., New York, N.Y. 10011

Grid Leaks at Play .....	1
The Monitor .....	1
The Beauties of Simple Proportional Control .....	6
Rescue Craft .....	8
The OX-5 Challenger .....	14
1964 R/C Equipment Survey ...	10, 11, 12, 13, 20, 21, 22
Transmitter Conversion for Higher Tone .....	18
? Seen These .....	23

PAUL RUNGE, Publisher—WILLIAM WINTER, Editor  
 WITTICH HOLLOWAY, Art Director—BOBBIE RUNGE, Sec.-Treas.  
 Contributing Editors: Gordon Flenniken—Phil Kraft  
 Frank Schwartz—Dale Springsted—John Worth—John Phelps

GRID LEAKS is a bi-monthly publication, and is intended for the modeler who is interested in Radio Control. It is published by Ace R/C, Inc., at 203 W. 19th Street, Higginsville, Mo. Copyright 1964 by Ace R/C, Inc. Subscription rate is \$2.00 per 6-issue volume. For subscriptions outside the United States, add \$1.00 for postage. GRID LEAKS is a registered trademark.

FOREIGN SUBSCRIBERS: GRID LEAKS Subscription Agent for ENGLAND and all CONTINENTAL COUNTRIES is The MODEL AERONAUTICAL PRESS, LTD. 38 Clarendon Road, Watford, Herts, England

Application for second class mailing privileges is approved at the post office in Higginsville, Mo. and is pending at additional mailing offices.

## GRID LEAKS AT PLAY

● We'd like to begin this column by welcoming our many new readers. Effective immediately *Model Aircraft World* becomes a part of GRID LEAKS.

John Maloney of World Engines, on a recent visit here, completed arrangements whereby the publication of *MAW* will be taken over by GRID LEAKS. So we not only have a big group of new readers but, beginning this issue, we sport as well a new title as *Model Aircraft World* is incorporated.

To readers who are with us for the first time, we'd like to extend the invitation to you to write us and let us know your wants and needs in the radio control field. For as old time GRID LEAKS readers know, we are keenly aware of their desires and their indicated wants.

This is your magazine. We'd like to have you help us formulate the policies and the ideas we present. We also welcome your contributions of articles and ideas that you'd like to share with other readers.

To those of you who have subscriptions to both GRID LEAKS and to *Model Aircraft World* we want to mention that your GL sub will be extended and will now total the amount of issues that you had coming from both publications previously.

Dealers who have bulk subscriptions to *Model Aircraft World* will be hearing from Mr. Maloney direct. If any dealers have questions, please send them directly to John.

The enlargement of our audience, and this addition to our title, are but a few of the steps in a planned program of gradual growth. From present indications we will have more news on this before too many more issues.

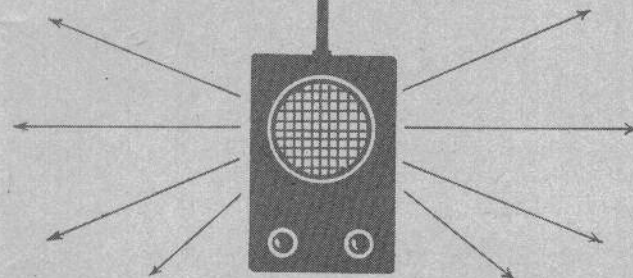
Meantime, *MAW* readers—welcome!

The second Heart of America contest—officially known now as the Mid-America R/C championships—is history. It proved to be the largest ever held here. Some 62 contestants competed in over 100 events and flying in these was at quite a brisk pace during the two days of the affair.

Held at Richards-Gebaur Air Force (Continued on page 28)

# THE MONITOR

Regular round-up of new and overlooked aspects of the growing R/C field ● Shop talk and just talk ● A discussion corner.



Cliff Weirick who won Class III at the Nats says he owes it all to wishbone and rabbit foot attached to his hat.

**T**HE MOST ENCOURAGING news since the FCC authorized Class C operation a decade or so ago, is its warning to those who abuse their Class D (voice) privileges. Slugging its story "Citizens Band is Warned: Don't Quote the Price of Eggs," *Newsday*, a New York area paper reported: "Housewives with a tendency toward gossip and children with a sense of adventure are two of the reasons the FCC has tightened up regulations for Citizen's Band Radio operators. . . ."

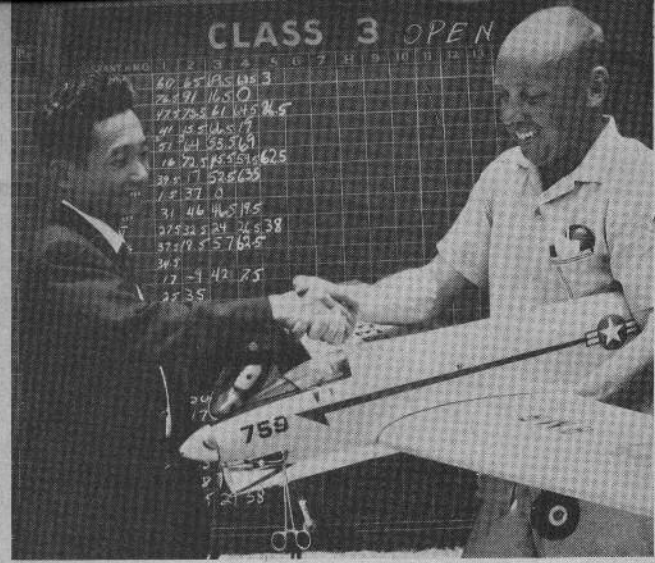
Other choice quotes: ". . . the service has turned into a partyline for hobbyists . . . housewives discussing marketing . . . children having themselves a good time . . . if there is a continued misuse of operating privileges, FCC will consider terminating the service."

As you know the Academy has retained the services of a communications counsel, Jeremiah Courtney, who works closely with the AMA Frequency Committee. One of his duties for the AMA is to keep tabs on such developments. His report in the September issue of *Model Aviation*, the AMA's official publication, is recommended reading.

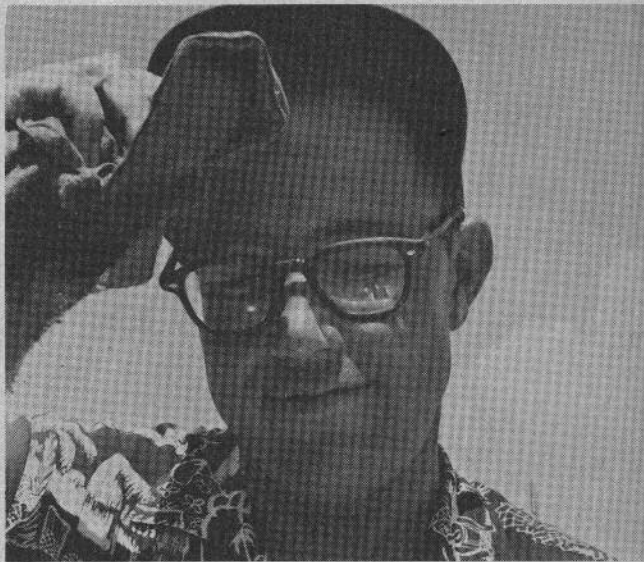
● *What Have You Done for Me* (Continued on next page)



Hardest working contestant in the event was the popular Zel Ritchie, second in Multi, here taking bit of shade!



International champion Ralph Brooke who won third Class III, sported realistic-looking job like a Navy fighter.



Wiping his brow after a fourth-place Multi flight, Phil Kraft joins three winners as '65 U.S. team (alternate).



Darryl Usher, fifth in Multi, and Joe the pilot, eye the camera on GL photog's admonition to watch the "birdie."

## THE MONITOR . . . continued

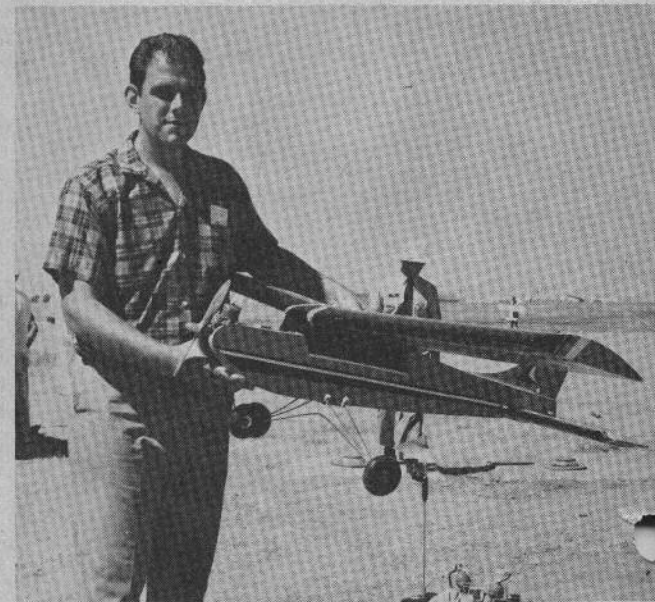
Lately? Politicians will be seeking votes across the country until November 3. To a politician's record of service, the classic voter's response is, "Well, that's OK, but what have you done for me lately?"

The Academy of Model Aeronautics soon will be seeking support in terms of new memberships and renewals for the 1965 season. It would like to obtain as much of this income as possible by the first of next year so that a budget may be drawn, and intelligent plans laid.

Although a large segment of the membership appreciates the continuing value of the organization, and renews upon receipt of the ballot and renewal notice, many do not. They procrastinate until May, June, July, and sometimes later until it finally becomes necessary to join in order to fly in a contest or sanctioned fly-for-fun event.

Perhaps there is justification for delay among some less ardent modelers who really don't know if they will be part of the flying scene next year, AMA believes, but can this be true of more than half the membership, it wonders.

Those who do not renew memberships early, will miss issues of *Model Aviation*, lose a period of insurance coverage, and be unable to take advantage of various discounts and services available to members. Then, if they do sign up later, they become part of the mid-summer crush, causing a delay in receiving their credentials, and (Continued on page 4)



Young Gary Leonard who put 91½ points between himself and second to take Class I in the Junior-Senior Division.

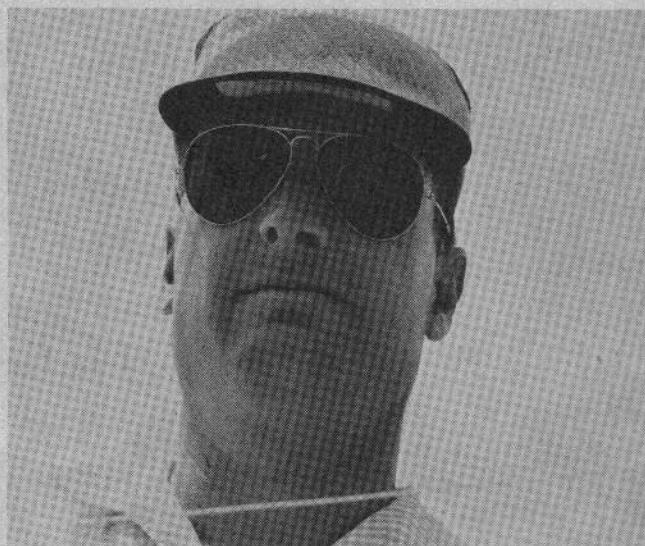




Scale master Maxey Hester, who topped this event at Nats with 6,933 points, seems oblivious to all but job ahead.



Smiling Tom Williams, always a top contender in Class I, captured a well-deserved first place in Open age class.



The man to beat in Intermediate (Class II), Lloyd Sager who placed at the top of this event at Dallas Nationals.



The original man in a hurry, who keeps breaking his own record, Dale Nutter fires up his Nats winning pylon.

## THE MONITOR . . . continued

adding to the headquarters burden.

These seem to be old fashioned reasons given to members year after year—producing notable lack of response. AMA could point out the great strides made during the past two years under the Worth and Hill presidencies, and in the past year under John Worth's executive directorship. Just knowing that the organization is operating more efficiently and improving financially, should be worth some congratulatory renewals.

But to the R/C membership in particular, AMA is seeking early sign-up by answering the politician's standard question—What have you done for me lately? AMA's recent activities in behalf of R/C apply to contest flyers and fly-for-funners alike, not to mention all prospective R/C flyers.

The FCC, of course, controls the radio frequencies flown on. By now, everyone must know of AMA's efforts to obtain a sufficient number of interference-free frequencies for safe and more enjoyable flying. Many clubs and individuals have been generous in contributing to the R/C frequencies fund. Working with the R/C frequencies committee volunteers, AMA has devoted a tremendous amount of staff time to coordinating the effort, including administering the fund, working with the attorneys, and meeting with FCC officials. The FCC has been receptive, has tightened control on interfering Citizen's Band operators, still has AMA's petition under consideration.

Also, the Federal Aviation Agency controls some of R/C's most usable air space, near airports and airlines. Right now, AMA is engaged in head-to-head confrontation with the prob-

lem of what to do about preventing or easing anticipated limitations on altitudes that models may be flown in these areas, and other restrictions. Of course, if model flying constitutes a hazard to full scale aircraft, regulation is necessary. But overly strict regulation could have serious consequences for R/C and free flight and is being opposed by the Academy which, at the same time, is contributing constructive ideas to encourage safe operations.

At its Dallas meeting, the AMA Executive Council discussed a report by Ernie Kratzet of Chicago on his committee's progress in obtaining a greater voice in AMA for R/C'ers. Although the committee was not yet ready to make a final proposal, much of the blueprint is developing to promote the special needs of R/C'ers. Whether as part of a special R/C society within AMA, or by special attention to the Academy's R/C flyers, these needs are receiving attention and action.

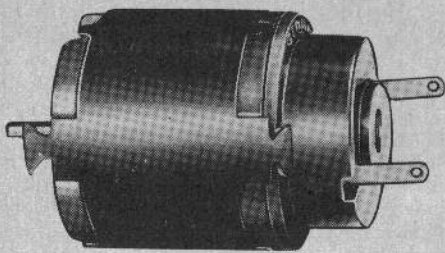
AMA devoted a tremendous amount of planning to the R/C event at the Dallas Nationals, and it turned out to be the best such event ever held. Thanks to the cooperation of the Collins Radio Company, an elaborate method of processing transmitters to insure proper frequency output was employed. Collins equipment was used again on the field for monitoring, and practically no interference was reported on the four flight lines operating simultaneously. This experiment proved the R/C can live with the current superhet frequencies for a little longer, anyway, before Citizens Band voice communication takes over. At least it worked that way in Dallas.

Other things are being done by AMA to benefit all those who fly R/C. They include a promo- (Continued on page 30)

# PRECISION MADE

## GM MINIATURE ELECTRIC MOTORS

### MICROPERM AND MILLIPERM MOTORS

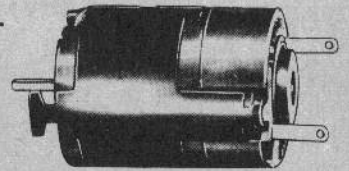


These motors are highly efficient, rugged, dependable, light weight and have a very low battery drain. They make excellent servo motors and drive units for miniature models. They are made of the highest quality material to insure long life. Their sintered bronze bearings and heavy duty brushes guarantee easy, smooth operation. They are both available in two resistances and their performance at various voltages is given in the chart below. The maximum drain recommended for the motor is the maximum current on which these motors can operate continuously without internal damage being inflicted.

**GM #63 MICROPERM 3 VOLT.....\$3.95**

**GM #64 MICROPERM 6 VOLT.....\$3.95**

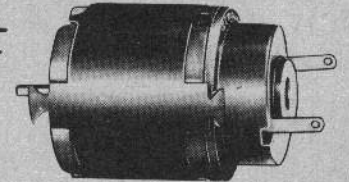
Diam.	1/16"	
Length	1"	
Weight	1/2 oz.	
Max. current	3 V	6 V
	1.3A.	.4A.
Torque (cm/gm)	6	6
Drain (Amps)	.8	.25
Power (Watts)	.54	.55
RPM (x100)	8000	88



**GM #53 MILLIPERM 3 VOLT.....\$3.95**

**GM #56 MILLIPERM 6 VOLT .....\$3.95**

Diam.	7/8"	
Length	1 1/8"	
Weight	3/4 oz.	
Max. current	3 V	6 V
	1.58A.	.05A.
Torque (cm/gm)	10	15
Drain (Amps)	1	.37
Power (Watts)	.68	.9
RPM (x100)	72	56



**GM #73 NANOPERM 3 VOLT .....\$3.95**

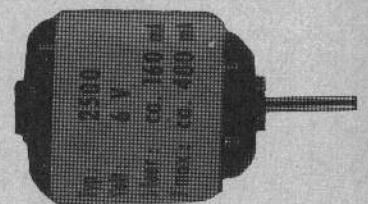
**GM #76 NANOPERM 6 VOLT .....\$3.95**

6 Volt—2500 RPM/per Volt

Min. Drain—160 ma

Max. Drain—480 ma

Diam.	1/2x5/8"
Length	7/8"
Weight	1/3 oz.



DISTRIBUTORS OF ALL HOBBY SUPPLIES



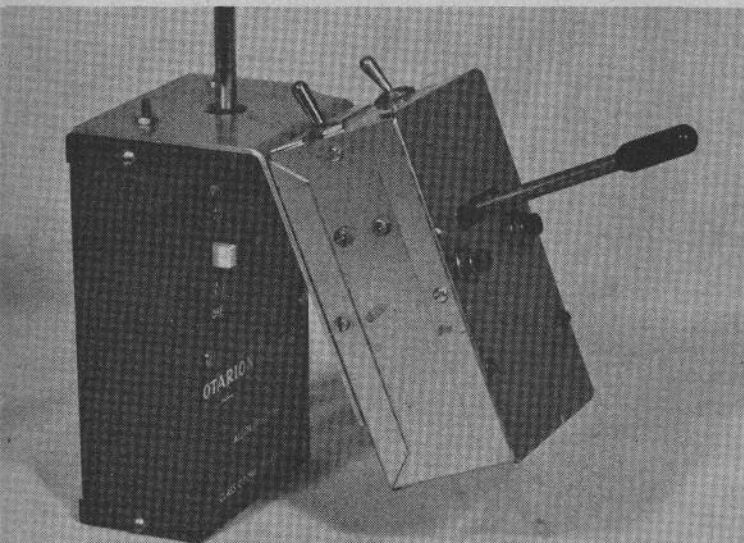
**HOBBY**  
**SPECIALTIES** INC.

2094 Fifth Street East Meadow, L.I., N.Y. 11554 516-489-1123

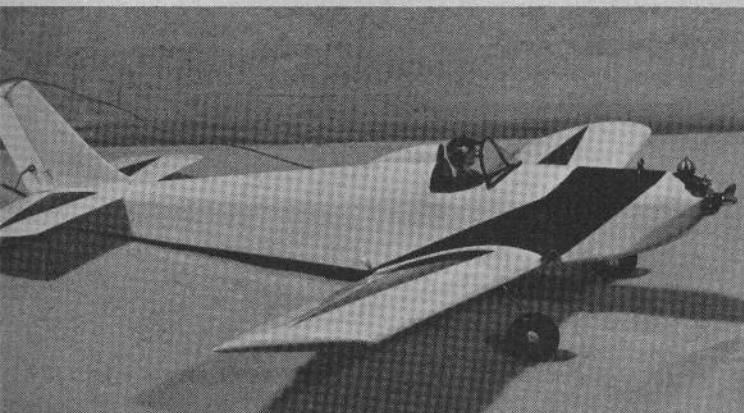
FOR COMPLETE CATALOG  
AND INSTRUCTION SHEETS  
ON ALL GM PRODUCTS  
SEND ONLY 25c



The author with his Top Flite Roaring 20. For small, lively airplanes proportional is the easiest and the safest method.



The Shows' pulser is mounted to an Otarion transmitter by a metal bracket, holding the pulser at proper angle for feel.



One of the author's One-Eight-A airplanes, the racy looking low wing. Proportional makes it a docile machine to control.

# The Beauties of SIMPLE Proportional Control

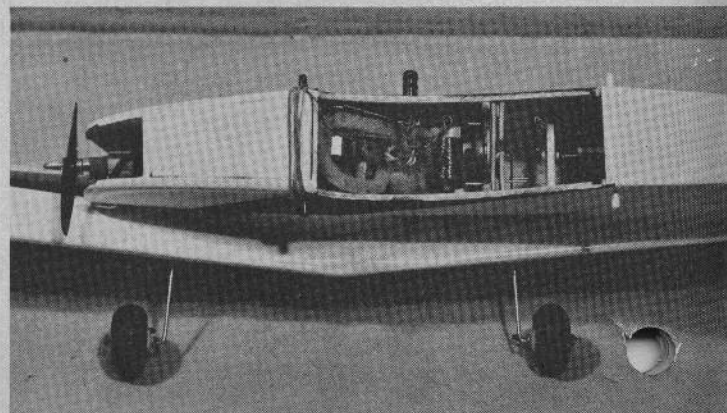
By FRANK R. ADAMS

To smooth out the flight path of an excitable tiny model, there is nothing like a magnetic-type actuator. One of the authentic pioneers in this field reviews 12 years of development.

IN 1950 AND 1951 MOST control was by means of self-neutralizing escapement, i.e., one signal sent gave right rudder, release of signal, rudder went to neutral, the second signal gave left rudder, and the release sent the rudder to neutral again. This was a sequence of events and with a fast moving airplane you could get into attitudes which were fatal if the next control in sequence was one that would aggravate the attitude rather than correct it. To get the correct control you still had one more neutral to go through before the correction occurred. This was time consuming and close to the ground could be disastrous. It also took a good memory to remember what was coming up next. If the receiver missed a signal you were out of sequence and didn't know what was coming next. The only way to find out was to send a signal and see what happened. My own experience was that it was usually a control I didn't want, especially if the airplane was close to the ground.

Compound escapements came next and the main thing they did was to eliminate one of the neutrals in the sequence. With these units one signal held gave right rudder, release took you through neutral, left rudder and back to the first neutral. Two signals sent and the second one held gave left rudder, but the unit cycled through right rudder and the second neutral first. To a degree this was built in memory, but quite often you had to make a quick swing through the unwanted control position to the one that you wanted.

The search for something better which would give us more of a chance to make the airplane do what we wanted without having something unexpected and undesirable happen led us to try a pulsing neutral, with signal giving right rudder and no signal giving left rudder. At that time we were thankful enough for the neutral that we just used pushbuttons for right and left.



The complete installation is accessible through wing opening. Receiver is foam-wrapped, forward, actuator on slide behind.





The latest Adam's actuator, a refinement of 11 years of work. Matchbox cover suggests the small size of magnetic actuator.

We were happy to be able to get as many rights in a row as we wanted without having to go through left or vice versa. Many badly trimmed airplanes lived through their initial test flights to fly again simply because you could have left or right as often as needed without going through a control that would aggravate a bad attitude.

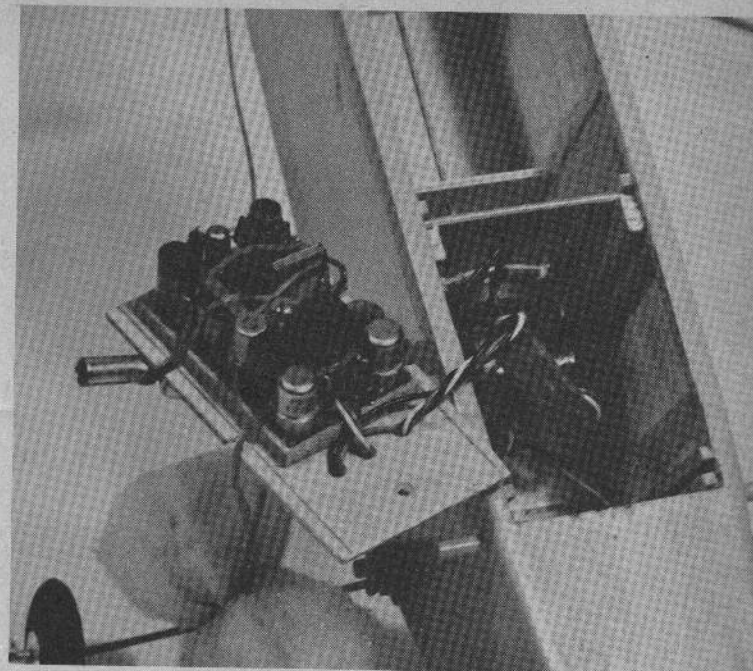
These earlier systems were mistakenly called proportional when, in truth, all that existed was a 50/50 proportion for neutral. The gentleness of a turn depended strictly on how fast you could get on the right button, off, and back on again repeatedly until the turn was completed. What you were attempting to do was to get the pushbutton synchronized with the pulse rate so that you were getting a little longer dwell in the right-rudder position than the length of time the rudder spent on the left when driven there by the pulser.

The 50/50 flapping of the rudder from right to left, if the rate was high enough, was more than the airplane could understand as individual controls so all it recognized was the average of the control positions. If the pulse rate was too slow the airplane started recognizing the individual control positions and hunted from right to left. Present day pulsers are capable of varying the ratio of on-signal to off-signal, from 50/50 neutral to 20 on/80 or 80 on/20 off with such small increments of change that the average control position recognized by the airplane may be anything from a very large gentle turn to a very sharp and violent one. This permits the flyer to make very small corrections at will for smooth pattern work.

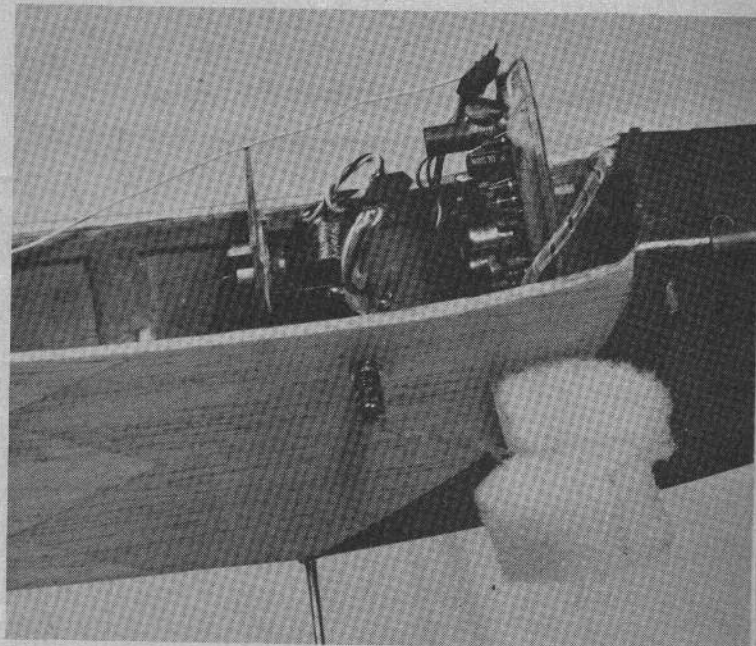
Straight flight is possible with very slight corrections for drift to the right or left and no lurch or indication by the airplane that correction is being applied.

We tried to accomplish the same thing back in 1952 with motor-driven cams operating microswitches, with the micro-switch assembly mounted to a spring-loaded stick, so the switch could be shifted from right to left to contact different contour shapes on the drum cam. Mark-space ratio was variable to get either more signal time or more off time. The most successful pulser we had came along in 1953 and consisted of a wiper contact rotated in a circle by a German Distler motor. This wiper rotated against a bakelite plate which had a thin brass plate inlaid in it. The bakelite plate was pivoted at its tip and had a stick and centering springs attached. With the stick at neutral the wiper's circle was half on bakelite and the other half on the brass. The wiper contact and the brass acted as contacts in a switch to key the transmitter on and off. Movement of the stick varied the amount of brass and bakelite presented to the wiper's circle. This was a great improvement over a condenser delayed pulser for neutral and pushbuttons for right and left. The WAG and Worth pulsers followed soon and were all great improvements over some of the home brewed equipment we had been using.

Our first servo was small DC motor with the wire stripped off of the armature and two of the segments rewound in such a manner that energizing one coil caused approximately 45 degrees movement clockwise, and energizing the other coil caused the same movement in the opposite direction. The beginnings of both coils were tied together and grounded to the shaft. The opposite end of each coil was connected to an insulated slip ring. Both slip rings were mounted on the motor shaft outside the case. A brush contacted each slip ring and was con-



Here's the installation in the Roaring 20. Both the actuator and the receiver are slide mounted. Receiver is "double end."



Switchcraft Tiny Jack (closed circuit) is used as switch. Remove plug and contacts close—more reliable than any switch.

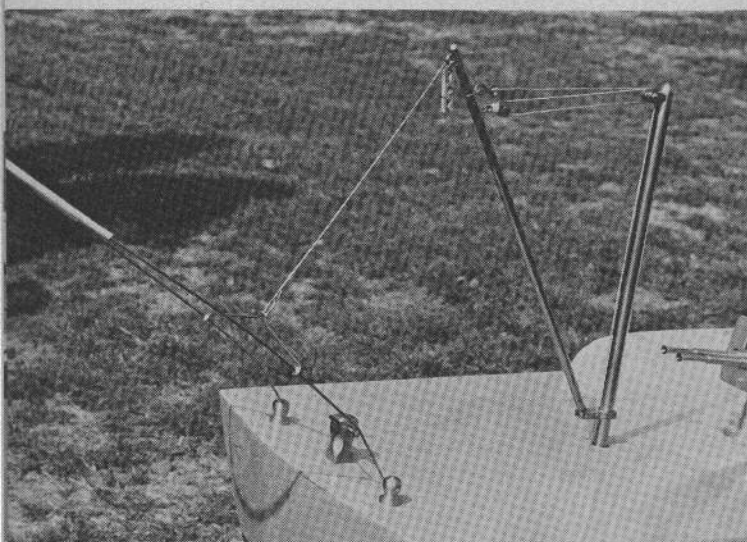
nected to the NC and NO points of the receiver relay. A third brush rode on the metal shaft and was connected in series with an on-off switch, a battery supply and the armature of the relay. If you could get those three brushes adjusted the servo would pulse along right in step with the transmitter, until a hard landing fouled things up.

Then it was back to the bench again. In effect this servo operated on the same principle as the present day magnetic actuator with center tapped coils except that the magnet stood still and the coils oscillated right and left.

Much cobbling and many mistakes later we had what we thought was a pretty workable magnetic actuator with the coil mounted in a metal frame and the magnet rotated right and left by the reversals of the magnetic field as caused by the center-tapped coil. That first one worked but not as well as we wanted so as a consequence a lot of different things have been tried over the last 12 years in an attempt to get a small, lighter, lower drain actuator that still had (Continued on page 25)



Cradled safely in its special carrying cart, the craft is being trundled from the parking lot to the familiar park pond.



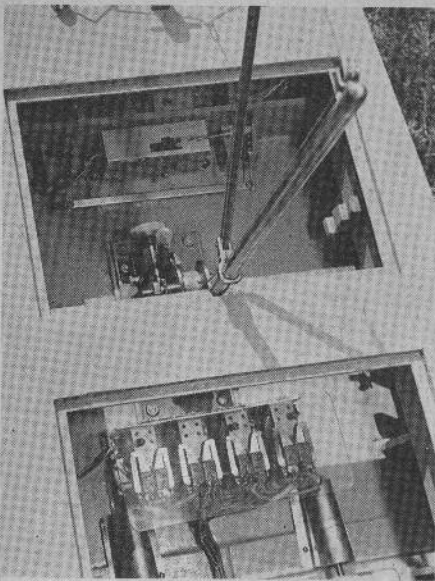
The boom—which both lowers and swivels—can be used with the hoop at the stern, or with hook for ordinary towing.

## RESCUE CRAFT

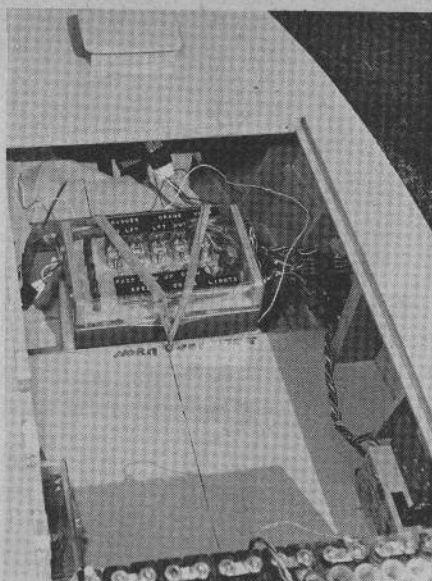
**YOU KNOW ABOUT FLYAWAYS BUT WHAT HAPPENS WHEN A BOAT GOES DEAD IN THE WATER? WITH AL SEIDENBERG AROUND THERE'S A TOW HOME!**

■ THERE IS A COCKEYED FALLACY that all you can do with boats is watch them run around. Actually, there's a host of things that can be done by the imaginative boat man, witness Al Seidenberg's ingenious rescue craft. He uses it like any other boat but finds pleasure and satisfaction in rescuing other people's boats—which often are not as reliable as his!

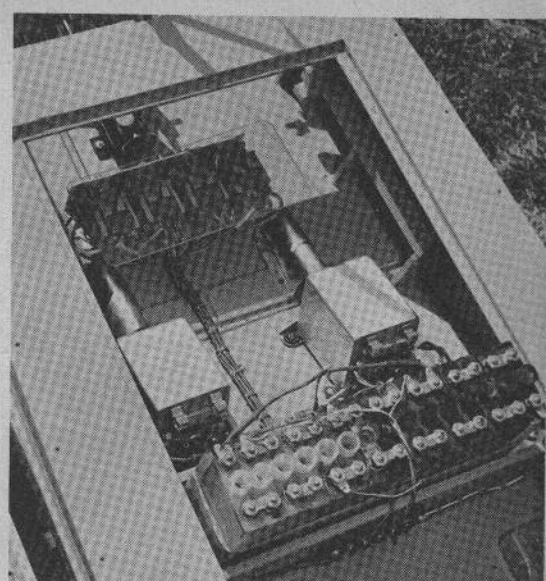
The idea is a simple one. A boom which can be lowered and swiveled to either side, to any degree, can drop a wire loop over some protruding part of the (Continued on page 24)



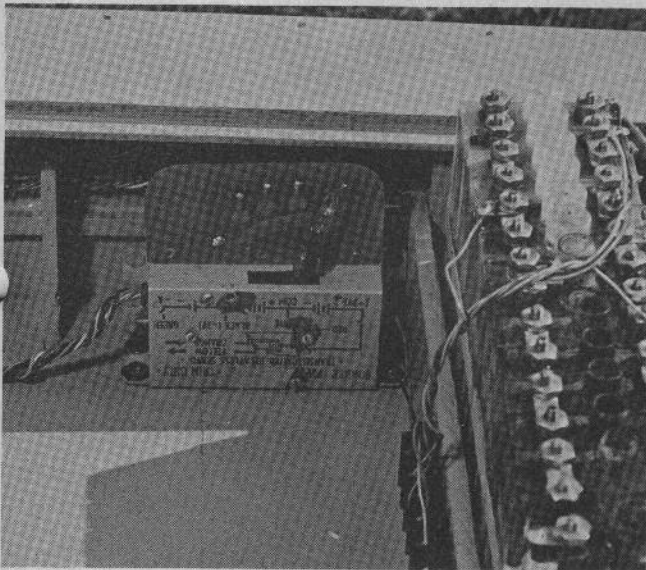
Switching relays, foreground, are used in the high-drain drive motor circuits.



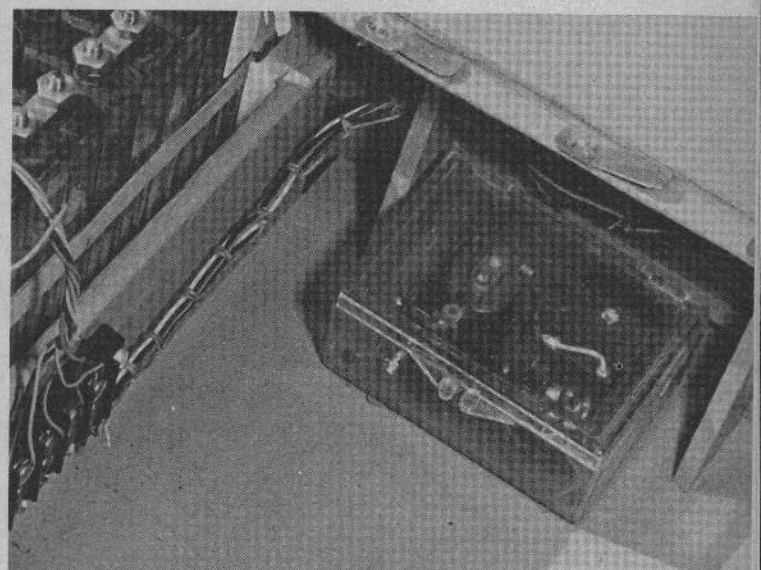
Relay converter units for C&S 10-channel reduces servo requirements to just two.



Two Pittman Boatmasters for drive. Although intended for 12V, 18V works OK.

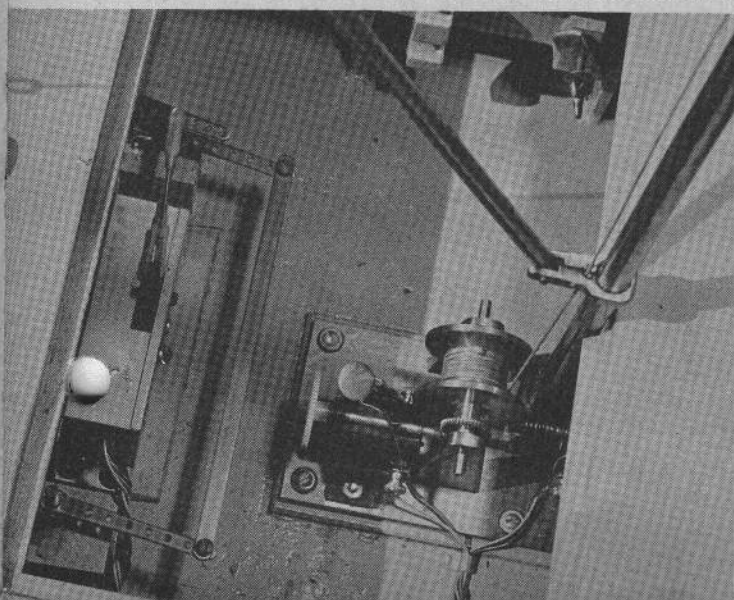


Switching done by modified Transmrite servo. Brass extension to arm picks contacts visible on attached PC board.

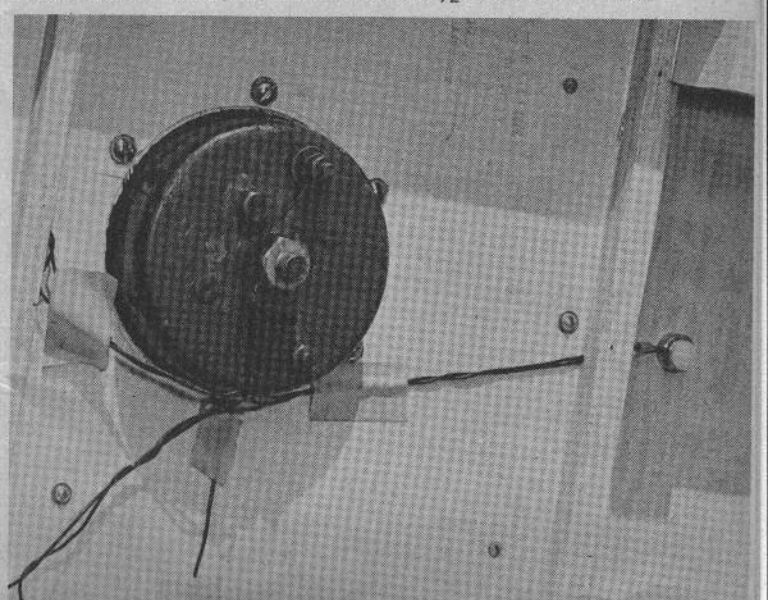


What looks like a small receiver case contains latching relay from American Flyer reversing unit—operates lights.

Construction of winch (Mighty Midget motor) can be deduced from this pic. At left, note servo tiller arrangement.



Foreign car horn mounts in the removable cabin, contacts made when cabin in place. Connections 1½ common and 12V.



A complete listing of important specifications and operating data for all transmitters and receivers on the U.S. market as of September 1. Multi-proportional arranged as complete systems

## TRANSMITTERS... Grid Leaks R/C Survey

### ACE R/C

Model: KT1K Kraft Tone (kit)  
Frequency: 26,995, 27,145, 27,255, 50-54  
Type: Single, tone, tube and transistors  
Channels: Single  
Audio cps: 400-500  
Dimensions: 8 x 5 1/2 x 3  
Keying: Pushbutton  
Voltage: A-1 1/2, B-6 7/2 or 135  
Current: Idle, A-220ma, B-18ma; Signal on, A-220ma, B-24ma  
Batteries: 2 Burgess XX45, 1 Burgess 4F  
Comment: One 3A5 for MOPA, two transistors for tone. High-low feature, B batteries parallel for long life, switching to series for extra power.

Model: KT6K 6-channel (kit)  
Frequency: 26,995, 27,145, 27,255, 50-54  
Type: Multi, non-simultaneous tube and transistors  
Channels: 6  
Audio cps: 225 to 400  
Dimensions: 8 x 5 1/2 x 3  
Keying: Lever switches  
Voltage: A-1 1/2, B-135  
Current: Idle, A-220ma, B-18ma; Signal on, A-220ma, B-24ma  
Batteries: 2 Burgess XX45, 1 Burgess 4F  
Comment: 3A5 for MOPA, 2 transistors for tone, high-low feature, two B batteries parallel for long life, switching to series for high power. Also with rcvr kits combinations at savings.

Model: Kraft KT10K Triple 10 (kit)  
Frequency: 26,995, 27,145, 27,255, 50-54  
Type: Multi, triple simultaneous, tube and transistors  
Channels: 10  
Audio cps: 225-500  
Dimensions: 9 3/4 x 8 x 3  
Keying: Lever switches  
Voltage: A-1 1/2, B-135  
Current: Idle, A-220ma, B-16ma; Signal on, A-220ma, B-28ma  
Batteries: 2 XX45 Burgess, 1 Burgess 4F  
Comment: One 3A5 for MOPA, two transistors for tone. High-low feature, B batteries in parallel for low, switching to series for high. Plug-in deck permits use with another reed receiver. Available for either Medco or Deans reed banks.

### AMERICA'S HOBBY CENTER

Model: Astro 33  
Frequency: 26,995  
Type: Transistorized, tone  
Channels: Single  
Size: 1 1/2 x 3 3/4 x 5 3/4  
Keying: Microswitch button  
Voltage: 18  
Current:  
Batteries: 2 Burgess 2 U6  
Weight: W/Batteries 13 1/2 oz.  
Price: With relay receiver, \$39.88

### ARISTO-CRAFT

Model: Rangemaster 2AP  
Frequency: 26,995 to 27,255  
Type: Tone, single, tubes  
Channels: Single  
Audio cps: 450  
Size: 8 x 5 x 3  
Keying: Lever switch  
Voltage: A-1.5, B-135  
Current: Idle, A-300ma, B-15ma; Signal on, A-300ma, B-20ma  
Batteries: 2 Burgess D cells, 2 Burgess XX45  
Price: \$19.95

Model: Rangemaster 1AP  
Frequency: 26,995 to 27,255  
Type: Single, carrier, tubes  
Channels: Single

Audio cps: (carrier)  
Size: 8 x 5 x 3  
Keying: Lever switch  
Voltage: A-1.5, B-135  
Current: Idle, A-150ma, B-15ma; Signal on, A-150ma, B-20ma  
Batteries: 1 Burgess D cell, 2 Burgess XX45  
Price: \$13.95

Model: Rangemaster T10-D  
Frequency: 26,995 to 27,255  
Type: Multi, dual simultaneous, tubes  
Channels: 10  
Audio cps: 250 to 375  
Size: 9 1/2 x 7 x 3 1/4  
Keying: Lever switches  
Voltage: A-1.5, B-135  
Current: Idle, A-800 ma, B-18ma; Signal on, A-800ma, B-22-28ma  
Batteries: 2 Burgess XX45, 1 Burgess 4F  
Price: \$74.95  
Comment: Converter power supply, \$31.95 (with special wet cells). Factory installed on request, \$39.95

Model: Rangemaster T-8D  
Frequency: 26,995 to 27,255  
Type: Multi, dual simultaneous, tubes  
Channels: 8  
Audio cps: 250 to 350  
Size: 9 1/2 x 7 x 3 1/4  
Keying: Lever switches  
Voltage: A-1.5, B-135  
Current: Idle, A-800ma, B-18ma; Signal on, A-800ma, B-22-28ma  
Batteries: 2 Burgess XX45, 1 Burgess 4F  
Price: \$49.95  
Comment: Converter power supply, \$31.95 (with special wet cells). Factory installed on request, \$39.95.

### BABCOCK

Model: BCT-21  
Frequency: 27,120 ± 120KC  
Type: Single, tone, transistorized  
Channels: Single  
Audio cps: 6000  
Size: 6 x 3 3/4 x 2  
Keying: Pushbutton. Tone frequency control, adjustable 4 to 8KC.  
Voltage: 18  
Current: Idle 12ma; Signal on, 20ma  
Batteries: 2 Eveready 216, or Burgess 2U6 or equivalent  
Price: \$49.95 (complete system—all pieces)  
Comment: Solely for use with BCR-21 rcvr and Mark VII escapement, 1 3/4 x 1 3/4, with 100-ohm coil and functions of right, left and up elevator

Model: BCT-18 Digitran  
Frequency: 27,045, 27,095, 27,145, 27,195 (26,995, 27,255 available extra—\$10)  
Type: Single, tone, transistorized  
Channels: Single  
Audio cps: 3500  
Size: 7 1/4 x 4 1/2 x 2 1/4  
Keying: Single stick electronically controlling time base, plus "quick blip" discharge circuit for motor control  
Voltage: 18  
Current: Idle, 18ma; Signal on, 22ma  
Batteries: 2 Eveready #216, or 2 Burgess 2U6 or equivalent  
Price: \$69.95 (complete system includes rcvr and escapements)  
Comment: Intended primarily for use with BCR-18 superhet rcvr and high-resistance escapements (Mk. VI Hyper Compound), and MMH Motorminder. Since power input to final is 100 MW, a station license is not required. Center-loaded whip antenna.

### CITIZEN-SHIP RADIO CORP.

Model: TMS  
Frequency: 26,995, 27,045, 27,095, 27,145, 27,195, 27,255  
Type: Multi, dual simultaneous, transistorized  
Channels: 10

Audio cps: 325 to 700  
Size: 8 1/4 x 6 3/4 x 2 3/4  
Keying: Lever switches  
Voltage: 9  
Current: Idle, 55ma; Signal on, 55ma  
Batteries: 1 or 2 Burgess C6X or Eveready Energizer 2356 or 276  
Price: \$119.95  
Comment: CPS range adjustable upward as much as 150 cycles, downward as much as 50

Model: SL-6  
Frequency: 26,995, 27,045, 27,095, 27,145, 27,195, 27,255  
Type: Multi, non-simultaneous, transistorized  
Channels: Six  
Audio Cps: Adjustable from 300-750  
Size: 6 3/4 x 5 5/8 x 2 3/4  
Keying: Lever Switches  
Voltage: 9  
Current: Idle, 45ma; On, 45ma  
Battery: Burgess D6 or Eveready #276  
Price: \$74.95. Packed with RL-6, \$119.95; with RL-6 and 3 Citizen-Ship Servos, \$189.95

Model: SPX  
Frequencies: 26,995, 27,045, 27,095, 27,145, 27,195, 27,255  
Type: Single, tone, transistorized  
Channels: Single  
Audio cps: 700  
Size: 6 1/4 x 3 3/4 x 2 3/4  
Keying: Slide switch  
Voltage: 9  
Current: Idle, 45ma; Signal on, 45ma  
Batteries: 1 Burgess D6 or 1 Eveready 276  
Price: \$39.95  
Comment: If operated with carrier off idle is zero

Model: TXX  
Frequency: 26,995, 27,045, 27,095, 27,145, 27,195, 27,255  
Type: Single, tone, transistorized  
Channels: Single  
Audio cps: 700  
Size: 3 1/4 x 5 1/2 x 1 1/4  
Keying: Slide switch  
Voltage: 9  
Current: Idle, 20ma; Signal on, 30ma  
Batteries: One Burgess 2N6 or one Eveready 246  
Price: \$29.95  
Comment: If operated with carrier off idle is zero

### CONTROLAIRE

Model: Mark II Mule  
Frequency: 26,995, 27,045, 27,095, 27,145, 27,195  
Type: Tone, Transistorized  
Channels: Single  
Cps: 600  
Size: 6 1/8 x 4 x 2  
Keying: Pushbutton  
Voltage: 9  
Current: Idle, 45ma; Signal on, 45ma  
Batteries: Eveready 276  
Price: \$29.98, assembled  
Comments: New sub-antenna for positive rcvr tuning; center-loaded main antenna; modulation percentage 97; available in kit form, \$23.98

Model: MTT-6A  
Frequency: 26,995 thru 27,195  
Type: Multi; Transistorized  
Channels: 6  
Cps: Adjusted for compatible reed banks, 270 to 650 Cps  
Size: 8 x 7 x 3-3/16  
Keying: Lever switches  
Voltage: 9  
Current: Idle, 42ma; Signal on, 42ma  
Batteries: Eveready 276  
Price: \$69.98 assembled  
Comments: On 10-channel PC. board with certain components eliminated, convertible by factory to 10-channel dual-simultaneous, \$39.98

# TRANSMITTERS... Grid Leaks R/C Survey

Model: MTT-10A or UTT-10A  
 Frequency: 26,995 thru 27,195  
 Type: Multi, dual-simultaneous, all-transistorized  
 Channels: 10  
 Cps: for Medco reed bank—350-650 Cps  
 Size: 8 x 7 x 3-1/16  
 Keying: Lever Switches  
 Voltage: 9  
 Current: Idle, 42, Signal on, 42ma  
 Batteries: (1) Eveready or Controlaire nickel-cadmium power pack.  
 Price: MTT-10A, \$99.98; UTT-10A, \$85.00  
 Comments: MTT-10A sold only as part of factory matched transmitter and receiver set. Model UTT-10 intended for home alignment of tone channels for use with kit model receivers.

## C & S ELECTRONICS

Model: Falcon II  
 Frequency: 26,995 to 27,255  
 Type: Single, tone, transistorized  
 Channels: Single  
 Audio cps: Approx. 600  
 Dimensions: 2 x 4 x 6  
 Keying: Pushbutton  
 Voltage: 9  
 Batteries: Eveready #276, Burgess D6, or equivalent; or 7 nickel cadmium, 500mah (important: 9V max)  
 Current: 40-45ma  
 Price: \$34.50  
 Comment: Center-loaded antenna. Instructions cover raising or lowering cps.

Model: Eagle CS-510  
 Frequency: 26,995, 27,045, 27,095, 27,145, 27,195, 27,255  
 Type: Multi, dual simultaneous, transistorized  
 Channels: 10 and 12  
 Audio cps: 650-700  
 Keying: Lever switches  
 Size: 2 7/8 x 6 x 7 1/2  
 Voltage: 9 (10V with nickel cadmiums)  
 Current: Idle, 40ma; Signal on, 80 ma  
 Batteries: Eveready 276 or 8 500-mah nickel cadmiums  
 Price: \$109.50—10 chan; \$119.50—12 chan.  
 Comment: Includes output monitor meter.

Model: Hawk CS-512  
 Frequency: 26,995, 27,045, 27,095, 27,145, 27,195, 27,255  
 Type: Multi, non-simultaneous, transistorized  
 Channels: 6  
 Audio cps: 410-600  
 Keying: Lever switches  
 Size: 2 7/8 x 5 x 7  
 Voltage: 9 (10V with nickel cadmiums)  
 Current: Idle, 40ma; Signal on, 80ma  
 Batteries: Eveready 276 or 8 500-mah nickel cadmiums  
 Price: \$64.50  
 Comment: Uses 6 center reeds of 12-chan reed bank.

## W. S. DEANS

Model: DM-100T  
 Frequency: 26,995, 27,045, 27,095, 27,145, 27,195  
 Type: Multi, dual simultaneous, transistorized  
 Channels: 10 and 12  
 Audio cps: 340 to 660  
 Size: 8 3/4 x 6 x 3  
 Keying: Lever switches  
 Voltage: 9  
 Current: Idle, 50ma; Signal on, 45ma  
 Batteries: 1 Eveready 276, or 7 VO-500 (8.75V) nickel cadmium  
 Price: \$118.50—10 channel; \$129.50—12 channel

Model: DM-60  
 Frequency: 26,995  
 Type: Multi, non-simultaneous, tubes  
 Channels: 6  
 Audio cps: 300—440  
 Size: 9 3/4 x 6 3/8 x 3  
 Keying: Lever switches  
 Voltage: A—1 1/2, B—135  
 Current: Idle, A—440ma, B—15ma; Signal on, A—440ma, B—30ma  
 Batteries: 1 Burgess 4F, 2 Burgess XX45  
 Price: \$61.50

## ECKTRONICS

Model: ET-2 Truflite  
 Frequency: 26,995  
 Type: Single, tone, transistorized  
 Channels: Single  
 Audio cps: 700  
 Size: 6 3/4 x 5 1/4 x 2 1/4  
 Keying: Pushbutton  
 Voltage: 18  
 Current: Idle, 40ma; Signal on, 40ma  
 Batteries: 2 Burgess 2N6 or Eveready 246  
 Price: \$39.95

Model: ET-1A Pacesetter  
 Frequency: 26,995  
 Type: Single tone, tube and transistor

Channels: Single  
 Audio cps: 700  
 Size: 8 x 5 1/2 x 3  
 Keying: Pushbutton  
 Voltage: A—1 1/2, B—135  
 Current: Idle, A—215ma, B—16ma; Signal on, A—215ma, B—14ma  
 Batteries: 1 Eveready 742 or Burgess 4F, and 2 Eveready 467 or Burgess XX45  
 Price: \$34.95  
 Comment: Neon-transistor modulator, MOPA

Model: KT-1 (Kraft)  
 Frequency: 26,995  
 Type: Single, tone, tube and transistors  
 Channels: Single  
 Audio cps: 600  
 Size: 8 x 5 1/2 x 3  
 Keying: Pushbutton  
 Voltage: A—1 1/2, B—135  
 Current: Idle, A—220ma, B—3ma (low), 14ma (high); Signal on, A—220ma, B—3.2ma (low), 16ma (high)  
 Batteries: 1 Burgess 4F or Eveready 742, 2 Burgess XX45 or Eveready 467  
 Price: \$39.95  
 Comment: Transistorized multivibrator modulator, MOPA

## F & M ELECTRONICS

Model: Echo  
 Frequency: 26,995, 27,045, 27,095, 27,145, 27,195, 27,255; 50-54  
 Type: Single, tone, transistorized  
 Channels: Single  
 Audio cps: 500 approx.  
 Size: 7 x 4 3/8 x 2 5/8  
 Keying: Pushbutton  
 Voltage: 6  
 Current: Idle, 90ma; Signal on, 125ma  
 Batteries: 1 Burgess F4BP (lantern)  
 Price: \$29.95

Model: Matador  
 Frequency: 26,995, 27,045, 27,095, 27,145, 27,255; 50-54  
 Type: Multi, dual simultaneous, transistorized  
 Channels: 10 or 12  
 Audio cps: 300—650  
 Size: 8 x 6 1/4 x 2 5/8  
 Keying: Lever switches  
 Voltage: 6  
 Current: Idle, 90ma; Signal on, 125ma  
 Batteries: 1 Burgess F4BP (lantern)  
 Price: \$99.50, 10 chan.; \$109.50, 12 chan.

## IRVING ELECTRONICS

Model: Tone E Q100  
 Frequency: 27,255, others on order  
 Type: Single, tone, transistorized  
 Channels: Single  
 Audio cps: 600—700  
 Size: 5 x 3 x 2 1/2  
 Keying: Pushbutton  
 Voltage: 9  
 Current: Idle, 121ma; Signal on, 30ma  
 Batteries: Eveready Type E146, Mallory TR146  
 Price: \$23.95  
 Comment: Microswitch at increased cost. No station license required—input is 100 milliwatts. With blip-timer \$29.95. Tone-E Thunderbolt X-mitter, 1/2 watt to final, \$29.95—with blip timer, \$39.95.

## KLINETRONICS

Model: Flightline—TTR-1  
 Frequency: 26,995, 27,045, 27,095, 27,145, 27,195  
 Type: Single, tone, transistorized  
 Channels: Single  
 Audio cps: 800; see comment  
 Size: 6 1/4 x 3 3/4 x 1 1/8  
 Keying: Pushbutton  
 Voltage: 18  
 Current: Idle, 38ma; Signal on, 45ma  
 Batteries: Burgess M6 or Eveready 266  
 Price: \$34.95  
 Comment: Audio frequency can be varied by customer, 400 to 1500 cps. Pushbutton sealed from dirt

Model: Jetfire 10—TTR-10  
 Frequency: 26,995, 27,045, 27,095, 27,145, 27,195  
 Type: Multi, dual simultaneous, transistorized  
 Channels: 10  
 Audio cps: 310 to 605  
 Size: 6 x 6 1/4 x 3  
 Keying: Lever switches  
 Voltage: 12  
 Current: Idle, 45ma; Signal on, 65ma  
 Batteries: 12V nickel cadmium recommended; TP-500 mah or TP-750 mah  
 Price: \$118.95. TP-500 mah pack—\$29.95; TP-750 mah pack—\$39.95

Model: Jet Stream—TTR-6 and TTR-6S  
 Frequency: 26,995, 27,045, 27,095, 27,145, 27,195  
 Type: Multi, non-simultaneous (standard) and dual

simultaneous (two models), transistorized  
 Channels: 6  
 Audio cps: 310 to 605  
 Size: 6 x 6 1/4 x 3  
 Keying: Lever switches  
 Voltage: 12  
 Current: Idle, 45ma; Signal on, 65ma  
 Batteries: 12V nickel cadmium recommended: TP-500 mah or TP-750 mah  
 Price: \$75.00—non-simultaneous (TTR-6); \$95.00—Simultaneous (TTR-6S)

## KRAFT

Model: Custom KT1  
 Frequency: 26,995, 27,045, 27,095, 27,145, 27,195, 27,250, 53,025, 53,100, 53,175, 53,250 at extra  
 Type: Single, tone, transistorized  
 Channels: single  
 Audio Cps: 500  
 Size: 6 x 4 5/8 x 2 1/2  
 Keying: Pushbutton  
 Voltage: 9  
 Current: Burgess D-6, or equivalent  
 Price: \$29.95

Model: Custom KT4  
 Frequency: Same as KT1  
 Type: Multi, non-simultaneous, transistorized  
 Channels: 4  
 Audio Cps: 330-650  
 Size: 6 x 5 x 3  
 Keying: Lever switches  
 Voltage: 9  
 Current: 60-70ma  
 Batteries: Burgess D-6 or equivalent  
 Price: Available only as a matched combination with 6V 4-chan. superhet reed receiver, \$89.95

Model: Custom KT6  
 Frequency: Same as KT1  
 Type: Multi, dual-simultaneous, transistorized  
 Channels: 6  
 Audio Cps: 330-650  
 Size: 6 x 5 x 3  
 Keying: Lever Switches  
 Voltage: 9  
 Current: 60-70ma  
 Batteries: Burgess D-6 or equivalent  
 Price: \$69.95

Model: Custom KT10  
 Frequency: Same as KT1  
 Type: Multi, dual-simultaneous, transistorized  
 Channels: 10  
 Audio Cps: 330-650  
 Size: 6 x 6 x 3  
 Keying: Lever Switches  
 Voltage: 9  
 Current: 60-70ma  
 Batteries: Burgess D-6 or equivalent  
 Price: \$119.95

Model: Custom KT12  
 Frequency: Same as KT1  
 Type: Multi, dual-simultaneous, transistorized  
 Channels: 12  
 Audio cps: 330-650  
 Size: 6 x 6 x 3  
 Keying: Lever switches  
 Voltage: 9  
 Current: 60-70ma  
 Batteries: Burgess D-6 or equivalent  
 Price: \$129.95

## LAFAYETTE

Model: Lafayette Super-trol  
 Frequency: 27,255  
 Type: Single, carrier, tube  
 Channels: Single  
 Audio cps: (carrier)  
 Size: 8 1/2 x 2 3/4 x 1 3/4  
 Keying: Pushbutton  
 Voltage: A—1 1/2, B—135  
 Current: Idle, A—95ma; Signal on, A—95ma, B—5.5ma  
 Batteries: 3 Burgess U30, 2 #2  
 Price: \$14.95. Combination with Lafayette receiver, \$22.90

## MIN-X RADIO INC.

Model: Powermite TT-12  
 Frequency: 26,995, 27,045, 27,095, 27,145, 27,195mc  
 Type: Multi, dual-simultaneous, transistorized  
 Channels: 12  
 Audio cps: 330-630  
 Size: 7 1/2 x 7 x 3  
 Keying: Lever switches  
 Voltage: 9V  
 Current: Idle, 55ma; Signal on, 50ma  
 Batteries: Burgess D-6 or equivalent  
 Price: \$134.95  
 Comment: Center-loaded antenna, meter and battery test, 12 Chan. X-mitter and Rcvr., \$229.95

# TRANSMITTERS... Grid Leaks R/C Survey

**Model: Powermaster T-2**  
 Frequency: 26.995, 27.045, 27.095, 27.145, 27.195mc  
 Type: Single, tone, tubes  
 Channels: Single  
 Audio cps: 800  
 Size: 7½ x 5¼ x 3  
 Keying: Pushbutton  
 Voltage: A—1½, B—67½  
 Current: Idle, A—400ma, B—20ma; Signal on, A—400ma, B—18ma  
 Batteries: 1 Burgess 4F, 2 Burgess XX45 or equivalent  
 Price: \$32.88

**Model: Powermite TT-10**  
 Frequency: 26.995, 27.045, 27.095, 27.145, 27.195mc  
 Type: Multi, dual simultaneous, transistorized  
 Channels: 10  
 Audio cps: 340-640  
 Size: 7½ x 7 x 3  
 Keying: Lever switches  
 Voltage: 9V  
 Current: Idle, 55ma; Signal on, 50ma  
 Batteries: Burgess D-6 or equivalent  
 Price: \$125.00  
 Comment: Center-loaded antenna, meter and battery test; 10-chan X-mitter and rcvr, \$199.88 (Convertible to 12 chan)

**Model: Powermite TT-1**  
 Frequency: 26.995, 27.045, 27.095, 27.145, 27.195mc  
 Type: Single, tone, transistorized  
 Channels: Single  
 Audio cps: 800  
 Size: 6 x 4½ x 2½  
 Keying: Pushbutton  
 Voltage: 9V  
 Batteries: Burgess D-6 or equivalent  
 Current: Idle, 55ma; Signal on, 50ma  
 Price: \$29.88  
 Comment: Center-loaded antenna

**Model: Powermite TT-6**  
 Frequency: 26.995, 27.045, 27.095, 27.145, 27.195mc  
 Type: Multi, simultaneous, transistorized  
 Channels: 6  
 Audio cps: 305-540  
 Size: 7½ x 7 x 3  
 Keying: Lever switches  
 Voltage: 9V  
 Batteries: Burgess D-6 or equivalent  
 Current: Idle, 55ma; Signal on, 50ma  
 Price: \$80.00  
 Comment: Center-loaded antenna, meter, and battery test, 6 Chan, X-mitter and Rcvr, \$129.88 (Convertible to 10 or 12 ch)

**Model: TCPT-1 Pulsmite 1200S**  
 Frequency: 26.995, 27.045, 27.145, 27.095, 27.195  
 Type: Tone, transistorized, pulser  
 Channels: Single  
 Audio cps: 1200  
 Size: 2½ x 5 x 6½  
 Keying: Single stick with rate and width including trim for each. Also two pushbuttons for full on and off tone switching.  
 Voltage: 9  
 Current: 55ma  
 Batteries: Burgess D-6 or equivalent  
 Price: \$59.95  
 Comment: For use with SHS-1 rcvr; and primarily for Simpl-Simul (Galloping Ghost) systems. Modulation, 90%. Center-loaded antenna.

**Model: TT-1P Pulsmite 800S**  
 Frequency: 26.995, 27.045, 27.095, 27.145, 27.195mc  
 Type: Single, tone, transistorized  
 Channels: Single  
 Audio cps: 800  
 Size: 2½ x 5 x 6½  
 Keying: Single stick with rate and width, including trim for each. Also two pushbuttons for on-off tone switching.  
 Voltage: 9  
 Current: 55ma  
 Batteries: Burgess D-6 or equivalent  
 Price: \$59.95  
 Comments: Built-in electronic pulser for receivers requiring 100% modulation at 800 cps (Capri SRC-1), primarily for Simpl-Simul—(Galloping Ghost)—systems. Center-loaded antenna.

**Model: TCT-1, Powermite 1200K**  
 Frequency: 26.995, 27.045, 27.095, 27.145, 27.195mc  
 Type: Single, tone, transistorized  
 Channels: Single  
 Audio cps: 1200  
 Size: 2½ x 5 x 6½, gold anodized aluminum  
 Keying: Key operated, positive action, light spring  
 Voltage: 9  
 Current: 50-60ma  
 Batteries: Burgess D-6 or equivalent  
 Price: \$39.95  
 Comment: For use with SHS-1 rcvr. Modulation 90%. Center-loaded antenna.

## MRC-ENYA

**Model: 104**  
 Frequency: 26.995, 27.045, 27.095, 27.145, 27.195  
 Type: Single, tone, transistorized  
 Channels: Single  
 Audio cps: 500  
 Size: 5½ x 3 x 2½  
 Keying: Pushbutton  
 Voltage: 18  
 Current: Carrier, 25ma; tone, 28ma  
 Batteries: 2 Eveready #216, Burgess 206, or equivalent  
 Price: \$37.50  
 Comment: Built-in battery voltage indicator

## NEW HAVEN ELECTRONICS

**Model: Custom-Made Pulse**  
 Frequency: (See comment)  
 Type: Single, tone, transistorized  
 Channels: Single  
 Audio cps: (See comment)  
 Size: 7 x 3 x 5  
 Keying: Stick for pulse rate, width; two pushbuttons for full on-off to tone, plus 2 trim knobs  
 Voltage: 12 to 15  
 Batteries: 8 Burgess 230 flashlight cells  
 Current: 130-140ma  
 Price: \$89.00—includes batteries  
 Comment: Power output at antenna is in excess of 1.25 watts. Choice of RF and tone frequencies and of pulse rate and width, optional. Designed primarily for use with Tel-star-B rcvr. 50 MC with reduced output

**Model: High-Power Module**  
 Frequency: To match rcvr (\$8 extra for 50MC)  
 Type: Universal, basic 2-watt X-mitter  
 Channels: For use with existing systems  
 Audio cps: See comment  
 Size: 2 x 3 x 1  
 Keying: See comment  
 Voltage: 12  
 Current: 130ma at 1.25watts RF radiated  
 Batteries: 8 D cells (Burgess 230 or equivalent) or 2 lantern batteries, Burgess F4P1, etc., or equivalent. Alkaline cells (AL-2) 10 times longer usage than D cells.  
 Price: \$38.50  
 Comment: Module includes RF oscillator, amplifier and modulator. Ideal for converting old tube-type X-mitters, for pulse mounted in pulse box, or with New Haven PR/PW Function Generator Module.

## ORBIT ELECTRONICS

**Model: Orbit Single**  
 Frequency: 26.995  
 Type: Single, tone, transistorized  
 Channels: Single  
 Audio cps: 400-600 (Adjustable)  
 Size: 2½ x 3¾ x 5½  
 Keying: Pushbutton  
 Voltage: 9  
 Current: 60-70ma  
 Batteries: RCA VS-306  
 Price: \$35.00

**Model: Orbit T4 and T6**  
 Frequency: Any CB  
 Type: Multi, tone, non-simultaneous, transistorized  
 Channels: 4 or 6  
 Size: 2½ x 6¾ x 6  
 Audio cps: 300-600, depending on 4 or 6  
 Keying: Lever switches  
 Voltage: 9  
 Current: 60-70ma  
 Batteries: RCA VS-306  
 Price: 4 channel—\$69.00; 6 channel—\$79.00

**Model: T-10X and T-12X**  
 Frequency: All CB  
 Type: Multi, dual-simultaneous, transistorized  
 Channels: 10 and 12  
 Audio cps: 340 to 610 (on 10); 355 to 690 (on 12)  
 Size: 3 x 6½ x 7¾  
 Keying: Lever switches  
 Voltage: 10  
 Current: 70-75ma under all conditions  
 Batteries: Orbit nickel-cadmium power pack  
 Price: \$118.50—10 channel; \$133.50—12 channel  
 Comment: Center-loaded antenna, miniature edge reading meter to monitor RF output. Power pack and charger: \$29.95 (1.25 aph capacity, 8 cells in series—"C" size cell configuration).

## SPACETRON, INC.

**Model: Cougar I**  
 Frequency: 26.995—27.255  
 Type: Tone, all transistorized  
 Channels: Single  
 Cps: 700  
 Size: 5 x 4-3/16 x 1-27/32  
 Keying: Pushbutton  
 Voltage: 9  
 Current: 30ma  
 Batteries:

Price: \$34.95  
 Comments: Slightly greater power output than Mustang I tube. X-mitter, 90-100% modulation.

**Model: Mustang 1**  
 Frequency: 26.995 to 27.255  
 Type: Single, tone, tubes and transistors  
 Channels: Single  
 Audio cps: 650  
 Size: 7 x 5 x 3  
 Keying: Pushbutton  
 Voltage: A—1.5, B—135  
 Batteries: A—2AA pencils, B—two Burgess XX45  
 Current: Idle, A—220ma, B—18ma; Signal on, A—220ma, B—18ma  
 Price: \$24.95  
 Comment: 3A5 MOPA; transistor sine-wave modulator. Operates with B-plus as low as 30V. Neutralized triode output for high efficiency.

# RECEIVERS..

## ACE R/C

**Model: Kraft Audio KR1K kit**  
 Frequency: 26.995 to 27.255 (tunable), 50-54  
 Type: Super-regen, tone, relay (arc suppression), tube and transistors  
 Channels: Single  
 Cps: 400-600  
 Description: Plastic box, 2-1/16 x 1-9/16 x 7/8  
 Weight: 1-15/16 oz.  
 Voltage: A—1½, B—22½  
 Batteries: Eveready 915 and 412, or equivalents  
 Current: Signal off, A—13ma, B—1.3ma; Signal on, A—13ma, B—4.5ma+  
 Comments: 50-54 mc use of 1AG4 tube changes filament current from 13 to 40 ma.

**Model: Kraft Hybrid 10 (kit)**  
 Frequency: 26.995, 27.045, 27.095, 27.145, 27.195  
 Type: Superhet, multi, relayless, simultaneous, reeds, transistorized  
 Channels: 10  
 Cps: 350-660  
 Description: Metal case, 2¾ x 1-27/32 x 31/32  
 Weight: 3½ oz.  
 Voltage: 6  
 Current: Signal off, 3ma; Signal on, 25ma  
 Batteries: 5 500-mah BH cells (servo pack)  
 Comments: RF portion prewired, aligned. Remaining parts put into audio section and reed—30 minutes wiring.

**Model: Kraft KR6RK (kit)**  
 Frequency: 26.995 to 27.255 (tunable), 50-54  
 Type: Super-regen, relayless, multi, simultaneous, reeds, tube and transistors  
 Channels: 6  
 Cps: 400  
 Description: Metal case, 2½ x 1¾ x 1¾  
 Weight: 4¼ oz.  
 Voltage: A—1½, B—30  
 Current: Signal off, A—13ma, B—3ma; Signal on, A—13ma, B—5ma  
 Batteries: Eveready 915 and 413, or equivalents  
 Comments: Kit, 50-54mc; filament current changes from 13 to 40ma with 1AG4 tube. Converter uses servo batteries for A and B supply. This is KP/C. May be mounted on present PC board.

**Model: Kraft 10 KR10K (kit)**  
 Frequency: 26.995 to 27.255 (tunable), 50-54  
 Type: Super-regen, multi, relayless, simultaneous, reeds, tube and transistors  
 Channels: 10  
 Cps: 290-540  
 Description: Metal case, 2½ x 1¾ x 1¾  
 Weight: 4½ oz.  
 Voltage: A—1½, B—30  
 Current: Signal off, A—13ma, B—3ma; Signal on, A—13ma, B—5ma  
 Batteries: Eveready 915 and 413, or equivalents  
 Comments: Filament drain increases from 13 to 40ma with 1AG4 tube on 50-54 mc. Converter kit may be mounted on present PC board, using servo batteries for A and B. This KP/C.

**Model: Kraft Relayless K3VK (kit)**  
 Frequency: 26.995 to 27.255 (tunable)  
 Type: Super-regen, tone, relayless, transistorized  
 Channels: Single  
 Cps: 400  
 Description: No case, 1-11/16 x 1-11/16 x ¾  
 Weight: ¾ oz.  
 Voltage: 2.4 to 4.8  
 Current: Signal off, 50ma; Signal on, 280ma+  
 Price: \$9.95  
 Comments: Mn batteries (Mallory magnesium)

## AMERICA'S HOBBY CENTER

**Model: Astro 33**  
 Frequency: 26.995 to 27.255 (tunable)

# RECEIVERS... Grid Leaks R/C Survey

Type: Single, super-regen, transistorized, relay  
Channels: Single  
Cps: 600  
Description: Metal case, black, 1/4 x 1 1/4 x 2 1/2  
Weight: 2 1/4 ozs.  
Voltage: 9  
Current: Signal off, under 12ma; Signal on, 25-30ma  
Batteries: Burgess 2U6 or equivalent  
Price: With X-mitter, \$39.88

Model: Astro Pee Wee  
Frequency: 26.995 to 27.255 (tunable)  
Type: Single, tone, transistorized, relayless  
Channels: Single  
Cps: 600  
Description: Plastic case, 3/4 x 1 x 1 1/4  
Voltage: 3  
Current: Signal off, under 12ma; Signal on, 25-30ma  
Batteries: 2 penceils  
Weight: 1/2 oz.  
Price: \$12.88

## ARISTO-CRAFT

Model: Rangemaster R10-D  
Frequency: 26.995 to 27.255 (tunable).  
Type: Super-regen, multi, simultaneous, relays, tube and transistors  
Channels: 10  
Cps: 250-375  
Description: Metal case, 2 x 2 1/4 x 4  
Weight: 10 oz.  
Voltage: A—1.5, B—45  
Current: Signal off, A—40ma, B—6-8ma; Signal on, A—40ma, B—15-20ma  
Batteries: 1 Burgess Z cell, 2 Burgess U-15  
Price: \$74.95  
Comment: Converts to relayless (instructions)

Model: Rangemaster R8-D  
Frequency: 26.995 to 27.255 (tunable)  
Type: Super-regen, multi, simultaneous, relays, tube and transistors  
Channels: 8  
Cps: 250-350  
Description: Metal case, 2 x 2 1/4 x 3 1/4  
Voltage: A—1.5, B—45  
Current: Signal off, A—40ma, B—6-8ma; Signal on, A—40ma, B—15-20ma  
Batteries: 1 Burgess Z cell, 2 Burgess U-15  
Price: \$69.95  
Comment: Converts to relayless (instructions)

Model: 5AR and 5A  
Frequency: 26.995 to 27.255 (tunable)  
Type: Super-regen, tone, relayless (5AR), relay (5A), transistorized  
Channels: Single  
Cps: 450  
Description: Metal case, 7/8 x 1 1/2 x 2 1/4  
Weight: 2 1/2 oz.  
Voltage: 3  
Current: Signal off, 8ma; Signal on, 200-300ma.  
Batteries: 2 penceils  
Price: \$19.95  
Comment: Nickel cadmium or alkaline batteries may be used.

Model: Rangemaster CR-1  
Frequency: 26.995 to 27.255 (tunable)  
Type: Super-regen, carrier, relay (arc suppression), tubes  
Channels: Single  
Description: Plastic box, 1 1/4 x 2 3/4 x 1 1/2  
Weight: 4 oz.  
Voltage: A—1.5, B—67 1/2  
Current: Signal off, A—100ma, B—3-4ma; Signal on, A—100ma, B—8-1ma  
Batteries: 1 Burgess C, 1 Burgess K-45  
Price: \$8.95

Model: Rangemaster TRR  
Frequency: 26.995 to 27.255  
Type: Super-regen, tone, relay (arc suppression), tube and transistors  
Channels: Single  
Cps: 300 to 600  
Description: Plastic box, 1 1/4 x 2 3/4 x 1 1/2  
Weight: 4 oz.  
Voltage: A—1.5, B—22.5  
Current: Signal off, A—40ma, B—1.6ma; Signal on, A—40ma, B—5-6ma  
Batteries: 1 Burgess C, 2 Burgess U-15  
Price: \$19.95

## BABCOCK

Model: BCR-18  
Frequency: 27.045, 27.095, 27.145, 27.195, (26.995, 27.255 available extra—\$10)  
Type: Superhet, tone, transistorized, relayless  
Channels: Single  
Cps: 3500  
Description: Metal case, 3 x 1 1/4 x 7/8  
Weight: 2 1/4 ozs.  
Voltage: 9

Batteries: Eveready #216, Burgess 2U6 or equivalent  
Current: Signal off, 5ma; Signal on, 95ma  
Price: \$69.95 (complete system with X-mitter and escapements)  
Comment: Designed primarily for use with BCT-18 Digitran x-mitter, but may be used with any tone-type x-mitter giving 400 to 600 cps; latter usage sacrifices automatic coding of BCT-18. Escapements must be high-resistance type (100 ohms)—MK V1 compound and MMH motor control. Sensitivity better than 2 Microvolts.

Model: BCR-21  
Frequency: 27.120± 120KC  
Type: Super-regen, single, tone transistorized, relayless  
Channels: Single  
Cps: 6000  
Description: Metal case, 2 1/2 x 1 1/4 x 3/4  
Weight: 1 oz.  
Voltage: 9  
Current: Idle, 5ma; With command, 95ma  
Batteries: Burgess 2U6, Eveready 216 or equivalent  
Price: \$49.95 (complete system with MKVII escapement)  
Comment: Comes complete with switch panel, test points, battery connector assembled and wired. Only connections necessary to make are to antenna and to Mark VII escapement. Has frequency selective audio of approximately 6KC

## CITIZEN-SHIP RADIO CORP.

Model: RSH  
Frequency: 26.995, 27.045, 27.095, 27.145, 27.195, 27.255  
Type: Superhet, tone, relayless, all transistorized  
Channels: Single  
Cps: 500-1500  
Description: No case 2 x 1 1/2 x 3/4  
Weight: 1 1/4 oz.  
Voltage: 2.4-4.5  
Current: Signal off, 7ma; Signal on, 300ma  
Batteries: 2 penceils  
Price: \$34.95. Packaged with PSN-2 escapement, \$39.95; with SE-2 escap. \$41.95

Model: RL-6  
Frequency: 26.995, 27.045, 27.095, 27.145, 27.195, 27.255  
Type: Superhet, multi, reeds, relayless, all transistorized  
Channels: 6  
Cps: 425-650  
Description: Metal Case, 2 1/4 x 1-13/16 x 1  
Weight: 3 1/2 oz.  
Voltage: 9  
Current: Signal off, 5ma; Signal on, 15ma  
Batteries: Burgess P6, 2U6, or 2N6; or Eveready 226, 216, or 246  
Price: \$54.95. Packed with SL-6, \$119.95; with SL-6 and 3 Citizen-Ship servos, \$189.95.

Model: JSH  
Frequency: 26.995, 27.045, 27.095, 27.145, 27.195, 27.255  
Type: Superhet, tone, relay (arc suppression), transistorized  
Channels: Single  
Cps: 500-1500  
Description: Metal case, 1 x 2 1/4 x 1-13/16  
Weight: 2 3/4 oz.  
Voltage: 9  
Current: Signal off, 3ma; Signal on, 18ma  
Batteries: 1 Burgess 2U6 or P6, or 1 Eveready 216 or 226  
Price: \$49.95

Model: MDL  
Frequency: 26.995 to 27.255 (tunable)  
Type: Super-regen, tone, relayless, transistorized  
Channels: Single  
Cps: 500-1500  
Description: Plastic box, 7/8 x 1 x 11/16  
Weight: 1/2 oz.  
Voltage: 3  
Current: Signal off, 6ma; Signal on, 300ma  
Batteries: 2 Penceils  
Price: \$24.95  
Comment: Smaller than postage stamp. Box really is plastic cover on four sides

Model: LT "3"  
Frequency: 26.995 to 27.255 (tunable)  
Type: Super-regen, tone, relayless, transistorized  
Channels: Single  
Cps: 500-1500  
Description: No case, 2 1/4 x 1 1/4 x 7/8  
Weight: 1 oz.  
Voltage: 3  
Current: Signal off, 6ma; Signal on, 300ma  
Batteries: 2 Penceils  
Price: \$22.95; with PSN escap., \$27.95; SE escap., \$29.95

Model: R/C Pak

Frequency: 26.995 to 27.255 (tunable)  
Type: Super-regen, tone, relayless, transistorized  
Channels: Single  
Cps: 500-1500  
Description: Metal case, 2 1/4 x 3-1/16 x 1-7/16  
Weight: 5 oz.  
Voltage: 3  
Current: Signal off, 6ma; Signal on, 300ma  
Batteries: 2 Penceils  
Price: \$32.95 with PSN-2 escapement; \$34.95 with SE-2 escapement  
Comment: R/C Pak is completely wired system ready to drop in place, plug in batteries, and fly.

Model: 3VTR  
Frequency: 26.995 to 27.255 (tunable)  
Type: Super-regen, tone, relay (arc suppression), transistorized  
Channels: Single  
Cps: 500-1500  
Description: Metal case, 1 x 2 1/4 x 1 1/4  
Weight: 2 oz.  
Voltage: 3  
Current: Signal off, 2ma; Signal on, 65ma  
Batteries: 2 Penceils  
Price: \$34.95

Model: ZR-10  
Frequency: 26.995, 27.045, 27.095, 27.145, 27.195, 27.255  
Type: Super-het, multi, reeds, relayless, simultaneous transistorized  
Channels: 10  
Cps: 425-650  
Description: Metal case, 1-1/16 x 3 1/4 x 2 1/4  
Weight: 4 oz.  
Voltage: 9  
Current: Signal off, 6ma; Signal on, 15ma  
Batteries: 1 Burgess P6 or 206 or 1 Eveready 226, 216 or 246  
Price: \$79.95

## CONTROLAIRE

Model: Controilaire "5" Relayless  
Frequency: 26.995-27.255 (tunable)  
Type: Super-regen, relayless, tone, all-transistorized  
Channels: Single  
Cps: 400 to 1200  
Description: No case, 1 1/4 x 1-9/16 x 9/16  
Weight: 1 oz.  
Voltage: 3  
Current: Idle 2 to 3ma; Signal on, 300ma—depends on escapement  
Batteries: 2 penceils or up to 3.6v nickel cadmium  
Price: Assembled, \$13.98; Kit, \$7.98  
Comments: Temperature stabilized for 0° to 130°F. Self limiting detector that will not swamp with strong RF carrier. Excellent noise rejection.

Model: Controilaire "4"  
Frequency: 26.995-27.255 (tunable)  
Type: Super-regen, tone, relay with arc suppression, all transistorized  
Channel: Single  
Cps: 400 to 1200  
Description: Metal case, 1-15/16 x 1-7/16 x 7/8  
Weight: 1 3/4 oz.  
Voltage: 3  
Current: Idle, 2 to 3ma; Signal on, 55ma  
Batteries: 2 penceils  
Price: Assembled, \$22.98; kit, \$17.98  
Comments: Self-limiting detector that will not swamp with strong RF carrier. Especially suited for pulse work. Pulse response linear up to about 25 cps. Temperature compensated to operate from 0° to 130°F. Sensitivity, 4 microvolts.

Model: SR6-10  
Frequency: Tunable 26.995 thru 27.255 mc  
Type: Super-regen, multi, reeds, relayless, all-transistorized  
Channels: 10 available, 6 used  
Cps: 270 to 480. OS reed bank  
Description: Metal case, 2 x 1 1/4 x 1 1/4  
Weight: 3 1/4 oz.  
Voltage: (See Batteries)  
Current: Idle, 3ma, Signal on, 40ma  
Batteries: 4.8v nickle-cadmium recommended  
Price: Assembled, \$45.00  
Comments: Extremely small multi receiver with self-limiting detector that will not swamp with strong RF carrier. Temperature compensated 0° to 130°F. Sensitivity, 6 microvolts.

Model: SH-20  
Frequency: 26.995, 27.045, 27.095, 27.145, 27.195  
Type: Superhet, multi, reeds, relayless, all-transistorized  
Channels: 10  
Cps: 350 to 650. Medco reed bank  
Description: Metal case, 1 1/4 x 1 1/4 x 2

(Continued on page 20)



Skimming distant hill line, Jim's nostalgic little crate is an eyeful for any scale fan. Does not wobble in flight.

# THE OX-5 CHALLENGER

By **JIM DEAN** . . . A CHARMING ONE-INCH-SCALE MODEL OF A KREIDER-REISNER BIPLANE OF THE 1920'S. EQUIPPED WITH A SINGLE-CHANNEL PULSE PROPORTIONAL, IT FLIES REALISTICALLY ON .049'S — PERHAPS OF A SLIGHTLY TIRED VARIETY. WORTH TRYING!

**T**hough not so well known as some of the other biplanes of the period, the Kreider-Reisner Challenger was one of the prettiest ships produced in an era when attractive airplanes were the rule and wings, rather than sheer horsepower, were used for flight. The design was about standard for the time, being three-place, open cockpit, land, biplane—or simply 3POLB—with the 90-hp, Curtiss OX-5 engine.

Designed in the mid-twenties by Bill Kreider and Lou Reisner, the KR series of biplanes were made in the Kreider-Reisner factory at Hagerstown, Md., and remained in continuous production until replaced by the Fairchild 22 and 24 in the early 1930's. The original factory was Kreider-Reisner Aircraft Co., but not long after the untimely death of Bill Kreider at Cleveland in 1928, the ownership of KR was acquired by Fairchild. For a time it was known as the Kreider-Reisner Division, was later changed to Fairchild Airplane Mfg., Co., and has remained Fairchild ever since.

During the production life of the KR's there was little change in the design other than the powerplant, landing gear, and ailerons. The last of the series, the KR-34, used an Oleo sprung gear in place of the original straight axle and shock cord, ailerons in the bottom wings only, and offered a choice of powerplants—usually the 165-hp Comet or the 165-hp Wright J-6. Both engines were five-cylinder air-cooled radial and were a considerable improvement.

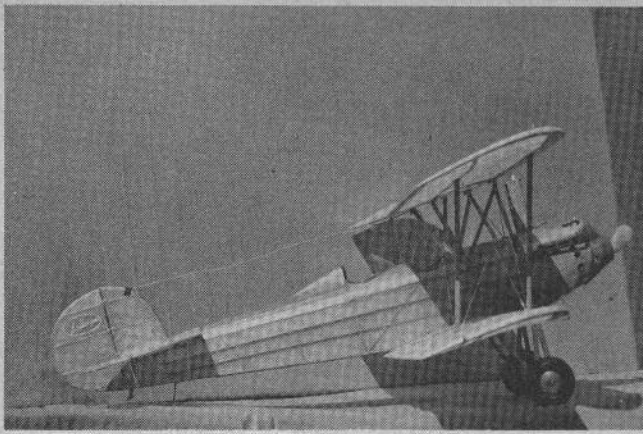
Performance was in keeping with comparable aircraft and the ability to get into and out of small fields was exceptional. This was a decided asset considering the lack of airports at the time—the nearest field, usually of questionable size, being the airport—and hard surfaced runways were almost unheard of. While not intended as an aerobatic craft, the Challenger was a structurally strong airplane and, with a capable pilot, needed apologize to few other aircraft. Though not generally known, a number of Challengers were purchased by the Chinese government, equipped with machine guns and bomb racks—guns were mounted in the space normally used for the front cockpit, the bomb racks under the wings—and used in an attempt to control the banditry so prevalent in China. It is doubtful that any of these ships engaged other aircraft in combat but, however brief or sketchy it may be, the Challenger does boast of even a military history of sorts.

The KR-21 was another of the KR family though not a direct off-spring of the KR-31. Slightly smaller than the '31, it was a two-place, tapered-wing biplane, powered by a 90 hp Kinner, five-cylinder, air-cooled, radial. Not many of the '21's were built—rumor has it as few as two. However, a 21 has been seen on TV in recent years, supposedly flown by an old-timer who refers to it as a Jennie. You may have seen it.

Rigging wires will be a new experience for most builders but the designer states method of installation is tops.



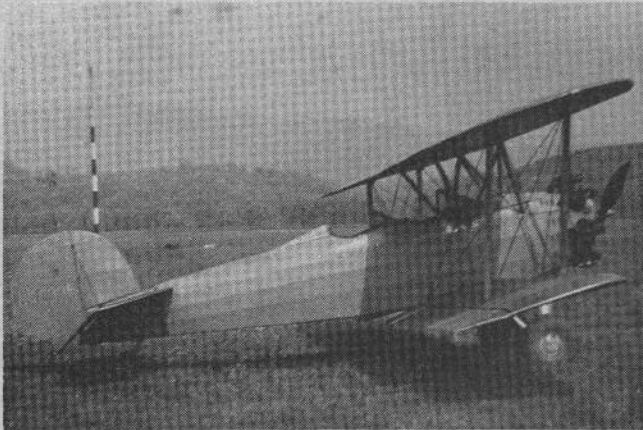




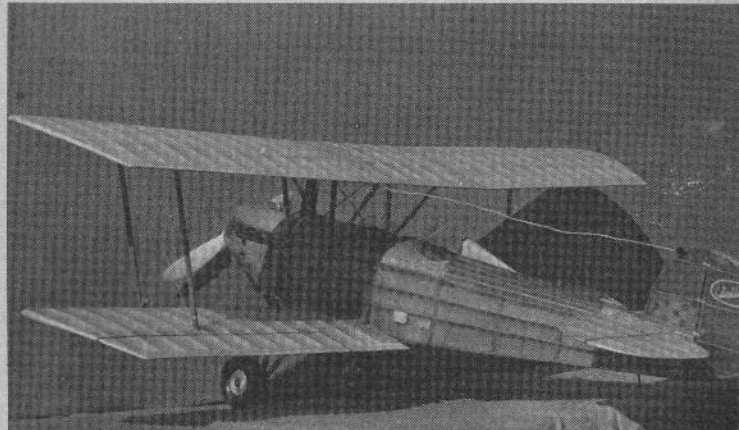
A reasonable facsimile of the real thing (just below!), the water-cooled version of the model poses three-point.



Headed "west" here, but from a slightly lower eye-level. Holes near nose mount dummy cylinders of radial engine.



Even at this late date a few of the KR's are still to be found. Kreider-Reisner absorbed by Fairchild Aviation.



Model has slight dihedral (9/16" each side) on top wing. The entire movable rudder area is required for control.

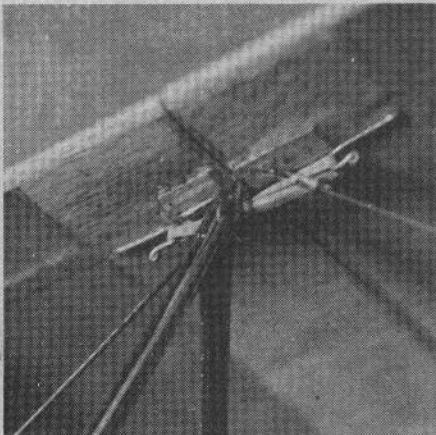
The following is from the Fairchild advertisement in *Aero Digest* for March 1930, page 123: KR-34. ATC 162. Three-place, for training, taxi, and sport. With Wright J-6 165 hp engine. Top speed 123 mph, climb 800 fpm, service ceiling 14,100 ft. Price \$6575 flyaway Hagerstown. KR-21. ATC 215. Two-place, tapered wings, for training and sport. 90 hp Kinner engine. Top speed 113 mph, climb 775 fpm, service ceiling 15,000 ft. Price \$4,685 flyaway Hagerstown.

So there you have it. Though one of the lesser known, it was quite an airplane and, even at this late date, a few of them are still around. Incidentally, 21, 31, and 34, does not signify model year. This was a model designation initiated, apparently, after the Fairchild take-over and, although research may prove otherwise, had no evident rhyme or reason other than to just differentiate the several models of the series.

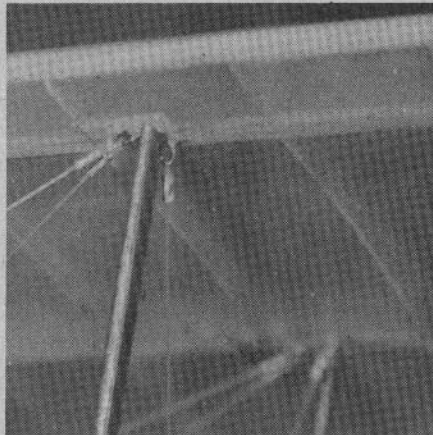
The R/C Challenger given here is done 1" to 1'. Information on the KR-13 was taken from NC-767-W and on the KR-34 from two other ships whose registration was, unfortunately, not copied at the time. However, at last report, one of the '34's—a Comet-powered version—was based at Baltimore. The other, a J-6-powered ship, is presently based at Somerset, Pa. The KR-31 is no longer in existence.

The model is small, light—about 16 oz., f.a.f.—and the flight is extremely realistic. It is fun to fly even though it will not do the AMA pattern and is designed for pulse proportional rudder only. Anything else and you are on your own although it is possible that other systems *may* work well. (Wonder how it would do on multi in 2" scale?)

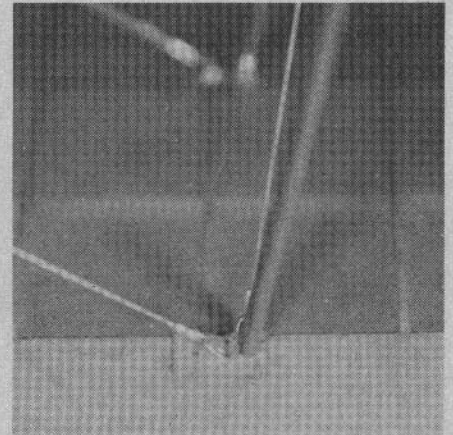
It isn't hard to build although the construction may seem strange and left field-ish to most (Continued on next page)



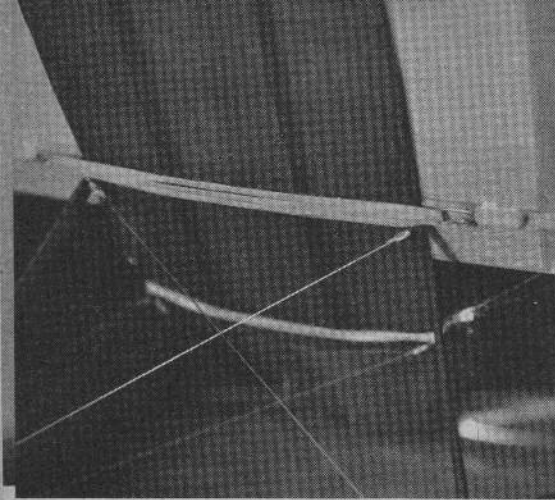
Detail shows how panel is rubber-banded to center-section; and wing to fuselage.



Rigging detail at interplane struts and top wing, showing attachment of wires.



How interplane struts, rigging, attaches to bottom wing. Wires are just snug.



How bottom panels are held tightly to fuselage by rubber bands across body.

## OX-5 CHALLENGER CONTINUED

R/C'ers. However, don't beef it up. It's plenty hefty as is and flight performance will suffer. All balsa used should be no heavier than medium weight—some of it a bit lighter—except for the wing leading edges. These may be hard balsa. Drawing notes are almost complete but some additional info may be helpful, so here 'tis:

**FUSELAGE:** Build the side frames one on top of the other. Before removing frames from board, cover top frame with 1/32" sheet. Grain of sheet must be 90 degrees to center-line of fuselage. When done, remove frames from board, do not separate, trim sheeting and cover opposite side of other frame—might be well to install lower wing tongues at this time (Refer to: Wing Fastenings). Assemble sides in usual manner with sheeting on inside of fuselage. Cover bottom with 1/32" sheet except for section occupied by landing gear. This section sheeted on inside. Not necessary to sheet the top.

**STEP DOOR:** Aluminum foil. Draw door on foil. Pliobond after fuselage is covered, doped. Left side only.

**COWL INSPECTION DOOR:** Draw. Usually right side only although shown on left. On full scale for draining carburetor wells of OX-5.

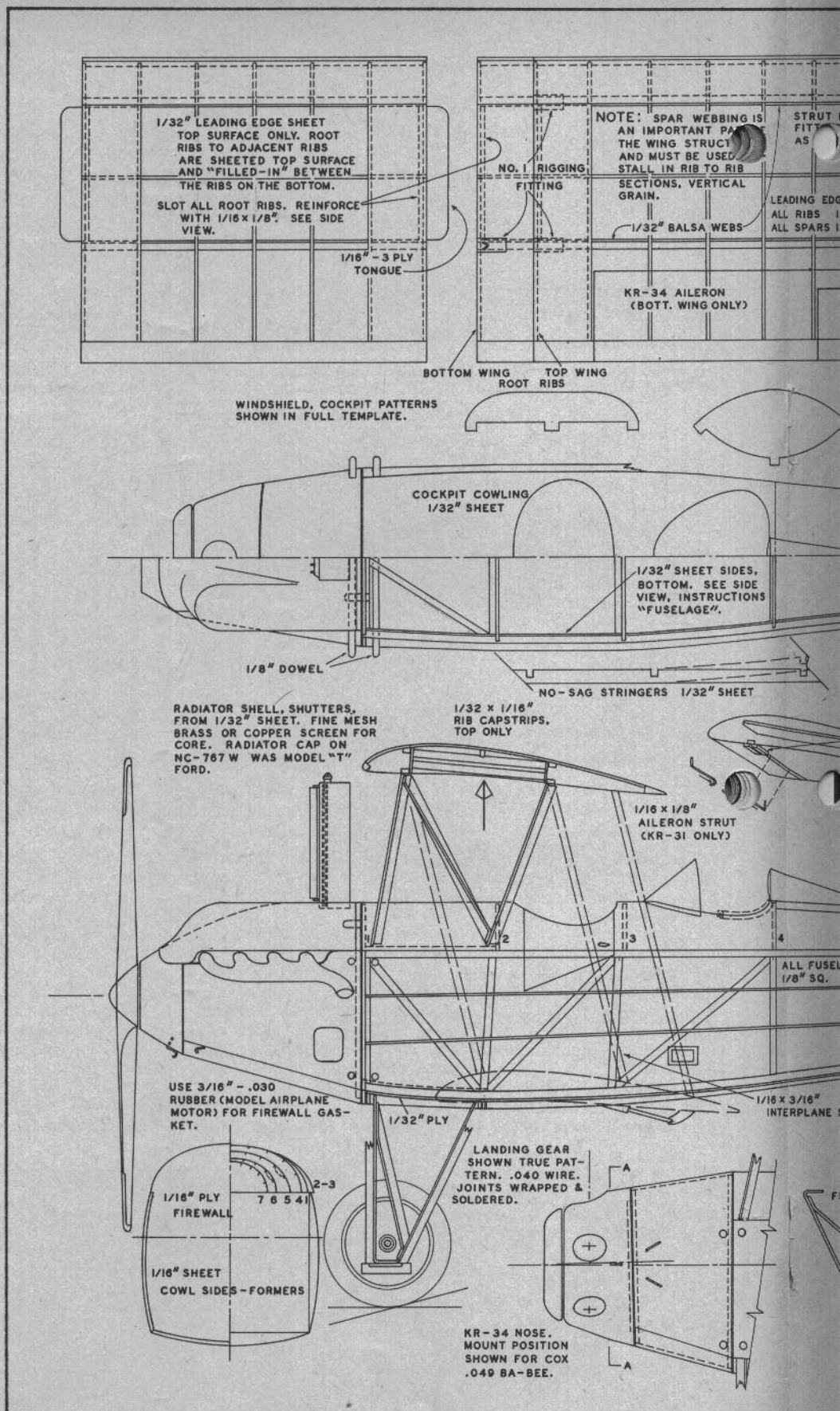
**PASSENGER DOOR:** Draw. Left side only. Door handle from scrap—silvered. **COCKPIT COAMING:** Split tubing, black. Pliobonded. Shown only on rear pit, used on both.

**WINDSHIELDS:** Slit cowling at angle same as face of shield and to fit tab. Pliobond from underneath cowl.

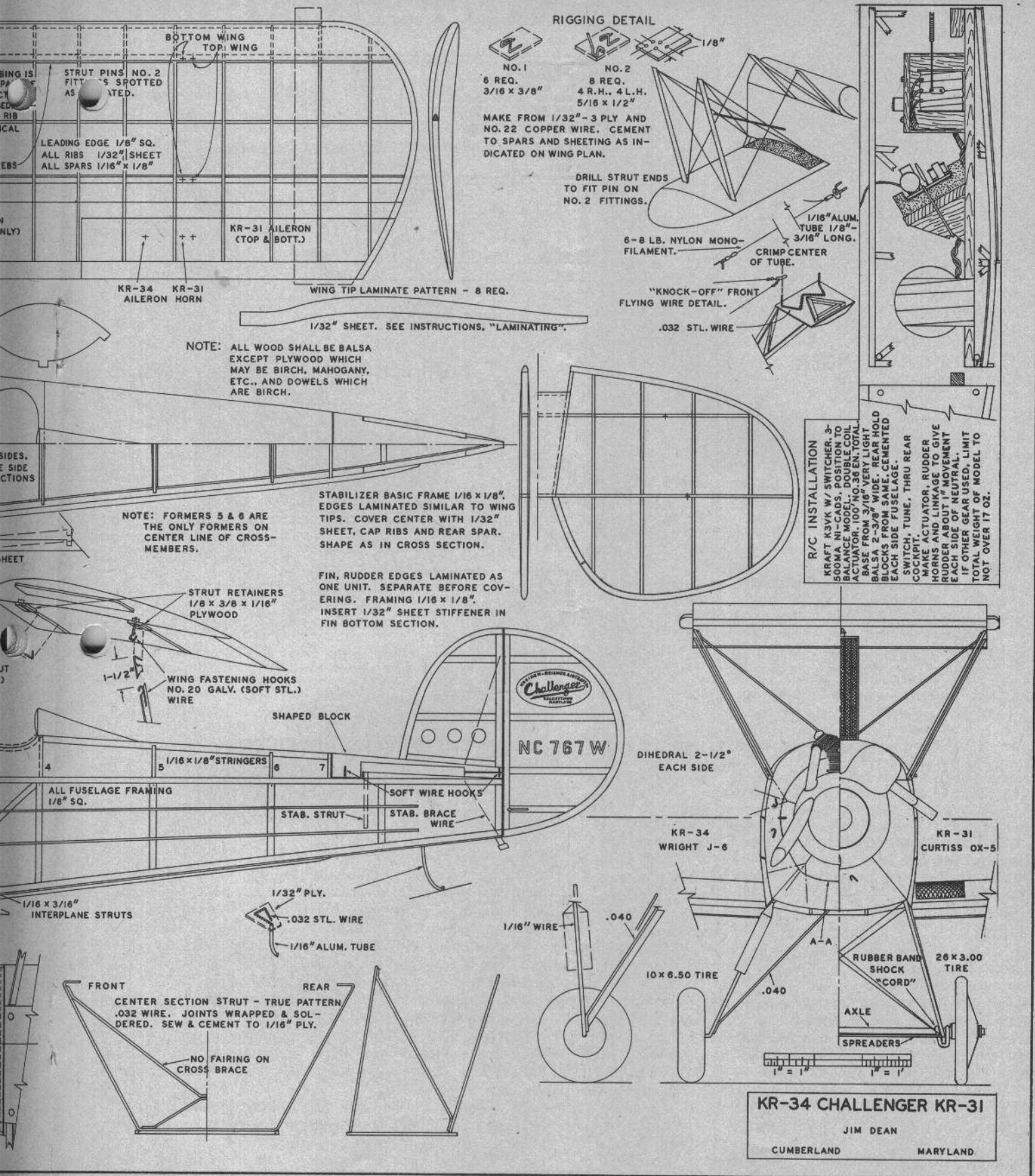
**WINGS:** Building surface must be flat, flat, flat! Webbing keeps spars as built, must be used. Cement in place while on workboard. Don't omit sheeting on end ribs or ribs will "cover scallop."

Make thin aluminum rib pattern to cut, notch, and slot ribs. This is a must. If carefully done, pattern may be drilled with 1/16" drill at each end of slot and ribs and fuselage sides drilled using pattern for template. Marking is not accurate enough. Then using drilled holes as a guide, cut slots with razor blade. An accurately slotted pattern is best, although slots may be cut using drilled index holes.

(Continued on page 26)

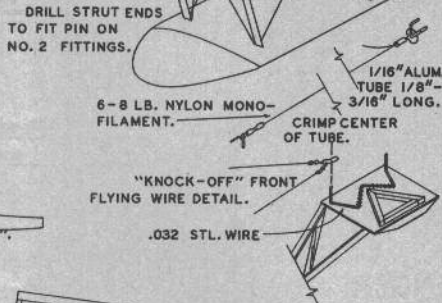


**FULL-SIZE PLANS OF THE OX-5 CHALLENGER ARE AVAILABLE!** These plans are individual prints—they are not folded—shipped to you in a mailing tube. Send \$2.00 to Grid Leaks, Box 301, Higginsville, Missouri. Outside of the United States add 50 cents extra.



**RIGGING DETAIL**

- NO. 1  
6 REQ.  
3/16 x 3/8"
  - NO. 2  
8 REQ.  
4 R.H., 4 L.H.  
5/16 x 1/2"
- MAKE FROM 1/32" - 3 PLY AND NO. 22 COPPER WIRE. CEMENT TO SPARS AND SHEETING AS INDICATED ON WING PLAN.



NOTE: ALL WOOD SHALL BE Balsa EXCEPT PLYWOOD WHICH MAY BE BIRCH, MAHOGANY, ETC., AND DOWELS WHICH ARE BIRCH.

NOTE: FORMERS 5 & 6 ARE THE ONLY FORMERS ON CENTER LINE OF CROSS-MEMBERS.

STABILIZER BASIC FRAME 1/16 x 1/8". EDGES LAMINATED SIMILAR TO WING TIPS. COVER CENTER WITH 1/32" SHEET, CAP RIBS AND REAR SPAR. SHAPE AS IN CROSS SECTION.

FIN, RUDDER EDGES LAMINATED AS ONE UNIT. SEPARATE BEFORE COVERING. FRAMING 1/16 x 1/8". INSERT 1/32" SHEET STIFFENER IN FIN BOTTOM SECTION.

**R/C INSTALLATION**  
 KRAFT 43VK W/ SWITCHER, 3-500MA NI-CADS. POSITION TO BALANCE MODEL. DOUBLE COIL ACTUATOR, 100" NO. 36 EN. TOTAL BASE FROM 3/16" VERY LIGHT BALSA 2 3/8" WIDE. REAR HOLD EACH SIDE FUSELAGE COCKPIT, TUNE, THRU REAR MAKE ACTUATOR, RUDDER HORNS AND LINKAGE TO GIVE RUDDER ABOUT 1" MOVEMENT EACH SIDE OF NEUTRAL. IF OTHER GEAR USED, LIMIT TOTAL WEIGHT OF MODEL TO NOT OVER 17 OZ.

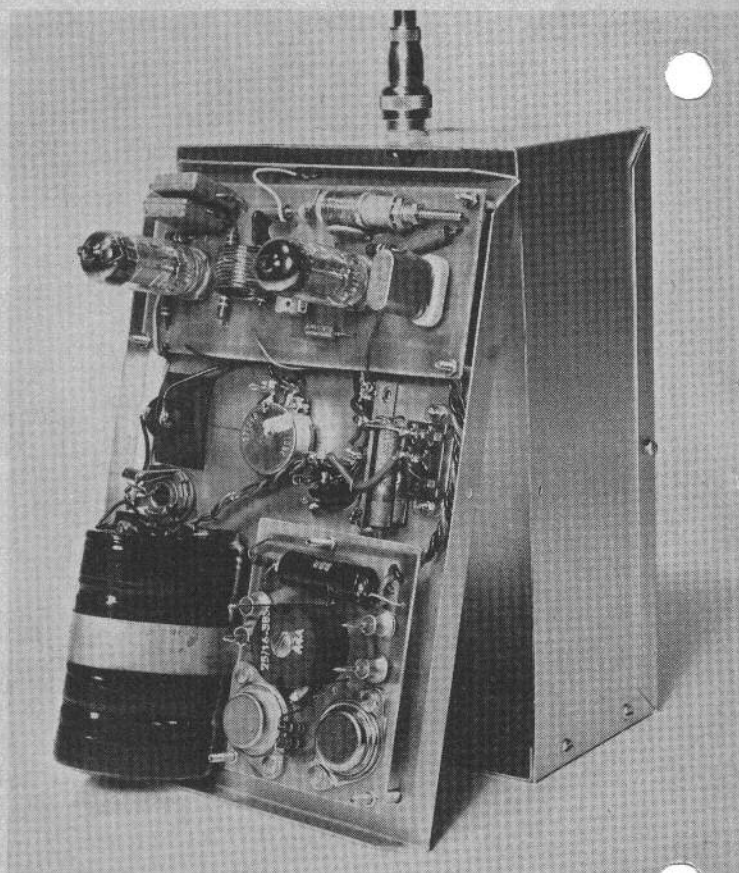
**KR-34 CHALLENGER KR-31**  
 JIM DEAN  
 CUMBERLAND MARYLAND

Why did Grid Leaks select this Jim Dean Design? It's a gem, we're sure you'll agree. It is petite, but a good flier and a "poor man's" scale job that does not require 10 channels. Even if you don't mean to build it—now that is—it qualifies as a plan well worth the collecting.

# ♦♦ TRANSMITTER



Using the PC Board on opposite page this typical transmitter was assembled. Provides for pulse-box plug, charger plug.



Everything is assembled on the cover. Pot is for tone adjustment. Lower right is converter, at left, nickel cadmium pack.

## CONVERT ONE OF YOUR OLDER JOBS FOR THE PHELPS RECEIVER

■ There is only one copy of the hand-held transmitter in the two photographs shown above. Despite the decals and the manufactured look of the item, even Publisher Paul Runge knew nothing about it until surprised by the page proofs! When this article originated, the editor received a parts package as part of his briefing. The basic components were the same as a Kraft; a few additions would transform them into a sample transmitter. It was assembled by Norm Rosenstock, who added a 3.6-volt Kraft converter with 135 volt output at 20 mils.

The physical arrangement is both simple and practical. Both the chassis printed circuit board (at top) and the converter (bottom, right, in the righthand picture) are mounted to the back of the front cover by stand-offs. The three 2-ampere-hour nickel-cadmium sealed Sonotone batteries are held in place by a metal strap, the battery pack being tape-wrapped. The 2PST switch is in the input to the converter, using both sides of the switch for reliability. The filament is wired across the three cells with a dropping resistor (4.5 ohms), visible adjacent to the switch.

Provision is made for a plug-in charger—note socket on cover—and both manual keying for escapement systems and for pulse required for proportional work. The latter is accomplished by means of an open-circuit jack in parallel with the switch. (See jack just below the push-button-type microswitch.) A control box or pulser either can be plugged in by means of a cable, or affixed by means of a permanent

metal bracket to the side of the transmitter, as so many people have done.

The VFO pot, visible between the keying switch and the charger socket, provides for the adjustment of tones. Incidentally, commercial transmitters have appeared which use high tones (3500 cps, for example, by Babcock) in order to reduce the hazards of voice interference, such as is so often noted from the Citizens band Class D operators. The Marcy transmitters, too, utilize higher tone frequencies than is "standard."

For inspection and maintenance the innards of this transmitter remove as a unit, upon extraction of just two self-tapping screws. Both the transmitter case and the antenna are standard Ace items, although, of course, the builder may want to use substitute items which are conveniently at hand.

As a matter of hindsight, the builder of this mythical Hi-Tone transmitter, thought that the optional keying Jack might have been located—requiring shifting the pushbutton switch—a shade higher, toward the top of the case. It is rather close, as shown, to the battery back. The convenient location of the tuning slug suggests that a small adjustment hole for tuning could be provided in the side of the case.

It must be remembered, of course, that only the properly qualified person is permitted by FCC regulations to adjust and tune the oscillator.

END



# RECEIVERS... Grid Leaks R/C Survey

Weight: 3½ oz.  
Voltage: (See batteries)  
Current: Idle, 6ma; Signal on, 40-50ma  
Batteries: 4.8v nickel cadmium recommended  
Price: Assembled, \$79.98; kit, \$54.98. Sensitivity, 4 microvolts.

Model: SH-100  
Frequency: 26.995, 27.045, 27.095, 27.145, 27.195  
Type: Special purpose superhet, relay with arc suppression  
Channel: Single  
Cps: 400 to 1200  
Description: Metal case, 1-9/16 x 7/8 x 2  
Weight: 2 oz.  
Voltage: 3 volts  
Current: Idle, 3ma; Signal on, 45ma  
Batteries: 2 pencils  
Price: Assembled, \$32.98; kit, \$24.98  
Comments: Special design with excellent noise rejection. Requires transmitter of 95 to 100% modulation. Excellent for pulse. Pulse response linear up to 20 cps. Temperature compensated from 0° to 130°F. Sensitivity, 4 microvolts.

## C & S ELECTRONICS

Model: CS-508M Cardinal  
Frequency: 26.995, 27.045, 27.095, 27.145, 27.195, 27.255  
Type: Superhet, multi, relayless, simultaneous transistorized  
Channels: 6, 10 and 12  
Cps: 325-650  
Description: Metal case, 1 x 1¼ x 3  
Weight: 3½ oz.  
Voltage: 6  
Current: Signal off, 8ma; Signal on, 40ma  
Batteries: 5 500 mah nickel cadmium (includes servos)  
Price: \$69.50—10 chan., \$89.50—12 chan.  
Comment: Standard Medco or Deans reed bank, solid state I.F. requires no tuning

Model: CS-503A Lark II  
Frequency: 26.995 to 27.255 (tunable) Super-regen, tone, relay (arc suppression), transistorized  
Channels: Single  
Cps: 400 to 1000  
Description: metal case, 1 x 1½ x 2½  
Weight: 1½ ozs.  
Voltage: 2.4 to 3.6V  
Current: Signal off, 6ma (with carrier), 4ma (no carrier); Signal on, 35ma (at 3V)  
Batteries: Alkaline or nickel cadmiums (225 mah) recommended (3 cells)  
Price: \$29.50

Model: CS-505A Finch II  
Frequency: 26.995 to 27.255 (tunable)  
Type: Super-regen, tone, relayless, double-ended, transistorized  
Channels: Single  
Cps: 400-1000, 600 optimum  
Description: Plastic box, 5/8 x 1¼ x 1½  
Weight: ¾ oz.  
Voltage: 2.4 to 3.6  
Current: Signal off, 12ma (carrier on), 15ma (carrier off); Signal on, 325ma, at 3V, with 8-ohm escap.  
Batteries: Alkaline or nickel cadmium (225mah) recommended  
Price: \$24.50

Model: CS-511 Honey Bee  
Frequency: 26.995 to 27.255 (tunable)  
Type: Super-regen, tone, relayless, transistorized  
Channels: Single  
Cps: 400-1000, 600 optimum  
Description: Plastic box, 5/8 x 1¼ x 1½  
Weight: ¾ oz.  
Voltage: 2.4 to 3.6  
Batteries: 2 pencils, Alkaline recommended, or 3 nickel cadmium 225mah  
Current: Signal off, 6ma (no carrier), 4ma (carrier on); Signal on, 325ma at 3V on 8-ohm escap.  
Price: \$21.50

Model: Oriole CS-507S  
Frequency: 26.995, 27.045, 27.095, 27.145, 27.195, 27.255  
Type: Superhet, tone, relay (arc suppression), transistorized  
Channels: Single  
Cps: 300-800  
Description: Metal case, 1 x 1¼ x 2½  
Weight: 2½ oz.  
Voltage: 6  
Current: Signal off, 10ma; Signal on, 70ma approx.  
Batteries: 4 Alkaline pencils or 6V nickel cadmium 225 or 100mah; separate pack recommended for escap. or servo through relay  
Price: \$59.50  
Comment: Converts to 10-channel by factory installation New Haven reed bank. (\$23.00), solid

state I.F.

Model: CS-508S Cardinal  
Frequency: 26.995, 27.045, 27.095, 27.145, 27.195, 27.255  
Type: Superhet, tone, relay (arc suppression), transistorized  
Channels: Single  
Cps: 300-800  
Description: Metal case, 1 x 1¼ x 3  
Weight: 3 oz.  
Voltage: 6  
Current: Signal off, 10ma; Signal on, 70ma  
Batteries: 4 Alkaline pencils or 6V nickel cadmium 225 or 100mah; separate pack recommended for escap. or servo through relay  
Price: \$59.50  
Comment: Converts to 10-channel by factory installation Medco or Deans reed bank, \$23.00; to 12-channel, \$33.00, solid state I.F.

Model: CS-507M Oriole  
Frequency: 26.995, 27.045, 27.145, 27.095, 27.195, 27.255  
Type: Superhet, multi, relayless, simultaneous transistorized  
Channels: 6 or 10  
Cps: 325-650  
Description: Metal case, 1 x 1¼ x 2½  
Weight: 2¾ oz.  
Voltage: 6  
Current: Signal off, 8ma; Signal on, 40ma  
Batteries: 5 500 mah nickel cadmium (includes servos)  
Price: \$79.50—10 chan., \$69.50—6 chan.  
Comment: New Haven subminiature reed bank with high frequency reeds with 10 chan., on 6 chan. Medco reedbank, solid state I.F.

Model: Wren CS-513  
Frequency: 26.995 to 27.255 (tunable)  
Type: Superregen, multi, relayless, transistorized  
Channels: 6  
Cps: 350-600  
Description: Metal case, 1 x 1½ x 2½  
Weight: 1½ oz.  
Voltage: 6 to 6.5  
Current: Idle, carrier off, 6ma; Carrier on, 4ma  
Batteries: 5 1.25V nickel cads recommended, 225 or 500mah  
Price: \$42.50  
Comment: Audio tone range of 6-chan. reedbank is safe as 6 center reeds of 10-chan.

## W. S. DEANS

Model: DM-100  
Frequency: 26.995, 27.045, 27.095, 27.145, 27.195  
Type: Superhet, multi, relayless, simultaneous transistorized  
Channels: 10 and 12  
Cps: 350-670  
Description: Plastic box, 1 x 2 x 3  
Weight: 5 oz.  
Voltage: 6  
Current: Signal off, 15ma; Signal on, 35ma  
Batteries: A—2 pencils; B—Burgess U20; or converter off servo pack  
Price: \$89.50—10 channel; \$99.50—12-channel

Model: DM-60  
Frequency: 26.995  
Type: Super-regen, multi, relays, non-simultaneous tube and transistors  
Channels: 6  
Cps:  
Description: Plastic box, 1 x 2 x 3  
Weight: 5½ oz.  
Voltage: A—1½, B—30  
Current: Signal off, 4ma; Signal on, 10ma  
Batteries: A—2 pencils; B—Burgess U20; or converter off servo pack  
Price: \$57.50

## ECKTRONICS

Model: KR-1 (Kraft)  
Frequency: 26.995 to 27.255 (tunable)  
Type: Super-regen, tone, relay (arc suppression), tube and transistors  
Channels: Single  
Cps: 300-1000  
Description: Plastic box, 1 x 1½ x 2½  
Weight: 1¾ oz.  
Voltage: A—1½, B—22½  
Current: Signal off, A—14ma, B—1.4ma; Signal on, A—14ma, B—4.5ma  
Batteries: 1 Eveready 412, 1 pencil  
Price: \$29.95

Model: E3V Courier  
Frequency: 26.995 to 27.255 (tunable)  
Type: Super-regen, tone, relayless, transistorized  
Channels: Single  
Cps: 400-1000  
Description: No case, ¾ x 1-1/16 x 1¼  
Weight: ¾ oz.  
Voltage: 3

Current: Signal off, 10ma; Signal on, 400ma  
Batteries: 2 Pencells  
Price: \$21.95

Model: ERR Relay  
Frequency: 26.995 to 27.255 (tunable)  
Type: Super-regen, tone, relay (arc suppression), transistorized  
Channels: Single  
Cps: 400-1000  
Description: Plastic box, 1 x 1½ x 2½  
Weight: 1½ oz.  
Voltage: 3  
Current: Signal off, 10ma; Signal on, 80ma  
Batteries: 2 pencils, C cells or 4 pencils (2 and 2—2 on escap.)  
Price: \$29.95

## F & M ELECTRONICS

Model: Vanguard  
Frequency: 26.995, 27.045, 27.095, 27.145, 27.195, 27.255  
Type: Superhet, tone, relay (1-side arc suppression) transistorized  
Description: Metal case, 1 x 1½ x 2½  
Weight: 2 oz.  
Channels: Single  
Cps: 500 approx.  
Voltage: 3  
Current: Signal off, 10ma; Signal on, 50ma  
Batteries: Pencells; alkaline, nickel cadmium recommended  
Price: \$39.95

Model: Midas  
Frequency: 26.995, 27.045, 27.095, 27.145, 27.195, 27.255; 50-54  
Type: Superhet, multi, relayless, reeds, simultaneous transistorized  
Channels: 10 or 12  
Cps: 300-650  
Description: Metal case, 1 x 2 x 2½  
Weight: 4 oz.  
Voltage: 6  
Current: Signal off, 15ma; Signal on, 35ma  
Batteries: Nickel cadmium; alkaline OK  
Price: 10 channel—\$79.95; 12 channel—\$89.95

Model: Saturn  
Frequency: 26.995 to 27.255 (tunable)  
Type: Super-regen, tone, relay (1-side arc suppression), transistorized  
Channels: Single  
Cps: 500 approx.  
Description: Metal case, 15/16 x 1¼ x 2¼  
Weight: 1¼ oz.  
Voltage: 3  
Current: Signal off, 10ma; Signal on, 50ma  
Batteries: Pencells; alkaline, nickel cadmium recommended  
Price: \$29.95

Model: Pioneer  
Frequency: 26.995 to 27.255 (tunable)  
Type: Super-regen, tone, relayless, transistorized  
Channels: Single  
Cps: 500 approx.  
Description: Uncased, 7/8 x 1¼ x 1¼  
Weight: ¾ oz.  
Voltage: 3  
Current: Signal off, 10ma; Signal on, 50ma  
Batteries: Pencells; alkaline, nickel cadmium recommended  
Price: \$18.95

## IRVING ELECTRONICS

Model: Tone E Model T  
Frequency: 26.995 to 27.255 (tunable), 50-54  
Type: Super-regen, tone, relayless, (double-ended) transistorized  
Channels: Single  
Cps: 300 to 1200, 600 optimum  
Description: Uncased, 5/8 x 1¼ x 1¼  
Weight: 1¼ oz.  
Voltage: 2.8 to 3.6  
Batteries: 2 Alkaline C cells or nickel cadmium  
Current: Signal off, 10ma; Signal on, 300-400ma  
Price: \$15.95 (single ended \$13.95)  
Comment: Case extra \$.50. "Quick blipper", 1 x 1 x ½, for use with 100-ohm relay, or with transistor switcher built-on operating on 2 to 4.5V (6ma relayless, 30ma relay), \$4.95 for relay type, \$5.95 relayless. When using 3 nickel cadmiums, 2 are for receiver, 1 for escapement. Model R: Relay-type for use in pulse systems using Mighty Midget or magnetic actuators.

## KLINETRONICS

Model: Flightline—RR-1  
Frequency: 26.995 to 27.255 (tunable)  
Type: Super-regen, tone, filter, relay (arc suppression), transistorized  
Channels: Single  
Cps: 1,000 or 1520 (2 available)

# RECEIVERS... Grid Leaks R/C Survey

Description: Metal case, 1 x 1-5/16 x 2-13/16  
 Weight: 2 1/4 oz.  
 Voltage: 3 to 3.6  
 Current: Signal off, 8ma; Signal on, 50ma  
 Batteries: Nickel cadmium recommended; or Alkaline  
 Price: \$26.95  
 Comment: Filter before relay

Model: Jetfire 10—SHR-10  
 Frequency: 26.995, 27.045, 27.095, 27.145, 27.195  
 Type: Superhet, multi, simultaneous, relayless, transistorized  
 Channels: 10  
 Cps: 330-610 (high-frequency .010 reeds)  
 Description: Metal case, 15/16 x 1 1/8 x 3 3/8  
 Weight: 4 1/2 oz.  
 Voltage: 6  
 Current: Signal off, 8ma; Signal on, 45ma  
 Batteries: Nickel cadmiums, ESP-5 recommended  
 Price: \$69.95  
 Comment: ESP-5 Klinetronics potted pack—\$27.95

Model: Jet Stream 6—SHR-6  
 Frequency: 26.995, 27.045, 27.095, 27.145, 27.195  
 Type: Superhet, multi, simultaneous, relayless, transistorized  
 Channels: 6  
 Cps: 380-590 (high frequency .010 reeds)  
 Description: Metal case, 15/16 x 1 1/8 x 3 3/8  
 Weight: 4 1/2 oz.  
 Voltage: 6  
 Current: Signal off, 8ma; Signal on, 45ma  
 Batteries: Nickel cadmium recommended, ESP-5  
 Price: \$64.95  
 Comment: ESP-5 Klinetronics potted pack—\$27.95

## KRAFT

Model: Custom KR1  
 Frequency: 26.995, 27.045, 27.095, 27.145, 27.195; 52.950, 53.025, 53.100, 53.175, 53.250 extra.  
 Type: Relay, superhet, transistorized  
 Channels: Single  
 Description: Metal box, 2 7/8 x 1-13/16 x 1  
 Weight: 2 1/2 oz.  
 Voltage: 9  
 Current:  
 Batteries: Burgess 2U6 or equivalent  
 Price: \$39.95; KTR-1 combination X-mitter and rcvr, \$64.95

Model: Custom KR4  
 Frequency: Same as KR1  
 Type: Superhet, multi, relayless, transistorized, non-simultaneous  
 Channels: 4  
 Cps: 330-650  
 Description: High impact plastic case  
 Voltage: 6  
 Current:  
 Batteries: 5-cell nickel-cadmium pack  
 Price: Sold only in combination with matching KT4 transmitter, \$89.95.

Model: Custom KR6  
 Frequency: Same as KR1  
 Type: Superhet, multi, simultaneous, relayless, transistorized  
 Channels: 6  
 Cps: 330-650  
 Description: Metal case, 2 7/8 x 1 1/8 x 1  
 Weight: 3 1/4 oz.  
 Voltage: 6  
 Current:  
 Batteries: 5-cell nickel-cadmium pack  
 Price: \$74.95; KTR-6 combination X-mitter and rcvr, \$119.95

Model: Custom KR10  
 Frequency: Same as KR1  
 Type: Superhet, multi, simultaneous, relayless, transistorized  
 Channels: 10  
 Cps:  
 Description: Metal case, 2 7/8 x 1 1/8 x 1  
 Weight: 3 1/2 oz.  
 Voltage: 6  
 Current:  
 Batteries: 5-cell nickel-cadmium pack  
 Price: \$89.95; KTR-10 combination X-mitter and rcvr, \$189.90

Model: Custom KR12  
 Frequency: Same as KR1  
 Type: Superhet, multi, simultaneous, relayless, transistorized  
 Channels: 12  
 Cps:  
 Description: Metal case, 2 7/8 x 1 1/8 x 1  
 Weight: 3 1/2 oz.  
 Voltage: 6  
 Current:  
 Batteries: 5-cell nickel-cadmium pack

Price: \$99.95; KTR-12 combination X-mitter and rcvr, \$209.90

Model: KRSC-1  
 Frequency: Same as KR1  
 Type: Single, relay, transistorized, convertible at factory to 6, 10 or 12 channel.  
 Channels: Single, but convertible  
 Cps:  
 Size: 2 7/8 x 1 1/8 x 1  
 Weight: 3 1/4 oz.  
 Voltage: 3.6  
 Current:  
 Batteries: 3-cell nickel cadmiums  
 Price: \$49.95; \$5 extra for 6-meter on 1, 4, 6 chan.

## LAFAYETTE

Model: Lafayette single  
 Frequency: 26.995 to 27.255 (tunable)  
 Type: Super-regen, carrier, tube, relay  
 Channels: Single  
 Description: Case, 3 x 2 3/4 x 1 1/2  
 Weight: 5 oz.  
 Voltage: A—1 1/2, B—45 or 67 1/2  
 Current: Signal off, A—100ma, B—2.45ma; Signal on, A—100ma, B—1.1ma  
 Batteries: 1 Burgess No. 2, 1 UX-45 or XX30  
 Price: \$8.95. With Lafayette X-mitter \$22.90

## MIN-X RADIO, INC.

Model: Superhet SH-6  
 Frequency: 26.995, 27.045, 27.095, 27.145, 27.195  
 Type: Superhet, multi, simultaneous, relayless, transistorized  
 Channels: 6  
 Cps: 305 to 540  
 Description: Metal case, 15/16 x 2 x 2 7/8  
 Weight: 4 ozs.  
 Voltage: 6.25V  
 Current: Signal off, 8ma; Signal on, 50ma  
 Batteries: 5-500mah nickel cadmium (includes servos)  
 Price: \$70.00. 6 chan. X-mitter and Rcvr—\$129.88 (Convertible to 10 or 12 chan.)

Model: Superhet SH-10  
 Frequency: 26.995, 27.045, 27.095, 27.145, 27.195  
 Type: Superhet, multi, simultaneous, relayless, transistorized  
 Channels: 10  
 Cps: 340-640  
 Description: Metal case, 15/16 x 2 x 2 7/8  
 Weight: 4 ozs.  
 Voltage: 6.25V  
 Current: Signal off, 8ma; Signal on, 50ma  
 Batteries: 5-500 mah nickel cadmium (includes servos)  
 Price: \$89.95. 10 Chan. X-mitter and Rcvr—\$199.88 (Convertible to 12 Chan.)

Model: Capri SRC-1  
 Frequency: 26.995 to 27.255 Mc. (tunable)  
 Type: Super-regen, tone, relay (arc suppressed), transistorized.  
 Channels: Single  
 Cps: 800 optimum  
 Description: Metal case 7/8 x 1-5/16 x 1 1/8  
 Weight: 2 ozs.  
 Voltage: 3V  
 Current: Signal off, 8ma; Signal on, 26ma  
 Batteries: Standard pencils  
 Price: \$24.88

Model: Superhet SH-12  
 Frequency: 26.995, 27.045, 27.095, 27.145, 27.195  
 Type: Superhet, multi, simultaneous, relayless, transistorized  
 Channels: 12  
 Cps: 330-630  
 Description: Metal case, 15/16 x 2 x 2 7/8  
 Weight: 4 1/4 ozs.  
 Voltage: 6.25V  
 Batteries: 5-500 ma nickel cadmium (includes servos)  
 Current: Signal off, 8ma; Signal on, 50ma  
 Price: \$95.00. 12 Chan. X-mitter and Rcvr—\$229.95

Model: Superhet 1200. SHS-1  
 Frequency: 26.995, 27.045, 27.095, 27.145, 27.195  
 Type: Superhet, tone, relay (arc suppression) transistorized  
 Channels: Single  
 Cps: 1200 ± 20  
 Description: Gold anodized aluminum case, 1 x 1 7/8 x 2 1/8  
 Weight: 3 1/2 ozs.  
 Voltage: 3-3.75  
 Current: Signal off, 4-6ma; Signal on, 30-35ma  
 Batteries: Pencils or nickel cadmiums  
 Price: \$49.95  
 Comments: Selectivity 5kc, sensitivity 15 microvolts, noise problems virtually eliminated, for use with Pulsemite 1200S and Powermite 1200K x-mitters.

## MRC-ENYA

Model: 004  
 Frequency: 26.995 to 27.255 (tunable)  
 Type: Single, super-regen, tone, transistorized, relay or relayless  
 Channels: Single  
 Description: Metal case, 2 1/2 x 1 x 2 7/8  
 Voltage: 9  
 Current: Signal off, 3ma; Signal on, 20ma  
 Batteries: Eveready #216, Burgess 2U6, or equivalent  
 Price: \$17.95

Model: 1004  
 Frequency: 26.995, 27.045, 27.095, 27.145, 27.195  
 Type: Single, superhet, transistorized, relayless  
 Channels: Single  
 Description: Metal case, 2 1/2 x 1 x 2 7/8  
 Voltage: 9  
 Current: Signal off, 3ma; Signal on, 20ma  
 Batteries: Eveready #216, Burgess 2U6, or equivalent  
 Price: \$45.50  
 Comment: Comes matched to receiver for frequency

## NEW HAVEN ELECTRONICS

Model: Telstar B  
 Frequency: 27, 30, 50 (bands: any authorized frequency)  
 Type: Superhet, multi, simultaneous, transistorized  
 Channels: 10 or 12  
 Cps: See Note  
 Description: Metal case, 1-1/16 x 1-13/16 x 2 3/8  
 Weight: 2 3/4 oz.  
 Voltage: 6 (4.8 nominal)  
 Batteries: Across servo batteries, (4 cells)  
 Current: Signal off, 8ma; Signal on, 30ma  
 Price: \$69.95  
 Comment: high-frequency reeds; also complete kit; designed for triple simultaneous; amplified AVC and AGC circuit; no alignment, frequency changed by plug-in crystal. Note: Tones match new Medco reed bank, or available within plus-or-minus 1 cps any specified frequency; can supply any spot RF frequency (legal) from below 27MC to above 60MC.

Model: Telstar B—Single  
 Frequency: 27, 30, 50 (bands: any authorized frequency)  
 Type: Superhet, tone, relay (arc suppression), transistorized  
 Channels: Single  
 Cps: 400 to 600  
 Description: Metal case, 1-1/16 x 1-13/16 x 2 3/8  
 Weight: 2 3/4 oz.  
 Voltage: 6, 4.8 nominal (4 cells)  
 Current: Signal off, 8ma; Signal on, 25-30ma  
 Batteries: See note  
 Price: \$46.95

## ORBIT ELECTRONICS

Comments: Available kit form; AGC and AVC, provided; no alignment, frequency determined by plug-in crystal. 3Kc band width. For pulse transistorized switch, SPDT, replaces relay, is available. Note: Rcvr uses actuator batteries. Minimum of 3 cells when relayless switcher is used. Switcher available in kit form or assembled.

Model: 2-10 Relayless  
 Frequency: 6-meter only  
 Type: Super-regen, relayless, tube plus transistors  
 Channels: Allows optional use of 2, 4, 6, 8 or 10  
 Cps: 260 to 690 approx.  
 Description: Metal case, 2 1/4 x 2 x 1  
 Weight: 4 oz.  
 Voltage: A—1.5, B—30  
 Current: Signal off, A—10ma, B—2ma; Signal on, A—10ma, B—2ma  
 Batteries: Medco PM5-30 or Ritchie 5830

Model: Orbit 1  
 Frequency: 26.995 to 27.255 (tunable)  
 Type: Super-regen, relay (arc suppression), tube plus 3 transistors  
 Channels: Single  
 Cps: 350 to 700  
 Description: Metal case, 1 5/8 x 2 1/4 x 1  
 Weight: 2 1/4 oz.  
 Voltage: A—1 1/2, B—22 1/2  
 Current: Signal off, A—10ma, B—.6ma; Signal on, A—10ma, B—5ma  
 Batteries: Burgess Y15, U15 for B; Burgess Z for A  
 Price: \$34.95

Model: Superhet multi  
 Frequency: All CB frequencies  
 Type: Superhet, relayless, simultaneous, transistorized  
 Channels: 10 and 12  
 Cps: 340 to 610 for 10; 355 to 690 for 12

## RECEIVERS... Grid Leaks R/C Survey

Description: Metal case, 2 1/4 x 2 1/4 x 1  
Weight: 5 oz.  
Voltage: 6  
Batteries: Medco PMS-6V or PN 2.5  
Current: Signal off, 4ma; Signal on, 4ma  
Price: \$89.95—10 chan; \$99.95—12 chan.  
Comment: With power pack and charger \$114.90 (in 10)

Model: Orbit 4 and 6 superhet  
Frequency: All CB frequencies  
Type: Superhet  
Channels: 4 or 6  
Weight: 3 1/2 oz.  
Cps: 300 to 700 approx.

Description: 3 x 1 1/8 x 1, metal case  
Current: 20ma  
Batteries: Medco PMS-6V or Medco PM.2.5-6V  
Price: \$65.00—4 chan; \$69.00—6 chan

### OTARION

Model: Otarion 0-21

Frequency: 26.995 to 27.255 (tunable)  
Type: Super-regen, tone, relayless, transistorized  
Channels: Single Cps: 300 to 1000, 600 nominal  
Description: No case, 5/8 x 1 x 1 1/4  
Weight: 1/2 oz. Voltage: 2.2 min, 3.3 max.  
Voltage: 2.2 to 3.3 max.  
Current: Signal off, 4ma; Signal on, depends on escap.  
Batteries: 2 eveready E91 or 2 Mallory Mn 1500  
Price: \$24.95  
Comment: Built-in "Synchro" tuning indicator—bulb tuned to maximum brightness. Nickel cadmium batteries should not be used (note rcvr. max. voltage)

Model: Otarion 0-22  
Frequency: 26.995 to 27.255 (tunable)  
Type: Super-regen, tone, relayless (double ended), transistorized  
Channels: Single  
Cps: 300-1000, 600 nominal  
Description: No case, 5/8 x 1 x 1 1/4  
Weight: 5/8 oz.  
Voltage: 2.2 to 3.3 max.

Current: Signal off, 16ma; Signal on, varies with actuator  
Batteries: 2 Eveready E-91 or 2 Mallory Mn 1500  
Price:  
Comment: "Synchro" tuning indicator—bulb-tuned for brightness

### SPACETRON

Model: Opal 400  
Frequency: 26.995 to 27.255 (tunable)  
Type: Super-regen, tone, relayless, transistorized  
Channels: Single  
Cps: 300-1300, 650 optimum  
Description: Completely encapsulated military airborne type foam epoxy except for tuning hole, 1.5 x 1.7 x .65  
Weight: 2 oz.  
Voltage: 2.2 to 3  
Batteries: 2 pencils  
Current: Signal off, 3ma; Signal on, depends on load resistance  
Price: \$18.95. Matching relay, \$2.95

## PROPORTIONAL... Grid Leaks R/C Survey

### AIRBORNE CONTROL LABS.

ACL Mark II  
Transmitter: 9 1/2 x 6 x 3 1/2, transistorized  
Frequency: 26.995, 27.045, 27.095, 27.145, 27.195, 27.255

Keying: Single stick for yaw and pitch. Trim for yaw, pitch. Toggle switch trimmable engine control. Trim knobs for elevator and rudder.  
Receiver: Includes 3 servos, superhet, 6 3/4 x 2 3/4 x 2 1/2, transistorized

Weight: 14 oz. (with servos built in)  
Servos: Feedback, 6V; drain 80ma average, 40ma ea. ACL mfg., Micro Mo 05 motor  
Batteries: X-mitter—5 D-size nickel cadmiums; converter—filament 6V; B-plus 150V at 22ma, 900 mils input, converter built in

Rcvr and servos—5 AA-size nickel cadmium  
Price: \$299.95. Excludes batteries and switches  
Comment: System is wired to accommodate electrically coupled aileron servo (\$37.50). Aileron can be mechanically coupled (CAR). Fail-safe, all-control neutral, low motor. Model 11B allows independent gear and servo installation

### DEE BEE ENG. CO.

Quadruplex 21  
Transmitter: 7 x 4 x 10 1/2, built-in power supply  
Frequency: 26.995 or 50-54

Keying: Single stick for yaw, roll, pitch; push-button microswitches for hi-lo MC, trim knobs aileron and elevator. Switch couples and uncouples rudder and ailerons

Receiver: Superhet, transistorized, 2 1/4 x 1 7/8 x 3 3/8  
Weight: 21 oz., complete airborne  
Servos: Graupner Bellematic case, Micro-mo motor, torsional spring centering aileron and elevators. Slip clutch modified. Mounted (2) on fiberglass base which carries amplifiers. Separate engine servo non-neutralizing

Batteries: X-mitter—4AH nickel cad pack; rcvr/servos, 4.8V pack  
Price: \$479.00

Comment: Transmits 3 simultaneous subcarrier channels; time ratio modulation of subcarriers for independent controls positions—0% and 100% time ratio rudder channel, actuates motor trim servo.

### KLINETRONICS

Astroguide  
Transmitter: 7 1/4 x 8 1/4 x 3 1/4, transistorized  
Frequency: 26.995, 27.045, 27.095, 27.145, 27.195

Keying: Four separate lever-type controls  
Receiver: 1 7/8 x 2 5/8 x 3, transistorized, Superhet  
Weight: 7 oz.

Servos: Bonner Duramite closed-loop, Klinetronics amplifiers, on Klinetronics Astroguide servos

Batteries: X-mitter: 18V nickel cadmium pack, built in

Rcvr: ESP-6 nickel cadmium pack, 4.8V  
Price: \$579.00. Includes servo lids with amplifiers, all Ni Cad power packs and connectors, custom charger. SSA-P servo and amplifier, ea. \$25.95

Comment: X-mitter and rcvr transistorized, 4 tones, all functions simultaneously, tones electronically commutated without relays, 1 tone on air at time—commutation rate 60 cps. Four controls trimmable at X-mitter (fully metered for output and battery). Auxiliary chan. landing gear. (Relay in rcvr for SPDT contacts.) Rcvr superhet RF, toroide tone filters. New servo lid has feed-back pot built in, wired to new amplifier and connector. Servo separate item for use with Space Control, Sampey, DeeBee, etc. Fits Duramite and Transmite. Filter circuit allows single channel use, no surface flutter.

### MIN-X RADIO, INC.

Astron  
Transmitter: 3 x 6 1/4 x 8 1/2  
Frequency: 26.995, 27.045, 27.095, 27.145, 27.195

Keying: Single stick for yaw, roll and pitch; separate controls for trim of yaw, roll, and pitch; control lever for proportional motor

Receiver: 2 x 2-3/16 x 3, Superhet, transistorized.  
Weight: 10 ozs.  
Servo: Position feed-back

Batteries: X-mitter—nickel cadmium power pack, Rcvr and servos, 4-250ma and 4-500ma nickel cadmium (4.8V each set)  
Price: \$599.88

Comment: X-mitter uses four oscillators, time-sharing modulator; loaded-antenna, (current 55ma signal on.) No start button is required. Audio discriminators used to reduce interference and drift problems. Rcvr current—Signal off, 10ma; Signal on, 30ma. Servo, Signal on, 100ma

### F & M ELECTRONICS

F & M Digital  
Transmitter: 6 1/4 x 2 3/4 x 8 transistorized  
Frequency:

Keying: Two sticks; righthand, aileron and elevator; left, rudder and engine. Trim knobs adjacent to appropriate sticks. Pushbutton switch actuates fifth-channel control (auxiliary). New box will have switch for reversing aileron action.

Receiver: Superhet, transistorized, 2 x 1 1/8 x 3  
Weight: 5 oz.

Servos: Bonner Transmite cases, motors and gear trains, F & M electronic components  
Drain: Transmitter, 150 to 175ma; Receiver, 30ma —with servos, 60ma

Batteries: X-mitter, 1 lantern battery (6V), or 5 1.2V rechargeable cells; Rcvr, 7 1.2V rechargeable cells  
Price: \$439.50

Comment: Transmits train of short duration pulses coded by varying intervals; control stick movement changes position of one pulse relative to others. Coded information consists of 8 pulses .00025 seconds long, separated by space at neutral of .0015 seconds. Sampling rate approximately 40 per sec. Completely wired except for batteries. Closed-loop servo, 4 lbs. torque. Fail-safe: Holds last given position for 1 1/2 seconds, then goes to neutral all controls and low motor.

### ORBIT ELECTRONICS

Orbit Proportional  
Transmitter: 7 x 8 1/4 x 2 3/4, transistorized  
Frequency: 26.995, 27.045, 27.095, 27.145, 27.195, 27.255

Keying: Stick. Two versions: Single and 2 stick.  
Receiver: 2 1/4 x 2 5/8 x 1 1/8, superhet, transistorized  
Weight: 6 ounces

Servos: Special design Micro-Mo manufactured for Orbit

Batteries: X-mitter: Orbit T-125 10V nickel cadmium. Rcvr: Orbit T-125 5V  
Price: \$595.00 with packs, chargers, servos

Comment: Twin-stick described: left stick, elevator and rudder; right stick, aileron. Elevator and motor trim levers roll forward, down, high motor respectively, vice versa. Aileron trim knob. Single-stick version similar to Space Control but MC now 70-deg. lever, not 270-deg. pot. System utilizes 2 variable modulated tones (ail. & el.), pulse rate and pulse symmetry detectors (rud. and mc.). Fail-safe. Total airborne weight 27 oz. All controls on transmitter face including trim(s)

### SAMPEY

Sampey 404  
Transmitter: 8 x 3 x 3  
Frequency: 26.995, 27.045, 27.095, 27.145, 27.195, 27.255; all 6 meters (supplied on 53)

Keying: Single stick, roll, pitch, yaw. Trim of roll, pitch, yaw, by knobs. Motor control proportional. Separate items installed on request. Pre-program for motor, pitch plus pitch reverse control switch.

Receiver: Superhet, 2 1/4 x 2 1/8 x 1 1/8, transistorized  
Weight: 6.5 ozs.

Servos: Sampey S-75  
Batteries: X-mitter—4 (ea. 4.0SC) Gould nickel cadmium. Rcvr—4 (ea. 1.2SC) Gould nickel cadmium

Price: Basic System, 404-B1, \$399.95; complete system 404-B2, \$498.00, 404-B3, \$525.00 (with extras, preprogram motor control and pitch reversing switch)

Comment: X-mitter sequence transmission 4 commutated tones, switching rate 25 pps, 1.25 amps. Input 2.8 watts. System includes battery power packs, chargers, prewired distribution plugs—these items also available separately.

## MANUFACTURERS' ADDRESSES

ACE R/C, BOX 301, HIGGINSVILLE, MO.  
AIRBORNE CONTROL LABS, P.O. BOX 1493, POUGHKEEPSIE, N.Y.  
AMERICA'S HOBBY CENTER, 146-148 WEST 22nd ST., NEW YORK 11, N.Y.  
ARISTO-CRAFT DISTINCTIVE MINIATURES, 184 PENNSYLVANIA AVE., NEWARK 5, N.J.  
BABCOK CONTROLS, INC. 20762 LAGUNA CANYON RD., LAGUNA BEACH, CALIF.  
CITIZEN-SHIP RADIO CORP., 810 E. 64th ST., INDIANAPOLIS, IND.  
CONTROLAIRE DIVISION, WORLD ENGINES, 8206 BLUE ASH RD., CINCINNATI 36, O.  
C & S ELECTRONICS, 13400-12 SATICOY, NORTH HOLLYWOOD, CALIF.  
DEE BEE ENG. CO. WEST LAMBS RD., PITMAN, N.J.  
ECKTRONICS, 2001 S. EASTWOOD, SANTA ANA, CALIF.  
F & M ELECTRONICS, 135 VERMONT ST., N.E., ALBUQUERQUE, N.M.  
IRVING ELECTRONICS CO., BOX 9222, SAN ANTONIO 4, TEX.

KLINETRONICS, 4137 NORTH ROCKWELL, CHICAGO 18, ILL.  
KRAFT SYSTEMS, INC., 2519 LEE AVE., SOUTH EL MONTE, CALIF.  
LAFAYETTE, P.O. BOX 10, SYOSSET, N.Y.  
MRC-ENYA COMPANY, INC. 5300 21st AVE., BROOKLYN, N.Y.  
MIN-X RADIO, INC., 8714 GRAND RIVER, DETROIT 4, MICH.  
NEW HAVEN ELECTRONICS, 579 RYALTON DRIVE, NEW HAVEN, IND.  
ORBIT ELECTRONICS, 11612 ANABEL AVE., GARDEN GROVE, CALIF.  
OTARION LISTENER CORP., P.O. BOX 711, POST RD., OSSINING, N.Y.  
SAMPEY & COMPANY, 1607 FORSYTH RD., ORLANDO, FLA.  
SPACETRON, INC., BOX 84, BROADVIEW, ILL.  
W. S. DEANS COMPANY, 8512 EAST GARDENDALE, DOWNEY, CALIF.

## Grid Leaks R/C Survey

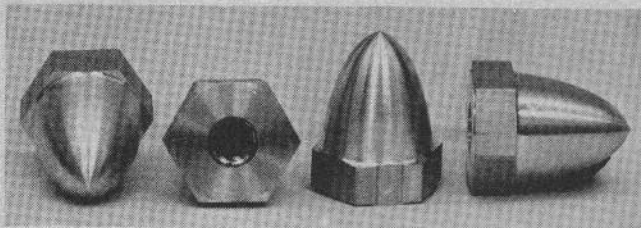




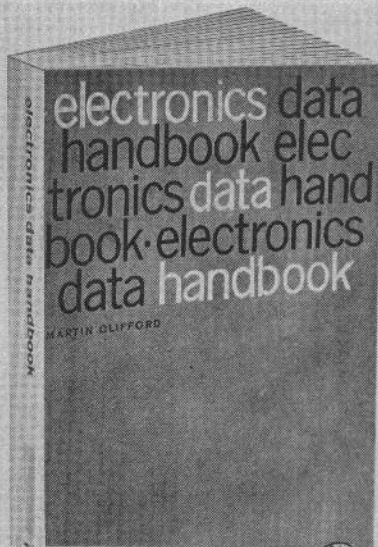
To the trade: This feature is open to all makes of equipment, domestic and foreign. Selection will be edited for reader interest and need.

# SEEN THESE

GL's coverage of new items, information and trade releases, now includes a coverage of useful products on the market.



1. Hill Machine Products spinner nuts.

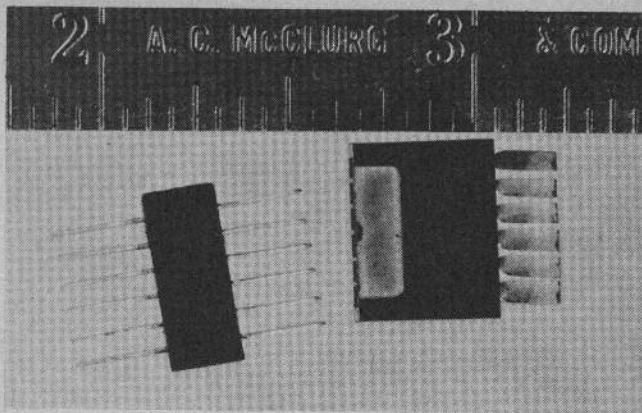


2. A useful book from Gernsback.

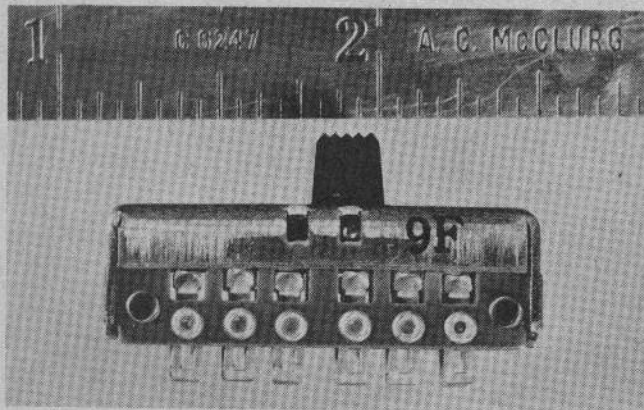
1. From Hill Machine Products, 194 Meadowlark Place, Harrisburg, Pa. spinner nuts in three different sizes: The nuts are made from Alcoa 2017-T4 heat-treated high-strength aluminum alloy. The aluminum stock is fixtured to insure the nuts running dead true and being in perfect balance. They comply with AMA safety regulations. The three sizes available are 10-32, price of 85¢; 1/4-28, price, 95¢; and 5/16-24, \$1.15.

2. From Gernsback Library, Inc., 154 West 14th St., New York, N.Y., announces an "Electronics Data Handbook" by Martin Clifford.

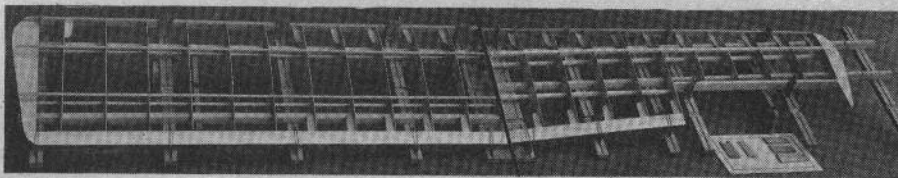
This book was specifically written to be of assistance to all those who want to make an effective use of electronics. According to Gernsback, it is just about a must for everyone interested in the intelligent application of radio control. Claimed to be the simplest computer of them all, a pencil plus a copy of this new book will help you find the formula you want, and covers such items as DC, AC, Vacuum Tubes, Transistors, Antennas



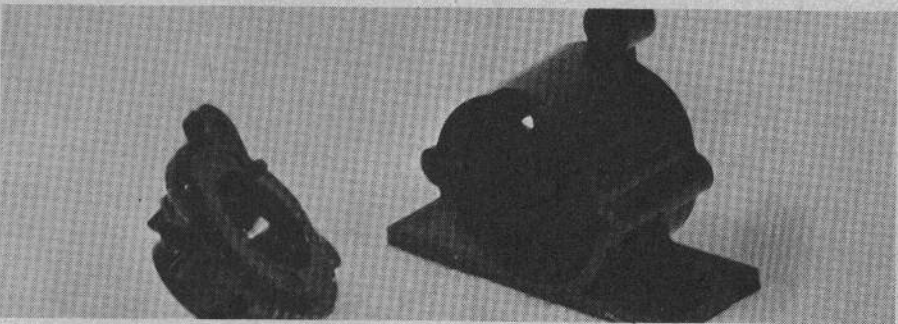
3. Kraft 6-pin in-line submini plug.



4. Kraft DT4P slide switch.



6. Broadfield Wing-A-Jig.



5. Glass City Injection-mold MM case.

and Transmission Lines, Measurements, and Miscellaneous Tables. Supplies hundreds of the most used formulas in electronics, page after page of the most wanted data. Material is arranged in a logical, orderly fashion. All formulas are set up so you can select easily and quickly. Price is \$2.95.

3. KPL-6 Six-pin in-line subminiature plug, retail 98¢. A very high quality imported plug which has long been needed. Possibly the only disadvantage to this plug is it's nonpolarized, but since it is desirable to have a universal plug, this will be an advantage in some applications.

4. KSW-4 double-throw four-pole slideswitch. The biggest single problem in radio control installations today is the lack of a suitable switch. None of the moderately priced switches are at all reliable. This imported switch has an in-line action with wiping contacts and should be extremely reliable. Contact action is the same as in the rotary switches used in expensive electronic test equipment. (Continued on page 24)



Some of the 30 members Northern Connecticut R/C Club. L to R: W. Sawn, E. Diehl, L. George and son, C. Cousineau, R. Brandoli, A. Francia,

J. Benoit, P. Caisse, Skip Traska, F. Mitchell and son, A. Roberts, Al Case, J. Secondo, R. Bernier. They want action for an escapement event.

## Rescue Boat

(Continued from page 9)

disabled vessel. Or the boom alone can be employed with a hook for towing the helpless craft back to port—which makes the derelict's owner happy, to say the least.

AI's boat includes many interesting features worth noting. The use of a relay pack reduces the servo requirements to two units—one for steering and the other for switching—because other functions, including boom operation of the Mighty Midget winch, can be handled directly by the receiver (thanks to the relays). One should note that relay-type receivers are at a premium for marine work.

The large relays, visible in some pictures, used for operation of the twin drive motors—forward, reverse, etc.—are Clare 6-volt coils, with modified contacts to a DPDT setup, capable of handling currents as high as 11 amps! Contacts are tapped off different sections of the huge nickel cadmium pack to give 6, 12, and 18 volts in forward, and 12 in reverse. Actuation for the relays is 6V, sectioned off by the special PC board seen attached to the switching Transmitter in one picture. In the photo, the contact arm is resting on the reverse contact.

This simple switching device gives results usually requiring four channels. A brass extension to the servo arm is bent channel-sectioned and has two old contacts soldered to it. Study will show that the arm closes a circuit between the long printed strip at the bottom of the board and the series of contacts above the strip, thus eliminating the need for a loose wire to fatigue failure.

which otherwise would have to be attached to the moving arm—an invitation

The light control system—see pictures—requires only one channel, direct from the receiver. The contained American Flyer reversing latching relay is modified for this use. AI finds that his C&S 10-channel with Medco reedbank operates from both his C&S and Control-Aire transmitters. A new creation—which we await with interest—uses a 12-channel Kraft.

The crane-boom uses pulleys home-made from brass rod. The boom stores inside the boat when not in use—note

rack and clamp in crane compartment. The winch employs two Mighty Midget geared-down worm gears. One on six volts raises and lowers the boom, the other, on 2.4 volts, handles left and right swinging.

The hull is a modified Sterling Corvette, the original cut down. The 40-mm gun is decorative only. Design of the boat is based upon a Coast Guard plastic boat kit.

## ? Seen These

(Continued from page 23)

KPSA packaged assortment containing 5-6 pin plugs and one switch to retail at \$6.49.

Kraft KC-5-50 Battery charger (not shown) for 5 cells at 50 milliamps charging rate, \$3.95 list. This unit is transformer isolated and UL approved. It plugs into a standard receptacle and will have a 4- or 5-foot cord to plug into the pack. When supplied with battery pack, the units will have a matching plug supplied. When ordered separately, it will be furnished less plugs so it may be adapted to any other 5-cell-type pack.

5. Glass City Electronics (Box 2864, Station B, Toledo, O.) announces an injec-

tion-molded case that fits all parts of the Mighty Midget motor. The material is Bearing Quality Nylon. The bearings have been precision cored for both size and proper gear mesh.

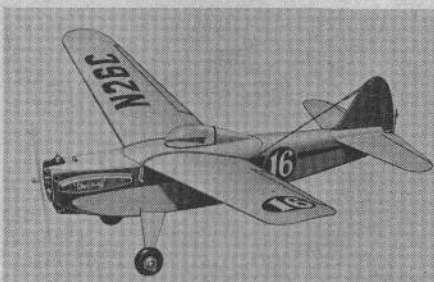
This motor case is practically indestructible and impossible to wear out. The nylon is self lubricating material and needs no oil for proper operation (a small amount of oil will quiet the motor somewhat). Motor efficiency is increased approximately seven to ten percent due to high slip characteristics of the nylon bearing material and accurate gear mesh.

The Mighty Midget motor in this nylon case is the best available low cost servo motor for the Simple Simul, R.O. and various other proportional systems such as "Kickin' Duck" and the Glass City Multiplex. It is cheap, efficient.

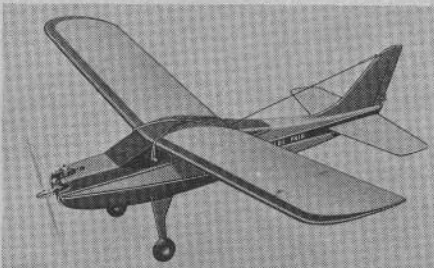
Users can rebuild their old worn or broken Mighty Midgets into a really good servo for \$1.50.

6. Broadfield Air-Models, Ashland, Mass. wing-a-jig is capable of assembling most wings and stabilizers up to a 72 in-span and a 12½-in. chord. Shown in the picture are, left, half of a Beachcomber wing and, right, a Taurus-Orion type tapered wing. Notched jig components set up quickly with screws. A ready-made fixture with slotted rib-holders, plus movable parts to align span and chord setups. Dihedral props for 4-degree setups; hinges wood and machine screws. \$15.95.

7 & 8. Scientific Model Airplane Co. (113 Monroe St, Newark, N.J. 07105) has released two identically spec'ed kits for the Cox .02 TeeDee and similar powerplants, the "Shoestring" and "Miss World's Fair." Developed and tested by Howard McEntee and Walter Musciano, the models use sheet-balsa construction and list for \$3.95. Span is 30 in., length 21, wing area 140 sq. in., gross weight 12 ounces. Designed for good penetration and smooth flying characteristics, both ships make use of an appropriate single-channel equipment, using either escapements or magnetic actuators for proportional flying. Full-size plans include step-by-step illustrations and show several types of radio gear. Both men are well known to the field, and have been magazine contributors for many years.



7. Scientific "Shoestring."



8. Scientific "Miss World's Fair."

## PROPORTIONAL

(Continued from page 38)

enough torque to do a job and was uncomplicated in construction.

Most of my own flying has been done on either pulsed neutral or proportional. I have tried DC motors direct and geared as servos but didn't like having to carry two sets of batteries or the drain connected with using the motor. One set of batteries could be used with a switcher or with a double-pole double-throw relay, but the battery life is cut in half. I still prefer to use something with a lower drain. Some of the earlier airplanes were pretty boxy and large and had fairly low wing loading. It soon became evident that a smaller ship with a higher wing loading would move out faster and be more responsive to rudder control. We attempted to build in more control than we would ever need, then not use all of it. It felt good to have it available if you got the airplane close to the ground and nearly stalled out and a wing went down and had to be brought back up. It also made for a very lively airplane at full bore. This is fun flying and can be a point-getter in contest work.

We have also had a lot of fun with Eight-A and Quarter-A planes, keeping the wing loading fairly high—in the 14 oz. to square-foot range, but still coming out with 8 to 11 oz. gross. A good portion of this weight still can be put into construction and strength, as most of our ships have a complete radio weight of three to 3½ ounces, using dual output, transistorized receivers or single output with a trigger, to operate a small magnetic actuator. This with a pair of pencils makes a nice light radio installation and, with only about a 100-ma drain at three volts for the actuator, can give quite a few flights in one afternoon without having to change batteries.

One other advantage to proportional with this small set up is that there is no problem with vibration. There isn't anything mechanical for vibration to affect. I have run .020's on the little 3-in.-dia. three-blade props by TD with no ill effects other than a real fast moving and almost too responsive ship. This same prop caused a friend's escapement to run itself down and caused a fly away. One more advantage of the little airplanes is that they are hard to hurt no matter how bad a mistake you make. A light weight airplane hitting the ground is about like throwing feathers at a brick wall.

## FULL SCALE PLANS R/C JAY

AVAILABLE  
AT ACE R/C

by BOB FERRIS . . . An extremely easy-to-fly advanced multi stunt trainer with especially nice handling traits for proportional. Featured in the May-June issue of GRID LEAKS, this low wing beauty has already proven itself a choice of many R/C fans. Each plan is individually printed from Original Drawings.

PLAN SET - - \$2.00 P.P.

## GRID LEAKS

BOX 301 • HIGGINSVILLE, MISSOURI 64037

GRID LEAKS • September-October

# MRC-ARCON

The New Dimension  
In Radio Control



Only the MRC-ARCON single channel transmitters have all these features. 1. Micro switch for keying. 2. Battery voltmeter. 3. 12 section long range antenna — 50 inch length. Retracts into transmitter case. 4. Higher output. 18 volt battery supply eliminates range problems. Uses two inexpensive nine volt transmitter batteries. 5. Economical operation.

Amazing range, unusual freedom from interference and rugged dependability mark the advance design MRC-ARCON R/C gear. Engineering Excellence from the combined skills of Japan's finest R/C manufacturer allied with the U.S. hobby industry's oldest and most dependable supplier of electronic equipment. Designed by professional flyers to commercial standards

and incorporating circuitry and features heretofore unavailable in any single unit. Completely transistorized, hand crafted, precision pretuned and supplied in matched sets. Simple installation with complete instructions and one year written guarantee supplied. Compare the finest in R/C at your dealer now. SINGLE CHANNEL MATCHED SET TRANSMITTER AND SUPERHET RECEIVER . . . \$79.95

### TRANSMITTER Model 104 . . . \$37.50

HIGHER OUTPUT—18 Volt battery supply eliminates range problems.  
EASY TO HANDLE—comfortable one hand operation.  
PRECISION CONTROL—microswitch for positive feathertouch actuation.  
PENETRATING SIGNAL—tone modulation at 500 cycles per second.  
BATTERY VOLT METER—built in monitor warns you before it is too late.  
CRYSTAL CONTROLLED—shock mounted crystal for frequency stability.  
ECONOMICAL OPERATION—uses 2 inexpensive 9 volt transistor batteries.  
LONG RANGE ANTENNA—12 section 50 inch retracts into transmitter.  
COMPACT & LIGHTWEIGHT—Fits into Jacket pocket, weighs less than 1 pound.  
RUGGED—Heavy gauge aluminum cabinet.

### RECEIVER Model 1004 SUPERHET . . . \$45.50

HIGHEST SELECTIVITY—three If stages for adjacent channel rejection.  
RELAYLESS—electronic switching, no vibration problems.  
SENSITIVE—Greater Range  
RUGGED—sturdy aluminum cabinet, Epoxy-glass printed circuit board.  
DEPENDABLE—9 volt transistor battery power—no design compromise.  
PRE-TUNED—precisely matched to transmitter, crystal control stability.  
COMPACT & LIGHTWEIGHT—miniaturized components selected for dependability.  
COMPLETE—EASY INSTALLATION—connector prewired to receiver.

Also available, and tailored for the 104 Transmitter—a fine quality Superregenerative Receiver in Relay or Relayless Models—great for Boats, Cars—Tanks and all the unusual and interesting things R/C is used for . . . \$19.95

MRC-ENYA COMPANY INC. • 5300 21st AVENUE • BROOKLYN 4, NEW YORK

## WHITE HEAT 60: FULL-SIZE PLANS AVAILABLE

Single step racing hydroplane for RC. Use .45 to .60 engine. First-place winner in ¼-mile oval and 1/16-mile straightaway at Annual IMPBA Regatta July 4-5, 1964 at St. Louis, Mo.

Plans now available in special limited time offer.

- (A) Full-size plan, full-size patterns and step-by-step building and operating instructions . . . \$4.50 postpaid  
(B) Full-size patterns, 1/3-size plan and step-by-step building and operating instructions . . . \$2.50 postpaid

Send coupon below plus money order or check (no cash or stamps please) to Ace Radio Control, Box 301, Higginsville, Mo.

Name \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_ Zip code number \_\_\_\_\_

- ( ) Full size plans, patterns and instructions, \$4.50  
( ) Full size patterns, 1/3 size plan and instructions, \$2.50  
( ) Check ( ) Money Order enclosed

# 10 REASONS WHY YOU\* SHOULD JOIN A.M.A.

## \*RADIO CONTROLLERS!

If you read anything about the Nationals at Dallas this year, you know that the R/C event was a tremendous success. This was due to a very special effort by the Academy of Model Aeronautics, U.S. governing body for model aviation and responsible for the conduct of our annual National Championship Meet. The Academy, in addition to serving modelers in general, is similarly providing special services for radio control.

### FCC FUND

An AMA project to support legislation for more R/C frequencies and interference relief.

### WORLD RECORDS

Three new world records—Altitude, Speed, Duration have come from AMA's current efforts assisting record attempts (only AMA members are eligible for records in the U.S.).

### NATIONAL RECORDS

FAI R/C TEAMS—Only AMA members may represent the U.S. at world championships. The 1965 team—Weirick, Ritchie, Brooke—won team places at the 1964 Nationals.

### SUPERB R/C EQUIPMENT

Present performance and reliability is the direct result of developments from AMA competition. Sport flyers would not have such fine equipment today without the accelerated competition developments.

### NATIONAL RECORDS

AMA R/C Pylon flying is an established U.S. national record event. All AMA members eligible.

### INSURANCE BENEFITS

AMA members are protected from injury and property damage claims both by fellow members and Sunday flyers, whether at contests or sport flying. Special third party liability available for AMA clubs.

### CONTEST CALENDAR

Details of all AMA sanctioned contests in U.S., including local R/C meets, fun-fly sessions and record trials, are sent monthly to AMA members.

### R/C JUDGES GUIDE

Every AMA member gets this special section covering maneuvers, interpretations, flying advice for higher scores.

### PUBLICATION DISCOUNTS

Grid Leaks, R/C Modeler, American Modeler, Model Airplane News at 15% off to AMA members.

### NEW NOVICE/EXPERT BREAKDOWN

For 1965, national standards for AMA contests to permit novices to fly against their own, class competition. Up to now, only a local option.

## How to Join:

Your license classification is based on your age as of July 1, 1965.

**JUNIOR LICENSE** (including 15 years)

**SENIOR LICENSE** (16 through 20 inclusive)

**OPEN LICENSE** (21 years and over)

Please enter me on the membership roll of the Academy of Model Aeronautics.

I enclose \$.....

Junior	<input type="checkbox"/>	\$3.00	R
Senior	<input type="checkbox"/>	\$4.50	C
Open	<input type="checkbox"/>	\$6.00	

Date of Birth .....

Name .....

Street .....

City and State .....

Mail to: ACADEMY OF MODEL AERONAUTICS  
1025 CONNECTICUT AVENUE  
WASHINGTON 6, D.C.

## SINGLE CHANNEL CHAMP!



World Wide Radio Control brings you the finest superhet transmitter and receiver for pulse or escapement applications MIN X RADIO has ever developed. Called the "PULSEMITE 1200", transmitter features include all transistor 9v. circuit, unijunction pulser, and electronic keying in a lightweight hand-held case. The PULSEMITE receiver is extremely selective superhet with a C.B. and electrical noise filter, relay output, powered by nicads or pen cells of 3-3.6V, and weighs only 3½ ozs.

FREE With your PULSEMITE 1200, World Wide will include FREE 1 Mighty Midget pulse actuator, Dion nylon case for the mighty midget and instructions for building an R.O. or G.G. actuator.

# 109<sup>95</sup>

WE PAY THE  
POSTAGE

SORRY  
NO C.O.D.'s



9810 WYOMING, DET. MICH. 48204 dept G/L 11

Clip and paste to card for your free copy of "Quick Blips" or shoot us a dime for the latest World Wide catalog, don't forget your name and address.

Please send me Quick Blips  
 Here's my dime for a catalog

## Challenger

(Continued from page 15)

**LAMINATING:** Applies to wing tips, stabilizer, rudder. Exceptionally strong, light. Make forms of 3/4" pine, etc., to inside outline. (Now there's a phrase!) See dashed lines near tip on wing drawing. Anchor one end first, laminate strip to form with pins, rubber bands—no cement. Beginning at anchored end, press strip around form, making certain strip is kept securely in contact with form as you go. Sort of "inch" your way along. If "slack" gets into strip it will snap. Done right, laminating surprisingly easy. Wetting wood may help, may not be necessary. Secure strip to form—pins and rubber bands. Second strip cemented to first, even if wet. Will be necessary to remove pins from first strip as you go but replace through second strip as you "inch" along. Third and fourth likewise. Wood usually slightly thicker than 1/32" so laminated tips, etc., may be thicker than 1/8" when done. Will be OK. Wing tips must be two right and two left, not interchangeable. For tail surfaces, use of narrow strips means making sure laminations are in level plane around form, otherwise twisted surfaces result.

**WING FASTENINGS:** Put slotted rib pattern (See Wings) proper position on fuselage side and cut slot. Slot must be same position each side. Reinforce slot similar to wing ribs. Best done before fuselage assembly, inside tongue flush with inside fuselage. Other fastenings as shown.  
**WING WALK:** Left side only. Use medium grit sandpaper. Paint same as fuselage.  
**STRUT FAIRINGS:** Cement to struts.

**LANDING GEAR:** Knock-off type. The axle of KR-31 simulated by use of aluminum tube over axle to fit wheels used.  
**STABILIZER:** Stab struts, wires needed only for scale appearance. Angle of stab not mistake, don't change. KR's normally flown with stab at this setting.

**NOSE SECTION:** Various engines make impossible complete instruction, patterns. Use 1/16" sheet for side and top view patterns. Allow for length, position, engine used—also for sheet cowl cover. Remove 1/16" strip from lengthwise center of top view pattern. Cement each side of side pattern. Cement firewall to rear, motor support to front. Cover 1/16" sheet. Carve removable sections from blocks, hollow to suit. Line engine compartment with aluminum foil, Pliobonded.

**COVERING:** Silk all surfaces, cowls, radiator shell, tail block. Three coats clear nitrate, three clear butyrate. Colored silk. Standard colors, green, all except orange wings, stab and stab struts. Blue and yellow, same order. Somerset Challenger black and orange.

**RIGGING:** New to most builders but method is tops. Don't pull wires too tightly, just snug. Clamp tubing ferrule firmly but don't overdo and crush Nylon. Dihedral only about 9/16" each side at tip on line extended from undersurface.

**ASSEMBLY:** Gum-banded, around fuselage, over stab, around fuselage. Hook, around fuselage to hook on tail block. Wings, hook to hook, center section to top panels. Bottom wings hooks similar to top. Hook to hook via landing gear at front hooks. Front landing gear held by

lower cowl band. Other parts banded hook to hook.

**FLYING:** If built, rigged, and balanced as instructed, should fly off board. Best flight with Ba-Bee but Cub was well worn at time of installation. An 8-4 prop, bashed to fit .049. Pick weather for this one. Winds rough, but slight breeze OK. Full scale rudder needed.

Where to draw line on scale fidelity is big problem. Personal opinion leans to true outline, major features—includes air-foil section, construction where useable. (Note: *American Modeler Annual for 1964 shows some nice pics of a rebuilt KR-31. Tailskid has been changed, radiator apparently fastened to center section, wing-walk added on right side, and top nose cowl missing. Otherwise, ship pretty much as original.*)

## Transmitter Conversion For Higher Tone

(Continued from page 19)

favorites a few years ago, and there should be some around to afford easy conversion.

Both of these transmitters used one 3A5 tube in the Radio Frequency section as an MOPA (Master Oscillator, Power Amplifier) section. Both of them also used another 3A5 tube in a multivibrator audio tone generator. The WAG transmitter was originally designed for 400 cps, while the



Winner Citizen-Ship award for win with their equipment, Bob Reuther, Nashville, 1st Class I, 8th Annual Exchange Club Air Show; 2nd Coffee Airfoilers 5th Annual. Used TMS, ZR.

## FULL SCALE PLANS R/C JAY

AVAILABLE  
AT ACE R/C

by BOB FERRIS . . . An extremely easy-to-fly advanced multi stunt trainer with especially nice handling traits for proportional. Featured in the May-June issue of GRID LEAKS, this low wing beauty has already proven itself a choice of many R/C fans. Each plan is individually printed from Original Drawings.

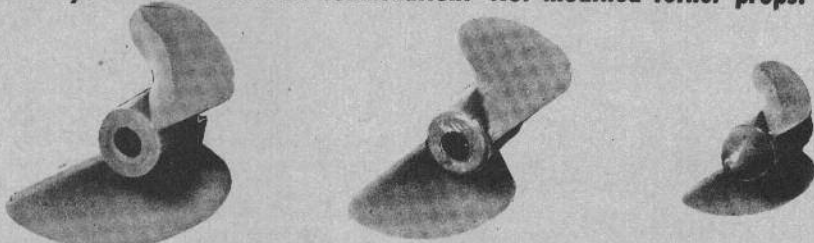
PLAN SET - - \$2.00 P.P.

## GRID LEAKS

BOX 301 • HIGGINSVILLE, MISSOURI 64037

## Prize Winning OCTURA Hi-Impact Plastic R/C PROPS!

Designed specifically for R/C model boats . . . get best performance from your motor and hull combination! Not modified tether props!



Octura props are the result of extensive tank testing and competition running. Are molded of high luster, high impact plastic. Range of diameters and pitches suitable for engines from .15 to 1.50 c.i. displacement. Completely finished and balanced—ready to install and run. Holder of more R/C model boat records, both here and abroad, than any other propeller. Look for the distinctive red color and shape. Propellers X35 thru X70 and 40P thru 62P are supplied with 3/16" bore and slotted to fit drive dog OC—6D.

The X30, 30P and 35P are tapped 8-32 and equipped with a molded tail nut. Available in two patterns, the power thrust designs for displacement and heavier type model boats plus speed thrust design, for hydro and light displacement hulls.

**SPEED  
THRUST**

X30—1 3/8" D x 1 7/32" Pitch—	.15 Eng.—	55c
X35—1 7/16" D x 1 11/16" Pitch—	.19 Eng.—	65c
X40—1 9/16" D x 2 7/32" Pitch—	.29 Eng.—	75c
X45—1 3/4" D x 2 1/2" Pitch—	.35-.45 Eng.—	85c
X50—1 3/4" D x 2 1/2" Pitch—	.56-.60 Eng.—	95c
X70—2 3/4" D x 3 7/8" Pitch—	O & R, Twin 60 Eng.—	\$1.75

**POWER  
THRUST**

30P—1 3/8" D x 1 3/4" Pitch—	.15 Eng.—	45c
35P—1 7/16" D x 1 7/16" Pitch—	.15-.19 Eng.—	55c
40P—1 9/16" D x 1 3/4" Pitch—	.15-.29 Eng.—	65c
45P—1 3/4" D x 1 3/4" Pitch—	.29-.35 Eng.—	75c
50P—1 3/4" D x 1 7/32" Pitch—	.35-.45 Eng.—	85c
55P—2 7/32" D x 2 3/4" Pitch—	.45-.60 Eng.—	90c
62P—2 1/2" D x 1 7/32" Pitch—	.60 Eng.—	95c

For RED-HOT sizzling performance ORDER one for your boat TODAY!

If your dealer can't supply you . . . send stamped, self-addressed envelope for literature and prices.  
**OCTURA MODELS** BY MODEL BUILDERS . . . FOR MODEL BUILDERS!  
8144 1/2 No. Milwaukee Avenue • Niles 48, Illinois

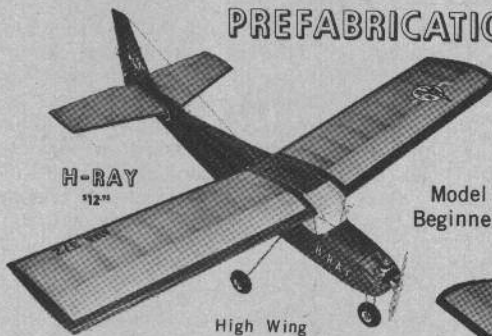


For the R/C Modeler

**AT LAST!**

PREFABRICATION THAT IS TANGIBLE

THINK YOU BUILT MODELS  
FAST BEFORE? TRY THESE!



**H-RAY**  
12"

High Wing

Wingspan 50 in. For .09 to .15 engines using  
Length 38 in. single channel equipment  
Wing Area 425 sq. in. with escapments, or four to  
Flying Wt. 2 1/4 - 2 3/4 Lbs. six channel with servos.

### KIT FEATURES

- Preformed Landing Gears.  
(The Simplest most Functional Landing Gear System Ever Invented.)
- Best available balsa and hard woods, selected and tailored for the individual requirements of the model.
- Clean die cutting.
- Full length one piece Fuselage sides!
- Full size superbly detailed plans.

Model Performance that is Docile for the  
Beginner and Exciting enough for the Expert



**S-RAY**  
\$11.50

Shoulder Wing

Wingspan 50 in. Rudder Only - Single  
Length 38 in. channel escapement,  
Wing Area 425 sq. in. or servo operation  
Flying Wt. 2 1/4 - 2 3/4 lbs. for .07 to .10 engines.

BOTH MODELS feature "BOX-LOK" Construction.  
LOOK for these "AMCO" double A quality  
kits at your dealers.



**ANDREWS AIRCRAFT MODEL CO. INC.**

2A PUTNAM COURT, DANVERS MASSACHUSETTS

# NEW 1964 FOX MOTORS

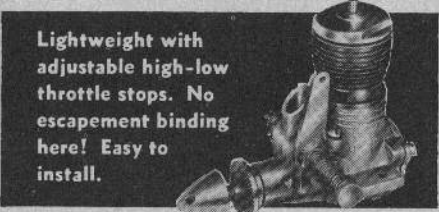
## FOX 59R/C



Best of the big motors! No "break-in." Exclusive Fox carburetion maintains proper low speed mixture at any attitude.

\$39<sup>95</sup>

## FOX 07



Lightweight with adjustable high-low throttle stops. No escapement binding here! Easy to install.

\$10<sup>95</sup>

**FOX**  
MANUFACTURING COMPANY  
FORT SMITH, ARKANSAS

Marcy had a range of 1800 to 3900 cps.

In the case of the WAG it was necessary to raise the frequency to the higher cycles, and in the case of the Marcy it was necessary to limit the audio cycles, so tuning would not be so critical or narrow.

Conversion of the existing WAG and Marcy Single transmitters should be a simple affair, using point-to-point wiring, as used in the earlier versions. However, for those builders desiring a complete change over, a printed circuit base was developed. For the first group only the schematic is necessary; for those wanting to go all out, the printed circuit board, and layout and photo are provided.

Tune up of the RF section is conventional and any First or Second Class license holder can be of help here. It is simply a matter of tuning up the oscillator section first, using a milliammeter in the B+ lead and tuning for a dip. Then the amplifier section is peaked again using the meter for the second dip. Best method of peaking the amplifier, however, is by using a field strength meter and tuning for optimum output.

In the audio generator you will note a fixed 15K resistor and a 25K pot. The pot setting determines the tone output. The 15K is a limiting resistor to avoid a short when pot is rotated in one direction. It also provides a broader setting on the pot. If still a broader setting is desired, increase the fixed resistor to about an 18K and reduce the pot to a 10 to 15K.

We believe the information presented will allow our readers to go ahead. Do look for a Phelps Transistor Transmitter in an early issue.

## 12 CHANNEL SUPER-HET

*Flight Proven Reliability*

Receiver operates on 6 volts. Temperature compensated zero°-140° F. New design high frequency reeds. High impact plastic case 1" x 2" x 3". Wt. 4½ oz.

Ten Channel Super-het ..... \$89.50  
Twelve Channel Super-het ..... 99.50

### ALL TRANSISTOR TRANSMITTER

Operates on one nine volt battery. Features a meter for accurate tuning and battery checking. High quality components assure RF and tone stability. Size, 3"x5⅞"x8¾". Wt. 3½ lbs. with battery.

10 Channel Transmitter ..... \$118.50  
12 Channel Transmitter ..... 129.50  
(less battery)

### DM 60 Six Channel

6 Channel Super-regen. (relay) receiver ... \$57.50  
6 Channel non-simul. transmitter ..... 61.50

### CONNECTORS

8 pin-polarized ..... \$1.30 pair

### SPDT RELAYS

50 ohm ..... \$3.85    500 ohm ..... \$4.00  
100 ohm ..... 3.95    1250 ohm ..... 4.10  
5000 ohm ..... 4.25

### REEDS

2, 4, 6, 8, 10 and 12 Channel

See Your Dealer Or Order Direct  
Calif. Res. Add 4% Sales Tax

w. s. deans co. 8512 Gardendale  
Downey, Calif.

KALMBACH PUBLISHING CO. PRESENTS

## HOW TO BUILD R/C MODELS

by WILLIAM WINTER

This all new and most up to date book on R/C modeling discusses the popular, commonly accepted combination of vehicles and control systems. A few chapters deal specifically with detail installation of radio-control in boats and planes, not to mention a full chapter on troubleshooting.



96 pages on:

Something for everyone

Tools  
Material  
Control Systems  
Types of Airplanes  
Building the Airplane  
Boats  
Airplane Installation  
Troubleshooting  
Misc. Types

\$3.00

AT YOUR HOBBY SHOP — OR

Kalmbach Pub. Co., 1027 N. 7th Street  
Milwaukee, Wis. 53233, Dept. 4722

Enclosed find \$3.00. Send postpaid your new book, How To Build R/C Models.

Name .....

Address .....

City, State, Zip .....

## Grid Leaks at Play

(Continued from page 1)

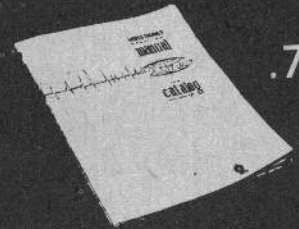
Base, near Kansas City, the meet was sponsored jointly by the Kansas City Aero Club, Richards-Gebaur Community Council, the Air Force, and GRID LEAKS. The cooperation between these various groups was terrific and, to say that it could not have been done without their extreme cooperation, is putting it mildly. Coordination of all groups was handled by Contest Director, Carl Lindsey, of Blue Springs.

Four flight lines were devoted to Classes I, II and III. Open Pylon, Scale and Bal-



Citizen-Ship Award Winner, Dick Wangler, Smyrna, Tenn., 1st Class III Mid-South RC Contest using TMS and ZE Aircraft is popular Taurus.

## WORLD ENGINES



.70

### New Catalog

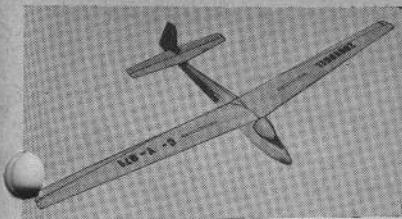
The new World Engines catalog and technical manual now runs one hundred thirty some pages. We think this to be the most complete catalog in model aviation. To justify the title "Technical Manual" the book includes. . . .

- ▶ Three view scale engine drawings.
- ▶ Circuit diagrams for Control-air transmitter, amplifiers & receivers.
- ▶ Information on the new Orbit proportional equipment.
- ▶ Displacement, bore, stroke information of most of the World's model aircraft engines.

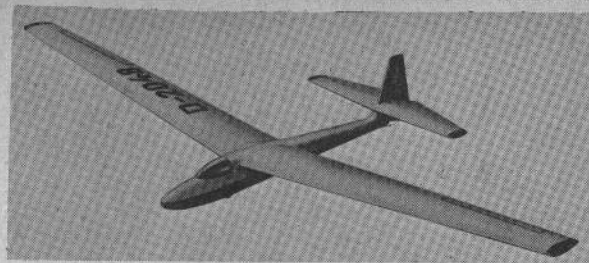


WORLD ENGINES INC.

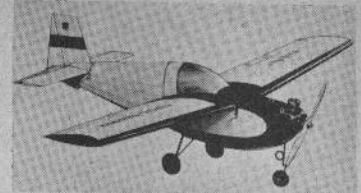
8206 BLUE ASH RD. CINCINNATI 36, OHIO



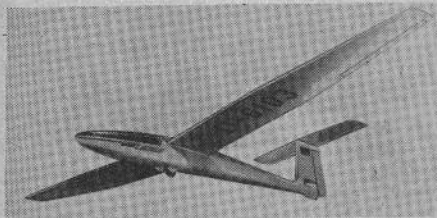
**Robbe ZUGVOGEL III**  
94 1/2" span .....\$25.00  
(10-12 channel aerobatic)



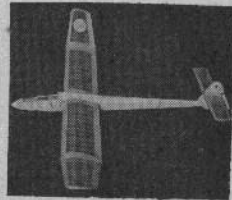
**Graupner SCHLEICHER K-10 79"** .....\$20.00  
(2-6 channel Thermal/Slope)



**Robbe TIPSEY NIPPER**  
58 1/2" .....\$27.50



**Hegi SB-7**  
90 1/2" —Foam fuselage .....\$20.00  
(4-6 channel Thermal/Slope)



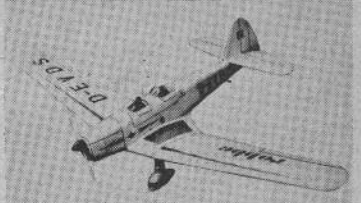
**Aviomodelli PELICAN**  
69" .....\$16.95  
(2 channel Power/  
Slope/Thermal)

**COMING**  
 WIK STANDARD  
 AUSTRIA, 87"  
 Modellbau MISTRAL,  
 107"  
 WIK BJORN,  
 -SB-1, 81"



**Robbe DORNIER Do-27**  
54 3/8" .....\$21.00

**Robbe Ka-7 RHONADLER 74"** .....\$15.00  
Not shown (4-8 channel Slope/Thermal)



**Robbe KLEMM K-35**  
51" .....\$13.50

**Aviomodelli PIPER VAGABOND**  
Not shown —44 1/2" .....\$16.95

\*Publisher of The ZEPHYR  
World Wide R/C glider designs & news reports.  
Subscription \$2.50 year

**WILLOUGHBY ENTERPRISES**

14695 Candeda Place  
Tustin, California  
92680 (714) 544-2077

**WESTERN DISTRIBUTOR OF ROBBE R/C KITS & ACCESSORIES**

1964 Catalog—Send 10c to cover postage.  
See your dealer first—When ordering direct include \$1.00 postage on all kits.

- Willoughby RAZOR PLANE .....\$1.75
- Willoughby SUPER SOLDER ..... .60
- Willoughby FREQUENCY FLAGS ..... .25

loon Bust were held as separate events. Spectator interest was high. On Sunday the Air Force Thunderbirds performed with their precision maneuvers and pulled 50,000 people to the base, according to estimates by the press and TV people, who covered the meet on both days. It is estimated by other officials that over half of this large crowd stayed to see the model meet after the Thunderbirds finished. Interest was high, as evidenced by numerous questions asked by many of the visitors. Without a doubt, many new people were exposed to the hobby.

While many of the faces were familiar from the contest standpoint, it was heart-

ening also to see some of the newer flyers venturing into the contest circuit. They performed creditably and we feel that many more of the beginners need to get their feet wet by going the contest route. Here is where you learn—and fast. Here is where there can be some of the best sharing of ideas that can be found. There really should be no excuse given for not trying.

We observed many old timers giving some of these beginners a willing hand. We seriously doubt that any old timer would ever laugh at any so-called showing which a lack of experience might give. We'd be willing to bet, that once in the

contest circuit, these "beginners" will now become avid contest goers.

Among the visitors present were Walt Schroder, Editor of *Model Airplane News*, Mr. and Mrs. Carl Goldberg, and Frank Garcher and Bob Baldwin. Contestants came from eight states. There were other visitors from as far as California!

First place winners were as follows:  
 Class I—Leonard McCoy, Lamar, Mo.;  
 Class II—Charles Reed, Raytown, Mo.;  
 Class III—Jerry Krause, Tulsa, Okla.;  
 Scale—Dick Weathers, Kansas City, Mo.;  
 Pylon—Loren Tregallas, Wichita, Kan.;  
 Balloon Bust—Bob Williams, Kansas City, Kan.  
 (Continued on next page)

**NOW, 24 HOUR ASSEMBLY!**

COMPLETE CONTROLS!  
Rudder, Elevator,  
Ailerons and Engine.  
Wing Span: 57"  
Wing Area: 620 sq. in.  
Wght.: 5 lbs.

COMPLETE KIT  
only \$14.95

TAKE A GOOD  
LOOK AT  
**"JENNY"**

THE NEW LIVEWIRE!

**Versatile!**  
Use the "JENNY"  
for . . .

- TRAINING!
- ACROBATICS!
- CONTESTS!
- COMBAT!

and considerable FUN!  
SEND FOR COMPLETE DETAILS!

**New Type Kit!**  
Assemble the "Jenny"  
.. Like a plastic model  
from completely fin-  
ished parts, even the  
plywood fuselage! Kit  
has many unusual fea-  
tures plus all the bits  
and pieces required.



.19 to .45  
Engines

2 or 3 wheel  
landing gear!

SINGLE TO MULTI CHANNEL RADIOS!

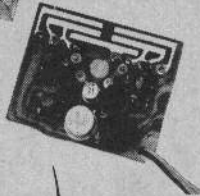
**deBOLT MODEL ENG. CO.**

3833 HARLEM RD.  
BUFFALO 15, N. Y., U. S. A.

# Citizen-Ship

NEW • COMPACT • RUGGED  
TRANSISTORIZED REED-SERVO

REQUIRES NO BIAS BATTERY  
(uses just 4 nicads or pencils)



## MODEL TLB

For Linear output

5/8" total travel in 1 second

Ideal for Motor and Trim—good for any control

True linear motion—rack and pinion gearing

## MODEL TCB

For Cam Action output

5/8" total travel in .7 second

Perfect for Aileron, Rudder, and Elevator control

Slow start for smooth flying—Fast finish for quick recovery

CHOICE  
**\$25.95**

Suggested  
List  
Price

Either Model May Be Converted To  
Other Model By Simply  
Rearranging Parts

- Precision moulded nylon parts and gears for long life and low noise.
- Integral amplifier board and switcher plate. Eliminates troublesome interconnecting wires inside servo.
- Can be made trimmable by modeler.
- For direct operation from any reed receiver. Servo is independent of receiver voltage.
- Measures only 2 5/8" x 1-9/16" x 1"—weighs only 2 3/4 oz.

In addition to all the above marvelous features, you can do a lot more with this servo. You can shorten the travel, which gives the same results as speeding up the operation, by shortening the bell crank on the control surface.

You can shorten one side and leave the other alone.

You can add two wires to give additional up-elevator for spins when full rudder is signaled, yet normal operation for loops is unaffected.

All these accomplishments are the work of two young men named "Ed" who help run CITIZEN-SHIP, and I am personally gratified that CITIZEN-SHIP has such people to design better and better equipment for the modeler.

Vernon C. Macnabb

Send For Free Catalogue Sheets

# Citizen-Ship

RADIO CORPORATION

810 E. 64TH ST. INDIANAPOLIS, IND.

Trophies were awarded to the first five places, and merchandise contributed by many manufacturers was given to all who had registered and competed.

In passing, the idea that has been advanced by Ed Kazmirski and others, that the modeler be allowed two planes for a large contest, particularly if he has traveled a great distance, gained some acceptance. Some of the flyers coming from the furthest points had the tough luck to crash on their first flights—in several cases this was due to interference—and for them to be told that they could no longer compete, although they might have had another ship, did not seem realistic. This rule might be one which could be considered for a change when the R/C rules are reviewed.

Again we'd like to express our appreciation to the many fine contestants who travelled many miles. With them, too, we'd like to express our deepest thanks to all of the cooperating groups for making this contest possible. Also, to the CD, Carl Lindsey—hats off, for a job well done!

—Paul Runge

## Monitor

(Continued from page 4)

tion program to attract more modeling interest, particularly among youth. The engine noise problem is being studied in cooperation with engine manufacturers as it relates to the universal problem of scarcity of flying sites. And encouragement is being given to FAI R/C record trial events which are gaining popularity with contest and non-contest flyers alike.

All of these problems and activities are of a national scope, and can be handled effectively only by a national organization coordinating the efforts of dedicated R/C'ers across the country. AMA is the only such national organization and feels that everyone who flies is benefiting, and that it is only fair that everyone who benefits should contribute.

This listing of AMA efforts lately in behalf of R/C flyers could go on, but the effective politician, like the effective salesman, does not belabor his cause. He asks for your vote. The AMA asks that members renew promptly upon receipt of their applications, and that prospective new members join for 1965 by the first of the year. The earlier, the better.

• In the sports world of R/C, as differentiated from the hobby side, the pace is tor-

# ADAMS PROPORTIONAL ACTUATOR



THIS PATENTED PROPORTIONAL ACTUATOR has many features not found on others of its type. Designed for 1/8 A to 1/2 A airplanes. Weighs 29 grams, has 30 ohm coils on each side of the double coil, pulling 100 MA at 3 volts. May be used up to 6 volts. Designed for double ended relayless or relay type receivers. Features a Delrin bearing which never requires any lubrication, and makes the actuator free swinging, and is part of the secret of its fantastic performance.

Adams Manufacturing Co. was one of the first to introduce a proportional actuator. This is a refinement of eleven years of testing.

Only \$6.95. Available through your Ace R/C dealer.

Adams Manufacturing Co.  
Janesville, Wisconsin

rid. Evidence of this was noted by GRID LEAKS' reporter (George Wells, who comments below) at the 1964 Nationals directed by AMA at the Dallas NAS.

"Competition in all classes, but particularly class III, was extremely close, spirited, and of the highest sports caliber. Looking ahead to Philadelphia and the 1965 Nationals, indications are for an even more exciting RC contest.

"In Dallas, first place in Classes III and II was determined by the final flight on the sixth and final day of pattern flying. Only two or three points separated the top 10 or 12 multi flyers all week.

"Several factors point up a new trend in multi competition, and to a lesser extent in the other classes. The pilot is be-

**MAYNARD HILL'S DURATION FLIGHT:** Taking off at 7:56 A.M. and landing 8 hours, 52 minutes and 25 seconds later at 4:49 P.M. on September 18, Hill's original design, powered by a Merco 49 and carrying some 80 ounces of special fuel, broke the Russian-held record by a 42 percent margin. Span was just over 7 feet, takeoff weight just under 11 pounds. Air-vent-pressurized wing tanks gravity fed the fuel. Radio was Sampey proportional—also used by Hill on his 13,320-foot world altitude record set in July 1963. Maynard modified the servos. Controls were elevator, rudder and engine. Witnesses (required by FAI) were AMA officials. Officialing were: John Worth, Executive Director, and Frank Ehling, Technical Director. Record attempt director was Harold Peterson, an AMA Contest Director. The flight was made from a small hilltop near Hill's home in Silver Spring, Md.



coming more important than the airplane design or equipment in terms of winning the event.

"Most of the equipment used at Dallas was similar—multi proportional, whether or not the manufacturer utilizes one or two sticks, knobs or levers. The aircraft were very much alike—about the same size, power, airfoil, weight, mostly low wing, and most able to perform all the maneuvers necessary.

"Not too many years ago, reliability of equipment was the most important factor," Wells continues. "The guy who kept his working longest usually won. With more reliable equipment coming later, the design of the aircraft seemed to be the primary factor. The design which was capable of properly performing most of the maneuvers usually won.

"This is to take nothing away from the winning pilots of those days, all of whom were good, many repeating their victories at succeeding Nats. But it also was apparent they flew superior equipment.

"Today's winner is flying equipment comparable to 20 or more competitors. His ability to fly the equipment and airplane he has selected seems to be the determining factor, and this is what is making a real horse race in Nats competition.

"This year's winners are unlikely to repeat next year, if the pattern of the last few years holds. Most feel this is good for the sport because we don't need in RC perennial champions such as Joe Louis or the New York Yankees.

"Readers will see from now until next year's Nats pictures and descriptions of the winning aircraft. For a change of pace, Grid Leaks shows you (scattered throughout the Monitor) some of the pilots who will be in contention next year. Of course, some easterners and better flyers from other parts of the country did not make it to Dallas, and some in Dallas escaped our close-up lens.

"So, we don't claim to show them all, and realize, as a matter of fact, that one of next year's winners might be you!"

• Babcock's Digitran system consisting of a stick-control transmitter; superhet, relayless receiver; and two high-ohmage escapements for left, right, up, down and engine control, has been reviewed in various places, including GL, as a new item. The idea bugs us. For one thing it unquestionably is the most determined effort yet made to idealize escapement control of an airplane. For another we suspect that much of the modeling public thinks of it as just another transmitter, receiver and a pair of escapements—which really is a shame. Having played with this intriguing system, ending up with a sport cabin project for one of the big monthlies, there was this singularly strong impression of a tightly engineered system, but also an impression of leftover possibilities with the units that comprise the system.

In the middle Fifties had worked with Babcock's first single-channel and three-channel sets, both of which featured a relatively low RF output with tone, at a time when everybody was blasting tremendous signal strength—on-off carrier only—from big black boxes, perched on a car, with nine-foot antennas. The smart guys taped spare tubes inside their home-built cases because it was not uncommon to blow a "valve." Of course, those Bab-

# NOW

## SCIENTIFIC ANNOUNCES 2 NEW EXPERTLY DESIGNED RADIO CONTROL MODELS

BOTH MODELS WERE DEVELOPED AND TEST FLOWN BY THE TEAM OF HOWARD McENTEE AND WALTER MUSCIANO. THIS TEAM USED THE KNOWLEDGE ACCUMULATED OVER A COMBINED 79 YEARS OF MODEL EXPERIENCE!



**SHOESTRING**  
**\$395**

Wingspan: 30" Wing Area: 138 Sq. In. Length: 21½"

These new SCIENTIFIC RADIO CONTROL models were designed for Single Channel Radio Equipment, using either escapement or proportional servo mechanism. Power with .020 or .024 engines (or a hot .010). In test flights the models showed excellent response and superb wind penetration. Construction is made easy with the prefabricated parts . . . without the usual tedious open framework and paper covered surfaces. The rugged design employs an extra strong steel landing gear engineered to withstand vigorous treatment. Both models have all the deluxe features that assure a minimum of maintenance and a maximum of flying enjoyment. Truly the finest radio models available, they are ideal for the novice or expert R/C flyers.



**MISS**  
**WORLD'S**  
**FAIR \$395**

Wingspan: 30"  
Length: 22¾"  
Wing Area: 143 Sq. In.

Both Models Were Developed by the Finest Team in Model Aviation



WALTER MUSCIANO

HOWARD McENTEE is the Radio Control editor of American Modeler Magazine and is considered to be one of the leading radio control authorities today. Howard has been building model airplanes since 1920 and has specialized in Radio Controlled models for the past fifteen years. He has won many prizes in Radio Control contests and is the author of six books on electronics.

WALTER MUSCIANO is a prominent model airplane authority — his designs are built and flown successfully by model builders the world over. Having won numerous contests, Walter's designs continue to win many prizes throughout the world including the Nationals.

**SCIENTIFIC MODEL AIRPLANE CO.**  
105 MONROE STREET • NEWARK, N. J. 07105

## NEW



### OMEGA'S MINIATURE "SPDT" MAGNETIC REED RELAYS

MODEL	PULL-IN SENSITIVITY	RESISTANCE	PRICE EA.
300-DT	10 ma @ 1.6 to 2.8 V	300 ohm	\$5.95 p.p.
HR-DT	2.5 ma @ 5 to 8 V	3600 ohm	\$6.95 p.p.

### OMEGA MINIATURE "SPST" MAGNETIC REED RELAYS

MODEL	PULL-IN SENSITIVITY	RESISTANCE	PRICE EA.
AR-300	10 ma @ 1.6 to 2.8 V	300 ohms	\$3.50 p.p.
AR-500	7 ma @ 1.8 to 3.8 V	500 ohms	\$3.75 p.p.
HR-1	2.6 ma @ 4.5 to 8.0 V	3600 ohms	\$4.00 p.p.

**NOTE:** For a Specific Pull-In of any of the above, add 25¢ to the price of each unit.

**SIZE:** 3/8" x 3/8" x 7/8"

Send Check or Money Order — No C.O.D.'s.

- Model 300 DT — \$5.95 p.p.   
  Model HR DT — \$6.95 p.p.   
  Model AR 300 — \$3.50 p.p.  
 Model AR 500 — \$3.75 p.p.   
  Model HR 1 — \$4.00 p.p.

NAME \_\_\_\_\_

STREET \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP \_\_\_\_\_

OMEGA SALES & ENGINEERING • BOX 321, RACINE WISCONSIN 53401

cock receivers were highly sensitive, so much so that a touch of a metal spout fuel can during a prime would harmlessly trigger a control. There was a ground plane wire running inside the ship and everything, including the engine, was grounded to it. The ground range was so great that you could walk out of sight of an auto, to say nothing of the guy helping you! So the low output of the Digitran—100 milliwatts input which obviates a station license, form 505, and that big \$8 bucks FCC fee—means nothing.

What impressed us then, as now, was a determined effort to eliminate trouble points, and, in those days, there was nothing worse than the big, heavy, undependable relays. The only reed banks we had seen up until then were those used by the great Ed Rockwood from before, and just after, the war. Babcock installed a plug-in, hermetically sealed, vibration-proof relay which probably would have lasted a life time; and a filter to restrict acceptable tones, and to select tones for up down of a trim servo and for keying a compound escapement. It was a big, heavy thing that three-channel receiver, as the trend to transistors, printed circuits, etc., then beginning, would soon prove, but it was magnificently reliable. We recognized in Digitran the same emphasis on reliability—to render escapement flying easy and dependable with a maximum of control functions. However, we are not making a case for escapements, per se.

It is interesting to read that the BCT-18 Digitran transmitter circuit includes an audio multi-vibrator, coding multi-vibrator, stick controlled time base and quick-

blip discharge circuit for motor control, but all this has real meaning when you listen to the coded beeps that come over the monitor. To anyone who has keyed escapements for years this is music to the ears. The audio operating frequency is 3500 cycles, intentionally high to eliminate voice interference. Someone pointed out to us a not-too-far-fetched similarity between this keying and the old Jim Walker system, in which varied length pulses, we believe, caused a single motor-driven actuator mechanically to pick up appropriate controls which included four progressive positions of either up or down, and three of left or right (or was it vice versa?). Walker's system suffered from falling voltage of dry batteries, a problem which does not exist today with nickel cads. Anyway, this Babcock idea seemingly offers the expert tinkerer opportunity to do things with the transmitting end.

Although all the items in this system are designed for use as a group, each, as we've said, offers independent usage. For instance, the transmitter can be used for pulse work. While, on the one hand, the consumer may not always instantly appreciate the system significance, on the other hand he contrarily hesitates to think of the components of that same system for independent usage! What escapement man, for example, can fail to be excited about 100-ohm resistance escapements? With the old Good Brothers at 12 ohms, dry cells lasted a season. So the high-resistance Babcock escapements from the new system can hardly fail to improve single channel setups involving relay receivers with separate actuator voltage.

## FOR YOU:

Each month the staff of R/C Modeler wraps up another issue designed to bring you the finest material and latest information in the radio control field.

Successful designers and flyers explain the latest trends in RC, providing YOU, The RC'er, with up-to-the-minute data on every phase of our sport.

Whether at home or abroad, your RCM editors are constantly searching for new and better material. Foreign news, compiled by Cliff Rausin, is brought to you while it's still news; W. R. Weaver discusses RC techniques in the Far East; Bill Murray scans the Canadian scene; and whether in Germany or Belgium, South Africa or New Zealand, RC activities from every far-off point of the globe are as near as your mailbox.

The result is the most complete magazine ever published covering interests vital to the radio control modeler. It is YOUR magazine — written by RC'ers for RC'ers. If you have not already done so, use the coupon to subscribe today.

Gentlemen:  
Enter my subscription to R/C MODELER

for 1 year for \$ 5.50  
 for 2 years for \$10.00

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_

Clip and Mail This Coupon with Payment to:

**R/C MODELER**  
P.O. Box 487, Sierra Madre, Calif.

# Kraft Custom Radio Control

## TAKES PLEASURE IN ANNOUNCING AN EXCLUSIVE FRANCHISE DISTRIBUTION PLAN!

This is a first in the R/C industry. It will provide the finest in distribution for the consumer through his Franchised Dealer. Further details on the Franchise plan may be had by writing Ace R/C, Inc., Box 301, Higginsville, Missouri 64037.

### ★ HERE ARE YOUR ACE R/C-KRAFT-FRANCHISED DEALERS!

- ALABAMA, Birmingham  
BILLS HOBBY HAVEN  
2102 Warrior Rd.  
ALABAMA, Fairhope  
FAIRHOPE HOBBY CENTER  
Route 1, Box 181
- ARIZONA, Phoenix 85012  
WEBSTERS HOBBY HOUSE  
521 Camelback Rd.  
ARIZONA, Scottsdale  
HOPKINS R/C HOBBY SHOP  
4906 No. 85th Street  
ARIZONA, Tucson  
DONS HOBBY SHOP  
5329 So. 12th Ave.  
Box 11187  
ARKANSAS, Fayetteville  
ROY'S HOBBY SHOP  
7 N. Block, 1st Fed. Bldg.
- CALIFORNIA, Bakersfield 93301  
STEWARTS HOBBY SHOP  
900 21st Street  
CALIFORNIA, Burbank  
T & A HOBBY LOBBY  
3518 W. Victory  
CALIFORNIA, Covina  
COVINA HOBBY CENTER  
167 E. College Street  
CALIFORNIA, El Monte  
North El Monte Hobby  
4720-22 Peck Rd.  
CALIFORNIA, Eureka  
FOSTERS TOYS & HOBBIES  
309 F. Street  
CALIFORNIA, Fresno 21  
EASTMAN HOBBY SHOP  
1449 Fulton Street  
CALIFORNIA No. Hollywood  
VALLEY PLAZA HOBBY SHOP  
12160 Hamlin Street  
CALIFORNIA, Long Beach 90808  
CRAFT SERVICE HOBBY SHOP  
3966 1/2 Studebaker Rd.  
CALIFORNIA, Los Angeles  
COLONEL BOBS  
3707-09 W. Pico Blvd.  
CALIFORNIA, Oakland  
ROOTS HOBBY HUT  
6036 Telegraph Ave.  
CALIFORNIA, Pasadena  
ACE MODEL SHOP  
1655 E. Colorado Blvd.  
CALIFORNIA, Redding 96001  
SHASTA MARINE SALES  
1635 Garden Avenue  
CALIFORNIA, San Francisco  
FRANCISCAN HOBBIES  
1935 Ocean Avenue  
CALIFORNIA, Sacramento  
C & M HOBBY SHOP  
1613 Del Paso Blvd.  
CALIFORNIA, San Jose  
ED'S HOBBY SHOP  
1362 Lincoln Avenue  
CALIFORNIA, Santa Monica  
EVETTS MODEL SHOP  
1636 Ocean Park Blvd.  
CALIFORNIA, Ukiah  
UKIAH WAREHOUSE SALES  
976 No. State Street
- CONNECTICUT, Hartford 06103  
HOBBY CENTER  
222 Pearl Street  
CONNECTICUT, Waterford  
SHORELINE MACHINE CO.  
97 Post Road, Box 222
- DELAWARE, Newark 19711  
NORTHROP RADIO CONTROL  
56 Holly Lane  
DELAWARE, Wilmington 3  
SIMPSONS HOBBY SHOP  
5107 Concord Pike
- FLORIDA, Miami 33142  
ORANGE BLOSSOM HOBBY  
1896 NW 36 Street  
FLORIDA, Orlando  
COLONIAL PHOTO & HOBBY  
636-38 N. Mills  
FLORIDA, Pensacola 32505  
BOBES HOBBY HOUSE  
3319 Mobile Highway
- ILLINOIS, Barrington  
LANGES BIKE SHOP  
120 W. Main Street  
ILLINOIS, Belleville  
HAROLD'S RADIO CONTROL CENTER  
200 Optimist Drive  
ILLINOIS, Chicago  
WEST TOWN HOBBY SHOP  
5808 W. Chicago Avenue  
ILLINOIS, Hamilton  
THE POT SHOP  
940 Broadway  
ILLINOIS, Harrisburg 62946  
THE HOBBY HOUSE  
512 So. Granger
- IOWA, Des Moines 50309  
IOWA SERVICE COMPANY  
12th & Mulberry  
IOWA, Hampton  
REMINDER PRINTING CO.  
IOWA, Webster City  
HOBBY HOUSE KNIGHT RADIO & TV  
Box 312
- KANSAS, Lawrence  
GEORGE'S HOBBY SHOP  
1105 Massachusetts  
KANSAS, Shawnee Mission  
KENS MODEL AIRPLANE SHOP  
5022 Rosewood Drive  
KANSAS, Wichita  
HOBBY HUT  
2309 South Seneca
- LOUISIANA, Alexandria 71303  
SMITHS HOBBY LOBBY  
2123 Linda Road  
LOUISIANA, Shreveport 71105  
BOSKOS HOBBY HOUSE  
1253 D. Shreve City
- MAINE, York 03909  
DOWN EAST MODEL SUPPLY  
Scotland Bridge Road, RFD #1
- MASSACHUSETTS, Cambridge 02138  
CROSBY HOBBY CENTER  
1704 A Massachusetts Ave.
- MICHIGAN, Detroit  
JOE'S HOBBY CENTER  
9810 Wyoming Street
- MICHIGAN, Flint  
HOBBIES, INC.  
3302 Corunna Rd.
- MINNESOTA, Minneapolis  
WOODCRAFT HOBBY & ARCHERY STORE  
903 West Lake Street
- MISSISSIPPI, Gulfport  
THE HOBBY SHOP  
2500 16th Avenue
- MISSOURI, Blue Springs  
C & M PRODUCTS COMPANY  
1505 B Street  
MISSOURI, Florissant  
BOBS HOBBY CRAFT SHOP  
426 St. Francis St.  
MISSOURI, Springfield 65804  
JIM'S R/C SHOP  
2117 So. Luster  
MISSOURI, Warrensburg 64093  
WARRENSBURG HOBBY SUPPLY  
206 W. Coulton
- MONTANA, Bozeman 59715  
BOZEMAN HOBBY CENTER  
13 So. Willson
- NEBRASKA, Hastings  
DICK'S HOBBIES & CRAFTS  
218 North Denver  
NEBRASKA, Lincoln 68501  
FLITE LINE INDUSTRIES  
Box 853  
NEVADA, Sparks  
SIERRA DISTRIBUTORS  
1939 Prater Way  
NEW JERSEY, Red Bank  
HOBBY HEADQUARTERS  
62 White Street  
NEW YORK, New York 10011  
AMERICA'S HOBBY CENTER, INC.  
DIV. OF MOD. AD AGENCY  
146-148 W. 22nd St.  
NEW YORK, New York  
MODEL CRAFT HOBBIES RETAIL INC.  
314 Fifth Avenue  
NEW YORK, Bronx 71  
BROWNS HOBBY CENTER  
6031 Broadway  
NEW YORK, Buffalo 21  
GRELLS TOY & HOBBY  
5225 Main Street
- NEW YORK, East Meadow L.I.  
LEES HOBBY SUPPLIES, INC.  
2072 Front Street  
NEW YORK, East Northport  
LEES HOBBIES SUPPLIES, INC.  
3018 Jericho Turnpike  
NEW YORK, Tarrytown 10591  
ANDY WRIGHTS PRODUCTS  
16 Woodfield Terrace  
NEW YORK, Vestal  
CUSTOM MODEL SHOP  
729 Delano Avenue  
NORTH CAROLINA, Burlington  
RONNIES HOBBY SHOP  
111 So. Main  
NORTH CAROLINA, Greensboro  
COBLE SPORTING GOODS CO.  
119 No. Green Street  
NORTH CAROLINA, Winston Salem  
PAUL'S HOBBY & BIKE CENTER  
714 Woughtown Street  
NORTH DAKOTA, Minot  
MERYL'S HOBBY SHOP  
24 B North Main Street
- OHIO, Cincinnati 45224  
THE HOBBY SHOP  
5754 Hamilton Avenue  
OHIO, Cleveland  
GENES MODEL SHOP  
14506 St. Clair  
OHIO, Columbus 43211  
LINDEN HOBBY & BIKE SHOP  
2458 Cleveland Avenue  
OKLAHOMA, Tulsa  
HOUSE OF HOBBIES  
6118 East Admiral Pl  
OREGON, Portland 97217  
HOBBYLAND  
4503 No. Interstate  
PENNSYLVANIA, Feasterville 19048  
FEASTERVILLE HOBBY SHOP  
244 Bustleton Pike  
PENNSYLVANIA, Philadelphia 19111  
ALLIED HOBBIES  
6607 Rising Sun Avenue  
PENNSYLVANIA, Pittsburgh  
A. B. CHARLES & SON  
3213 W. Liberty Avenue  
PENNSYLVANIA, Norristown  
BABY TOWN HOBBY SUPERMARKET  
33 Germantown Pike  
PENNSYLVANIA, Reading  
HAINES HOBBY HOUSE, INC.  
60 So. Sixth Street  
SOUTH DAKOTA, Sioux Falls  
DONOVAN'S HOBBY CENTER  
1409 Thompson Dr.  
TENNESSEE, Tullahoma  
THE HOBBY CRAFT SHOP  
317 So. Anderson  
TEXAS, Amarillo  
AMARILLO HOBBY HOUSE  
4400 So. Washington  
TEXAS, Dallas 8  
BERNIE'S HOBBY HOUSE  
209 A. West Jefferson  
TEXAS, Houston 5  
G & G MODEL SHOP  
2522 Times Blvd.  
TEXAS, Texarkana 75501  
MODELTRONICS  
2705 Milam Street  
TEXAS, Waco  
THE HOBBY SHOP  
521 No. 18th  
VERMONT, Burlington  
CASSLER'S INC.  
333 N. Winooski Avenue  
VIRGINIA, Elkton 22827  
EASTSIDE HOBBIES  
Route #2, Box 292  
VIRGINIA, Norfolk 5  
ZEPHYR MINIATURES  
123 W. Little Creek Rd.  
WASHINGTON 1, D.C.  
CORRS, INC.  
813 9th St. N.W.  
WEST VIRGINIA, Kenova  
BLEVINS MODEL SHOP  
1829 Maple Street Rear  
WISCONSIN, Milwaukee  
HOBBY HOUSE  
5500 Capital Court  
WYOMING, Cheyenne 82001  
RADIO CONTROL CENTER  
2516 Snyder Avenue  
WYOMING, Sheridan  
THE MODEL SHOP  
659 Marion Street

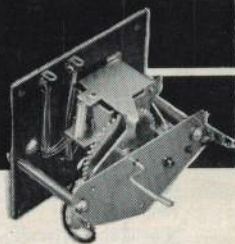
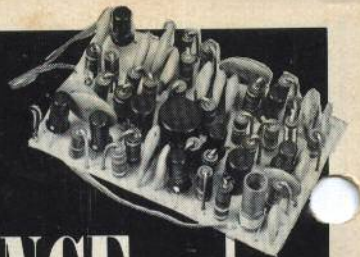
# Kraft Systems, Incorporated

SOUTH EL. MONTE, CALIFORNIA

*You're Invited...*

To A New Concept In

**PERFORMANCE**



## THE BABCOCK BC-21 SINGLE CHANNEL SYSTEM

Introduces an entire new standard of reliability and performance to single channel sport flying. The BC-21 system comes complete with transmitter, receiver, Mk VII escapement, pre-wired switch panel, test points and battery connection. Complete installation can be completed by an absolute beginner in less than 30 minutes by simply connecting the antenna lead plus two wires to the escapement. The BCR-21 receiver is an entirely new superregenerative design concept that surpasses the superheterodyne in rejecting interference — making the BC-21 system an absolute must in congested areas.

- Interference free!
- 4 ounce airborne weight!
- 1500 feet guaranteed ground range — tested consistently to 3300 ft.!
- Completely trouble-free system recommended for .020 through .15 size planes. Selective rudder plus optional kick-up elevator!
- A single 9V transistor battery supplies entire airborne system — two economical transistor batteries power the transmitter!

R/C Modeler Magazine says: "...the one we've been waiting for... the BC-21 system exceeds the manufacturers specifications in every respect. Highly recommended to the sport flier demanding consistent, trouble-free performance."

**\$49<sup>95</sup>**

### MARK VII

100 Ohms

9 Volts

**\$6.95**

Selective rudder, Up elevator

### MARK II

8 Ohms

3 Volts

**\$6.95**

### MARK V

8 Ohms

3 Volts

**\$7.95**

Selective rudder, Up elevator, quick blip motor. (Mark V also has Down)

## FAMOUS BABCOCK ESCAPEMENTS AT NEW LOW PRICES

Send your order today — Fly tomorrow with the world's finest equipment

### EM I

8 Ohms

3 Volts

**\$3.95**

### MMH

100 Ohms

9 Volts

**\$4.95**

Motor control or SN.

MAIL NOW

BABCOCK CONTROLS INC.  
20762 Laguna Canyon Rd.  
P.O. Box 666  
Laguna Beach, Calif. 92652

PRE-PAID CASH ORDER

C.O.D. ORDER

NAME \_\_\_\_\_  BC-21 SYSTEM

ADDRESS \_\_\_\_\_  \_\_\_\_\_

CITY \_\_\_\_\_ ZONE \_\_\_\_\_ STATE \_\_\_\_\_  \_\_\_\_\_

AMOUNT ENCLOSED WITH ORDER \$ \_\_\_\_\_ BALANCE \$ \_\_\_\_\_  \_\_\_\_\_

PLEASE MAKE PAYMENT BY CHECK OR MONEY ORDER. 20% DEPOSIT REQUIRED ON C.O.D. ORDERS. CALIF. RESIDENTS ADD 4% SALES TAX. POSTAGE PAID ON ORDERS OVER \$25 UNLESS C.O.D.

**OVER 250,000 HAVE BEEN SOLD**