

American MODELER[®]

LEADING MAGAZINE OF AIR-MODELING AND AERO PROGRESS

AIRCRAFT
NEWS & PLANS

RADIO CONTROL
ELECTRONICS

POWER BOATS

HELP FOR
BEGINNERS

SEPTEMBER 1961

3/6

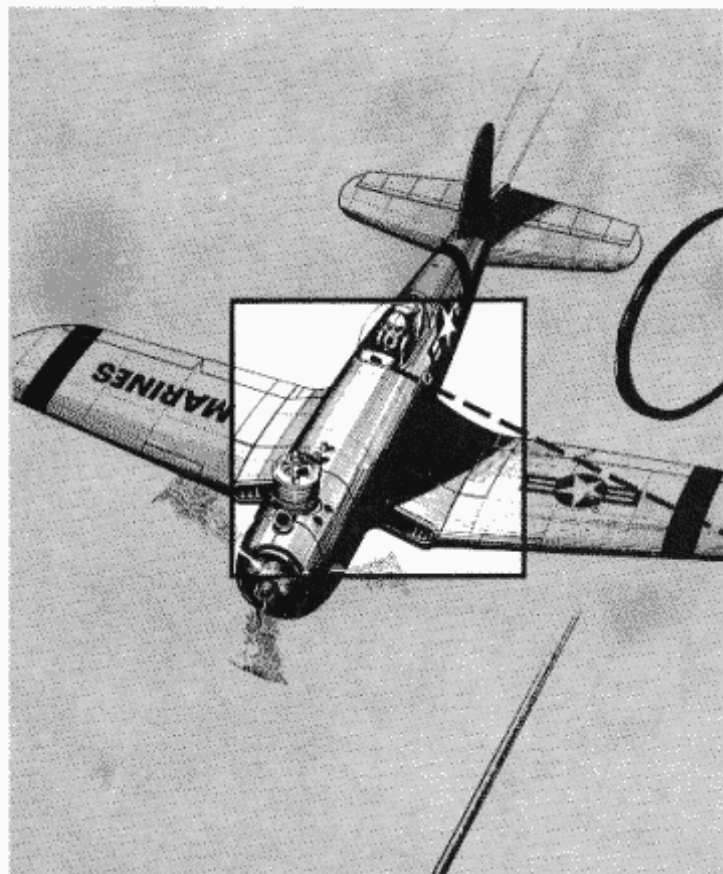
*Modeler's Award of Merit
Goes To St. Louis County
Park and Recreation Department
For "Flying Site" Help*



Bob Johnson & Company
with P-47D Thunderbolts

Cal Smith

*Smith-Stegens Proto Speed Racer
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Build Republic's P-47D Thunderbolt Control Liner
Las Vegas Wander: Martin Moad's "El Toro" Radio Plane
International Free Flight Winner "Lucky Lindy III" by Conover
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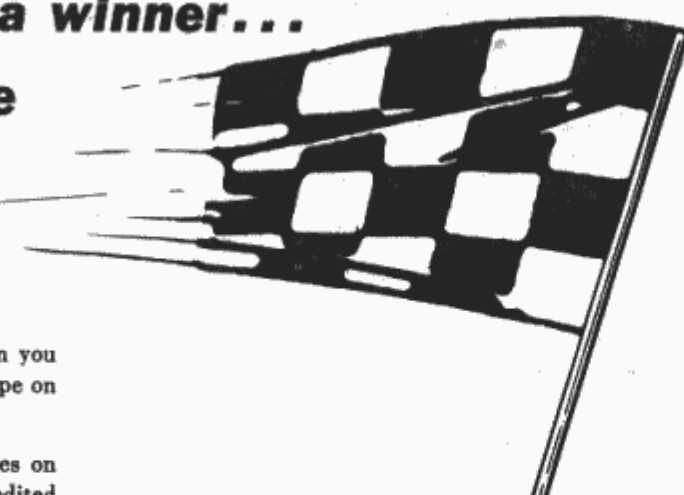
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SEPTEMBER, 1961

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WE CANNOT ACCEPT responsibility for unsolicited manuscripts or art work. All contributions must include return postage. The editors regret that because of the large number of entries they cannot enter into correspondence concerning any of American Modeler's design, photo or modeling competitions, nor can these be returned.

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American Modeler — September 1961



Career-minded Jay C. Douglass of Elizabethtown, Pa., asked...

“How should I get started?”

This year some 100,000 ambitious young people will answer this question the same way Jay Douglass did—they will become members of the Air Force. The road they will start upon leads straight into the Aerospace Age. And the organization of which they will become a part is the most important one in our world. For it is our country's first line of defense.

In time to come many of these young men will advance to the role of skilled technicians in such fields as airplane and missile maintenance, communications equipment, computers, radar. A number of these young men will enter the vital support specialties—administration, supply, air police... to name a few. Any one of these career fields holds the promise of a bright and rewarding future—a future *you* should know about in detail right now.

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Airman 2C Douglass is presently working as an electronics specialist at Duluth Air Base, Minn. As Air Force aptitude tests indicated, he finds he can handle his job well. He feels *he* has made a good start.



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air notes

Mock-up of Bell D-250,
light Army copter.



■ Bell and Hiller each will build 6 evaluation prototypes of light helicopter, having bested 10 other concerns in competition. Light Observation Helicopter (LOH) is 4-seater with single-rotor, 126 mph cruise while carrying 400-lb payload plus pilot and fuel. Allison T-63 gas turbine powerplant. LOH intended to replace all Army's L-19, Bell H-13, Hiller H-23 fixed and rotary wing craft now in service. Following Army evaluation of Bell and Hiller designs, single craft will be chosen, production order of possibly 4000 helicopters placed!

New U. S. helicopter records include USAF Kaman H-43B "Huskie" climb to 25,814-ft with 2205.5-lb payload on May 25 to beat Russian Mi-4's 24,491-ft. This set "Class E-1" record for all copters, regardless of weight or size, plus first national record. T-53 gas turbine power. Took 1-hr 5-min. On December 9, 1959 a "Huskie" took Class E-1D altitude mark away from Russia flying to 29,846-ft (for copters weighing between 3858-lbs and 6614-lbs). Second world record set May 17 at Windsor Locks, Conn.: Navy Sikorsky HSS-2 made 192.9-mph over 300-km closed course, beating Russian Mil-6's 167.09. On May 24, same HSS-2 did 174.9-mph over 100-km. Cdr. P. L. Sullivan and Lt. B. W. Witherspoon piloted the HSS-2; Capt. W. C. McMeen the USAF H-43B.

Downer Aircraft Industries of Alexandria, Minn., announces a refined Belianca, the 260A; deliveries expected by late summer. Performance, flight characteristics, remain same but craft will have 58% increased window area. Smaller nose wheel, improved fork lowers nose 4-in., raises tail 9-in. or better forward visibility. Door redesign permits easier entry. New wing root fairing. 203-mph cruise, 62-mph stall, 1750-ft/min climb with 260-hp Continental IO-470.

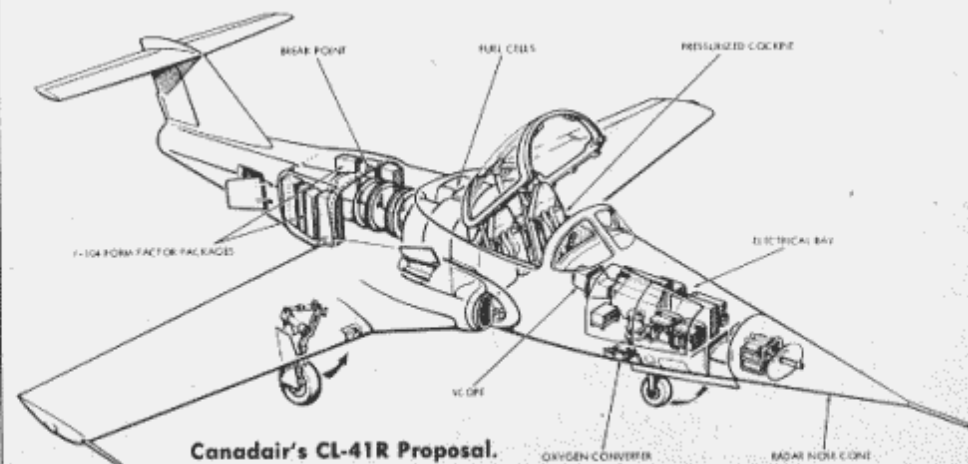
Canadair Ltd, Canada division General Dynamics, proposes advanced version of their CL-41 for radar training of F-104G NATO pilots. Would mount same electronic equipment as F-104G, using same long nose radar. Canadair claims CL-41R halves cost of an advanced trainer, is one-third that of flying classroom type. With P&W JT-12, 2570-lb thrust, it would top 475-mph, or 512-mph using military thrust rating at 20,000-ft. Wingspan 36-ft 4-in.; length 40-ft 7-in., gross weight 7870-lbs. (Fall 1960 "Air Progress" had photo/data coverage of CL-41.)

Grumman and France's S.A.A. Aviation Louis Breguet inked papers covering exchange of technical information, manufacturing facilities, sales promotion of products. Thiokol Chemical and French S.E.P.R. concern entered into sales agreement for solid propellant rocket engines. Other European set-ups including some partial ownership by U.S. manufacturers: Cessna has 49% of Max Holste (France); Bell Aero-systems and Nord Aviation (France) huddling for U.S. sale of Nord target drones; Piasecki and Louis Breguet on STOL/VTOL; Bell Helicopters and Agusta (Italy) regarding Italian development of Bell projects; Douglas and Piaggio (Italy); Douglas and Sud Aviation on the "Caravelle"; Republic and Sud Aviation re U.S. assembly-sales of Sud copters; Beech assisting SFERMA (France) in turboprop developments of Beech designs; Lane and Marchetti (Italy) for U.S. assembly-sales of Nardi amphib; Lockheed and Macchi (Italy) for production of LASA-60; Kaman and Westland (England) for latter's Rotodyne helicopter; Republic and Fokker (Holland) VTOL/STOL research; Daystrom and Bolkow (Germany) for manufacture-sales of latter's "Cobra" anti-tank missile for USMC.

Boeing-Vertol received contract for further development of Model 76 VTOL/STOL. Wings to be modified to improve stability and control during descent, transmission uprated from 630 to 700-hp; new 50-hr qualification program prior to return to NASA Langley Field for flight evaluation. Lycoming T-53 gas turbine geared to pair of 3-bladed rotor-props and tilting wings; initial transition flight made in 1958. So far it has completed 448 flights, flown over 50-hrs; 12 pilots flew through 273 conversions, including 34 "full" (vertical take-off, wings pivoting to horizontal for forward flight, back to vertical position for landing).

Donald R. Robertson, WW-II test pilot and British yachting enthusiast designed and built small GEM "Skimmer" with assistance of students of College of Aeronautical and Automobile Engr., London. 11½-ft long, 7½-ft wide; weighs 250-lbs, operates at 4-in altitude. Powerplant 40-hp Johnson outboard. Materials, excluding "borrowed" engine (from Robertson's sail boat), \$200. Hull plywood. Directional control right/left by rudder pedals which move 40 small blades in main duct, fore and aft by "body English."

(Continued on page 53)



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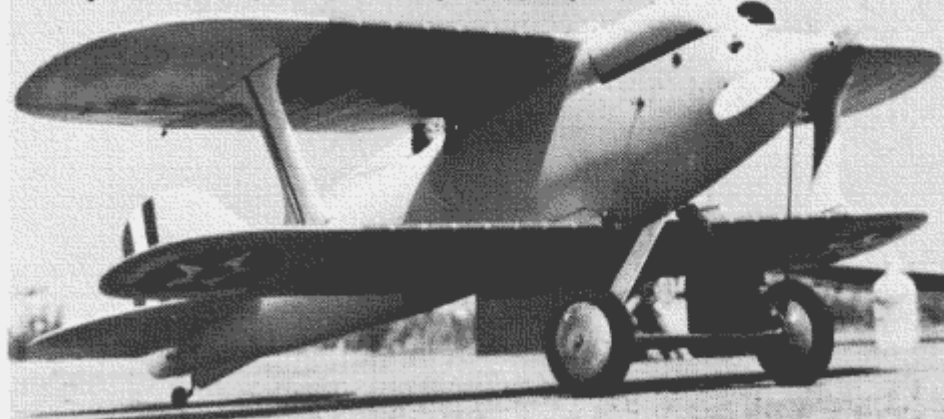
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WESTERN MODELING with Dick Everett

■ Johnny Brodbeck, back from his annual trip to Japan for a model clinic and PACAF model championships, reports entries cut in half due to AF alert on Korean situation.

R/C events were held at Chofu, Free Flight at Yakota golf course, U/C at the Taichi control line circle. This was a six-day affair with 12 events which paid off for quality of the airplanes and their flying was better than ever.

The battle for individual high point champion and team championship was a ding-dong fight down to the wire. Sgt. Curtiss Burrus of Misawa ended up as top man with 592 points, only 5 points in front of Sgt. John Aiken of the same team. Sgt. Billy Howard of Itazuke also gave it a battle, totalling 537 points. Misawa, due to Burrus and Aiken, nosed out Itazuke's team, 1978 to 1890. Very close.

Don Buckley, hobby and craft director in Korea, is mighty proud of his new hobby shop building (just dedicated) and understandably pleased with his official citation for a hard job well done.

The Sunday following this PACAF contest, Hal deBolt and Brodbeck put in an appearance at the Japan-American R/C contest where Hal made some beautiful demonstration flights and was presented a trophy for his superb flying. Hiroyuki Oki won this contest over a large field. According to Bob Dunham,

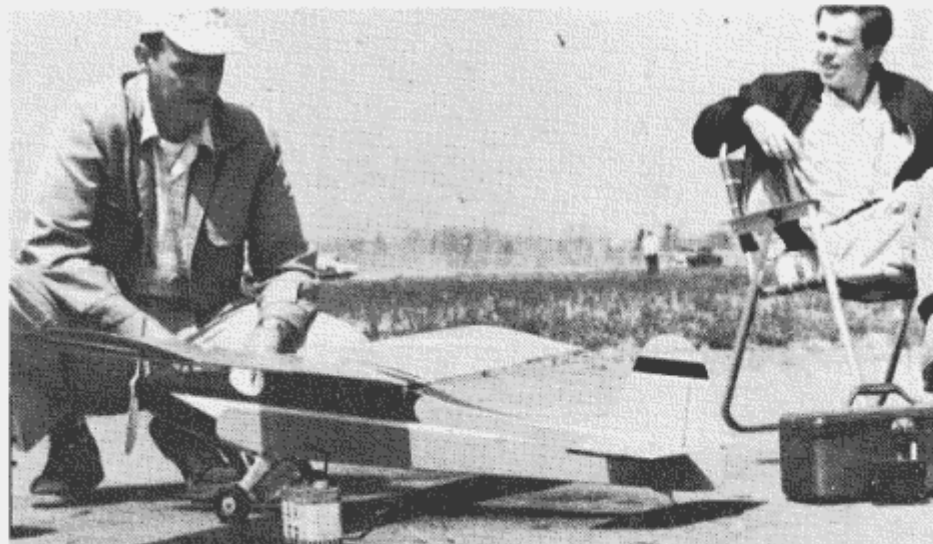
Oki could hold his own at any contest in this country.

The word is that Col. Denton and Sandy Sims are making plans for next year's contest—bigger and better! Leo Bushman, according to John, had a well organized affair.

Free Fighters. FAI elims proved the big contest news this month. Outstanding fliers found the going real rough. Power was the toughest of the lot. Many did not get the new 15's in time to build new models to handle all that additional power. The ten second run caught most guys by surprise for an entirely different flight pattern was dictated. Those models trimmed for a fairly straight power pattern really suffered during the pull out and couldn't make the 12 minutes needed to qualify. Most models we saw that were able to do consistent times had a sweeping circle of power and actually gained altitude on the pull out.

The weather at most places was very poor, sun was scarce and wind high. Many high-aspect Nordics with their thin sections folded wings during tow. Former West Coast Nordic team member, Bob Wiehle, became an early cropper in a series of events that shouldn't happen to anyone. His first flight, a fine 2:40 plus, was cut due to a malfunctioning stop watch. On his second attempt a huge gust folded the wing on his number

(Continued on page 48)



Clarence (Motorman) Lee fuels his radio bird while National R/C Champ Doug Spreng relaxes at Los Angeles' model airport. (See Veco-Lee 45 on page 48).



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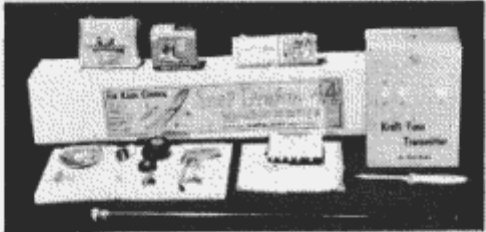
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MODELERS NOTE: Here's a picture of the Famous ACE SNAP-DRAGON COMBO KIT OFFER! The very BEST way to get started in Radio Control—ON PAGE 52 OF THIS MAGAZINE IS THE COMPLETE STORY OF THIS "ONE STEP" way to R.C. Flying Pleasure!

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KINGSWAY HOBBY SHOP
3329 Kingsway
- Hamilton, Ontario
UNIVERSAL HOBBIES
Box 842
- London, Ontario
RAE J'S CYCLE & HOBBY
1110 Adelaide Street
- London, Ontario
THOMPSON'S HOBBY
& CRAFT SHOP
113 King Street (East of Talbot)
- Toronto, Ontario
KLEIN BROS SPORTS & HOBBIES
3187 Bathurst
Phone: RU7-9631

- COLORADO**
Denver
TOM THUMB HOBBY CENTER
7020 East Colfax
- FLORIDA**
Miami
ORANGE BLOSSOM HOBBY SHOP
1896 N. W. 36th Street
- Tampa
PHIL'S HOUSE OF HOBBIES
2308 Tampa Street
- ILLINOIS**
Barrington
LANGE'S BIKE SHOP
120-A West Main Street
- Chicago
HOBBY HOUSE
5516 South Damen Avenue
- Chicago
STANTON HOBBY SHOP
4736 North Milwaukee Avenue
- Chicago
WEST TOWNS HOBBY SHOP
5808 West Chicago Avenue
- Des Plaines
MASTER HOBBIES, INC.
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- East St. Louis
EAST SIDE HOBBY SHOP
2303 State Street
- Evanston
HOBBYMODELS
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- St. Charles
JOE'S HOBBY SHOP
220 West Main St.
- IOWA**
Des Moines
HIGHLAND HOBBY SHOP
1061—8th Avenue
- KANSAS**
Topeka
JOHNS FISHING & SPORTS CENTER
2615 California
- MARYLAND**
Baltimore
LLOYD'S HOBBY HEADQUARTERS
2291 North Charles Street

- Bethesda
BETHESDA HOBBY SHOP
7814 Old Georgetown Road
- Wheaton
GENE'S HOBBY SHOP
2537 Earns Avenue
- MASSACHUSETTS**
Cambridge
CROSSY'S HOBBY CENTRE
1704-A Massachusetts Avenue
- Chicopee Falls
BOB'S CAMERA & HOBBY SHOP
698 Grant Street
- MICHIGAN**
Ann Arbor
BEAVER'S BIKE & HARDWARE
605 Church
- Detroit
BOWLAND HOBBIES
13938 East Warren Avenue
- Detroit
JOE'S HOBBY CENTER
9810 Wyoming Avenue
- Ft. Linn
FLINN'S HOBBY & MODEL SUPPLY
3302 Cornua Street
- Lansing (Holt)
THE CURIO SHOP
2423 North Cedar
- MINNESOTA**
Minneapolis
ROCKET RADIO
AND AEROTRONICS
3453—4th Avenue, South
- Minneapolis
WOODCRAFT HOBBY STORES
903 West Lake Street
- MISSOURI**
Sedalia
H & W ELECTRONICS
1611 West 13th Street
- St. Louis
BOB'S HOBBY MART
8472 Page Blvd.
Phone: HA 7-8541
- St. Louis
CHARLIE'S HOBBY
HOUSE, INC.
4611 Macklind Avenue
- NEBRASKA**
Hastings
DICK'S HOBBY SHOP
218 North Denver
- NEW JERSEY**
Parlappany
RICH'S HOBBYTOWNE
U.S. Route 248

- NEW YORK**
Bronx
BROWN'S HOBBY CENTER
6031 Broadway
- Buffalo
FIELD'S HOBBY CENTER
3184 Bailey Avenue
- Buffalo 27
GREL'S TOYS & HOBBY
5225 Main Street
- East Meadow, L.I.
LEE'S HOBBY SUPPLIES, INC.
2072 Front Street
- OHIO**
Cincinnati
THE HOBBY SHOP
5754 Hamilton Avenue
- Cleveland
CLEVELAND HOBBY SUPPLY CO.
4528 Lorain Avenue
5238 Ridge Road
- Cleveland 18
THE HOBBY HOUSE, INC.
800 Huron Road
5200 Warrensville Road
- Cleveland
RED'S HOBBY-CRAFT
7804 St. Clair Avenue
- Columbus
AAA HOBBY DEN
Great Southern Shopping Center
Town & Country Shopping Center
- Willoughby
KIRTLAND HARDWARE
& HOBBY SHOP
Route 306
- OREGON**
Baker
J. I. MODEL MART
1804 Dewey Avenue
- Portland
FLEDEL HOBBY SERVICE
4503 North Interstate
- PENNSYLVANIA**
Allentown
BLOCH'S PAINTS & HOBBIES
22 North 8th Street

- Denora
BEDOGNE HOBBY SHOP
524 McKean Avenue
- Fogelsville
DON MOHR'S HOBBYLAND
Junction Routes 22 & 100
- Philadelphia
RICHARD FRANCIS HOBBIES
5615 Woodland Avenue
- Pittsburgh
A. S. CHARLES & SON HOBBY SHOP
3213 West Liberty
- Pittsburgh (E. Liberty)
WALTY'S HOBBIES
5903 Penn Avenue
- Upper Darby
TODD'S RADIO CONTROL SHOP
7036 Terminal Square
- SOUTH DAKOTA**
Sioux Falls
STITCH'S MODEL SPECIALTIES
314 South Grange Avenue
- TENNESSEE**
Chattanooga
A & M TOY & HOBBY
3816 Ringgold Road
- TEXAS**
Austin
HOBBY TOWN
5933 Burnet Road
- VIRGINIA**
Arlington
ARLINGTON HOBBY CRAFTERS
625 North Glebe Road
- Richmond
THE HOBBY CENTER
3029 West Cary Street
- WASHINGTON**
Bellingham
HOBBY HIVE
205 East Holly
- WISCONSIN**
Racine
MARC'S HOBBY SHOP
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For PROMPT SERVICE on ALL UNITS Return ONLY to
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NEED FLYING SITE HELP?

Air-modelers everywhere can profit from this stirring report on how the Greater St. Louis flyers worked with Recreation and Parks Department representatives to create a model airport!

■ Have you and your fellow club members ever dreamed of a model airport with improvements tailored to your own needs? Naturally, you say.

So did the modelers in St. Louis County, Missouri. And, what is more, thanks to the leadership of Wayne Kennedy, superintendent of recreation in St. Louis County, their own work and the Greater St. Louis Modeling Association, their dreams are coming true.

During 1960, the newly organized association, with its six member clubs, was given the use of a flying site at Buder Park, an area centrally located within the county and not too heavily populated. The site itself is relatively flat, but the surrounding topography acts as a natural shield for engine noise.

The noise factor had been a problem with most of these clubs which had been looking for a permanent flying place. Also, some groups that already had flying facilities were not able to make any improvements on their sites.

At Buder Park they all found both a permanent site and the opportunity to make improvements. As soon as the set-up was approved, they immediately set to work, with the encouragement of Mr. Kennedy, to raise funds for fixing up the flying area. The park department also gave them assistance.

Within six months the U-control flyers had completed: Three graded flying circles, one of them oiled and rolled for speed events; a small shelter; a low fence around the entire area containing the flying circles; a rocked entrance road; a mowed and leveled parking space and temporary restroom facilities.

Any club or group of clubs can reserve these flying circles for contest purposes, otherwise the space is available at all times for use by individuals for practice. The park department has requested that all contests be under the direction of leader members of the Academy of Model Aeronautics.

These improvements were made with donations solicited by the association and volunteer labor given by the club members, except for the grading and some other things done with park department employees and equipment. All of the work was done with the approval and under the supervision of the park department. The cost of hiring a contractor to oil and roll the speed circle was paid by the association.

The park department's basic philosophy was summarized early for the

group by Mr. Kennedy. "We are not going to spend taxpayers' money," he said, "on a venture with a special interest group until such time as the group itself shows sufficient interest to do some of the work."

The way the modelers pitched in to improve the site and the extensive use they made of the facilities during the first season of operation impressed the department so favorably that much more extensive improvements have already been planned. In fact, the park department has \$2,800 in the 1961 budget for modeling facilities at Buder Park. And, again, the members of the association have pledged volunteer labor to do what they can of the necessary work.

The ten projects, now getting underway, are: (1) Planting trees around perimeter of the field to eventually furnish shade for spectators; (2) Grading and seeding of three new circles; (3) Running concrete for the center of speed circle and installing a yoke; (4) Erecting control tower; (5) Building a carrier deck runway; (6) Re-oiling and rolling of speed circle; (7) Completing new road directly to highway; (8) Erecting

new restroom facilities; (9) Improving the parking lot; (10) Clearing picnic area and installing tables.

Radio control modelers also were included in the project by the park department, being allowed the use of a large flat area located near-by. There are, however, two baseball diamonds located in this area, and a permit must be submitted and approved before any flying is permitted. The proximity of the Meramec River and several highways makes the flying of free flight planes at Buder Park impossible.

A little over a year ago the situation in St. Louis County was much the same as in many other places—people were complaining. In this instance, the park maintenance superintendents felt that the flying practices then in force at the various parks were both potentially dangerous and a noise nuisance.

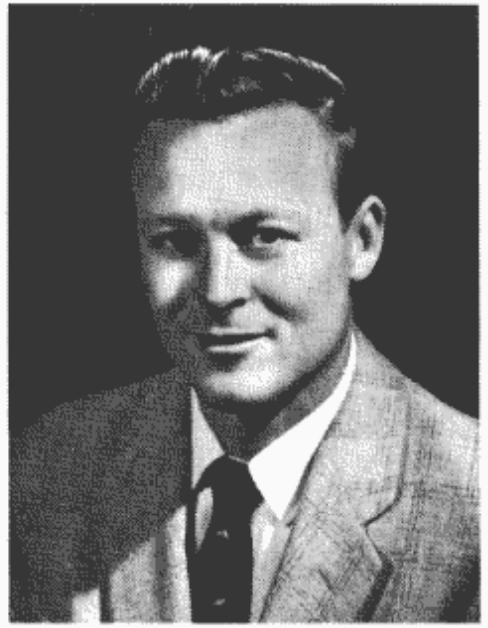
They discussed the matter with Mr. Kennedy and he dug back into his files to unearth a letter written by the Manchester Double Cola club asking for a flying site.



Concrete for center of carrier deck circle is finished off by Charles Eschmann, head of Greater St. Louis Modelers Association. A real working prexy!

Monthly Award of Merit Goes To Recreation Leader Wayne Kennedy

Mr. Wayne C. Kennedy, Superintendent of Recreation in St. Louis County, is starting his fourth year at this position. Mr. Kennedy inaugurated the St. Louis County Recreation Program, which in 1961 will have over 17,000 participants. He was the founder of the R-9 Community Center, a "Do-it-yourself" project. Its buildings and grounds now have an estimated value of \$90,000. Mr. Kennedy is 37, married, has three children. A native of northwestern Iowa, he received his B.S. degree from the University of South Dakota and his masters degree from St. Louis University. Mr. Kennedy was a junior high school principal and teacher for eleven years. He has been a Y.M.C.A. instructor and Physical Education director of a Turner Hall.



Upon contacting the Double Colas (now the Lafayette Esquadrilles) Mr. Kennedy found that a number of clubs were in need of sites for U-control flying. So he called together representatives of the various model airplane clubs, and offered them a permanent place to fly at Buder Park, with a ban on flying at all other public parks.

Also, out of this meeting was born, two months later, the Greater St. Louis Modeling Association, the advisory group for the development and supervision of the site. In addition, the association was charged with the responsibility for volunteer labor.

It was agreed, and written into the constitution of the association, that the representative sent to the group by each club should be an "open" member (over 20 years of age).

The association, at present represents the interests of the following six clubs: St. Louis Yellow Jackets M.A.A.; Lafayette Esquadrilles (formerly Manchester Double Cola Club); Hazelwood Aero Modelers Association; Hot Heads; Wing Wagglers and Affton Air Rebels.

Charles Eschmann of the Yellow Jackets is currently serving as association president. New officers are elected an-

nually. The association is not empowered to levy a special assessment on any club except by a 75 per cent vote of all member clubs, and there are no dues charged for association membership.

Any model club in the St. Louis area is eligible for membership in the association as long as they are an A.M.A. chartered club and are voted in by a two-thirds majority. The association endeavors to aid the national A.M.A. program as much as possible and to help advance model aviation in all its phases.

Each month, or whenever business matters require, the association meets with Mr. Kennedy and with Harold Gravatt, parkkeeper at Buder Park. These joint sessions give both groups a chance to improve their public relations and to keep cooperation at its peak.

Needless to say, the modelers are already completely sold on Mr. Kennedy and the park department. As a member of the Lafayette Esquadrille says, "We believe our club would have disbanded except for the wonderful cooperation of Mr. Kennedy, Mr. Gravatt and Charles Skow, commissioner of the St. Louis County parks and recreation department. We are looking forward to a great future for model flying in this area."

And Mr. Kennedy, in his turn, allows that the respect is mutual. In his words, "I thoroughly enjoy working with these groups. Their hobby is one that inspires great efforts on their part and on the part of others. They are sincere, competitive, cooperative and above all, they are good sportsmen."

And just how did the association and its member clubs go about the job of securing the cash donations for the 1960 improvements and signing up volunteer workers.

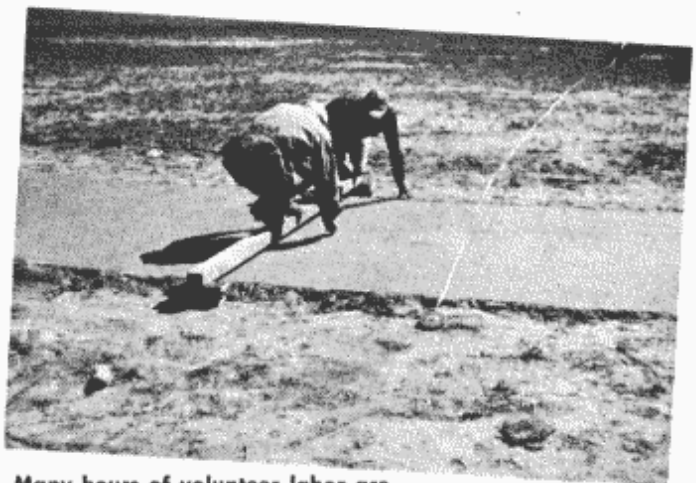
First, the financial contact work was done by members of the association. They estimate that about 60 per cent of the \$542 for improvements was covered by individual donations. The other 40 per cent, plus a quantity of materials, they add, came from the local hobby dealers and distributors who feel that the facilities at Buder Park are a big step ahead for model aviation in St. Louis County, and will produce many potential model builders.

Secondly, on the matter of the labor force required. This was handled on a strictly voluntary basis. Times and dates were set by the chairmen and everyone was asked to come out and help.

(Continued on page 51)



Model flyers (above) assist improvement program by planting trees.



Many hours of volunteer labor are contributed by flyers from six GSILMA member clubs. Landing strip is smoothed above.



Designer JCS, left; much-flown "Special" above.

SMITH-STEGENS

"SPLINTER"

By John C. Smith

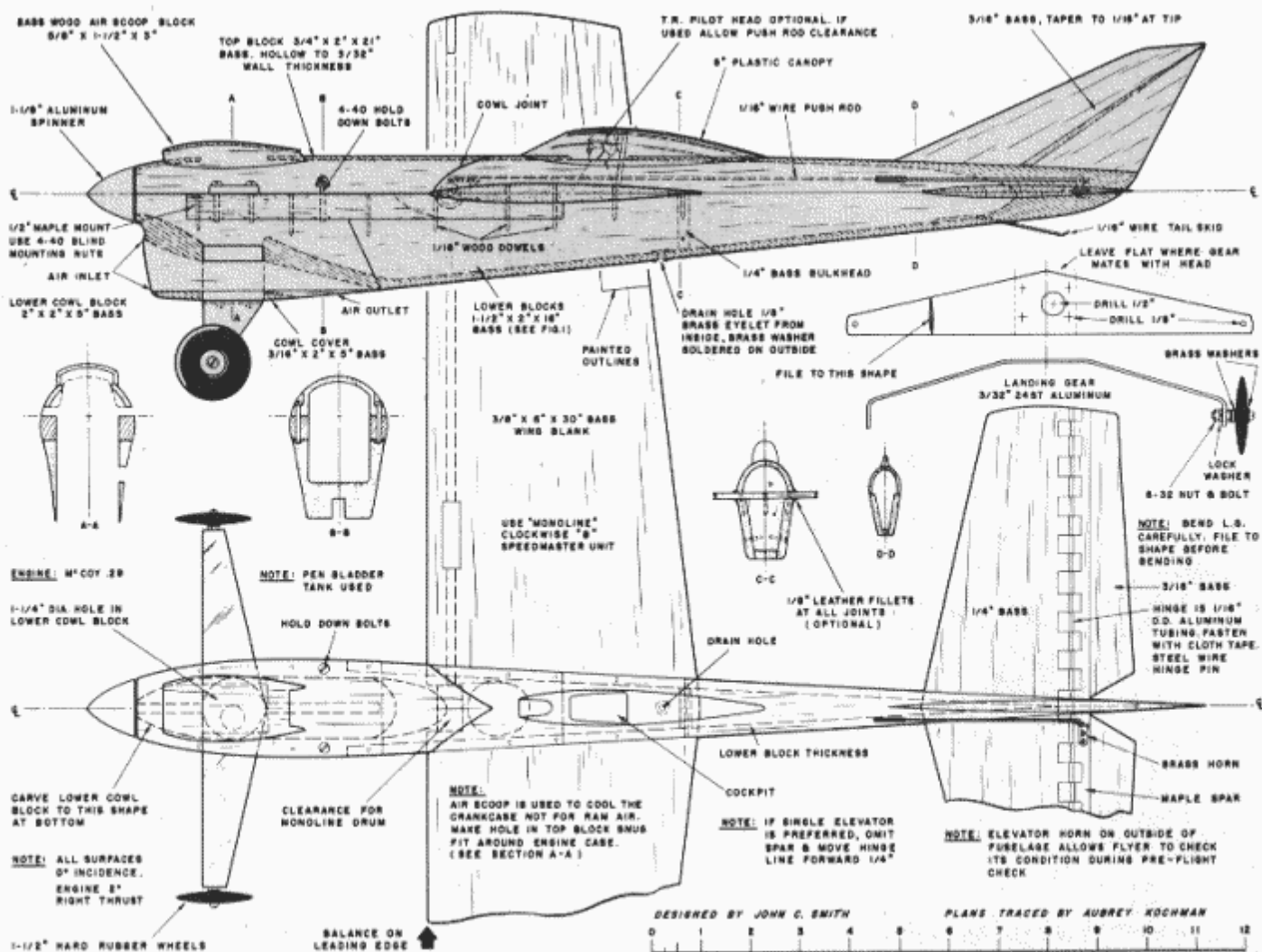
■ In the spring of 1956 the group I fly with, Al Stegens, Jere and Larry Draper, and I began to get interested in the then new Proto Speed event. Jere built the first proto model in the group. This was a stock Veco "Redskin"; at the Dallas Nationals it set a new Jr. record of 96 mph. After the Nats we traveled to Far Hills, N. J., to a meet there. Jere took first again with his "Redskin" and I took second with a "Goodnews" design.

After the Eastern trip as we still had some meets coming up in the Detroit area, Al, Larry, and I built

three new models. These were basic "Goodnews" kits modified by thinning the fuselage, beefing up the front ends with fiberglass and running the lead-out wires through the wings. Using McCoy .29s these models placed in every contest entered.

About 90 days before the '56 King Orange Meet in Miami, Fla., I started the original of what was to become the "winningest" proto model in the country. I took 1st in open at the KOI, along with 2nd in the Embry Riddle "Design Award" for best first-place

(Continued on page 63)



INCREDIBLE CONTEST RECORD SCORED BY SMITH-STEGENS MONO-LINE PROTO RACER

Flown by Al Stegens, Jere Draper, Tony Kuester, John Smith

1956: King Orange Internationals, Miami, Fla.—First and Second places (plus Embry Riddle Award).

1957: Strathmore, Mich.—First, Second; Cincinnati, Ohio—First, Second; Cleveland, Ohio, Armed Forces Day—First, Second; Cleveland, Junior National Air Races—First, Third; Willow Grove, Pa., National Championships—Two Firsts (both records); Detroit, Mich.—First; Flint, Mich. (July)—First, Second, Third; Flint (Aug.)—First, Second, Third; Hamilton, Ont., Canadian Zone Nationals—First, Second, Third; Niagara Falls, N. Y.—First; King Orange Internationals—First.

1958: Cleveland, Armed Forces Day—Two Firsts, Third; Cleveland, Junior National Air Races—Three Firsts; Glenview, Ill., National

Championships—Two Firsts, Second, Third (design held all 3 American records at this time!); Springfield, Ohio—First, Second; Kokomo, Ind.—First, Second; Detroit—First, Second; Hamilton, Ohio—First, Second; New York City, Mirror Model Flying Fair—First, Second, Third; Canadian Nationals—Second, Two Thirds; King Orange Internationals—First.

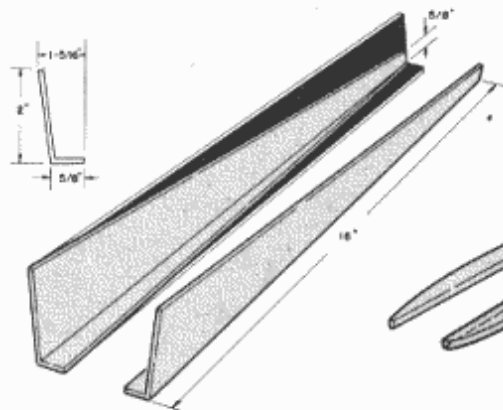
1959: Cleveland, Higbee Static Competition—Two Firsts; Cleveland, Armed Forces Day—Three Firsts, Third; Akron, Ohio—First, Second, Third; Springfield, Ohio—First, Third; Kokomo—First, Third; Flint—First, Second; New York City, MMFF—First, Third; Parkersburg, W. Va.—Two Firsts.

1960: Cleveland, Armed Forces Day—Three Firsts, Second; Dayton, Ohio—First, Second, Third; Indianapolis, Ind.—First; Springfield, Ohio—First, Second; Flint—First; New York City, MMFF—First, Second; Kokomo—First; Dallas, Texas, National Championships—Second; Cleveland, Junior National Air Races—Two Firsts, Second, Third.

1961: Cleveland, Armed Forces Day—Two Firsts, Third.

This list covers only the contest record of the four individuals listed. The design has been duplicated by others who have also racked up numerous "wins" with it!

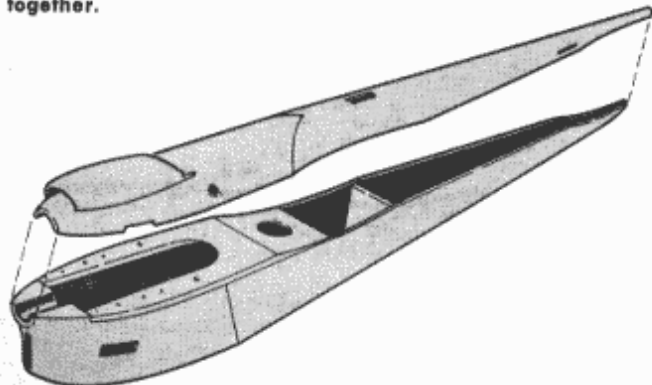
World's Best "Proto" Contest Racer Design



Make one left and one right side. Cut away shaded areas and glue halves together. Use Elmers white glue for all joints.

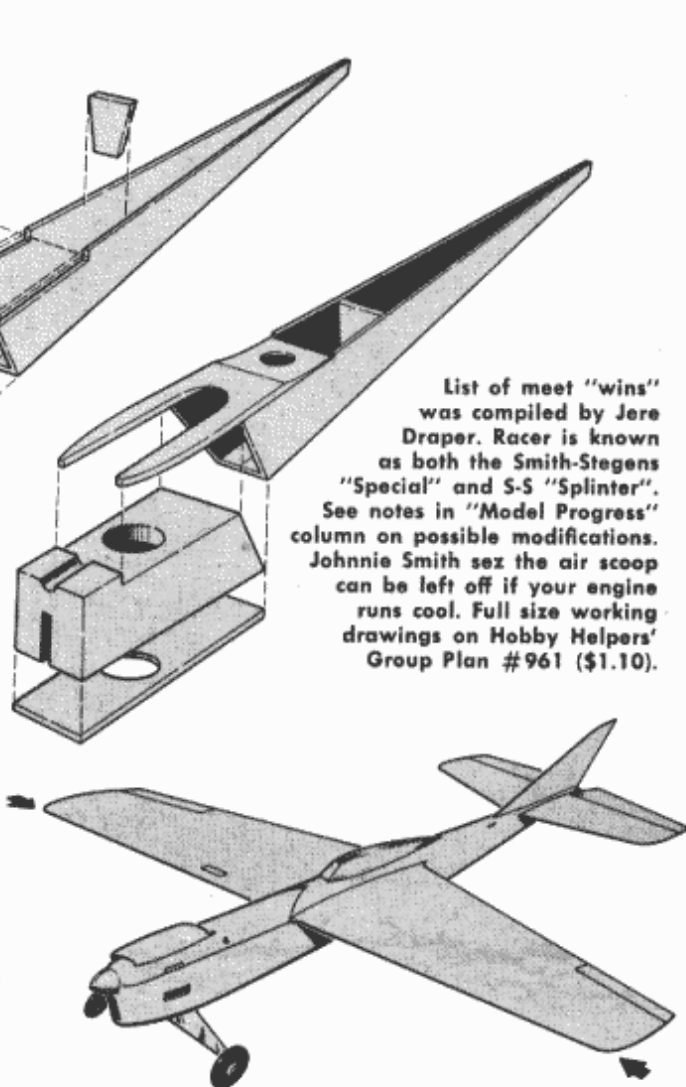
Cut away areas indicated by dotted lines. Install motor mount and bulkhead. Glue tailskid in place.

Tack glue lower cowl block to engine mount and engine to mount. Cylinder head is turned down to 1 1/4" O.D. and head fins are flattened. Carve cowl block to final shape and hollow inside. Install engine and cowl hold-down blind mounting nuts. Glue cowl on permanently. Dowel all parts together.



Cut top block to rough shape and tack glue on lower half. Carve to finish shape and hollow to wall thickness specified. Cut hatch loose and install air scoop. Install drain tube and paint inside from bulkhead to nose with 2 coats of fiberglass resin. Carve wing and stabilizer. Glue stab in place and install Mono-Line control unit. Glue and dowel wing in place to lower half. Glue top shell on. Install rudder. Add leather fillets if desired.

American Modeler — September 1961



List of meet "wins" was compiled by Jere Draper. Racer is known as both the Smith-Stegens "Special" and S-S "Splinter". See notes in "Model Progress" column on possible modifications. Johnnie Smith sez the air scoop can be left off if your engine runs cool. Full size working drawings on Hobby Helpers' Group Plan #961 (\$1.10).

Finish sand model. Lay light weight fiberglass cloth from trailing edge of wing forward over cowl on lower cowl only. Lay 2 layers of fiberglass cloth over engine mount area. Finish complete model with fiberglass resin (no cloth), sanding between coats with 4/0 dry paper. Put on 6 thin coats and wet sand last coat when bone dry with 320, then 400 wet or dry paper. Rub with rubbing compound. Trim, wax and fly. When balanced on leading edge without propeller or fuel, model should point nose down 10 degrees.

World Aviation Year by Year

1957

Selection and drawings
by Douglas Rolfe

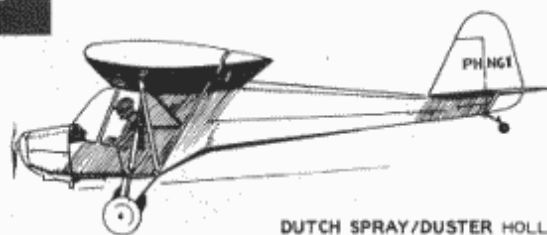


GERMAN BUSINESS PLANE KLEMM KL. 107B
THREE PLACE. 150 HP LYCOMING ENGINE. TOP
SPEED - 188 MPH. CRUISING SPEED - 133 MPH.

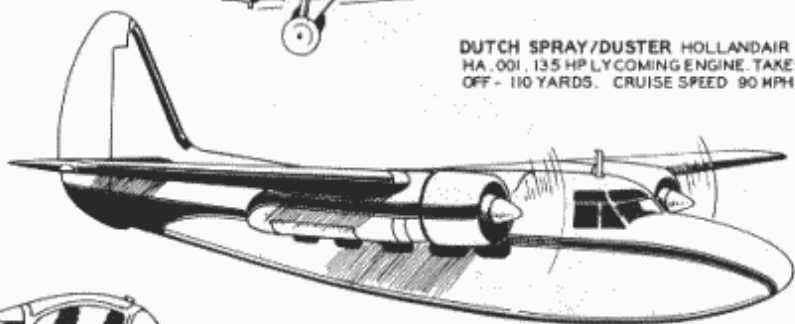
GERMAN PRIMARY TRAINER ►
FOCKE-WULF P. 149 (LICENSED BY
PIAGGIO) 275 HP LYCOMING ENGINE.
TWO PLACE. TOP SPEED - 187 MPH



U.S. BUSINESS PLANE CESSNA 182
SKYLANE. 230 HP CONTINENTAL EN-
GINE. 4-PLACE. CRUIS. SPEED - 158 MPH.



DUTCH SPRAY/DUSTER HOLLANDAIR
HA. 001. 135 HP LYCOMING ENGINE. TAKE-
OFF - 110 YARDS. CRUISE SPEED 90 MPH



BRITISH EXECUTIVE TRANSPORT HUNTING
PERCIVAL PRESIDENT. TWO 520/540 HP ALVIS
LEONIDES RADIALS. 8/12 SEAT PLUS CREW OF
TWO. CRUISING SPEED - FROM 163 TO 221 MPH



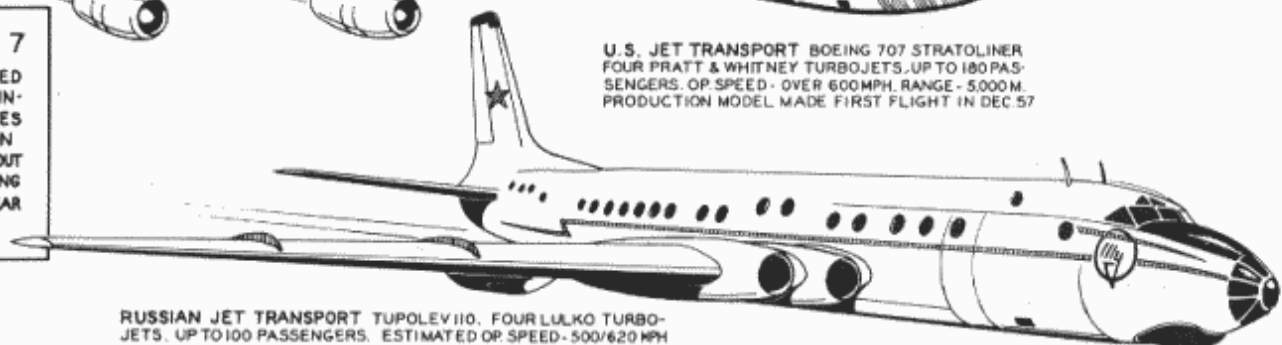
U.S. EXECUTIVE PLANE BEECH 95 TRAVEL AIR
TWO 180 HP LYCOMING FLAT SIX ENGINES. FOUR
PLACE. TOP SPEED - 208 MPH. CRUISE - 191/200 MPH.



U.S. JET TRANSPORT BOEING 707 STRATOLINER
FOUR PRATT & WHITNEY TURBOJETS. UP TO 180 PAS-
SENGERS. OP. SPEED - OVER 600 MPH. RANGE - 5,000 M.
PRODUCTION MODEL MADE FIRST FLIGHT IN DEC 57

1 9 5 7

AIRCRAFT DEPICTED
HERE VARIOUSLY IN-
CLUDE PROTOTYPES
AND PRODUCTION
MODELS ROLLED OUT
OR UNVEILED DURING
THE CALENDAR YEAR

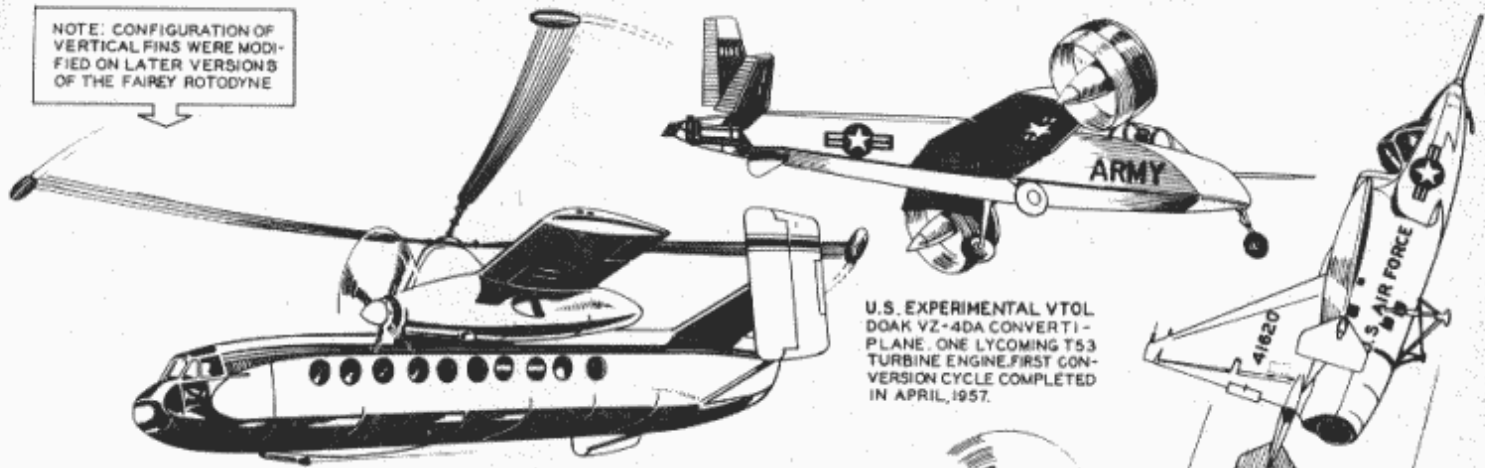


RUSSIAN JET TRANSPORT TUPOLEV 110. FOUR LULKO TURBO-
JETS. UP TO 100 PASSENGERS. ESTIMATED OP. SPEED - 500/620 MPH

■ The year 1957 saw the diminishing superiority of the piston-engine plane, a corresponding growth of the pure jets. In the military field especially piston-engine craft were being discarded in favor of two-seat jet trainers. Furthermore the year marked the dawn of the civil jet transport with the U.S., Britain, and Russia flight testing large subsonic jet airliners nearing the operational stage. Another phenomenon was an enormous growth in this country of personal and executive type aircraft. These retained the familiar piston-engine power plants, but there were signs

that the jet might someday take over in all but the lightest and cheapest aircraft. Equally significant was the number of VTOL aircraft and large, low-cost-payload, helicopters. In the U.S. two purely VTOL aircraft made successful conversion flights from vertical takeoff to normal flight and back. In Britain the Fairey Rotodyne demonstrated that vertical lift could be hitched to a near-normal airplane design and thus end the nightmare of mile-long runways for short-haul commercial aircraft. It also raised the speed of rotary wing aircraft to a practical 190 miles per hour. Critical

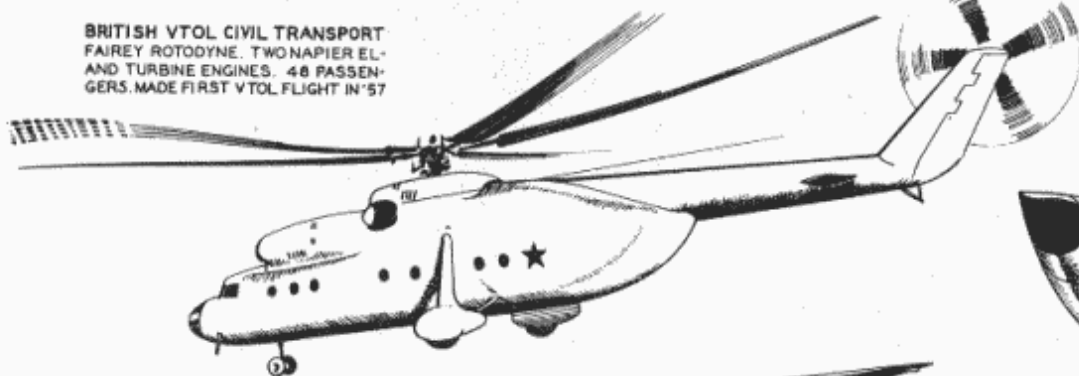
NOTE: CONFIGURATION OF VERTICAL FINN WERE MODIFIED ON LATER VERSIONS OF THE FAIREY ROTODYNE



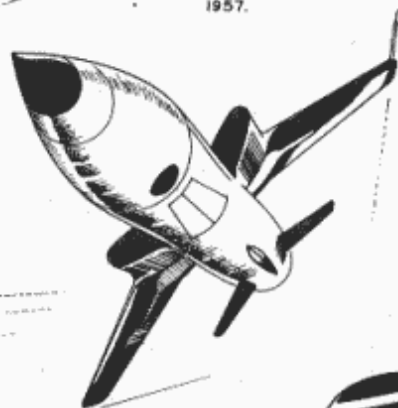
U.S. EXPERIMENTAL VTOL DOAK VZ-4DA CONVERTI-PLANE. ONE LYCOMING T53 TURBINE ENGINE. FIRST CONVERSION CYCLE COMPLETED IN APRIL, 1957.

U.S. EXPERIMENTAL VTOL RYAN X-13 VERTIJET. 1 ROLLS-ROYCE AVON. FIRST TRANSITION FLIGHT COMPLETED IN MAY, 1957.

BRITISH VTOL CIVIL TRANSPORT FAIREY ROTODYNE. TWO NAPIER EL-AND TURBINE ENGINES. 48 PASSENGERS. MADE FIRST VTOL FLIGHT IN '57

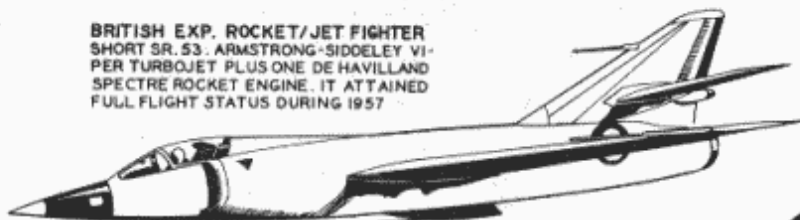


RUSSIAN ROTARY WING TRANSPORT M.L. MIL-6 TWO TURBINE ENGINES, 5-BLADE ROTOR. PAYLOAD OVER 12 TONS



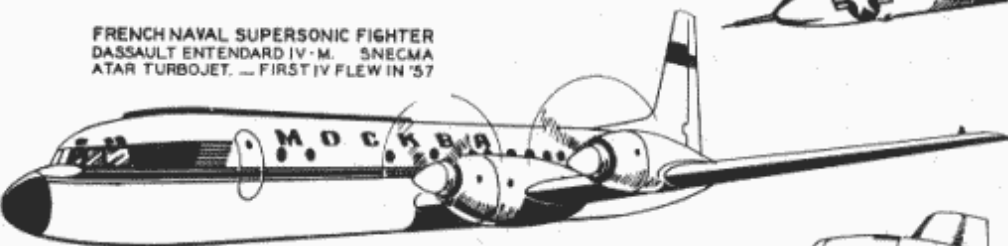
U.S. A.F. SUPERSONIC FIGHTER REPUBLIC F-105 THUNDERCHIEF. PRATT & WHITNEY J75 TURBOJET. MADE MAIDEN FLIGHT IN MAY, 1957

BRITISH EXP. ROCKET/JET FIGHTER SHORT SR. 53. ARMSTRONG-SIDDELEY VIPER TURBOJET PLUS ONE DE HAVILLAND SPECTRE ROCKET ENGINE. IT ATTAINED FULL FLIGHT STATUS DURING 1957



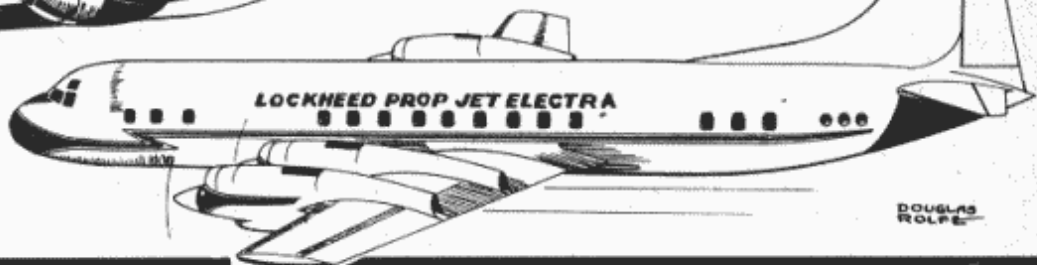
FRENCH NAVAL SUPERSONIC FIGHTER DASSAULT ENTENDARD IV-M. SNECMA ATAR TURBOJET. — FIRST IV FLEW IN '57

U.S. NAVY SUPERSONIC FIGHTER DOUGLAS F5D-1 SKYLANCER. P & W J57-P12 TURBOJET. — FIRST PRODUCTION MODEL FLEW IN 1958



RUSSIAN TURBOPROP TRANSPORT ILYUSHIN-18 MOSCOW. FOUR 4,000 HP KUSNETZOV TURBINES. COMPARABLE IN NUMEROUS WAYS TO THE ELECTRA

U. S. TURBOPROP CIVIL TRANSPORT LOCKHEED ELECTRA. FOUR 3,700 HP ALLISON TURBINES. PROTOTYPES OF THE ELECTRA WERE FLYING IN 1957



DOUGLAS ROLPE

readers may question some of the aircraft depicted as to the exact year when they first "appeared." The fact is that it takes so long these days to get any given design from the first prototype stage to operational use that it becomes increasingly difficult to fix the precise date of its unveiling. A case in point is the Boeing 707 Stratoliner. The first production model flew in this year (1957), but the first prototype was flying in 1954. There is nothing new in this. For example, the famed Spitfire of World War Two was only just going into RAF fighter squadrons at the start of the American Modeler — September 1961

Battle of Britain in late 1940, but the first prototype Spit flew in 1935. And aircraft today are enormously more complicated than the types built then. The illustrations, a mere handful of the many types which appeared in 1957, have been selected to give an overall picture of design trend. It will be noted that designers everywhere, be it the United States, France, Britain or Russia, tend to follow a similar pattern regardless of the type aircraft produced. One might even say that there still exists a tendency to copy proven designs. Or maybe it's just "configuration coincidence"?

Meet BOB JOHNSON Fighter Ace from Oklahoma

By Walter A. Musciano



Robert S. Johnson, USAAF, in his Republic P-47 Thunderbolt (note 25 victories).

■ In a single year of combat flying Robert S. Johnson became America's second highest Ace in the European Theatre of Operation during World War Two. Every one of his 28 victories was scored against a German fighter, not against slow bombers or defenseless observation planes. This superb flyer never lost a wing-man—not one received a single bullet hole in his aircraft! Such was the ability of Squadron Leader Johnson.

As a lad in Lawton, Oklahoma, Bob decided to become an Army pilot after witnessing an aerobatic demonstration by Army flyers when he was eight. The urge to fly increased as he grew older; young Johnson had his first airplane ride in a Ford Trimotor. This hop convinced Bob that here was the life for him. At eleven he took a part time job in order to pay for flying lessons. After less than seven hours of flight instruction Johnson soloed—he was twelve years old!

By the time he reached sixteen he had logged over 35 solo hours. Robert Johnson studied engineering at Cameron Junior College, joined the Civilian Pilot Training Program at that school. He worked as a fireman at night to support himself.

Johnson's childhood dream came true in 1941 when he was 21; he joined the U.S. Army Air Corps and trained at Kelly field in Texas. While still a cadet he married Barbara Morgan, his college sweetheart. When Johnson completed Air Corps training he was assigned to a multi-engine school for bomber pilots. The combined long distance flying and radio blind flying training proved most helpful during his wartime career.

Strange as it may seem, Johnson, then a Second Lieutenant, was assigned to the 56th Fighter Group notwithstanding his bomber pilot training. Early in 1943 Johnson was on his way to England as a member of the 61st Fighter Squadron which was one of the first to be equipped with the rugged Republic P-47 "Thunderbolt."

This group was to become famous as the "Zemke Wolf Pack" through the superb leadership of Major Hubert A. Zemke and the fantastic flying by pilots like Gabreski, Mahurin and Johnson. This outfit of aces shot down more German planes than any other fighter group in the ETO. They destroyed 1,006 enemy aircraft, losing only 128 of their own Thunderbolts. Due to his exceptional flying ability and his leadership qualities Bob Johnson soon became a flight leader, later was assigned leadership of the 61st Squadron. The 56th Fighter Group was stationed across the English Channel from the famed "Abbeville Boys" (one of the crack German Geschwaders) therefore they fought the best pilots in the Luftwaffe.

Robert Johnson had never fired a machine gun until he went into action against the Luftwaffe. And he was not officially qualified to fly the P-47 because he had been trained only as a bomber pilot!

Death came mighty close to the Thunderbolt Ace during a routine sortie over Rouen, France. All was quiet and peaceful as the three squadrons of the 56th Group flew in formation when Johnson's keen eyes spotted sixteen Focke Wulf 190 fighters above and behind the formation of "Jugs." The enemy planes, gaining on the unsuspecting Thunderbolts, were preparing to attack. Bob's squadron leader did not respond as wingman Johnson reported his discovery over the radio. Over and over his warning was sounded but the squad-

ron continued on its way unaware of the danger lurking above. Johnson dared not break off to attack because he had been severely reprimanded for previous unauthorized attacks on enemy aircraft. He had been ordered specifically never to attack unless his leader gave the signal.

Johnson called frantically into the radio until suddenly cannon shells and machine gun bullets ripped into his P-47; the craft vibrated with every deafening impact! Within seconds fire licked into the cockpit accompanied by dense, blinding smoke. Johnson tugged frantically to open the sliding canopy so he could bail out, but it jammed after moving only six inches. With the plane falling out of control, his oxygen supply cut off, and leaking oil covering the windshield, the trapped pilot fought with maniacal strength to open the canopy. Luckily as quickly as the flames had started they disappeared. The young Lieutenant babied his craft's controls until it was in level flight. However, the engine had been hit and losing rpms it was vibrating violently. A bullet had creased Johnson's nose, his face was burned, his hands were imbedded with splinters from exploding cannon shells, two bullets had ripped through his thigh. The mechanism of his wrist watch had been carried away by a machine gun bullet leaving the strap and case on his wrist!

Johnson tried to read the instruments to determine his speed and altitude, but the panel had been reduced to a mess of shattered dials by Focke Wulf cannon fire. The trapped pilot in the smoking Thunderbolt soon had more problems: the hydraulic system was out and the fluid was blowing in his face—so swollen that his eyes were almost closed; his nose was bleeding profusely. A hole in the canopy top was large enough to admit his shoulders but not big enough to include his parachute. While this prevented him from abandoning his airplane it did enable him to stick his head through briefly to see where he was going! Under these incredible conditions Johnson nursed his smoking wreck toward the English Channel losing altitude continuously.

Suddenly a lone Focke Wulf from J.G. 26 appeared flying alongside the crippled P-47. Then it peeled off only to return to riddle the Thunderbolt with more .30 calibre slugs! Johnson lowered his seat and crouched behind the armor of the cockpit which afforded protection against the rain of bullets. For some reason the Focke Wulf did not or could not fire its cannon. Again and again the German swept in to attack his helpless victim. Johnson fired the P-47's eight guns blindly hoping to score a lucky hit. Eventually, the Focke Wulf pilot shook his head in despair and broke off the engagement to head back to the French coast. Bob's limp Thunderbolt continued its agonizing flight toward England at about 170 miles per hour.

The eventual landing, a dangerous operation in view of inoperative flaps and brakes, proved to be one of Johnson's best. Examination of the P-47 revealed that there were over 100 bullet holes plus 21 cannon shell openings in the wings, fuselage and tail—including five holes in the propeller! The rugged plane, beyond repair, never flew again.

[Major Robert Johnson attributes his combat success to three specific factors: First, his frequent shooting as a boy with a .22 rifle at small swift game and birds of prey . . . with such constant practice his eyes became skilled at following the most elusive target. Second, his activity in sports,

especially boxing . . . this taught him to recognize and cope with fear. Johnson was afraid at first to enter the ring but forced himself to face opponents. Third, his football playing while attending school . . . at that time he weighed only 145 pounds, other players averaged 10 pounds more. He credits his coach with a "go get 'em" attitude which helped considerably when the Ace faced adverse conditions in battle.]

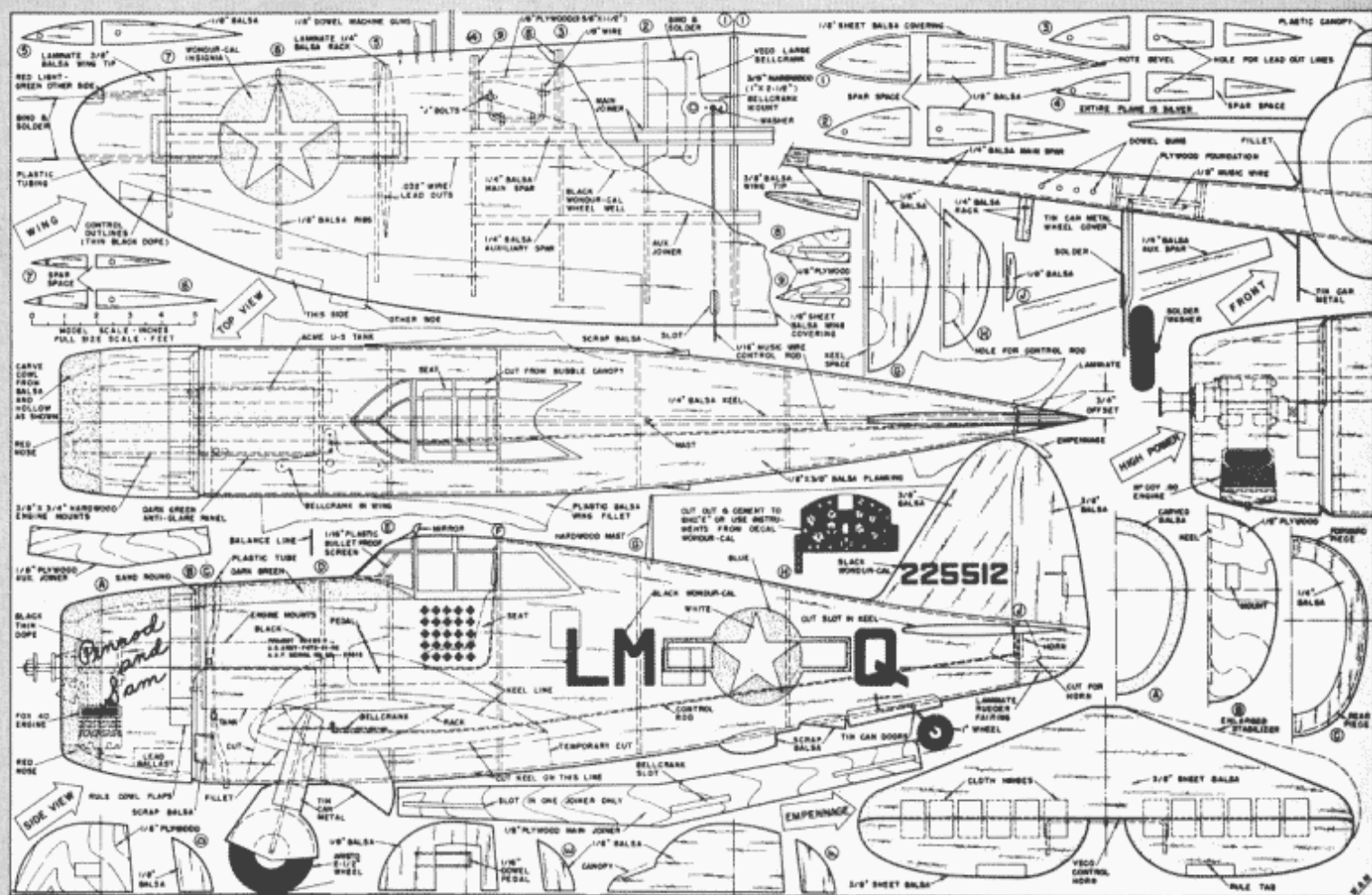
After less than a year of combat flying Johnson became the leading American Ace of the European Theatre with 22 victories. By that time he had flown the standard 200 hour combat tour which meant he was scheduled to return to the United States. But Captain Bob requested an extension and an additional 25 hours was granted. These he used to good advantage by running his score up to 28 official victories. Johnson then returned home to be greeted by President

Roosevelt and General "Hap" Arnold. Bob was sent on a tour of the United States. This was a bond-selling mission during which he demonstrated the capabilities of the Thunderbolt.

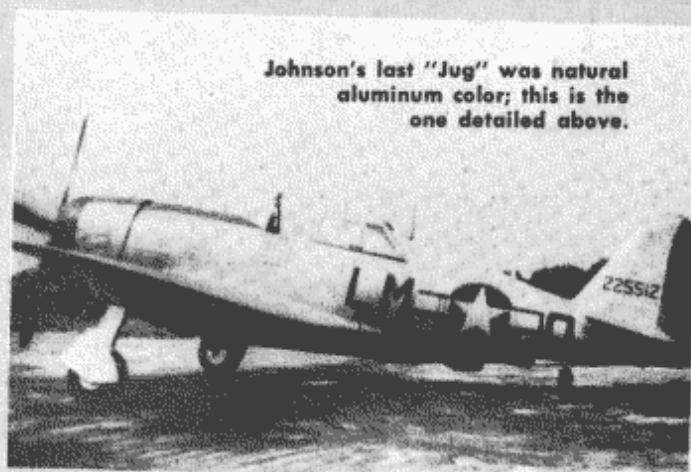
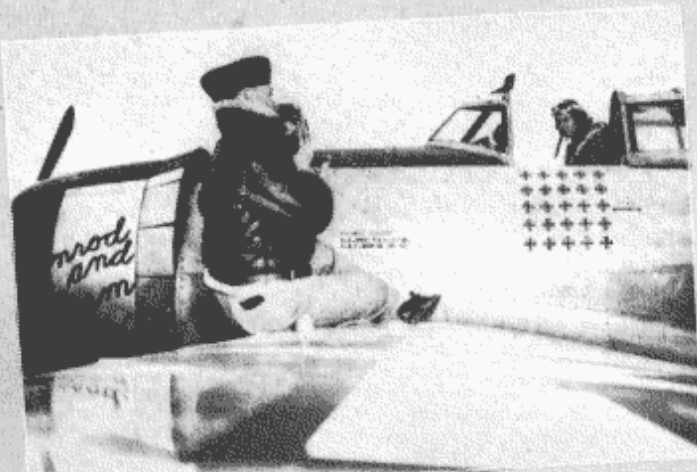
Johnson received many of his country's highest honors including: Distinguished Service Cross; Distinguished Flying Cross with eight Clusters; Silver Star; Purple Heart; Air Medal with four Clusters . . . plus British and French decorations. Today he is with Republic Aviation Corporation, builders of the famous Thunderbolt, as Manager of Customer Relations.

Bob Johnson has written a wonderful book in association with Martin Caidin, about his war experiences. Titled "Thunderbolt," it is published by Rinehart and Co., New York, and recommended to everyone interested in World War Two aviation and the brave men who flew the P-47.

Major Johnson's Last Thunderbolt Miniaturized by Walt Musciano



Working drawings for P-47D Thunderbolt control line scaler are part of Hobby Helpers' Group Plan #961.



Johnson's last "Jug" was natural aluminum color; this is the one detailed above.

How to Build a Control Line REPUBLIC P-47D



When wartime Thunderbolt pilots gathered for recent reunion at Republic plant they cheered as this "Jug" flew with F-84F Thunderstreak (center) and F-105D Thunderchief

■ Republic's P-47 "Thunderbolt" was one of the largest, most successful single seat fighters of the second world war. Generally considered a development of the famous P-35 and P-41 pre-war designs, in reality the P-47 was much more powerful and heavier with a maximum loaded weight of over 17,000 pounds . . . more than twice that of other contemporary single engine fighters.

Powered by a 2,300 horsepower supercharged 18-cylinder Pratt and Whitney engine, the P-47D attained 429 miles per hour at 30,000 feet, had a rate of climb of 2,780 feet per minute. Its range was 950 miles.

Over 12,400 "D" Thunderbolts were constructed (out of a total P-47 production of 15,700 aircraft). The "D", by far, was the most widely used Thunderbolt. It was during production of this series that the bubble canopy was introduced on an American design; therefore P-47D's could be seen with or without the bubble depending upon when they were built. The amazing ruggedness of the "Jug" was its outstanding quality. Virtually all of the leading Thunderbolt Aces survived the war; this was due, in part, to the ability of the plane to absorb terrific punishment and still limp home saving its valuable pilot.

The eight wing-mounted .50 calibre Browning machine guns could tear an adversary apart with one burst. When used as a dive bomber the P-47 carried two 1,000 pound bombs or three 500 pound bombs. Long range drop tanks could be substituted. Rigged for level bombing runs Republic's joy could carry half the load of a B-17 Flying Fortress! Thunderbolts dropped over 130,000 tons of bombs, fired over 135 million rounds as their contribution toward winning the war. Ten 5-inch rockets were carried by some Thunderbolts during the final years of the great conflict.

Ace Bob Johnson piloted several different Thunderbolts during World War Two. Our plans illustrate the last P-47D he flew before he was ordered home. Unlike the earlier planes which were camouflaged, this particular craft was left natural aluminum. The twenty five crosses beneath the cockpit were increased to twenty eight before the Ace left for America. Close-up photos of a P-47 are scheduled for the next Air Progress quarterly on sale August 31.

This one inch to the foot scale produces a plane which can accommodate any powerplant from .29 to .60 cubic inch displacement; the deep cowl will hide almost any model engine.

Wing construction is started by cutting spars, ribs, and joiners. Cement spars to joiners, when dry, add ribs—except Nos. "8" and "9". Lower covering is assembled by butt-joining along seams to form correct chord dimension. Cement lower covering to ribs and spars. Bend music wire landing gear struts, attach to plywood support with "J" bolts. Cement support into slot in ribs Nos. "8" and "9." Make hole in lower covering in exact location of landing gear strut. Pass strut through hole; firmly cement assembly to ribs, lower covering, and spar joiner.

Add lead-out wires to bellcrank, bolt bellcrank to hardwood mount. Pass lead-outs through rib holes; cement mount securely to ribs and spar joiner. Cut and bend control rod, attach to bellcrank.

ACKNOWLEDGMENT

The author expresses his sincere appreciation to Robert S. Johnson; Leon Shloss, Republic Aviation Corporation; and Major James Sunderman, U.S.A.F. for their wonderful cooperation which made this article possible.

Bevel leading and trailing portions of lower covering, sand smooth. Cement upper covering to ribs, spars, and bevelled lower covering. Laminate wing tips, cut roughly to shape. Include tubing in one tip for control lines. Cement tips in place. When thoroughly dry tips should be finished and entire wing thoroughly sanded.

Cut fuselage keel. Cut accurate openings for wing, stabilizer, control horn, fuel tank. In addition, keel is cut away to clear cockpit. Keel is cemented to wing—to accomplish this, two temporary cuts must be made in the keel running up to wing opening from keel bottom. Remove piece below this opening and cement keel in place. Close opening by cementing removed section back to keel and wing.

Cement all formers and bulkheads to keel side. Two different former "C" pieces are required. One is larger so they can form a step where the planking begins.

Install engine mounts — cement securely to bulkheads. Apply several coats of cement.

The commercial "store-boughten" fuel

tank cements in keel hole. A portion of the wing covering must be cut away to accommodate the tank. Cement the brace tank until it is rigid. Add plastic tube extensions for filling, vent, and to engine. Make hole in bulkhead "B" for engine supply tubing, be sure latter is long enough to reach engine.

Cut tail surfaces, carve and sand to proper cross section. Join elevators with control horn, hinge this assembly to stabilizer. Cemented latter into keel slot. Check alignment before cement dries! Connect control rod to horn, solder washer to rod end. Check operation of control system to be certain it works freely.

Rudder pedals and cockpit floor are installed now.

Plank fuselage with $\frac{1}{8}$ " x $\frac{3}{8}$ " balsa strips. "Berkeley" planking strips will save you time by eliminating considerable beveling. Use plenty of cement and cement strips to one another as well as to bulkheads and formers. Hold strips in place with pins until dry. Fill any cracks with "Plastic Balsa" pressed into openings with the fingers. Note fuselage depresses slightly aft of cockpit to provide rearward view for pilot between the canopy and the fuselage. Sandpaper completed fuselage thoroughly; round off bulkheads "B" and "C" as illustrated.

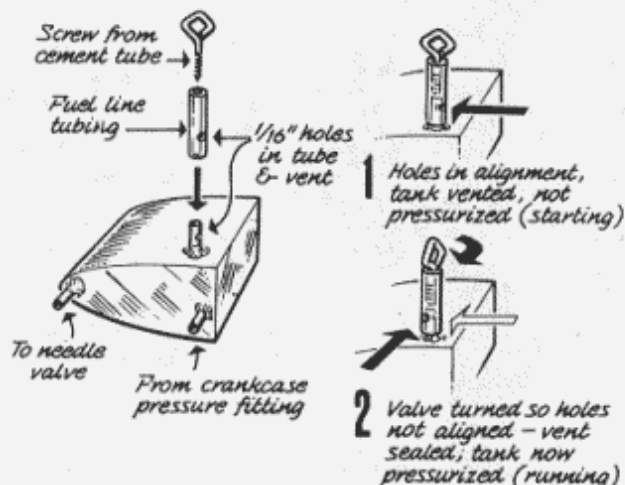
Cement fin and rudder in place. Rudder fairing should follow fuselage shape. Hollow to permit free control horn movement, this can be built from laminations. Sand smooth.

For economy engine cowl should be assembled from four blocks of wood along horizontal and vertical center lines. Cement well; when thoroughly dry carve cowl. Hollow as shown to clear engine cylinder and plug. Cut opening for exhaust. This should be at least $\frac{3}{16}$ " larger all around than the engine's exhaust stack. Paint engine mounts, bulkhead, cowl interior to protect from fuel. Cement cowl securely to fuselage.

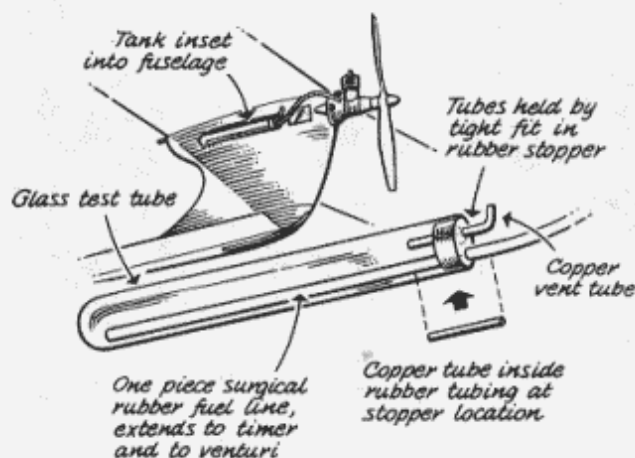
No pains should be spared if you want a good finish. After wing fillet has been built up with several layers of "Plastic Balsa" and sanded smooth sealer can be applied. This, brushed on liberally, is sanded after each coat thoroughly dries. Many builders prefer to cover their entire model with silk or Silkspan tissue before applying the sealer. While this reinforces the covering tremendously, it is optional. Add scrap balsa exhaust and supercharger outlets.

After a dozen coats have been liberally
(Continued on page 64)

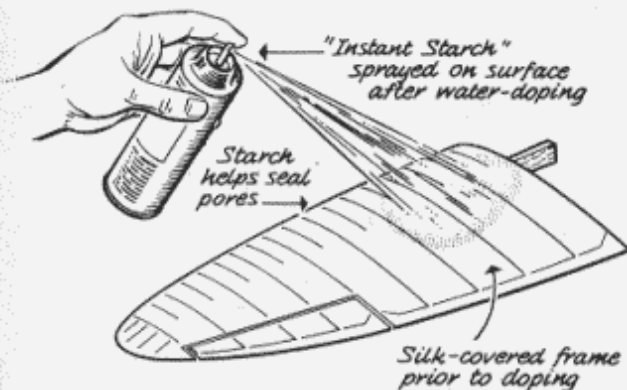
SKETCHBOOK



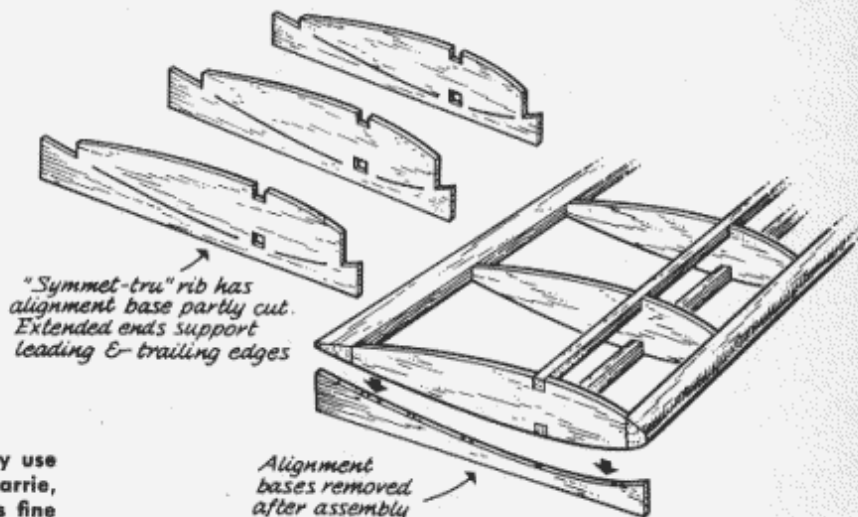
Starting pressurized engine is simplified by clever vent plug and valve device originated by Larned Meacham, Summit, N. J. Engine cranked without pressure by opening valve; twist of valve pressurizes fuel system.



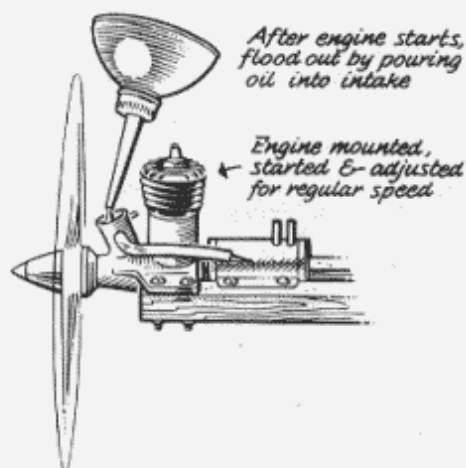
Test tube with rubber cork, inset into pylon or fuselage, serves as efficient freeflight gas model tank. Fuel line of surgical tubing, copper vent tube assembled without soldering. From Eli Weaver, Bethlehem, Penna.



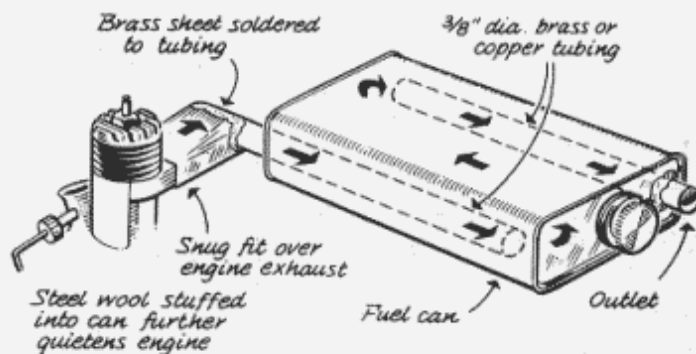
Problem of filling pores of silk covering was solved by use of laundry starch in spray can. C. M. Robertson, Barrie, Ontario, Canada, claims saving in time, dope; reports fine finishes.



Tip from the top: Carl Goldberg, Chicago, Ill., discloses idea of "symmet-tru" rib, used in "Shoestring Stunter" kit. Flat bottom part, left temporarily on ribs, allows true line-up of ribs, edges.



For thorough lubrication of engine before storage, John Porco, San Diego, Calif., runs engine at top speed then pours lubricating oil into venturi to stop engine. All parts become thoroughly lubed.



"Neighbor pacifier" is description of model engine muffler designed by Walter Rebenstorf, Brooklyn, N. Y. for run-in of new engines. Addition of steel wool in pint can further reduce sound.

Got a new idea for construction, adjustment or operation of model planes, boats or R/C? "AM" pays \$10 for each "hint & kink" used. Send rough sketch and description to Sketchbook, c/o American Modeler, 575 Madison Ave., New York 22, N. Y. Please note that because of the very large number of submissions, none can be returned to the sender.

Club Chatter

ing in touch with technical advances, contacts that advance personal skills, techniques and satisfaction, essential good fellowship and shared activity that banishes boredom.

Dozens upon dozens of clubs publish "newsletters" which record ideas, report techniques and designs, provide tips and hints and describe activities.

Many clubs have been highly effective—where everything else failed—in obtaining flying sites, improving those sites, fighting off crank attempts to chase the modelers out of town. Many have ex-

cellent beginner programs which, in some case, have brought hundreds of new modelers, beginners, into the fold. They have successfully combated delinquency, both directly and indirectly. Police groups, churches, schools—and too many other outfits to mention—have achieved sensational results by means of model clubs.

Some clubs have become amazingly effective, and a social force, in their communities, if not regions, with memberships growing into the hundreds. Some, like chain letters, have divided and re-divided as they grew until state-wide and regional associations have resulted. Demonstrations, shows, promotions of every conceivable kind, at YMCA's, schools, hospitals, before ball-game crowds, have accomplished far reaching results which cannot be measured in terms of dollars.

(Continued on page 42)



CALLING ALL ACTIVE MODEL CLUBS! REGISTER NOW!

An updated "Directory of Model Clubs" is planned for the next "American Modeler Annual." All active modeling groups should register immediately by sending the form below to Annual headquarters. If you do not wish to cut your copy of the magazine, please submit in typewritten form.

■ Perhaps the greatest single asset this model hobby possesses is the model airplane club. Without clubs, there would be no competitive modeling, no AMA or national contests, as we know them. The hard-core "dedicated" hobbyists who elevate aero-modeling above the casual toy stage, whose constantly developing specialized interests lend focus and intelligence to the movement, would quickly lose their drive if clubs did not exist. In fact, the news sources you depend upon very well could wither if deprived of the powerful stimulus of club activity.

To many individual modelers all this may seem to have no connection at all with testing that new radio job, or saving dimes for a Super Wheezer engine, or getting out this coming weekend to fly that Half-A. But clubs have got everything to do with you and your aeromodeling pleasure.

The majority of the 20,000-odd members of the Academy of Model Aeronautics belong to some 305 AMA-affiliated clubs. Scores, perhaps hundreds, of other clubs exist which, for one reason or another, just haven't gotten around to pulling their oar in the national organization. Over 600 AMA-sanctioned contests are held annually, drawing an estimated 25,000 entrants, exposing and promoting our activity before hundreds of thousands of spectators.

Practically all clubs hold their own more-or-less informal club contests, and interclub meets, an unevaluated activity which does contribute heavily. Only the existing club organization, via AMA, permitted the Air Youth Championship movement to get started and grow.

Many clubs have been highly effective find that club activities mean everything—pleasant and useful associations, keep-

DIRECTORY OF MODEL CLUBS c/o American Modeler Annual 575 Madison Avenue, New York 22, N. Y.

Please include the following model club in your list of active modeling organizations:

Name of club (print).....

Serves what community?.....

Name of contact man (print).....

His address

City, Zone, State

His position in club

His telephone number

Number of members..... Organized when.....

Sponsor (if any).....

Sponsor's address

City, Zone State

Meetings held where.....

When

Club specializes in (check): Planes; Boats; Cars; R/C; Rockets

Other?

What and when are your invitational meets?

Location of your flying field, lake or track?

Are you seeking new members?



No Strings Attached

By Bill Winter

One of Modeldom's most beloved observers writes on the passing air-model scene

By now many of us have realized that *Model Aeronautics* is an enjoyable and satisfying lifetime hobby—therefore, let us treat it as we would a lifetime companion.

—Frank Zaic's *Yearbook*.

■ A never-ceasing phenomena of making a book like Frank Zaic's latest 1959-1961 *Model Aeronautics Yearbook*, or a magazine like this one, is that the finished product hardly hints at the piles of material and mountains of work that were shrunk into so small a package. Having been impressed many times by the compression of so much material into the finished product which we all so blithely speed through, we can appreciate the staggering amount of stuff—and labor—that went into Frank's latest worldwide round-up. Before us is just part of Frank's "raw" material that comprises gas free-flight, rubber and Nordic gliders; this portion alone justifies the highest praise. Frank is a prodigious correspondent. He presents information on all the world's stand-out models and many dozens of others be-

sides, plus a large number of fascinating articles. He must be a Mach-3 draftsman! How he manages a feat like the *Yearbook* and holds down a job besides is beyond our comprehension.

Of all the good products we've plugged enthusiastically through the years, there is none we'd rate higher for any modeler, regardless of his interests, than this more-impressive-than-ever latest by Frank Zaic. To attempt a fair review within the confines of a column is impossible—one could spend weeks inspecting the incredible variety of designs.

Frank tells us that some of the older *Yearbooks* are still available and can be ordered postpaid from Model Aeronautics Publications, Dept. AMP, Box 333 Cooper Station, New York 3, N.Y. 1951-52 *Yearbook*, 208 pages, 136 plans, \$1; 1953 *Yearbook*, 128 pages, 116 plans, \$1; 1955-56 *Yearbook*, 192 pages, 135 plans, \$2; 1957-58 *Yearbook*, 224 pages, 164 plans, \$2 (hardcover, \$3).

We Hate To Make Wings. Stabs, too, for that matter. Wings seems to be growing

more complicated than ever. Time was when any lazy modeler worth his salt connived to reduce the number of pieces—but we'll never forget Goldberg's beautiful Valkyrie with 1400 pieces in the wing alone! Our notion of a wing is a single-spar deal, flat-bottomed, with hobby-shop shaped edges. Or maybe the Jedelsky wing with a couple of pieces of sheet-balsa and a few strengthening ribs. But this won't get you far these days.

Vic Cunyngnam's Space Rod 290 has over 160 pieces in its wing. And this is a simple multi-spar wing; he doesn't even use diagonals like so many FAI and Nordic boys are prone to do. Larry Conover uses about 130 pieces in his Lucky Lindy FAI gassie wing. On his GAWN-FAI job Woody Blanchard utilizes sheet-balsa top surfaces and diagonal ribs and get away with 60-odd pieces. And so many wings are really hard to build, what with drooped or drooped-and-cambered trailing edges, ultra-thin and highly cambered surfaces, and so on.

Ed Miller's Texan FAI-ton wing is rather similar to Blanchard's but, like Conover, he uses a flat-bottom section. Whether or not Conover's three turbulator strips pay off we don't know—knowing Larry, they probably do—but otherwise we wonder why flat-bottom, sheet-topped sections aren't good enough. Anyway, you can always add turbulators.

Rudder-Only is no longer a radio control event at the British Nationals. This figures because of the universal one-eyed preoccupation with multi. After considerable soul-searching our English cousins simply figured that the



Jerry tested model all last Winter. Wotta man!

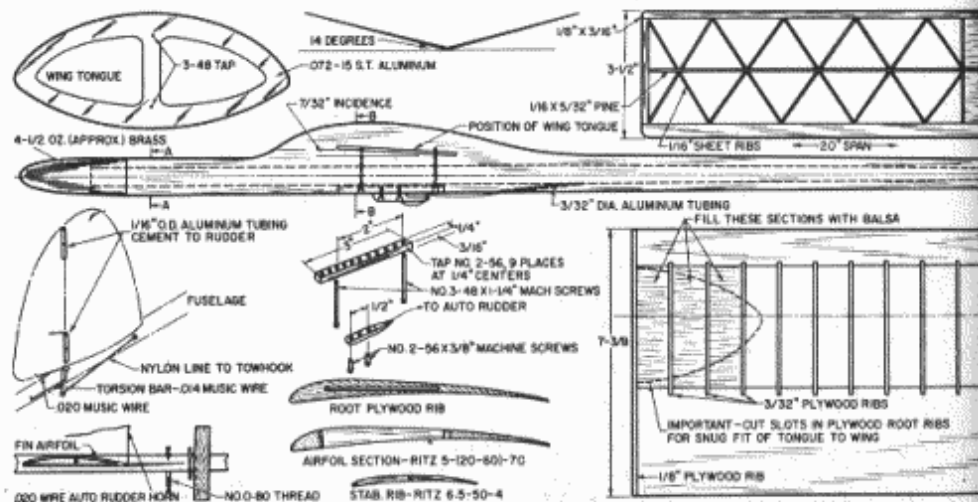
International Champ JERRY RITZ Unveils His Best "Windy-Weather" Towline Glider "TERN-V"

■ Through 1957 and 58, I worked hard to develop an all-weather Nordic towline glider that would have good still-air duration, and yet could stand up under the worst punishment that Old Man Weather could dish out. By the end of 1958 the test program was nearly complete. The model would do about 2:45 in calm air, and adjusted for turbulent air, it would ride out nearly any wind. Best of all, it would thermal at the drop of a hat, and never seemed more in its own element than when it was tearing around crazily in a tight circle riding some really turbulent thermal air.

I won the 1958 King Orange Contest with this model, and since then it has

won 14 straight firsts, including the 1959 Central States Semi Finals for an International team place. It has never been beaten in any contest. Of course it will be, but so far it sure has a doozer of a record. The only two Nordic contests I lost during these two years was when I foolishly flew my "Continental" design in air that was just too rough for it.

In the 1959 FAI Semi-finals, there was a gale of about 40 mph, and I think that of all the flyers I was the only one that didn't bust a wing (although I did break a new 25 lb. towline). I attribute this mainly to the sparsless non-rigid construction in which I use only the leading and trailing edges a la "Ritz



standards in rudder-only were so low that the event wasn't worth wasting time on. Is this true in the U.S.?

A pretty good argument can be made that rudder-only is harder to fly than multi. We know one consistent placer in multi events who was probably the world's worst rudder-only flier. Multi saved him. All those controls for getting out of mischief! If you don't think multi-controls make you look good consider the expert we saw recently who got a good rudder job downwind and couldn't get it back again. It flew away. "Man, how I missed all those con-

Carl Goldberg (right) scored third in Half-A free flight at Dallas Nats; 45" Hi-Thrust Blazer 300; .049.

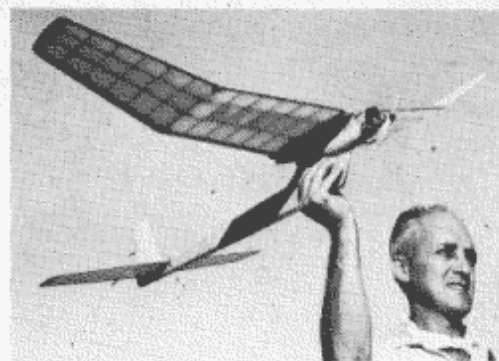
trols!" said he, in shocked disbelief.

Guys who yack that multi is hard don't realize they are trying to fly over-powered undersized bombs; it is the power and speed they fight. A big engine in a rudder job is poison, too (though the experienced get away with it by use of positive, but risky, engine control). Before R/C goes the way of control line speed perhaps we should remind ourselves of a few basics that usually go overlooked.

The most beautiful thing in the world (to some of us) is an airplane in the glide. This is the essence of flight. Of conquering nature to fly; a renewal, every time you fly, of one of man's greatest achievements. In the glide a model is the nearest thing to bird flight, silent, majestic, hypnotic. This is why—or one big reason why—so many people build free flight, towline gliders, rubber jobs.

The point is that the real breakdown in R/C is between those people who like to stunt, and those who like to watch airplanes fly. You cannot really watch a multi job fly. The good ones are not pretty to watch—and they don't sit still long enough to watch. Try it. Everytime the job seems set the guy "dials a number" and an outside loop

Bill Poesch, holds unusual Wakefield rubber model, has rapt audience. Details in "Western" column.



comes out. Marginally stable, requiring constant corrective action to stay in the air, given to ugly, darting changes of direction like the 1950 ukie stunter, the high-performance multi is not worth watching, unless you are interested in the pilot's technique, or speed or response, and so on. Multi simply is not perfection or necessarily the ultimate.

Rudder-only and Intermediate classes both deserve greater respect. Decent rudder technique is almost a lost art. Most of the ships we see are out of trim. Many crack up or fly away. This is a sad commentary. One reason rudder suffers is because practically any one good enough to show the others how, seems to think his social standing would be kaput if he was caught with a single-channel box in his hand. To us, rudder is an extension of free flight. You don't have to time the motor run and you keep the ship nearby for as long as you want to. There is no (oops, very

(Continued on page 61)



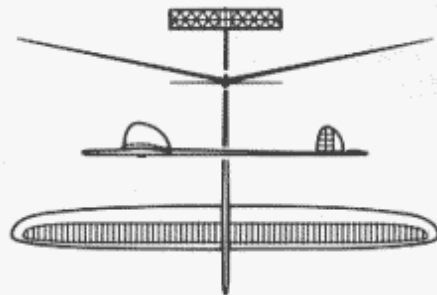
wing" as I have been doing for many years. On some of the tows the wings flexed to about 90° dihedral (some of the flyers swore the tips nearly touched) but the construction held up without trouble.

Since the fuselage is the base to which all the components are attached, let's start by gluing this important structure together. Select some hard 1/4" sheet 48" long and cut 2 pieces for the top and bottom 1/2" wide tapered to 1/4" wide, with the taper starting 14" from the front. The backbone is cut of rock-hard 1/4" stock to 1/2" width x 14" long. Glue this in place, centering it between the top and bottom strips. Now glue and

pin the front 14" of the fuselage together, binding with 1/8" rubber to make sure all joints are tight.

When thoroughly dry, glue and pin the rest of the fuselage, again binding with rubber for tight joints. When binding, use two strands spiraling in opposite directions, so that your fuselage will not be twisted. Align the fuselage carefully and set aside to dry. You will need to mount the wing tongue and tow bar before you go any further on the fuselage, so get them ready.

The wing tongue is cut and filed from .072 aluminum 75ST. Bend the 28° dihedral in the center of the tongue before cutting out the centers and tapping the

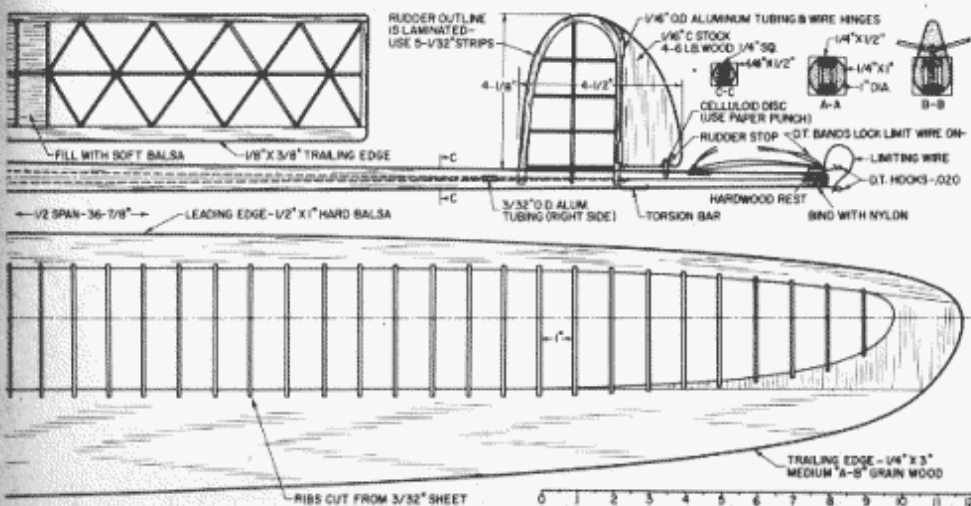


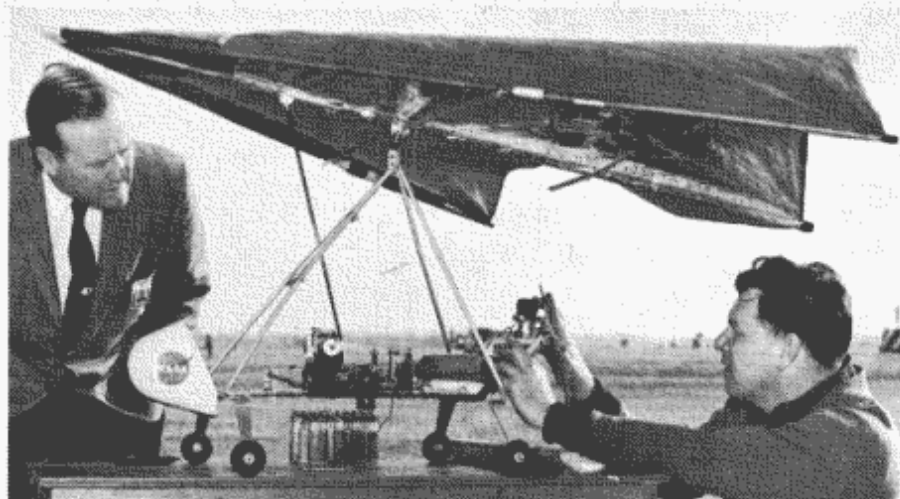
Full size plans for "TERN-V" are part of Hobby Helpers' Group #961. See pix in "Model Progress" on Ritz "wing."

mounting holes. The tow bar is made out of a 3/16" x 1/4" strip of magnesium or soft aluminum. The holes are bored and tapped—be careful to maintain exact 1/4" centers so that the tow hook will fit in any position.

Fit the wing tongue onto the fuselage, using a base of hard balsa trimmed to fit the dihedral and give the 4° incidence. This block is glued on top of the fuselage. The tow bar is recessed into the bottom of the fuselage, holes for the tongue mounting screws are drilled through the backbone, and the tow bar and tongue are fastened into place with the mounting screws. Remainder of the wing center base can be built up by gluing balsa blocks into place. It is best to wait with the trimming of this part until the wings are done and can be fitted into place on the tongues—then the center base is trimmed flat to fit the

(Continued on page 59)





Axel Mattson (far left) and John Worth with NASA's R/C flex-winger.

Space Control equipment weighs 4 lb., less radio installation.

Only one flown fitted with TTPW and CAR was built by Ralph Jackson; weighs 6¼-lb in flying trim, does not have the flaps that Dick fitted to his. We saw this one in action at the LIDS meet; it looked impressive. Third P-39 by R. C. Noll carries Orbit 10 channel relayless gear. The planes have 720 sq. in. wing area.

Plane Raffle. Tried last year and a real success, Uniontown (Pa.) Flying Electrons have built and equipped another R/C plane, which they will award a lucky raffle winner at their Aug. 20

McEntee on RADIO CONTROL

World's most widely read columnist on R/C matters tells you what's new in equipment, clubs, airplane designs, contests . . . in other words, the big picture!

■ Scientists at the Langley Research Center of the National Aeronautics and Space Administration prepare to test a 1/5,6-scale radio controlled research model of a Ryan Aeronautical Company version of a flexible wing-supported utility vehicle as part of extensive basic research in this field. The purpose of the test is to determine low-speed, dynamic stability and control characteristics as well as to demonstrate one of many possible applications of the flexible wing, a concept developed by the NASA Langley Research Center.

The body of the model consists of a platform upon which the crew, payload, and power plant are supported with the wing attached by an overhead truss. The wing is fabricated of nylon covered by mylar. Booster batteries used to start the engine are shown beneath the model. On an actual vehicle the pilot would be seated on a forward portion of the platform with the power plant and pusher propeller supported at the rear. On the ground the platform is supported by a four-wheel, conventional fixed landing

gear system; the front wheels are steerable. For storage, the wing could be collapsed, and folded.

The flexible wing also is proposed for use as an auxiliary wing to aid in take-off of heavily loaded aircraft or to reduce landing speeds of supersonic airplanes; the recovery of early booster stages; the dropping of cargo or personnel; emergency wings for jet vertical takeoff-landing (VTOL) aircraft; and a reentry vehicle capable of gliding to a chosen site and accomplishing a safe landing at moderate speeds.

For photo of earlier test model see page 22 of July 1961 A.M.

R/C Airacobra. Model of the famed Bell design shown, work of Dick Allen (58 Brookside Ave., Apalachin, N. Y.), is one of three built by Aeroguidance Society members. Plans came from Harold deBolt; Dick's model has shorter nose moment, smaller fuselage cross section than full sized 'Cobra. The Aeroguidance boys also made some mods from the deBolt plans. Dick's plane for

R/C contest. Tickets were 50c each. Work done in Bob Keener's shop, with Mrs. Keener furnishing refreshments to keep the builders going strong! Other clubs have used this means to offset costs of a meet, help bolster a sagging club treasury.)

Scale Spit. Not yet test flown when photo was taken, Bud Atkinson of KC/RC is shown with his scale Spitfire, which he hoped to fly at the 1961 Nats Scale event. Pic sent by Paul Runge of Ace Radio Control (Higginsville, Mo.) so are we surprised to see an Ace multi channel Kraft transmitter?

Trimmable M.C. Ckt. For single channel Galloping Ghost plane, circuit illustrated was submitted by John Krauer (10389 Violetlawn, Detroit 4) of Min-X fame. Can operate standard multi servo in full-trim fashion on single channel proportional system so any degree of throttle opening may be obtained. John used 50-mf capacitors across transistor inputs for proper time delay with his plane, which uses a rather low pulse rate. For higher rates, capacitors may be reduced.

In John's setup, if full up and hard over rudder are held with control stick, M. C. servo would creep in one direction or the other (depending upon whether stick was held for right or left rudder). Speed of "creep" can be varied by altering electrolytic capacitors. It was not found necessary to select transistors, any samples of types indicated worked nicely. Relays were set to pull in at 15 ma; John figures 50-ohm relays might work equally well.

We omitted wiring from the two relays to M. C. servo, this is quite conventional. If rudder works in opposite direction to way you move control stick, reverse connections to rudder motor.

Slow Starting Oscillator. We have heard of some instances where crystal oscillator of Numac II (p. 23, Oct. 1959 A.M.) appeared starting slow; that could be troublesome if transmitter were used



Here are Flying Electron members with their "raffle" plane (from left): Paul Tileri, Joe Rich, Alva Coffman, N. M. Darr, Sr., R. H. Keener, Aura Rogers and Merle Mansel. Pennsylvania club sells 50c tickets, has drawing at August 20 contest.

with CW receiver. With tone modulation it probably wouldn't even be noticed.

Original conversion of Mac II to MOPA circuit as described in A.M. was checked for pulsing operation on CW, with quite an assortment of crystals. Those in parts list were peppiest of several makes tried, hence were specified. Possibly those who had "slow starting oscillators" used other makes. A simple change will allow fast pulsing with most any crystals. The info comes from Dale Springsted (837 Eastern Ave., Schenectady, N. Y.).

Main change connects oscillator tube as a triode instead of employing screen grid connection shown on original circuit. Latter was used because generally such an oscillator connection results in less RF crystal current, which means crystal will have less tendency to drift

Current drain averages 30 ma, so pair of C-cells works fine. Relay salvaged from Radio-sonde modulator unit, hence total parts cost less than \$10.

Dave had no trouble setting up pulser so that it shows minimum interaction between rate and pulse length, but he doesn't vouch for circuit reproducibility in this respect. However, it is no trick to get going for rudder-only. His unit gives 80-20% pulse length variation, rate change of 4 to 10 cycles. 2N107 transistors are low cost units somewhat variable in their characteristics; with two rather dissimilar, it is possible that interaction might be worse, or you would not have 50-50 pulsing with the control stick in neutral. Latter effect could also be caused by fairly large capacity differences in the two 200 mf condensers.

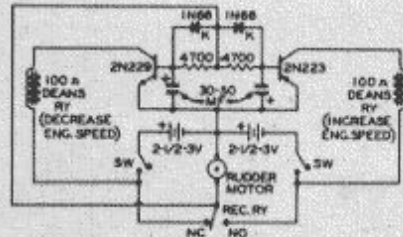
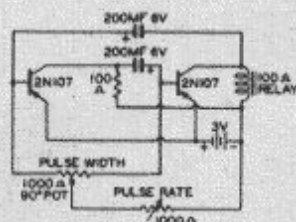
Georgia Gasser. Paul West (205 W.

film to other groups. Write to Bill Alexander, College Park Hobbies, 108 E. John Wesley Ave. Group planning bigger meet for Fall.

"Detroit System" Shifts. Reporting Rudder-Only contest sponsored by R.C.C.D., Ernie Kratzet (5026 Hillcrest, Grosse Pointe 36, Mich.) tells changes in Detroit System of scoring, originated by his club.

They now use two judges, who sit with announcer; each maneuver is graded from zero to five by each judge, who holds up fingers of one hand as soon as maneuver has been performed. Announcer adds fingers of both, gives total over PA system. A Recorder takes down this total, multiplies it by a "K factor," then by 0.3 to get final result for maneuver similar to that which would have matched basic AMA scoring throughout.

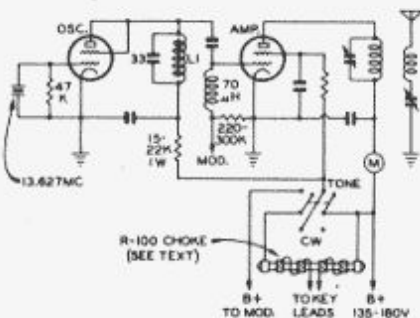
Dick Allen's modified Cobra (left). Dave Lewis' proportional pulser at right; far right, John Krauer's nifty motor control circuit. Chap with radio controlled WW-II Spitfire is Bud Atkinson of the KC/RC outfit. See column for details on all these.



frequency from its calibrated value. Dale has the equipment to check such frequency drift. So we are sure his revised circuit will hold required frequency tolerance, as specified under present F.C.C. rules. Only those parts with values indicated need be changed. L1 has 18T of #22 enamel wire on CTC 1/8" form (as originally specified), or an Ace 1/8"-dia. "vibration proof" form.

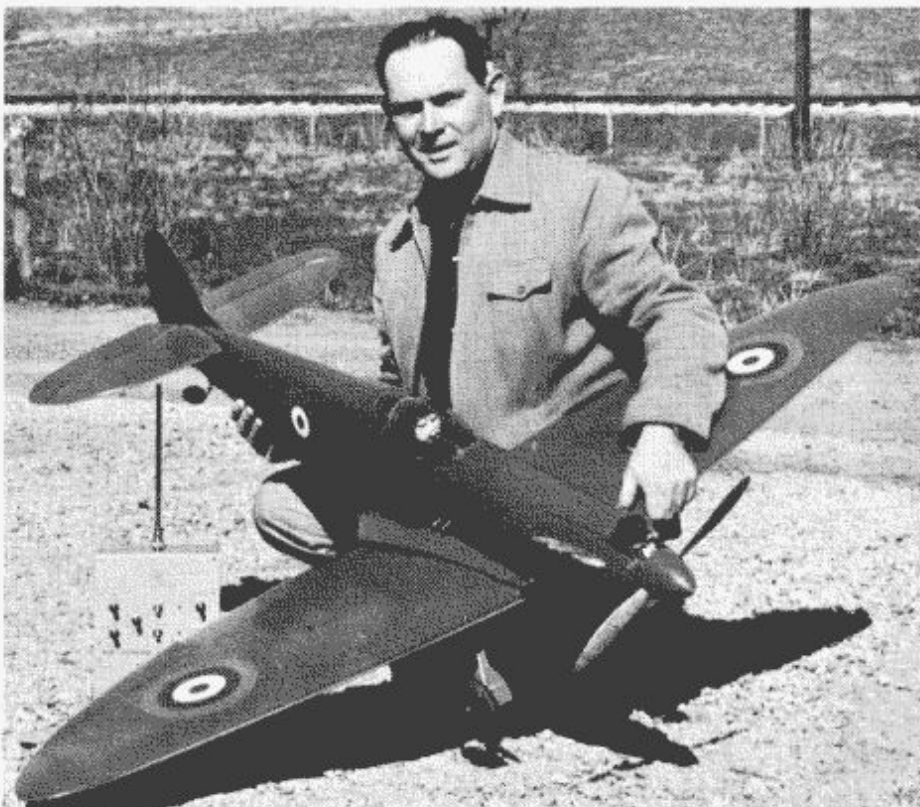
In transmitters he builds up, Dale uses Ace transistor modulator, includes tone-CW switch. He has found variations of plate current as keying lead is moved about can be reduced by putting an RF choke in each key lead. Actually, he uses a single 2.5-mH National R-100 choke. This is 4-pie unit, the lead between center two pies is clipped, to split the unit into two separate chokes (on the same form) of about 1.25-mH each. The 70 microhenry RF choke in doubler grid circuit is an Ace item, should work as well as 250 microhenry unit originally specified.

Transistor Pulser. One of the simplest circuits, by David J. Lewis (Liberty Bell Village, Trevese, Pa.), has been used for over a year with GG control systems. He also employed same circuit minus variable rate pot in dual pulser.



Transmitter modifications are work of Dale Springsted, versatile designer.

American Modeler - September 1961



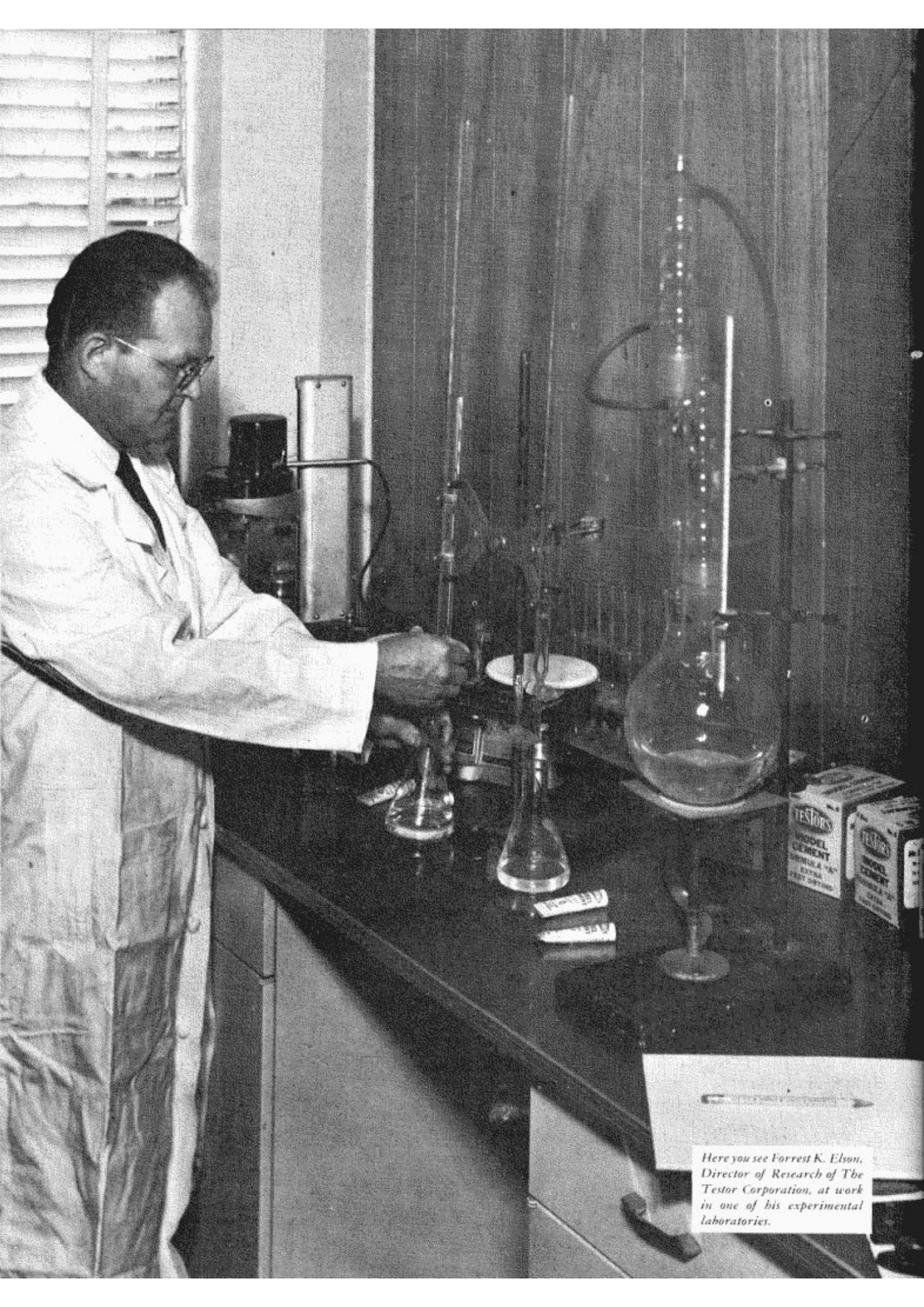
Walker Ave., College Park, Ga.) reports Ga/RC meet was real success. 20 contestants were topped by James Bowen (Tallahassee, Fla.) in Rudder, with local Prop Spinners Jim Cooper and Harold Coleson following. Junior Rudder went to Nicky Moore, pride of the Spinners Junior Group (his third trophy this season!). Al Pinson (Atlanta) took Multi with his Pegasus, followed by Doc Woodall (Thomaston, Ga.) with same design, then came Glenn Henry (Gainesville) with an Orion.

Professional photog took movies in 8 mm color; club will loan 35 minute

Those K factors run from 2 to 7, depending upon maneuver difficulty, as reflected in AMA scoring. Thus, if contestant did perfect Wingover, both judges would hold up five fingers. Announcer would call "10" over PA system, Recorder puts down 10 on his adding machine, multiplies it by K Factor of 2, then by .3. Result would be 6—exactly what perfect Wingover gets in normal AMA scoring. Ernie declares this simpler in practice than it seems in writing!

Kratzet has finished a new ESKimo biplane, having worked on it for several

(Continued on page 44)



*Here you see Forrest K. Elson,
Director of Research of The
Testor Corporation, at work
in one of his experimental
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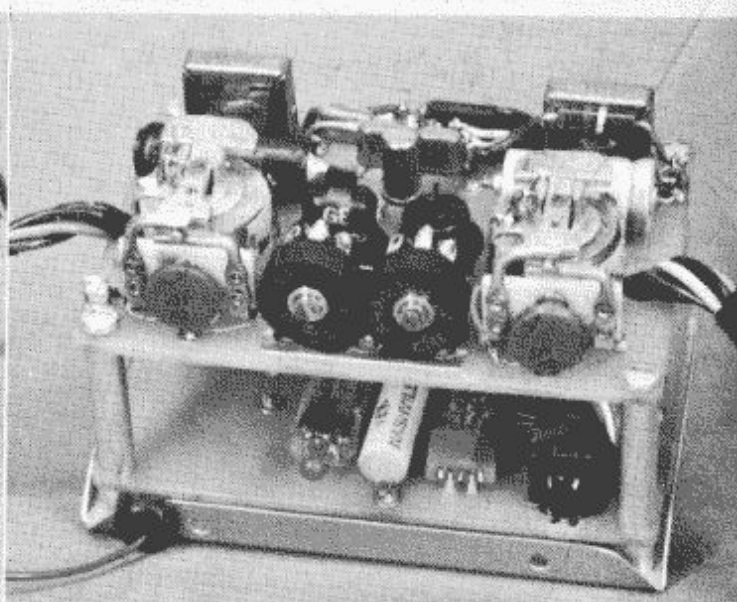
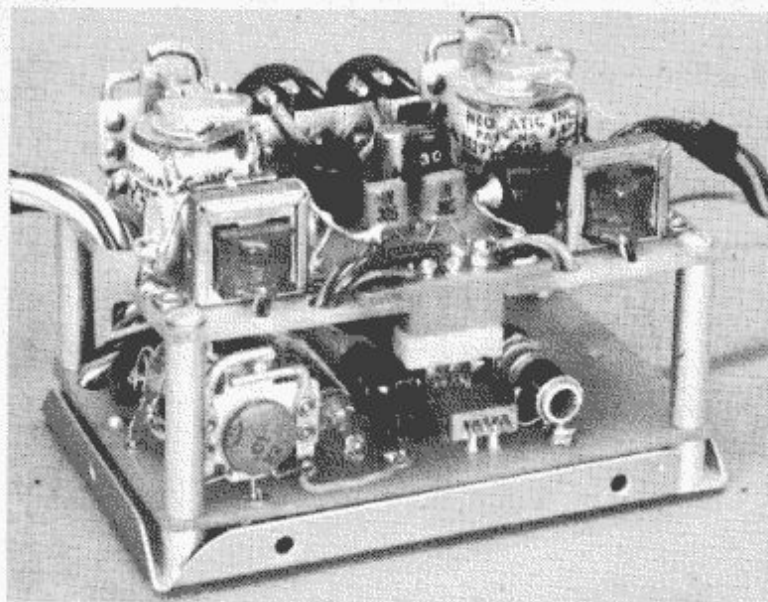
maintaining proper viscosity control, because this — in turn — has a direct bearing on each Cement's ability to provide maximum adhesion within prescribed limits.

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The "Kickin' Duck" Strikes Again!

To many modelers this is just a bunch of electronic Greek, but to radio control fans it's a real find! For those in the know, here's McEntee's updated Intermediate System—the best ever.

■ A lot of water has gone over the dam . . . and a lot of flights have been racked up since the original story on the "Kickin' Duck" was printed (see reference 1). An improved system, tested in two more shoulder-wing planes, is based upon the same principles; we advise all interested in this simplified dual proportional control to check into the original article for useful background material.

Some improvements have been made on the original outfit, a motor control has been added; further refinement can be expected but the system has worked splendidly in 500 flights on three different planes, so we present it to those who want "simplified" dual proportional control right now. (Matter of fact, this article has been forced upon us—it just takes too long to copy off the circuit and all the data that should go with it, to fill all the requests received for this information!)

It will be noted that simplified is in quotes above; we feel this control system

can be made to approach the results obtained with such true multi systems as WAG-TTPW and Dual Marcy. It does take a bit more tinkering than these, but the advantage is that it can be used with existing transmitters and receivers. It will work just as well with a CW outfit (about half the mentioned flight total was with CW transmitter and receiver) or with single channel tone providing the equipment, especially the receiver is a good high-speed pulser. Most receivers now in use, were designed with good high speed pulsing in mind.

If you have a single channel transmitter and receiver of any type that will work well at pulse rates up to 15 PPS (pulses per second) you can use it with the system to be described. Our quotes on the "simplified" come simply from the fact that in the plane the equipment must be just about as complex as that of TTPW or any similar dual proportional system—you need the same number of relays, the same servos and battery drain for same, just about the

same overall complexity in the receiver circuitry itself. At the transmitting end the equipment can be much simpler—you could get along fine with a single tube transmitter and a mechanical pulser, about the same apparatus needed for the simplest rudder-only proportional controls.

For those modelers who have come in late (and who possibly can't obtain ref. 1) we might state briefly that the name "Kickin' Duck" came from the mode of operation of the control system we are describing . . . "IN-DUCTive KICK". It is based upon operation of the rudder relay of the receiver. The rudder itself is controlled by variation of pulse length, as in all rudder-only proportional models. Across the relay is connected a small transformer (we actually use two), and every time the rudder relay opens and every time it closes an inductive pulse is produced in the associated winding of the transformer. It makes little difference which kick you use, but you take one of them, put it through a "pulse-stretcher" (consisting mainly of C2) and feed the result to a transistor. The latter will then close a relay once for every on-off pulse going through the rudder relay; it also holds the elevator relay closed as desired to give about a 50-50 on-off pulse to this relay at neutral elevator stick position.

The elevator circuit is "rate-sensitive," that is, it varies the elevator position as you vary the pulse rate at the transmitter. The basic problem therefore is to set up a system that has the least possible interaction between pulse length (which works the rudder) and pulse rate, for the elevator. We'll show how this has been done, to end

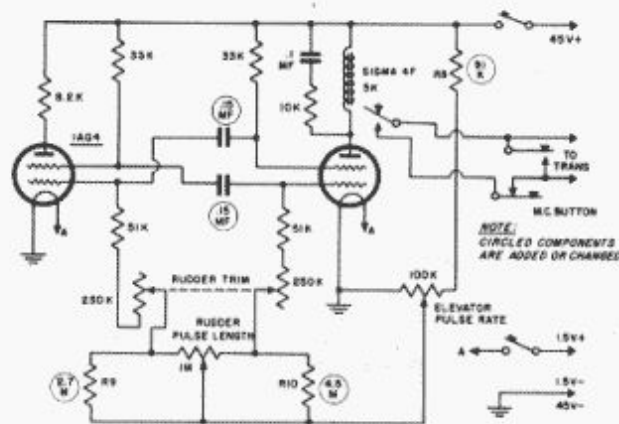
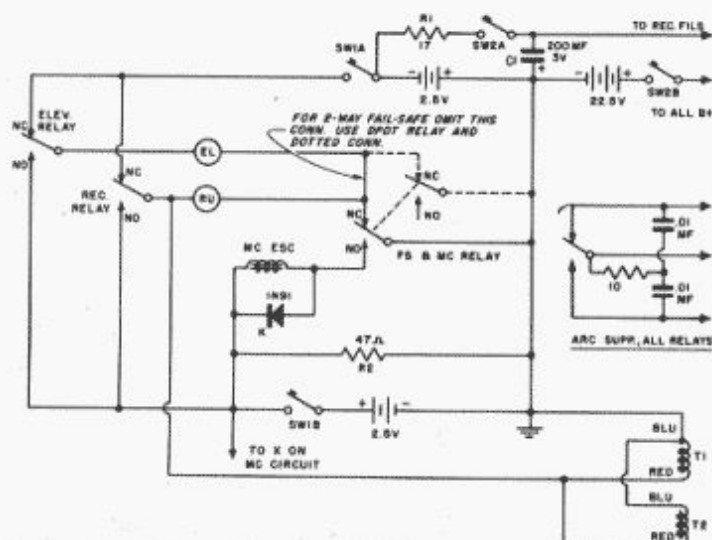
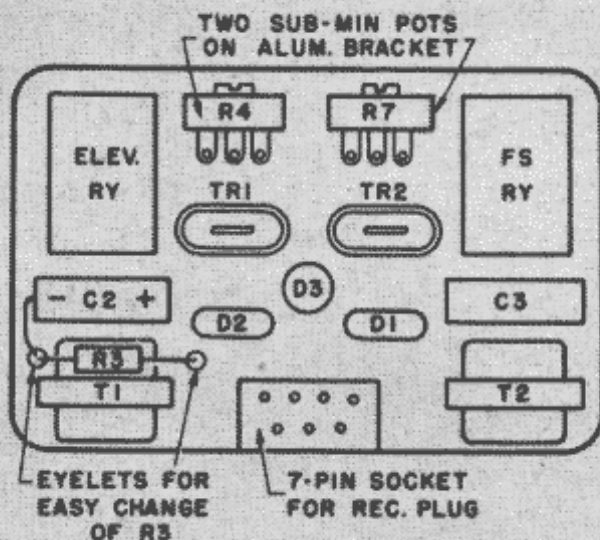
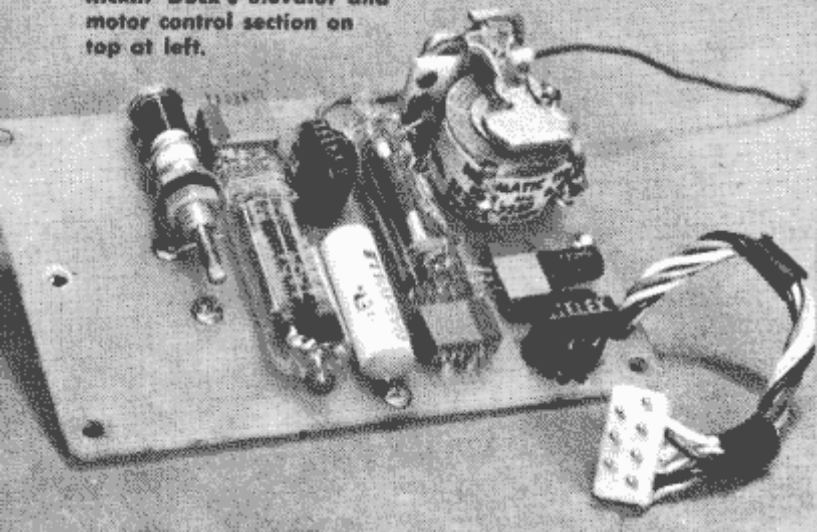


Figure 1 (left) gives the low voltage circuits; Fig. 4 (above) is Mac's Compact Pulser; changes made to previously published circuit are incorporated herewith.

Receiver components below. Kickin' Duck's elevator and motor control section on top at left.



Full Size Inductive Kick Chassis Top; see article data.

up with a system which for most practical purposes can be said to have two controls that DO NOT interact.

In any system with variable pulse rate, it is always desirable to use rates high enough so that the plane itself cannot follow the pulsing—that is, it won't "wag its tail" as it goes through the air. True, the elevator and rudder surfaces will wiggle, but at such a high rate that the plane can't follow them. We've accomplished this, too, in the present modification of the original K.D.

One more addition is a motor control and fail-safe circuit, which was not used in the original plane. This is operated simply by interrupting the pulsing. The present plane being flown with this system has a tone receiver and anything that interrupts the pulsing tone will cause the FS and MC circuit to act; normally this is used to operate a motor control escapement, but a special type of escapement is used (ref. 2) that will go to low engine speed automatically if the MC circuit cuts in and is held that way. At the same time, power to the rudder and elevator servos is cut off and they are forced back to neutral (or very close to it) by centering springs. You can choose whether you want this action to occur with no pulsing, or with solid signal from the transmitter; unfortunately you can't have it both ways. The elevator relay will always go to the N.O. contact when pulsing ceases (i.e., with no signal or with solid signal) but the rudder relay will be on the N.O. contact with one of these two conditions, on the opposite with the other.

With the MC relay on its N.C. contacts, one condition will allow automatic centering of the two servos by their springs, the other will drive both servos to maximum position! We chose to have centering with NO signal. The MC escapement will operate in either case, of course. Actually, we get hard over rudder and full up elevator in the "non-fail-safe" condition; this is fine for producing spins, will also give instant snap rolls, if you hit the button during level flight!

If you insist on fail-safe with EITHER on or off signal, you can get it by use of a DPDT relay, as indicated in dotted lines in Fig. 1.

Plane #2 in the K.D. series used two Austerman servos, which were based upon Mighty Midget motor parts. Thus the current drains and servo power were closely equivalent to what you would obtain from double-gearered Mighty Midgets, several forms of which have been described in past issues (ref. 3 and 4). The power supply was four Eveready N-52 nickel-cad cells, two for each side of the servo circuit; filament power for the tone receiver was taken from one pair of cells, while the MC escapement was tapped across the other pair. Since the latter did not have the steady 55 ma drain, we added resistor R2 across them,

to make them use up a charge at about the same rate as the cells supplying the filaments. These cells gave fine service, they were kept on a continuous 10 ma trickle charge night and day, except after flying sessions, when the rate was increased to put back into them about the same amount of power used in flying (only a very rough guess was ever made on this, but the cells will stand considerable overcharging, if the recommended charge rate is not exceeded, and they never let us down in flight).

For comparative purposes, the average current drains off the entire system, including the drain of filaments and resistor R2, also the two transformer windings, was about 340 ma on each set of cells, with the control stick in neutral. Of course in one extreme corner stick position this would rise to about 600 ma, in the opposite corner it would drop to perhaps 200 ma.

The cells mentioned gave fine service, but they did give a rather rapid voltage drop under this much load. We found it possible to get good operation down to about 1 volt per cell, but this depends mainly upon the receiver used, of course. Since the cells might be as high as 1.4 volts each when first taken off charge, a fair amount of change in circuit operation might be expected, with this total of .4 volt drop (for one reason, because the inductive kicks that you get also drop in strength as the cell voltage drops). Actually, this didn't cause as much trouble as we had anticipated, but we feel that the sin-

tered plate type of cell is a better choice for this system. Possible selections might be the VO-800 (800 maH plastic-cased cells), the new VO-1 (1 AH metal-cased button cell) or the Gould 1.25 SC cells. The latter have been used in the latest plane, with very fine results.

Sintered plate cells generally will stand much heavier loads, with only very slight voltage drop. Silvercels or Silcads would be a logical choice, if the very lightest weight were mandatory, but the high voltage peak of the former should preferably be drained off, before putting them in use.

For the B battery, we find the Eveready #420 to be an ideal size; the average current drain for the elevator and MC kick circuits plus that of the receiver is only about 3.5 ma; this figure will vary according to your receiver, of course. Our tone receiver idles at about 1 ma, draws some 4 ma with full signal. It will be noted that we show 7250 ohm relays in the E and MC circuits, and the same value is used in the receiver. This fairly high resistance was picked to keep the total battery drain down, so that the #420 unit would give good life, which it certainly does.

Back at the transmitter end, the prime requisite for a system like this, of course, is a pulser which will cover the range you want, and will do so with little or no interaction between pulse length and rate. All three planes mentioned have been flown with the Compact Pulser (ref. 5), used almost exactly as shown in the original article, but with a few modifications, as seen in Fig. 4, which we will describe later. We strongly suggest that a zero-center meter be used to check the pulser, the receiver relay and elevator circuit relay, when the system is first set up. Use of such a meter in this connection has been described in a past issue (ref. 6).

With the Compact Pulser circuit, the pulse rate varies from about 5½ cycles to 11½ cycles over the full stick range. These exact values are not mandatory, but if you go much lower at the low end of the rate range, it becomes possible for some planes to start showing tail wiggle, in the full up condition, which corresponds to lowest pulse rate. Because the motor control circuit operates with lack of pulsing, we limit the rudder pulse length to about 80-20 and 20-80%; that is, the pulses are never shorter than 20% of the length of a full pulse. This limitation also helps in keeping the elevator circuit from acting up, which it tends to do with very short pulses.

While the original K.D. system worked with a pulse rate range of 3 to 12 PPS, we find the approximate 2:1 rate change ratio of the present setup very satisfactory. It was not felt wise to go higher than 12 PPS since some receivers tend to become erratic when pulsed much higher (this

(Continued on page 38)

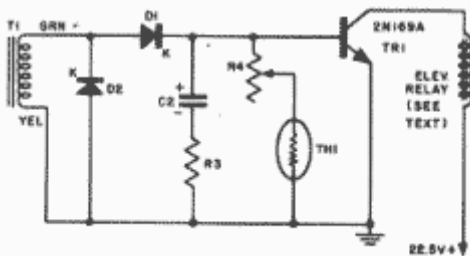
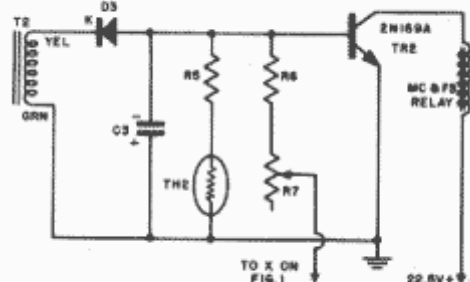


Figure 2 (above) is elevator circuit; Fig. 3 (below): motor control, fail-safe.



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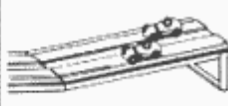
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shows up at the 20% and 80% pulse limits, not so much at 50-50 pulsing), and also the receiver relays themselves can distort the pulsing at high rates.

For clarity we have shown the actual circuit in the plane in three separate sections; Fig. 1 gives the low voltage circuits, including the two servos, contacts for all three relays, plus all the batteries. Since the B minus connection of most receivers is usually considered "ground" we use this symbol in all the circuits. Actually, of course, there is no connection to the earth—"ground" in this case merely means that the indicated lead is common to all the various circuits. A 1N91 diode is across the escapement coil, to kill its inductive kick and keep the FS relay from sticking.

Though omitted for clarity, all three relays have the usual arc suppressors on their contacts, as shown in the small inset on this drawing. The 17 ohm resistor R1 is right for our particular receiver, which has 1AG4 tube and a 6007 tube; for any other tube complement, you will have to change this value, of course. The large electrolytic condenser helps keep the filament supply stabilized despite the pulsing load on the batteries from the two servos. R2 should be chosen to draw about the same current as the receiver filaments do. All three relays are shown in the position they give with power supply turned off.

The elevator circuit is given in Fig. 2. Be sure the transformer is connected as shown. While an NPN transistor is indicated, this was used only because this type of transistor is mandatory in the MC circuit. A PNP could be used just as well (if it is, reverse the B battery leads, the two diodes and the electrolytic condenser). The diodes are a high conductance type and were picked mainly because they are rather compact and fitted on the cramped baseboard well. Actually, 1N91 diodes will do just as well, but they take up much more space. Doubtless other "high conductance" diode types will work well in this circuit, but these two we KNOW are

usable; if you substitute others you are on your own! As a matter of fact, we strongly suggest that ALL parts be just as indicated; we know they work and that the circuit can be "tuned up" within the range of the variable controls shows. Other diodes, transistors, transformers, even battery voltages might require rather extensive changes in the circuit.

You will note a thermistor (TH1 and TH2) shown in both elevator and MC circuits; these help to temperature-stabilize them, but actually, the system was used for over a year without these units, carbon resistors of the same value being used in their place. We feel the small extra cost of the thermistors makes their inclusion worthwhile, though. Other values of relay coil resistance can be used if you wish. For the 7250 ohm units we used, it was found satisfactory to set all three to operate at 2 ma and open at 1 ma. They get a maximum of a little over 3 ma in operation.

The variable resistor R4 is used to set the elevator center position. R3 may require some change, as noted a little later.

The motor control and fail-safe circuit is seen in Fig. 3. You will note that it is somewhat similar to that of the elevator, one of the main differences being that the diode and electrolytic condenser are polarized in the opposite direction to the corresponding parts in the E circuit. The reason is this: The transistor in the elevator circuit draws practically zero current (just a slight leakage current—the less the better) when no pulses are coming in. With pulsing, the inductive kicks from the transformer are passed by the upper 1N305 and "bias" the transistor into a conducting condition, so that it will operate the E relay. The MC circuit, however, draws full transistor current with no pulsing, and when pulses come in, they tend to drive the transistor to LOW current, so it will not close its relay.

To make the MC transistor conduct, we have to put a steady bias on it, and this comes via R6 and R7, from one set of servo batteries. This bias could have been

taken from the B battery—in fact the circuit was set up this way originally—but there is a good reason why it isn't. As noted previously, the servo batteries drop their voltage quite rapidly as they are used; as they drop, the inductive kicks grow weaker. We normally set up the MC circuit to operate with the very least time lag possible, so that the plane will not be deflected from its straight flight path as radically when the MC button (actually, the no-pulsing button) on the pulser is depressed. With a steady bias voltage coming from the B battery and decreasing kick pulses, this time lag is upset.

By taking BOTH the kicks AND the transistor bias from the same batteries, we make one compensate for the other, and the MC setting holds very stable. It was not found worth the added parts to apply this sort of compensation to the elevator circuit.

It was because of this bias arrangement for the MC circuit that we went to NPN transistors, such a transistor being mandatory in the MC circuit due to our use of a common B battery for all circuits, and use of one set of servo cells for the receiver filaments. The 2N169A transistors have been found ideal for this outfit; they have extremely low leakage current, ample gain and are rated for use on 25 volts.

The receiver and kick circuits in the plane are mounted on two decks, both contained in a single sheet aluminum box. We give a rough layout of the kick circuit chassis, but if you have more space it would be wise to spread things out a little more. The outfit uses Neomatic relays, but these are not generally available now, and Gems will fit on the base very nicely. Overall size of our complete receiver package is 3 x 2 3/4 x 2" and it weighs 6 1/2 oz. Parts placement on the kick circuit chassis is not too fussy, but that shown has worked out well and is recommended. We used point-to-point wiring, but a P.C. plate could doubtless be worked out nicely.

Now, what about getting the rig operat-

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ing? First point is to be sure your pulser works correctly, and here is the first use for that zero-center meter we mentioned earlier. If it does, then shift the meter to the rudder relay on the receiver and check again. This should follow the pulser with no non-linearity or crowding, at various pulse rates and lengths. With no pulsing, check the relay current in the MC relay circuit; it should be about 3 ma or a bit more for relays around 7,000 ohms, or about 4½ ma for 5K relays. With pulsing, this current should drop. The elevator relay circuit should show almost zero current, with no pulsing, around 1 ma (this is an average meter reading figure) with the control stick in neutral; this figure will vary as the elevator adjustment R4 is varied.

Before we go into the final adjustment of the circuit, we ought to look at the changes made to the Compact Pulser, since all the values of the receiver circuits are based on the modified pulser. A look at Fig. 4 will show what has been changed; the two feedback capacitors were reduced to raise the pulse rate range, then R8 was added to reduce the maximum rate. R9 and R10 are used to compensate for a slight case of interaction in the system; there are probably other and more sophisticated ways to do this job, but this way works fine. What we found was that the pulser control stick, when moved from its center position to the right and left extremes would move the plane rudder just as desired, but it would give a little up elevator at the extremes, and a bit more on one side than on the other. (This action could have been partially due to the pulser itself—no attempt was made to localize it). The two resistors cause the pulser relay to speed up slightly as the stick is moved away from center, thus producing a little down elevator compensation. The lower the resistor, the greater the pulse rate change as the stick is moved to the sideways extreme; the values shown were right for the setup in plane #2, which used the N-52 servo cells, and Austerman servos.

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When the outfit was put in the latest plane, using Gould 1.25 SC cells, and servos based upon Bonner motors, it was found necessary to drop R9 to a still lower value of 1.5M. We suggest setting up the system without these resistors first, checking out the two kick circuits, then adding R9 and R10 if they are needed.

With transmitter, receiver and pulser in normal operation, try setting the elevator to mid position with R4. Then move the stick to full up; we like to have the elevator ALMOST cease its pulsing at this position. If it is still pulsing quite strongly, reduce the value of R3 about 10 ohms, reset R4 for center elevator (with the stick centered) and try full up again. It will be found possible to get virtually solid up this way; at the other end of the rate range, the elevator will give practically solid down, due to its high-pulse rate. Once set, R3 will not again require change.

With the elevator circuit set up this way, you can check for that slight up-elevator at extremes of rudder movement (stick held in neutral for elevator), and add compensating resistors as noted above. When this has been accomplished to your satisfaction, hold the stick full up and set resistor R7 for adjustment of the MC circuit time lag. You want a little leeway here, of course, to allow for wide battery voltage and temperature variations; if you find your motor control operates in flight (it will usually only do so when you have the stick in full up position) just back off on R7 a bit. We find that when this resistor set up too close, a rapid movement from full right to full left (or vice versa) with the stick in full up will trigger the MC circuit, so you will have to back off a bit more on R7 to accommodate this effect too. This latter effect seems to be inherent in the plane circuits, not in the pulser itself.

All this adjustment might seem to be a lot of fuss. But remember, this is not a genuine "multi" system (at least under the AMA definition). It is a compromise arrangement, and when you come to think

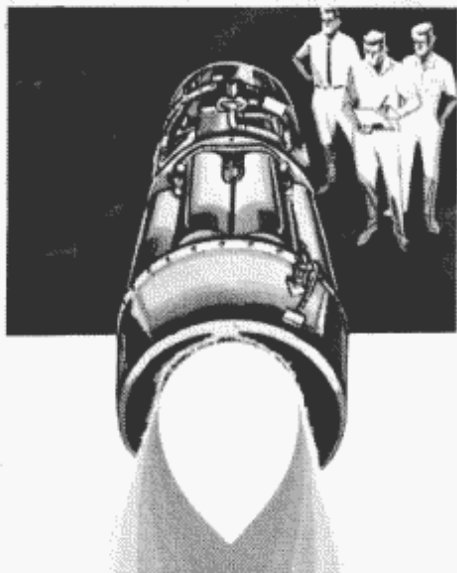
of it, you are sending a lot of information over a single radio "channel". If you don't like to tinker, this rig is not for you! Actually, it is not really tough to get into flyable condition; but if you want to get it as close to TTPW action as possible, then you will have to fuss and tinker as outlined above.

As noted, the outfit is in a plane now which uses servos with Bonner motors and 1.25 SC Gould nickel-cadmium cells. These servos give lots more power, but take more current; the entire system, including the same 55 ma filament drain, shows an average drain on each set of cells in neutral of about 460 ma, this can go as high as 800 ma in some stick positions. With this new installation, it was found necessary to change R3 to about 90 ohms. The new plane is bigger than #2, has coupled rudder and ailerons (CAR) and a .35 engine. It looks like a lot of fun to fly—when we learn how!

The system has a few peculiarities that should be understood at the outset. For one thing, as we've noted, it depends heavily upon a good pulser and a receiver that will pulse well at high speeds; things tend to be the worst at the top pulse rate (down elevator) and with rudder held full right or left. If your controls hold well at these extremes (a receiver or relay that won't follow fast and short pulses can give you sudden full UP elevator, as you hold the stick at full down and move it to right and left extremes!) you need have no worries on pulsing capabilities.

There is another little peculiarity to watch for—and it is quite normal. If you move the stick rapidly from one side to the other, with the elevator centered, you will find the elevator gives a short kick up when the stick goes one way, and a kick down in the other. But the elevator displacement is rather slight and it goes right back to neutral; this seriously worried one builder of the circuit, though, so we thought it better to mention it.

(Continued on page 60)



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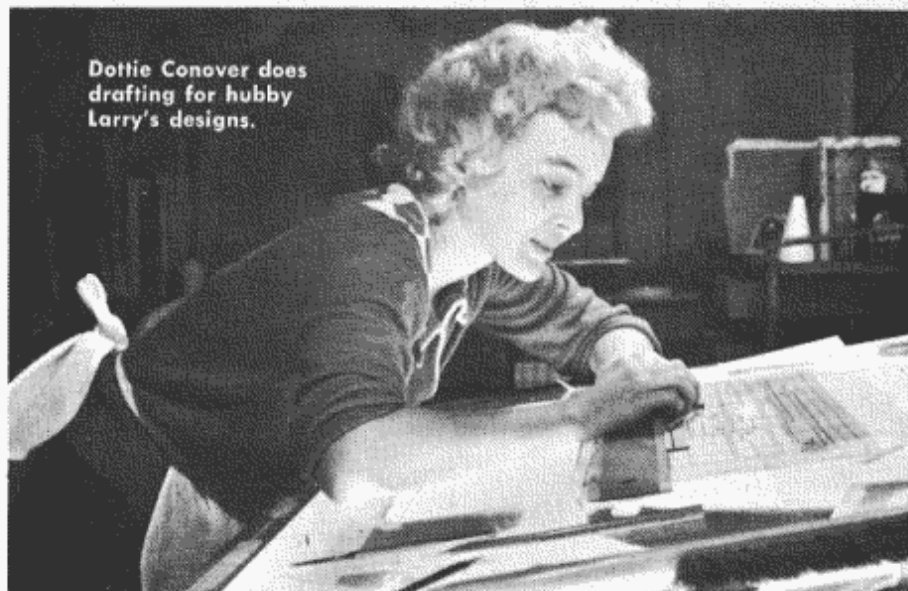
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Dottie Conover does drafting for hubby Larry's designs.

Model Progress

(Continued from page 23)

To that we can only add "amen." We were pleased at Johnnie's comment: "I hope lots of guys build 'Specials' from the article and give us some good hot competition this season. Our new ones will be fitted with the latest K&B 29's; only modification needed is in the mount."

As is indicated on the plans, and as Smith points out, the stabilizer can be changed to a one-side control surface if desired. If you do this increase the width of the left elevator by $\frac{1}{4}$ " and omit the cutout on the right side. This simplifies construction by eliminating the spar. Sez JCS in a parting note: "The air scoop can be left off if your engine runs cool."

Indoor Team. Scheduled to have competed at Cardington, England, in the first F.A.I. (World) Indoor rubber-powered championships was a U. S. group made up of Joe Bilgri (Western representative), San Jose, Calif.; Carl Redlin, Jr. (Midwest), Detroit, Mich.; and William Bigge (East), Washington, D. C.

Dick Kowalski of Detroit was selected by A.M.A. to serve as Team Manager.

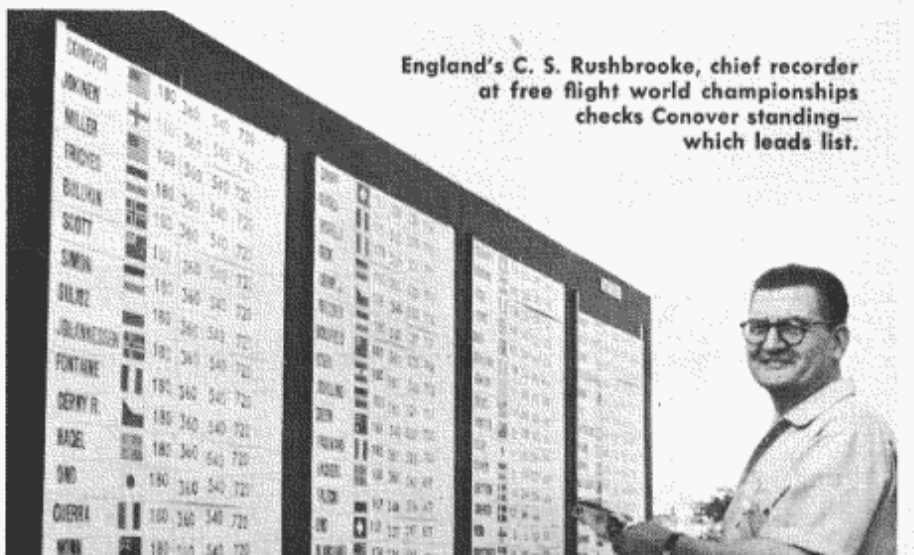
El Toro Plans. Martin Moad, designer of the El Toro radio control plane highlighted in this issue, advises that a set of full size plans is available from him for \$6. This includes mailing fees; plans are sent in a tube to arrive unfolded; wing is full size. Checks or money orders should be made out to Martin Moad, 1230 Barnard Drive, Las Vegas, Nevada.

At last hearing, Marty had been testing his model in lengthy power dives—2,500', 150 mph!

Canadian Association HQ. Neighboring modelers to the North who may not be aware of their own Model Aeronautics Association of Canada can secure membership details from MAAC Headquarters, 270 E. 26th St., Hamilton, Ontario. Membership license fees: For those under 18 on January 1st, \$2.50; over 18, \$4. Leader memberships over 21, \$5. These include insurance coverage up to \$100,000.

New Parks Booklet. Parks College (St. Louis University) has a brand new book on its various aviation courses which will be sent to anyone interested in a B.S. Degree in 1) Aeronautical Engineering; 2) Aeronautics; 3) Aeronautical Administration; 4) Aeronautical Meteorology; 5) Aircraft Maintenance Engineering.

(Continued on page 42)



England's C. S. Rushbrooke, chief recorder at free flight world championships checks Conover standing—which leads list.

GOSSIP

PICTURES

DEALERS



First bit of news I have to offer this month is to tell you that Mr. Ogawa of OS Engines has just concluded his first visit to us and also his first visit to the U.S.A.

Mr. Ogawa was very interested in seeing the U.S. so after a few days visit in Cincinnati we motored to Buffalo and Niagara Falls and spent a day at the Falls with Allan Germaine, OS Canada. From there flew to New York City, where we spent a pleasant Sunday with Walt Schroder on a sightseeing boat around Manhattan.

OS R C — We introduced OS 5 channel (\$49.95 @ Tx & Rx) several months ago and it has been received very well. This month it is our pleasure to introduce several of their new single channel items. The equipment is all tone. Prices are very attractive as you will notice. The SA receiver is all transistorized 3V. The receiver has good sensitivity and also swamping and noise rejection characteristics are good. Size very small — 1" x 1 1/2" x 2 1/4". The SA receiver is also offered in a relayless variety with a power transistor acting for the relay. Both of these are attractively priced at \$19.98. Coming along soon from OS will be a single channel Tx with tubes and also a small all transistorized model at 12 v. the transistorized version is not quite as powerful but should be just the ticket for these little .01 and .02 powered jobs. From OS we also have a nice Tx lever switch \$1.39. Service on OS radio equipment will be supervised by Jack Part of Controleaire.

Had a nice visit with Harold de Bolt last Monday. Harold is working on some fascinating new products and he had some interesting stories to tell of his recent adventures in Japan. Harold went over to Japan with Johnny Brodbeck to help administrate U. S. Air Force contest. While Harold was there he entered the Japanese Nationals and was high point man but admits that he really had to fly to do it. Harold also reports that the best prop for a Supertigre 35 R C is an 11/5 Top Flite prop. This is the one with the narrow blade. Pappy also showed me the new Pylon nylon hinge and the new Deans B pin connector which is complete with spagetti. I hope Bill Deans will offer this spagetti for covering wire joints separately.

I appreciate that this isn't a photo magazine but here are a couple of picture taking stories that may interest you. First I have a couple of rolls of motion picture film here that were taken at a Japanese contest. The contest was sponsored by OS in honor of their 25th anniversary. I am having the films copied. If any clubs want to show these at their meetings please write. Second camera story — this Mr. Ogawa is a pretty sharp fellow. Besides being a good model-builder he is interested in music and plays the piano. He also takes a lot of pictures and during his stay in the States we jokingly referred to him as the "Professional Photographer." Like all experts he was having a field day shooting Niagara Falls from the Maid of the Mist only to discover he hadn't loaded his camera. Mr. Ogawa and camera shown in one of our pictures.

Also we have a picture of Harold Nash and Bill Pardue. Nash is holding their ST-15 powered speed model that they set an AMA open class "A" speed record with of 145.10 (No Tetra). Bill Pardue also sent me a picture (which I'm taking the liberty of publishing) of D.R. "Red" Willard, Winston Salem, N. C. Red just applied for an Open class "B" record of 154.31 with a Supertigre 29 powered model. Red took the fins off the head of his Tigre. I also had a very nice letter from Jack D. Siebenhaar of Newark, California. Jack has also been running a modified Supertigre 29. He uses a rear rotor and has upped the compression ratio up to 12 to 1. Jack has been flying in W.A.M. competition on 2 lines and set a "B" W.A.M. speed record on March 5th with the engine and also set a proto record of 121.50 with it. One thing that OS left with us during their visit was a sample of their new 29X. The new engine has the needle valve in the rear, advanced porting on the shaft and a change in the head.

JOHN MALONEY



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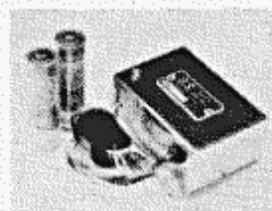


"Professional Photographer"

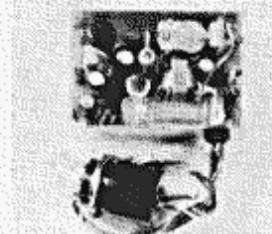
S. OGAWA
OS Engines



New OS 29X Speed
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OS SA RX 3V. TONE \$19.95
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For Tube Lovers OS 4A2 RX \$27.95
With Tube Circuit



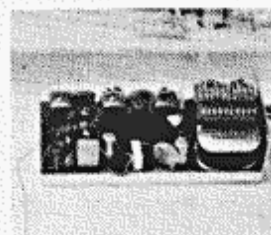
H. Nash and Bill Pardue
With Their Record Setter
S-T 15 Pow.



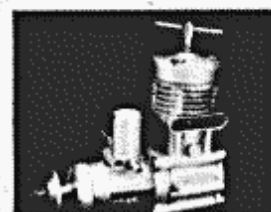
D. R. "Red" Willard Turned 154.31
With S-T 29 Powered Job



J. Maloney and S. Ogawa inspect
Max 35 Powered Sonic Cruiser



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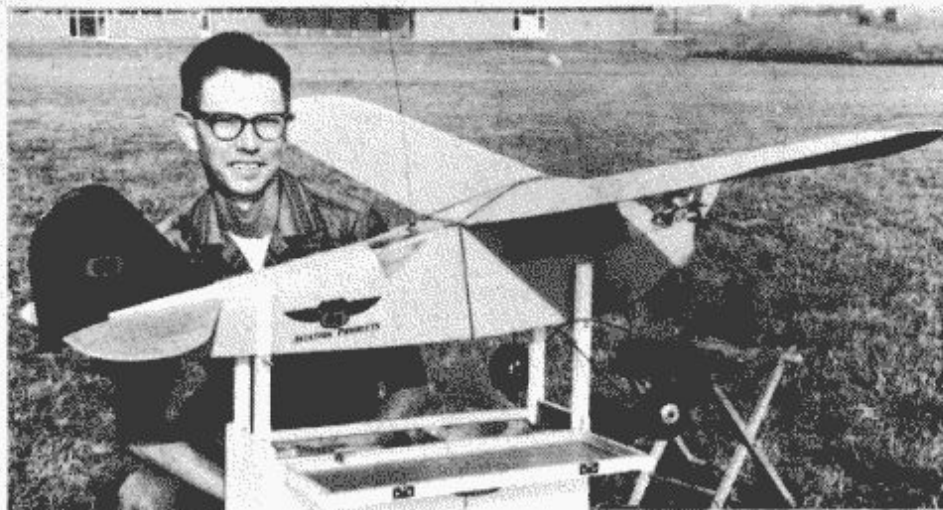
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Ed Parsons takes "My Favorite Model" award with 22 year old Buc (left).

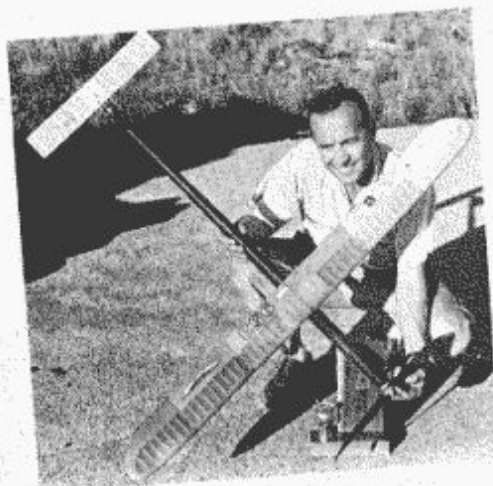
Model Progress

■ Talk about people getting old! Although Ed. D. Parsons of Bartlesville, Okla., is just getting his second teeth, his "Favorite Model" (above) is 22 years old. It's a Berkeley Buccaneer first flown in 1939. The only modification has been in the landing gear and in painting over the rear window on each side.

Ed's Buc made its last free flight with the original Brown Junior powerplant in September 1956. Then he installed a K&B .15 2-speed engine, a Lorenz home-built receiver and Bonner escapement in 1958. Job performed fine but then came a flyaway on its 14th flight. The Buc lay out in a field for more than 2 months before it was spotted and returned to Parsons. Rodents had chewed on the balsawood a bit, but the worst damage was a very pronounced wing warp.

EDP rebuilt the wing, re-covered the entire ship, installed new R/C equipment, this time upping power to a K&B .19. Its flight log now shows 92 radio controlled flights, more than any other job in the area. Wheels are the original Ohlsson streamlined pneumatic type. Photo was made in late 1960. Since then the only change has been installation of a deBolt knockoff landing gear.

Queries Ed: "Does anyone else have a radio controlled Buccaneer of this vintage?" (Meantime, he gets this month's \$25 "favorite model" photo award.)



Gerald Ritz, towline glider model world champ, with winning Wakefield model (left) at last King Orange Internats. Jerry placed 1st in Nordic A/1 glider at same affair. An earlier rubber model, displayed above, shows the famous "Ritz wing."

Outstanding Designer. Gerald G. Ritz of Des Plaines, Ill., current holder of the international towline glider championship crown, works harder at keeping his contest skills in tip-top shape than any air-modeler we know. Jerry can be expected to place high in or win any event he enters. This is no matter of luck; he "trains" constantly the year around, much in the manner of a long-distance runner or a boxer.

All last winter GGR test-flew power and towline planes. When he says a design is good for windy weather, he knows. (How that wind can blow around Chicago way!) Ritz reports that his Tern-V glider detailed in this issue racked up a first place in every contest entered—including the King Orange Internats, the 1959 American eliminations and semi-finals.

Seven firsts, all told. The design Jerry flew in Belgium to win the world title was specially designed and built for that one competition (the only meet it was flown in).

To illustrate the magnificent work of this world-famous designer, we're including several photos. The elliptical

beauty is a dramatic example of the well-known "Ritz wing" method of construction.

Jerry pursues his modeling hobby so intensely that some folks have gotten the impression that he's a rather cold-blooded, out-to-win-only guy. That's not the case at all. As a successful furniture manufacturer, Jerry's hobbying time is somewhat limited. When he can get away from his desk to test-fly or enter a meet, he is so wrapped up in his avocation that he hasn't much time for idle chit-chat or evasive answers. Ask him what he thinks of your model, he tells you . . . his quick reaction is based on



Ray Demestro receives Eveready cup at Tri-O-Rama Field ceremonies.

his many years of outstanding designing and competition. You may not like his reaction, but if you listen carefully you can certainly learn a lot!

It took us quite a while to penetrate his busy-busy venter, but when we did we found him a very warm, very likeable guy. Ritz has been an active participant in many sports, including full-scale sailplane flying and big-time sailboat racing. But he always comes back to modeling and modelers everywhere have benefited from his theories, plane designs and adjustment techniques.

Aviation in Public Schools. A survey by researcher Henry Goldstein turns up the fact that 25 high schools in the country have departments of aviation.

But Aviation High School in New York City has carved out a very special, unduplicated niche for itself. It is not only the nation's largest public aviation high school offering a 3-year program of study in the 10th, 11th and 12th grades, it is the only all-aviation high school in the world.

Celebrating its 25th anniversary this September, the school offers an FAA certified curriculum which prepares its graduates for aeronautical non-flying jobs, a higher education, or the armed forces. The school, housed in a modern \$8½ million building in the Long Island City section of Queens (one of NYC's

American Modeler — September 1961

Richard Sette (far rt.) Oscar Grasser, Monogram kits at NYC/AHS.

five boroughs), possesses classrooms, shops and a 3-story maintenance hangar containing approximately \$3 million worth of training aids, much of it donated by the military. A.H.S. is the goal of almost every air-minded youngster in New York City. Although there is room for only 800 incoming students, 2,500 apply each year.

How does the school cope with this selection problem? According to Frank Woehr, Aviation High's principal, prospective students must first pass stringent entrance exams. Personal interviews follow to gauge the student's interest in aviation and his general attitude towards technical training.

"We try to enroll students who not only have the necessary ability," says Woehr, "but also a deep interest in aviation. Our aim is to find boys who've been interested in airplanes since they were knee-high to a propeller."

One of the yardsticks Woehr and his associates use in these interviews is interest in model building. "We regard an interest in and experience with building



Bill Stinson Jr. and Nats' Team Race winner (plans in last month's A.M.).

as plus factors in determining a boy's vocational aptitude," Woehr declares.

Model building is also an important factor in the school's Exploratory Division. Here, 9th graders who have graduated from elementary school can enroll in a basic one-year program of academic and shop subjects designed to further test the student's abilities and interests and guide him in making a vocational decision. The exploratory shop activities are broken down into woodworking, metals and aviation.

It is in the latter particularly that model building comes into play. For example, in one exploratory shop devoted to power transportation, the student's introduction to rotary engines is accompanied by the use of a model of the Curtiss Wright "Cyclone 9" radial aircraft engine developed by Monogram Models, Inc. The engine, familiar to aviation enthusiasts the world over as the one which powered the Boeing B-17 and many Douglas transport planes, has

been reproduced with great fidelity.

Monogram draftsmen, working with actual engineering drawings supplied by Curtiss Wright, scaled the model hobby kit 1" to the foot and provided for highly detailed cylinders and all engine parts including crankcase, pushrods, ignition, intake manifolds and magneto. The completed kit, which was cited by "Consumer Bulletin" for its amazing detail, can be hooked to a battery-operated motor to turn the prop.

The course of study in the Exploratory shop calls for use of models such as this in its 5th and 6th weeks, again in its final 13th week as the basis for review.

Pinpointing the value of model hobby kits in Aviation High's exploratory curriculum, Woehr states, "The kits have excellent motivational value for today's 9th graders and are more interesting to work on than the typical book racks their fathers used in shop classes in earlier days. Then, too, kits are an excellent medium for developing knowledge of aviation technology. Students can relate the models to the real engine and in seeing these relationships, understand powerplant functions better."

Lucky Winner. First modeler to receive the T-O-R "Eveready" Hobbyist-of-the-Week award at Rich Palmer's Tri-O-Rama Field, Parsippany, N. J., was Ray Demestro of Newark, N. J. Ray was awarded his trophy by not one, but two beauties: Ruth Wuesthoff ("Miss Greater Newark") and Mary Ann Poles ("Miss Garden State"). Every Sunday an outstanding modeler will receive the designation; in September Richard Palmer will announce the winner of the annual "Hobbyist Award" for the East Coast's stellar model builder.

The Eveready battery people are participating in the series of presentations. After Ray's overwhelming ceremony, we bet the sale of Eveready equipment shot sky high.

Latest book on rockets tells youngsters how to build non-operating scale copies.

Rocket Book. "Model Rockets For Beginners" by H. H. Gilmore (117 pages, 5½ x 8¼", \$2.50, Harper & Brothers, 49 E. 33rd St., New York 16, N. Y.) shows young people how to make simplified, non-operable models of such big-time rockets as Polaris and Atlas. The book tells how rockets work, how to identify various parts, describes needed tools and materials for these fairly simple projects.

Rockets in silhouette are presented along with a series of construction projects with patterns and sketches.

Quite a Collection! We should all feel honored that such big-time winners as Jerry Ritz and Larry Conover are gracing our pages this month with their illustrious designs. Another plane that's won a real claim to fame is that Smith-Stegens "Special" (sometimes known and flown as the "Splinter" design).

Johnnie Smith of Proto racing circles was somewhat apologetic about the racer photos which appear on page 14. Sez Johnnie, "This is a pretty 'grubby' model because it is two years old. The nose is rough from a test we made with Tetra last fall; it took the fiberglass right off! The wing is from the first one built; it's 4½ years old and originally used a two-wire system. Basswood sure makes an airplane last."

(Continued on page 40)



World Champion Larry Conover Tells You How To Win With "Lucky Lindy III"

Dorothy and Larry Conover
at England's Cranfield
Airport after 12th Flyoff
Round in 1960 F.A.I.
Power Championships.
Larry was co-winner
of "Internationals."



■ *Lucky Lindy, a consistent, stable, high performance model has won a place on the U.S. Power Team four consecutive times. Proxy flown to a joint first place in the 1956 World Championships by Silvio Lanfranchi. Again tied for first place in the 1960 World Championships in a gruelling twelve round flyoff, repeatedly making over four minutes in normal air, on fifteen seconds.*

This design has proven itself adaptable to all conditions and rules, including unlimited events.

■ The closing of round five at Cranfield 1960, marked the beginning of a flyoff unparalleled in the history of World Championships. The Mk-III Lindy was in that match and fortunately remained among the final five who were declared "joint champions". A total of seventeen perfect rounds, per man, in rain and sun and cloud, uncertain English weather.

It takes more than luck to stay alive in this kind of competition. The airplane, whether it be a Zipper, a Zeke, or a home-design, must be stable, consistent and capable of very high performance. You must have the best engine available. Fuel system has to be foolproof. Engine shutoff

must be dead-on 9.8 seconds. Dethermalizing can and does determine the "luck" of a contest.

Many little things contribute to success in competition. The skid that takes the beating of endless runaway DT's, and saves cracked wing joints. The special keying arrangement that prevents shifting of wing and tail, but allows for a bad tree landing. The stop on the timer that does away with haphazard visual settings under flyoff pressures. Well, those and other things, you learn from flying in many contests. You probably know them already. So how about design features? Here's how we see them . . .

1. A 10% flat bottomed, low drag, turbulent flow section that goes up fast, and hangs into the lightest lift. It rides safely thru wind and ground turbulence.

2. A proven method of control using a combination of three fins. It does the work of an auto-rudder without the dangers or complications associated with that gadget.

3. Wing and tail are Warren Truss structures with full depth spars. They resist warping and heavy winds. Wing area has been reduced to permit a near minimum all-up weight.

4. Double DT is the secret to keeping your models. As you progress to the high performance phase of your world championship preparations, loss of a model can write disaster. Good engines and models are hard to come by. The double-DT permits pin-point landings through use of the Tatone DT timer. This fine clockwork is delicate, and susceptible to dirt stoppage. Perhaps two flights per hundred. When this happens, and it's usually a hot thermal flight, the old fuse method is ready insurance to cover a calculated risk. The combination of these two are an important consistency factor.

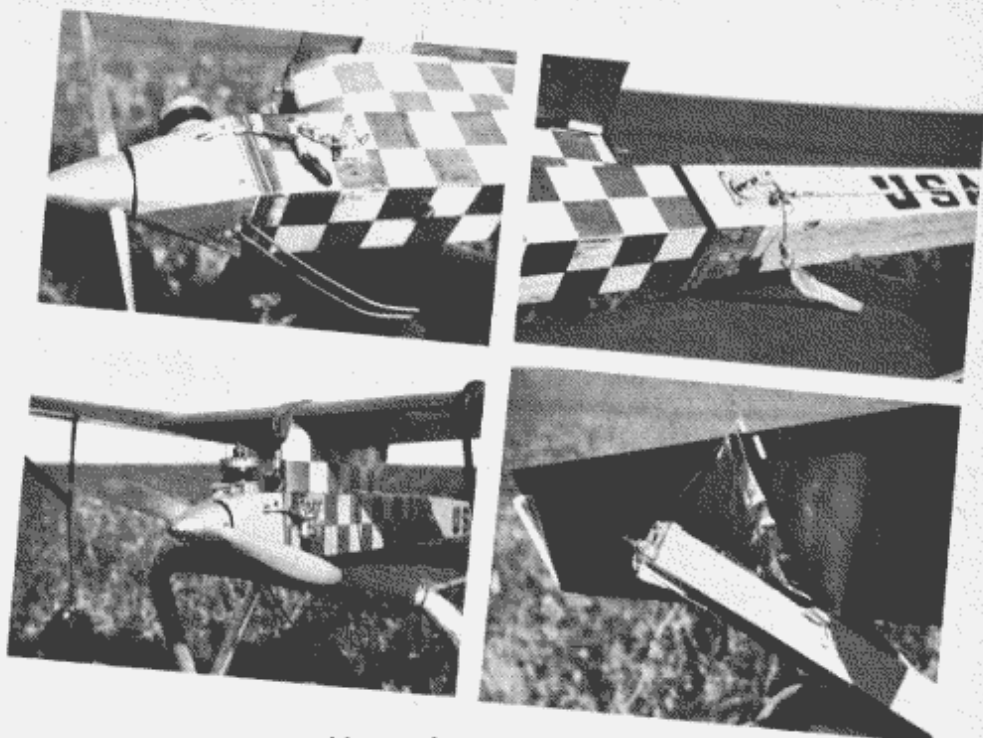
Another feature of the Lindy DT system is the accordion flap that comes up with the tail pop. When the heavy-weight rules for FAI were introduced it became necessary to lower the angle of tailplane pop-up, to slow the rate of descent. If you fly only in soft pasture country you might get by. However, when required to DT onto hard surfaced runways, many wing joints and fuselages cracked and cracked. Now as you decrease the tailplane angle, the model will spin. Tail spin. This is dangerous. The cure is to add lateral area at the rear to damp out

Working drawings for Lucky Lindy III are on Hobby Helpers' Group Plan #961. At right in photos note: timer stop; double D-T and anti-spin fin of thin plastic which folds and tucks under stab; flag and pull-pin on D-T timer—timer arm is spring-loaded "on".

the spinning. Any light flexible material that is wind proof can be used. A piece of thin polyethylene will do. It is taped securely to the inside of the fuselage and the tail platform—a bit less securely to the bottom of the stab, for easy take-apart. Black Scotch electrical tape is best for this.

5. PRESSURE: It took a long time for the regenerative pressure system to reach acceptance in free flight. Control line modelers have used it for years. However, they do not have the cut-off problem that was encountered by the high climbers. Ordinary shutoff systems failed to do the whole job. The main fuel supply would be cut off, but alternate low and high pressure in the crankcase drew fuel back into the motor through the pressure tap. The result was a two or three second run down with no power.

I found one answer to this problem through a lot of hard test flying. You must prevent the pressure input line to the tank from drawing fuel at any time. The easy way to do this when your standard tank is buried in fuselage: Measure the amount of fuel you put in the tank, and never fill past a level that will contact the pressure line. I would fill the tank. Make one complete flight, with over-burping. Then the next flight was dead-on engine run. Forty squirts from the pump each time would maintain the fuel level. This was a makeshift arrangement, but it worked. In the meantime



some smarter guys came up with a good answer, as shown on the plans. Ed Miller and his friends in the Max-Men group, Paul Kaitukoff, and I believe Chuck Diller.

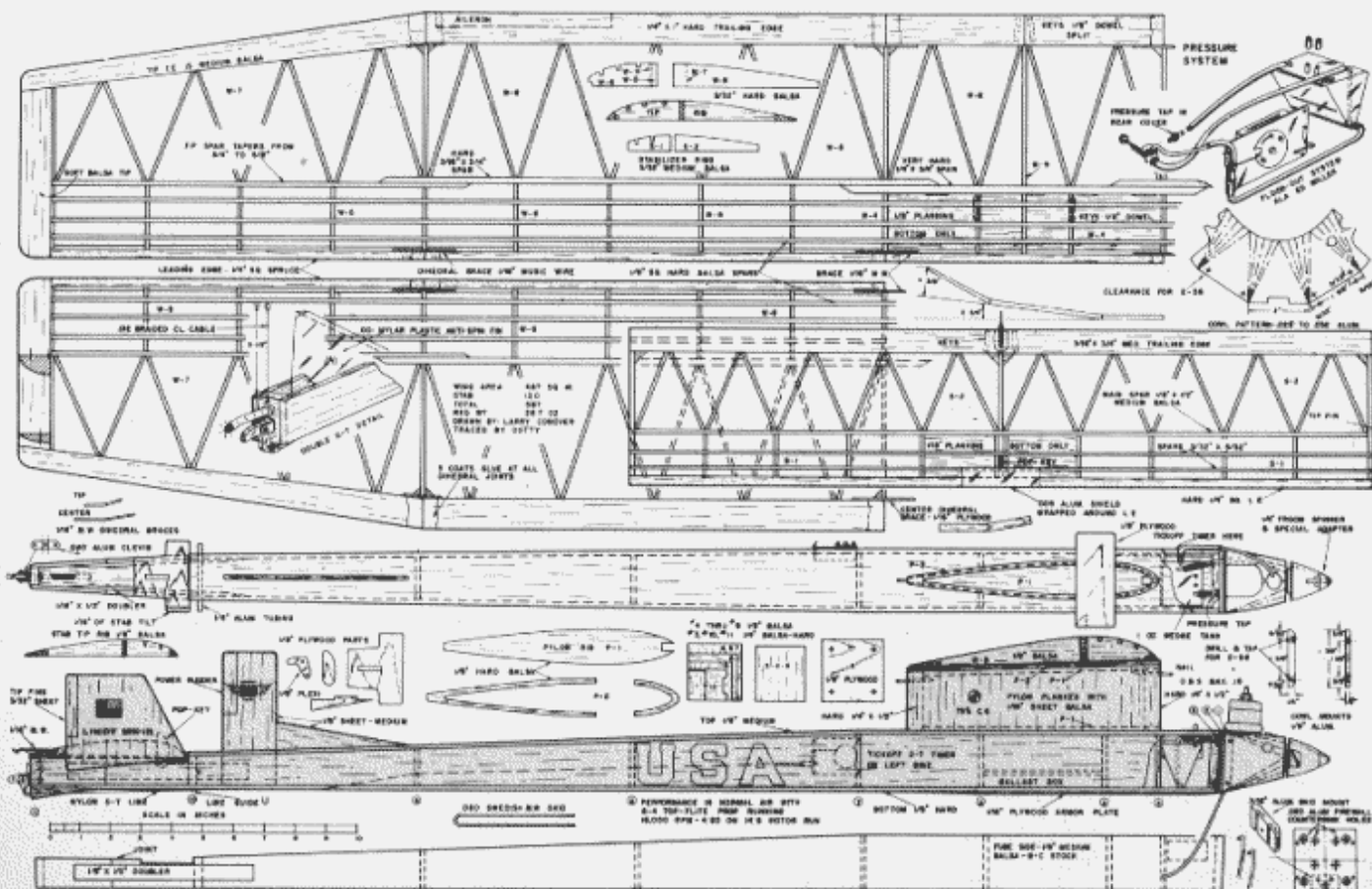
You take a standard Tickoff engine timer and make a larger face-plate. Then steal a cam plate from the DT Tickoff, or make one. The flood-out line is kept closed during the engine run. When the timer releases the wire squeezing shut the surgical tubing, fuel under pressure is hosed into the venturi. Freezes the glow plug immediately. It stops running.

You can get into trouble with pressure if the engine doesn't start quickly, or if it stops while adjusting. Be sure to al-

low for a pressure relief plug that can be easily removed if flooding occurs. This can be one of the filler cap plugs.

Don't expect pressure in itself to give you more rpm. My tests indicate no change. But you can gain HP by opening up the intake ports to get a deep breathing engine. This operation gives the largest single increase in power.

6. THE COWL is a bit of polish which should be used this year. It is one of many refinements to help you get into "maxing" range. The pattern makes it easy. When laying out, use a ball point pen or a pencil. Never scratch a bend (Continued on page 65)



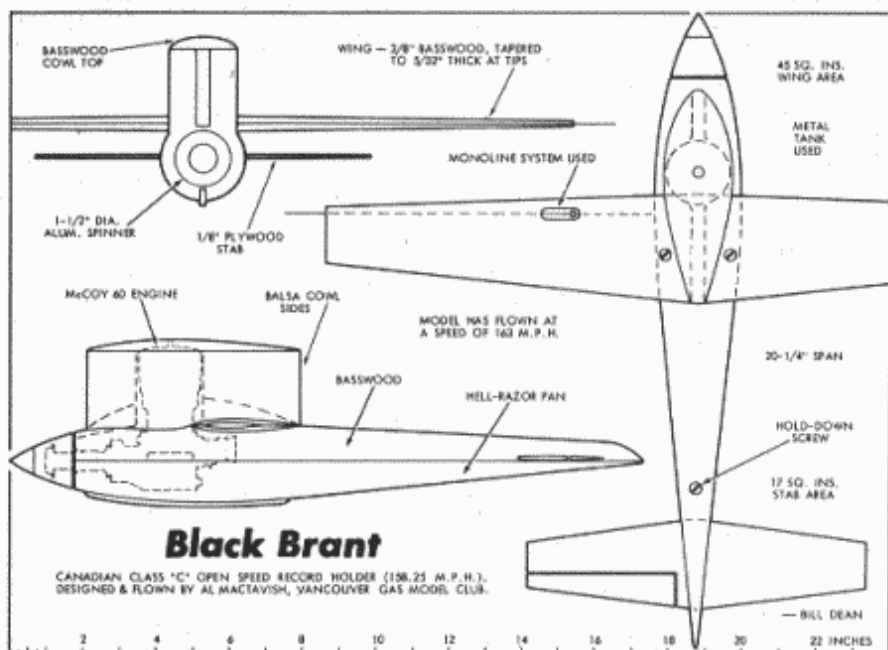
Wild Bill Netzeband's

CONTROL LINE CAPERS

■ As this is being written, our first column had just hit the newsstands. (There is that old two month delay from conception to delivery.) Have had already yet a fan letter (from a prop shop), an invitation to a kite contest and the following comment from Jeronimo O. Knocknik, Esq.: "Deer Wild, I am going to use your vertikle board building system from now on. My shoos are glood to the floor by it." Frankly, sports fans, I *do* build this way. Find that I can think better while standing up. (Ed. note: We *still* think hez kidding us!)

Stunt Runt Stands Tail. Have been flying the Fox .07 "Stunt Runt" and honestly enjoying myself. Til now, have held a rather low opinion of "little" stunt ships, but "SR" is very convincing in its ability. Not only will it easily complete the AMA program, but it is capable of such knee-knockers as vertical squares, horizontal whing-dings and overhead dilberies. Product tests are being conducted by building closely to manufacturers recommendations without re-designing anything. And that's tough for me!

Our test "Stunt Runt" weighs 12 oz. dripping wet, lifts with 250 square inches and is flown on the suggested .008 dia. x 50' lines. Wing loading is a super-light .048 oz. per sq. in. The "Skyhook" tip plate and included "Reverse flow" baffle tank (knocked down) combine to give excellent big ship line tension and constant power overhead. A really solid feel



Vancouver Gas Model Club's "Hot Head" club bulletin gets our \$10 award for this "informational" three-view of Al MacTavish's Class C speed record holder.

gives the confidence that "she will make it" necessary for close stunt work. The plane is put together like a big one, yet you don't have "40 acres" to sand and paint. Haven't had to test the crash resistance yet, but the formula of light weight and low speed is correct.

Duke's 07 is plenty potent and while we couldn't find the 8x2 prop, it's real capable on a 7x4 wood. Engine doesn't mind lugging either. Next month, the Magician 15 and the Rumble . . . if we get them built.

The Burning Question. David Brown solved the backward starting of a Space Hopper by using a 7x5 prop for more fly-wheel action to carry the prop through. Question is "Is it too much load." Answer "It depends . . . if the engine and large prop will haul the model without overheating the engine, it is a good combo." Wouldn't seem right to peak the engine with that much prop, but results speak loudly.

Backward starting is natural for glo engines since firing occurs on the piston's up stroke. You carry it through the first

shot, but next one very likely will go back, and away she goes. Reed valve engines such as the older Thimble-Dromes don't care which way they run. Methods to obtain correct rotation starts:

- (1) After priming, flip the prop several times (5 or 6) with the battery disconnected. Overpriming aggravates reverse starting.
- (2) Hook up and flip smartly with good carry through. A hard fast flip will carry it by the hard second pop. Cranking backward is not very reliable as a rule.



And away they go (left) in Tulsa, Okla., Glue Dobbers' Tomato Crate (nee Apple Box) Derby. Le Mans start and hidden box numbers essential sex Wild Bill to get competition off to good start. Winner Gary Strode holds top entry (above) with his associate-in-crime, Mr. Elby.



Strode (above) constructing (you'll forgive the term) ultimate winner in Tomato Crate derby. At right, Dan Hodges and Orville Tunstill (plaid shirt) hard at work.



Above: Dave Carter (arm and leg) and Bill Jagers. This is about 15 minutes since the derby got underway. Sounds like an exciting event.



- (3) Start with the needle valve a little leaner than the running setting. Be ready to open it quickly when she takes off. This trick helps some pressured engines too. Only exception is a Stunt Fox. They like to start rich or where they run. Shaft rotary valve engines will run backward only if set too rich, since their timing is fouled up on reverse turning.

A.B. Derby or "Who Copped My Hatchet?" The intrepid Glue Dobbers finally said "So what if it's blowing, lets fly!" Three teams of Tulsa's best hatchet men met in an 18 to 25 mph breeze for the Apple Box Derby (Tomato. Crates this time). Idea is to build a C/L model using only the box and fly it. Rules allow pre-fabbed landing gear, controls and pre-filled tanks. Engine must be bolted in, while the rest of the model must be of conventional layout—wing, fuse, stab, elevator, etc. Teams must carry all tools to their assigned box, which has a number somewhere on it. An exciting LeMans type start—Build the plane as quickly as possible—Call for the referee—Get Safety Check—String lines—Try to fly 5 laps. First one to do so wins a big trophy. Finally, clean up your own mess. Warning to judges: don't argue with the contestants—axes, you know.

Blow-by-blow. Gary Strode finished in 15 minutes. While he cranks, Dan Hodges takes off . . . the hard way going North pointed South. Back for repairs. Hodges does it again. Pow! Carter fires up his OS 15 and taxis slowly to a flip-over. Hodges takes off for last attempt. Same pattern, and out. Carter taxis once more. Flip. Carter taxis for third and last time. Strode? He changed engines. He's away. I won't say it was wild, but he was up in

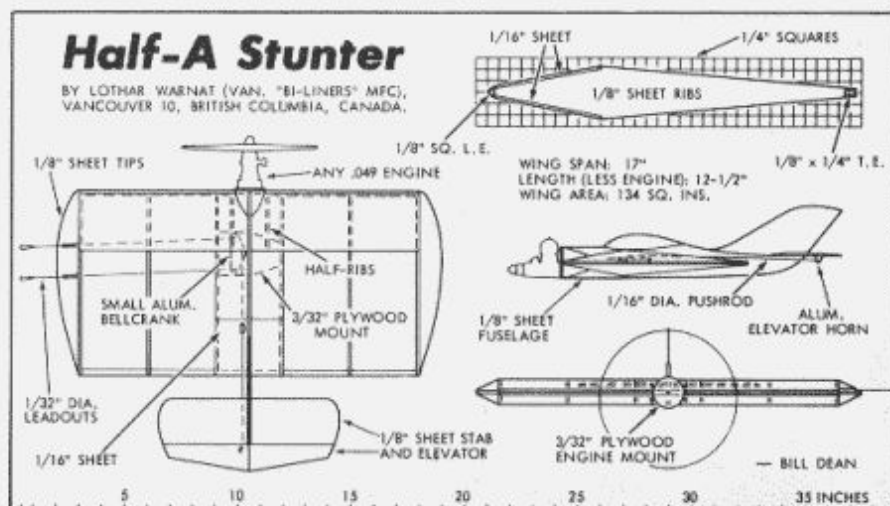
From another Canadian club bulletin, this by Vancouver Bi-Liners, comes "Green Bee" with diamond airfoil.

$\frac{1}{4}$ lap, way up in $\frac{1}{2}$ lap, augered in where he took off and it took over 10 seconds to do it. He won on distance. And no one used a drop of glue—masking tape, rubber bands, nails, screws, chewing gum, string and carpet tacks, yes—but no glue.

Among other events on this Fun? Day we had a 10c HL glider meet. Winning time for 3 flights 17 sec. And a hat throwing contest. Winning time for three throws, 11.5 sec. Your reporter filed a protest, since his was the only official AMA cap entered. He got a rousing 11 seconds with it. Try these for real honest fun and throw in a family barbeque to round out a fine day.

Zaic Writes Again. Just looked over proofs from Frank Zaic's "1959-61 Model Aeronautic Yearbook." He has a C/L section with some good crates and worthwhile information. I recall I got design-happy after absorbing his 1951 Yearbook. Frank has a no-nonsense approach to theory and invariably gathers together pungent thoughts from the best minds in the world. These yearbooks are a "must item" in your library, if you care at all about WHY. The part by Art Cangialosi on combat design is very good and highly accurate. Has been out since June 20 after 16 months preparation. Costs a paltry \$3 for 288 jewel-like pages and over 250 plans. I got mine.

The Big "E". Not only was I pretty close when the Equalizer was designed, but the plant kitting it is close enough for me to snoop. Actually this set-up gives above-average advantages for a designer, since I was able to help set up the tooling, jigs and special machinery. Have built a couple of kit "E"'s from rejected parts, even they fit nicely. Pioneer is liv-
(Continued on page 60)

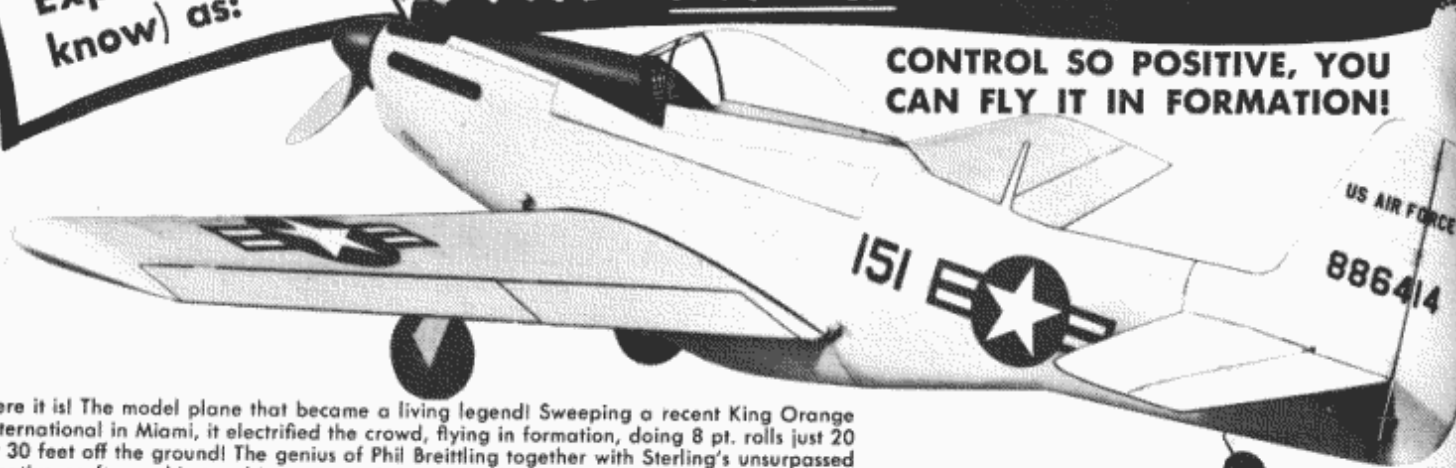


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Here it is! The model plane that became a living legend! Sweeping a recent King Orange International in Miami, it electrified the crowd, flying in formation, doing 8 pt. rolls just 20 or 30 feet off the ground! The genius of Phil Breittling together with Sterling's unsurpassed creative craftsmanship combine to now bring you what is probably the most advanced design radio model in existence today! You've heard about it . . . maybe you have even seen it . . . now YOU can fly it! Unquestionably, the F-51 Mustang is the most realistic, most responsive radio control model in the air today!

This is a BIG model! A full 66 inches tip to tip, with a 50" fuselage, of selected balsa and finest plywood throughout! And check these exceptional features! One-piece 45" balsa sides! Custom-shaped upper and lower cowl blocks, air scoop . . . shaped motor mounts . . . shaped hardwood wing spar! Giant crystal-clear canopy almost 14" long, made of fuel-proof $\frac{1}{8}$ " thick plastic! Special landing gear clamps of hardened steel! $\frac{1}{16}$ " diameter formed landing gear, struts individually mounted! Permanently brass-bushed plywood bell cranks and horns, not just bolted on but *built right in!* Wing flaps operable with either 8 or 10 channel equipment! 158 different parts in the hardware package! And the largest air force decals you ever saw in any kit!

Complete step-by-step plans are a work of art, with every phase of the assembly covered by beautiful sketches and detailed instructions. Plans also show how to build the Mustang into a beautiful control-line model.

Phil Breittling's Legendary

F-51 MUSTANG

KIT FS-10

Wing Span 66"
For .35 to .60
engines

\$27.50

May also be flown as control line model . . . instructions on planes

WHEN IT'S MADE BY STERLING, IT'S UNCONDITIONALLY GUARANTEED . . . IN WRITING!

Parks offers a Bachelor of Science degree in 3 years instead of 4 with no elimination of subjects. Classes are held for 45 weeks out of the year. Such an accelerated program permits "Parksmen" to start their careers nearly 1 year sooner. For you free copy of the "View Book" write Parks College, Harper Hall, Dept. 2101, East St. Louis, Ill.

More on Smith. Before we tell you a bit more about Johnnie Smith of Massillon, Ohio, we want to acknowledge the fine, quick work of Massillon's Davis Photography Studio who "shot" Johnnie at our request. Thanks, DPS; nice work.

Smith, we discovered, is the operator of Scale Craft Models; his outfit turns out scale models for architects, museums, collectors, aircraft—you name it, SCM will build it. Three of Johnnie's models are displayed in the National Air Museum at the Smithsonian in Washington, D. C.: Travel-Aire "Mystery Ship"; Chance Vought F8U-1 Crusader; Omega BS-12 helicopter. The Pentagon has on display his miniature copy of a Cessna YH-41.

JCS served in Army Ordnance, put in 16 months at Ladd AFB in Fairbanks, Alaska. Started modeling in 1937 at the age of seven with Strombecker kits. First built-up attempt was a 50c Comet Ryan ST. His first free flight was a Playboy Senior powered by an Ohlsson 60; ten years later he was building research models for the NACA Lewis Flight Propulsion Labs in Ohio.

Married last year, Johnnie says his wife Erna loves models and contests. Lucky guy, hey? A charter member of the Lakewood Flitemasters (National Champions in 1959), Smith was co-editor of the very fine club paper.

High-Climbing Lindy. We've been holding back a note from Larry (Lucky Lindy) Conover, America's ace free flihter, written last year just after he'd ended up in a 5-way tie for the World's Best title. In it Conover reported that "many people at the World Championships assured me that the Lucky Lindy Mk. III was the best model there. I felt they were being very kind."

Bertil Beckman, Swedish team manager, told of a camera and tripod his crew had set up far down the field. Purpose was to get a record of the models that climbed highest. Beckman revealed that the Lindy appeared highest on the ground glass . . . about a third higher than most of the competition. The Canadian contingent had an audio tach on the field; they claimed Conover's engines jumped from 16,000 rpm on the ground to 17,400 in the air.

Club Chatter

(Continued from page 29)

Clubs are the life-blood of the hobby. Why, then, do we not make better use of this great natural asset? Why don't we publicize clubs? Indeed, as successful and indispensable as clubs

have become, the greater tasks—and rewards—lie before us.

For just such reasons this column has been begun. In future issues it will become a clearing house, a means of essential communication that will light the way to greater progress and achievements. Required is the active support of clubs, their spokesmen and their leaders.

How can you help?

This partial rundown of problems and objectives will do for a starter.

1. How do you start a club? Magazines continuously receive letters from small groups of young modelers, who wish to join a club, or start one of their own. Assuming that no club exists nearby, what is your advice to them? Step by step, what do they do? How many members do they need to start, how often should they meet, do they need an adult adviser (who is qualified?), what working examples can they follow?

2. Clubs who lack direction tend to fall apart. How do you hold interest? What is your program? Do you mix activities? What makes your outfit successful? What special ideas have you tried—which paid off?

3. Many clubs lack beginner programs, others have been notably successful with young beginners. We must have new blood—if we don't give, we shall not receive. What have you done for beginners? Tell us about your program. How do you measure your value in the community?

4. Flying sites. We always need them,

INCOMPARABLE CONTROL! INSTANT RESPONSE!

RADIO CONTROL!"

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NEW!
1/2A RC

Designed with the Beginner in Mind!

SO EASY TO BUILD . . .

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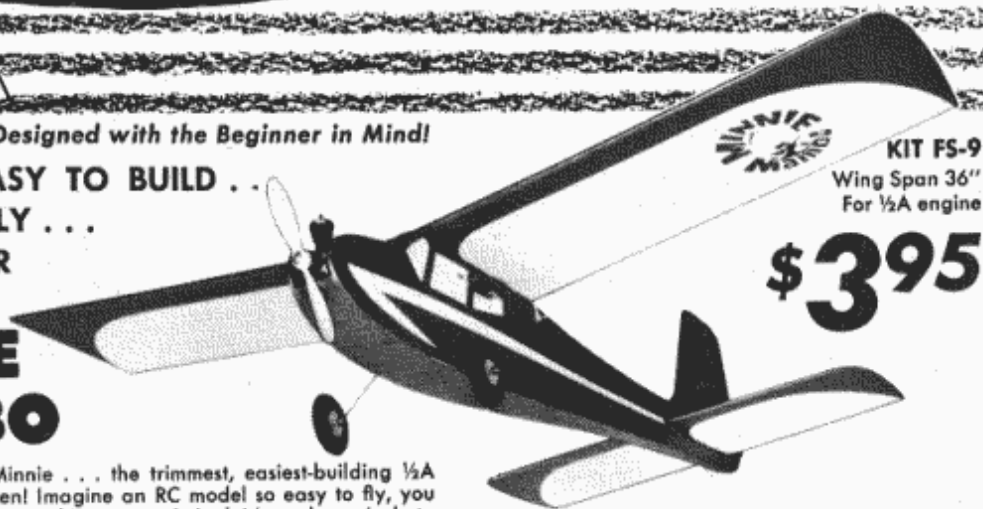
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You'll fall in love with Minnie . . . the trimmest, easiest-building 1/2A RC model you've ever seen! Imagine an RC model so easy to fly, you can launch it without even taking a step! And it's such a cinch to assemble that it's a natural for beginners!

Special features include one-piece fuselage sides . . . new anti-warp design elevator . . . sheet-covered fuselage for extra strength and longer life! Kit includes formed landing gear, colorful decals, silkspan, shaped and notched parts of balsa and plywood, etc.

Complete step-by-step plans loaded with illustrations and hints.



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sometimes we lose them. Tell us how you obtained your flying area. What officials or departments proved helpful? What was your "pitch?" Any problems along the way? How did you overcome them? What advice do you have for less fortunate clubs? This area is of paramount importance—won't you help?

5. Active participation in contests has built many a fine club to a sharp effectiveness that has lasted for years. How can new, small, or just shaky clubs, get into the swim? What should they do? What did you do?

6. Shows, exhibits, flying demonstrations, and so on. What promotional schemes have you tried? How did they pay off? What are the pitfalls? What works like a charm? We need to know.

7. Meetings. We all know there is an art to running meetings. Some clubs bog down in drawn-out business and haggling and argument. How do you streamline procedure? Do you resort to committees? Just what makes a satisfactory meeting that brings out members again and again? Short, long, or mixed? What officers do you have? What about dues? Do you require funds and how do you raise them?

8. Club bulletins and other publications. When should a club have a paper? A matter of membership? Do you have a paper? How big? How many pages? How is it prepared? What does it cost you to produce—and is it worth it? What do you put in your paper? Tell us how you do it, how you print it, and we'll tell others.

Where do we go from here? To get things rolling, this column plans next month to introduce some of the most successful groups, via their club papers, affording useful impressions of programs and activities. Following that, we'll present a detailed profile of one of the nation's most famous clubs, sitting in on a meeting, reviewing their programs, history, and goals and, quite important, find out how and why they enjoy it. By then, the third month, reports from the field will have been analyzed for future, fruitful presentation.

You can help your fellow modelers by writing to this column. Address communications to: Club Chatter, c/o American Modeler, 575 Madison Ave., New York 22, N. Y.

SHOP TALK Across The Counter

■ Jim Preston of the J. & J. Hobbyhouse, 122 N. Main St., Attica, Ohio, announces construction of a new building 2 miles East of Attica on Route #224. An adjoining model airport will have U-control circles, free flight area, R/C runways, and a boat pond. Preston expects to have the site in operation not later than October 1st; "open to modelers 9 AM to 9 PM seven days a week, with no charges involved."

Radio Control Sub. From the many inquiries we get about R/C submarines we imagine there will be much interest in the \$19.95 kit shown by Polk's Model-Craft Hobbies (314 Fifth Ave., NYC 1). Shaped wood parts, formed super-structure, dual electric drive shafts, full size plans. No complicated diving mechanism. Called the "U25."

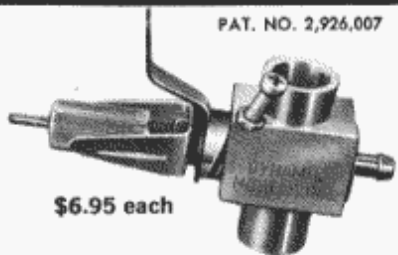
Bigger By Banner. Banner Model Co., manufacturers of "Streamlite" model airplane wheels, now offer a 3" diameter job as part of their standard line. All Banner items are sporting new packages.

Monogram Expansion. Billed as "the largest single building devoted to the manufacture of plastic hobby kits," Monogram Models' new Morton Grove, Ill., home consolidates all its operations under one roof. Monogram, founded in 1945, began business in a basement with 2 employees; in its latest plant (cost, \$1,300,000), it will employ more than 250 people.

Industry Briefs. Philadelphia's Bernie Paul, subject of a recent A.M. story, took over the local branch of another major hobby-model distributor . . . Donald F. Duncan, a model manufacturer years ago, is currently foremost producer of Yo-Yos . . . Hobby trade association earmarked funds for 1962's AYSC competitions . . . Model car building contests catching on among Eastern hobby dealers.

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AUTOMIX Features

- NO FLOODING
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- HOLDS FULL 2 CYCLE AT ANY SPEED FROM IDLE TO FULL THROTTLE
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NOW AVAILABLE... Optional Extra Needle valve pins with different tapers for all AUTO MIX Carburetors. Top performance regardless of altitude, temperature, fuel type, etc. Cat. No. 1524 \$1.25 per set.

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McEntee

(Continued from page 33)

years. It weighs 7-lb, 3-oz.; if it proves out in flight tests he hopes to make one with epoxy fiberglass fuselage and wings of expanded polystyrene—which should cut down building time a bit.

LIDS Meet. Second meet of season in NYC metropolitan area, sponsored by Long Island Drone Society, was success in spite of early morning overcast. 35 entrants, the majority in Multi. Winners: *Multi*, Jerry Wagner (Plainview, Conn.), low wing original, 140 points; *Intermediate*, H. McEntee (Ridgewood, N. J.), shoulder wing original, 107; *Rudder*, E. Pomponi (White Plains, N. Y.), 68.

Threatening early morning skies (and it was Mother's Day) reduced number of entries, but LIDS had fine batch of prizes for those who did show up.

A monitor in action on 27 mc all day, a surplus tank receiver used just as you purchase it, would make a fine deal for other clubs. The BC-603, it's usually listed as an FM receiver covering 20 to 27.9 mc. Simple external connection changes it into an AM receiver. Used on 12 volts (be sure to get 12 volt dynamotor DM-34), 10 tube superhet has loudspeaker on case front. Its 10 push-buttons can be set to any desired spot frequencies over the tuning range; has continuous coverage knob and dial, other features useful for monitor service.

Widely available in surplus market, we found it listed brand new by RW Electronics (2430 S. Michigan Ave., Chicago 16), \$17.95; DM-34, also new, \$2.95. Used prices are often considerably lower; RW Electronics quotes \$14.95. This monitor is most useful to the LIDS, since there is a traffic light system on 27 mc in operation near them on Long Island.

DC/RC Symposium. At long last, DC/RC had perfect weekend for 4th Annual Symposium. Meetings and banquet held at Applied Physics Laboratories of Johns Hopkins University, 40 minutes into Maryland countryside from Silver Spring. Most flying took place at DC/RC club field near Colesville, Md.

Modelers came from 15 states including California, many from north, south and midwest. Symposium was sponsored jointly by DC/RC and the AMA; techni-



Columnist McEntee launches Norm Cassella's Charger at LIDS meet.

cal papers given, available from AMA for \$3 per copy, covered: Transistorized Intermediate Class Systems, John Phelps; Relayless Servos for Reed Receivers, Robert Elliot; The Superheterodyne Receiver for R/C, Vernon Macnabb; Triple Proportional R/C Receiver, William Hershberger; Engines, Fuels & Throttles for R/C, Darrel Peugh; Quadruple Proportional R/C System, Hershel Toomim. The bound volumes include many illustrations and a 40-page index of R/C articles that were published in U. S. modelplane magazines from 1955 to the present.

This priceless index, compiled by DC/RC members, should be a tremendous time saver for anyone searching for articles on specific R/C subjects. It is broken down into 15 categories, such as Transmitters, Receivers, Control Systems, Power Supplies, etc. Many Symposium attendees felt this index alone was worth the price of admission!

JIFF. Jersey Invitational Flying Fair, a fun-fly weekend sponsored by the Central Jersey RCC was held at Sky Manor



It used to be this big, sez Joe Martin after his Orion bit the dust during LIDS Long Island meet. Was modified version.

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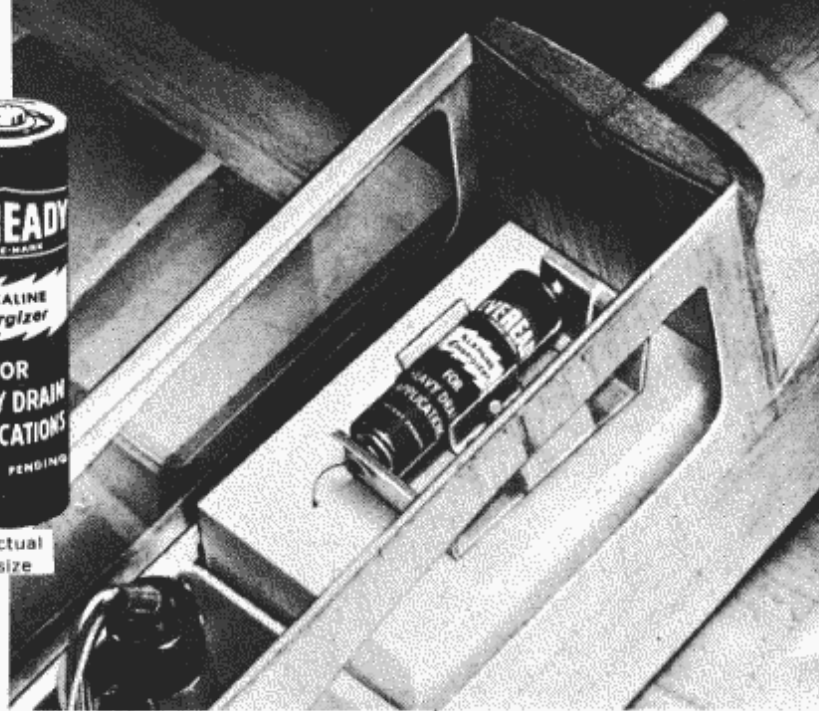
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Airport, Quakertown, N. J., ideal for such an affair.

The model boating contingent of the CJRCC put on a demonstration in the field swimming pool. Barbecue banquet was enjoyed by 40 who braved earlier rain. Sunday modelers competed in various informal events such as Spin Contest, Touch & Go, Roll Contest, Le Mans Start. Top prize was a beautiful fur-lined trash bucket, in which the sufferer of the worst crash could carry off the remains! Parachute jumping staged by Tri-State Skydivers, two leaped out of their plane at 7500' altitude (real, not R/C!), for free-fall of a mile before their chutes popped! Airport planes scouted out several models that flew away, all were retrieved in good condition. CJRCC hopes to hold its October Stunt contest at the same spot.

International Boat Club. J. Tarvin sez Neptune Model Power Boat Club (5850 Rumble Street, S. Burnaby, B. C.) has members in England, Germany, U. S., and Canada. Club held regatta with events for Escapement-only, single channel; Rudder-only, servo, single or two channel; Multi channel with engine control; Free running steering event; Beauty event; Race for single channel air driven boats. Modelers attended from Bellingham, Wash., area and Harry Selene took back the Multi trophy.

Seal Relayless Receivers? Peoria R/C Modelers (Ill.) have concluded that such receivers are more susceptible to dirty reeds than reed units in relay type receivers. Vern Springer and Jim McClintick suggest relayless outfits be sealed to keep dirt out, that the reeds

be cleaned regularly. Latest member to make his first successful multi flights is Hy Lyle, 12 years old, who is fast becoming one of the better fliers in the club! Group has 90 minutes of films on flying sessions in the area, would be glad to swap same for showing for films from other clubs. Contact them c/o Hobby-models (418 SW Adams, Peoria).

He Started It All? First R/C club papers we can remember came from the Larks (Los Angeles) and the DC/RC. The former undoubtedly served as inspiration to what has become an avalanche of club papers each month. Called the LARK (this forced the Los Angeles group to change the spelling of "Controllers"), it was the brain child of Bob Bowen, who published it monthly for six years. In recognition of this, the club has presented Bob with an engraved plaque. Though "retired" from the Editorship, Bob who knows how tough it is to dig up copy continues to send news to help his successor, Bill Butler.

Paper reports Bill Deans (of reed unit fame) will market 8-pin servo plug of light-weight nylon at less than \$1.50 a pair; 21/32" x 13/32"; each unit has 4 pins and 4 sockets; you don't match "pairs"—any two will fit together.

Club contest at Chino saw as winners: *Class 1* (single air control), Bill Williams, 69 points; *Class 2* (two air controls), Dave Gammie, 53 points; *Class 3* (anything goes), Lloyd Sager, 519 pts. Exhibition flights were performed for Casa Colina Rehabilitation Center patients transported in wheel chairs to the field. FAST Club Speed Contest at Mile Square field won by Ray Downs with 43 mph. First in AMA category taken by Keith Storey at 44.5 mph.

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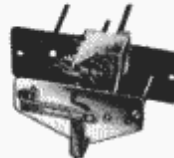
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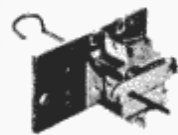
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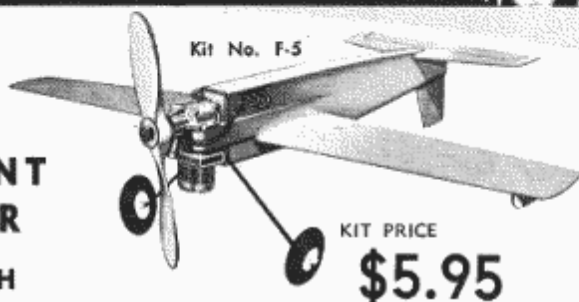
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28" WINGSPAN

FOX TYRANT RAT RACER

Clocked at 110 MPH



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Specially designed around the power-packed Fox .40, this clean, uncomplicated design will consistently turn speeds of 110 MPH. Built like a brick outhouse, the Tyrant can tumble on landing without damage. Kit Features: plywood fuselage and tail planes; solid balsa wing; simple, rugged construction; die-cut parts; hardwood motor mounts and detailed plans. It is the world's finest competition Rat Racer, yet is easier to build than most trainers. Fly this super-fast Racer and you will fly a winner.

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win. But the same fellows will spend hours on the golf course with no hope of breaking par, or hours in the bowling alley without a chance of rolling a 300 game. They keep trying to improve themselves. But in modeling they seem content to just roar around in the air, without improving their technique. With a little practice and contest participation their flying would certainly improve.

New Look? Photo of upswept fuselage inverted engine "Sorcerer" flown by Bob Dunham appeared in our July issue, page 48. More details come from RCL/Orange County (Calif.) bulletin: design by Don Menzimer, plans from Orbit Electronics, \$3.50 postpaid. All surfaces swept back, inverted engine, trike gear. Bob's weighs 5 1/4 lb., K&B 45 power, fitted with Orbit gear.

Valkyrie . . . Added Notes. Its pix also in July issue (p. 32); designed by Bill Bertrand (14803 Englewood, Allen Park, Mich.). Span 65", 675 sq. in. area, 5 1/4-lb ready to fly. Torp 45, original semi-symmetrical 9 1/2% thick airfoil. Feedback servos based on Micro-Mo motors; full-house proportional outfit operates on single channel! Bill offers rough blueprints of plane, \$2.50 (not the equipment).

TORKS Active. The Oklahoma Radio Kontrol Society's Tom Williams (Box 4386, Oklahoma City) reports about 20 multi planes flying, twice that in rudder. Tom operating 10-channel CG relayless outfit, feels much of the trouble reported with 3 volt equipment is due to poor soldering techniques, since with this low voltage you must have good connections throughout. To prove his point, T. W. flew his 10 channel Esquire all day with just 1 1/2 volts on receiver and servos. Worked like a charm—not too much servo power available and of course he could not get simultaneous controls, but no problems showed up.

Contacts Wanted. Relay? No, really! John Purpura (1007 Nathaniel Rd., Cleveland 10, Ohio) sez Cleveland Radio Controls, Inc. would like to correspond with other groups, exchange club papers. Membership is 57, monthly paper is the Plane Dealer. Prexy Bill Richardson did much in getting a public flying site. Majority fly multi, with wide range of equipment and plane designs.

More On Venting. Remember our mention of razor blade slits to vent plastic cased nickel-cad batteries? This is possible only on cells that have rubber "valve" on removable filler screw. Walt Good (DC/RC) had set of 5 AH cells where screw turns into a shielded neck with rubber ring fitted to latter. Since these cells were to go in a hand-held transmitter (yup—Walt has finally retired that huge lead-lined dull green transmitter with the Y-type antenna!) and charged without opening case to loosen screws, W.A.G. evolved simple method of reducing vent release pressure. A dental hand tool with 90 degree curved end was sharpened and inserted into cell neck to prick holes in rubber from inside. Possibly a bent thick pin would do the same job. Several pricks were made through each valve. His cells, not heavily "constrained," do not swell up when charged, so it's evident the modified valves are releasing pressure at point lower than standard 20-lb or so. He has found no evidence of corrosion inside case so far.

Walt provided info on patching kit

Busy Bisons. Western N. Y. State club via Fran Ptazkiewicz (23 Marlee Pl., Tonawanda, N. Y.) reports trend toward R/C Scale, with such models as Spitfire, Airacobra, Curtiss Hawk, Waco Cabin, L-19, Smith Mini-Plane, plus 82" span Curtiss Robin under construction. Rudder, Multi, Pylon meet set for Sept. 16-17.

Prop Named. Nylon variable pitch production props developed by Dale Root, named by Ted Morrison and Bob Heise: "Pitch-O-Matic."

East Bay (Calif.) R/C boys have set up group which will fly stunts together, do elaborate routines. This will take a lot of time and practice; team planes must be of same design, power, have full-house controls with trim.

Monroe Retriever. When RC/NC members meet in Monroe, N. C., they enjoy professional retrieving service for strayed models! They fly from Monroe Municipal Airport, field operator Norman Potteat is an ardent R/C fan. He pilots a nifty (full-size) open cockpit Baby Ace. Cruising near the field, he will follow a wandering plane till it lands. Then he returns to the airport, takes model owner aboard and out they go to retrieve plane.

Getting 'Em Out to Contests. NERCM (New England) Relay Chatter writer Joe Martin shocked when many members suggested club drop all contest flying. NERCM has tried all sorts of contests, but same fliers show up at each, few new ones. Joe figures average club flier doesn't enter because he feels he can't

by Hysol Corp. (Olean, N. Y.)—#0151, "reading-clear" epoxy adhesive. The material, somewhat cloudy when first mixed with hardener, turns to glass clear film as it cures. Useful bonding metal to glass, metal to fiberglass, repair of printed circuits, many other combinations. Available only from Hysol distributors (Hysol will supply address of outlet nearest you), \$2.95.

Cute Bipe. Tiny biplane, Radi-O-Too, designed and flown by Herb Clukey (133 Ashley Pl., Fairfax, Va.), was conceived as free flight six years ago; very stable, simple construction. Both wings have 23½" span, 4¼" chord, so there is plenty of area to carry R/C gear. Herb has flown it with Citizen-Ship UR and LT-3 receivers on escapement. Intended for .02 engines. Detailed plans from Flyline Models (above address) for \$1.35. Herb has hand-cut kits for \$6.95. Also available: ¼A Curtiss Wright Pusher plans, 72" span P-38 with two .19 engines, plus other planes.

"Separator" Plans. This hot rudder plane has been flown with great success in contests according to Jim Houston (1626 West Malone, San Antonio); close-coupled shoulder wing job has been made in several sizes. Plans for Separator Mark IV in three sizes from Arthur Lang's Hobby Shop (4908 S. Flores St., San Antonio, Texas); \$1.50 each—35" span, 38 incher, and 5' version. The 35 is flown normally with .049 Space Hopper; .09 K&B is used in the 38. Largest size, fine contest flier, has been scaled down to 4' for .15 power. Jim recommends standard "compound" escapements not be used in these hot planes. Normal setup is SN escapement on rudder, a compound wired in parallel to get advantage of quick-blip engine control, another escapement to work engine throttle. Jim points out that the plans have little detail, local buyers copy missing details from the original models. He suggests interested modelers contact him for their first plans to get assembly instructions, details of trim and balance. San Antonio fliers cover their models with parachute nylon—they buy surplus parachutes at the Kelly Field AFB repair depot, at low cost!

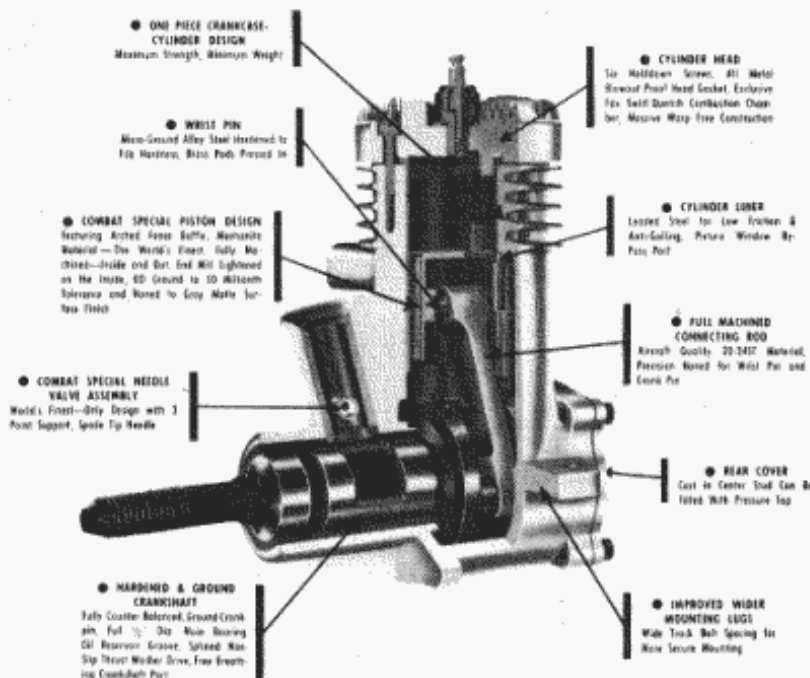
Active Scaler. His newest scale plane finished except for canopy and equipment installation, Claude McCullough (Route 5, Ottumwa, Iowa) has been stalled on the bubble business. He has home-molded many smaller canopies with no trouble, but the 18" greenhouse required on his new Fairey Barracuda V British shoulder wing torpedo plane was a toughie. It has 70" span, 770 sq. in. area, will weigh around 9 lb. Mac sez this was simpler to build than his Martin Mauler (see cover of May '61 A.M.). Latter plane in spite of its weight turned out to be docile job in the air.

McCullough interested Maxey Hester of Des Moines in Scale planes (Maxey was "test pilot" on the Mauler project), drew semi-scale plans for P-63 King Cobra. A very fast builder, Maxey had this plane flying in no time. Weighs around 8 lbs.

Too Fast? Beginning to wonder if plane speeds are getting too high for good stunting? Not many modelers can competently handle the present "bombs", even those few who can feel we should slow down a bit. One of the early advocates of high speed stunters International Champ Ed Kazmirski apparently feels there is a point here. We hear Ed has been trying out new designs that will

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do the stunts the way he wants them to . . . but at more moderate speeds. One plane he has under consideration, Taurus, has 15% thick wing section, weighs 5-lb, 6-oz. Ed has tried many unusual ideas, even an anhedral wing (wing tips droop downward, instead of angling up as with dihedral). This was not considered too practical—tips were too prone to drag on the ground during landings!

Air Force Meet. Harold deBolt who helped run the annual U.S. Air Force model meet in Japan reports about 50 entries. Small turnout due to unsettled conditions in Southeast Asia; 20 entered R/C. Rudder fliers made the best showing. Multi boys needed more flight experience. Most were using Jap equip-

ment, which seemed to work well. All are plagued by lack of those little modeling accessories that we here take for granted. DeBolt took part in a Japanese-American R/C meet, which he won with a trike-gear LW Pursuit fitted with Space Control equipment. He has had a lot of flights with this, is increasingly enthusiastic about it, though he freely admits it took some learning after his having been a reed flier for so long.

R/C Rules Changes. AMA bulletin carried proposals for rules changes as approved by R/C members of AMA Contest Board. These will be up for discussion for 6 months, members and clubs should make their reactions known to their respective R/C C.B. members so latter will reflect feeling of members.

New . . . 100" GLIDER

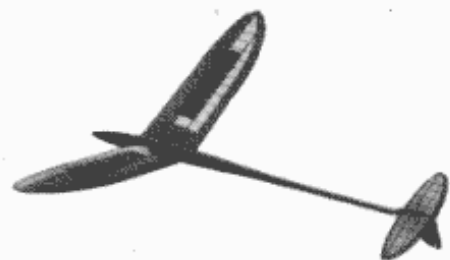


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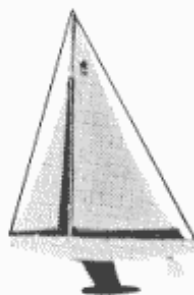
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Western

(Continued from page 10)

one model. Bob's 2nd bird, for some reason or another, D-T'd early for a short flight.

All in all, Nordic was a dither, 8 entrants were only 18 seconds apart after 4 rounds in Los Angeles, the wind was so strong fliers were using helpers for the chase, their models were off the field in 3 minutes.

Fantastic Wakefield! Bill Poesch, a Wakefield old-timer, had an outstanding rubber-powered entry. Bill acquired some 1 1/2 thousandth 2024-T4 aluminum sheet; using this as laminate with balsa as a core he fabricated his fuselage and wing center panels so light and strong that it was simply amazing. For the tube fuselage he first put on a layer of dural, then cemented 1/16 sheet, then another layer of dural using epoxy resin. This fuselage was lighter than magnesium with more than ample strength. His wing was carved to shape from solid balsa, then lightened by punching 3/8" holes closely and alternately spaced, this was then covered in the center sections with 1 1/2 dural using epoxy. The tips were fabricated the same way except thin balsa sheet was used for covering.

In power we know of 5 qualifiers in Los Angeles, 3 in Bakersfield, 2 in the San Francisco area, one in the Washington-Oregon area. In Wakefield there were 7 qualifiers in the Los Angeles area, 4 in Nordic.

In the indoor semi's, Joe Bilgri topped all with 32 plus minutes. Carl Rambo, who had top elim time of 35 plus, just could not get a complete flight in due to the "Jet Stream" inside the Moffett hangar.

R/C flying at Chino Airport sees more birds with trike gears: Smog Hogs, Astro Hogs, and a multitude of new originals. Top R/C fliers from Radio Control League of Orange County and Larks outfits put on aerial shows on Armed Forces Day at El Toro Marine Base, March Field and Norton Air Force Base to very appreciative crowds.

Las Vegas Annual R/C Contest. Many fliers stayed away afraid they couldn't get reservations due to golfing's Tournament of Champions. Those who went had a ball—till the wind came up at noon Sunday. When the 20-foot long sock started to straighten out, they decided to call it quits. Capt. Larry Beason and Jack Butler again fought it out with Larry and his Stormer, coming out on top. Jack peeled a wing 200 feet up. Ugh! Hal DeBolt found time to stop by, was promptly put to work!

Newsletters' Wisdom. Ocie Randall (in his 21st year with the "Fresno Model

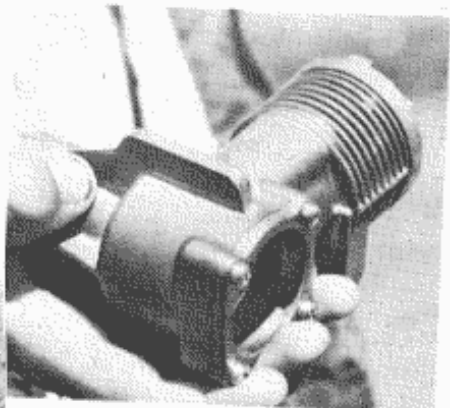


Dave Gammie and his "Grasshopper"; R/C plane has two moveable surfaces. Consistent flyer, reports Everett.

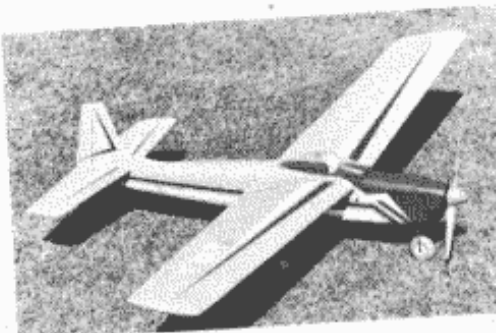
News") on a subject that modelers should heed: "The practice of parking your car in the parking area here in Fresno, then getting out your planes, assembling them and flying right there places a real dangerous situation on our club members. Fortunately most of our club members use the testing area to the east of the flight circles or the flight circle itself for testing. Now and then some fellows come out who are not members (which is fine, we love to have them) and are not familiar with our rules. It is up to each and every one of our club members to notify any person who does this. The modeler who flies his plane from the parking area endangers our ladies, children and men spectators. Luckily there have been no serious accidents. But — we almost had two of them at our last contest. So please, fellows, don't do it — notify anyone who does to fly away from the cars." Frank Gallo, their C/D, pleads for cooperation. This happens all too often at too many places and it is very dangerous, specially in this present day when complete families make this flying of model airplanes a family affair. Be safe! Fly safely!

Gogi Goguillot takes note in the Vancouver Gas Model Club "Hot Head" that they have been in operation since 1935! Also a sad story of another modeler killed flying U-Control near power lines. Chased from school grounds, chased from parking lots, chased from recreation areas, the only thing left was near power lines.

Jack's Our Friend. Pomona's City Council passed an ordinance prohibiting Go-
(Continued on page 55)



Above: crankcase of Veco (nee Lee) 45; note exhaust on opposite side from Lee prototypes. Columnist Everett's "El Pachangas" (Good Times) at left features full-house radio installation. Original design, 735 sq. in. area; 6-lbs; Atlas trike gear.



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1/16x1/4	2/3e	1/8 x2	17e	1	x2	72c
1/16x3/8	3c	3/16x2	21e	1-1/2x2		97c
1/16x1/2	4e	1/4 x2	26e	2	x2	1.25
1/16x3/4	5e	3/8 x2	32e	1/2	x3	88c
1/16x1	7e	1/2x2	38e	3/4	x3	90c
3/32x3/32	4/5e	1/16x3	18e	1	x3	1.15
3/32x3/16	2/5e	3/32x3	21e	1-1/2x3		1.45
3/32x1/4	3e	1/8 x3	25e	2	x3	1.75
3/32x3/8	4e	3/16x3	31e	3	x3	2.65
3/32x1/2	5e	1/4 x3	38e	1/2	x4	88c
3/32x3/4	7e	3/8 x3	50e	3/4	x4	1.18
3/32x1	9e	1/2x3	58e	1	x4	1.48
1/8 x1/8	3/5e	1/16x4	28e	1-1/2x4		1.83
1/8 x3/16	2/5e	3/32x4	30e	2	x4	2.36
1/8 x1/4	3e	1/8 x4	35e	3	x4	3.42
1/8 x3/8	4e	1/4x4	40e	1/2	x5	1.27
1/8 x1/2	5e	3/8 x4	47e	3/4	x5	1.80
1/8 x3/4	7e	1/2 x4	52e	1	x5	2.20
1/8 x1	9e	3/4x4	59e	1-1/2x5		2.82
3/16x3/16	4e	1/16x5	35e	2	x5	3.44
3/16x1/4	5e	1/8 x5	40e	3	x5	5.17
3/16x3/8	6e	3/16x5	45e	1/2	x6	1.83
3/16x1/2	8e	1/4 x5	50e	3/4	x6	2.40
3/16x3/4	10e	3/8 x5	57e	1	x6	2.97
3/16x1	14e	1/2 x5	64e	1-1/2x6		3.77
1/4 x1/4	4e	1/16x6	40e	2	x6	4.58
1/4 x3/8	6e	3/16x6	45e	1	x7	6.31
1/4 x1/2	8e	1/8 x6	50e	3	x6	8.50
1/4 x3/4	10e	3/8 x6	57e			
1/4 x1	14e	1/2 x6	64e			
3/16x3/16	4e	1/16x8	11e			
3/16x1/4	5e	1/8 x8	14e			
3/16x3/8	6e	3/16x8	17e			
3/16x1/2	8e	1/4 x8	20e			
3/16x3/4	10e	3/8 x8	23e			
3/16x1	14e	1/2 x8	26e			

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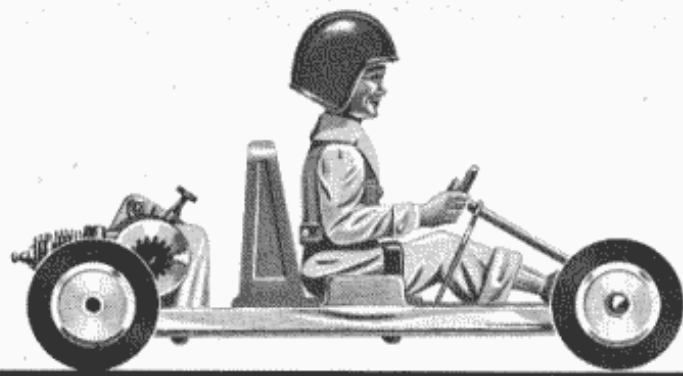
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Test Drivers Report: Cub-Kart's OK!

Here's a great item to keep small fry active; cars can be tethered, or raced straight-away.

■ Three and a half years ago there was no such thing as a "go-kart." Today there are untold thousands of these noisy little beetles roaring around parking lots or on special tracks. Little did Indy race car builder Art Ingels realize that his brain child would mushroom into one of the biggest week-end activities since Wilbur and Orville decided that flying was not "strictly for the birds."

When Al Lewis invited us to test the Cub-Kart built by the Herkimer Tool and Model Works Inc. of Herkimer, N.Y. we literally jumped at the opportunity. At a private briefing session, Chuck Brebeck, its designer, not only checked us out on handling qualities but filled us in on the development of their kart from its earliest design stages and modifications to its industry presentation—4 1/2 months and 3,000 track tested miles later.

The following weekend, with our Cub-Kart safely nestled in the car trunk, Tim MacEichel, my mechanic, and I drove out on Long Island to one of the many newly opened Kart tracks. When we arrived activities appeared to have reached their peak. The hustle and bustle of tune-up time kept everyone as busy as a herd of cows in fly time.

Mac and I unloaded our gear and set the Cub-Kart on the track. It must have been the bright red plastic upholstery that caught the eye of the other aficionados because as quick as you can say Enzo Ferrari we were surrounded by drivers and spectators.

When the track was finally cleared for us we decided to get right on with our first trial run. One flip and the engine started. Our inexperience with Karts dictated that we take it easy for the first tank of fuel. Visions of scratching our shiny new kart on the blacktop did not present a happy picture, nor did the absence of a roll-over bar to protect the driver add to our peace of mind.

The first few laps demonstrated the excellent road qualities of our kart and without realizing it we began circling the track at full bore. An empty fuel tank 36 laps later ended our first trial run.

Comments from more experienced drivers indicated that this was the best handling kart they had ever seen. It takes turns like it was tied to a string or running on rails! There is absolutely

no lean and it would seem practically impossible for it to flip. This is definitely one kart that anyone can drive with complete safety. Hitting bumps at full bore caused the Cub-Kart to become air-borne on several occasions but even this had no ill effects on either kart or driver. Shall we stop right here? What more can we, or should we say...?

In all fairness, we must admit that what we tested was a 1/10 actual size model that sells for \$8.95 including the driver. However, the trip to the track and the genuine enthusiasm of the full scale drivers for our miniature kart are factual.

The exceptionally fine riding qualities of the Cub-Kart are a tribute to Herkimer designers who obviously have hit upon a perfect combination of the 3.5:1 gearing of their racing .024 engine to the all up 10 oz. weight of the kart. The live rear axle affords snappy acceleration and gets the kart up to top speed in about 20 feet. No starting push is required. Solid neoprene tires give good traction with minimum wear. Serations in the aluminum wheels aid greatly in preventing tire slippage.

The chassis is a solid pan formed from aircraft grade aluminum. Hardened steel bushings are used at the rear axle to reduce wear and maintain proper gear clearance. The cut gears are also hardened steel. The driving gear has an odd number of teeth (13) while the driven gear on the axle of the rear wheels has an even number of teeth (46). This odd-to-even design greatly increases the long-wearing qualities of the gears by reducing the number of times the same two teeth (any 2!) engage each other. No lubricating of the gears is required as the engine exhaust does a beautiful job of depositing a film of oil over the entire rear end of the kart.

The nickel plated steel flywheel allows the engine to really wind up even though it has been detuned slightly by a reduction in compression ratio. The driver's seat, floor and simulated front controls are molded of red polyethylene plastic while the scale driver, steering column and wheel are blue. The choice of this plastic was a wise one for it is practically indestructible and it is not affected by gl-fuels. A metal "seat belt" ties the plastic parts to the chassis

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Wing Span: 66"
Wing Area: 860 sq. in.
Wt., Minus R/C: 60 oz.
Power: .19 to .49 Eng.

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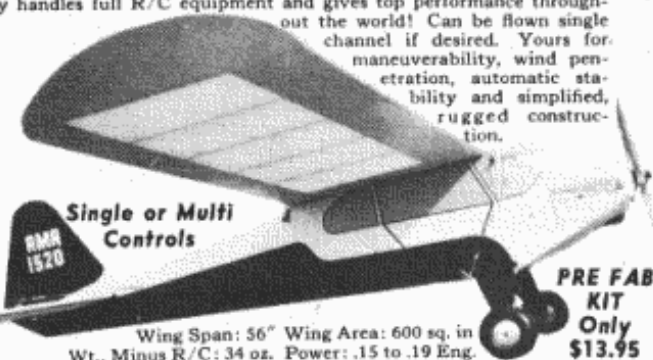
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Single Channel R/C Flying At Its Best!

More performance and action than you ever dreamed of with a single channel radio and only an .09 engine!

Engineered for finer wind penetration, take-off and maneuverability. Removable R/C unit for easy maintenance and interchangeability. Simplified assembly.



Wing Span: 48"
Wing Area: 432 sq. in.
Wt., Minus R/C: 21 oz. Power: .09 to .15 Eng.

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via a single bolt.

Engine starting is not unlike Herkimer's aircraft powerplant. A healthy prime directly into the exhaust, needle valve set at approximately 3 turns open and a good spin of the drive wheels results in fast starts every time. The use of a reed valve type engine is the only point that can puzzle you. In its aircraft application the engine's ability to run backwards is easily detected by the propeller blast. In the kart, however, it is almost impossible to tell in which direction the wheels are turning. This can prove a little embarrassing when the kart takes off backwards! However, with practice in the starting procedure, this should not prove too troublesome.

An .038 music wire bridle is supplied as is a 20-pound test braided nylon tether and a double-headed spike equipped with a swivel hook to act as a center post. If a circular course is to be run, fashion a weighted platform into which the spike can be secured. The instruction sheet supplied suggests an 8" x 12" board with a piece of 2 x 4 nailed to it. The spike is driven into the 2 x 4 until the swivel hook is approximately 5" above the ground. At top speed—about 20 mph and on a 6' tether the Cub-Kart only develops 3½ pounds pull so a building brick on each side of the 2 x 4 is sufficient weight to hold the center post in position.

A circular track to handle more than one kart at a time will require accurate handicapping; even to run single karts against the clock means you need a stop watch. Straight line running for karts in actual competition against each other demands neither. So this would

be our choice for a more exciting and far simpler "track" to regulate . . . providing space is available.

All that would be necessary is a 100' (minimum) length of 20-pound test braided nylon fishing line for each car to be run in a heat. Say up to four per heat. The lines could be fastened to two weighted 2 x 4's allowing 12" between lines. About 10' from one board a finish line is drawn. Immediately behind the finish line a loosely rolled blanket is laid across the lines to act as a safety barrier. At the starting line, the karts are "threaded" to the line through lugs provided on the front and rear of each chassis. With all engines running—and

with their front wheels on the ground indicating the drivers are ready—the operators at a signal from the official starter drop the rear wheels onto the track. No pushing is allowed! Each driver is responsible for maintaining tension on his own line to prevent accidents on the track. The only other requirement: keen-eyed judges at the finish line to declare the winner.

Sounds like great fun to us, how about you?

Specifications: Model tested—Cub-Kart . . . wheelbase, 5"; height, 2-5/16"; tread, 4"; overall length, 6-1/2"; weight, 10 oz.; engine, .024 O.K. Cub racing plant; scale speed, over 100 mph.

Flying Site

(Continued from page 13)

Of course, as all you club members everywhere might guess, some came and donated many hours of work, and others just didn't show up.

However, those who did the work feel the greatest pride in their model airport, and whenever they fly from its for the time and labor which they excellent facilities they feel well repaid pended.

Some of the clubs involved live some distance from Buder Park. For instance, most of the Yellow Jackets of South St. Louis, the club of Ronald O'Toole, Missouri's 1960 A.Y.S.C. winner, live about 20 miles from the park. They have the use of the parade grounds at Jefferson Barracks for flying by permission of the Missouri Air National Guard. However,

they consider the Buder Park model airport a valuable addition to their flying resources and have been behind it from the beginning giving their full share or more of the work required.

The Hazelwood Aero Modelers also have a long drive to the park, which is a handicap to the junior and young senior members. However, they feel that all small clubs in an area must pool their numbers in order to justify their use of public recreation areas. Also, they hope that the success of the site at Buder Park may eventually help them in getting some additional facilities closer home.

It is this full united front of the modelers and the willingness of the individuals to subordinate their own interests to work for the common good which have impressed the officials of the park and recreation department and made possible the excellent improvements of the model airport at Buder Park.

switch to Hi which gives stepped up output power. Lo was found adequate for matching Kraft receiver under most conditions.

Purchaser must obtain copies of FCC Form 505 for licensing, plus Part 19 of FCC rules dealing with Citizens Radio Service matters, before he can be licensed. Latter is available only from the Government Printing Office in conjunction with Parts 12 and 20, \$1.25.

What extras make this R/C Combo such a useful one to the beginner (and to his dealer)? You receive: Bonner Vari-Comp escapement, Fox .09 engine which has built-in fuel tank (can use larger external tank if you prefer), yard of covering silk, two 2" and one 3/4" wheels, Top Flite 7-6 propeller, Hillcrest type D box which carries all batteries required (four 1 1/2 volt pencils, a 2 1/2 volt B battery), switch and meter jack and plug. Also: foam rubber, rudder hinges, escapement rubber, bands to hold wings and landing gear, nuts and bolts.

Ace Kraft 27 mc Single Channel Tone Transmitter. Single 3A5 tube as oscillator and doubler, crystal at half output frequency. Two 2N224 transistors as 400 cycle multi-vibrator for grid modulation. Three section 57" antenna, 21" collapsed. Front panel on-off switch, Hi-Lo power switch-keying button. Case 3 x 5 1/2 x 8". With batteries, 4 1/4 lb.

Transmitter Power supply: "A" supply, 1 1/2 volts at 200 ma (Eveready #742 or equiv.); "B" supply, 67 1/2 or 135 volts (Eveready #467 or equiv.). With 67 1/2 volts, RF section draws 5.6 ma, modulator 0.5 ma; with 135 volts, these rise to 14.5 ma and 1.4 ma respectively. Modulation percentage, 100 on Lo power, 96% on Hi.

Ace Kraft 27 mc Tone Receiver. 6007 tube detector, three 2N224 transistors. Deans sub-miniature 5,000 ohm relay. Antenna length, not critical, 18" to 24" total. All parts mount on epoxy fiberglass P.C. plate 2-1/16 x 1 1/8". Receiver requires audio tone approximately 400 cycles, but not critical. Weight with plastic case, 2 1/4 oz.

Receiver Power Supply: "A", 1 1/2 volts at 10 ma; "B", 22 1/2 volts; with no signal input, about 1 ma; with tone signal, about 5 ma.

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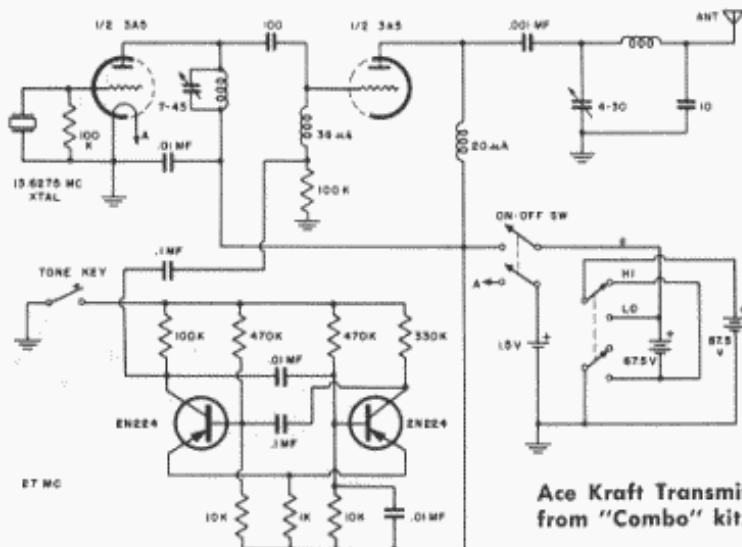
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Ace Kraft Transmitter from "Combo" kit.

Air Notes . . . from page 6

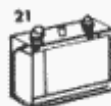
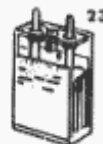
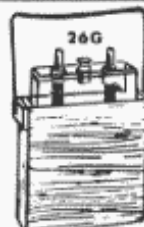
Northrop's Norair Div modifying WB-66D as Laminar Flow Control test bed. Company's LFC aimed to increase range, payload or endurance of large aircraft 50% by decreasing friction drag. Compressors in under-wing pods suck air through paper-thin slots in wings to prevent turbulence in boundary layer. LFC plane will have extra large wings; B-66's normally fitted J-71 powerplants to be replaced by GE J-79's aft mounted in fuselage nacelles. Three-year, \$30,000,000 program under USAF Systems Command.

According to AIA, U.S. general aviation (all civil flying except commercial airliners) will move upward from today's 70,000 aircraft to 100,000 by 1970. Example of growth was CAA's (now FAA) 1955 estimate that business flying hours would climb to 5,700,000 annually in 1960 (46% increase over 1954). Latest figures place business flying in excess of 6,000,000 annual hours. General aviation flies nearly four times the hours of scheduled airlines; sales have grown from \$25,000,000 in 1950 to \$200,000,000 in 1960; should quadruple by 1970.

End of 1960 showed world's air transport fleet (excluding USSR, Red China, and the other few non-members of International Civil Aviation Organization—ICAO): 388 turbo-jets; 723 turbo-props; 1,621 4-engined pistons; 2,282 2-engined piston planes. Some 659 jets are on order for delivery before end of 1962; successor to "2nd generation" jets will be supersonic transport (SST) with 1500 to 2500 mph speed range; earliest delivery seen as 1967-1970. However, there were more DC-3s (1,296) in service than any other type!

American Modeler — September 1961

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No. 23—2V, 3 amp. hr. capacity	1.75
No. 41—4V, 1.5 amp. hr. capacity	1.65
No. 61—6V, 1.5 amp. hr. capacity	2.75
No. 64—6V, 4 amp. hr. capacity	4.75
No. 21—2V, 1.5 amp. hr. capacity	1.25

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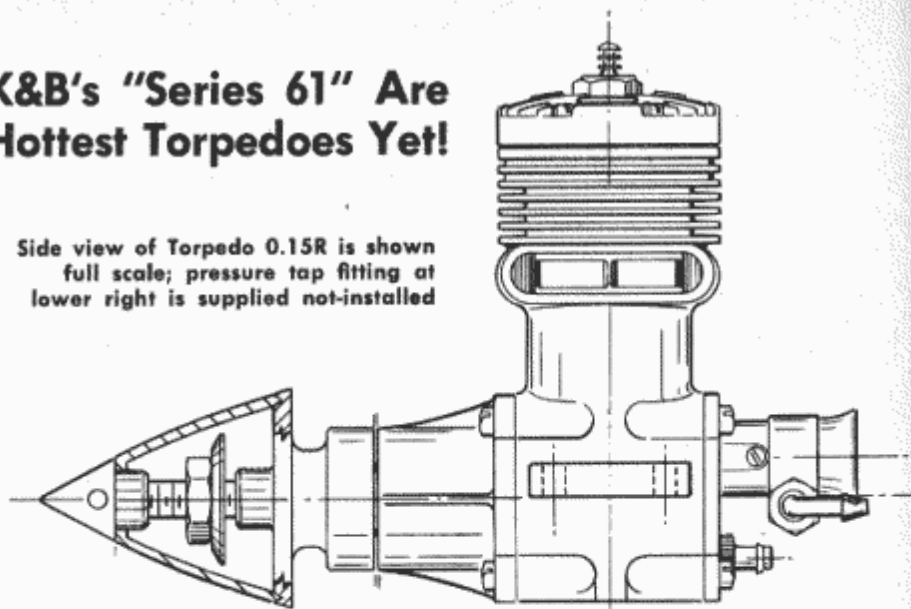
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BOX 128 — BAKER, OREGON

K&B's "Series 61" Are Hottest Torpedoes Yet!

Side view of Torpedo 0.15R is shown full scale; pressure tap fitting at lower right is supplied not-installed



"The dream engines you've been hearing about!" That's the way the K&B Mfg. Corp. of Los Angeles, Calif., extols the virtues of their all new Torpedo "Series 61" powerplants. We can't argue. Their 15/100 cubic inch displacement mill is one of the sweetest running, easiest starting and most powerful 15's we have had the opportunity to evaluate.

We imagine much credit should go to Bill Wisniewski for the design and development of the series. His years of "hop-up" experience and his many wins in the speed circles have been used to the fullest in the "Series 61" jobs.

There is very little that could be done to make these engines run any faster. Internally, where it really counts, our test motor was exceptionally clean . . . although we did detect feather edges at the bridges of the intake and exhaust ports. This could cause serious trouble if even the smallest piece should break off and drop inside. Careful removal will insure the long life inherent in the design.

K&B's 15-R utilizes the disc rotary valve induction system. This disc valve located within the crankcase, by virtue of its large diameter, can be ported to admit a greater volume of fuel than is possible with a crankshaft rotary valve. Added to this are features directly descended from the best racing engines which when added together get more fuel to the combustion chamber than any other engine of comparable displacement. Result is an extremely high power output. Addition of twin ball bearings and a Nylon rotary disc add further to the power potential by reducing internal friction to an absolute minimum.

The crankcase is cast of aluminum alloy as are the front and rear covers. Front cover houses the twin ball bearings. Rear cover incorporates the rotary disc valve and a hole drilled for fuel tank pressurization. Although this hole is sealed by a machine screw, a brass fitting (supplied) replaces it. Since the 15-R was designed to run with a pressurized fuel system it is recommended that such be used. During our test it was found that without a pressurized tank, the engine is extremely sensitive to fuel levels. Do not change the diameter of the pre-drilled crankcase hole . . . any alteration will prove detrimental to performance.

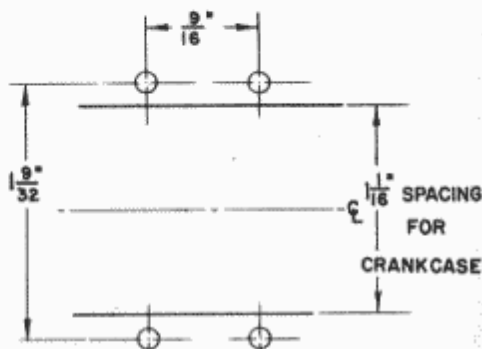
The crankshaft counterbalance is novel: completely round outwardly, it is fully counterbalanced. An aluminum

ring conceals the lightened portion. Prop drive washer-spinner backplate combination is an aluminum die casting secured to the crankshaft by an Allen head set-screw. (An Allen wrench is supplied.) The prop shaft, a separate piece, threads into the drive washer and tightens against the front face of the crankshaft. The spinner as supplied is intended for use with small high-pitch racing type props. For use with larger diameter props some altering will be required.

The connecting rod is forged aluminum. Two oil holes at the lower end insure proper lubrication; top end utilizes a steel wrist pin fitted with aluminum pads. The straight baffled "Electrolized" piston is relieved just below the wrist pin. Two 1/4" dia. ports in this relieved portion face the fuel by-pass. They allow fuel, otherwise trapped in the hollow of the piston, to escape into the by-pass via two matching ports in the meehanite cylinder liner. This liner, a hand push-fit into the main crankcase casting, is not keyed. Six machine screws hold the head and liner. As all mating surfaces are machined, the one gasket necessary is for the glow plug.

Another feature that adds greatly to the overall performance is the needle valve assembly. The 15-R incorporates a collector ring and six small fuel holes around the venturi throat. Venturi is adjustable in that you can rotate it to position the needle valve more conveniently. Tension on the needle valve is adjustable, or it may be locked to prevent "floating."

Except for removal of the cylinder liner the engine is easily disassembled for cleaning purposes. However, care must be exercised when reassembling not to reverse the exhaust port! The manu-



HOLE PATTERN FOR MOUNTING

American Modeler — September 1961

facturer advises against this for the simple reason that your engine will not run with the exhaust relocated.

Running tests were a delight. We had expected some hard starting as usual associated with most racing engines. Instead we found the 15-R to be an exceptionally fast. Even when fitted with a 5½" dia. prop, priming directly into the exhaust gave one-flip starts almost every time.

Break-in time is quite brief since only the piston need be "seated." After 30 minutes running rich our test engine was ready to be revved up. Incidentally this 15-R was more or less of a two speed engine . . . fast and faster! Rich running with the needle valve opened to maximum limit only resulted in a drop of about 4,000 rpm.

Best recorded speed with Supersonic 100 fuel and an 8/4 prop was 18,000 rpm. With a 5½" dia. 10" pitch racing prop this engine reached 17,000 rpm. Speeds of over 20,000 rpm should be easily reached with racing blends of fuel and/or lower pitch props.

Although designated "R" for racing, we see no reason why this engine could not be used for most any modeling need. In the nose of a good FAI free flight it should make a hard to beat combination. At control line circles it would naturally be at its best in speed events. Yet its ability to run steady at lower speed with larger props makes it adaptable to any type plane calling for an engine of this class. For those of you who intend operating this engine all out for extended periods of time, K&B will install special bearings designed for speeds in excess of 20,000 rpm. Cost of installation, \$12.

The introduction of the 15-R and the 29-R is certain to be hailed by many flyers seeking more power in these particular displacement classes — especially by serious minded speed merchants with no hop-up experience. Now they can compete on an even basis, at least engine-wise, with the best "file Doctors."

Specifications: Bore, .600 inch; Stroke, .537 inch; Weight 4.9 oz.

Western

(Continued from page 48)

Kart racing and model flying on city school property, has referred modelers to Jack Hoxsey, head of Parks and Recreation, to work together and establish "suitable" flying areas. Jack is studying the fairgrounds and various Little League parks as possible locations for flying activity under the supervision of the Parks and Recreation personnel. Flying tentatively would be allowed from 9 to 5 Saturdays and 1 to 5 Sundays.

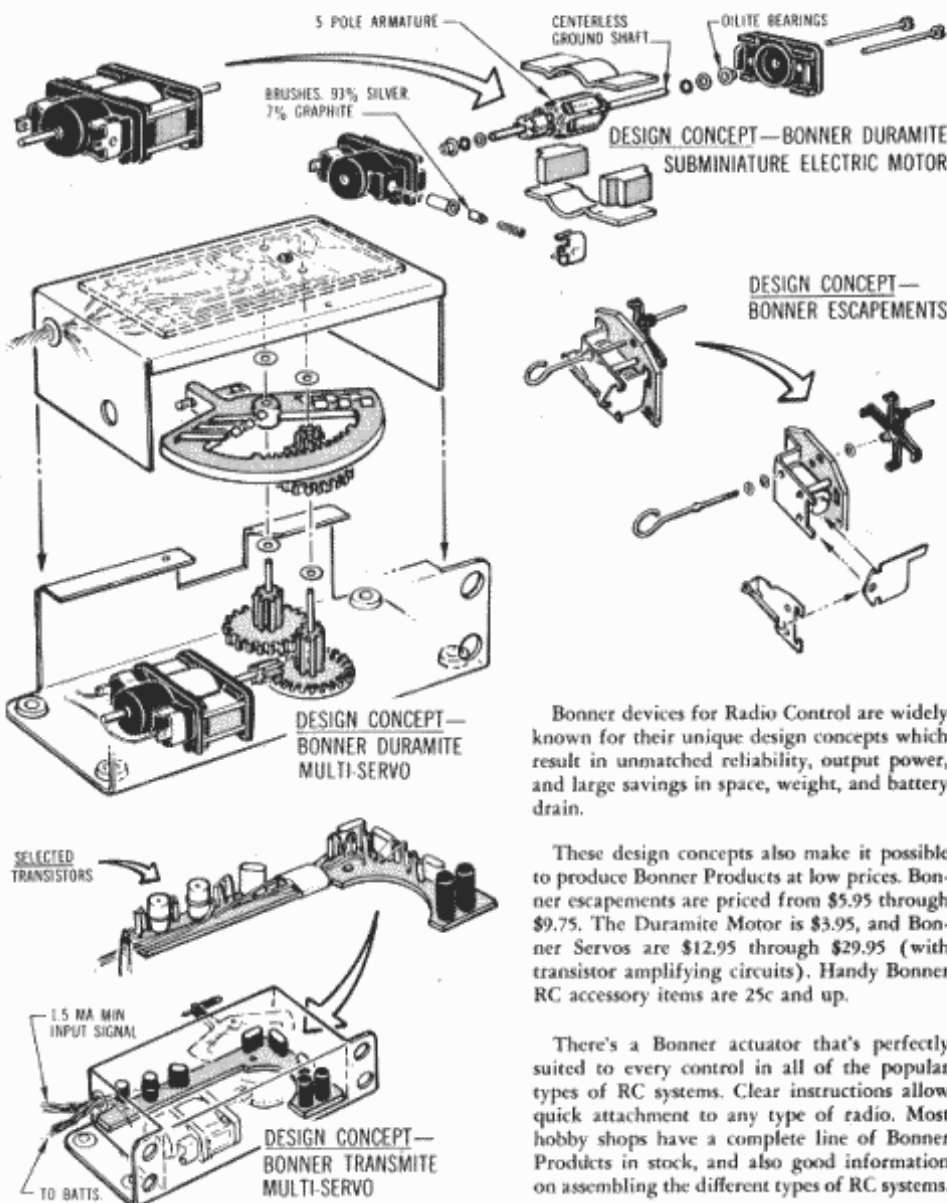
Hi-Sign on Hi's Stuff. Hi Johnson's new R/C 36 and variable-pitch prop received and tested with good results. Engine is well made, held to close tolerances, compression holds even with the smooth, free-moving parts. Power was surprising: turned 12-4 Nylon prop in excess of 11,000 rpm with Supersonic 100 fuel. Low speed in the zero pitch rpm of the variable-pitch prop very smooth though slightly rich. Hi sez a new needle valve of sharper taper eliminates this.

The prop a 11" diameter 5-7 pitch model was test flown by Lloyd Sager in his "Grandpappy" Astro. The test flight was number 398. Ground handling was exceptional — taxi out and stop easy, Torp 45 very smooth at no-thrust rpm.

American Modeler — September 1961

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These design concepts also make it possible to produce Bonner Products at low prices. Bonner escapements are priced from \$5.95 through \$9.75. The Duramite Motor is \$3.95, and Bonner Servos are \$12.95 through \$29.95 (with transistor amplifying circuits). Handy Bonner RC accessory items are 25c and up.

There's a Bonner actuator that's perfectly suited to every control in all of the popular types of RC systems. Clear instructions allow quick attachment to any type of radio. Most hobby shops have a complete line of Bonner Products in stock, and also good information on assembling the different types of RC systems.

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In flight the 11" blades even at 7" pitch was not quite enough prop, so the 12 recommended should be adequate. Flying for the first few flights should be done carefully since thrust stops completely when the engine is throttled back. Lloyd, ready for this, was equal to the occasion. We broke a set of blades on the flight but found that it took only a few minutes to replace them and that it was easy—even the first time. The blades are carefully weighed and put into three classes: L for light, M medium, H heavy. The weight range is a mere .8 grams; even so match the blades.

We noted . . . Clarence Lee with one of the first crankses for the Veco 45 that he is supervising . . . contrary to the earlier Lee 45, look for the exhaust on the right side instead of the left. An-

other scoop — look for the new Torp 35 before the 29 . . . K&B is moving into a new, larger building.

From Dan Lutz and the Inglewood Flightmasters notice of their 12th Annual Flying Scale Contest, to include R/C, at Los Angeles Model Airport (Sepulveda Basin) August 26th and 27th.

Next issue!
FLYING SAUCERS
(Model, that is)
OVER TOKYO BAY

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| Mig. 15 | Saunders | Gradiator | "88" Comet |
| Hawker | Roe 5.B. | Supermarine | Reconnaissance R.E.8 |
| Typhoon | Rocke-Wulf | S.A.B. | North American |
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AIRFIX OLD TIME CARS



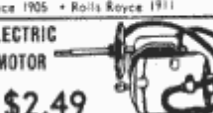
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Scale Views by Paul Plecan



"Most Realistic Model" is by John Zawiski

Just how much detail is necessary to win the Scale Events at major contests, including the "Nationals"? Plenty, you say. You are so right. But let us dig into the subject of judging these scale models. And then the reasons why the scale event rules need drastic revamping. Granted, there is a lot of effort expended in making a good scale model under the present rules, but does the average person realize how unfair the present rules are, especially when the beginner is considered. And the Junior category is the one we need to encourage the most.

How fair can a judge be with a Junior or Senior Class scale entry, when the builder is from a small town and has never seen a Navy airplane, for instance. Let us say he has mixed up some dope that is not 100% Insignia Blue. Do we knock off a few points? And how about the next Navy job in the line-up? The builder of this model has a relative that works in a company that makes these airplanes (no names, please) and can bring home some of the dope as used on the real ship. The strict interpretation of unduly restrictive rules makes the beginner a quick convert to the "sour grapes" school of thinking. Simplification of rules, with less restrictions for beginners is sadly needed.

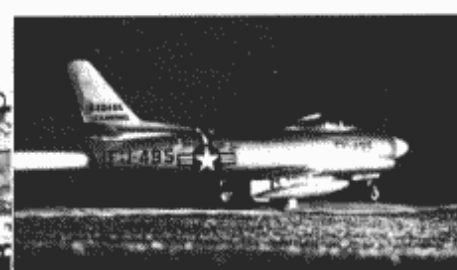
In selecting judges at large meets, is enough stress placed on strict unwavering impartiality? Wouldn't engineers from any aircraft firm be partial to designs that same firm once made? Would military personnel be any more impartial judging Air Force designs competing against Navy jobs? Present rules unwittingly favor 1920-1930 vintage aircraft. Some of us favor the jet types, but this

involves the use of much-too-noisy pulse jets (with risk of loss of local flying sites due to complaints on noise). So a prop job is almost mandatory, unless you live in a desert area, where the noise disturbs only gophers and snakes.

Where do we draw the line on machine work and other complexities? Most of us are satisfied with steel wire for landing gear struts, with a few scale balsa "non-working" details added. But take George over there—his uncle has a basement workshop with all types of machinery, stacks of dural, brass, steel and other metals in all shapes and forms. Fancy spray equipment, with welding rigs and all that stuff. He can come up with a scale counterpart of the real thing, which you and I can't compete against on equal terms. The average Joe is lost against this type of competition.

The complex detailed-scale category belongs in a NON-FLYING division, apart from the FLYING scale events. This category would not really be new, as it was a very popular event thirty years ago and is currently in the Ohio area. This would help separate the men from the boys and maybe put more Flying into Flying Scale, whether it be free-flight or control-line.

The beginner could then build from kits (not presently encouraged), deviating from "true scale" on dihedral, propeller diameter, landing gear strut length and tail areas, all in the interest of better flying characteristics. And with "judging", as we presently interpret it, practically non-existent. A step further, in the Senior age category, the rules



"Night shot" above is by Charles Jacobs. Capt. Slattery with part of his helicopter collection.

could narrow down some, calling for exact outlines and true scale prop diameters, struts, and all that. But still no fuss over judging and possible conflict with prime flying weather.

Once in the Open age class, the model builder could go "all out" on super-duper scale. But he would have progressed in a more logical stepping-stone fashion than currently possible. Look how popular U-control Stunt scale-like jobs are! Primarily because the rules are not restrictive, and the builder is not awarded a variable quantity of points at the whim of a judge. There has been a lot of noise made recently to get things agitated at the "grass roots" level. The emerging of Air Youth State Champs, steadily growing in popularity, points up the need for more simple events with less involved rules and more fun. That means flying in our book.

The above opinions are only partly the author's—they represent many expressions voiced by A.M.A. members, at contests and at bull-sessions. And much basic work has been done by the A.M.A. Scale Advisory Committee.

Word comes from SAC's chairman Le Roy Weber of Rio Vista, California, proposing a simplified scale event at the A.Y.S.C. level, plus maybe an International Scale event. And Roy mentions that the Scale Advisory Committee sees the need for non-flying scale events. More will certainly be reported as soon as news is made on this subject.

Life-like F-104. The picture of a Lockheed F-104A takes this month's "Most Realistic" award. John Zawiski (1000 Oakland Dr., Woodland Heights, Elgin, Illinois) is the enterprising assembler-builder. What started as a Hawk plastic kit wound up with underwing fuel tanks, refueling probe, centerline bomb load, and a paint job to match aircraft flown by the 479th Tactical Fighter Wing. Although painted the usual silver color, various tones were used to simulate the tonal variations on the real ship, where titanium and magnesium panels alternate with the usual dural sheeting.

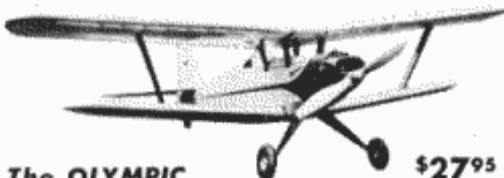
The quest for realism was carried right back to the tailpipe. This was formed from .008" sheet steel and heated in a gas flame to obtain the characteristic blue-green tones seen on the tailpipe of the prototype. Seems like a lot of trouble for the much-maligned plastic model. But we are reaching a stage where serious modelers are duplicating the fine efforts put forth by the "scratch-builders" in the model train field. These fellows take a particular design in hand "from scratch", working from magazine plans (sometimes from a kit, too) and come up with a real gem.

John has flown every type of model except R/C and Gas Helicopter, so when he says that building a good scale plastic job is just as demanding as other traditional types, we have to agree. About 110 hours of fun went into the F-104 job. We can more readily appreciate the effort and time put into this model when it is noted that all lettering and numbering was individually trimmed, leaving no clear decal areas to detract from appearance. Another photo submitted by John showed a Lockheed Vega, entirely handpainted, as per the Jeffries drawings in December, 1958 American Modeler.

Night Scene. The North American F-86D night shot is by Charles Jacobs (16277 Liberal Ave., Detroit 5, Mich.) and was

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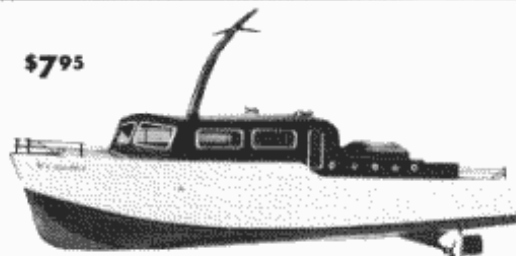
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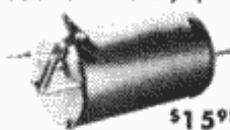
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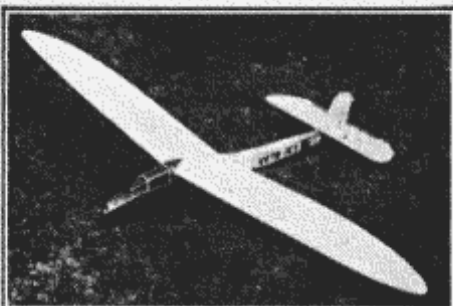
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snapped with an Argus C-3 camera. Panatomic X film was used, developed in Microdol. Charles uses two portrait lenses, getting a focussing depth of 12.5" to 22" (just perfect for the 1:48 scale models in his airplane collection). Charles liked the article on photographing airplane models by Frederic Howard that appeared in the April, 1961 AM. According to Charles, good results can be obtained with a #2 Photofood in a reflector 4' from subject, exposure being one-half to a full second (checked with exposure meter).

Ground shots are posed on landscape matting, as used for model train set-ups. Flight shots call for a white background, with models suspended on white thread. Although the thread can be "spotted out" in enlarging the photo, it is far easier to watch the lighting angles, so that shadows are eliminated on the thread before exposure is made. Jacobs has used Marshall Photo Oils (used for portrait coloring) for tinting pictures of model airplanes. With just a little practice, excellent results can be obtained.

(Continued on page 59)



MU-118 R/C Glider with 96 inch wingspan. Ideal for both multi and single channel flying. Kit is furnished with Power Pod for power flying. The kit is very complete and is prefabricated many parts such as ribs and formers already cut out. Building instructions are in English. Price \$19.95, shipped post-paid, sorry no C.O.D.



BERGFALKE (Wing Span 86) Price \$17.50

A scale model of the well-known Bergfalke made by the chelbe Works in Munich, Germany. Designer Hans Meyer has created a high-performance model for single channel or multi R/C slope and thermal gliding. The simple design makes this glider easy and quick to build. The kit contains all parts and materials die-cut and numbered. Building instructions in English. This glider can also be flown with an auxiliary engine. 86 in. wingspan.

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"Skyhook" \$2.29 control line kit, designed-manufactured by Duke Fox, introduces Skyhook tab on its outboard wing. Spans 22"; for Fox .07.

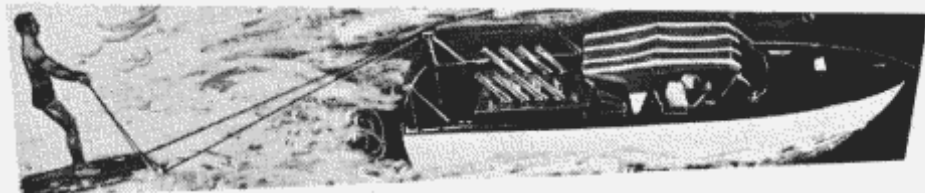


.....SHOWCASE.....



Thompson sub-machine gun "civilian model" (Kit B) by O'Brien Guncraft. Replica is \$5.95 with all machine work done for you. Billed as easy to finish.

"Drift-A-Long" A/1 Nordic glider (above) from Ace Products; \$3.95 kit features contest-sanded balsa wood; spans 48". Hawk Model Company's "Rag Top" drag and ski boat kit is motorized to pull aquaplane through water; \$2.

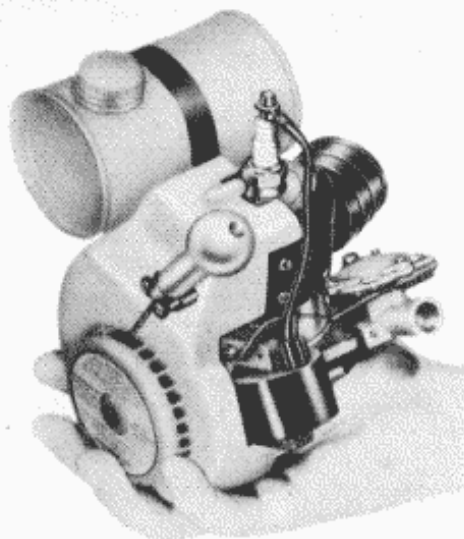


Dornier Do.217E-2 medium bomber is 1/72 actual size; kit molded in plastic under auspices of Associated Hobby Manufacturers. With two types of tail cones; \$1.

Radio control delta wing "Mach 3" by Modelcraft has 34" span, 15" max chord, takes .049 to .09 powerplant. Has flown with 6-channel relayless receiver. All parts die-cut. Kit, \$5.95.



Scientific's P-40 Tiger Shark is jaunty \$1.39 control liner for .010 to .049 engine; spans 16"; construction is quick.



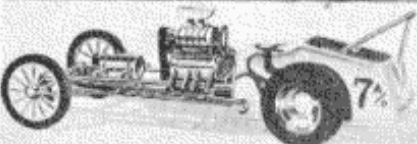
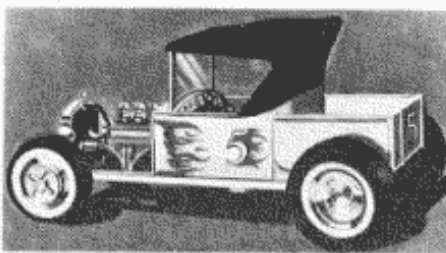
Small gasoline engine by Ohlsson & Rice is "Compact": Disp. 1.26 cu. in.; 3/4 hp at 6,300 rpm; 3 1/4 lbs and \$41 less tank; 5 1/4 x 5 3/4 x 6".



Kidde Mfg. Co.'s "Jet King" butane blow torch is great aid to modelers. Torch, soldering tip, plus items shown, \$2.95. Cartridge lasts 30 min.



Hot rod plastic kits in Monogram Modelers' "Forty Niner" series include the Roadster (top), the Pick-Up, the Dragster (bottom). Each 49c.



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10 Channel transmitter is a simultaneous tone unit, fully metered for the most accurate indication of the condition of its transmitted signal and internal "A" & "B" Batteries. Fully production engineered and field tested. The R.F. section of this equipment has been designed to give you the highest radiated signal of any hand held transmitter. The phase shift tone generator used is the most stable type to be designed as attested to by any elec. engineering handbook, as well as being voltage regulated \$129.95 including either 3 foot or 18 inch fiberglass top loaded antenna.

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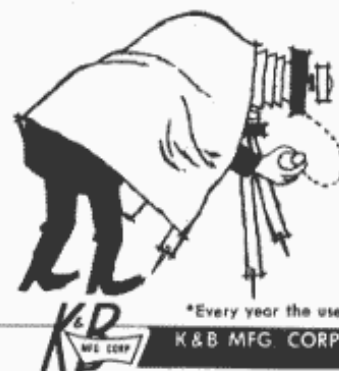
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Scale Views

(Continued from page 57)

A hint worth passing along to the modeler who also has darkroom facilities. And just the thing for decorating a den or hobby room.

Now for the whirlybirds. The picture of a helicopter collection introduces Capt. John M. Slattery (Box 237, Hq. WRAMA, Robins AFB, Georgia) with his extensive collection of "chopper" models (not all shown). As a Lieutenant in Korea, Slattery's interest in helicopters began the day he was evacuated by one as a frostbite case. Later, as a flying cadet in Texas, he much preferred flying helicopters to hot-rodding around in jets, eventually achieving his goal of flying rescue and search missions. Has amassed well over 1,500 hours flying time, currently piloting a H-19. Many foreign makes of helicopters are included in his collection.

While he was stationed at Wheeler AFB in Tripoli, the collection was put on display by the U. S. Information Service to promote Arab-American friendship. A member of the American Helicopter Society, John currently hopes that some manufacturer would bring out a plastic kit of the Sikorsky VS-300, the "Grandad" of all American helicopters. Or at least a few more of the early types.

(Readers are invited to discuss their scale model questions with Mr. Plecan. Write him: Paul Plecan, Scale Views, American Modeler, 575 Madison Ave., New York 22, N. Y.)



Tern-V

(Continued from page 31)

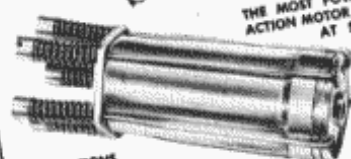
stub end of the wings. Once a good fit is made, the rest of the center base can be rounded off to a nice streamlined shape, fairing it into the fuselage. The fuselage is trimmed round with a razor plane, and sanded smooth; use a circular motion to get a round cross section.

The fin outline is laminated of 1/32 balsa; soak the strips in hot water, then glue them with polyvinyl glue and bend around a form. Place this outline on its left side on your board, and insert the 1/16 sq. balsa strips for the flat side of the airfoil section. The center spar, 1/16 x 3/8 hard balsa, is tapered slightly at the top. (Additional construction instructions and adjustment details are on Hobby Helpers' Group Plan #961.)

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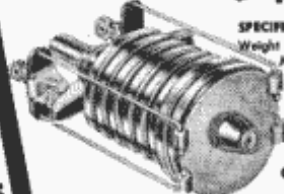
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Duck

(Continued from page 39)

And now, what can be done to improve the circuit? For one thing, we would like to try the Shows-Dickerson full-wave rectifier circuit in the M.C., instead of the half wave rectifier we have used so far; this should result in much faster MC operation (in other words, less time lag in MC operation, and less of a twitch in the path of the model when you hit the MC button). It seems likely that a single transformer could be used for both the MC and elevator circuits; the TR98 has a center tap on the winding that goes to the transistors, and half of the winding might do for each circuit, with the center tap as the "ground". A little more work on temperature compensation might be done on the elevator circuit (the MC is already very stable).

Use of an emitter resistor (this would necessitate considerable circuit part changes), possibly different values of thermistor, even the use of silicon diodes and transistor in this circuit would be worth trying. We had hoped to try all of this before putting the circuit into print; but it began to look as though such experimentation would take a year or more. And meanwhile many modelers have been flying the outfit as it is; it does work well, as many who have seen our planes fly in the Northeast can testify. For further proof we can point to a fairly impressive array of Intermediate trophies that the equipment has brought us. We feel this is an ideal Intermediate system.

REFERENCES: (1) original Kickin' Duck article, '58 Air Trails Model Annual; (2) modified motor control escapement, Sept. '58 A.M., p. 29; (3) double-gear Mighty Midget, Nov. '56 Young Men, p. 52; (4) single geared M-M with cord drive, April '58 A.M., p. 31; (5) Compact Pulser, Oct. '55 Air Trails Hobbies, p. 37; (6) zero center meter, June, '56 Young Men, p. 54; see also Dec. '56, p. 48 for info on obtaining proper electronic pulser action.

PARTS LIST: All fixed resistors half watt; R1, R2, see text; R3, about 100 ohms, see text; R4, R7, 5K sub-min variable; R5, 5K; R6, 12K; R8, R9 and R10, as required. TH1, 1000 ohm thermistor, Lafayette 31TD1; TH2, 5K thermistor, Laf. 35-TF1. T1, T2, Lafayette TR98, 10K to 2K interstage. TR1, TR2, G.E. 2N169A transistors. D1, Hoffman HB-2 (Ace Radio Control); D2, D3, Raytheon 1N305. C1, 200 mf, 3 V electrolytic, Sprague TE1064 (Laf.); C2, 110 mf, 3V electrolytic, Sprague TE1060 (Laf.); C3, 50 mf, 6 V. elect. (Laf. CF-105). Switches, batteries, relays, etc., as in text, and per preference. Parts for modification of Compact Pulser not included herein.

Capers

(Continued from page 27)

ing up to its name, setting quality standards. Except those high-strength bolts. They were promised for the initial packing date, but the bolt manufacturer broke his special dies. Then he got a 2-shift Government order and Pioneer got back-ordered. Just to make your mouth water, the specs are for 140,000 PSI in tension and 3 to 4 million cycles on fatigue. Should outlast an engine. By the time this is read, the bolt problem is sure to be solved—one way or the other.

On the performance of the model, Jim Mears of the Texans, designer of the "Sizzor" and "Barndoor," says the "E" is one of the few combat planes capable of competition in Lubbock. Bob Gialdinni from Milwaukee flew his "E", promptly scrapped his standard model. And he'd built 24 of them. These guys know combat and their comments are worth a great deal. The stabilator is here to stay and win.

American Modeler — September 1961

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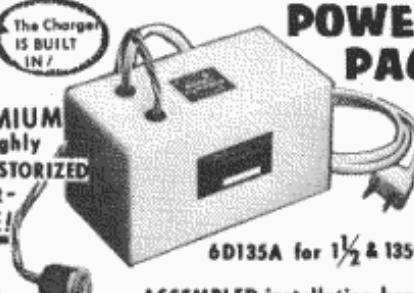
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Canadian Capers. That Half A stunter from Maple Leaf country (see three-view) should be a neat one. Area looks right for good snappy goings-on. Recognize the C speed job? Thought you would. Al didn't mention whether tank was pressured or not. Any bets down that 158 mph would win this year at the Nats? What with Tetra removed, all speed should have dropped, and we can see how much engine hop-up really does. Look for the speeds turned last week to be about the same as at Willow Grove in 1957.

Are Diamonds Our Best Friend? In the midst of the glitter and noise surrounding "diamond" airfoils we cast this dimming note. Are they really superior to streamlines? Needless to say, if they are outstandingly superior, this Missouri boy would have been on them like a hound dog after a coon. So far, no one has flown alongside my ship at the same weight and speed and turned as tightly. Anyone got wind tunnel data yet? It appears to be only the line of least resistance, when you analyse the actual average contour of a wing with two cap spars and no planking. If there be an advantage it appears that the center of pressure is farther aft than a streamline, allowing a diamond to be balanced farther aft and still remain facile. The comment "it looks like it turns better," won't prove anything. Good sound data are needed. If the diamond is really superior or even equal to the streamline in all aerodynamic respects, we need to know it. If they are merely a simplification on the road to mediocrity, we need to know that. This assumes that you also, are interested in having the best equipment. I am.

Kinks. When running out your lines next time, try wiping them with talcum powder on a clean rag. About three trips this time, and then one trip every time you fly. Will cut the castor oil and give a dry lube to prevent sticking, especially those .006 and .008 size lines. Remember the last time your controls locked? Probably gummy lines. Also a cheap reel appears when two 10" or 5" pie pans are soldered back to back with drawer pulls for handles. Look around for the tin ones. Alumi-

num is hard to solder and a bit too soft for knocking around.

Speed Merchants. For special speed equipment, you might try some of these: Bill's Miniature Engines, 1325 Carol Drive, Memphis, Tenn.—TMHK Cherry Wood props, engine rework, fuel.

Franny's Chrome Specialty Products, 513 Vesta Place, Hyde Park, Reading, Pa. Molyfilm, This-is IT; Dooling parts, special engine work.

Thought For The Day. If you keep your eye on the ball, your nose to the grindstone and your shoulder to the wheel, how are you getting any work done?

No Strings

(Continued from page 31)

little) chasing. Of course, it is not possible to impress your fellow fliers as you think you can in multi. (Status stuff, mebbe?)

And why all this malarkey about Intermediate? Having fiddled with coupled Vari-comps we can offer these suggestions. Don't go beyond a .19—a hot .15 is ideal. Flippers should be aerodynamically and statically balanced. There must be no need for timing or you will miss controls, ending up with third-positions instead of seconds if you are slow, or rights instead of lefts, or missing downs altogether. To eliminate timing, use one-quarter inch rubber, lubbed, with some slack. When the rubber is new wind it a few times to break it in. At first, the escapements may seem too fast for you. But they won't be too slow—you cannot pulse too fast for them. Practice on the bench and, above all, a decent microswitch will pick up your speed so that you'll never be too slow.

One of the greatest causes of unreliable control in both Rudder and Intermediate is in the keying switch. It should be easy to use, requiring very little pressure. It should not need much travel to make contact and it should make contact with an audible click or feel. Stiff switches cause more accidents than anything else—a wrong-side



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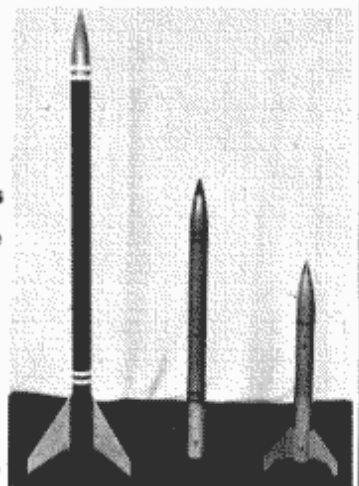
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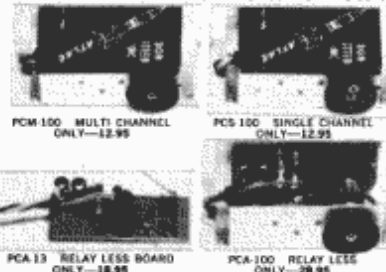
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turn into the ground coming out of a spiral recovery is one example.

You should know the pull-in and drop-out voltages of these escapements under fully wound rubber. Sometimes it is desirable to increase spring tension and go to 4 1/2 volts—or 3.6 volts if you use nickel-cads—to improve this spread and to make sure that you can pull in despite load. The same goes for drop out. Higher voltage means a greater electrical load so use six pencils rather than three. After all you will hold on two escapements at times.

Once you have it set up right, you don't have to think. For instance, click off four signals and hold, just as fast as you can make the switch go, and the ship will follow through with consecutive outsides. This takes a semi-symmetrical section and a CG at least 40 per cent aft on the chord line. Too far forward on the CG and you'll get loggy buttonhook outsides—like many of the nose-heavy multi's. If the CG is too far forward, full down gives vertical dives that won't tuck under. Adding to flippers gets you nowhere—move the CG back. To avoid surface blow-back use sturdy torque rods and at least 1/16" wire. Drill out the Vari-comp bushing for this wire. Don't have sloppy linkage set-ups.

Carl Goldberg's new Viking Half-A free flight is a weapons system! What is a weapon's system? It's a kind of an overall package in which the airplane is just a part. For example, people used to build a fighter, then figure out where to cut the holes for somebody's latest zip gun. Nowadays they plan the works—guns, electronics, airplane—be-

fore anybody cuts metal. In modeling the equivalent of the oldtime fighter is the kit that can make up into a flyable model but puts the burden of everything else on the builder. Since most builders are not experts the result often is chaos.

In his Viking, Carl has viewed over all the many requirements that make for success. This Viking is a high-thrust design with the power egg projecting forward from the pylon at a point about midway between fuselage top and wing platform. For .049's and .051's it spans 48 inches and has 330 squares of area. (Fifteen years ago guys flew 225 to 275 squares on ignition .19's—four times the displacement!) Carl has embellished, clear, well-done, full-size plans with numerous detailed sketches that leave nothing to chance.

Included in the kit is a small pamphlet entitled "How to Adjust and Fly Your Free-Flight Gas Model." This embraces a series of sketches and info on wet-covering, and more of the same on all important alignment and balance. It is this kind of guidance the tyro cannot do without. Finally, Carl runs down adjusting and flying. The fact that he did not have to elaborate greatly on adjusting and flying instructions speaks well for the modern high-thrust configuration and the Viking in particular. And if Carl, who invented the pylon, has switched to high thrust, this is a significant move.

Whenever free flight rules are discussed

—and in almost 30 years of gas the ideal rules are yet to be found, too many good citizens shy away from the problem because they do not approve arguing over something that is supposed to be good fun and sport. Some hot heads do carry things to extremes. However, rules for free flight, and the making thereof, are part and parcel of the sport, and the discussions cannot be eliminated for the sake of peace in the family—though we'll have that, too, before long 'tis hoped. Were these good folks as upset about the unseemly donnybrook that was the last National election they would have voted for neither Kennedy or Nixon.

"Everyone is trying to find one set of rules to take care of the whole country," opines Frank D. Thompson, Bossier City, Louisiana. "It just won't work . . . the West Coast boys wrongly insist that everyone go along with them on keeping the old rules. They were right in their feeling that they were unjustly handicapped by insistence on rules that Easterners could fly under. But that doesn't give them the right to hurt everyone else. If the Westerners didn't have the right to make free flight impossible for the rest of us then we similarly have no right to handicap them. There must be some system of separation in the rules."

Thompson then goes on to review possibilities that have been suggested to date, finding fault, like most us, with all these ideas. But it seems to us that there is much good in his letter. If California cannot prejudice free flight for the rest of the country, those who differ with them should not insist on wrecking free flight on the Coast. The Coasters obviously cannot have their way. The "Easterners" can but at a cost to the hobby they surely do not want to pay. Perhaps we are learning that, first and foremost, free flight must be kept enjoyable for all. It is a time for diplomacy and for the give-and-take cooperation required to find a solution.

Somewhere over Europe—World War II. The "Jugs", P-47 Thunderbolts, have been flying cover for the vanguard of the bomber stream. "Bandits" have been sighted climbing from 10 o'clock and the Jugs are diving to intercept. Called "Little Friends" by the bomber pilots, the Thunderbolts delivered performance anything but "little"! In addition to escort missions the P-47 flew a lion's share of ground support attacks in the battle for Europe. (See article page 18.)

The cover painting, based on photos to insure authentic detail, is made double the final printed size. All drawing is done on tracing paper first, and then transferred to water-color board from tracing paper by "carbon paper" technique, using graphite on back of tracing and a hard pencil. The penciled aircraft areas are next covered with clear Scotch tape cut carefully to the outlines to mask and protect the board. Next the background colors are applied, over the tape, too. Windsor and Newton's Designers gouache (tempera) colors in tubes are employed. In this cover the background was painted on with a 1" wide "sky" brush, although sometimes an airbrush is used to spray on color. When the sky is dry, the Scotch tape over the aircraft outlines is peeled off and the rendering of the aircraft proceeds. The same tempera colors are used and a variety of sable hair watercolor brushes down to size No. 1 are used for the fine details.

Sound like fun? One characteristic of tempera (that makes the artist's life interesting) is the fact that the colors vary slightly in quality and intensity from wet to dry. So each and every tone must be mixed and a sample permitted to dry before using in the painting.

S. Calhoun "Cal" Smith, our cover artist for this issue, attended Pratt Institute. He served in the Air Force as both a pilot instructor and a graphics art specialist.

Smith-Stegens

(Continued from page 14)

original designs. Al took 2nd in proto (modified "Goodnews"). Steve Babbin, another of our group, took 3rd in proto. Jere and Larry took 2nd and 3rd in Jr.-Sr. Proto.

We knew we had the design for proto. After coming home from Florida Al, Jere and Larry each built one of the new models. Starting in May of 1957 these models were never beaten in competition until the Chicago Nationals when Jere was dropped to 2nd place in the senior flying division. At that time this design held all three National records for Proto Speed.

I believe the design is good because it is a compact model, no fancy curves, just a series of straight lines running from the engine to the fin. We have plenty of room for the Pen Bladder Tank, a good solid engine mounting, which can be lacking in an all-balsa model. The Fiberglass finish will outlast dope 100 to 1. The large stab area allows the model to be flown in high winds when other entires are grounded or are flying all over the sky. The method of mounting the landing gear on the engine head not only makes a strong mount, but helps cool the powerplant and protect it on landings. Being far forward it gives us very good handling on takeoffs. We have yet to see one of our models "come in" at us on takeoff.

The only unusual features of construction are the landing gear mounting and the lower fuselage shell. The gear on the head, being removable, makes it very easy to pack in a car as the models will nest together. The lower shell makes

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Bass: two blocks 2" x 1 1/2" x 16" for lower fuselage; (1) 3/4" x 2" x 21" for top fuselage block; (1) 2" x 2" x 5" for lower cowl block; (1) 3/16" x 2" x 5" for cowl cover; (1) 3/8" x 1 1/2" x 3" for air scoop; (1) 3/16" x 3" x 7" for rudder; (1) 3/8" x 6" x 30" for wing; (1) 1/4" x 2" x 2" for bulkhead.

Maple: (1) 1/2" x 2" x 8" for engine mount; (1) 3/16" x 9/16" x 12" for elevator spar.

Mahogany: (1) 1/4" x 3 1/2" x 12" for stabilizer; (2) 3/16" x 1" x 6" for elevators.

Also: 1/16" O.D. aluminum tubing 12" long; (1) 1 1/2" x 9" x 3/32" 24ST aluminum; 24" of 1/16" steel wire; 1 pair 1 1/2" dia. wheels; clockwise Mono-Line "B" Speed Master unit; 1 1/2" to 1 3/4" aluminum spinner; steel wire for hinge pin; 4-40 blind mounting nuts; brass elevator horn; 5" plastic canopy; plastic team racer pilot head; fiberglass resin and cloth; 4 ft. of 1/8" leather fillet material; 6-32 nuts and bolts; 4-40 bolts; colored dope for trim.

Canopy can be obtained from Cleveland Model Products Co., Dept. AMP, 4506 Lorain Ave., Cleveland 2, Ohio.

it simple to build as there is only one glue joint to worry about—no carving, other than the cowl and top fuselage blocks, which makes a very easy assembly job. A model put together with this method of construction should last through at least two seasons of active contest flying.

Testing: *Balance on leading edge of wing!* First flights are made with engine wide open. Helper releases model straight ahead; as soon as model is moving, give up till ship breaks ground. Flatten off at about 10 feet. After getting used to model fly about 6 feet during flight. Make sure you are in the pylon on first lap for timing. When engine quits, hold 6 ft. altitude till model slows down. Back up and whip slightly to keep line tight till model settles on wheels.

Thunderbolt
(Continued from page 20)

ally applied the model can be painted. However, do not hesitate to apply more sealer if your model requires it. Seal and add bomb racks under wings. Paint entire model silver. When six coats are completely dry surface should be buffed with rubbing compound for a high lustre. Add red nose and dark green anti-glare panel. The cockpit canopy was made from two pieces of plastic and one bubble canopy. Sheet plastic is used for the windshield; remainder is cut from a commercial bubble canopy available at most hobby shops.

Cut insignia and letters from "Wonder-Cal" decal sheets, apply where plans indicate. The "LM-Q" should be arranged on the right side of the model so that the "LM" is located to the rear of the star AND NOT FORWARD OF THE STAR as is shown for the left side.

Miscellaneous details completed at this time include: mast, rear view mirror, wheels, wheel covers, seat, instrument panel. The flat bullet-proof glass screen in front of the cockpit, cut from thick clear plastic, is cemented in place.

We drew "Penrod and Sam" on the cowl with thin black dope and a "No. 4 Speedball" pen point. Note that the "Pe" of "Penrod" is slightly outlined with white. See photographs.

Carefully cut hatch in cowl with sharp single edge razor blade. Fill and paint any bare wood; install engine.



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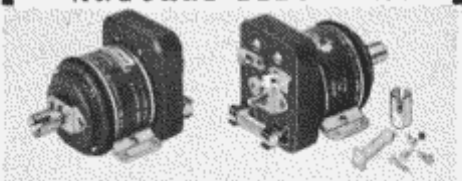
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(All material medium balsa unless noted)

Two 1/4" x 3" x 36" for fuselage keel, wing spars, fuselage formers, bomb rack; (1) 3/8" x 3" x 36" for tail surfaces, wing tips; (6) 1/8" x 3 x 36" for wing ribs, wing covering, rudder fairing; (1) 1/8" x 6" x 24" plywood for bulkheads, L.G. supports, spar joiners; (20) 1/8" x 3/8" x 36" for fuselage planking; (2) 3/8" x 3" x 8" hardwood for engine mounts; 1/8" dia. music wire 24" long for landing gear; 1/16" dia. music wire 36" long for control rod, tail wheel strut; 3" x 4" x 24" balsa for cowl; (2) .032" diameter music wire 36" long for lead out control lines; 3/8" x 1" x 2 1/2" hardwood for bellcrank mount; (1) De Bolt plastic canopy.

Miscellaneous: Acme U-5 fuel tank; black, white and blue "Wondur-Cal" decal; "J" bolts; Veco large bellcrank and control horn; tin can metal; "Wondur-Cal" instruments; 2 1/2" dia. wheels; 1" dia. wheel; solder; 1/2" dowel; 16 ounces Testor Butyrate Sanding Sealer; 8 oz. Testors Butyrate Aluminum Dope; 2 oz. Testors Butyrate Dark Green Dope; 2 oz. Testors Butyrate Red dope; 4 oz. Butyrate thinner; 1/0, 3/0, 8/0 sandpaper; large size plastic tubing; "Plastic Balsa"; "Ambroid" cement; "Aero Gloss" rubbing compound.

Balance model. It may be necessary to add lead weight in cowl depending on engine size. Ballast should be rigidly attached with plenty of cement and braces.

The hatch can be held with a hinge and internal rubber bands, or large dress snaps.

Flight lines at least .014-inch diameter should be used. These can vary in length from forty to seventy feet. It is advisable to conduct initial flights on the shorter lines, then gradually increase the length up to the more enjoyable long lines. A control handle-reel combination is ideal for varying line lengths.

The full size Thunderbolt was fitted with a four-bladed propeller; there is no reason why your model cannot be fitted and flown with a four blade club. Half-lap two wooden two-bladed propellers together. These should possess fairly narrow blades. Paint propeller black.

When built and flown your replica of Major Johnson's P-47D should provide many enjoyable hours of control line flying. Happy modeling!

Lucky Lindy

(Continued from page 25)

line on aluminum. The cutting can be done on your vibrator jig saw. Bending operation is carried out with two pieces of heavy sheet metal clamped in a vise to act as bending jaws. The rest is hand-work.

You will find quite a bit of metal-work on the front end of the model. It will pay you well to get acquainted with this skill. You can do most of the jobs with a hack saw, sharp files, and a small electric drill. A tap wrench and two taps, a 2-56, and a 4-40, will take care of average modelling requirements.

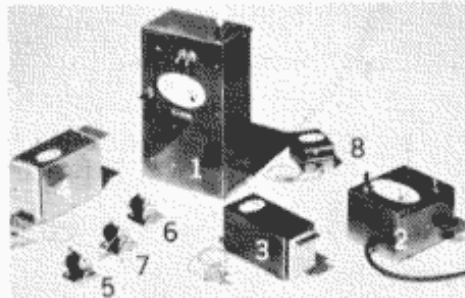
The cowl mounts are secured to the aluminum firewall with 2-56 flat head machine screws. The cowl fits to them with 2-56's.

The **TIMER STOP** is made from a strip of .032 brass 1/4" wide. An L-shaped upright is soldered to the base strip, which has two holes for fastening to the face of the timer.

Additional construction instructions, fuel and adjustment details, are detailed on Hobby Helpers' Group Plan #961.

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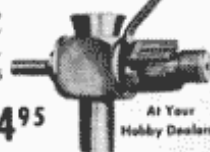
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Ambroid has always made the world's #1 model cement and now model builders across the nation are discovering that the same top quality is featured in the new line of Ambroid model plane kits. Shown above are just a few of the twenty fine custom kits already available



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RADIO CONTROL "COMMERCIAL" NEWS

■ From Ace Radio Control's (Box 301, Higginsville, Mo.) catalog supplement 61-A: Ace stocking battery pack and charger marketed by Bramco, as well as latest Bramco 10 channel transmitter, also Citizen-Ship line. Kit for Kraft Triple Ten xmtr, \$95.95, for 27 mc and 50 mc. Extra "pot deck" kit, \$11.95. Ace offers Ecktronics finished versions of Kraft equipment, also F & N Products lightweight nylon hub wheels, 2 1/4, 2 1/2 and 2 3/4" sizes. R/C decal sheet contains almost every label needed for R/C equipment; \$1 per sheet, black or white lettering.

Extensive line of lead-acid cells and batteries at Polks (314 5th Ave., New York City 1), from single 2 volt cell of 1AH.



Most are imported; Polks also lists high grade cell of U.S. manufacture (not surplus), Aristo Power Pak; this 6AH, \$4.95, with filling fluid and screw terminals. Graupner (German) items include complete 10 channel multi proportional outfit—transmitter with antenna and batteries, 10 channel receiver, four Bellomatic servos and one Motomatic (latter to operate engine throttle), \$399. Units available separately. New Graupner Unimatic servo, 1.85 oz., motor-driven, with replaceable switching discs for various purposes, mainly for single channel, \$10.95. Also new is Unimatic for multi control. This ingenious servo has Micro-Perm motor which drives centrifugal clutch; when motor is not turning clutch disengages, springs bring gear train to exact neutral. Servo operates on 6 volts, requires only two wires for connections to relays and battery; weight 2.15 oz., \$19.95; has well made 260-1 gear train.

Hep modelers always welcome Frank Zaic's Yearbooks. We have seen proofs of a few pages of his latest; it appears there is more R/C than ever. We find plans for the Voltswagon, Orion, Don Mathes' World Speed record plane, Bob Heise's successful twin engine "Heisendoppel," several deltas, R/C gliders—a wide variety of R/C planes, including some docile jobs ideal for the beginners. Also there are quite a few pages of observations by Harold deBolt on the International R/C Championships.

Newest power packs from Space Control Corp. (used to be known as Ritchie packs) have built-in charger, are sealed in epoxy resin. With detachable power cord which plugs into 110V circuit. With 250 or 500 maH cells, in voltages from 3.75 to 7.5. Taps for all cells brought out in each unit, so they will fit variety of control systems. Space Control also makes transmitter power packs with built-in transistor converters. New is cable connector for R/C applications; set with plastic protective hoods, \$1.49.

Orbit Electronics' (11612 Anabel, Garden Grove, Calif.) 18 page booklet describes their transmitters and receivers. Along with considerable operation data, booklet covers single and multi channel installation, tuning of transmitters and receivers, description of every unit, circuits of same; 25¢ from Orbit or hobby shops.

Top Flite Models' (Chicago 16, Ill.) steerable nose wheel kit for Orion installation can be used on other planes. Includes 2 1/2" dia. pneumatic nose wheel, formed 5/32" music wire struts for nose wheel and for main wheels, nylon mounting brackets, hardware for attaching parts to plane and for making a nose wheel brake. Many diecut ply pieces and channeled hardwood strips for main gear. Kit designed and approved by Ed Kazmirski, \$9.95.

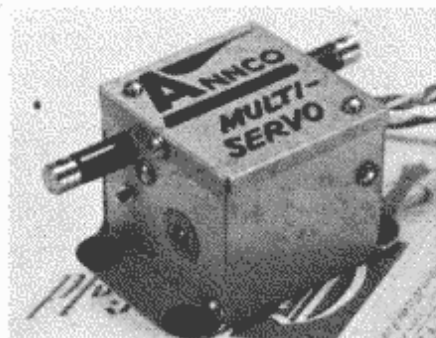
Two items by Lafayette Radio (165-08 Liberty Ave., Jamaica 33, N. Y.) are of special interest to R/Cers. Low cost transistorized "bull horn" operates on six standard C flashlight cells, 2 1/2 lbs. complete, 2000' range. Handle grip carries trigger to turn on power; unit may be used as sound detector and amplifier as well as for voice amplifier. \$10.99 less batteries; fine purchase for R/C clubs. Lafayette has low cost transistor amplifier that might be basis for useful R/C monitor, their Model PK-522. Mounted on P. C. board, 2-13/16x1 1/4x3/4". Has three transistor stages, final one with tiny transformer to match 8 ohm speaker. Uses 9 volt battery, requires connections to on-off switch and 5K volume control (variable resistor with switch, 59¢ additional). With transistors, less V. C., battery and speaker, \$3.95.

Ecktronics' (2109 Wright St., Santa Ana, Calif.) first model plane kit, "Freedom Seven", is design by Dick Eck; 40" span, for .049 to .09 engines, wing area 271 sq. in. Very simply constructed shoulder wing, trike gear; you get formed L. G. parts, even the wheels. Ecktronics "Membership Contest" ends Oct. 31st; for club adding most new members over a four month period. Fine prizes offered, contact Ecktronics for details. Concern reports sales of simultaneous six channel transmitters about equal to non-simul units; latter converted to simul, \$19.95.

New type of centering evolved for proportional servos marketed by Dee Bee Engineering Co. (1102 S. Broadway, Pitman, N. J.). Units originally had dual centering arrangement, one part depended upon rubber band for operation; worked fine, but some purchasers worried over life of bands (makers have used 'em for months with no problems) so new system is all metal. See p. 57, July '61 issue, for details.

Their tiny VP-1A transmitter has been discontinued, reports Ramaco Products (Box 385, Huntington Sta., N. Y.); superseded by more powerful all-transistor transmitter—just under 100 mw input, range about twice that of VP-1A, due to better transistors, other improvements. Does not require F.C.C. license. Size about same as flip-top cigarette box, uses two 9 volt batteries, \$21.95. Will be called "Shrimp".

Compact lightweight multi servo by Ancco Engineering Co. (6621 10th Ave. So., Minneapolis 23, Minn.) weighs 1.17 oz., 1-3/16 x 1-3/16 x 1", \$12.95. Said to produce 3.5-lb thrust, available in straight line motion from each end of servo. Works on 1 1/2 to 4 volts; current drain, 150 to 275 ma.



All parts including gears made in Ancco plant, except motor. At present only for relay type receivers, but can be driven by various transistor amplifiers such as Altair Switcher Pak.

Low cost relays possibly useful for R/C announced by Lionel Corp. (Hoffman Pl., Hillside, N. J.). 4325 Series with coil resistance up to 5000 ohm; at latter value, relay operates on 3.2 ma, opens on .5 ma. All single pole style, can be soldered on P. C. board, or fastened to baseboard with screws; 1.3 x 1.2 x 1.2"; 1.1 oz.

Sub-min silicon diodes for arc suppression on relay and switch contacts announced by International Rectifier Corp. (El Segundo, Calif.). ASG3 to ASG30 units differ in price and max. working voltage. For R/C purposes, the ASG3 should suffice in many cases; \$1.07 at Int. Rectifier distributors (Lafayette Radio stocks this line). Glass shell .265" long x .110" dia. Data sheet available from distributors.

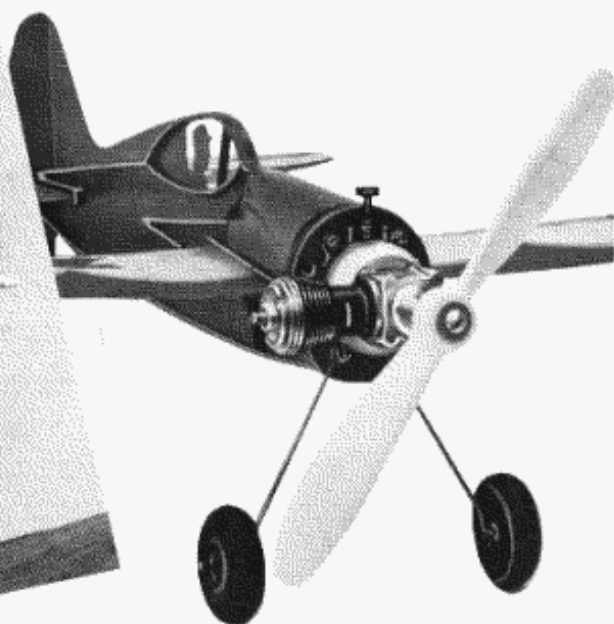
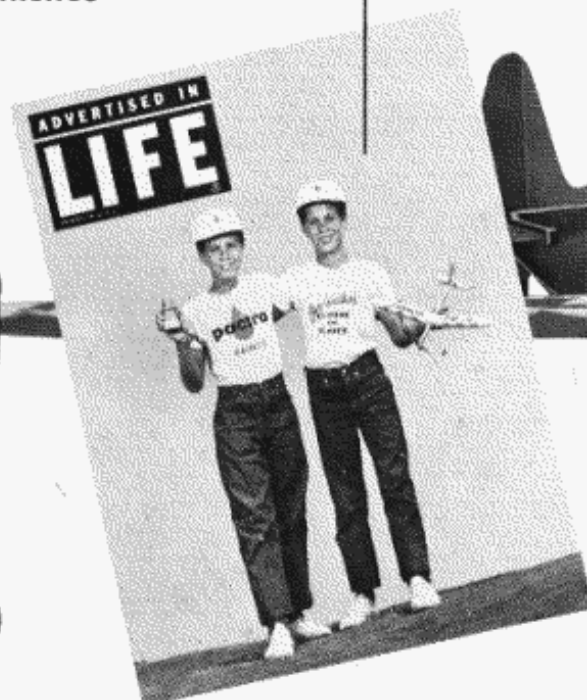
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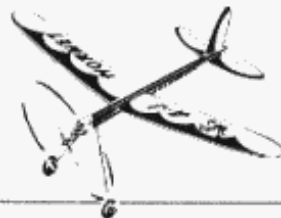
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