

MODEL AIRPLANE NEWS

July, 1968 • 60 cents

WITH
NEW!

**Radio
Control**
SPEED & SPORT



- Claude McCullough's finest scale construction, the YAK 18-PM, for radio control... FAI Power by England's George French... Field and Bench for Heath Digital System... Dixie Special Quarter Midget Racer... multi Indy Racer with full transmission system

39th Year of Publication

MODEL AIRPLANE NEWS

JAY P. CLEVELAND, President and Publisher

WALTER L. SCHRODER, Editor

July, 1968

Vol. 77, No. 1

CONTENTS

CONSTRUCTION

All American Eagle	11
Meyer OTW	15
Yak P or PM	26
Dixie Special	38

ARTICLES

Coupe d'Hiver 1968	14
Field Trip	21
Road and Bench	32
Prototype Pattern Event	37
Field and Bench	40
Come ROAR with Us	43

FEATURES

MAN at Work	2
Foreign Notes	4
VTO	8
Wylam—PW-8 and XF-5C1	18
Engine Review	20
Round and Round	22
Radio Control News	25
Yak P or PM	30
Wylam—PW-8 and XF-5C1	47

BILL NORTHPROP, Managing Editor

WITTICH HOLLOWAY, Art Director

RHONA STATLAND, Editorial Assistant

Contributing Editors: Peter Chinn (England)

David Linstrom, Douglas Rolfe, Pete Soule

Ron Scalera, Staff Photographer

Executive and Editorial Offices:

551 Fifth Avenue, New York, N. Y. 10017

ALDA OSBORN, Advertising Manager, 551 5th Ave.

New York, N. Y. 10017; West Coast Adv. Mgr.,

Murray Bothwell, 495 So. Arroyo Parkway,

Pasadena, California 91101, Telephone 213-681-9155

BEATRICE ZAMBORSKY, Subscription Manager

Published monthly by Air Age, Inc. Second and Dickey

Streets, Sparta, Illinois. Editorial and Business Offices,

551 5th Avenue, New York, New York 10017. Jay P.

Cleveland, President; V. P. Johnson, Vice President;

Louis V. De Francesco, Treasurer; G. E. De Francesco,

Secretary. Second Class Postage Paid at Sparta, Illinois

and additional Mailing Office.

Copyright 1968 by Air Age, Inc.



Al Siegel snapped this photo of Pappy deBolt, Howard McEntee & me at PARCS Assn. meeting.

m.a.n. at work

► It would be interesting to know your reaction to this, the first issue, of the newly expanded Model Airplane News designed to keep up with our rapidly changing and growing sport. It is our sincere hope that we have met the challenge and you, the reader, appreciate the new effort on your behalf.

First impression is a lot more of everything, which it is but this lot more comes only from the readers so I ask that you continue to send your new creations, designs, ideas and how-to's as you have in the past, but a bit more.

Cars, Goodyear racing; Quarter Midget, regular 450 Goodyear and Continental 600 and boats are the areas in which we need material at the moment, so let's hear from you. Pix, color & black and white with rough plans and some details with specifications, is all that is required for review. We promise fast review and prompt answers.

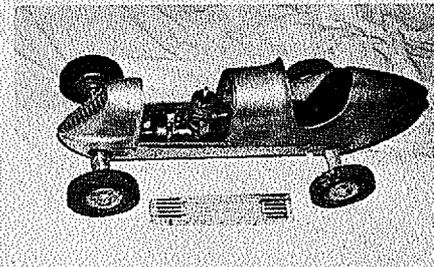
It was only last month that I ex-

plained the problems of cover announcements and here we are again in exactly the same bind. Somehow, somehow, George French's article and plans became sidetracked between old Blighty (England) and New York. We sweated it out right up to the last possible minute and still no "Night Train". Calls between Linstrom in Missouri and ourselves and cables to England availed nothing. Just hope it's on hand for next month since it is a winner and should be on hand before the contest season gets going full blast. What is it they say about "you can't win them all", how about just one though!

And still another Trade Show for the radio control people. This time in Red Bank, New Jersey and master-minded by that old hobby shop owner, Bob Peru. Bob tells us that their show ranks third in the country in numbers of manufacturers displaying and quite likely in numbers of spectators. When I



Kids are kids everywhere. Believe it or not, this is a group of refugee children in Viet Nam camp. See details in column requesting help for kids.



Bill Webb offers this Dusenbergs car free to a serious collector. See details in this column.

SUBSCRIPTION PRICES

U.S. & POSSESSIONS: 1 year \$6.00, 2 years \$10.00, 3 years \$12.50

CANADA: 1 year \$6.50, ALL OTHER COUNTRIES: 1 year \$8.00

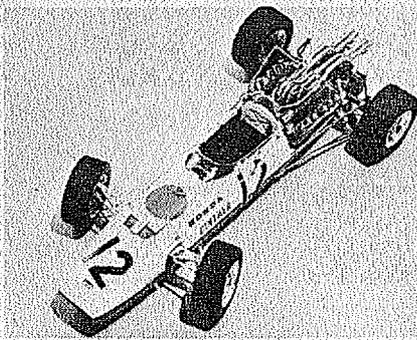
Payment from all countries except Canada must be in U.S. Funds.

CHANGE OF ADDRESS—Send to MODEL AIRPLANE NEWS, SUBSCRIPTION DEPT., 551 FIFTH AVENUE, NEW YORK, N.Y. 10017 at least one month before the date of the issue with which it is to take effect. Send old address with the new, enclosing if possible your address label or copy. The Post Office will not forward copies unless you provide extra postage. Duplicate issues cannot be sent.

PLANE ON THE COVER

First of our new covers features Claude McCullough's YAK P or PM, see pages 26 thru 29. Our color photo shows the tremendous finish which is synonymous with Mac's scale planes.

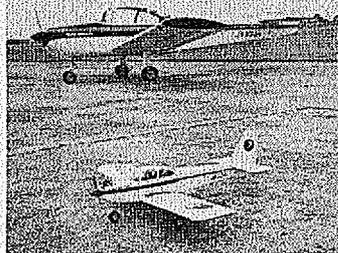
Our second cover is not too familiar with our readers but the future will hold more and more. Our insert is a shot of Ra/Car's Indy/Formula fuel powered racer. See pages 32, 33.



Honda race car at top of page is first in new line of MRC-Tamiya 1/12th super scale model cars. Mr. Soichiro Honda, President of Honda Motor Co., admires precision details of MRC/Tamiya Honda kit.

left, they already had over 350 paid admissions. Payment here is the same as Toledo, just the male adult pays his fee and the rest of the family rides along on the same fee.

Like Toledo and California, it was so crowded that you were at least three deep in front of each of the 26 manufacturer displays. It was old home week for this old man as I saw many of our Jersey friends and did lots of reminiscing while the off-water flying activities were going on. I saw old free fighters such as Joe Beshar. Last time I saw him (Continued on page 86)



NEXT MONTH'S COVER
FA-200 Aero-Subaru full scale and semi-scale.

NEW!! DELUXE SEALECTOR HEAT SEALING IRON \$9.95



Deluxe heat sealing, heat shrinking iron for Monokote, Super Monokote, Coverite, SPL Shrinkkote. The SEALECTOR DELUXE heat sealing iron has a rheostat controlled heavy duty heating element that is thermostatically controlled to maintain temperature within close tolerances. The DELUXE iron has a reflow coated heating surface that glides easily without sticking to surfaces. The small heating surface is much easier to use for model airplane work than a conventional household iron, and the shape of the heating surface permits sealing of fillets and corners. Air cooled handle fits the hand perfectly and keeps the electrical cord away from the work.

NEW!! HOBBY LOBBY RIGGING CABLE 10 FOOT PACKAGE 60c

HOBBY LOBBY RIGGING CABLE is a special fifteen pound test nylon coated steel cable for mechanical brakes and scale type control surface cables. The cable has absolutely no "stretch" or "give" This feature makes HOBBY LOBBY RIGGING CABLE far superior to plastic or fabric type mechanical brake strings. The fifteen pound test feature is designed to be strong enough for any control or brake applications, but still be a low enough breaking test so that in a crash the cable will break and not destroy servo mechanisms.

The unique feature of HOBBY LOBBY RIGGING CABLE is that the steel cable core is encased in nylon. The nylon FUSES when heat is applied. This allows the modeler to make finished loops at his cable ends by twisting the cable upon itself and then heating the joint with the flame from a match. The finished loop has a higher break test than the cable.

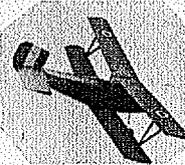


NEW!! MIDWEST AIRCRAFT NUMBERS 15c each



3" PRESSURE SENSITIVE MYLAN NUMBERS, BLACK, RED, YELLOW, A, M ZERO THRU NINE.

NEW!! MIDWEST NIEUPORT 17 AND FOKKER D-7 BIPLANES \$19.95



MICROFLAME TORCH SET \$19.95

WITH EACH ORDER FOR A TORCH RECEIVED BEFORE JULY 31, 1968 WE WILL INCLUDE FREE A MICROFLAME FIELD SOLDERING TIP VALUED AT \$3.95

TWO NEW SIG KITS

SIMCO \$34.95 SENSATIONAL FAT PATTERN SHIP T-34 SEVENTOR \$36.95 GREAT SCALE SHIP

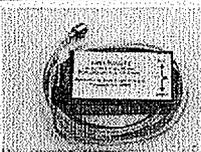


"G-PAD" \$1.35 1/2" x 8" x 12" SENSATIONAL SHOCK ABSORBING FOAM FOR CRASH PROTECTION.

SPECIAL HOBBY LOBBY SURGICAL RUBBER FUEL LINE TUBING REGULAR PRICE 25c PER FOOT, SPECIAL PRICE 10 FEET FOR \$1.50



STERLING COVERITE \$2.9522" x 40" SHEET



ANDY WRIGHT FUEL PUMP \$8.95

GRIFHOLD #88 DUAL CUTTER \$3.50

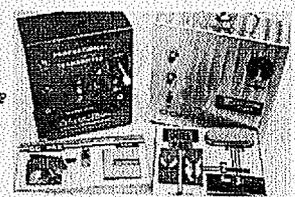


Adjustable to 1/2" width. Handiest gadget ever for cutting stripes in Monokote, cutting roundels, etc.

6 GREAT GG OUTFITS FROM HOBBY LOBBY

WE GET LETTERS EVERY DAY FROM FLYERS WHO HAVE GOTTEN ONE (OR MORE) OF OUR GG OUTFITS TELLING US ABOUT THEIR SUCCESSES WITH THESE SYSTEMS. I THINK THAT OUR PRACTICE OF ACTUALLY HOOKING UP AND CHECKING OUT THE OUTFITS BEFORE SHIPPING THEM IS THE KEY TO THE SUCCESS OF THESE RIGS.

Jim Martin



CITIZEN SHIP DUAL PAK PROPO II.....	\$129.95
CITIZEN SHIP GG PAK PROPO III.....	\$105.00
CONTOLAIRE DUEL PAK PROPO I.....	\$139.95
CONTOLAIRE GG PAK PROPO IV.....	\$114.00
F&M RELAYLESS GHOST III.....	\$ 95.00
F&M DUAL PAK PROPO IV.....	\$124.95

HOBBY LOBBY INTERNATIONAL

2604 FRANKLIN ROAD, NASHVILLE, TENN. 37204

DROP YOUR ORDER IN THE MAIL BOX, THEN JUMP BACK BECAUSE WE SHIP FAST!

We pay postage on all orders accompanied by check or money order. The United States Post Office demands that we use your ZIP CODE on all shipments, so be sure to use your Zip Code. Satisfaction guaranteed or money refunded. Phone 615-297-6361. Store hours 10 A.M. to 5 P.M. except Sunday.

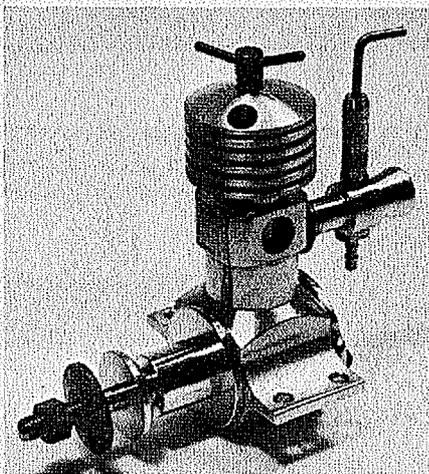
NOTES

P. G. F. CHINN

ers who appreciated its ideal qualities as a fly-for-fun motor and there are quite a few Mills users who have not lost any opportunity to build up stocks of Mills Diesels rather than face a future of having to use some other motor.

We have been reminded of all this by an entirely new make of small diesel that is just beginning to appear on the U.K. market. This is the "Embee" 75. It looks just like something out of the now distant past: one of the better examples of small-production European diesels that appeared just after World War II and the immediate reaction to it in British model circles has been that it is the logical "Mills replacement". Personally, we feel that it has a little way to go yet before it can claim to be the perfect successor to the Mills but we are sure that, if the manufacturers, Moore & Bailey of Leicester, persevere with it, it can have an assured future.

Like the earliest Mills (the .0804 cu.in. Mk.I "1.3" of 1946) the Embee has a machined all over crankcase, left in a natural polished aluminum finish. Again like the Mills, it uses the three-port two-cycle layout with a very long stroke. The bore and stroke of the Embee are (Continued on next page)



Vintage 1968, not 1948. New Embee 75 looks just like early type diesel. Hopes to fill gap left by demise of popular Mills diesel.

RADIO CONTROL

FAMOUS BRANDS AT BIG SAVINGS

\$15 R/C OUTFIT

SCHOOLMASTER \$6.95
Order Combo R/C 13

1195 VALUE \$15.95
30 Wingspan, For. 049 Engines
All bolso construction, Die cut parts. For single channel use.

MEDELLION .049 \$6.95
Medellion .049 \$6.95
RPM 18,000
Wt. 1.2 Ounces

ASTRO Pee-Wee

RELAYLESS COMPLETE OUTFIT

\$24.88 BOTH TRANSMITTER & RECEIVER

LESS BATTERIES

RECEIVER: Super sensitive 3 Volt relayless
Wt. 1.00, W. 1.15
Printed circuit Tuning
Light indicator Tunable 25-28 MC Metal case
TRANSMITTER: Uses inexpensive general
purpose tube D47A, 2 1/2" x 1 1/2"
*Sealed no tuning necessary. Micro keying av.
*37 Collapsible antenna *Toggle switch.

\$10 R/C OUTFIT

Order Combo R/C 2

JR. FALCON \$5.95

VALUE \$11.95

37" Wingspan, For. 049 engine
Large roll moment for smooth flying. For single channel

895

BABE BEE \$5.95
Babe Bee .049
RPM 15,000
Wt. 1.5 Ounces

Order-By-Mail From America's HOBBY CENTER, 146 West 22nd St., New York, N.Y. 10011

SAVE TESTORS R/C system

SIMPULSE I PROPORTIONAL PULSE

5988

REG. \$79.95

R/C digest

Reg. \$2.00

R/C SHOES TRING For. 10 to .40 Engines 54" Wingspan

Deluxe Kit **2495**

CE MULT. CHAN. **995**

CONTROLAIRE 5 SINGLE CHANNEL RELAYLESS RECEIVER

798 1398

3 volt fully transistorized receiver. Weights 3/8 oz. Ideal for 1/4A or 1/8A models.

STABILIZED CESSNA 180 48" Span

Deluxe Kit **995**

08-.35 Engine

SABRE by Losm
Ready-To-Fly **4995**

Motor	Engine Price
Hummer 65	45-60 29.95
Trenail 65	35-45 39.95
Tomco 65	45-60 44.95
Purcell 65	45-60 44.95
Midget 65	45-60 46.95
Go Go 65	45-60 44.95
T-Ball 65	45-60 44.95

TOP DANG by Top Fly
39" Wingspan

049 to Single Channel **1295**

your choice 72.88 EACH

810 44" WINGSPAN POWERED BY 049 FLYING WT. 23.92

R/C Plane READY TO FLY

TESTOR Length 16" Ready-to-run R/C Mustang

Order-By-Mail From America's HOBBY CENTER, 146 West 22nd St., New York, N.Y. 10011

SALE

ASTRO Pee Wee COMPLETE R/C OUTFIT

Here's what you get:

- ASTRO PEE WEE SET
- RECEIVER 40.00
- TRANSMITTER 40.00
- BABE BEE .049 ENGINE 5.95
- STEERING WHEEL 2.95
- ANTHON SW ESCAPEMENT 2.30
- 6" WIND PROPELLER 2.25
- BATTERY BOX 1.25
- SWITCH 1.25
- HOOD-UP WIRE .60
- FOAM RUBBER ESCAPEMENT RUBBER .15
- R/C BOX .25

TOTAL VALUE \$56.93

36.95

SAVE ALMOST \$20.00

SPECIAL OFFER!

ALL-TRANSISTOR R/C OUTFIT \$47.95

OPERATES ANY MODEL BOATS, CARS & PLANES

From 1/4 A to the Largest

Verified **\$65.00**

FREE OUTFIT

Of Extra Cost With Radio Control Combination

R/C Solder * Guide to R/C Book
R/C Tuning Word * 35" Neckup Wire
From Rubber (2" x 1") * Parts Boxes
R/C Hardware (nuts, bolts, etc.)

SALE

SAVE \$26.45 on this "SUPERHET" De LUXE R/C OUTFIT

CITIZEN SHIP

HERE'S WHAT YOU GET

- CITIZENSHIP TRANSISTORIZED TRANSMITTER 60.00
- SUPER-NET RECEIVER 15.50
- EXTRA 10 R/C ENGINE 15.50
- FALCON 35 AIRPLANE 16.00
- QC COMPROMISE ESCAPEMENT 8.85
- FOAM RUBBER ESCAPEMENT 5.95
- 1 YARD SILK COVERING 1.35
- YECO 2 oz. BLUME TACK 1.35
- 10' HOOD PROPELLER .25
- ESCAPEMENT RUBBER .25
- FOAM RUBBER .25
- ESCAPEMENT RUBBER .25
- R/C HOOD OF WIRE .25

TOTAL VALUE \$112.33

84.95

AERO MASTER 48 Inch Wingspan For. 45 to .61 Engines

3895

by AMCO

CHEROKEE 85" Wingspan For. 40 to .51 Engine

2995

VK Models

1/2 SKYLANE 42" Wingspan For. 040 Engine

695

NAVIGATOR 52" Wingspan For. 014 to .10 Engine

1195

Jetco

MISS WORLD'S FAIR For. 010 to 020 engine 30" Wingspan

395

SPAN JR. FALCON 37" FOR. 046 5.95
SR. FALCON 60" FOR. 45 29.95

Order-By-Mail From America's HOBBY CENTER, 146 West 22nd St., New York, N.Y. 10011

RADIO CONTROL TANK

IMPORTED MODEL

Less Batteries

RADIO CONTROLLED... OPERATES UP TO 20 FEET WITHOUT WIRE. AUTOMATIC. RECORDED SOUND OF BULLETS, MACHINE GUNS, CANNONS AND MISSILES... ELECTRONIC PARTS GUARANTEED. RECORDED SOUND EFFECTS

34.98

WITH RADIO EQUIPMENT

SAVE \$30.00 ON THIS CITIZEN SHIP

Complete Single Channel DIGITAL Proportional System—DP-1

Reg. \$111.90

79.95

Colors Available: Green, Insignia blue, aluminum, gold, white, orange, yellow, red and black.

3.50 EA. **3.849**

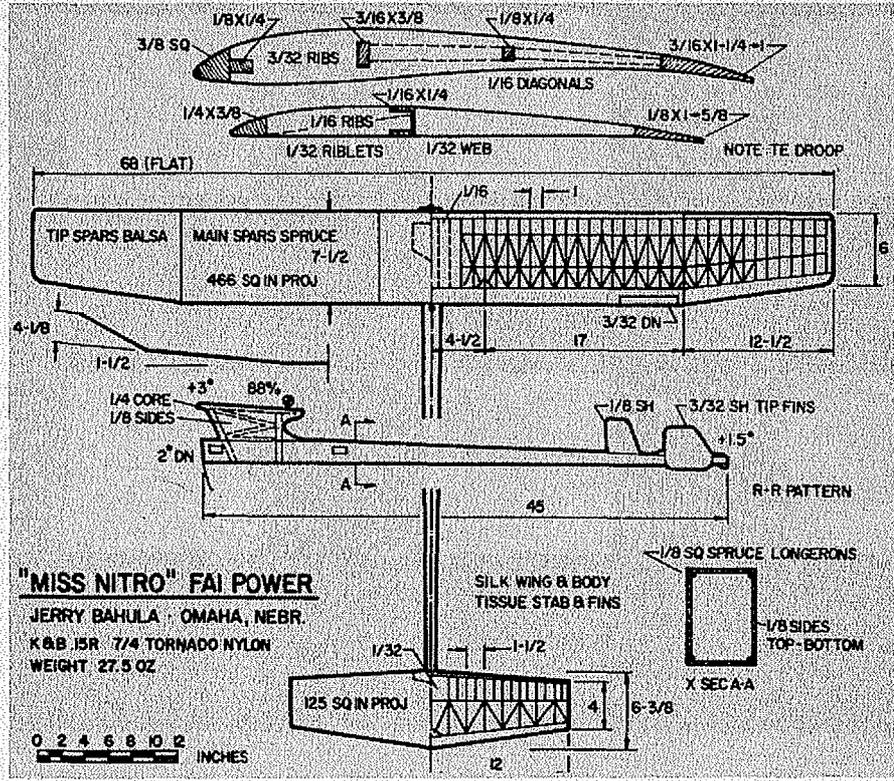
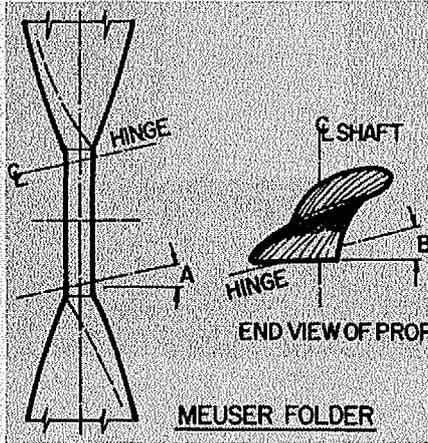
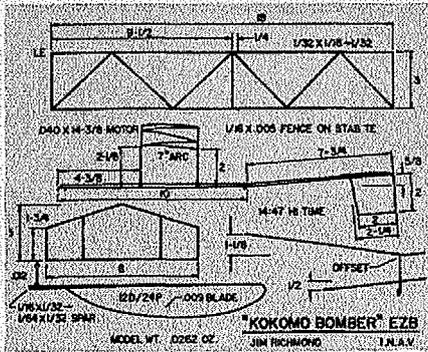
RADIO CONTROL TELEVISION VAN

RADIO CONTROLLED TV TELEVISION BROADCASTING VAN... HIGHEST QUALITY ELECTRONIC DEVICE... ASSEMBLED & TESTED BY SKILLED CRAFTSMAN

19.98

WITH RADIO EQUIPMENT Less Batteries IMPORTED MODEL

Order-By-Mail From America's HOBBY CENTER, 146 West 22nd St., New York, N.Y. 10011



Report of First Annual
National Free Flight Society
Symposium
August 5, 1968
U.S. Naval Air Station
Olathe, Kansas

Proposed cover for NFFS symposium report.

photos this page: Robert B. Meuser



Junior Gerry Geraghty of the Oakland Cloud Dusters does just that with his half A ship.

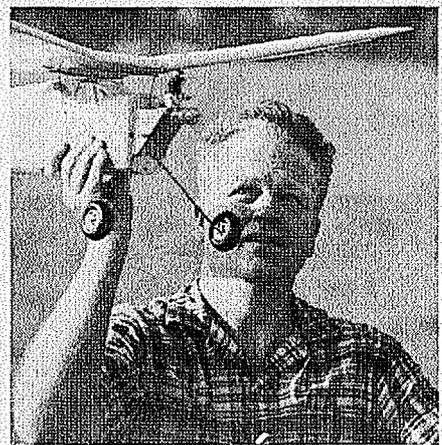
YO FREE FLIGHT AFFAIRS By Dave Linstrum

RUBBER · POWER · INDOOR · GLIDER · FLYING SCALE

LUCKY LINDY IS ALIVE
AND WELL IN OMAHA

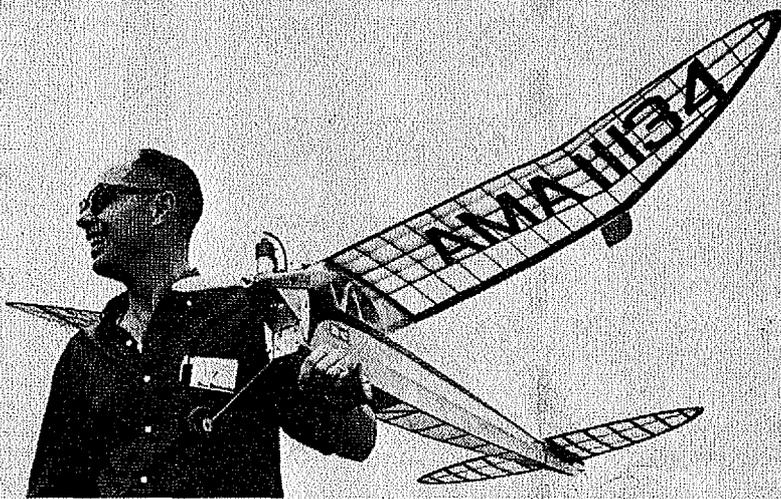
► That's the button that Jerry Bahula should wear when he flies his tri-tailed FAI Power ship in competition though the real resemblance to the famous Conover power ship is superficial. The main parallel is in the trimming technique which is a bit unusual for pylon

models, but works very well. Pylon ships usually tend to swerve to the right upon launching and this sometimes results in a splatter! To avoid this, Conover used an aileron on the right wing to keep it up in the turn and a center "power fin" offset to the left, with tip fins offset to the right. The center fin is in the prop blast and has an effect at very low speed which occurs just after launching. It keeps the ship going straight until speed builds up and the tip fins take over, forcing a gentle right spiral climb. Downthrust is thrown into control looping tendencies. This combination results in a very safe, smooth, and consistent power pattern. You don't see too many "Lucky Lindy" ships flying in FAI these days but there is no reason why the ship (once a World Champion) or the trim concept should be forgotten.



Jim Root of Kansas City launches Golden Eagle O.T. Ship has Bantam 19 ignition powerplant.

Closer inspection of the 3-view will reveal that "Miss Nitro" (originally named like a beauty queen—but now, with cold fuel, you can say "Oh, how I Miss Nitro!") is quite a bit more sophisticated in outlines and structure than a Lindy. The wing section results in a Nordic-like soaring glide and the

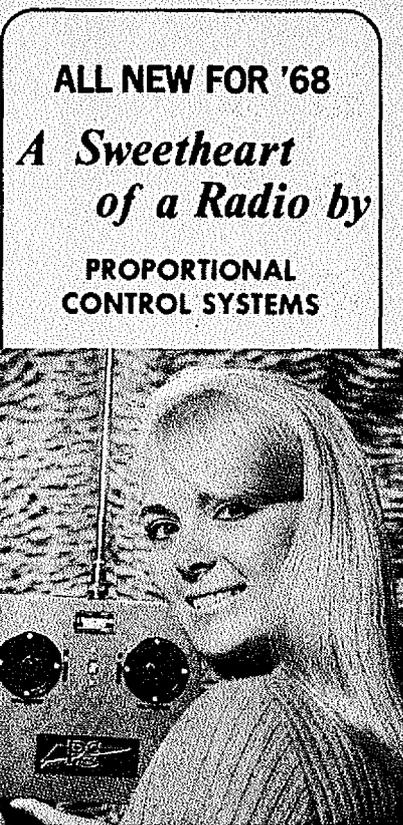
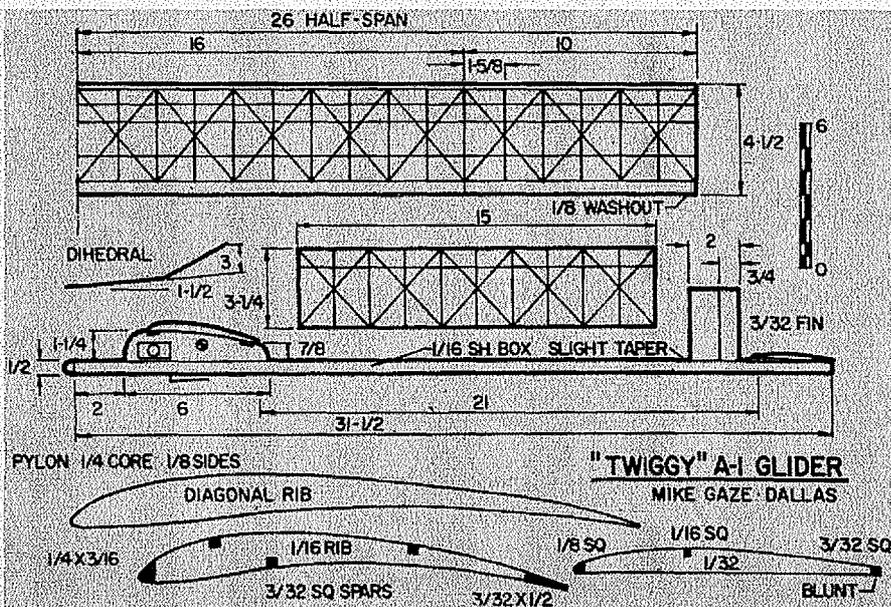


Bill Bruning and his class B Old Timer winner. Looks like Comet Clipper with Brown B.

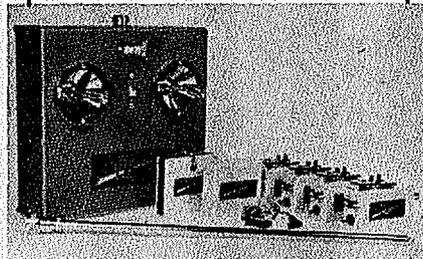
droop TE on the stab lifts the tail up to get a really smooth transition. The intricate diagonal geodetic bracing may seem a bit much but not to Jerry. Detail is his forte and he crafts really lovely ships. I have seen him prang a model, bashing it into what would seem to be an irreparable bag of balsa; then he will come out with it next season and you can't even see where it was damaged and repaired! He is one of the best free flight craftsmen I have come across.

Jerry has been a consistent supporter of the FAI Free Flight Program from the beginning, both as a Contest Director and as a multiple event flyer. He flies Nordic, Wakefield, and Power with equal skill but he considers the latter two to be his best events and concentrates on them. He gets lots of practice and shows up at the semi-finals with well tested ships but he has been dogged by bad luck over the years. It seems to be a case of always the bridesmaid but never the bride. He has come within a couple of seconds of

making the Wake team and has often been in the lead in Power and Wake in Midwest FAI elims. Somehow, bad luck catches up with him, though, and his fine models and flying technique just aren't enough. A typical example is the truly horrible first round he had on Power day at the Strother Field (Winfield, Kansas) Semi-Finals in 1965. He cranked up his reliable "Miss Nitro" for his first attempt on the blustery September morning but was hit by a severe crosswind gust just as he launched. He calmly walked out to pick up the debris from the plowed field, then put up his reserve "Miss Nitro" for his second attempt. A beautiful climb and recovery, but the timer cried out "Overrun!". To top off this 10.1 second disaster, the model did not DT until it was out of sight and he lost it—all for nothing. Jerry's score for Round One: a big fat zero. Now you can imagine he was more than a little heartbroken. The next day, he led in Wakefield but an unexpected wide loop lost him all (Continued on page 54)



- ★ New VINYL-CLAD Transmitter
- ★ New KRAFT-HAYES Controls
- ★ New Improved Receiver
- ★ New KRAFT-HAYES Servos
- ★ New Airborne Power Pack



COMPLETE SYSTEM ONLY

\$ 299⁹⁵

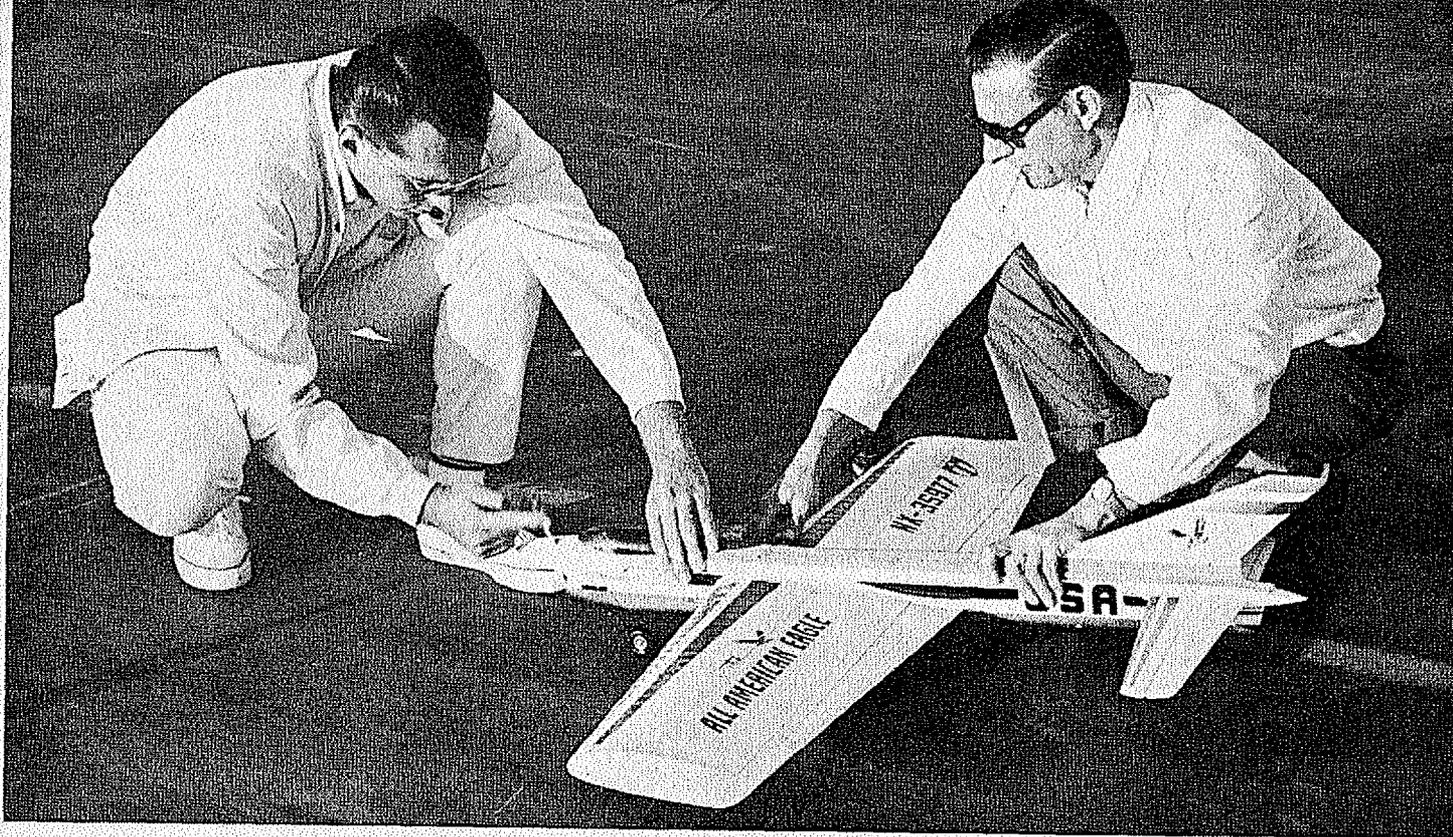
FOB FACTORY
Add \$20⁰⁰ for 6M or 72MHz
California Residents
Add 5% Sales Tax



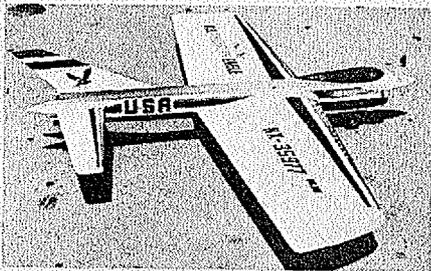
for details write

PROPORTIONAL CONTROL SYSTEMS

A Division of KRAFT SYSTEMS, Inc.
2466 SEAMAN AVE.
SOUTH EL MONTE, CALIF.
91733



Author fires up his engine preparatory to still another win in stunt. Good-looking machine, superbly finished, is an eye catcher on flight line.



Another view of the Eagle showing finish detail

ALL-AMERICAN EAGLE

Designed specifically for FAI, the EAGLE will carry your colors to victory in any competition. It will also win the accolades due it for beauty of design and appearance. In all ways, it is a real advance in the state-of-the-art in ukie stunt.

By DAVID GIERKE

► The "ALL AMERICAN EAGLE" is my first attempt to design and build a truly F.A.I. competition stunt ship with qualities enhancing the nature of the event. International competition, with all its patriotism, symbolizes the mood and sets the stage for extraordi-

nary competitive efforts at the control-line world championships.

After extensive thinking concerning the patriotic nature of the event, the following qualities were deemed desirable:

(a) Colorful and symbolic name. (b)

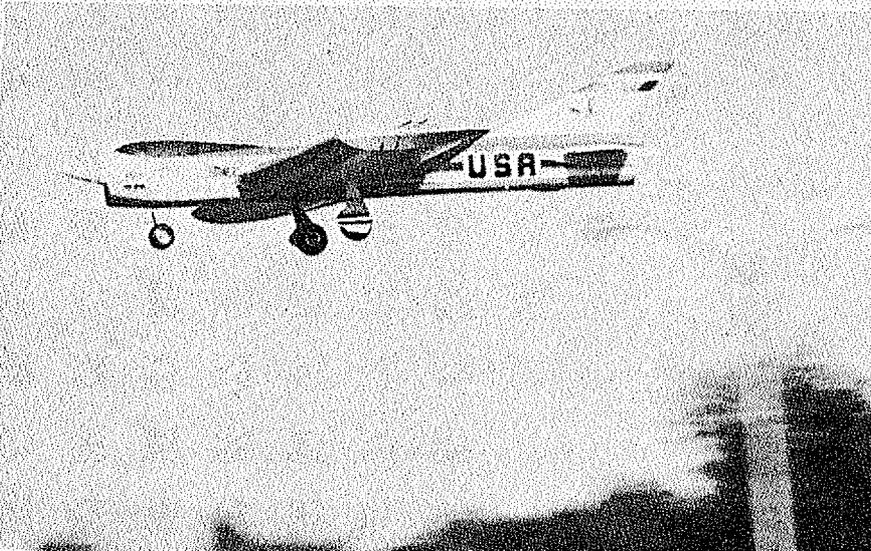
Appropriate national colors. (c) Extensive detailing and finish. (d) The ability to display more complete control of the situation by being able to throttle the engine and brake for landings. (F.A.I. limits the flight time to seven minutes as compared to our eight minute maximum.

The name, "ALL-AMERICAN EAGLE", was by no means original. It was borrowed from Dan Gurney, America's leading designer/driver of world competition Formula I cars. It seems to be quite adequate for a symbolic and colorful splash across the wing.

The second condition, of course, was solved by the red, white and blue color scheme. White was chosen as the base color because of its excellent visual qualities in the air. Notice in the photographs the red and blue trim of the fuselage. The wide top red stripe is running parallel to the thrust line into the red tinted canopy. The same is true concerning the bottom stripe of blue.

This was a (Continued on next page)

Steady as a rock out on the end of the flight lines. Third line used for R/C friction brakes.



ALL-AMERICAN EAGLE continued

continued attempt to prove that fuselage trim, when kept parallel to the thrust line, greatly enhances the appearance of square corners in the stunt pattern. A specific attempt was also made to keep the top and bottom fuselage blocks parallel to the thrust line for the same reason. The depth of the fuselage was cut down from previous designs in order to give the appearance of length. This illusion of length, plus parallel top and bottom blocks, along with the above-mentioned trim, produces a pleasingly directional profile.

The actual aerodynamic configuration is very similar to my "NOVI" stunt series. As I mentioned before, the emphasis has been shifted to total effect. In order to accomplish this, the reliable, contest-proven design was adhered to throughout.

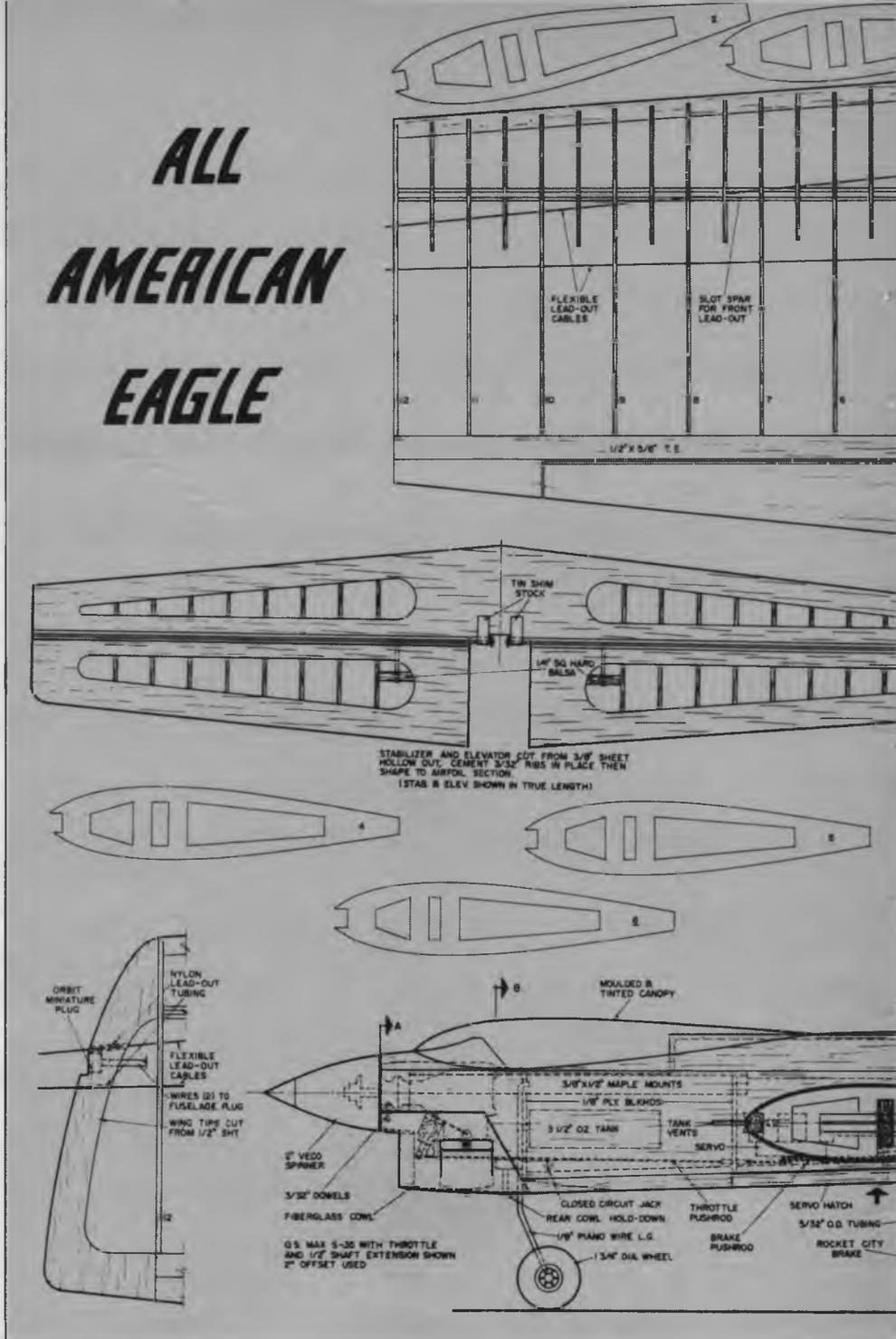
Detailing was performed as closely to full size aircraft as possible. Most sheet metal lines and control surface outlines were applied with a ruling pen using water-proof black India ink. All lettering and rivet work was accomplished via "Letro-Set" Instant Lettering. I discovered the dots used for the rivet detail while leafing through the "Instant Lettering" catalog. They came in six different sizes with sell for approximately \$2.00 per sheet. The tiny detail lettering was obtained from "Letra-Sets" model railroad area.

Many stunt modelers today are searching for reasons why new people are not joining our ranks while other control-line events are flourishing. A great many modelers feel that it takes an excessive effort to compete with the "super specialists" with their exotically-finished and detailed machines. As a result, in an effort to alleviate the apparent intolerable situation, the whipping boy has been our appearance point system. The critics of our event see a "cure-all" in doing away with said forty points. The feeling persists that if all fliers start on an equal basis at the beginning of each flight, the aircraft with its many variations ceases to be a problem.

Uniquely, stunt is a combination of the pilot's ability, the fly-ability of the ship, and the general appearance of each individual aircraft. With or without appearance points, judges, being human, will tend to be more magnanimous in point allotment toward the aircraft he admires.

It has been said that if appearance points were eliminated, the stunt men would not spend many long months trying to achieve the ultimate in design, finish, realism, and workmanship. Again, speaking for myself, it wouldn't matter if appearance points were eliminated. I would (Continued on page 60)

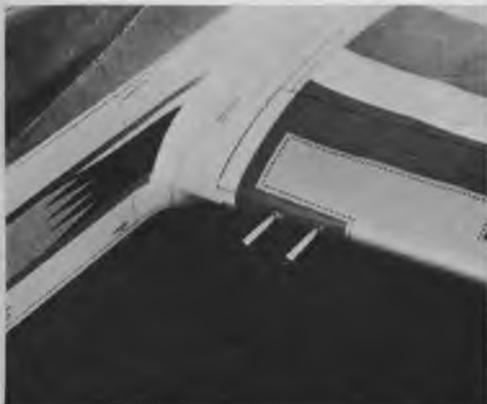
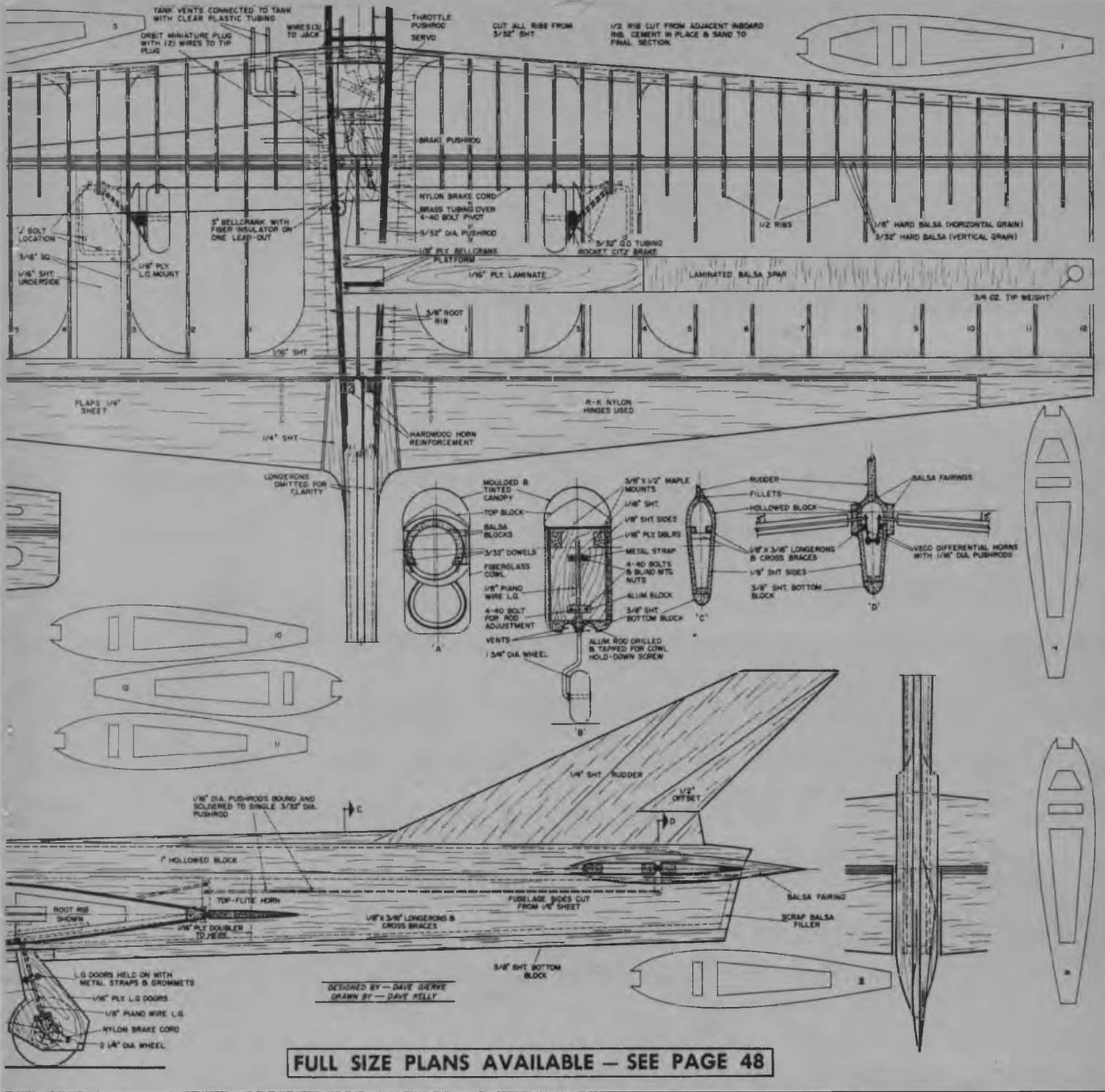
ALL AMERICAN EAGLE



Close-up view air intake and rivet details.



Wheel brake and throttle control servo mech.



Note wing mounted fuel tank filler tubes



Rand Mfg. wheel brakes on Banner wheels



Fibreglas cowl removed showing OS Max .35 R/C.



British contingent, minus Ron Moulton. L to R. B. Lamb, D. Hambley, R. Kenward, A. Crisp, Ray standing: Shirley and Bill Horton, John Lorimer, Firth. Kneeling: T. Dilks, H. Tubbs & J. O'Donnell.



Pure anguish! Henry Tubbs breaks motor as Rod Kenward holds. Should have had tape recorder.

COUPE d'HIVER 1968

By JOHN O'DONNELL . . . England's perpetual competitor and photographer did his usual good job. The following report with photos tells the story quite adequately of what transpired on a cold, windy day at Chavenay, France. Our hardy competitors turned out in force for fun and glory.



Smile of victory. Jacques Griveau just after being presented first place trophy by M. Bayer.



Many French entrants had solo winding rigs. Here one winds while other removes wound motor.



Author manages wan smile in spite of weather. Here he holds own design and Frank Monts model.

► "Coupe d'Hiver" is now a term commonly used to describe rudder models designed to a certain specification with little thought about its origin. Those who attended the annual Coupe d'Hiver at Chavenay, near Paris, on 25th February, 1968 were reminded only too well of the derivation of the phrase. It was certainly a *winter* contest, being overcast, murky, and a bitterly cold wind blew. Local opinion was that it was the

coldest day of the Winter!

Foreign entries gave the meeting true international status. There were a dozen in the British party organized by Ron Moulton of "Aeromodeller", and there were also participants from Holland and Italy. The U.S.A. was not too well represented this year because difficulties were encountered in obtaining willing proxy fliers.

Only three American models were

flown in the contest, those of Tom Medley (flown by Henry Tubbs), Frank Monts (John O'Donnell) and Walt Roselle (Rodney Kenward), Don Abbott, currently on Sabbatical leave at the Pasteur Institute, was present in person but he shredded a propeller blade on an unfortunate test flight. His model, incidentally, was built in France.

The contest was large by any standards with 232 (Continued on page 63)



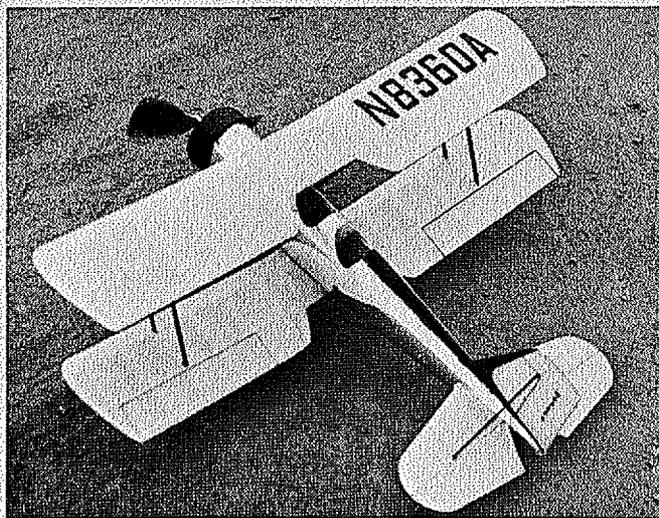
Not an A/1 glider as you might think. Very high aspect ratio entry by France's Krestinick.



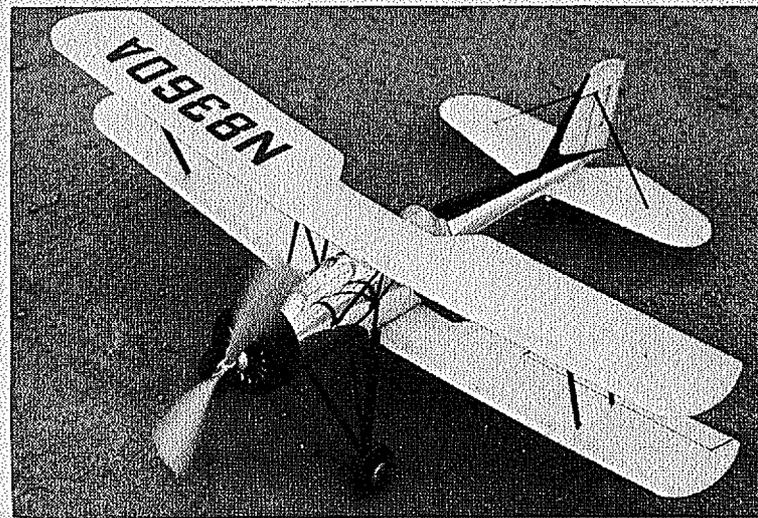
Well-known Coupe d'Hiver exponent with his fair helper and one of his five models entered.



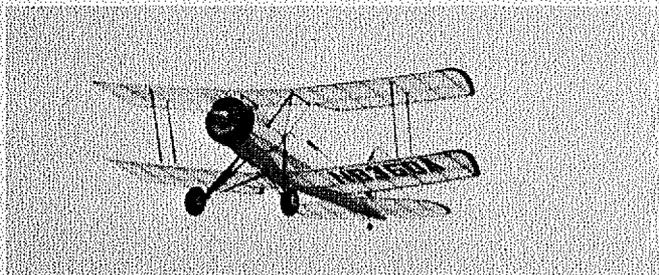
Foul weather raiment displayed by England's Barry Lumb. Cold did not deter their enthusiasm.



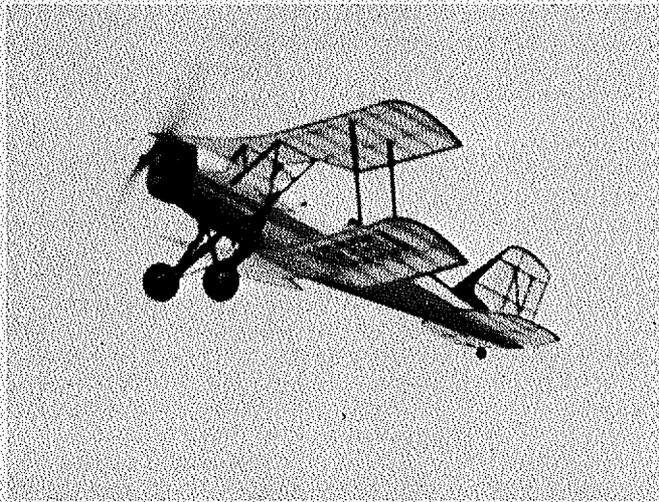
Finished with Walt's usual attention to details and good workmanship.



Front view with prop spinning shows effective use of metallic mylar.



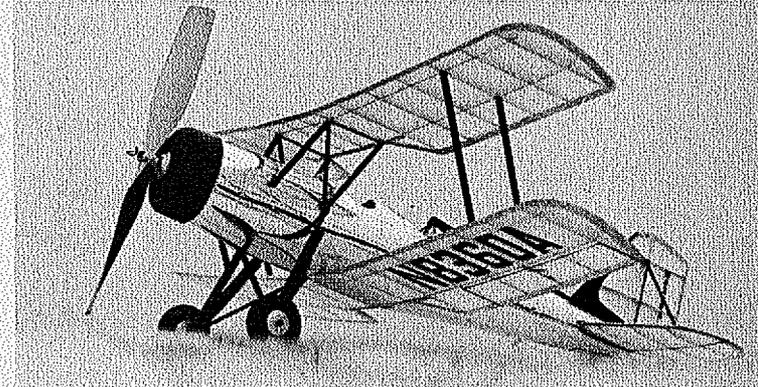
Straight away climb of our little beauty is seen in this flight shot.



Nothing prettier than light reflected through Jap tissue covering.



Aluminized mylar simulates metal covering. Note rivet detail on fuselage.



No, it's not flying above the clouds. Unusual photographic effect.

MEYERS OTW

All of you small, scale powered aficionados should have a ball with this latest in the line of scale rubber machines by California's old Professor of free flight.

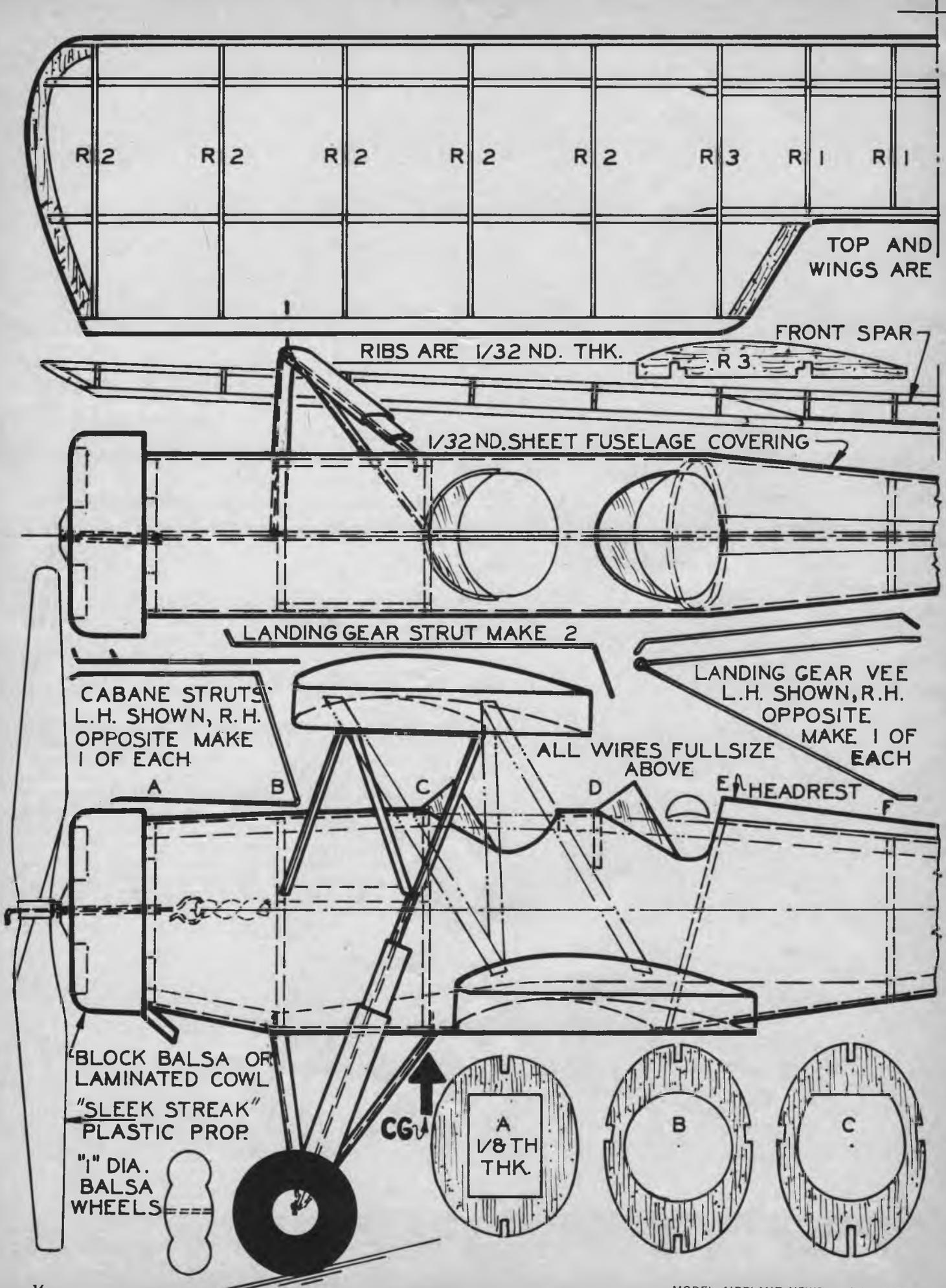
By WALT MOONEY

► The Meyers OTW is a classic biplane. It has been used as a Trainer, a Sportplane, and a Glider Tug. There are a great number of Meyers lovers although there were not a lot of OTWs made. It has an aerodynamic set up that makes it ideal for a small flying model. There is plenty of vertical tail area and a relatively long landing gear in addition to quite a good separation between the wings.

Model in the photographs was built during my spare time at the 1967 Nats. Several features may surprise Meyers enthusiasts. It has parallel interplane struts, and it has an engine cowl depicted. Most Meyers have N struts and a radial engine that is out in the breeze. This model was drawn up from a three view of the prototype and is accurate with the exception of the enlarged horizontal tail area. The flying propeller is oversize and all the rigging wires have been omitted. A cowed engine is easier to simulate than a uncowed radial and the flying wires add lot of drag in a model of this size. (Continued on page 69)

photo credit: Fudo Takagi

FULL SCALE PLANS FOR MEYERS OTW ON FOLLOWING TWO PAGES



R 2 R 2 R 2 R 2 R 2 R 3 R 1 R 1

TOP AND WINGS ARE

RIBS ARE 1/32 ND. THK.

FRONT SPAR

1/32 ND. SHEET FUSELAGE COVERING

LANDING GEAR STRUT MAKE 2

CABANE STRUTS
L.H. SHOWN, R.H.
OPPOSITE MAKE
1 OF EACH

LANDING GEAR VEE
L.H. SHOWN, R.H.
OPPOSITE
MAKE 1 OF
EACH

ALL WIRES FULLSIZE
ABOVE

E HEADREST

BLOCK BALSAM OR
LAMINATED COWL
"SLEEK STREAK"
PLASTIC PROP.

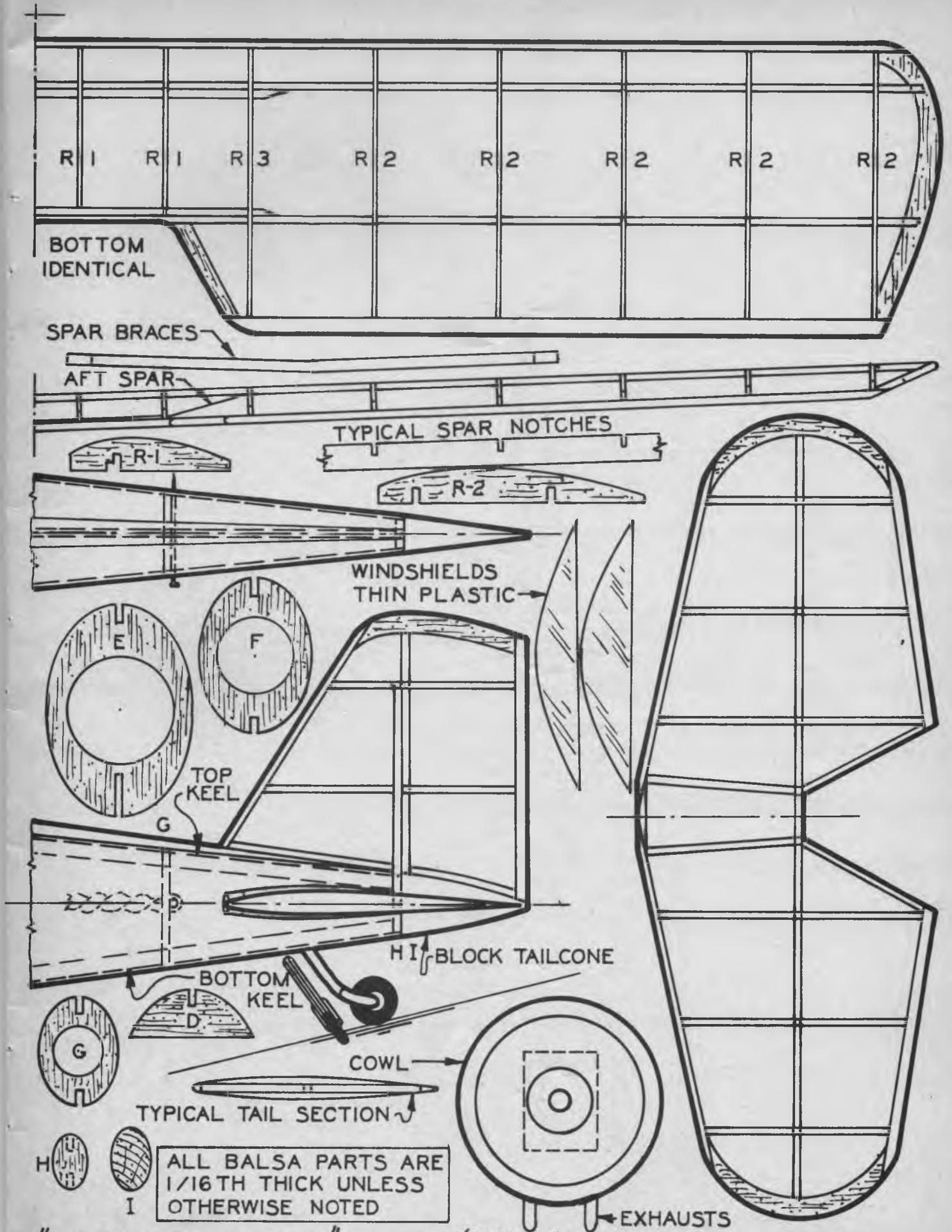
1" DIA.
BALSAM
WHEELS

CG

A
1/8 TH
THK.

B

C



R 1 R 1 R 3 R 2 R 2 R 2 R 2 R 2

BOTTOM IDENTICAL

SPAR BRACES

AFT SPAR

TYPICAL SPAR NOTCHES

R-1

R-2

WINDSHIELDS THIN PLASTIC

TOP KEEL

HI BLOCK TAILCONE

BOTTOM KEEL

COWL

TYPICAL TAIL SECTION

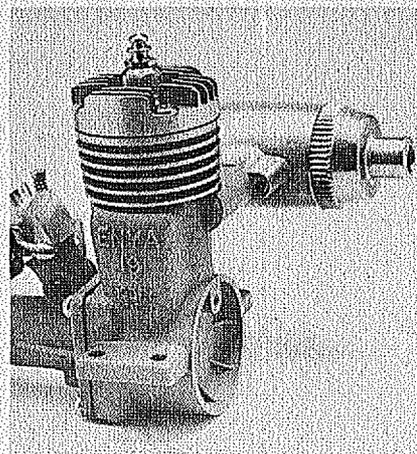
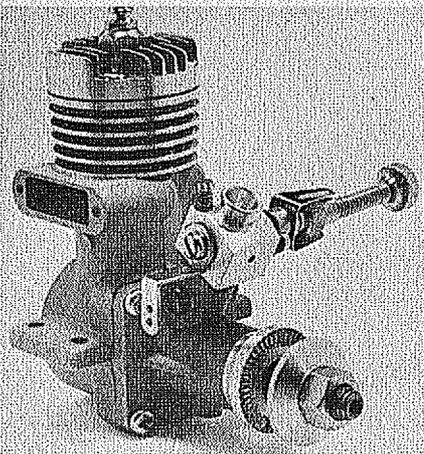
ALL Balsa PARTS ARE 1/16TH THICK UNLESS OTHERWISE NOTED

EXHAUSTS

"MEYERS O_{UT}TO W_{IN}"

BY *Walt Mooney*

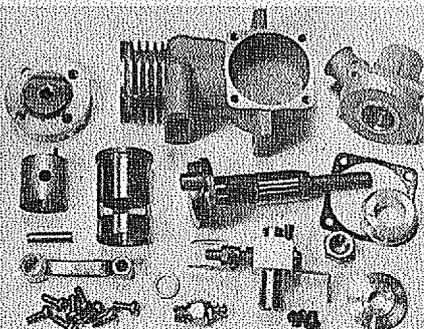
11-18-65



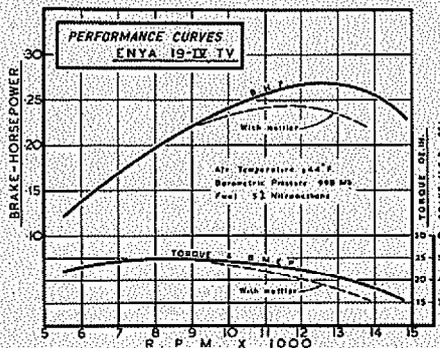
Enya's first 19 was built 18 years ago and 19 IV is result of continuous development program.

Pressure cast aluminum Enya muffler by external strap or by internal screws as shown here.

Enya's .19 IV TV is typical of Enya design. A well-made motor with good power output, sturdy, and at a reasonable price. History of good engine design reason for its qualities.



Parts are sturdy and well-finished. Engine can be converted to opposite rotation by repositioning the front housing at 90 degrees.



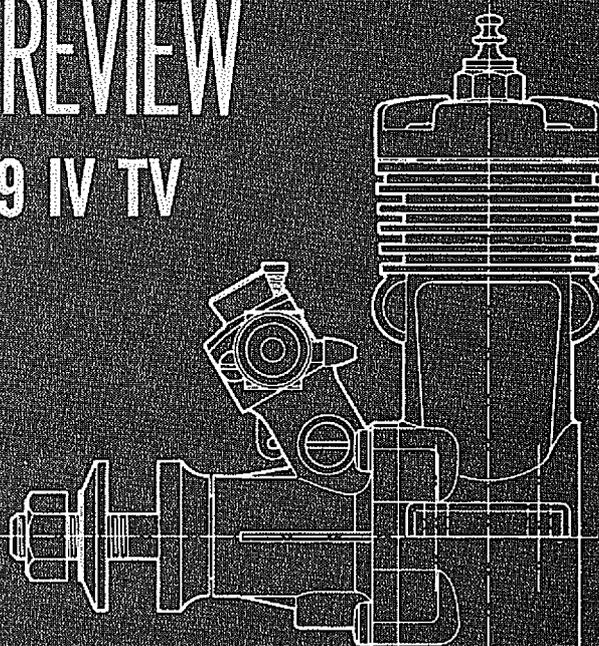
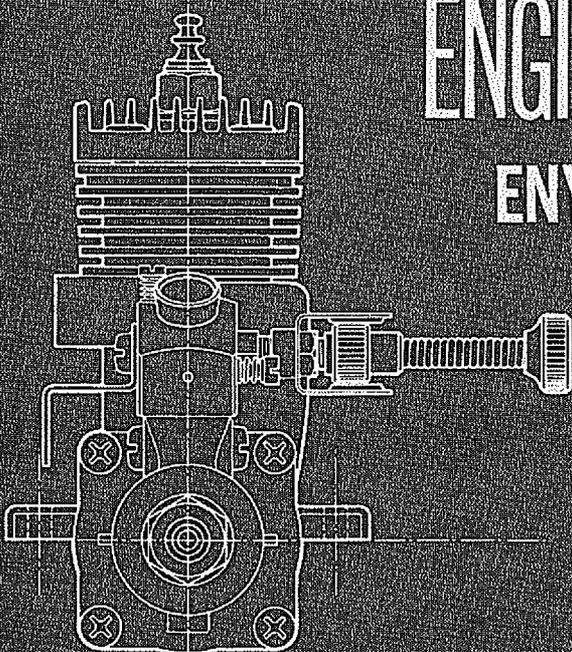
► The very first Japanese Enya engine to come into our possession, back in 1953, was, like the subject of this month's review, a 19. This was a "Model 4002", a diecast version of Enya's original sandcast 19 and the first Enya motor to be put into relatively large scale production. Prior to making these engines, the Enya brothers had built some bigger motors in the shape of the Enya 63, a rugged sandcast engine that later developed into the Enya 60 and remained in production right up until shortly before the now famous and highly successful 60-II was introduced.

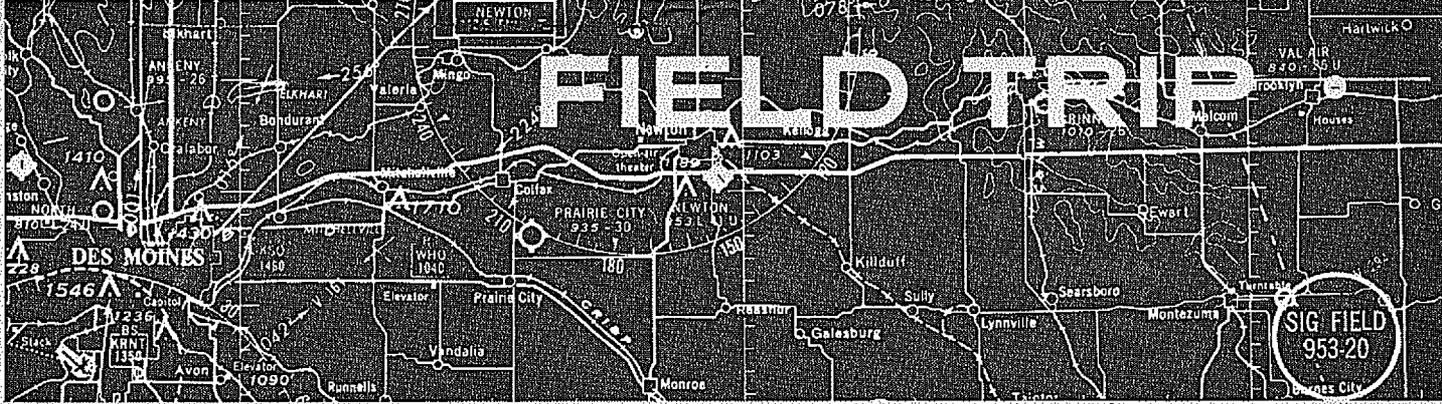
That early 19 impressed us with its sound construction and good performance. It was also extremely easy to start. As is still the case with most of the current Enya engines, it featured a one-piece cylinder and crankcase casting with drop-in cylinder liner and a separate front end containing the main bearing. It was a beam mount motor but the back of the crankcase also had four concealed lugs drilled and tapped for a rather neat diecast aluminum radial mounting plate which was supplied as an optional fitting.

Early in 1956, the Model 4002 was replaced by the 4003, otherwise known as the Enya 19-III and this was subsequently offered also in a "TV" (throttle-valve) version for R/C. In 1962, the 19-III and 19-III TV were, in their turn, superseded by the present, further improved, Model 4004 19-IV and 19-IV (Continued on page 63)

ENGINE REVIEW

ENYA .19 IV TV

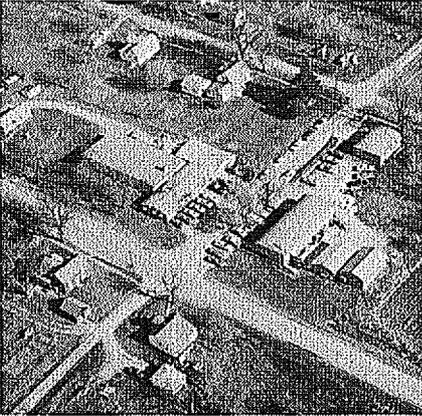




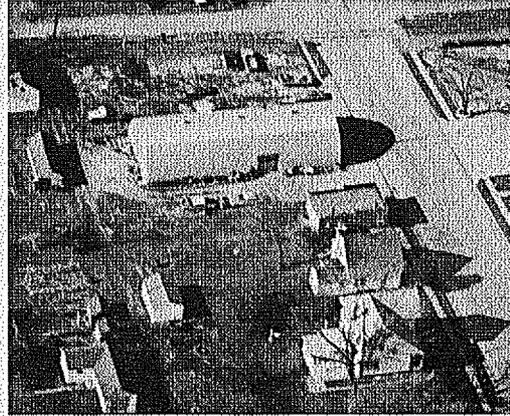
Come with us in our flying machine to the hinterlands of the Midwest. You can't comprehend the beauty of the Corn Belt until you have flown over it with both of the Sigs as guides.



Dig Hazel's flying coat! Both are asking for my impressions after our fly over Corn Belt.



Aerial view over six of the seven buildings. L-shaped building houses offices and wood shop.



Long Quonset-type building is the main warehouse in which bulkwood and kits are stored.



Glen explains the workings of a completed balsa folding propeller for rubber powered planes. We are standing in finished strip wood section. Very small part of the bulkwood waiting for the woodcutting shop. Before cutting, the raw wood is sorted and graded for weight and quality.

► MAN at Work, in his February, 1968 column, promised a run down on his trip to the Sig manufacturing facilities in Montezuma, Iowa and is now keeping his promise.

The actual purpose of the trip was to avail ourselves of the many invitations extended by the two Sigafosoes, both Hazel and Glen, to visit their facilities. In addition, the thought of visiting a midwest town with the name of Montezuma was just too much to discard lightly.

The photos on this page tell the story a lot better than words can but there are many areas of personal interest that require telling. How many of our model manufacturers can lay claim to the fact that they are the principal industry in their community? Sig can. How many manufacturers can lay claim that they have a flying field carrying their name on the airways map? Sig can. Check that print of the airways map on which Sig appears. Neither Hazel (continued on page 66)



Maxey Hester's many contest trophies are on display in the outer office. Glen takes time out to point to his favorite among the trophies.



ROUND & ROUND

Combat • Speed • Stunt
Racing • Slow Combat

By PETER SOULE



A shot from a well-attended "Is control line dead?" contest in Australia. C/D Harold Symmons checks starting time for Team Race event.



Babre/Favre French team record holders mimic Stockton/Jehlik by having pet mouse ride plane.



French FAI Team Racer Guy-Revel is a medical student in Paris but has time for his hobby.



Bill Long and pilot Paul Hagan New Zealand 1/2 A record holders with Oliver .09 diesel plans.

RATS IN ILLINOIS

► Bob Phillips, oldest brother of the Phillips Brothers Rat Race Team (Roger, Ronald and Bob) wrote in with a nice run down of their activity in Downers Grove, Illinois. They started a few years back and learned the business about the only way there is . . . by getting beat a lot. The results of the hard work and persistence show up in the photo they sent in with a whole flock of trophies garnered last season. They are justifiably proud of their last season and credit the help of most of the Midwest's top fliers, such as John Barnhart, Pat Flynn, Howard Weaver, Marty Grief and Frank Przybylski, to name a few. With lots of practice, lots of racing, lots of

listening (when you could have been talking) and help from the best in the business, the Phillips brothers are now "competitive."

The racers are conventional midwest design. Upright engine on a Harters mag pan, one wheel gear and 30 inch span (longer than most). The airfoil is described as "the eyeball variety". As they say around home, "Them's the best kind". A no-nonsense approach like the above allows you to concentrate on the fundamentals of pitting, setting the engine, flying (especially passing) and landing. The photos might not do the finish justice. They spray the planes with colored polyester resin and rub them down to a mirror finish. They give the appearance of being glass-dipped.

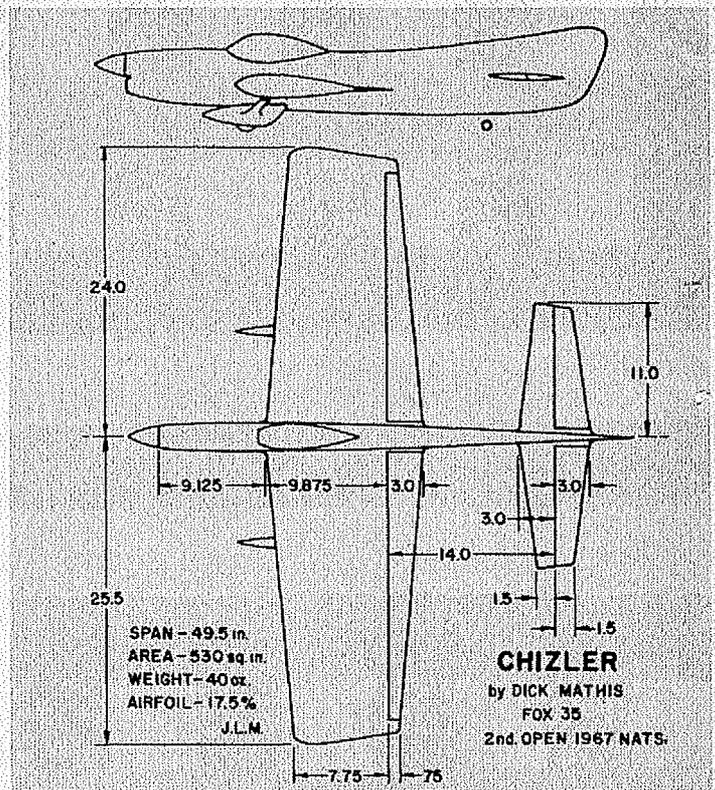
I have never had the courage to try fiberglass resin in my spray gun and I'd like to know the secret of making the colored resin thin enough to spray and yet set up hard. I mean other than using lots of elbow grease after the stuff gets on.

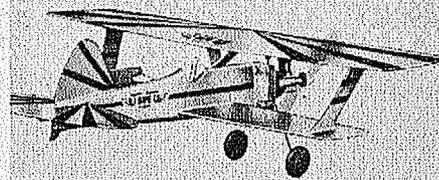
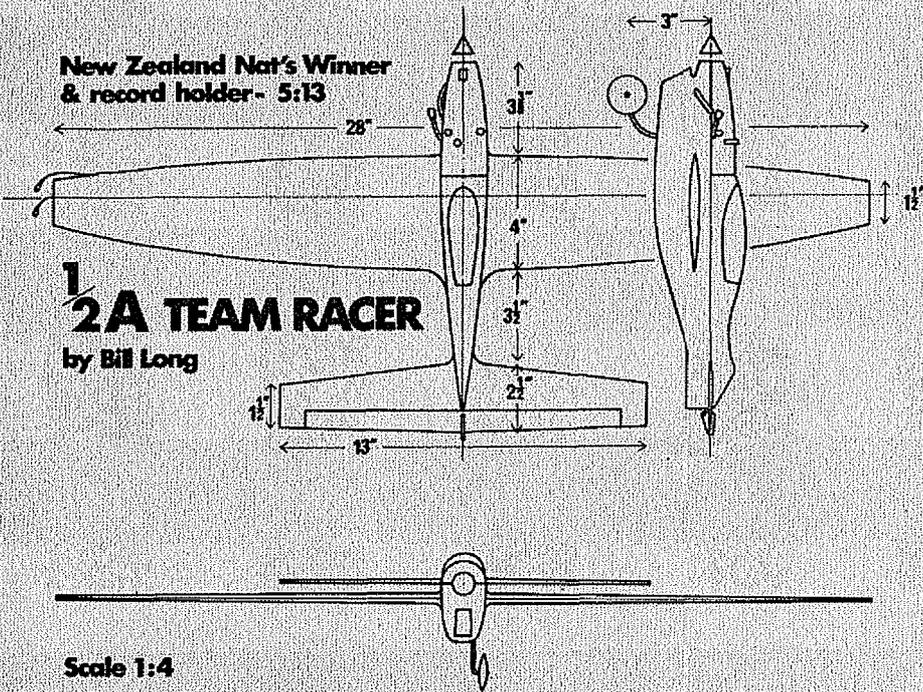
The fuel they run is 50 nitro-30 alky and 20 Ucon in summer and 60-20-20 in winter. Right up to the limit of plug element endurance.

In this season the Phillips brothers plan to take up FAI Team Racing and dabble in Goodyear for fun and are now fooling with a Webra diesel. We could use a few more tough customers in FAI, fellows.

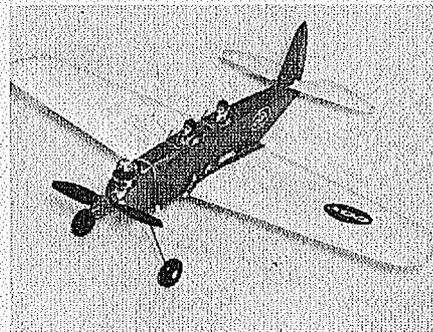
PHOENIX

Hottest speed meet of the winter was

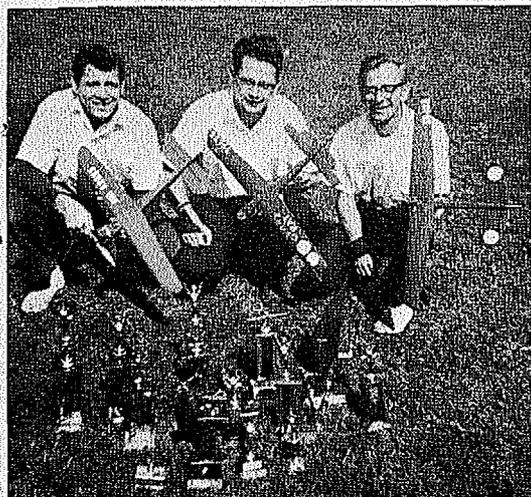




Latest in the Sterling line is this beginners' Ringmaster Bipe-21. Excellent beginners' ukie.



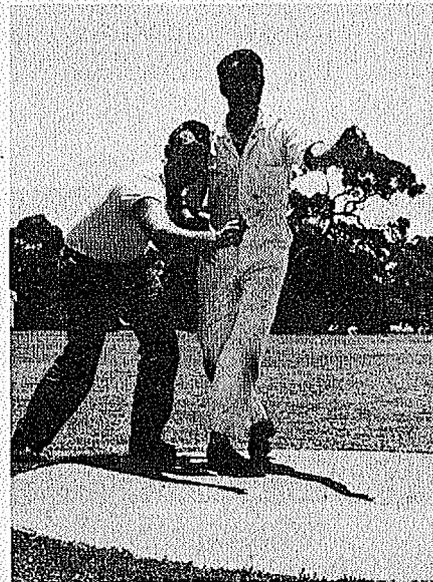
1968 Cox QZ trainer features "break-away" wing and landing gear rubber band part attachment.



Phillips Bros., Rog, Ron, and Robert, from Morton Grove, Ill. are a well-known Rat Racing team.



Famous French speed flier Jean Magne pits for a team race buddy. Bandages did not deter him.



Merv Bell (L) and Barry Franklin thrash out Open Combat heat at recent Australian event.

the Phoenix AAA meet. Here A speed went out of sight as the Newton/Nightengale team from L.A. beat the existing AMA record at 163.17 only to have to stand second as Theobald and Wisniewski went out into never-never land at 175.37 and backed it up with 170.5! This new AMA record is faster than the "World" record for Class A. Bill Nelson did 146 in Jr. A for what might have been a new record but walked away from it since no one at the contest knew what the record was. Good idea at a big meet to have a record sheet at hand.

Since the A record has been between 157 and 163 ever since the backup flight rule was put into effect a few years back, the new speed finally shows

the potential of the tuned exhaust in this area. Observers state the model came out of the dolly like a proto and was at full speed in what seemed to be about three seconds after becoming airborne.

Rat was won by Dick Brace at 5:39 which is about as fast as they come west of the Continental Divide. Incidentally, Dave Balch, a well-known British flier now residing in Connecticut, flew a K&B 40 rat in Britain before he came over. He ran an experimental E.D. Power Pipe #3 (for 40 to 60) on his rat and said he gets a 4 to 5 mi/hr increase without any particular quirks in starting, flying, and so on. We may see the Pipe in more and more competition in the coming two years. Unless the

ban-the-pipe rules are effective for all model events there is only one way left to go. The only question is: how fast will modelers get there?

VINTAGE CONTROL LINE

I see that the Old Timers are allowing some fairly modern planes to fly. Now and then, I lose my grip on reality and feel a nostalgic pull when looking at a picture of one of those pre-war class B cabin jobs. Will the trend continue? As the old timers progress, will control line overtake them like it did their late 1940 counterparts? Think of it. You could be flying Davy Slagel's Chekala Roma with a super Cyke. Maybe even a Drone Diesel in a Hot Rock if you prefer Eastern Style history. Experi- (Continued on page 78)

Best support we know for Don Lowe's Prototype Pattern event proposal is this action photo of Ray Nugen's "Krierkraft" during a demonstration flight in support of the proposal. See page 37 for details.

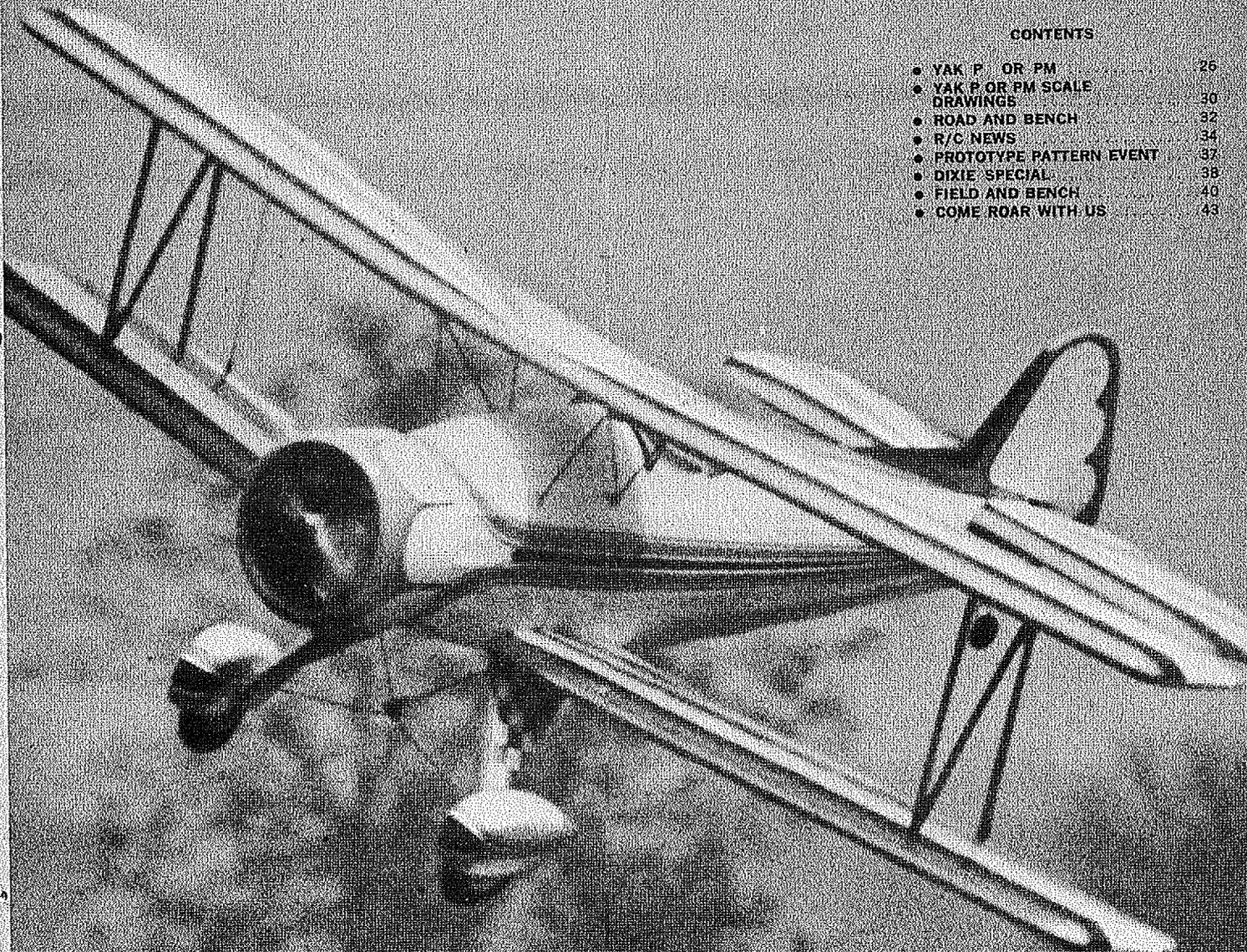


Radio Control

SPEED & SPORT

CONTENTS

• YAK F OR PM	26
• YAK F OR PM SCALE DRAWINGS	30
• ROAD AND BENCH	32
• R/C NEWS	34
• PROTOTYPE PATTERN EVENT	37
• DIXIE SPECIAL	38
• FIELD AND BENCH	40
• COME ROAR WITH US	43





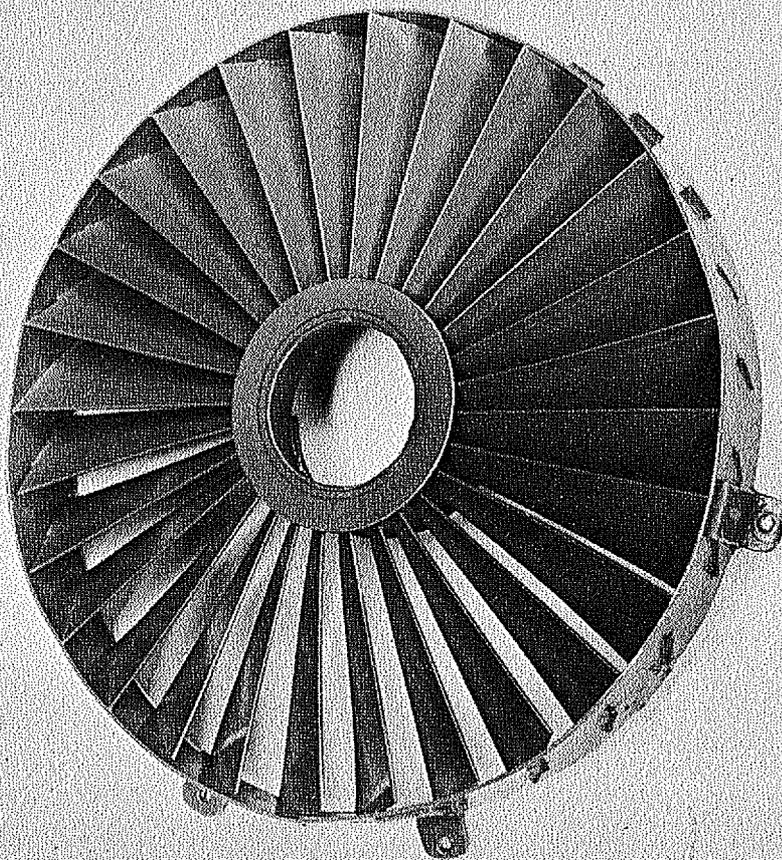
Come out from behind those dark glasses Claude, our readers know you. Man size machine, isn't it!

YAK P or PM

By CLAUDE McCULLOUGH

Photo shows radiator shutter unit that fits just inside front on the cowling. It is made of Air-

O-Sheet plastic, the covering material that is used on all of the Lanier "ARF" planes.



► The YAK story begins on a cold day in February, 1967. An Iowa-type blizzard had given me all the excuse necessary to retire to the workshop and cut a little wood for a multi-engine scale I had underway. It was bugging me not a little that despite years of beating the aviation history bushes, no cockpit pictures for this bird could be found. Without them, the otherwise good and rare scale documentation I had collected seemed incomplete. For this and perhaps other reasons (would you believe *three* inverted engines?), I had temporarily lost some of my enthusiasm for the project.

Into this scene comes the rural mail-carrier, plowing through the drifts in his trusty VW. Amongst the hog feed ads he left in my box was the January issue of the English aviation mag "Flying Review." It opened to a page liberally sprinkled with shiny red, star be-decked YAK's. Several weeks before I had drooled over James Gilbert's color photos of the YAK 18PM's at the Moscow World Aerobatic Championships in the January issue of "Flying." Now here were not only more photos, but also three views of various types and a complete breakdown on their history.

Red airplanes have always hypnotized me. With the trike gear and classically beautiful, functional lines staring up at me from the plans, something snapped! The X-acto knife slipped from my fingers and I groped for divider and ruler to check and measure. Then I wrote letters to such widely scattered spots as Australia, Czechoslovakia, and that strange foreign land, Southern California, searching for additional data. The multi-engine job was cast aside and forgotten.

The wind blew and the chips flew and soon it was July with the ship nearly done and test flights scheduled for the following weekend prior to leaving for the Nats the next weekend. But here the fickle finger of fate intervened and I found myself in the hospital instead of Los Alamitos. By the time I got back on my feet everything was over but the shouting for Lou Proctor and his Nieuport.

Spending my long planned vacation in bed was a bit dispiriting. It was some months before I got around to the little bit of work necessary to complete the red Red. At this point, M.A.N. at Work entered our script. Perhaps I should say tried to enter, for while he, Hazel, Glen, and Maxey stood on the porch pounding and yelling, I worked away oblivious in my darkroom, a radio talk show running in my ear. But they finally got to me. To make a short story shorter, that is why the YAK appears in these pages and will be a Sig kit soon.

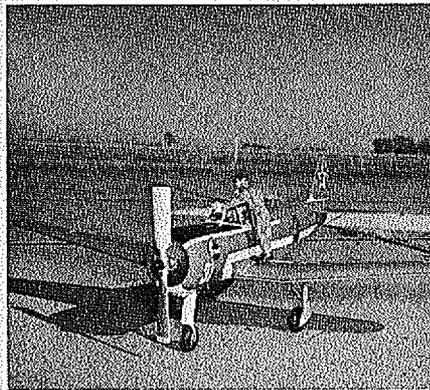
Walt hoped to be able to stay around for the test flights. However, the next



Side view of the Yak shows the incredible finish that Mac always achieves on his scale machines. Note reflections on wing root and stabilizer.



Added detail is this crewman receiving instructions from the pilot. Looks real, doesn't he?



Here we have the crewman diligently completing his chores. Clean windshield important to pilot.



Close-up of nose or cowling details plus scale prop and landing gear. Note Yak decal.

Magnificent radio control scale that combines realism and flying performance by the country's top scale designer and builder. It's our cover subject for the month and if this one color shot doesn't send you directly to the building board, you are not the modeler we know our readers to be.

day brought high winds, postponing the tests until after he had gone back to the Big City. Maxey Hester always gets handed my testing chores for I feel his quick reactions as a crack Class III (C?) flier are just a little better than those of ole "Who's nervous?" It's those fractional second decisions that can kill you on first flights. Having a top-drawer test pilot is the best insurance you can buy to have your new scale to fly another day.

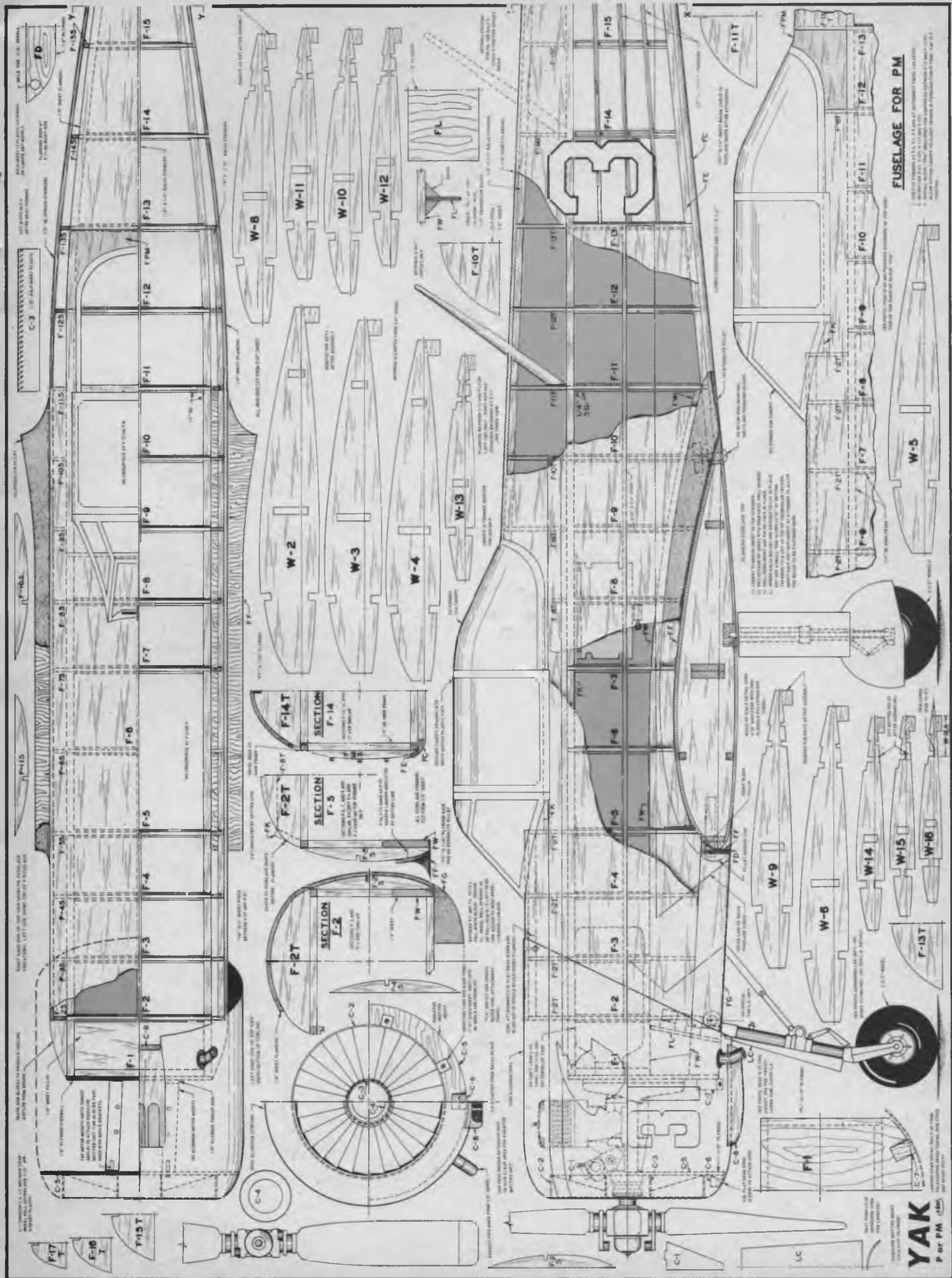
In the case of the YAK, I never was happier *not* to be on the box on that first outing. As befits a copy of a World Champion aerobatic design, the model proved to be very sensitive to the controls. There were some hairy moments just after takeoff but the man from

Montezuma's computer quickly adjusted. He began to move the stick like a brain surgeon's scalpel. We quickly gleaned the comforting news that it was not a snap-roller for in the first ten seconds it got into several vicious stalled attitudes from over-control on the elevator but broke out cleanly without falling off on a wing. The ailerons were also overly co-operative—all you had to do to roll was fidget! A quick landing and a clevis readjustment all around. This helped a lot, but we soon were fresh out of adjustment holes and things were still too sensitive. By now, the whole crew was well-frozen (except the test pilot, who sat in the car keeping his hands warm for those critical moments when he was needed) so we

called it off until changes in linkages could be made.

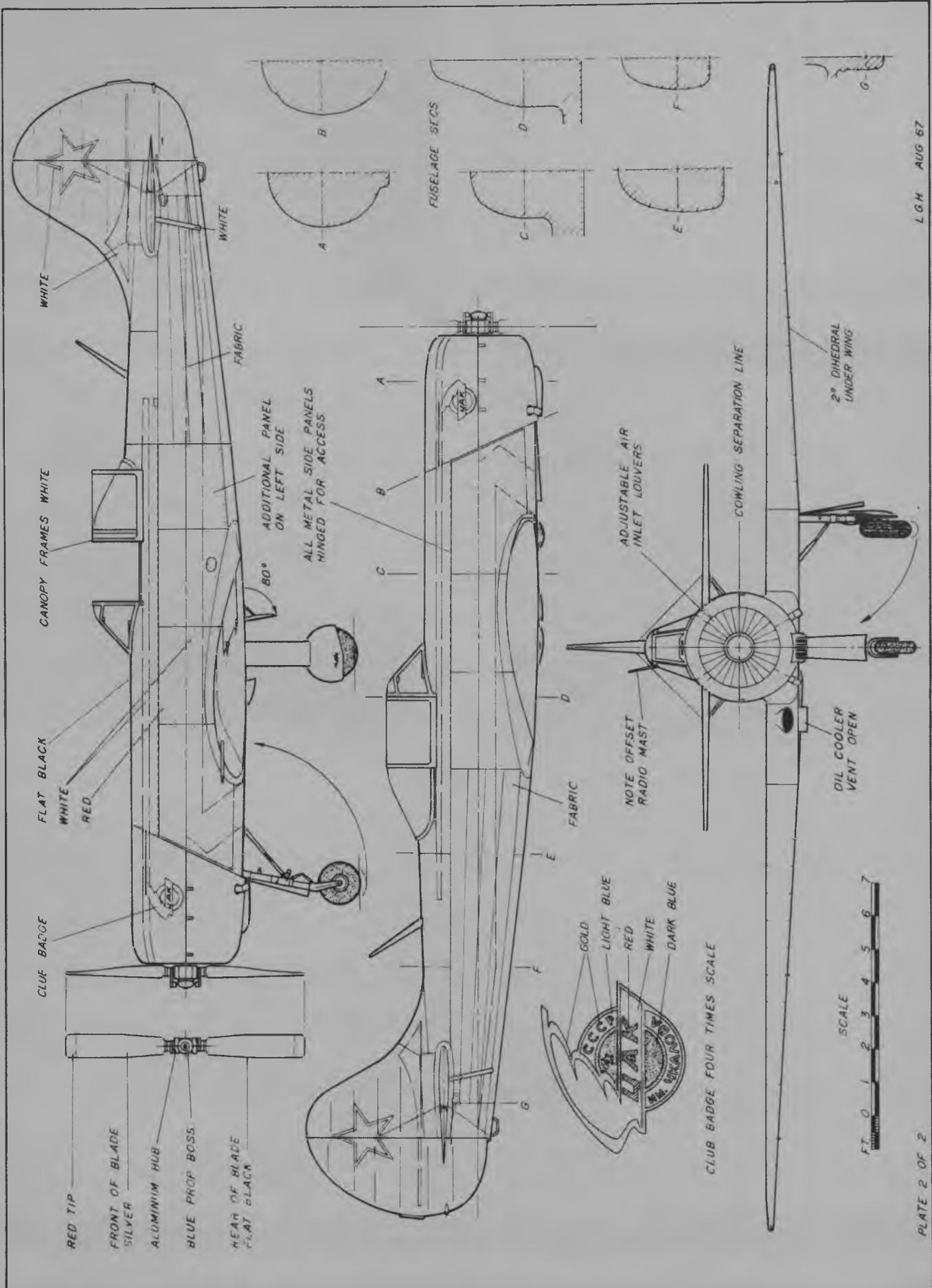
You will note on the plan that the scale elevator hinge line is shown but not used. When building the model I mistrusted this particular feature (though the tail area is exact scale) and used the movable area shown, about half the scale amount. I don't like to depart from scale at all, but if it appears to be absolutely necessary to have a model that will fly more than once, then I (Continued on page 49)

**YAK PLANS
ON FOLLOWING
TWO PAGES**



FULL SIZE PLANS AVAILABLE — SEE PAGE 48

these very accurate scale drawings of the World FAI aerobatic and free style Champion.



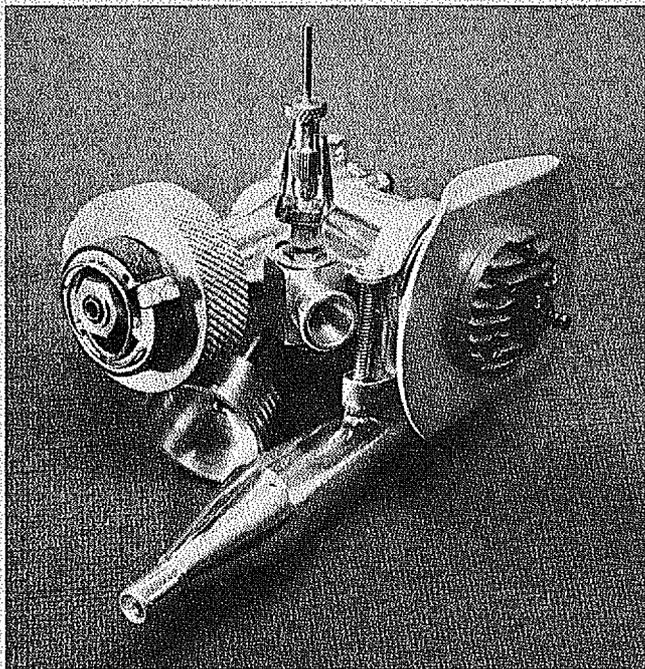
LGH AUG 67

PLATE 2 OF 2

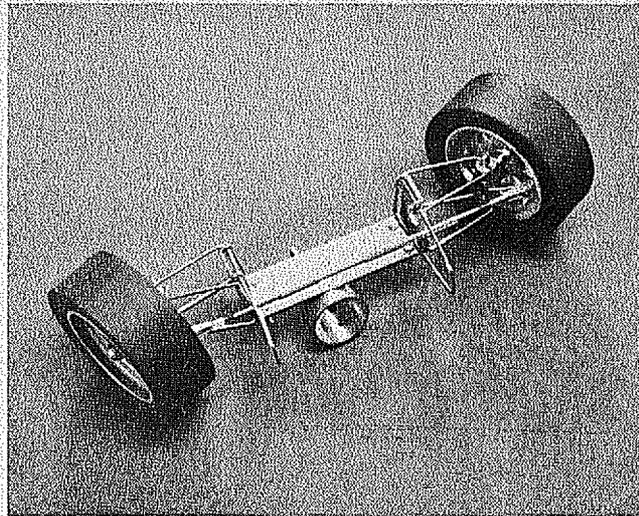
ROAD AND BENCH

Our review series departs from the field to the raceway in our development of Ra/Car's kit of a combined Indy/Formula racing car. It's a beauty and will stir any racing buff!

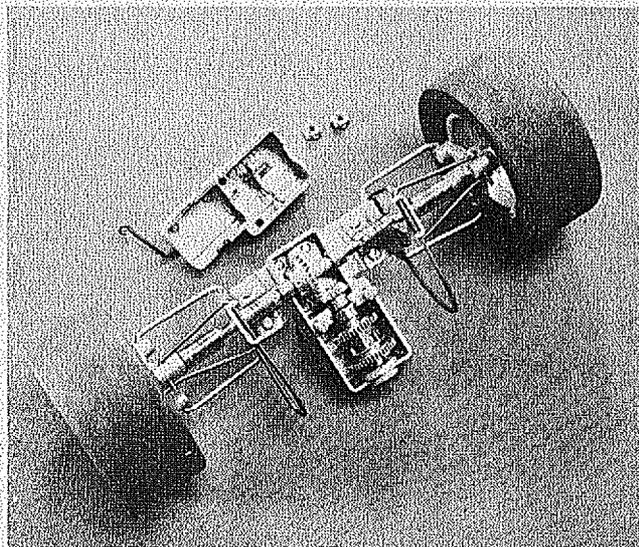
By BILL CROCKER



K&B .19 R/C engine with special cooling fin developed by Ra/Car. Note Taton's "Peace Pipe" muffler, Ra/Car flywheel, and clutch assemblies.



Front end suspension. Torsion bars are adjustable for various springing and tuning. Machined magnesium wheels with Butyl rubber slicks.



Rear suspension. Constant velocity Helicoil couplings, diecast hub hangers and transmission case. Shift fork in top of transmission case.

► We're extremely happy that *Model Airplane News* has decided to broaden its R/C scope with the addition of *Radio Controlled Speed and Sport*. Even though an R/C modeler may not care to indulge in more than one phase of the hobby, he should not cross out the opportunity of picking up new ideas generated by different approaches to related problems. Although the model airplane hobbyists and manufacturers have provided most of the backbone and organization to make it all possible, modern radio control equipment has opened up many new outlets for the model maker in general.

The development of proportional radio, in particular, allows the accurate, precise, and realistic control of models of just about any self-propelled object you can think of. M.A.N. has already published articles on the development of radio controlled, glow-powered cars and about R.O.A.R., the organization founded in the interest

of standardizing competition classes and exchanging information.

Many airplane R/Cers, having had their interest fired up by reading articles about R/C race cars or having seen (and heard!) the cars in action, have also noticed that the running gear is a bit complex. Without a small machine shop and/or the ability to use it, the cars could be out of reach of the average R/C modeler. This is not so any more.

RaCar Developments, 524 W. Central Park Avenue, Anaheim, California 92802 is the first, and at present the only manufacturer of equipment specifically for the R/C gas powered car enthusiast. Write for their catalog and pricing for all items indicated in this article.

As with any size car, construction begins with, and centers around, the chassis. In place of the usual frame or underpan of unit construction, the chassis of the RaCar is built similar to

a modern surfboard. Fiberglass cloth and resin is applied over a polyurethane foam core.

In kit form, the chassis includes a Lexan plastic mold, a supply of 4½ ounce fiberglass cloth, and the molded polyurethane "plug." You'll have to obtain some laminating resin.

The cloth, cut to shape, is laid over the mold. Resin is poured over and runs through the cloth. The plug is pressed into place. More cloth and resin are applied to the top. Finally, a protective sheet of Saran Wrap is laid over the works and a smooth flat board is placed on top to provide an even top surface and to hold the plug down in the mold.

The finished result is a shock absorbing base to which everything is attached. Its smooth "underpan" will be uncluttered with hold-down screws since it averages about ¾ inch thick. It has a certain amount of flexibility which prevents much (Continued on page 60)

New
we r
have
putti
In fa
"deli
nuts,
screw
eyelc
divic

P.S.
Great

DELUX
Here
— st
respc
Every
what
been
looki
flying
you.

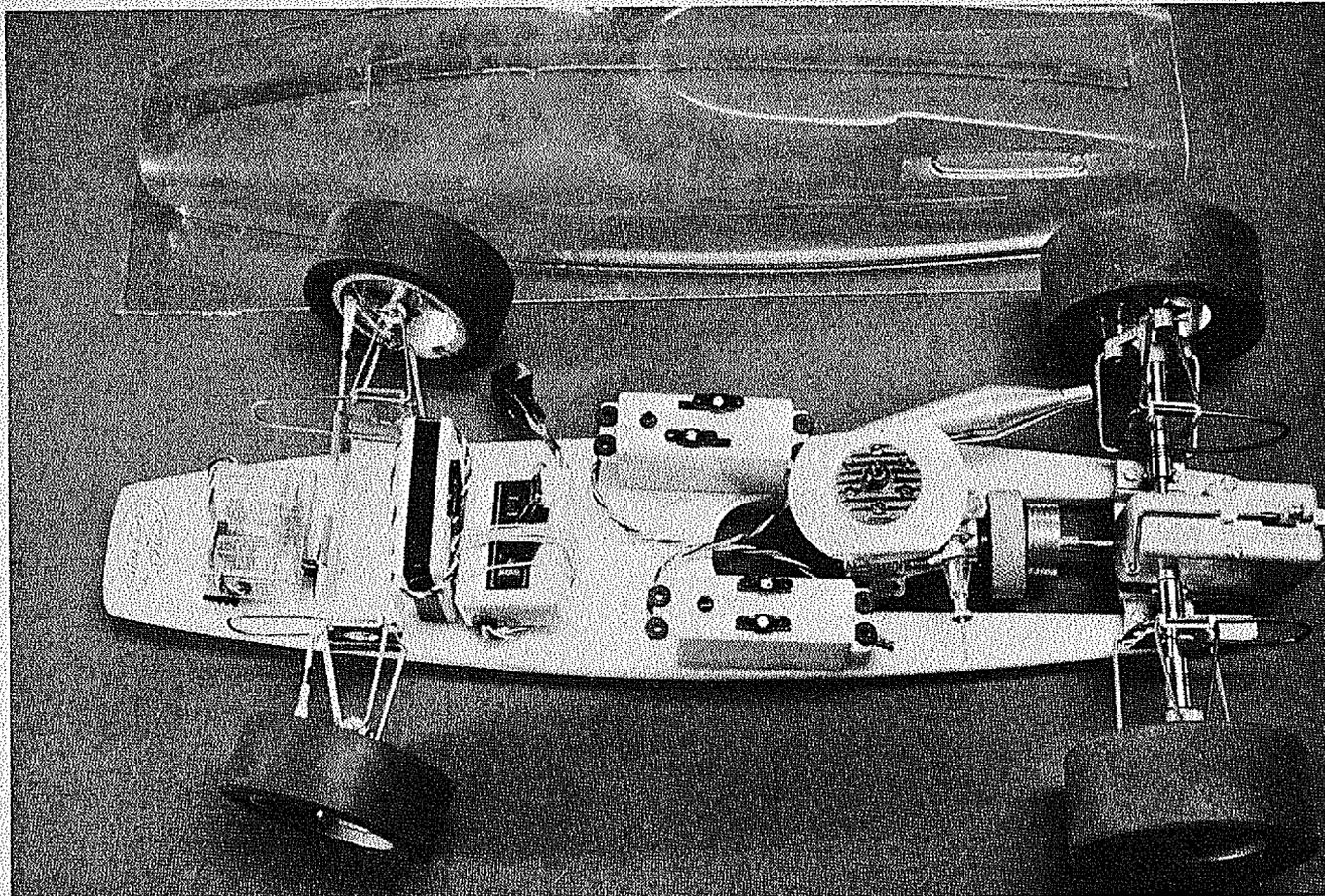
1/2
Span
Len

The
Enou
Stabi
Can

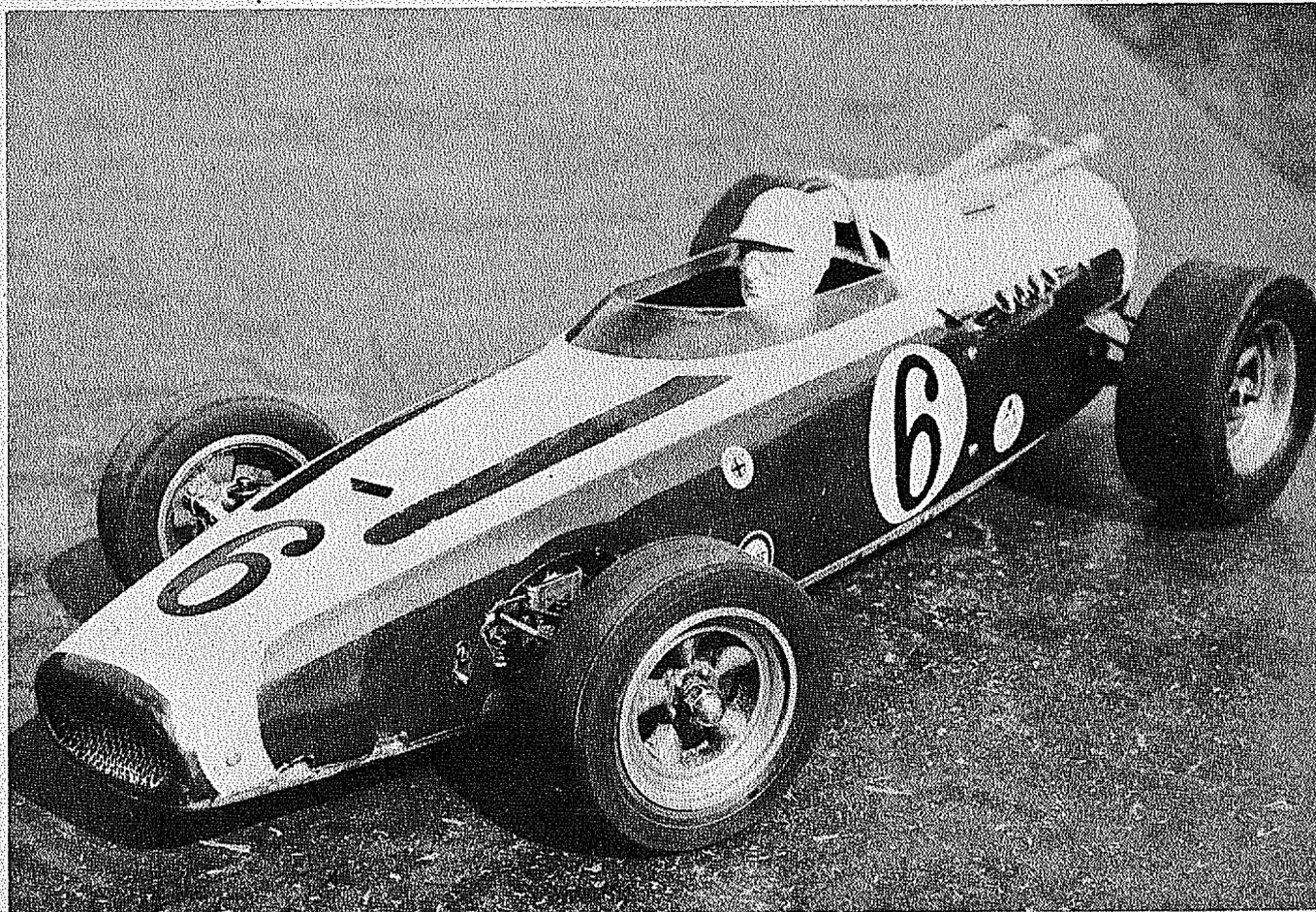
DELUX

Here
sign
in a
with
For
uprig
in ch

P.S.



General layout of parts on "Vibra-Zorb" chassis made of Styrofoam and fiberglass. 4 or 6 oz. fuel tank will be mounted directly behind the engine. Finished car built from the parts described in the article. This very realistic car built and raced by Norb Meyer founder of the Ra/Car line.





R/C NEWS

By BILL NORTHROP

club news
tech topics
new items



World's absolute duration record holder at work. George Friedrich's "Uranus" soaring glider out over one of those famous German valleys.

THE U.S. FAI TEAM ELIMINATIONS, OR WHATEVER HAPPENED TO THE OLATHE NATS?

► If you think, from the title of this editorial, that you're going to read a long tirade of accusations and name calling in connection with the folderol about this year's R/C Nationals, forget it. Our aim here is to give you a few thoughts to mull over during your next

cup of coffee or while the glue's drying, with the belief that most of you are mature enough to make up your own minds rather than having it made up for you.

Let's see who's involved in our competitive sport. R/C competition *is* a sport now, isn't it?

First, there's the contestant. At our R/C Nationals, the pattern flier repre-

sents less than one percent of the total AMA membership.

Second, there are the rules and policy makers. These are people who volunteered or were drafted into the position of doing something constructive in determining the common regulations by which the contestants compare their abilities.

Third, there are the bystanders. These



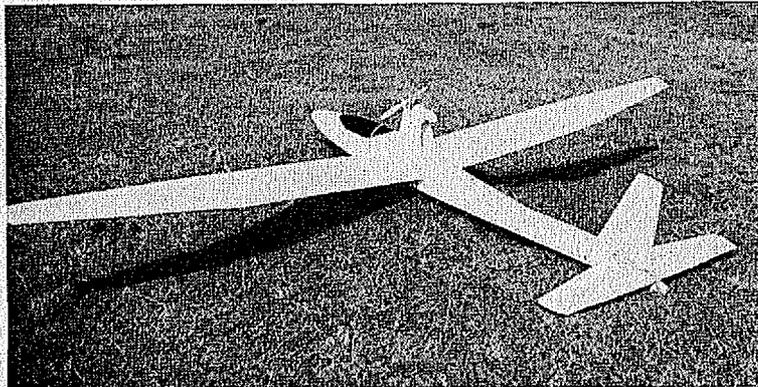
Long Island's Merokee Club, with 60 members, claims to be one of the fastest growing R/C clubs on the Island. Some members and their varied planes.



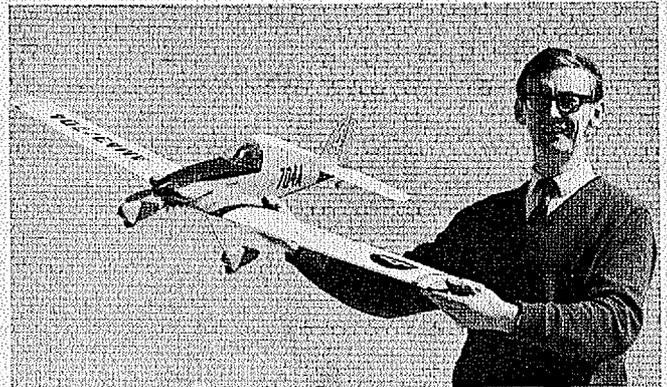
George Friedrich, holding, and his helpers for the record breaking flight.



Citizen-Ship has joined small digital market. Use integrated circuitry.



Another version of Geo. Friedrich's "Uranus," this one with a power pod.



Rand Mfg. Co.'s newest "actuator," Poté Waters, a recent import from Wales.

are the non-competitors, the non-officials, who nevertheless indulge in the hobby, are AMA members, and for the most part, are pretty well aware of what's going on. Oh, yes, about nine percent of them, plus some of the one percent of contestants, vote in AMA elections.

Fourth and last, there are the spectators. These are the Clem Kadiddlehoppers, bless 'em. Without them, who would ask, "How much are them things? I wanna buy one for my 7 year old kid." Or, "Let's go home, Clyde, I been here three hours and there ain't been a good juicy crash yet!" Or, "I built them when I was a kid (said in a tone that

implies that he ain't growed up yet), and we used to take 'em up to the attic, set fire to the tail. . . ." Well, who hasn't heard that one?

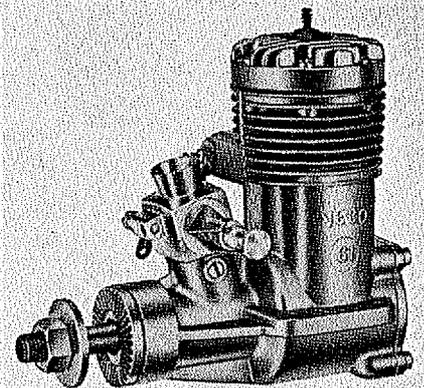
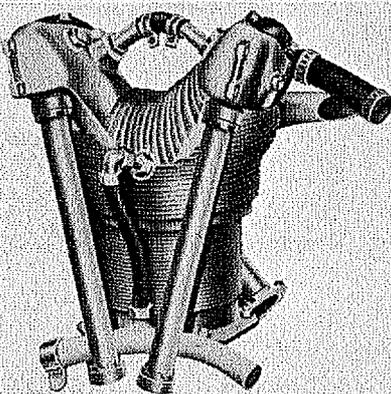
The spectators aren't necessarily food for thought at the moment, but mentioning them helps to define bystanders. Actually, the bystanders should be subdivided. Most are casual and/or interested observers. As such, they care not what the rules and policies are as long as they have the opportunity to compare various airplane designs, discuss equipment with contestants, and see maneuvers done somewhat as they are meant to be done.

These are good bystanders, and from

them come future competitors and/or rules and policy makers. Also from them, comes useful, constructive criticism. They represent the largest portion of the four categories.

Finally, we have the remaining few bystanders. You name their subdivision. They are armchair hobbyists, the nit-pickers, the wailers, the back-biters, the ones who have discovered that it is much easier to find fault than it is to suggest useful alternatives.

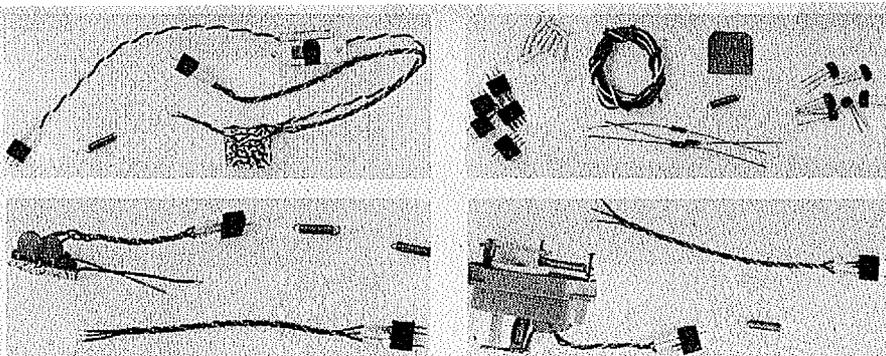
Unfortunately, a few of them are equipped in such a way that their comments and useless bleatings can be heard throughout the country. How sad it is that they don't use the opportunity to



Radial engine cylinders available in 1, 1½, and 2 inch scale from California's Williams Brothers.

K & B announces availability of new Veco 61 R/C.

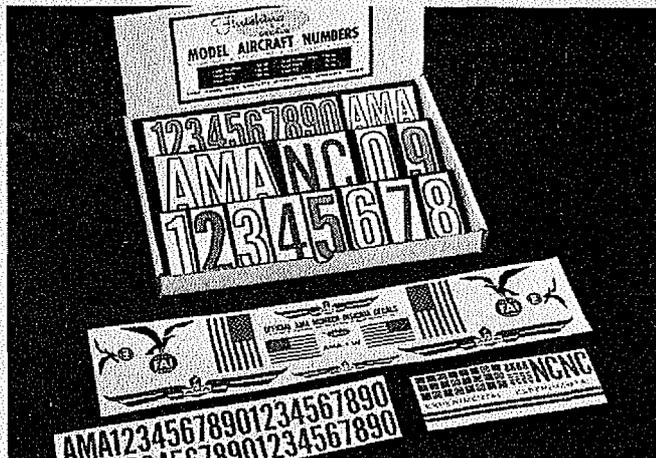
RADIO CONTROL NEWS CONTINUED



Photos above latest Rand Mfg. items. Top L., Switcher assy. and switcher kit; Bottom L., Decoder kit; C, Decoder assy.; R, elevator actuator with decoder.



Norm Harris of Harco announces the addition of this hot multi to their line of kits. Kit complete with 67" Styrofoam wing and all wood die cut.



Latest in the fine line of decals from Finishing Touch decals are these die cut and strip numbers, official AMA insignia and instrument panel.

offer help rather than to kick the wobbly legs a little harder.

To summarize, you have the varsity competitor, the umpires and referees, the student body made up of cheering supporters along with a few malcontents, and finally the happy-go-lucky spectator (doo-dee-doo-dee-doo . . .).

Now, let's try to figure how people in these four categories feel about the FAI vs. AMA rules being used for the Olathe Nationals pattern competition.

The serious contestant, who will spend so much more than the value of his AMA license entry fee in order to compete that the latter becomes infinitesimal, would fly at a Nats almost under any condition. His concern is not with who sponsored the Nationals, who decided what would be the pattern, or who decided which set of rules would be followed. He knows that as long as the rules remain consistent throughout the event, he will have as much of a chance as any other competitor. The trophies are superfluous.

His final standing will be determined by all the elements of chance cooperating with the skill he has acquired through hours of practice. One top ranking competitor with whom this writer discussed the coming Nationals said, "FAI Pattern? Well, I'd rather it was AMA, but when you think of it, where in hell's the big difference? If anything, the FAI's a little easier.

What's more, if I qualify locally or at the Nats, I can try for the FAI team right there and won't have to take off from work for another week and have the expenses all over again."

If anyone should feel bad about the switch to FAI rules for the Nats, it should be a portion of the individuals in the second category, the R/C Contest Board member. After a great deal of hard work, they saw it all thrown out of the window. This writer spent many long hours and quite a few dollars in phone calls before completing the writing of the 1968 rules and reworking the Judge's Guide originally written by Maynard Hill. Heck, I'm not the least bit (sob!) upset.

There is no doubt that the average bystander is also somewhat annoyed at not getting to see how well some of the hot shots do the flashy optional maneuvers. But remember, that's only at the Nationals. All other contests in the country will be AMA style. Furthermore, had the Nationals used the AMA pattern, it is entirely probable that the FAI maneuvers would have been preselected from the optional group, rather than the more spectacular ones.

The feelings of the minority subdivision of bystanders is already pretty well known, or don't you read all of the magazines.

And what about the spectator (doo-dee-doo-dee-doo)? Well, what he

doesn't know won't upset him. Keep him happy, don't hit him with your bird, and try not to destroy his ear drums. Who knows, he might own a big, unused meadow or a deserted flight strip!

In summary, think it all over carefully and try to conclude how it affects just you personally. No one else, just you.

Are you one of the less than one percent who will fly at the Nationals? Do you really care which pattern is flown?

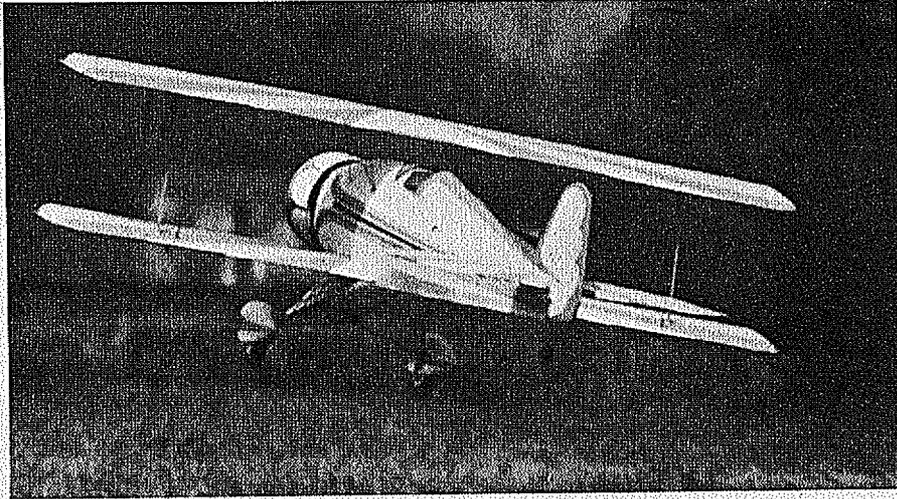
Are you one of the 11 R/C Contest Board members? Hi, out there! We don't care, do we? (Sob!)

Are you a majority bystander? Aren't you one of the 99 percent who doesn't fly at the Nationals, who attends when it's handy, gets into a local contest once in a while for kicks, builds all kinds of non-contest airplanes and has a ball on weekends flying any kind of a darned pattern you want to? It's only a hobby, right? You're supposed to enjoy it, right? So what's the fuss, right?

Are you . . . I say . . . are you a minority bysta . . . I said, are you . . . Why don't you shut up and listen, so I can . . . Oh, to heck with it

Are you a spectator (doo-dee-doo-dee-doo . . .)? Oops! Sorry! I guess if you're reading this, you must have decided to get into this FUN HOBBY, right? So join the majority bystanders for a start, huh?

By the way, (continued on page 82)



Author's idea of an excellent prototype entry is this fine Krier Kraft by W.O.R.K.S. Ray Nugen.

INTRODUCTION BY R/C EDITOR

Some people feel that if you simply turn your back on a problem, it might just go away, and then you won't have to face up to it. Of course, it isn't that easy.

In the last year or two, there has been a general turning away from the stunt problem. The result is not however, all bad. Modelers, in search of something else, have "discovered" pylon racing, scale, slope and thermal soaring, and many special events which we long ago nicknamed PFBF (Put the Fun Back in Flying).

There are a few dedicated modelers, however, who have tried to deal with the stunt problem rather than ignore it. One of these is Don Lowe of Dayton, Ohio. Don is well recognized as being in the country's top echelon of stunt pattern fliers and his Phoenix is an equally well known pattern ship.

As you read through and study the concepts of Don's Prototype Pattern Event, you'll realize why this editor is so enthused about it. The challenge has many facets; designing, building, meeting the wing and power loading limits, and most of all, coordinating the operation of controls in prototype flying fashion.

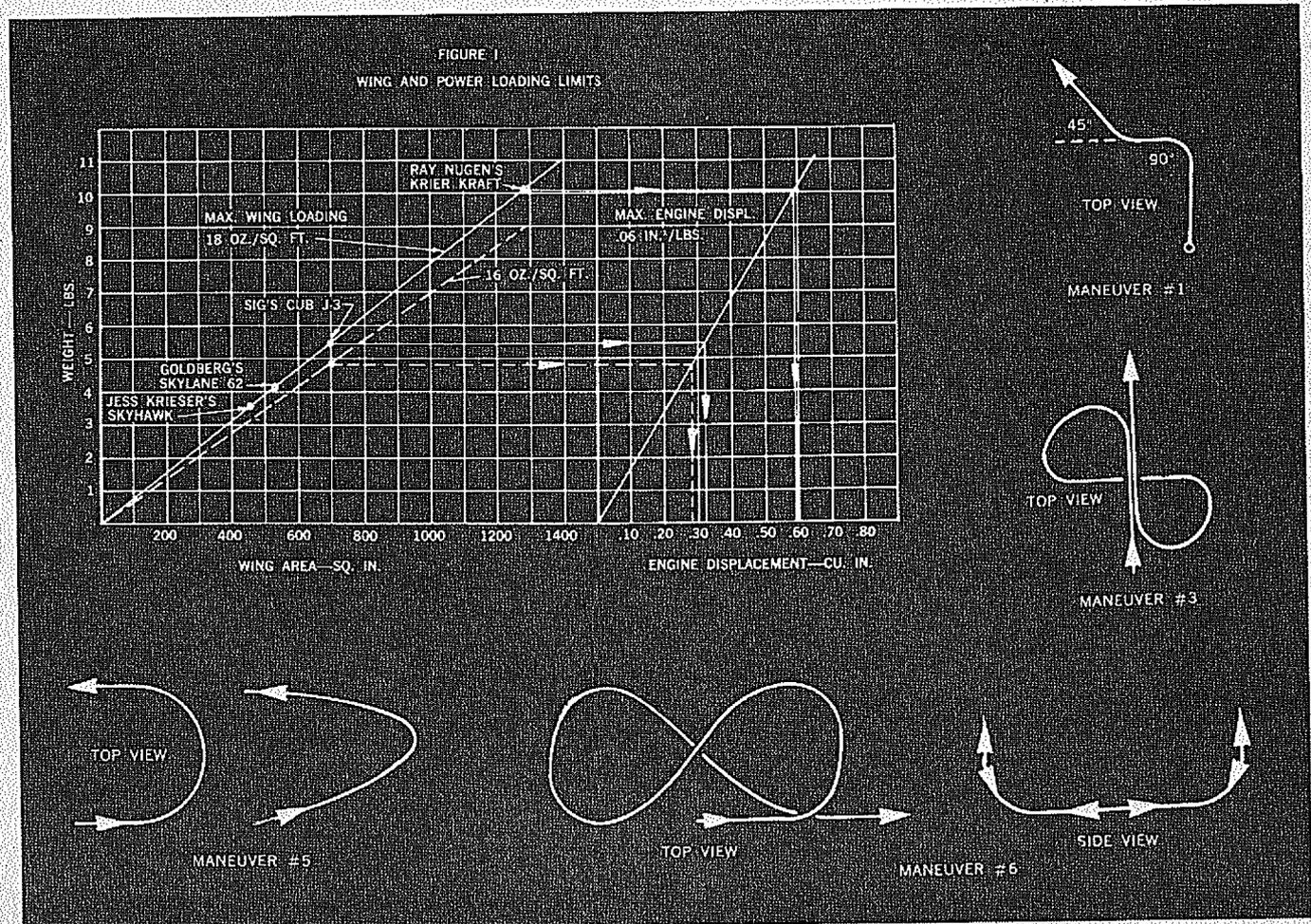
* * *

► Are you tired of the guided missiles necessary for (Continued on page 66)

PROTOTYPE PATTERN EVENT

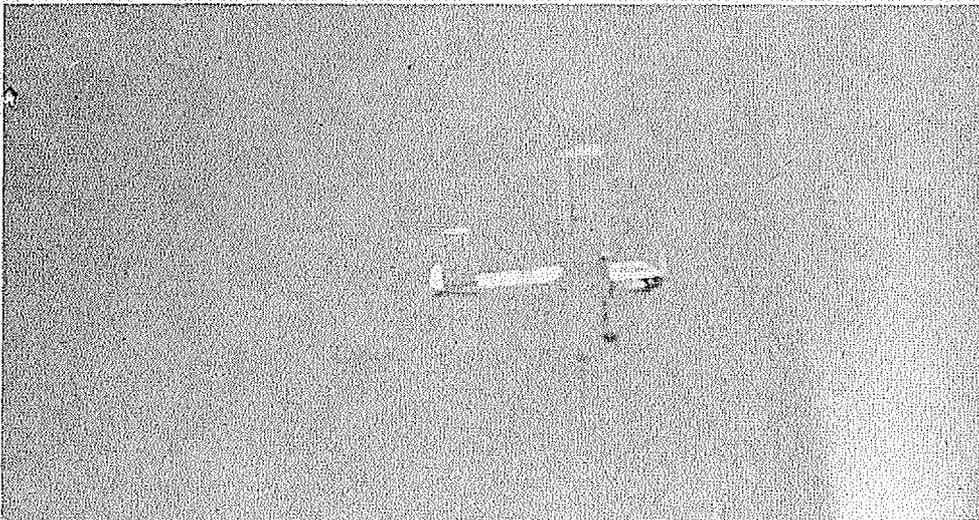
By DON LOWE

Stunt or pattern flying is quite apropos of Mark Twain's saying about the weather, "Everyone talks about it but no one does anything about it." Now we've an intrepid R/C'er who does something with a proposal for a pattern event for everyone!

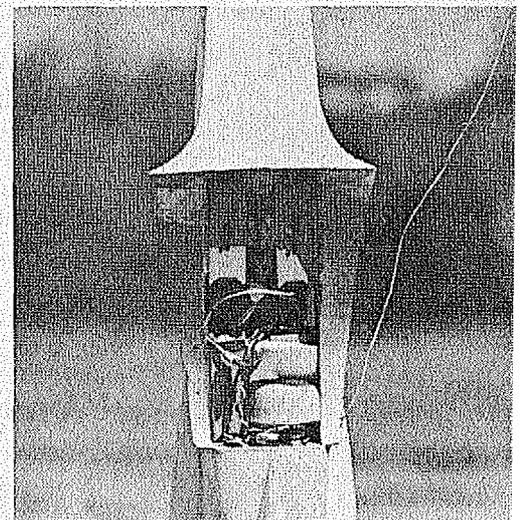




Three photos above show the little white racer in all its effective beauty. Compact, sleek, and trim is the best possible description for plane.



A pretty sight with the little racer flying by almost directly overhead. Had the camera stopped down 1000 speed and still fuzzed up a bit. No official speed timing runs as yet.



A look inside the compact fuselage. Bonner 4 RS used with servos held by double face tape.

DIXIE SPECIAL

By DIXIE CUTRONE . . . first of the little Quarter Midget pylon racers to appear in these pages is a happy little machine that can be made from Midwest's Hoosier Hotshot. .10 engine size is actual quarter size and thus gives meaning to designation of "Quarter Midget."

► Why not? That's what I found myself thinking after reading the Field and Bench article in the January '68 issue of M.A.N. in which Frank Schwartz made his "full house" Testor's Skyhawk sound like a fun machine and a real change of pace.

My Skyhawk was pulled around by an OS Max 15 and sported built-in ailerons. As I expected, this little plane

flew up a storm and provided much fun before the wing flexed just a little too much and presto! Two halves. But that's another story.

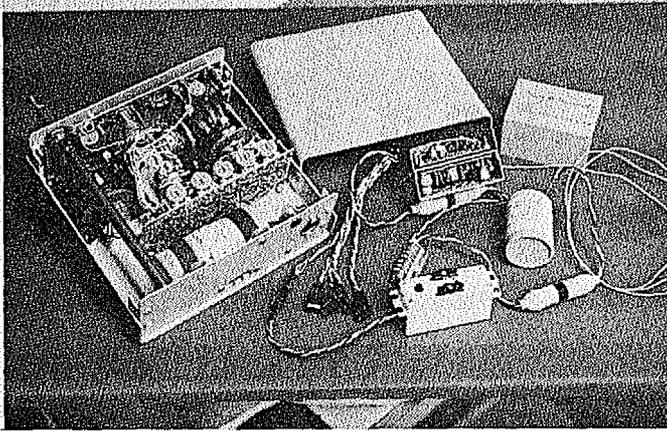
Really bitten by the small multi bug, I decided to build another small ship. I looked over the smaller kits available and decided on Midwest Products' "Hoosier Hotshot" with modifications. The modifications were few. The major

one was making a low wing airplane from the shoulder wing design.

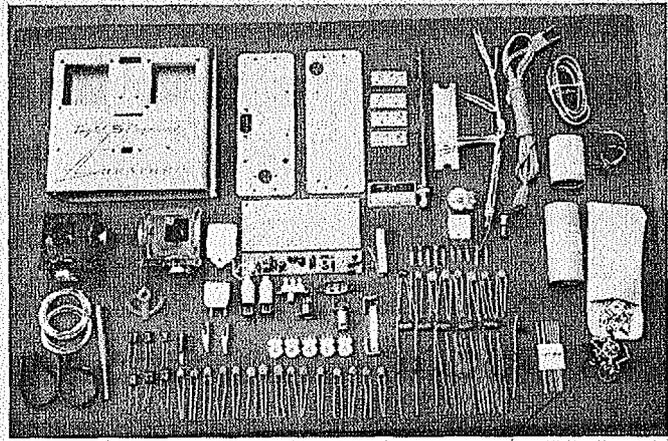
I felt that this type of ship should be ideal for Quarter Midget pylon racing with an OS Max 10 for power, which also happens to be 1/4 the engine displacement of its larger brothers. I used the Bonner 4 RS equipment in my "Special" and it fits very well, (see photo) as will (Continued on page 81)

His friends would recognize Dixie just by the lower portion of his anatomy. Blame MAN at Work for this chop in half of the plane's pilot.

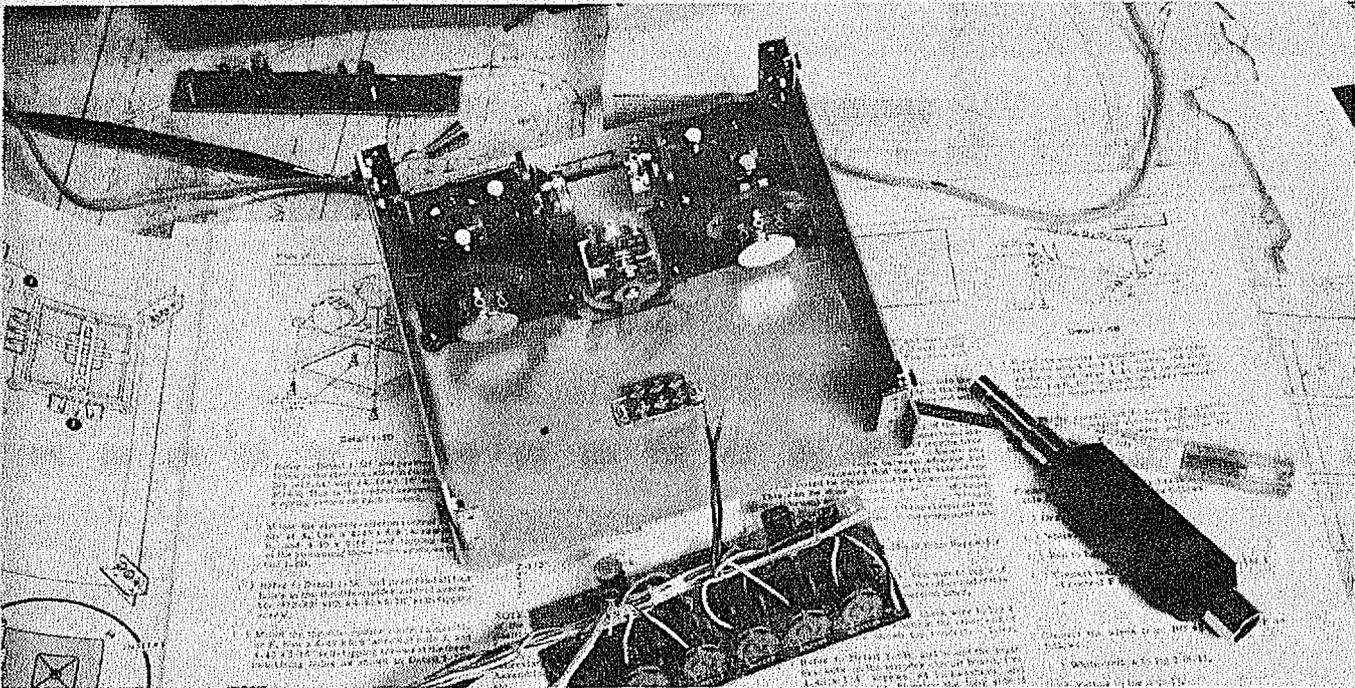




Here we have the whole ball-of-wax in its completed and working form! Note how the transmitter antenna retracts completely within the case.



Transmitter kit. Directly in center of photo, you can see completed R.F. section which eliminates the need of technician checking and approving.



Transmitter partially assembled. Encoder in foreground, harness for tuning pots and stick assemblies is prepared and ready for installation.

FIELD AND BENCH DO (SOME OF) IT YOURSELF PROPOR- TIONAL

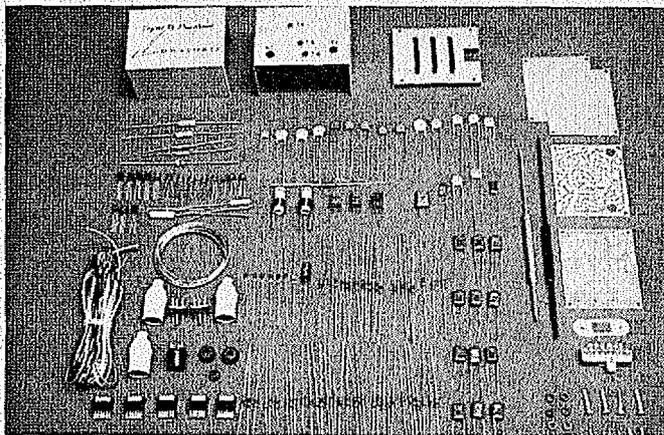
By BILL NORTHROP

► Boy, talk about being mortified! Here I am, the grand and exalted R/C Editor of M.A.N., fortunate enough to have received one of the first production kits for a Heath digital proportional, and what happens? After having built the transmitter, the receiver, and one servo (deadline time approaching), and after having tested and adjusted the transmitter, I ran into a stone wall when the receiver, although it idled properly, would not accept a signal from the transmitter. Did Heath goof? Did I goof? Was there a bad component?

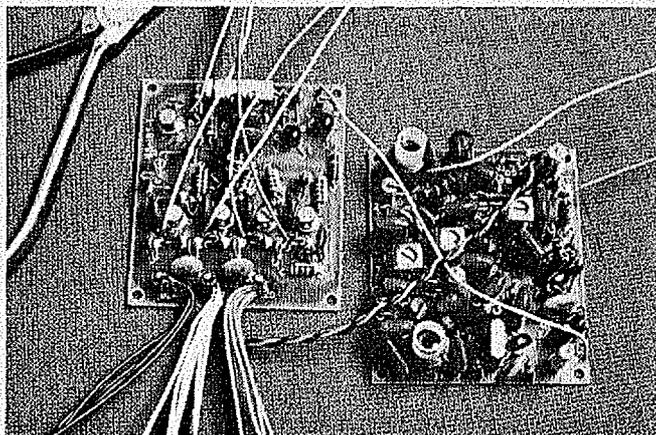
Of course, there has been on BIG question, one that many people have been asking ever since the well known electronic kit manufacturer of Benton Harbor, Michigan first announced that it would produce a digital proportional radio control set in kit form. Could the average model building hacker, who

is a modeler first and a radio fiddler second, by desire or necessity, put together such an exotic hunk of modern electronic achievement and make it work? Particularly, could he do it without the use of expensive test equipment that costs much more than the radio itself?

Before going any further, we'd better ease your apprehension and get the Heath boys to lower their shotguns by explaining that the "stone wall" turned out to be somewhat of a freak and the blame is shared equally between us. The first step in assembling the receiver printed circuit board is the installation of three short jumper wires on the component side. Following shortly after this, several transistors are installed and one of them happens to straddle one of those pieces of insulated, stranded hookup wire. The instructions specify that the transistors are to be positioned



Receiver kit. Holes in rear of case are for tuning coils and I.F. cans and each hole is identified. Makes job of tuning receiver very simple.



Receiver partially assembled. Decader board at left, R.F. board at the right. Receiver double decked to relieve cramped conditions for builder.

Our Field and Bench, we are sure, is the most eagerly awaited report in this series. Heathkit certainly has stirred the imagination of the radio control fraternity to the boiling point.

an 1/8 inch above the board. Are you beginning to get the picture?

While soldering the transistor leads to their respective lands, we thought of the possibility of a transistor lead getting hot enough to melt the insulation on the hookup wire which could cause a short and carefully held the wire away from the leads as we proceeded. All well and good. However, later on, as we busily installed components, bent the leads over, snipped off excess wire, soldered, and quite obviously forgot about the melting insulation problem, the inevitable happened.

Unaware of what had occurred, we went on to finish the job without a single problem and proceeded into the tuning and adjustment phase. First, using the meter which would eventually become permanently installed in the transmitter, we checked for R.F. output and found we had buckets of it. Next, still using the same meter, which is part of the kit, we checked and adjusted each stick pot for its optimum setting with a neutral control and trim condition.

Following this, the receiver was turned on, with the same meter now hooked across a test lead from the receiver and one socket of one of the color coded servo output connectors. First, a small deflection indicated the receiver was idling properly, but then, when the transmitter was turned on, the needle should have jumped way up. There was no reaction. After a quick recheck of the work to that point, we were forced by deadline pressure to fire the whole assemblage back to Heath.

Several days later, the word came back from Bill Hanna, Consumer Product Manager in charge of the R/C operation. Sure enough, that transistor lead wire finally managed to melt through the hookup wire insulation. We

had undoubtedly shifted it while installing other components, and somewhere along the line, heat from the soldering iron accomplished its nasty little task.

The thing that really shook up the Heath Troops was the fact that the set worked perfectly when they received it! The jouncing in the mail had apparently broken the outlaw connection. While Bill sat there, scratched his head, and wondered what was wrong with me, one of the technicians went over everything and finally found the trouble. Incidentally, subsequent instructions will specify a new route for the jumper wire in order to avoid any more of that stuff.

O.K., let's go back to the big question. Can anybody build, tune, and align the Heath digital proportion R/C kit? Hoping not to sound like the best whitewasher since Tom Sawyer, we'd have to answer with an almost unqualified "YES". By almost unqualified, we mean that you must be able to read and understand very non-technical instructions; you must be able to make a check mark as each construction step is carried out (you don't even have to know how to write); and you must have, and be able to use, small needlenose pliers, small diagonal sidecutters, medium and small screwdrivers, and a 25 to 30 watt pencil type soldering iron. A larger pair of pliers or nut drivers will also come in handy in assembling some of the hardware.

There is absolutely no need to have even the vaguest notion of what's going on electronically in order to assemble, tune, or align the set. In fact, unless you are curious enough to try to read and understand the specifications, theory of operation, and circuit description portions of the 124 page instruction manual, you could just as well tear these pages out and throw them away.

To carry this one final step further,

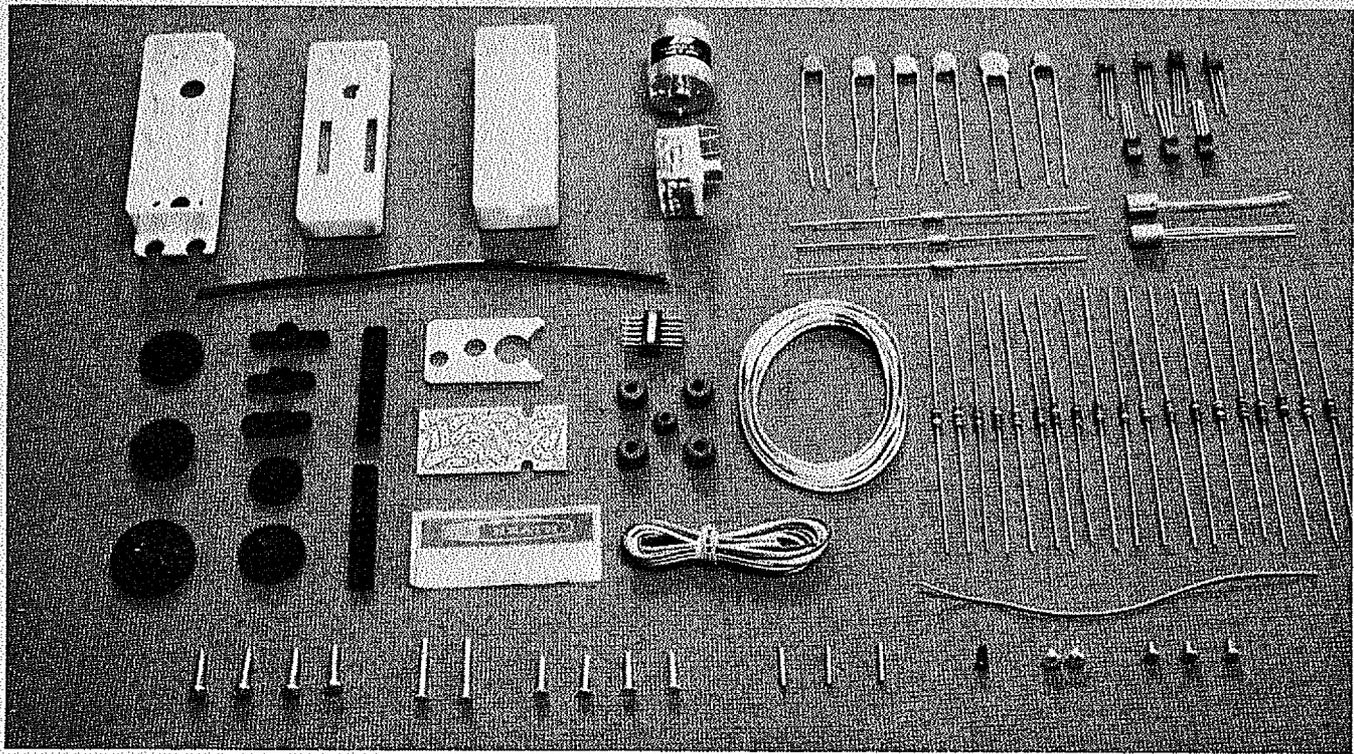
it is our firm conviction that you will have the least trouble in transforming the Heath radio from a pile of parts to a useable control system if you will adopt AOBO, "Attitude of Blind Obedience." It has worked well for us in over twelve years of building Heathkit portable radios, FM tuners, tape recorders, preamplifiers, amplifiers, stereos, turntables, and speaker systems. In all that time, it was just read the instruction, check off the steps, do what they tell you . . . AOBO.

To properly appraise the thoroughness of the instructions for building the propo rig, we decided at the outset not to use any extra test equipment, not even a voltmeter. We also kept pretty close tabs on the time required to complete each unit. For the purpose of obtaining photographs, the parts for each kit unit were laid out on a board, sort of store window fashion. Since everything was spread out and easy to find, we just went ahead and built each unit after photographing the display. It probably saved time doing this and is recommended.

Not counting the display layout time, the transmitter took 4 1/2 hours from the first step to the point where it was ready for check out and adjustment. This included the time taken to make up the charging cable assembly and to wire up the receiver battery.

The transmitter encoder board is quite roomy and no trouble should be experienced installing components. The board assembly is finished when you have installed the centipede-like, prefabricated, gaily colored wire harness.

The completed R.F. circuit board has been prealigned and pretested. Fiddling around with its circuits or making adjustments is a big NO-NO. It will void the warranty and decrease overall performance. Only persons holding second class (*Continued on next page*)



Servo kit neatly laid out by our stick wiggler. With servos, it is important to follow constructions closely as final assembly quite tight.

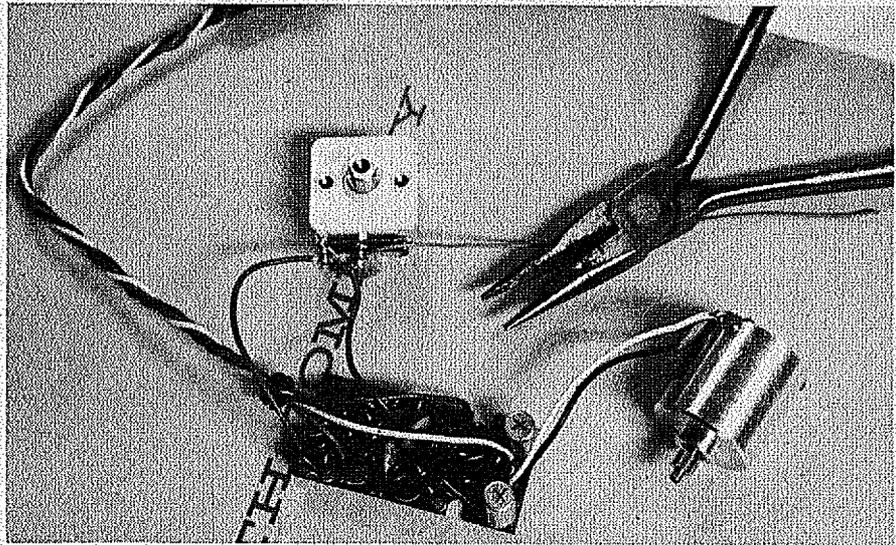
FIELD AND BENCH continued

or higher FCC radiotelephone licenses are legally qualified to "adjust" the R.F. section, and even so, unless they are R/C oriented, they could still goof it up.

The *only* thing you *might* want to do after examining the unit is to reinforce the little toroid, which seems to be rather shaky on its tender, little, wire legs. A little RTV or clear silicone rubber will strengthen its attachment to the board.

The transmitter soon begins to look like something as you assemble the cabinet parts and install the Bonner control stick assemblies. The P.C. boards, charging sockets, and battery pack are installed, all wiring is connected, and before you know it, the darn thing's finished.

The last step before proceeding with the receiver assembly is to connect the receiver/servo battery pack and transmitter with the charging cable and then gingerly connect the AC cord. This is the first time in the assembly that you will be testing your construction ability, and it is very encouraging to see the indicator lamp glow as the charger begins pumping juice into the nickel cadmium batteries. If the lamp doesn't light, you must yank the AC cord



Servo all wired. Variable capacitor is square white object. Instructions are careful to indicate the need of tape insulation on the motor.

quickly and check your work up to this point.

Incidentally, the nine section, 54 inch collapsible antenna is about the nicest we've ever seen. The best feature is that it almost completely retracts into the transmitter case, extending only 1½ inches, and making it unnecessary to remove every time you pack your gear.

While the batteries are charging, you can be assembling the receiver. Need we remind you to watch out for the insulation on those jumper wires? Another note of caution: there are seven transistors on the R.F. circuit board that look exactly alike. Carefully check the microscopic numbering on them. Four are 16G2349 and three are

2N3393. Don't mix 'em up.

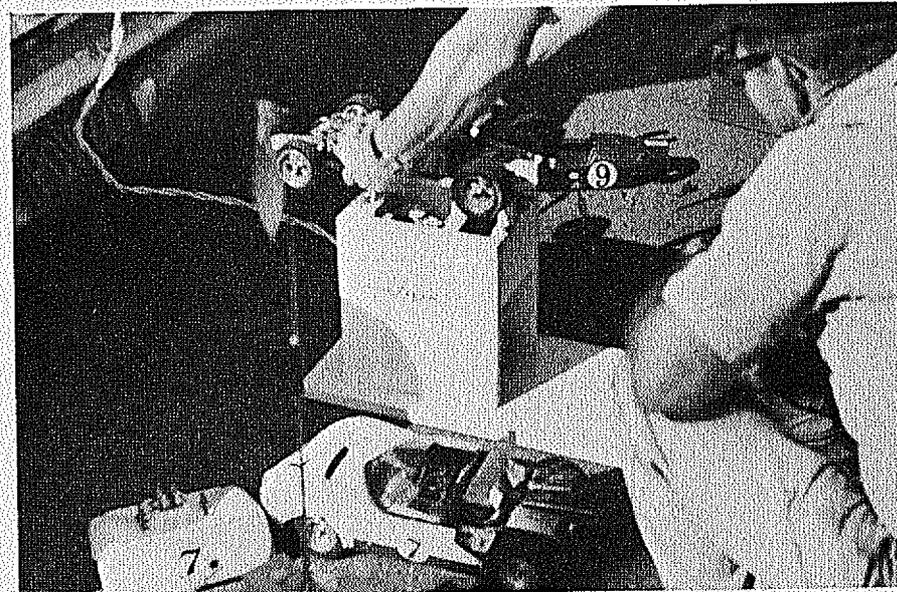
The most tedious part of the receiver assembly is attaching twenty black, white, and red pieces of hookup wire to three screw terminals on the decoder circuit board. These, plus six other wires sticking out of the board, make the whole thing look like a multi-colored wig.

It took us just under 6½ hours to completely assemble the receiver package and this included making up the power cable and the five servo output cables with connectors attached.

The switch harness, which, in the final assembly, inserts between the receiver and the receiver/servo battery pack, takes *(Continued on page 72)*

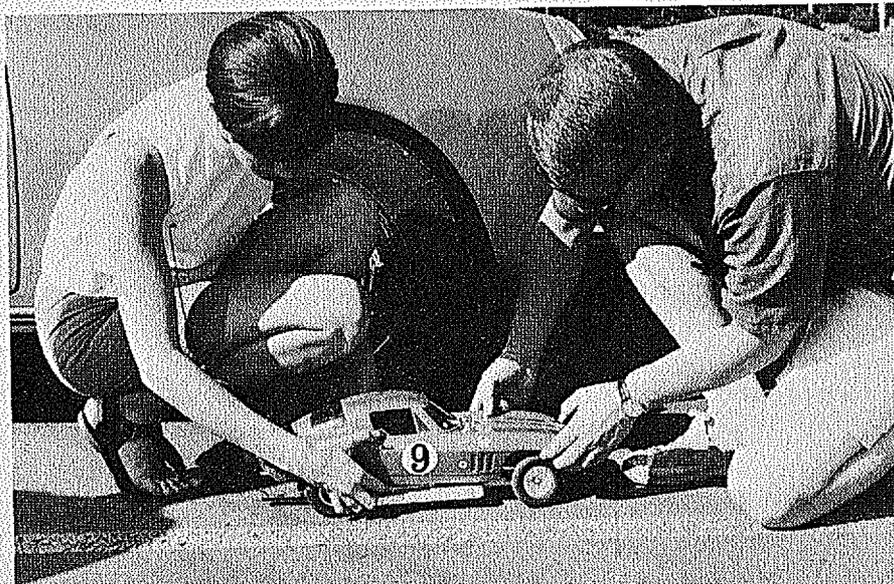


Indy/formula car with engine and transmission cover removed is undergoing scrutiny and contemplation by its driver. Rear slicks are well-conditioned for good ground control of the car.



Using an electric starter to fire up an engine. To start, it is necessary that flywheel be in contact with starter wheel. Foot operated switch on starter allows use of both hands to start.

One of the most popular types is the Grand Touring (GT) class. Corvette body made by Monogram.



COME ROAR with US!

By GEORGE SIPOSS

If you are at all interested in the fuel powered engine race cars, we suggest that you take full advantage of the TITLE offer.

► Whenever a new and exciting hobby or sport fires up people, it is not long before they form a club or association to put their endeavor on a formal basis. When radio controlled racing cars became a practical reality, most hobbyists built their cars on their own. When it came time to race the cars, other drivers had to be found to race against.

And so ROAR was born. ROAR is an acronym which stands for Radio Operated Auto Racing Association. Headquartered in Southern California, ROAR now has members from coast to coast, in Canada, Mexico, and overseas.

As a club, ROAR is quite unconventional. There are no formal meetings to attend and no officers to be elected. The official organ of the Association is the *Newsletter* which is published once a month and sent to members. The *Newsletter* is an information exchange medium which compares notes and ideas, discusses technical subjects, reports on new products and, in general, helps the beginner and expert to enjoy the hobby more fully.

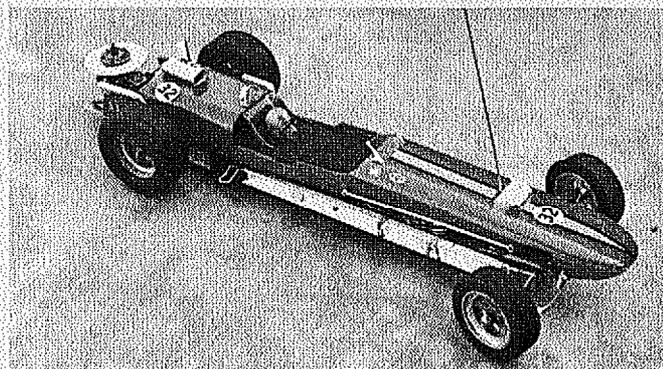
It was a long and arduous process to find our members. We advertised in sports car magazines, demonstrated cars at hobby trade shows, described our cars in hobby magazines and similar publications. We ran races on public parking lots, talked to hobby shop owners and model airplane flyers. Wherever we went, the reaction was enthusiastic and excited. People everywhere said, "Boy, I NEVER thought that this could be possi- (continued on page 46)



R.O.A.R. (Radio Operated Auto Racing) Assn. members experiment with many types of cars but 1/8 scale fuel powered car is only approved type.



R.O.A.R. booth at the recent Model Airplane Trade Show in California was the center of plenty of action as shown in photo above of the booth.



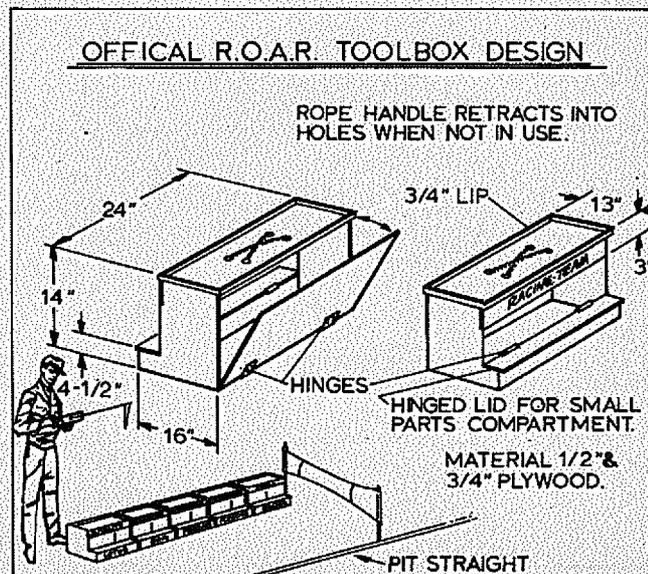
As we said, the Association members experiment with many types of cars. Here we have a 1/8 scale dragster. Top speed of the machine is 50 m.p.h.

COME ROAR WITH US! ...continued

ble, but here it is. Real racing cars in 1/8 scale."

The average ROAR member, according to our survey, is between 25 to 50 years old. The youngest is an 18 year old in San Diego, the oldest is a retired school teacher in Ohio. There are insurance executives and toolmakers, Army privates (as well as a Lieutenant Colonel in Vietnam) engineers and teachers amongst us . . . the usual array of hobbyists. About one half are died-in-the-wool sports car buffs, frustrated Fangios, who have a secret desire to build, tune, and race their own machines. The other group is the tinkerers, hobbyists some of whom are model airplane builders, converts to our hobby-sport. Their reason is simple and straightforward: planes crash and are usually wiped out after an encounter with a solid object. Cars, on the other hand, can be put back on the track in seconds to resume the race. Cars can be tuned constantly as well as overhauled and maintained. A car need not "grow old". It can be rebushed, repainted, oiled and it is ready for the track again.

Most new members ask for construction articles in the *Newsletter* and we try to oblige. In a recent issue, we described a new and ingenious method of starting a car's engine. Other issues carried analysis of uni- (continued on page 86)



MODEL AIRPLANE NEWS FULL SCALE PLAN SERVICE

PLAN OF THE MONTH

#81A 7/68
Yak P or PM: magnificent scale R/C famous aerobatic champion -60 R/C eng.

#81B
All-American Stunter: C/L stunt plane for FAI-35 eng. Dixie Special: True Quarter Midget pylon racer- 10/15 R/C.

#62 9/59
SAFIRE: Delta U/C St., to .35. ASTEROID: Rubber and glider. THE HOOK: F/F, 1/2A.

#64 1/59
STUNTACULAR: 29-35 Mono-Line. RAMROD 600: F/F, .15's.

#82 5/61
HITTHRUST "VIKING": Goldberg 1/2A F/F. National winner. .049 with mod. to .09 (FAI Power). PATRIOT: A/2 Nordic Glider Contest winner.

#83 6/61
WIRELESS WIDGEM: Scale R/C for rubber or multi trainer work. .29 engine. TEE DEE BIRD: F/F for the Cox .010.

#85 8/61
SCORCHER: 1/2A R/C Pylon Racer. LOW DOWN: Class "C" National's Indoor Champ. FAMOUS PROFILES: 1/4 & 1/2A C/L scale FAI.

#86 9/61
PULQUE: 12/2A FF Contest Trainer. R/C CURTISS ROBIN: 1/2A Scale R/C. PAA-ABLE: PAA-Load Gas .020.

#92 '62 Ann
GAWN: FAI, .15. MULVHILL: WINNER: Rubber. Woody Blanchard's GAWN International class F/F.

#7A 5/62
ANGEL: FAI F/F winner for .15's. CHAPARRAL: National record holder pylon racer R/C .19's.

#10A 8/62
DIZZY BUG: Bob Lauderdale's FAI Speed. WAKEFIELD TRAINER: 3/4 size rubber powered trainer. LONG HOME: Winning class B team racer. HOT CAMARY: Hi-performance F/F for .020.

#14A 12/62
U-NAME-IT: Spectacular C/L stunter .35. FLUFF: Contest winning 1/2A F/F.

#16A 2/63
SLI-FAI: FAI Indoor Contender by Dick Kowalski. MISS AMERICA R/C: 1/2A R/C. SPARKLER: C-2 F/F. ZA-B: Stunt & Combat trainer.

#17A 3/63
SKYSCRAPER: .45 Stunter by Bob Palmer. ROCKEY DELTA: Jetex Delta by Larry Conover. LADYBUG: Sport F/F Bipe .020.

#18A 4/63
X-70: VHTL F/F winner 1/2A and A. UP-41: Scale C/L .15 to .19.

#20A 6/63
FAI VIKING: Goldberg's F/F winner .15. TARGET & BULL'S EYE: C/L flying saucers for .15 and .010.

#22A 8/63
WEEK-END WONDER: Stunt C/L, easy to build and fly .29. RED COAT: Wakefield winner. MUDBEAM: Tractor/Pusher rubber model sport flier. HI-LO DUO: Pair of indoor/outdoor rubber-powered models.

#24A 10/63
PAPA TAGA: FAI Team Racer: So. American Champ .15. CHAMELEON: Semi-Scale Rudder only R/C. Make one or three different WWI fighters .15. TWO-BER: Wakefield Unlimited record holder both categories—real winner.

FINAL OFFERING OF THESE PLANS JUST A FEW AVAILABLE! . . . HURRY

ORDERS WILL BE FILLED ONLY AS LONG AS SUPPLY LASTS.

#65 12/59
BUTTERCUP: F/F, Scale, .02. SKY-SCRAPER: Wakefield, rub. ALTAIR: Rat Racer. U/C, .29-.35.

#72 7/60
THE SLIVER: RC, speed, .19/.60. BREWSTER BUFFALO: Scale, C/L, .35.

#77 12/60
KRAZY KAT: Stunt and Combat U/C. TINSY "WIPPER": Dual Purpose F/F Scale or RC. SUPER R.O.G.: Beginners hi-performance F/F.

#9A 7/62
SEPTAL III: S/C doubleheader for 1/4 and 1/2A. R-28 PROFILE: C-L stunter for 19 eng. STARBUSTER: F/F contest type by Sal Taibi. .049 engines.

#11A 9/62
SUPER TAILWIND: Scale F/F .049 eng. TWIN'S SPECIAL: Proto/speed winner .29. TOP KICK: A/1 Towline glider.

#25A 11/63
HUGHES H-1 RACER: C/L scale by Musciano. AERONCA DEFENDER: Rubber powered F/F scale by Walt Mooney. CONKY: Engine powered sport F/F.

#29A 3/64
VEGASUS: Super Stunt large engines. URANUS: Contest winning 1/2A and A F/F .049 and .051 engines.

#30A 4/64
MAULEN: .35-powered Carrier model. POMPELEY VIVETTE: Semi-scale sport F/F .020. DADDY: Sport Ukie for beginner. RAUNCHY: Contest winning Combat Ukie.

#31A 5/64
ARISTO-CAT: Class II Intermediate winner .45 engines. ELECTRA X-35: Stunter winner .35 eng.

#32A 6/64
SPORT BIPE: Fine rubber-powered F/F. SIDEWINDER: R/C Pylon record-holder Delta .19 eng.

#33A 7/64
BLITZ: Now 120 mph Combat possible for everyone. C/L .35 or better engines. MINUTE MAN: FAI Team racer for .15. CESSNA SKYLANE: S/C R/C, semi-scale .049.

#34A 8/64
TEMPEST 370: 1/2A and A F/F. DEMON: C/L combat by country's top combat man. .25 eng. ENVYD: Small C/L stunt .010.

#35A 9/64
DUSTER: Multi stunt Bipe for R/C .45. SCORCHER: Proto speed Racer winner .29 eng.

#36A 10/64
URANUS: FAI: F/F FAT power Jr. record holder. SUPER FLIPPER: Stunt model for .15. Unique half wing flap.

#37A 11/64
D.K.2.02: Twin engine rudder-only, sport RC .020. KING RAT: Winningest Rat Racer. MOUSTIQUE: Coupe d'Hiver F/F rubber

#38A 12/64
THE SWAMP BOX: Beginner's S/C RC model. .09 to .15. LIFE DUSTY: 1/2A Nats speed winner. CHIPPER II: Fine Sunday or Sport flying F/F model, small engines.

#42A 4/65
BELLY DANCER: Nats winning Wakefield. TWO-TUBE: Simple, cheap, C/L for one, two or three .020s. U-ALL-2: Fine S/C for galloping ghost .020.

#44A 6/65
LOCKNEED SUPER SCALE P-38: Nats winning scale C/L. LIL' SWELL: Exciting S/C flying boat by Ken Willard "small" engines.

#51 10/58
AMERICANO: .15 F/F, by Blanchard. BOMARC: Scale, Jetex, missile. COUTLASS: Sport U/C, .049's.

#53 12/58
SNAP: Sport U/C, .19-.23. PELICAN: PAA Cargo, .049. WINDMILL: F/F "win" 02-040

#58A 8/66
BILLY BOY: Wakefield contest winner for Junior & Open. AG-1 DUSTER: Semi-scale stunter by top stunt designer; .35/.45.

#59A 9/66
VIPER II: C/L Proto Speed. HARBINGER: Two-time FAI team A/2 Nordic glider. MAYFLY: Single-channel RC Rudder & CG .049, .09.

#43A 5/65
ARCTURUS: A1 Towline Glider for beginner or contest. LIL' KNARF: Semi-scale Goodyear for new Pylon racing event, .19 to .40 engines.

#45A 7/65
GRABBER: Wakefield Unlimited Rubber-powered F/F. MOXANE SAULNIER: Semi-scale WWI R/C glider.

#46A 8/65
WIDAS: Excellent C/L Stunter for .35-.45. GALLOPING JOHN: S/C R/C Biplane for police operation. .15, .19.

#47A 9/65
SUSPENSE: FAI Finalist in F/F power. VEERD: Versatile R/C model can be used for R.O., multi, and Goodyear Pylon racer. .19-.45.

#50A 12/65
THE SUNDOWNER: Class A-B F/F by Grand National '65 Champion. BLUE BONNET: 1/2A Speed by 1964 Record holder and Grand National Champ. SANTA MARIA: Aeromach's exciting S/C scale .049.

#51A 1/66
DOVE: Winning A2 Nordic Glider. THE DANCER: .010-powered C/L stunter, indoor/outdoor. DELTA TOD: AMA-Pylon Speed record holder. '65 Nats winner. 15 engine.

#52A 2/66
SKYPIRATE: U-Control Carrier, .60 eng. BONETTI'S P-39: Multi R/C plane with semi-scale features and good record.

#53A 3/66
PINK FINN: Rat Racer for contest or sport flying .40 eng. DOUGLAS C-43A: Powered F/F scale .020. PETITE PARASOL: S/C scale like R/C with eng. control .09.

#54A 4/66
P-38: Semi-scale stunter. Fine flyer, .35. 1/2A & 30-60: Nats winning F/F .049. MULTI FLOATS: Fine all built-up floats for multi R/C planes.

#55A 5/66
OLYMPIA: Wakefield winner by FAI team member. THE KLITZ BUG: Excellent multi trainer and sport plane .35/.45.

#56A 6/66
LOCKNEED VEGA: F/F .049, true scale. THE TRAVELER: Indoor Stick model that can be easily transported.

#57A 7/66
RYAN PT-22: C/L scale famous plane. RINGER: 1/2A and A F/F contest winner.

#60A 10/66
JAVELIN JR. NOW: Contest winning 1/2A and A-ROW or ROW F.F. P.A.T.I.: Primary & Advanced C/L .049. AERONCA C-3: S/C R/C Scale. 15.

#61A 11/66
LITTLE PROTO: 1/2A Beany Speed. FURSTURP: F/F & Sport. Rubber power d. PLANE JANE: RC propo or reeds. .060 eng.

#62A 12/66
MOSQUITO IV: Rubber-powered twin engine scale bomber. FLEET BIPLANE: Scale Multi RC Bipe, .45 eng.

#63A 1/67
MYSTERE: Exciting C/L Stunt .35/.45 eng. LIL' CRAMP: Baby brother of RC's best s.c. plane.

#64A 2/67
SUPER TWISTER: Top Combat plane by top Combat flier. #80ULT CHIEF: Contest RC multi.

#65A 3/67
STRATOLARK: Wakefield, F/F rubber. ROAD RUNNER: C/L stunt .35/.45.

#66A 4/67
PROP BUSTER: C/L trainer .15 to .35 OILY BIRD: R/C Class I and Class II: .45/.61.

#67A 5/67
DADDY RABBITT: '66 Multi R/C Champ. BEMOISELLE: F/F Scale. WOOTPEE: Contest winning Rat Racer.

#68A 6/67
CHIPMUNK: Class III & scale .45 to .60. TWO SPECIAL: 1/2A Proto racer .049. UGLY DUCKLINGS: A/1 Tow line glider.

#70A 8/67
MARTIN MARAUDER: C/L Scale of famous WW-II bomber. DeHAVILLAND DM-4: F/F scale of WW-I fighter/bomber .020 eng.

#71A 9/67
WYDAWAKE: F/F Wakefield winner. SUPER SATAN: Super Speed C/L Combat; .35 eng.

#72A 10/67
BRMZP-8: West Coast's best racer; .40 eng. SMALL WONDER: Jetex-powered F/F; contest finalist. BEARWIN SPORTSTER: S/C, RC Scale; .049 eng.

#73A 11/67
LEOPARD MOTH: F/F Scale .049. MOVA-TOD: RC Multi for single, twin or tri-motor operation.

#74A 12/67
AIRABONITA: Class I Carrier C/L .60 eng. HENCHMAN: Multi radio contest winner with a specialty for knife-edge flying; .60 eng.

#75A 1/68
RODNEY RISER: Simple free flight rubber powered for R/O/ROW. MOX MIX: Sport control line .19/.25 engine. FAIRCHILD PT-19: Scale R/C multi .19/.25 engines.

#76A 2/68
MKW-FLI MARK III: Internats and Nats winning multi plane by Phil Kraft .60 eng.

#76B 2/68
NORTHROP A-17A NOMAD: Contest winning scale control line .35. SOPHISTICATED LADY: Hand launch glider for beginner or expert.

#77A 3/68
BRISTOL BULLET: Contest winning World War I fighter by Hete Wallace. .60 engine.

#77B
C/L CHIPMUNK: Exciting semi-scale control line stunter of famous aerobatic plane .35

#78A 4/68
WITCH DOCTOR 800: Class C free flight contest winner to .40 eng. ORIGO: Single channel R/C sport flier .15 eng.

#79A 5/68
Fierce Arrow 400: Control Line Stunter Apprentice: Excellent R/C trainer, RME for .19/.40 eng.

#80A 6/68
P-51D Sharpshooter: fine control line scale machine. Brigand: Continental 600 pylon racer—R/C .40 eng.

MAIL EARLY
IN THE DAY!



THE ZIP CODE NUMBERS BELONG IN ALL ADDRESSES

PLAN SETS 75¢ EACH POST PAID

MODEL AIRPLANE NEWS • 551 FIFTH AVENUE, NEW YORK, N.Y. 10017

Enclosed is for plan sets numbered in boxes below

PLAN SET					
----------	----------	----------	----------	----------	----------

Please print your number **DISTINCTLY** in box for each plan you desire.

List additional plan orders on separate sheet.

NAME PLEASE PRINT

ADDRESS

ZIP #

Allow three weeks delivery for plans sent third class mail prepaid in the Continental Limits of the United States. First class mail add 25¢ extra per plan and 40¢ extra for each Air Mail plan within the Continental United States.

Yak P or PM

(Continued from page 27)

reluctantly do it. Even with this precaution and a fairly long horn, the model was super-sensitive and the horn had to be lengthened considerably. This modification produced the desired result and elevator reaction is now smooth. My advice is that unless your name is Kraft Weirick, leave that scale hinge line where it is—on the plan!

After the changes (which are on the plan so you won't have these problems) the model really showed what it could do. I wish we had a movie of one landing in particular, the smoothest, most scale-like, flap down, nose high grease onto the main gear a judge could ask for. Maxey decided on the spot to build a PM version and keep it light to emphasize the stunting capabilities. By the time you have this issue, we should have a readout on the characteristics of his plane.

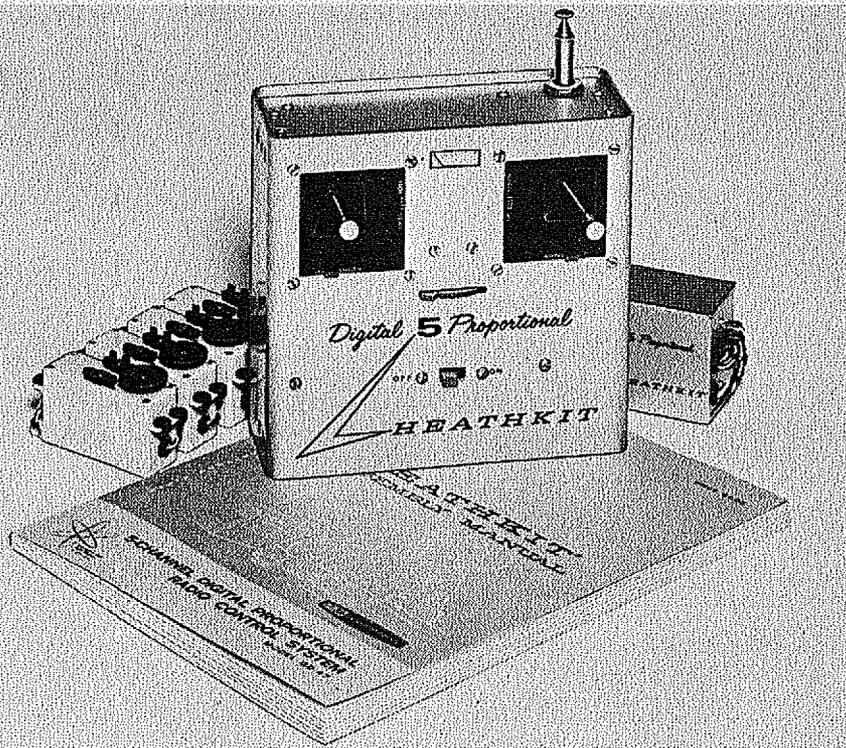
The differences between the P and PM are distinctive but the plans can be used to build either variant. The 18P, a special aerobatic and sport craft, came from a long line of YAK 18 trainers. It was used as the Russian team aircraft in the 1964 World Aerobatic Championships in Bilbao, Spain. While a spectacular performer, it did not win the individual championship and further modifications to increase the aerobatic characteristics were undertaken. The result was christened the 18PM. At the Moscow 1966 World Aerobatic meet, it really took the laurels, winning the first four places in both the men's and women's individual championships and the team trophy as well.

The modifications made on the 18P to produce the 18PM were as follows: Dihedral reduced from 7 degrees 20' to 2 degrees to improve inverted stability. Cockpit moved to the rear to move back the C.G. and increase maneuverability. Oil cooler on starboard wing enlarged. Flap replaced by a much smaller air brake on the former flap hinge line.

You can see these features on the working plans and elsewhere in this issue on the three view by Capt. Halls of the 18PM. Builders of the 18P should also get a copy of the January, 1967 issue of Flying Review so that the differences are apparent to scale judges.

I selected the 18P because the forward cockpit was better located for inclusion of complete cockpit detail and still have the servos in the proper place. This decision was made before the appearance on the modeling scene of Ny-rod and its derivatives. Now it would be easy to mount the servos ahead of the cockpit in a PM and route the controls along the walls and still have space for a complete cockpit and pilot. I also thought the larger dihedral of the 18P was a better choice for my flying skills and finally I liked the looks of the forward cockpit.

The scale of the model is just over 2" to the foot. Purists complain about uneven scales, but I maintain that a model of say 2.046" to the foot is just as much to scale as a 2" to the foot. In this case, the reasons for the size were compelling. At 2" the engine stuck through the cowling, whereas a small increase got it inside. The new rules for RC Scale require that if you use an unusual scale the judges must be provided with some way of relating the model to the 3-view provided. Take the Halls 3-view to a photo-copy place and have it enlarged so that the wing span on the three view is an exact multiple of the wing span of the model. Present this to the judge with a notation of the multiple to the model size. This will fulfill the rules and please the judge as well for it is much easier to check a model that is an



the only thing as impressive as the Heathkit® R/C System is the 124 page* manual that comes with it

* 60 pages of "how to build it" . . . 64 pages show how to test it, install it and, most important, how to maintain it yourself!

Thousands of owners can attest to the impressiveness of the performance and savings of their Heathkit R/C equipment. But what they may not mention is the superb instruction manual that comes with each Heathkit system. Less than half of this 124 page epic is devoted to the famous step-by-step instructions and pictorials that make Heathkit units so easy to build. The balance of the manual is a goldmine of the kind of information that's good to have around later.

Its mighty comforting to know that with the help of this manual you can keep everything in tip-top flying condition without those expensive "back to the plant" service and check-out excursions. You'll find complete details on troubleshooting, testing, locating faults, alignment instructions, installation hints, "x-ray" views of all circuit boards to aid in locating the position of all parts, voltage readings and test points, a complete parts list for each unit (right down to the last nut and bolt), and a lot more to help you understand the circuitry and theory of operation. If you'd like to see for yourself, send \$2 for a copy . . . it's refundable when you place your order for the system.

The system itself is strictly good news . . . for your wallet when you buy it (you can save over \$200), and for your enjoyment when you fly it. The system includes the Heathkit/Kraft Digital 5-Channel Proportional Transmitter and Receiver that operates on the 27 MHz band plus rechargeable batteries for each (charger is built into the transmitter), and 4 Variable Capacitor Servos with all necessary cables and connectors. Solid-state, of course, with fiberglass circuit boards for durability and easy assembly . . . you'll complete the entire system in about 25 hours. Flying weight with 4 servos is just 20 oz. Get into "full house plus one" radio control with the Heathkit R/C System . . . it's fun and it saves, when you buy it, when you fly it.

System Kit GD-47, all parts; specify freq. (26.995, 27.045, 27.095, 27.145, 27.195 MHz) shpg. wt. 5 lbs. saves \$12.45 only \$219.95

Kit GDA-47-1, transmitter, battery, charge cord; specify freq. from above; 3 lbs. \$86.50

Kit GDA-47-2, receiver, specify freq. from above; 3 lbs. \$49.95

Kit GDA-47-3, receiver battery; 1 lb. \$9.95

Kit GDA-47-4, one servo; 1 lb. \$21.50 (no money down, credit terms available)

FREE 1968 CATALOG



Now with more kits, more color. Fully describes these along with over 300 kits for stereo/hi-fi, color TV, electronic organs, electric guitar & amplifier, amateur radio, marine educational, CB, home & hobby. Mail coupon or write Heath Company, Benton Harbor, Michigan 49022.

HEATH COMPANY, Dept. 82-7
Benton Harbor, Michigan 49022

Enclosed is \$_____ including shipping.

Please send model (s)

Please send FREE Heathkit Catalog.

Please send Credit Application.

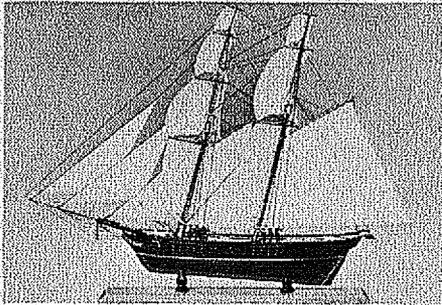
Enclosed is \$2, send GD-47 manual.

Name _____

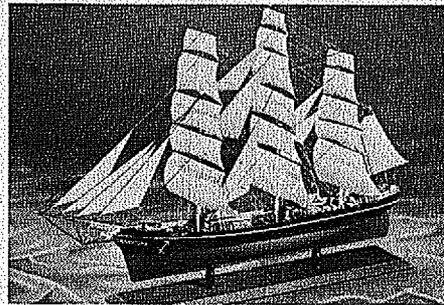
Address _____

City _____ State _____ Zip _____

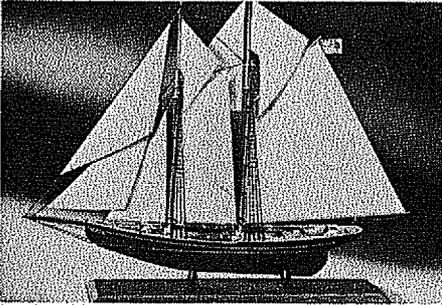
Prices & specifications subject to change without notice. **GX-165**



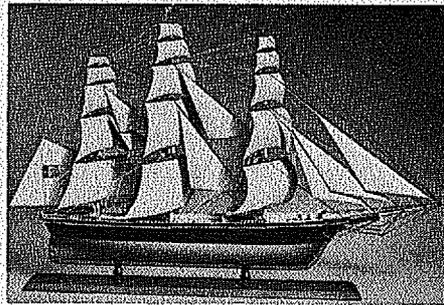
Kit 172 BALTIMORE CLIPPER, Dos Amigos. 22½" Deluxe kit, printed cloth sails, metal fittings\$16.95



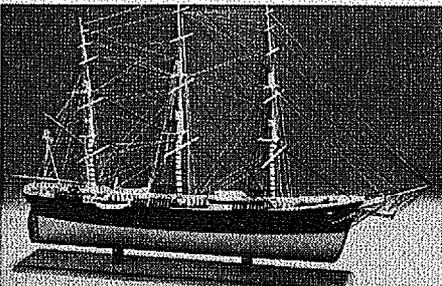
Kit 163 CUTTY SARK, CLIPPER SHIP. 23" exact scale replica of world's fastest ship. Printed sails ...\$16.95



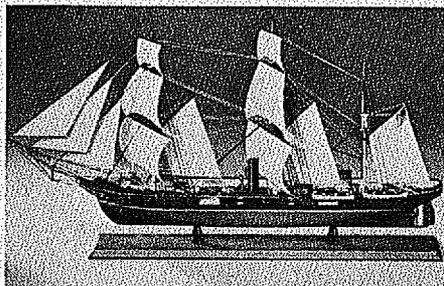
Kit 164 BLUENOSE. 24" Authentic sleek trim lines. Fine detail metal fittings, printed cloth sails\$16.95



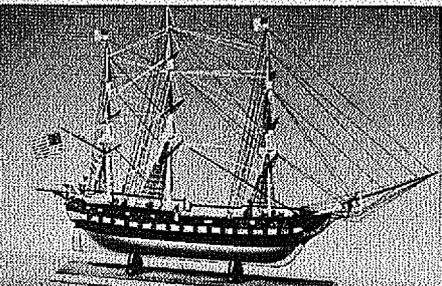
Kit 171 SEA WITCH. Big 27¼" super deluxe kit. Printed cloth sails, realistic metal fittings\$16.95



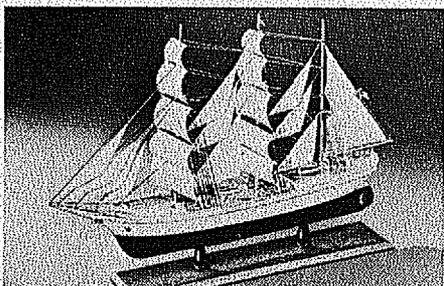
Kit 165 SOVEREIGN OF THE SEAS. 23¾" — 1852 model. Collector's model. Kit has finely detailed parts \$16.95



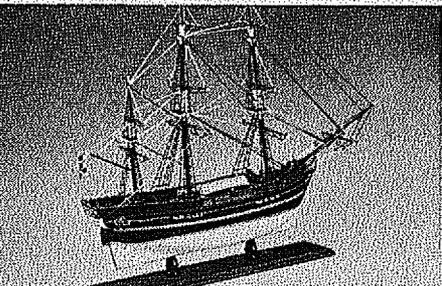
Kit 166 U.S.S. KEARSARGE of Civil War fame. Big deluxe 27" ship printed sails, cast fittings\$21.95



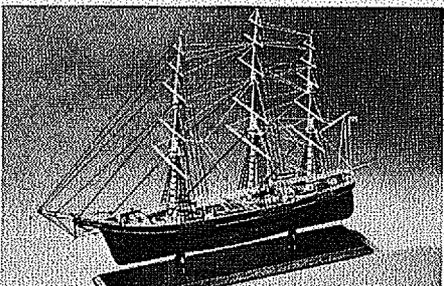
Kit 170 U.S.S. CONSTITUTION "Old Ironsides". Fought 40 battles successfully. Kit has cannons\$8.95



Kit 168 U.S. Coast Guard EAGLE. 13" model is true replica. Printed cloth sails, metal fittings\$8.95



Kit 169 H.M.S. BOUNTY. 13½" most famous ship in history. Display it in home or office\$8.95



Kit 167 FLYING CLOUD, CLIPPER SHIP. 13¾" model. A collector's item you'll be proud to display\$8.95

even multiple of the scale plan than to have the double chore of converting from the scale used, even when it is an unfractioned figure. An alternate way would be to make a special scale ruler with dividers which would read model dimensions when applied to the 3-view. (Step off the model wingspan on a dimension equal to the 3-view span, then all other dimensions of the model can be read directly from the 3-view using the special ruler.)

The model uses what may seem a rather old fashioned style of construction. I make no claims that you can build it in a week, but it is strong and can take lots of punishment as well as the pull of many coats of dope. Besides, I think there are still a lot of model builders around as opposed to mere assemblers. I'm not throwing rocks at ARF stuff. I use them myself for practice to save building time which I apply to scale projects.

Most of the building information is on the plans or can be deduced from study of the cross sections. However, there are some unusual items I'll touch on as long as the space holds out.

The fuselage is built on a ¼ sq.in. main frame with formers on top and sides, partially planked with ⅛" sheet and the rest open framework, just like the full-scale airplane. Note that "FW", the ¼" sheet piece that shapes the cavity for the wing, extends from the firewall to the wing trailing edge.

If you build the PM, you will be doing in model form exactly what was done when the prototype was built, i.e., the 18P canopy, not trimmed so close, will be moved backward to a new location. This, of course, requires dropping some formers and using others, as the plan details. The main difference is the block "FPM" used at the rear of the canopy in the PM fuselage. Since the fuselage has started to taper at this point the canopy doesn't quite fit and the purpose of the block is to change the fuselage curves just a little to meet the canopy. The best way to get this shaped correctly is to refer to the picture of the PM on page 29 of the December, 1966 issue of Air Progress. This shot shows the area clearly.

A ready made canopy will be available soon from Sig and as a scarred veteran of stretch moulding efforts, I recommend that you get this—or do you like plastic smeared all over the kitchen oven?

A Sig product that is unfamiliar to many builders was used for making the fillets. Improperly done filleting can ruin the looks of an otherwise perfect model. With Epoxolite Putty the job is a cinch. This is a sort of epoxy plastic balsa, light and sandable yet very strong and non-shrinking.

First complete the fuselage, including wing mounting attachments, covering and fillercoating. Apply the 1/32" plywood pieces "FF" to the fuselage with epoxy glue to keep them from pulling out of shape as the glue sets. Lay a piece of plastic sheeting such as Handi-wrap across the top of the finished, covered, and fillercoated wing and mount in place, using the wing attachment bolts to draw it up tight. If there are any places where "FF" does not fit flush against the wing, drive some toothpick wedges between it and the fuselage to force it down snugly against the wing surface. Allow the glue to set.

Mask the fuselage fillet line with Scotch plastic tape (it can be easily curved) to keep a clean edge. The wing fillet line is the edge of "FF" and the plastic covering already applied will keep the goop off of the wing. Mix a batch of Epoxolite according to the direction and slop it on. Roughly squeeze out the bead to fillet shape with a rounded object. Allow it to

set up slightly before trying to get a more perfect shape with a wetted instrument or finger. After complete setting, finish with sandpaper wrapped around a round form.

The nose gear used on the original model was a twin coil Franklin (English) bulkhead mount unit built up to scale diameter with brass tubing. A ready-made special YAK gear is being hatched in the Sig works that will be made from nylon and steel. This looks very strong and will not need much work to complete the scale touches since it will feature a fork and tubing leg.

Particular care should be taken in mounting the motor to insure it is centered on the cowl. The best way to do this is to mount the cowl first, using the rear attachment points only since C-6 will not yet be available. Then cut a corrugated cardboard ring the same diameter as the opening in the cowl and put it on the prop shaft, shimmed so as to be right in the cowl opening. The engine should be mounted on the mounts with the thrust shim glued in place. Set this unit on the firewall, fuselage vertical, with some tack glue spots. Drop the cowl on and fasten, bringing the engine into correct alignment by positioning the cardboard ring directly in the cowl opening. Allow the tack glue spots to dry, remove cowl, mark the mounts for bolting in place in this position.

The cowling is spun aluminum, a job I had custom made in Omaha with the help of Dr. Bill Clark. Sig will produce one for the kit and it could also be made from fiberglass.

One of the unusual features of the YAK is the use of radiator shutters, evidently required by those famous Russian winters to maintain cylinder head temperatures. It is a good feature in the model for it effectively fills in that gaping hole in the front of the cowling that so often spoils the looks of a scale craft without having to resort to the job of building a dummy radial engine. It may look like a difficult project but it is as easy as a kindergarten puzzle. Cut the patterns on the plan from 1/32" Air-O-Sheet. This is the soft plastic sheet used in Lanier ready-builts and is easily cut with an X-acto, is heat moldable and has a smooth finish that requires no filling and takes butyrate type dope. The dope should be sprayed on in light coats to avoid over softening the plastic.

C-2 and C-3 should be wrapped around round forms of the proper diameter and baked in a 300 degree oven for about five minutes. It is possible, though a little more difficult to handle, to make them without this heating. Make C-2 and C-3 1/4" longer and curve them into shape cold, overlapping the ends, clamping and cementing with Air-O-Sheet cement. This is a special item that quickly welds joints of Air-O-Sheet together. It is water thin and flows into the joint readily and melts the plastic together. If you heat treat C-2 and C-3, use a butt joint and reinforce with a scab over the crack.

Pin C-2 and C-3 in place on the front view of the cowl and add the 28 C-1 pieces by plugging the tab on the top of each one into the hole in C-2 and the corresponding slot in C-3. A drop of Air-O-Sheet Cement is put on each seam for initial assembly and after drying, coat each seam (on the outside of C-2 and the inside of C-3) with Sig-ment for additional strength. Add the front ring, C-4 and the brackets on the side for mounting. The brackets are made by bending Air-O-Sheet into a 90 degree angle and cementing two pieces together to make 1/16" thickness. 2-56 bolts and blind nut then fasten the shutter unit to C-5, the plywood bulkhead. This in turn is fastened, by tapping holes, to the motor mounts. If you aren't set up to tap holes you can make a small

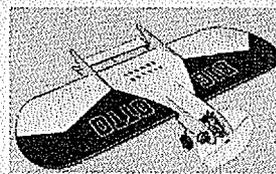
CONTROL-LINE PLANES

Gas Powered Models for Small 1/2A Engines .010 to .074.

Scientific



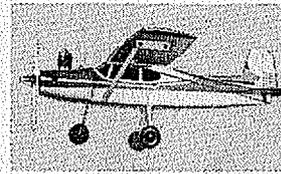
Kit 95 PIPER CUB TRAINER. 18" Carved body, shaped wing...\$2.95



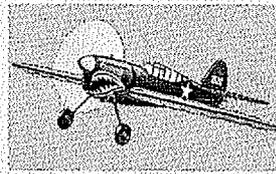
Kit 140 BIG OTTO. 24" Great Combat Flyer\$2.95



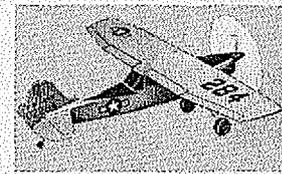
Kit 60 STUKA DIVE BOMBER. 18" Carved body, shaped wing....\$2.95



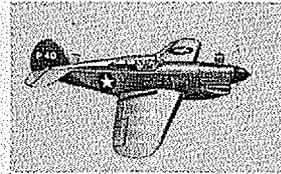
Kit 54 CESSNA "192" TRI-CYCLE. 18" Carved body, shpd wing \$2.95



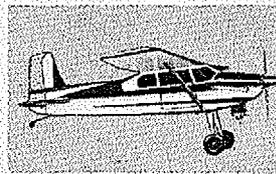
Kit 92 P-40 WARHAWK. 21" Built-up wing, formed cowl\$2.95



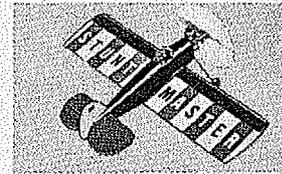
Kit 6 CESSNA BIRD DOG. 18" Carved body, shaped wing\$2.95



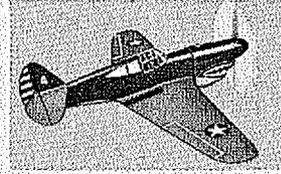
Kit 149 RED TIGER P-40. 19" Built-up wing, formed cowl\$2.95



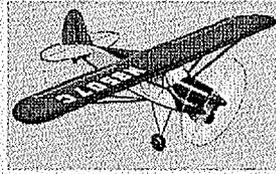
Kit 7 CESSNA "180". 18" Carved body, shaped wing\$2.95



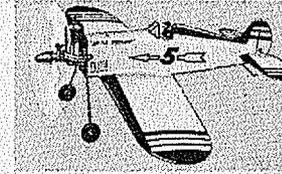
Kit 25 STUNTMASER. 18" Carved body, shaped wing\$2.95



Kit 59 P-40 FLYING TIGER. 18" Carved body, shaped wing...\$2.95



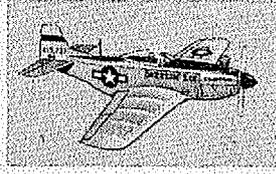
Kit 8 PIPER CUB CRUISER 18" Carved body, shaped wing ...\$2.95



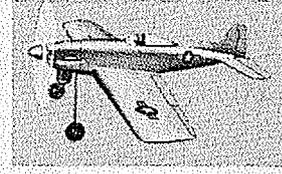
Kit 26 LITTLE MERCURY 18" Carved body, shaped wing\$2.95



Kit 142 ZIPPER. 19" Built-up wing and body, etc.\$2.95



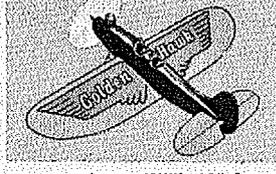
Kit 144 SIZZLIN LIZ. 18" Built-up wing and body, etc.\$2.95



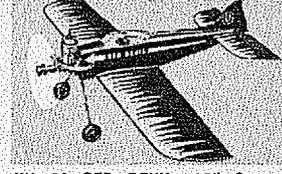
Kit 18 LITTLE MUSTANG. 18" Carved body, shaped wing\$2.95



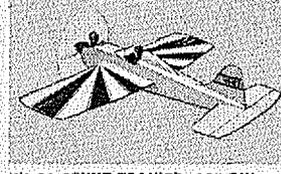
Kit 74 MESSERSCHMITT ME-109. 18" Carved body, shpd wing \$2.95



Kit 48 GOLDEN HAWK. 18" Carved body, shaped wing\$2.95



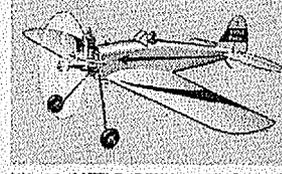
Kit 30 RED DEVIL. 18" Carved body, shaped wing\$2.95



Kit 91 STUNT TRAINER. 18" Built-up body, shaped wing\$2.95



Kit 14 PIPER TRI-PACER. 18" Carved body, shaped wing\$2.95



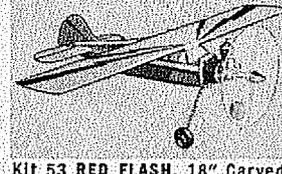
Kit 28 LITTLE DEVIL. 18" Carved body, shaped wing\$2.49



Kit 65 ZIG ZAG. 18" Carved body, shaped wing\$2.49



Kit 71 KINGPIN. 50 sq. in. wing Built-up wing, formed parts...\$2.49

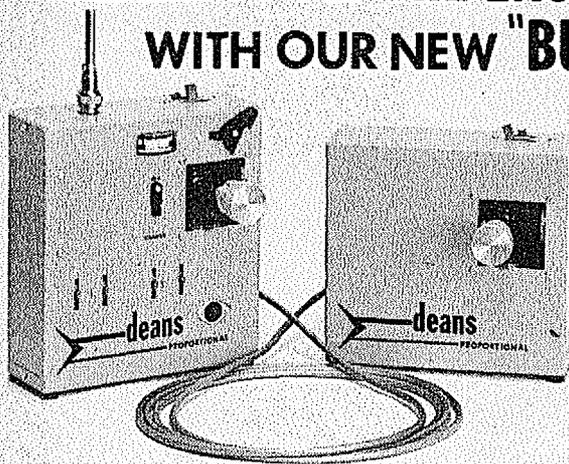


Kit 53 RED FLASH. 18" Carved body, shaped wing\$2.49

SEE YOUR DEALER. If kits are not available at dealer, you may order direct from factory adding 50c for postage & handling. Outside U.S.A. add \$1.00. Send for Catalog. 25c.

SCIENTIFIC MODELS, INC.
109 MONROE STREET • NEWARK, N. J. 07105

LEARN TO FLY THE EASY WAY WITH OUR NEW "BUDDY BOX"



- DP4-1 Dual Stick 4 Channel ENGINE LEFT OR RIGHT \$395.00
- DP8-1 Dual Stick 8 Channel ENGINE LEFT OR RIGHT \$475.00
- SP4-1 Single Stick 4 Channel \$410.00
- SP8-1 Single Stick 8 Channel \$490.00

DUAL CONTROL BOX

- DX-1 Dual Stick 4 Channel ENGINE LEFT OR RIGHT \$30.00
- SX-1 Single Stick 4 Channel \$45.00

BUDDY BOX AVAILABLE WITH NEW UNITS ONLY



NEW—Dual Rack Mini Servo
4 lbs Thrust

DEALER INQUIRIES INVITED

ELIMINATE The Crash Worry Tension
INSTANTANEOUS Control Switching

w. s. deans co.

Phone (213) 862-8345
8512 EAST GARDENDALE
DOWNEY, CALIFORNIA 90242

angle bracket of sheet aluminum and bolt C-5 to the motor mounts instead.

The spun aluminum cowl is very sharp looking but it brings along the problem of getting paint to stay on the metal. You may have your own favorite metal primer for this job. My solution takes a little longer but really does the job. I treat the cowl just like any other part of the model. Sand paper the metal, paint it with a coat of dope, lay on wet silk, stretch smooth and dope down. Turn the edges of the silk inside lap with epoxy glue to tie down the on the cowl inner surface. Go over this inside lap with epoxy glue to tie down the edges firmly. If you don't do this, the silk tends to separate from the metal along the edges after a period of being flexed. Epoxy must be used because the shrinking action of dope or ordinary cement tends to pull away from the cowl on the inside rather than toward it as it does on the outside. Fill the pores with several coats of fillercoat and sand smooth, ready for color doping at the same time and in the

same way as the rest of the model. I've used this method for years on spinners and cowlings and though it sounds strange, it works! The silk and fillercoat form a shell that will not chip or crack.

The lower air scoop C-8 is carved from a soft balsa block and is best fillercoated and painted separately and added to the cowling after it has also been painted. For a good picture of this scoop and the openings in it, see the photo of the 18P on page 36 of the August, 1966 issue of "Flying."

This photo also shows the scale prop details to good advantage. Often neglected by scale builders, this is a very necessary touch for realistic appearance and good for competition points as well. If you have carved a rubber model prop you can do this just as easily. I made the hub from pieces of copper pipe, epoxied washers on the front and back and filled in the gaps with Fred Angel's Epoxybond Hobby Putty, a very handy product that can be shaped and smoothed with a wet knife blade or

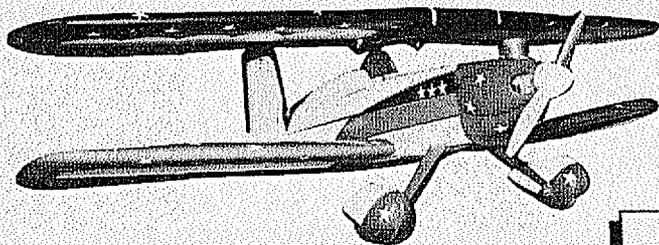
finger. The pitch weights were made from pieces of dowel fastened to a ring of Air-O-Sheet.

Equally neglected is landing gear detail. I also used Epoxybond here to give shape to the nose wheel fork. Landing gear cover doors were made from Air-O-Sheet. The nose gear door is curved and this effect was achieved by tying a piece of the plastic to a tin can and baking it in the oven. When you are doing this, make the piece large enough that the places where it was tied down or fastened to the can are on waste space because an image of anything touching it is impressed into the plastic during the baking process. Semi-flexible polyethylene tubing was used on the 3/16" main gear to bring it out to scale diameter. To paint this tubing, sand off the gloss and use Hobby-poxy.

The wing should bring back fond memories to some of you ex-free-flyers who built Carl Goldberg's epic creations, the Zipper, Sailplane, etc. with the ribs

TANGO

"READY TO FLY TYPE BIPLANE"

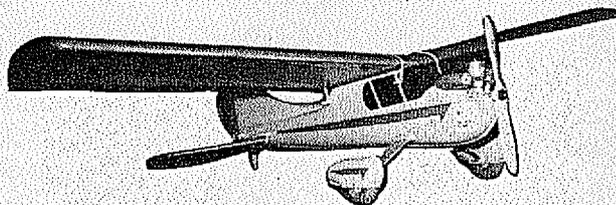


WING SPAN 52 IN.
WING AREA 936 SQ. IN.
ENGINE45 - .61
DRY WEIGHT 6 LBS.

SPECIAL
ABS CEMENT
\$1.50 Jar

SOLO MK 1

"READY TO FLY TRAINER"



WING SPAN 56 IN.
WING AREA 936 SQ. IN.
ENGINE19 - .40
DRY WEIGHT 3 LBS.

\$39.95

made with



\$49.95

MASS. RES. ADD 3% SALES TAX

LAZOTT PLASTIC CORPORATION

GLEASONDALE INDUSTRIAL PARK
GLEASONDALE, MASSACHUSETTS 01749



Put muscle in your models - build them with famous Ambroid cement



Ever since Ambroid cement was first produced 58 years ago, it's contained an important secret ingredient that is largely responsible for its superiority over all other cement brands.

This component of the exclusive Ambroid formula is known chemically as a "wetting agent" and its purpose is to soak immediately into wood, preparing the way for the cement to penetrate deep into the fibres to form the famous Ambroid permanent bond. The result, as any model plane builder who uses Ambroid will tell you, is a joint so tough that if you try to break it apart, the wood on either side will fracture while still leaving the actual cement joint intact. In addition to our special "wetting agent", the Ambroid formula contains a carefully balanced combination of four solvents, each contributing to the overall efficiency of the world's original — and still the finest — model cement. Finally, since we use only the very best of raw materials, our product quality never varies. If you are one of the very few who still haven't tried Ambroid, isn't it time you picked up a tube from your local hobby dealer (look for the distinctive orange, blue and white counter display) and started putting muscle in your models...

AMBROID "REGULAR CEMENT"

20 cc. Tube 15¢ Pint Can \$1.75
 1-3/4 Oz. Tube 30¢ Quart Can \$3.35
 4 Ounce Tube 60¢ Gallon Can \$8.75

AMBROID "EXTRA-FAST" CEMENT

Ideal for field repairs: 20 cc. Tube 15¢



IN EVERY FIELD THERE'S A LEADER - IN MODEL AVIATION IT'S AMBROID

AMBROID COMPANY • BOX 231 • WEYMOUTH 88 • MASSACHUSETTS

slipped over the spars. The ailerons are built as an integral part of the wing. After installing the outer planking and finishing the trailing edge, cut them off with a razor saw blade removed from its frame. This will be easy if you have carefully marked or slit the planking during assembly so the cut will be in the correct spot. Angle the open face of the ailerons with a sanding block and face with 3/32" sheet.

Speaking of sanding blocks—for this type of wing, with exposed rib edges not concealed by planking (scale!), an invaluable aid is a Delta straight-edge sander. It is the only practical way to get the wing in shape for covering. It's also very handy for beveling the fronts of the ribs before installing the leading edge. Just lay it down on the building board in front of the assembled wing and slide it gently back and forth against the ribs.

The color scheme on the Halls 3-view is basically correct for the 18P as well. The differences can be seen in the photos of the model. The 18P Russian team aircraft in 1964 had gold numbers "1" through "4" with black outline on the fuselage sides. At the World meet, competition numbers were assigned each entry and these are the white numerals on the cowling, "29" on "1", "30" on "2", etc. The badge of the Aero club on the cowling was used on the 18P without reversing on the right hand side, that is, the wings were backward. They evidently decided, and I sure agree, that this doesn't look quite right. When the 18PM appeared at the 1966 Championships the cowls sported right and left hand versions of the badge. (See color photo of badge, P-38, January 1967 "Flying".)

Sig will be producing this emblem as a decal but I painted mine on. Since I think the process will be of interest to scale builders in general, I'll say that it wasn't

nearly as hard as it looks and the result turned out much better than I thought it would. I used regular drawing instruments, a ruling pen and compass, with dope in them instead of ink. Thin the dope slightly with anti-blush thinner to slow the drying time and make it flow easily through the pen points. Prepare a paper pattern of the emblem from the 3-view.

The painting sequence is as follows: Dope the emblem, stripe and number areas white. Outline the outside edges with a red line. Mask off the white. Spray the cowling red. Remask and spray the black top. Remove the masking. Using compass and ruler, outline the blue half circles in blue and hand paint them with a small brush. Outline the gold area and paint it in by hand. Finally do the same with the red letters reading "YAK". If you think I'm going to say that next I drew the small letters, you're a better artist than I am. These were done with Instant Lettering slot car (you should pardon the expression) decals available in gold at most any hobby shop. Some of the crazy Cyrillic alphabet will take a little combining of letters or turning them over, but it can all be done very neatly.

Incidentally, I made my own gold dope for the rest of the badge so that it would match the shade of the rub-on decal lettering. Art supply houses have bronze powder in various shades and just a dab in some clear dope is all it takes. I found my home made gold had less tendency to streak when hand brushed than commercial gold dope. I also used this mix for the gold "3" on the fuselage side.

On first test, it generally appears that Instant Lettering decals cannot be doped over because they dissolve in dope. They will if you slobber a wet coat directly on the bare decal. However, if you hit them

several times with a fine mist and slowly build up a little clear dope over them, allowing it to dry thoroughly between coats, you can soon spray more normal coats and shortly will have completely buried them and have a 100% durable and fuel proof decoration.

Another color scheme, a little bit easier to do, appears in a color photo in the Nov. 1967 issue of "Sport Flying". A complete list of scale source information that shows other patterns, cockpit detail, etc. appears on the plan. You should try to get as many of these as possible. Photos of the actual aircraft can show nuances of curve and shape that no plan or description can manage. All possible sources of available information are itemized with the exception of an article from a Russian aviation magazine, the masthead again in that topsy-turvy writing, which you couldn't get and we couldn't reproduce. (Ken Sykora claims the English translation of the name of this publication is "String Beans.") Interesting item: The Russian 3-view has some obvious errors in outline and detail!

Since I can't cover everything in the space available, I'll try to answer any questions you may have. Send me a stamped (that is a Scotch name) self-addressed envelope at Rural Route 5, Ottumwa, Iowa 52501 and I'll be glad to do some yakking about the YAK.

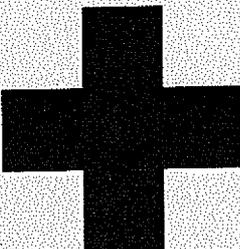
Right now I'd better get back to that multi-engine project. If any of you scale nuts out there in model building land ever run across some cockpit photos of the Bellanca 28-92, beg, borrow or steal them. Hang it all, there's got to be some pictures somewhere, the bird won second place in the '38 Bendix. With the data on hand, maybe I can get this monster done—*IF* no more red airplanes suddenly turn up!

MYERS MODELS OFFERS

- #1. The desire to help the beginner and sport flyer.
- #2. Practical R/C kits. The "Mayfly" and "Shoofly" for the best in Gallaping Ghost. The "Swan" and "Old Timer" for scale like fun planes. The "Pathfinder" for a much needed low wing trainer-sport plane.
- #3. Exclusive plywood fuselages. All balsa wings. Good-by warps.
- #4. All available as ready to fly hand crafted models. We have built hundreds, yet treat each one individually.
- #5. Custom installation of R/C equipment in any of our models. Your equipment or ours. Single to full proportional.
- #6. Experience — 30 years of building and I still love it. Dale Myers.

MYERS MODELS
STEWARTSTOWN, PA. 17363

**SUPPORT
RED CROSS**



help us help

VTO

(Continued from page 9)

his altitude and the contest. Jerry's friends all look forward to the day when he will emerge from under that black cloud and find the place he deserves on one of the USA Teams. Jerry never quits trying and keeps coming up with new designs. "Miss Nitro" is actually one of his older Power designs. He has several new ones, with auto gadgets and all the latest performance-enhancing goodies. However, his "Miss Nitro" is a reliable ship with an outstanding glide so he plans to continue flying it in competition. Perhaps what we will see next season is a "Miss Nitro" with a Wisniewski tuned pipe hung on the power-plant. Jerry has long been known for his hot K&B mills. As rival contestants have noted, his Torps really "turn on."

SYMPOSIA PROLIFERATE

Don't let that twist your tongue too tight — what we mean is that free fighters are finding that it is the "in" thing to hold technical conferences to expound on subjects aerodynamic and topics theoretical. The emphasis is on education of the adult modelers who have an interest in the "why" of model flight as well as the "how." Some of these conferences have outstanding authorities in model aviation, with excellent scientific credentials, as featured speakers. These learned gentlemen present material that deals with original research and development in model aerodynamics and associated fields. Far from being dull and dry, these men present their material with skill, using audio-visual aids to make the unknown clear and simple explanations of what, in their technical "paper," may be deep mathematics. For those with the interest and background to understand the full technical details, the papers are published in an illustrated report. The Na-

tional Free Flight Society Symposium, to be held jointly by NFFS and AMA at the Olathe Nats, is an example of this genre. The report is expected to be about 100 pages in length, printed in a quality 8½ x 11 format that will make it a collector's item. The admission charge (for adults) to the Symposium will include a copy of the Symposium Report which will be available at the door. Children and guests, though welcome to attend the meeting, will not be obligated to purchase the Report. The Symposium Papers will be available later by mail order from NFFS and AMA Supply and Service. Those unable to attend the Olathe Nats (and this includes many of our foreign aeromodelling friends) can reserve a copy now by sending a check or money order to the Symposium Business Manager, Hardy Brodersen. If you belong to both NFFS and AMA, send \$3.50 for your postpaid copy. If you do not belong to both organizations, send \$4.50 to: SYMPOSIUM, 4729 Walnut Lake Rd. Birmingham, Michigan 48010. Copies will be mailed out shortly after the Olathe Nats. Your best bet is to try to make the Symposium scene on Monday evening at the Olathe NAS Theatre. Then you can pick up on the tech talk "right from the horses' mouth." Stablemaster Bill Hartill will have a winning lineup of ponies ready for you.

Another type of Symposium, perhaps not as elaborate but still quite effective, is the local conference aimed at educating non-modelers and beginners about the technical and scientific nature of model aircraft, in other words, fighting the "toy airplane" image. Recent symposia in Chicago and St. Louis have come to my attention. Both dealt with Indoor flying. The one held here was sponsored by my club, the Kirkwood Thermaleers. The event was well publicized in advance attracting an overflow crowd, including some "old timers" who had not been seen for many years and many newcomers. The meeting was the brainstorm of KT Prexy Bob Hotze and Veep Dick Hardcastle. These guys discussed IHLG and Paper Stick respectively, while Lou Merlotti held forth on his first love, Indoor Scale, and Ed Capogreco told the tale of wondrous microfilm. He concluded with a dramatic demonstration: he set up his pouring tank, filled it with distilled water, and actually poured some microfilm for the audience! To prove that pouring film is an art that requires skill and patience, he blew the first frame (unintentionally). It split as he slipped it off the surface of the water. His second attempt was successful and provided a shimmering, spectrum-hued object of wonder for viewers. Such demonstrations, coupled with slides, plans, and actual models (as visual aids and in static display) help make it clear to any audience that these free flying craft are far from being toys. Try a simple symposium in your town, perhaps instead of a dull club business meeting. You will find plenty of volunteer "experts" among your flying buddies and you may find some new building and flying companions in the audience. Sympose away!

RICHMOND BOMBS KOKOMO

Sort of sounds like a Civil War Battle but it is really just big Jim Richmond with his ultra Easy B. Jim is an indoor expert and the challenge of EZB to him is not just to get the thing to fly at all (and the simple EZB designs make this feat possible for even the most inept indoor beginner) but to extract the ultimate performance from a specification class that does not allow ordinary high performance features such as rigid bracing and built up props (although the latter is allowed in some local Midwest contests). Jim has this to say about his featherweight: "The stab is made

WYLAM PLAN SETS!

NEW! EACH SET CONTAINS EIGHT 14" X 20" PLANS! BY THE ACKNOWLEDGED MASTER OF THE HISTORICAL PLAN! UNSURPASSED DETAIL OF CLASSIC WW I & WW II PLANES! ORDER NOW WHILE SELECTION IS STILL COMPLETE

<p>SET # W-1 SOPWITH CAMEL Famed WW-1 English pursuit WRIGHT MODEL A A true pioneer—a gem! WRIGHT MODEL B Another collector's item SE-5A WW-1 pursuit—a favorite</p>	<p>SET # W-2 SPAD S-XIII C 1 Renowned WW-1 French pursuit CURTISS MODEL A A competitor of the Wrights SPAD S-VII Great French WW-1 pursuit WRIGHT FLIER Man's first flyable plane</p>	<p>SET # W-3 CURTISS P-1 HAWKS Glamorous Army fighters F11C-2 GOSHAWK Navy carrier fighter P-8E HAWK Greatest of all the Hawks!</p>	<p>SET # W-4 REPUBLIC P-47D The wonderful Thunderbolt SPITFIRE 2 Battle of Britain hero MESSERSCHMITT Me-109J WW-2 German fighter CURTISS P-40D American WW-2 Warbird</p>
<p>SET # W-5 BRUNNMAN FGF-3 Navy's shipboard fighter DOUGLAS C-54 Air Force transport DOUGLAS A-26 Invader—now B-26 BOEING B-17 The Flying Fortress CONSOLIDATED B-24 Liberator—a heavy! CURTISS A-25 Navy divebomber</p>	<p>SET # W-6 CONSOLIDATED PBY That Catalina! NORTHROP P-61 Black Widow! BOEING B-29 Famed Superfortress BOEING C-97 Military transport MARTIN B-26 Medium bomber</p>	<p>SET # W-7 ALBATROS D-1 ALBATROS D-2 ALBATROS D-3 ALBATROS D-4 ALBATROS D-5 ALBATROS D-6 World War I German Air Force made wide use of these fighters.</p>	<p>SET # W-8 WACO D-6, C-6 Favorites in '30's LOCKHEED HUOSON For England WW 2 BRUNNMAN F3F-1, 2 Carrier biplane! BELL AIRACOMET First U.S. jet.</p>

EACH SET \$1.00— ALL EIGHT \$7.00 **NO STAMPS PLEASE**

Set # W-1 Set # W-5 Name _____

Set # W-2 Set # W-6 _____

Set # W-3 Set # W-7 Address _____

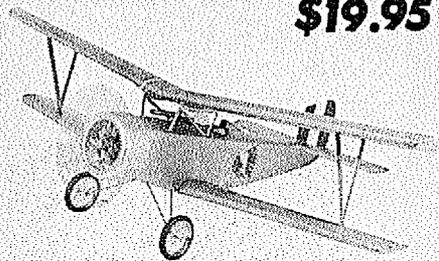
Set # W-4 Set # W-8 _____

Enclosed \$7.00 for all eight sets. City _____ State _____

ATR AGE INC • 551 FIFTH AVENUE • NEW YORK 10017, N. Y.

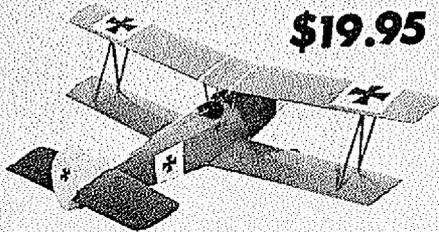
NIEUPOORT 17

\$19.95



Fokker D-7

\$19.95



RADIO CONTROLLED

--- Realistic WWI models which can use everything from the simplest single channel up to 5 channel multi. Both kits feature formed plastic cowl, decals, formed wire, hardware, 2 molded foam wings, foam stabilizer, and the most complete plans ever printed by MIDWEST. Wing-span 44", wing area 504 sq. inches, engines .15 to .19.



AIRCRAFT NUMBERS



Pressure Sensitive Mylar

AT LAST YOU CAN BUY SEPARATE NUMBERS --- Only The Numbers You Need - Durable, Fuel proof, Fade proof and EASY TO USE

JUST PEEL OFF THE BACKING AND STICK ON



Midwest Products Co. 400 S. Indiana St. Hobart, Ind. 46342

without a center rib, but the paper is supported by means of a small balsa upright cemented to the boom. The wing rib layout adds strength to the wing by acting as a crooked spar and the fence on the stab TE seems to reduce stall tendencies at the start. The extra wing offset was added for the same reason." Indoor pros will note the use of a double prop bearing, an offset wing post (which allows the left wing to flex up at the LE on launch under full winds, avoiding fatal tip washout) and stab tilt. This allows variable torque control without a lot of built-in wing washin, which ruins performance potential. Jim flew his super EZB at a recent St. Louis Indoor Meet run by the McDonnell-Douglas FF Club. His outstanding performance resulted in what may be a new Category I Easy B Record: a fabulous 12;48. That's a long time to flap around under a 32 foot ceiling, friends. If you want to improve the performance of your EZB, try some of the Richmond Recipe.

TWIGGY- AN EMACIATED TOW-LINER

Mike Gaze is an expatriate Limey so he hit a nostalgic twang when he named his stringbean A/1 after the famous British export. He has built three of the things, losing first two at meets. The plans show all current mods, as they say. Geodetic ribs make for rigid antiwarp surfaces. The stab ribs are merely rectangular blanks sanded to shape after assembly. The body is a 1/2 inch square box. What could be simpler? Add nose ballast to get it up to 5 1/2 ounces and set the pylon on so CG is 50 to 55%. Then trim off excess nose and add a hardwood noseblock. Be sure to use tip washout and adjustable towhook. Otherwise, the ship is "rahly quite straightforward, old bean." Try one yourself, and cover it with Mod tissue.

GET THE GOOD STUFF FROM VIC

Chubby Vic Cunningham has opened an emporium of free flight goodies that is worth your investigation. You can now obtain all your flying needs from one mail order source. However, all sales are restricted to outside California destinations. They have a complete lineup of materials, kits, gadgetry and hard-to-find items. They feature Vic's "Geodetic Galaxie" 1/2A kit (mentioned earlier in VTO) and they also sell some of the fine quality balsa as found in the kit. All this balsa is 7 lbs./cu. ft. or less, and that stuff is hard to come by these days. Come by your supply by sending for an order list. Just drop a line to: Hobby Specialties, P.O. Box 474, Charter Oak, Calif. 91722. Get a line now on the good stuff.

"Dear Editor,
The purpose of this letter is to request space for an article in your publication, regarding the 1968 F.A.I. Indoor Team. I think all modelers should be interested in knowing their team. If space is available, following is a resumé on the team.

"Clarence Mather: Age 47, junior college and high school Physics teacher. Modeling interests include all types of free flight models but especially indoor scale, indoor, and wakefield. World War 2 pilot, he is currently testing new models but has not finalized a design for the world champs.

"Al Rohrbaugh: Age 47, mechanical engineer. Modeling interests in all types of free flight including 10 channel radio control model. Stout trophy winner at 1966 Nat's. Presently he holds category II open B cabin record. He has concentrated on indoor the last three years after approximately a 10-year lay off, and is using the same model design as flown in the semi-finals with the exception of a longer moment arm and rearward C.G.

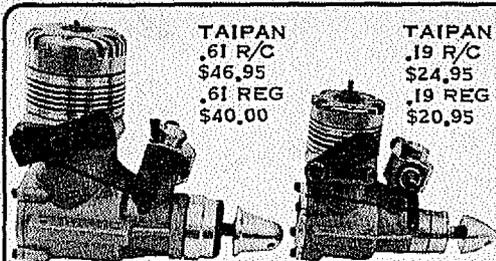
"Jim Richmond: Age 40, manager of the Tinning Division of Sunbeam Corporation. A builder of all types of models, he started building models at the age of 5. Used to fly U-Control stunt and speed, won first place in Jet Speed at 1949 Plymouth Internationals. Started building indoor models six years ago and is presently the holder of the F.A.I. 65 cm Indoor record. He will be using the same type of models that he flew in the semi-finals.

"Bud Romak: Age 39, self employed. Has built and flown all types of free flight models for 25 years, indoor models for 6 years. Was a 1966 indoor team member, and is participating as team manager for 1968 world champs.

Sincerely, Bud Romak WEST COAST FF CHAMPS- THE REALLY BIG SHEW

Chuck Broadhurst of the very active Capital Condors has just sent us a rundown on the recent WCFFC that resulted in what may be three new records (those California guys hog all the good air!) set by Mike Taibi (a Junior) in Unlimited Rubber (14:12), Walt Ghio, also Unlimited (27:40) and Pierre Brun, SCAT's answer to DeGaulle. Pierre pulled his A/2 to a 16:40 under the brand new seven flight rules. Here's the action as Chuck saw it:

"The SCAT Club . . . The SHOC Club . . . The Max Men . . . The Sky Kings . . . The San Francisco Vultures . . . The Oakland Cloud Dusters . . . The "900" Club of San Jose . . . The Stockton and Fresno Gas Model Clubs . . . The Capitol Condors of Sacramento . . . You name it! Just about every great California model club had its free-flighters on tap at the West Coast Free Flight Championships March 9-10, 1968 at Kerman, California. The big two-



TAIPAN
.61 R/C
\$46.95
.61 REG
\$40.00

TAIPAN
.19 R/C
\$24.95
.19 REG
\$20.95

• ULTRA HIGH PRECISION •
MADE IN AUSTRALIA

WRITE FOR LITERATURE AND NAME
OF NEAREST DEALER TO YOU,
DEALER INQUIRIES INVITED.

• P.O. BOX 863 • WOODLAND HILLS • CALIFORNIA 91364 •

1968 TAIPAN .61 R/C NOW AVAILABLE

- TWIN BALL BEARING
- EXTREMELY SMOOTH
- SPEED • POWER
- AND RELIABILITY

ALSO AVAILABLE
TAIPAN .09 GLO \$9.98
TAIPAN 1.5 DIESEL \$10.95
TAIPAN 2.5 DIESEL \$12.95
ACCESSORIES TOO

EXCLUSIVE U.S.
IMPORTER/DISTRIBUTOR
JERRY JOHNSON
- THE MOTOR MAN -

VTO

(Continued from page 55)

day meet started as a nightmare with 20 to 30 mph winds but ended as a pleasant dream for more than 100 modelers and their families when the weather turned almost ideal. Ocie Randall, venerable "patron saint" of the Fresno Gas Model Club, allowed as how he'd "never seen a turnout like it in the Fresno area before." That's a pretty nice compliment because Ocie (who turned 67 the day after the contest) has just about "seen 'em all" over the past thirty years.

Even though the birds were walking all day Saturday, a brave little band of FAI Power fliers led by Bob Van Nest of Sunland, California started the action. Bob put that new ship of his (sporting the hot K & B rear rotor .15 special engine) way, way up in the sky. At day's end, the host Condors and Dusters counted over seventy entries in five events. Three minute maxes and ten second engine runs were used both days. Sunday began with the threat of more high winds. But they began to let up about 10:30 a.m. and by noon CD Bob Cherny was busier than a one arm paper-hanger! 195 entries were recorded during the two days.

One of the very nicest things that could have happened during the two days took place Saturday night in Fresno. There, a special surprise banquet was held for the purpose of honoring Hazel and Ocie Randall. Modelers kept coming and coming until 93 were present! Jerry Gard, Secretary of the Fresno Exchange Club (which has sponsored the Fresno Gas Model Club for more than 25 years) presented Ocie with a handsome plaque and a resolution in recognition of his long record of service to modelers. A second beautiful plaque was presented also, and bore the inscription:

OCIE AND HAZEL RANDALL

In Appreciation of More Than Half-a-Century of Devoted Service to
Aeromodelling

Capital Condors Oakland Cloud Dusters It was a gala evening. The fact that Ocie and Hazel were to celebrate their 35th wedding anniversary in just another day or two, was one more reason for the banquet. It was a memorable event!

Prizewise, Jet Trego walked off with the Junior High Time trophy, posting 14:41. Marty Thompson's 41:26 took the Junior Sweepstakes award while Bill Hunter won Senior Sweepstakes (18:44) and Senior High Time (9:04). Open Sweepstakes winner Bill Hartill's 43:16 time was good for one K & B .40 rear rotor engine."

HOW TO FOLD A PROP PROPERLY

Bob Meuser of Oakland, Calif. proves he knows how to fold more than paper airplanes with this gem of advice (see diagram) on rubber model props:

"Finding the correct hinge angle that will make prop blades fold flat against the sides of the fuselage is a tedious, time consuming, and often frustrating experience if either trial-and-error or drafting layout procedures are used. If the hub is to be horizontal when the blades are folded, the process is even worse. Here is a disgustingly simple way to find the hinge angles. Find the blade angle, measured from the plane of rotation in the usual way, at a point about 85% of the distance from the shaft to the tip. Divide that angle by two. Set both hinge angles, A and B in the drawing, at that angle. That's all there is to it! Look Ma, no trig!

"If the hinge lines are straight across the hub, the blades won't fold flat unless you have a very deep old-fashioned fuselage. Canting the hinge lines slightly in one direction only, but keeping them in the plane of rotation, will produce a flat fold

WORLD WAR II FIGHTING PLANES TECH MANUALS

MOST COMPLETE PLANS,
DATA AND
PHOTOS

• F-94 STARFIRE



AIR AGE INC.
551 Fifth Ave., New York, N. Y. 10017

Herewith \$..... for copies F94

Name _____

Address _____

City _____ State _____

FAST SERVICE ON ALL STOCK ITEMS

- ZAIC YEAR BOOK 1935-36..... \$1.50
- ZAIC YEAR BOOK 1937..... 2.50
- ZAIC YEAR BOOK 1938..... 3.00
- ZAIC "MODEL GLIDER DESIGN"..... 3.00
- HOFFMAN "MODEL AERONAUTICS
MADE PAINLESS"..... 2.00
- LAZOTT TANGO BIPE (F.O.B.)..... 49.95
- PROCTOR "ANTIC" R/C KIT..... 49.50
- SUPER "MONOKOTE"..... Ft. 1.25
- MINIATURE OPERATING
TURNBUCKLES..... Ea. .35
- SMALL PHILLIPS SCREWDRIVER..... .35
- STERLING LARGE "FOKKER D-7"..... 39.95
- SUPER TIGRE G 15..... 17.98
- DU BRO KWIK LINK CLEVICES..... 2/ .75
- 1/2A R/C FOAM WING
REG. 3.95..... NOW 2.19
- BADGER AIR BRUSH..... 5.98
- 1" GOOD DOPE BRUSH..... 1.45
- 2" 3 BLADE NYLON SPINNER..... .75
- 22" x 4" WOOD PROP..... 1.80
- 24" x 4" WOOD PROP..... 2.50
- WHITE SILRON..... Yd. .98
- DUMAS PT-109 KIT..... 19.95
- DOPE PLASTICIZER (2 Oz.)..... .50
- "GEODETIC GALAZIE" FF KIT..... 4.95

Send 25¢ for orders under \$5.00

Include \$2.00 Deposit on C.O.D. Orders

Stanton Hobby Shop Inc.

4734 North Milwaukee Avenue
Chicago, Illinois 60630
Telephone 545-8185 area code 312

BACK ISSUES OF MODEL AIRPLANE NEWS

- 1952 August, September and Decem-
ber \$1.00 each
- 1953 March, April, May, June, July,
September, October, November and
December \$1.00 each
- 1954 January, February, April, May, June,
August, September, October and Novem-
ber \$1.00 each
- 1958 June, August \$.50 each
- 1959 All \$.50 each
- 1960 All except December June July \$.50 each
- 1961 January, March, July, August and October
\$.50 each
- 1962 December \$.50 each
- 1963 June, August
November and December \$.50 each
- 1964 January, March, May, June, July, August,
November and December \$.50 each
- 1965 All except February October and
November \$.50 each
- 1966 All except January and February
September \$.50 each
- 1967 All except January and February
July, \$.50 each

MODEL AIRPLANE NEWS
551 5th AVE. • NEW YORK, N.Y. 10017

MODEL AIRPLANE NEWS PRESENTS

FULL SIZE BLUEPRINT PLANS—CONTACT PRINTED FROM THE ORIGINAL PLANS

#4 REARWIN SPEEDSTER

Massive master full size plan (blueprint from original) includes every template necessary to jig-build this exciting master scale model of the Sport Plane that was years ahead of its time. Winner many times in Scale events on the West Coast, the Rearwin can win that important contest for you. 42" x 70" plan set only \$3.00 pp, outside USA, add 50¢.

#5 ROBIN

Jump on the BANDWAGON with the latest of the small multi ships that is not only a beauty but is a Winner in pattern. Bob Dunham and Mac Beauchamp started the trend to the small, high powered, multi ship that can fly under any conditions; wind means nothing, actually it helps. Dunham's 56" span machine with any of the sixties will move you right into the winners. 32" x 56" blueprint plans are the buy of the year at only \$3.00. Be among the first in your club with the latest. Send for your plans right now.

#6 LPL VERTIGO

Realistic F-86 Sabre-type multi machine that continues to present trend to smaller multi planes for all-weather flying and improved performance. Sixty-powered. It can perform with the best and with your help can move you into the winner's circle. Complete blueprint plans on two sheets, one 30" x 60", the other 30" x 46" gives all details necessary for building. An excellent buy at only \$3.

AIR AGE INC.—551 5th Ave., N. Y., N. Y. 10017

but the hub will end up at quite a large angle to the horizontal. Canting the hinge axes in two directions, according to recipe presented above, will give a horizontal hub position. The hub can then be shorter, the streamlining is improved, and it looks a lot neater. A fringe benefit is that gravity doesn't tend to either open or close the blades. They can be free floating and don't give a forward-rudder effect."

All-American Eagle

(Continued from page 12)

continue to apply the maximum effort merely to satisfy my ego which requires me to strive for greater results on each successive project. I, personally, can't see stunt regressing into clear, Jap tissue-covered Nobblers of little distinction.

Back in 1960, when I first began actively competing in precision aerobatics, being beat was the rule rather than the exception. However, the early experience inspired me to build better models, paying particular attention to alignment, lightness, and finish.

After all, let's face it, control-line stunt is not something which can be mastered in one season. For proficiency, the individual must concentrate on practice flying as well as the building phase of the event. Basic aeromodeling experience is the key factor for successful participation. This experience factor is probably the reason for the poor Junior-Senior entry at this past year's California Nationals while the open category remained fairly strong.

The servo mechanism is mounted close to the center of gravity. This prevents the either extremity of the lever arm (nose and tail moment) from becoming too heavy, thus reducing inertia moments.

Notice the servo access hatch details on the drawing and photographs. This relatively "blind" door exposes not only the servo, but also the closed circuit jack, push rods, wire conductors, and fuel tank.

Editor's note: Author Gierke's servo mechanism of his design is a story in itself and will be published with complete construction details in our August '68 issue. Build and finish the plane at which time the August issue will then be available.

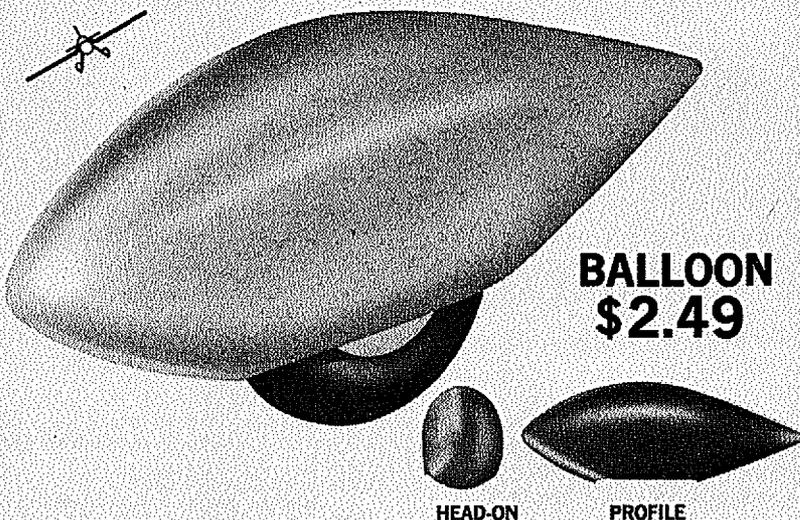
Pay special attention to the fuel tank location (vertical), the O.S. MAX RC .35 has a spray bar location which is 7/16" lower (inverted cylinder) than the conventional MAX without a carburetor. In suction feed stunt flying, it is desirable to locate the center of mass (fuel) directly through the spray bar of the engine in order to maintain an equal run both up-right and inverted.

The anhedral stab and elevator with its fuselage fairings may cause some grief if not started correctly. Otherwise the procedure is quite simple. Briefly:

1. Align and glue stab and elevator to the fuselage sides.
2. Install all push rods.
3. Tack glue and shape top fuselage block. Remove, hollow and re-glue permanently.
4. Cut stab elevator fairing from proper thickness balsa sheet directly from the fuselage side view.
5. Split (knife) from the leading edge to the trailing edge, directly through the center.
6. Fit individually the upper and lower halves on each side of the fuselage.
7. Tack glue, shape, sand, and remove for hollowing. Re-glue permanently.
8. Cut, shape and install rudder permanently to the top fuselage block.
9. After the model has been covered and clear-doped, apply plastic balsa (Aero Gloss) fillets to the fairings and rudder as well as the wing (see drawings).

OUTFIT YOUR FAVORITE PLANE WITH NEW, MODERN

WHEEL PANTS



BALLOON
\$2.49

Achieve that "WELL GROOMED LOOK"

These smart, stylish looking wheel pants on your favorite plane will elicit the "ohs" and "ahs" of all who see them! You will marvel at their lightness! Injection molded of durable styrene they never lose that new look.

Featured above is the Balloon Pants. 7" long. Houses 2½" x 1" balloon wheel.



HEAD-ON **PROFILE**
CONTOUR **\$2.49**

The Contour Pants shown above is 7" long and houses 2½" x 5/8" wheel.

COSMIC WIND (not illustrated)
10" long. Houses up to 3¼" x 3/8" wheel **\$3.10**



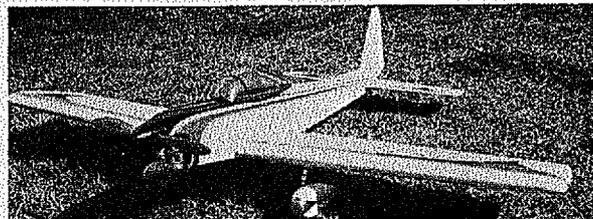
6719 SALT LAKE, BELL, CALIF. 90201

WILLIAMS
BROS.

"Mini Monk"

\$49.95

PRE-ASSEMBLED



All balsa construction. Foam wing 1/16 balsa covered. Jig built. Wing span 50 inches with an area of 450 square inches. All control surfaces hinged and wing halves joined. Ready for your particular finish.

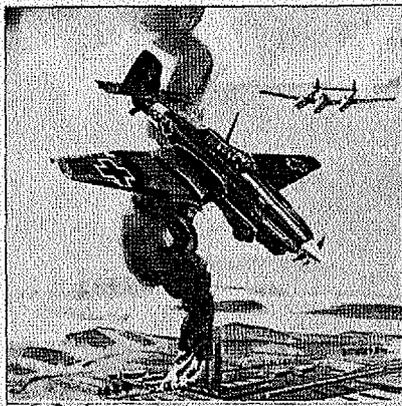
Includes prebent landing gear, canopy, wheel pants and a pair of nylon push rods and keepers for hooking up rudders and elevator.

Midwest Model Manufacturers

4046 BOOTHILL DRIVE

SALT LAKE CITY, UTAH 84120

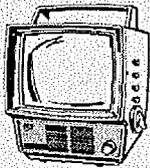
FREE!



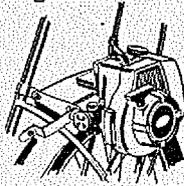
This full-color giant 30" x 50" Mod Poster (ret. val. \$1.50) is available FREE at any COX dealer to the first 24 who apply for one! Stop by where you see it displayed and ask for details on how you can

WIN FASCINATING ADDED PRIZES

Your Personal Portable Sony TV



Fabulous COX Bronco Bicycle Engine.



Exciting New Polaroid



Big Swinger Camera



PICK UP a COX Sweepstakes entry blank at your dealer. Follow instructions. Send as many entries as you wish. Sweepstakes subject to all local, state, and federal laws & void where not allowed.

L. M. COX MANUFACTURING CO., INC.
COX CENTER SANTA ANA, CALIF. 92702

The wing could also cause major distress if performed inadequately or incorrectly. Briefly:

The wing construction is similar to that of a conventional I-Beam. The fuselage and wing are built as an integral unit with the wing being jugged.

The wing is built upside down using wooden blocks under the leading and trailing edges. The difference between the top of the leading edge and the fuselage sides top is the dimension used for the above-mentioned blocks.

Leading edges, trailing edges, and wing spar are slid through the fuselage sides and not cemented in place.

All wing ribs are now positioned by pinning the leading and trailing edges in place. Tack glue ribs to the leading and trailing edges but not to the spar. The spar should remain to "float" until later. Check all alignments of fuselage, wing and spar. Epoxy leading edges, trailing edges, and main wing spar into fuselage center section. Glue ribs to main wing spar. Add half ribs. Allow the epoxy to cure before removing from jig.

Other construction particulars used on the "All American Eagle" are:

1. Fiberglass molded cowl.
2. Acetate Butyrate formed and tinted canopy.
3. Firewall mounted nose gear (removable).
4. Silkspan (light) covered.
5. Aero-glass finish.
6. Machine-polished.

● When finishing, try this for a super bright red pigmented dope:

- 3 Parts Aero Gloss Stearman Red
- 1 Part Aero Gloss Cub Orange

● Metallic blue (A.G.) as used on this version.

● Whenever spraying Red, Orange, Yellow pigmented dopes, first spray a light coat of white. This prevents dark grain marks, from bleeding through to the surface.

● Try not to add more than 25% thinner to the dope being sprayed. Excessive thinning causes unwanted penetration into the filler coat which may cause cracking of the finish.

● Allow the completed job at least two weeks for aging before rubbing. The finish must be allowed to complete its shrinkage or flaws will appear at a later date.

The "All-American Eagle" is a challenging and rewarding project for the avid control line flier who uses the systems outlined here and who wants a sleek, stable, easy-handling competition model.

Road and Bench

(Continued from page 32)

of the road shock from getting to the radio equipment.

The chassis may also be purchased finished ready for assembly.

Let's start at the front of the car and install running gear. Plans alone for the front suspension, a kit or a finished unit may be purchased. The kit includes kingpins, threaded swivel axles, and instructions. In addition, sheet brass and regular 3/32 and 1/16 inch music wire are needed.

The finished unit is ready to be fastened to the chassis. The method is simple but it requires resin-curing waiting time. Four sheet metal screws hold the unit in place. Underneath the fiberglass skin, the polyurethane foam is quite soft and will not hold screws. Here, and in other places of attachment, the foam is gouged out and the holes filled with fiberglass resin. Once these inserts are cured, undersize holes may be drilled to accept the self-

threading, hold-down screws.

Power for the RaCars, as specified by R.O.A.R. Association, shall not exceed .19 cubic inch displacement. Feeling the weight of a finished car, you would think this not enough, but the truth is, with the rpm's available, and the variable gear ratios you can use, a .19 is all you can handle. Straightaway speed is one thing, but the purpose of these cars, as with any road race car, is to negotiate a closed course in the least amount of time. All out top speed is of minor importance. One soon finds out that a .19 is a handful. Spin outs and missed turns are a usual part of the game. Of course, full size car enthusiasts have their dragsters, so there's no telling. Can't you see a "rail" car with big fat slicks in the rear, a .60 sitting right back there with the transaxle, Ernie Boling wire wheels shoved about two feet ahead of the rear axles, and a chute that pops out once the "thing" has crossed the finish line 165 feet (scale 1/4 mile) away?!

OK, back to earth. RaCar will furnish a K & B or McCoy .19 R/C engine with a cooling modification consisting of a large 1/16 inch thick aluminum fin. The head requires slight modification to accept the fin if you make one yourself but RaCar also has a bolt-on conversion kit for either engine.

The clutch and flywheel assembly is available and consists of a knurled brass flywheel upon which is mounted two spring loaded and lined flyweights. A special flywheel retainer nut also carries a ball bearing, which in turn guides the clutch bell. The turned brass bell includes a shrink fitted 1/8 inch music wire drive shaft.

It is important to note that the engine *must not be* run with the clutch parts attached to the flywheel unless the bell housing is mounted. The clutch is present to engage at about 3,000 rpm. Without the bell in place, the clutch weights would suddenly become dangerous flying missiles.

The transmission/rear end assembly, or transaxle, is the real heart of the whole situation. The bottom half of a Split, cast alloy case carries the input shaft upon which are mounted two spur gears. The transfer shaft is machined from square stock and carries two more floating spur gears on rounded portions. These engage the gears on the input shaft. Between the two transfer gears, mounted on a square portion of the transfer shaft, is a slider with steel pins 180 degrees apart. As the slider moves along the shaft, the pins slip into holes in one or the other transfer gear, thus locking that gear to the shaft and making it turn when the input shaft is turning. When halfway between, or disengaged, the transmission is in neutral. At the front end of the gear case, the output axle passes through bronze bearings and connects to the transfer axle through a set of heavy duty Boston bevel gears. Overall ratios supplied as standard are 5:1 and 7:1. Others are available.

If you've stayed with me through the above gibberish, you're probably wondering just how long the transfer gears could last with the pins on the slider popping into place at 3,000 rpm or more. Suffice it to say that Norb Meyer's car No. 6, pictured here, is using the same set of gears after more than a year of hard running. Oh, yes, you fill the gear case with an 1/8 inch of No. 20 engine oil before each day of racing and flush it out when you're through. If you keep your eyes shut while flushing, you won't even notice the powder-like specks of brass that wash out with the old oil!

There are different ways of transferring motion from the output axle to the rear
(Continued on page 62)



BONITRON Super Sport

Designed for versatility and reliability combines a receiver of unparalleled sensitivity and selectivity with a transmitter which matches all pulse systems.

Fast Pulse Dual Actuator
Galloping Ghost
Escapement

All may be flown reliably with the Super Sport as received from the manufacturer. Price for Transmitter and Receiver \$89.50.

No Modification Required

**NOW AVAILABLE DIRECT
FROM MANUFACTURER**

Write or Call

SALES DIVISION, BONITRON, INC.
633 Thompson Lane, Nashville, Tennessee 37204
Phone 615-256-3692

to steering, throttle, and transmission control, has been tried by experimenters. So far, however, the braking supplied by down shifting and allowing engine compression to retard the car's velocity has been sufficient. It is suggested that double-sided foam tape be used to mount servos and receiver. Battery pack, because of its weight, should be strapped down securely.

Total movement of the shift slider is only 1/4 inch, therefore some arrangement must be made to limit servo travel without binding, or an override must be provided.

Speaking of override, a device should also be installed on the throttle linkage so that hand "blipping" of the throttle may be accomplished, particularly while starting the engine. Incidentally, the engine is started by rotating the knurled flywheel. Cranking the rear wheel of an inverted bicycle and holding the flywheel against it is one popular method.

A little more exotic system is to build a starter, using a sturdy electric motor which may be run off the family car battery. Mounted in a wooden box, a rubber tire wheel of about 4 inch diameter is put on the output shaft and will provide plenty of power to kick the engine over.

Wheels may be purchased as finished or unfinished castings for hobbyists with machine tool facilities. Machined wheels are lightened for minimum unsprung weight, have polished rims, and are ready to install. Tires are molded from low hysteresis butyl rubber and are oil and fuel proof. Rear wheels and tires are wider and of larger diameter.

Finally we come to the body. Outside of the scale appearance that it adds to the car, the body's only other function is to help keep dirt out of the radio equipment. It is also probable that this is the area where the most variety and improvisation will occur. Everyone has their favorite car and if you can't afford the real thing, race it in miniature!

RaCar markets a molded, clear Lexan body in two parts that can be modified very simply into either an "Indy" or Grand Prix formula car. The Lexan is tough material and will take lots of knocks. Mounting is by epoxying brackets into the chassis to which the body is bolted. The rear portion can be fitted in such a manner that it will snap into place once the engine is started and needle valve adjusted.

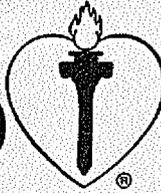
Another unique advantage of the clear Lexan is that it can be painted on the inside with fuel proof paints, sprayed or brushed on after washing with detergent soap. Stripes, numbers, and trim can be added to the outside using decals, painted tape, or original, sticky Monokote.

It also should be noted that Monogram markets an 1/8 scale Sting Ray. Even the wheel base is the ROAR specified 12 inches long! Although the plastic isn't as tough as Lexan or fiberglass, it could probably be reinforced to take more of a beating than the way it comes out of the box.

In summary, these are not bolt-it-together-in-two-evenings kits. The basic, usually unattainable needs are there. You must provide the remaining materials, labor, and ingenuity. The total price of a RaCar, if you buy all the parts as completed sub-assemblies, comes to around \$170. Expensive, yes, but only relatively speaking. Its life span should be considerably longer than that of the average multi R/C model. If you buy only the basic machined parts and do a lot of the work that any modeler should be able to handle with basic tools, you can get off for considerably less, possibly under \$100.

The cars, like planes, once built, are not finished. Though many modelers fly

GIVE...so more will live HEART FUND



Contributed by the Publisher

ROCKETS

FLY INTO THE EXCITING WORLD OF
SPACE SCIENCE & MODEL ROCKETRY:

Laser X

- SINGLE STAGE ROCKET (22" LONG)
- HIGH FLIGHTS OVER 1000 FT
- AUTOMATIC PARACHUTE RECOVERY
- SAFETY-APPROVED ENGINES

SPECIAL OFFER

INCLUDES: LASER X; 2
ENGINES; INSTRUCTIONS
PLUS FREE CATALOG

Only \$3.50
KIT #K-50

REAL FLYING MODELS

COMPLETE OUTFIT

INCLUDES: LASER X;
2 ENGINES; LAUNCHER PAD;
ELECTRIC IGNITION DEVICE;
INSTRUCTIONS... PLUS FREE
CATALOG AND SPECIAL BONUS GIFT

Only \$8.50
KIT #SK-500

FLY WITH CENTURI. A COMPLETE LINE OF
ROCKETRY SUPPLIES & EQUIPMENT FOR
THE MODEL ROCKETEER AND SCIENTIST

FREE COPY OF AMERICAN
ROCKETEER MAGAZINE
WITH ORDER OF
K-50 & SK-500

SEND 25¢ FOR THE MODEL ROCKETEER ILLUSTRATED
CATALOG SHOWING OVER 35 FLYING MODELS
(WHEN NOT ORDERING KITS.)

Centuri ENGINEERING CO.
ROCKET DIVISION K P.O. BOX 1988
PHOENIX, ARIZ. 85001

Road & Bench

(Continued from page 60)

wheels. The simplest is direct, with one U-joint; however, it is unsprung and very stiff, transmitting all surface shock to the car and providing rather poor traction. On the other end of the scale is RaCar's independent suspension using cast hub hangers, a pair of helicoid couplings for constant drive, and torsion bars similar to the front end. This whole set-up may be purchased complete, ready to bolt on the transmission, or hub hangers and helical couplers are available separately.

The whole drive assembly, engine, flywheel, clutch, transmission, rear suspension, and axles are mounted on the two legs of the surfboard chassis. For additional strength, 1/4 inch hard aluminum or brass angle is bolted in place with the engine and transmission mounting. These mounting bolts will go all the way through the chassis, so brass spacer tubes should be resined into the foam to prevent crushing the chassis. The use of Lock-Tite on all of these bolts is highly recommended.

In order to keep exhaust residue out of the car as much as possible, some sort of stack should be fitted. Considering that most cars will be run in closer proximity to the sensitive-eared public, it would be a good idea to try to get as much engine muffling as possible along with the exhaust control. We fitted a Tatone "Peace Pipe" to the K & B .19 and will add a short length of tubing to carry the exhaust gook a little farther back.

Radio requirement for the RaCar is three proportional channels. Considering the close proximity of components plus the unavoidable metal to metal contacts, the receiver must be particularly tolerant of noise problems. Use of brakes, in addition

Citizen-Ship

LIGHTER • SMALLER • SIMPLER • STRONGER

4 Channel Digital Proportional System



Adding to: CITIZEN-SHIP'S field-tested proven Digital Techniques.

Adding to: The OLDEST, MOST DEPENDABLE, MOST COMPLETE line of Radio Control.

INCLUDING
DMS MINIATURE MOLDED SERVO

The Hottest Items at the 1968 Radio Control Shows

DP-4 FOUR CHANNEL DIGITAL SYSTEM

(including Transmitter with AER or AMR stick arrangement, Receiver, 4 DMS Servos, Shorting Harness, Nicad Packs for Transmitter and for Airborne equipment, and Charger built into transmitter for ALL batteries).

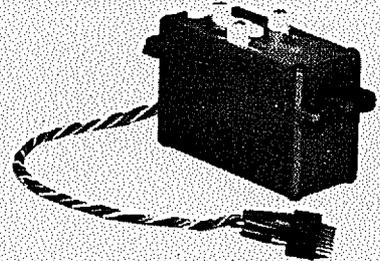
With: A small, single-deck Digital Receiver.

With: FIRST Servo in industry utilizing integrated Circuits PLUS

Receiver designed with integrated circuits.

With: Servo case and gears molded from nylon for EXTRA STRENGTH and PRECISION FIT.

With: ALL of CITIZEN-SHIP'S ahead-of-the-pack features in design and circuitry.



On 27 MHz.....\$374.95
(26.995, 27.045, 27.095, 27.145, 27.195 and 27.255)

On 72 MHz.....\$399.95
(72.080, 72.240, 72.400 and 75.640)

DMS Servo Purchased Separately \$39.95

WRITE FOR CATALOG SHEETS TODAY

Citizen-Ship RADIO CORPORATION

810 EAST 64TH ST. • INDIANAPOLIS, INDIANA 46220

planes, and will run cars, that are not properly trimmed and adjusted, apparently unaware of the real potential, this is still a part of the game for the more exacting modeler.

The car will need camber, steering, clutch, transmission, and suspension adjustments in order to run properly just as a plane needs balance, thrust and incidence adjustment to fly properly. Otherwise identical vehicles will be as different as day and night in performance, based on these adjustments.

There is no doubt that in the near future, more complete, more exotic, and more expensive components and completed cars will be available. In the meantime, however, RaCar has made it possible for the average R/C modeler to get his feet wet in a fascinating sport.

NOTE: Parts for the car shown in the accompanying pictures did not arrive in time to complete construction before finishing the article. Next month we will report on the final results.

Coupe d'Hiver 1968

(Continued from page 14)

entries of which most recorded scores. 175th position was 50 seconds and there were plenty more. It should be remembered that multiple entries at the rate of one per model are permitted. The organizers seemed to have no difficulty in handling this entry, despite flying the event in rounds. First flights had to be made between 10:00 A.M. and Noon, then there was a 1½ hour break for lunch, and finally two more 1½ hour rounds.

Matters were speeded up by a virtually complete absence of processing. "Spot checks" were threatened, but not witnessed. To discourage indefinite waiting (for lift) with the supplied timekeepers,

there was a 10 minute time limit in which to fly. This was little hardship since few entrants seemed to be making real efforts to detect lift, even though there were periods of relative calm and warmth (less cold might be a better description!) The resultant thermals were small and weak but gave flights in the region of 2½ minutes or a little more. Most well-known French competitors increased their chances by having several models, and hence entries.

In these conditions scores seemed surprisingly high. There were only a few maxs in the first round, about three or four "doubles", but only one perfect score. Winner was Jacques Griveau, just twelve seconds in front of Jean-Pierre Challine. Third place went to the lone Italian competitor, Roberto Giolitto, who had six models and who broke four motors in succession at one point. Subsequent scores followed only one or two seconds apart. The British contingent did not have an over-successful time with either their own or the American models—best of the proxy flown models being Tom Medley's at 49th—better than Henry Tubb's own models. It was noticeable that the tissue on Tom's model was very slack. Perhaps butyrate dope doesn't like zero temperature!

The compilation of results and distribution of prizes was a long and drawn out affair especially since the latter went down to about 70th or so. Top awards were trophies, plaques, and engines (and well worth winning) but even lowly places secured a souvenir prize to help compensate for a real Coupe d'Hiver.

Engine Review

(Continued from page 20)

TV. Over the years, the basic design and construction of these engines has not altered much, but there has been steady development, including the adoption of a

larger diameter crankshaft, modified port areas and timing, bigger volume bypass passage, an improved throttle, plus various minor refinements. The optional radial mount, however, is no longer featured in the latest version.

Currently, the Enya model engine range is just about the world's biggest. Counting throttle-equipped R/C versions and water-cooled marine models, the Enya Metal Products Company Ltd. lists no less than 49 different models for 1968. Not all these are exported. Mainly for the Japanese home market, Enya also make several small glow engines from .049 cu. in. upwards, plus three basic diesel models. Some of these are totally different in design and appearance from the MRC-Enya engines with which we are all now familiar. They do not, for example, have the detachable front housing or drop-in cylinder liner used by the other Enyas. Instead, they feature unit crankcase/main bearing castings to which separate cylinder assemblies are attached.

One of the advantages of a detachable front end on a shaft valve engine (a feature not too common these days) is that, in most cases, this can be employed to convert the engine to opposite rotation, such as for a pusher installation or when it may be desirable to use a "handed pair" of engines in a twin motor installation. To do this, simply remove the four screws holding the front housing flange to the crankcase, rotate the complete unit through 90 degrees so that the carburetor is on the right hand side of the engine and reinsert the screws. Where (as in the case of the 19-IV) the intake timing is 45 deg. ABDC to 45 deg. ATDC, the new intake port position will now give exactly correct timing for opposite rotation.

We know of several cases where this has been used to good effect in pusher

WHITE HEAT X

SINGLE STEP R/C RACING HYDRO

FIRST F-2 CLASS HYDRO TO OFFICIALLY RUN THE IMPBA 1/4 MILE IN LESS THAN 40 SECONDS!

*38.7 seconds to be exact! Here is the R/C hydro that truly runs as well as it looks! Designed to run with the new competition-proven O & R Compact III, it's been a real "eyebrow raiser" in regattas from coast to coast. Now, for the first time, offered in a kit that duplicates the all plywood construction of the trophy winning hull. Comes complete with full-size plan, step-by-step instructions and precision cut plywood parts.

Engine, motor mount, stuffing box, exhaust system, universal, drive shaft, propeller, etc. also available from this ONE source—

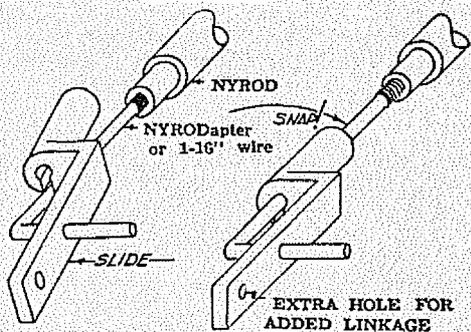
OCTURA MODELS

If your dealer cannot supply you—send stamped self-addressed envelope for literature and prices.
8148 MILWAUKEE AVE. • NILES, ILL. 60648



SPECIFICATIONS
Length 42" Beam 16"
\$29.95 (minus engine & fittings)
PLUS \$2.50 POSTAGE & HANDLING

THE "IN" KEEPER



Su-Pr-Keeper

Also at
Your
Dealers
NOW!
Su-Pr-Klevis



34 Copper Drive Plainfield, Illinois 60544

Spin Up a BIG WIN

WITH A **Tornado** PROPELLER

More forward travel per rev when you fly the finest! Try **TORNADO** propeller of consistent high quality. Feel its ultra smooth finish. . . . examine the airfoil section perfectly engineered with true pitch.

Delivers more POWER from your ENGINE.

2 Blade Pusher	2 Blade Tractor
5-3 5-4 5-5 3	5-3 5-4 5-5 3
5-1/2-4 6-3 6-4 25¢	9-4 9-6 9-7 9-8
7-4 7-6 7-8 40¢	10-4 10-6 85¢
8-4 8-6 8-8 60¢	11-4 11-6 11-8 \$1
	12-5 12-6 \$1.50
3 Blade Tractor	
5-3 5-4 30¢	
6-3 6-4 30¢	
3 Blade Pusher	
6-3 50¢	

3-BLADE NYLON
Metallic Aluminum Color

GRISH BROS.
ST. JOHN 1, IND.

installations. No modifications are strictly necessary. Because the 19 is not a ball-bearing engine, thrust will now be taken by the prop driver bearing against the end of the front housing but the normal leakage of surplus oil at this point will usually be sufficient to keep the two surfaces lubricated. Both surfaces have a machined finish but can be carefully polished if the user so wishes. For a deluxe job, add a thin steel washer between the two surfaces to reduce wear and limit rearward movement of the shaft.

Contrasting with the majority of current R/C motors, the Enya 19 has a "square" bore and stroke of 16 mm. x 16 mm., which makes it a little taller than most of its competitors in the 19 group. This is particularly noticeable when it is put alongside a compact short stroke motor like the O.S. Max 19 but, although the Enya is slightly heavier than the O.S., its weight of under 6 ounces still makes it one of the lighter R/C 19's presently available.

The Enya main casting, as already remarked, comprises the crankcase and cylinder block. As with other similar Enya engines, the fin edges are machined to make a pleasing contrast with the matt gray casting finish. The unit includes the usual right hand exhaust stack and this has solid ends which can be drilled and tapped to enable the appropriate Enya muffler to be secured with internal fixing screws. Alternatively, the muffler can be simply attached with the steel strap and external screws provided.

The casting is accurately bored for the steel cylinder sleeve which is located by the usual top flange. The flange, 2 mm. deep, sets into a recess in the casting of slightly larger o.d. and, below the flange, the sleeve o.d. is relieved for a further 2 mm. The actual lapped surface of the bore extends only as far as the upper limit of piston travel. Above this, the i.d. of the liner is opened up approximately .004 in. By these small refinements, the risk of the bore contracting or distorting at the top due to overtightening of the head screws is eliminated, while maintaining intimate contact between the major part of the sleeve and casing for maximum heat transference.

The cylinder ports are located for a 128 degree exhaust duration and a 106 degree bypass period. The cast-iron piston is of orthodox design with a flat head and straight baffle. It is coupled to the aluminum connecting-rod by a fully-floating 4 mm. dia. tubular wrist-pin having brass pads. At the lower end, the conrod is bronze bushed. The cylinder head is deeply finned with a cast-in brass bush for the centrally located glowplug. The joint face of the head has a machined surface and this makes metal-to-metal contact with a raised ground rim on the cylinder flange.

The hardened steel crankshaft has a full disk web and a generous crescent counterbalance. Journal diameter is 11 mm. with an 8 mm. gas passage and crankpin diameter is 6 mm. The shaft runs in a bronze bushing cast into the front housing. The housing has the usual integral intake, the circular bore continuing into the bearing aperture where it is uncovered by a rectangular valve port in the shaft journal.

The TV series carburetor is Enya's usual pattern. The body is of machined bar stock, with a ground steel throttle barrel to which a cranked throttle arm is attached with a single screw to allow for linkage adjustment. There are the usual airbleed and idling screws and the needle-valve assembly, complete with fuel inlet tee, is screwed into the opposite side of the body.

In common with all but the most recent Enya R/C engines, no exhaust baffle is fitted to the 19-IV TV. Instead, the user may equip the engine with an Enya muffler. The appropriate muffler for the 19 is the small type which also fits the 15 engine. The power loss with the muffler is negligible on props bigger than about 9x6 and is not excessive (up to 500 rpm) on the smaller sizes (9x5, 9x4, 8x6) allowing revs to approach the peak output.

Our test unit was given a break-in of approximately two hours accumulated running time, prior to test readings being taken. The engine was a little tight at first but improved after about 30 to 40 minutes. Typical prop rpm figures obtained at this point included 9200 rpm on a 10x4 Tornado nylon, 10,300 on a 9x5 Top-Flite wood, 10,400 on a 10x3½ Top-Flite wood, 10,800 on a 9x4 Top-Flite nylon, 11,500 on an 8x6 Top-Flite nylon and 12,100 on an 8x6 Power-Prop wood.

Starting, we have to confess, was not so foolproof as we expected from past experience of numerous Enyas, the 19-IV TV having a certain reluctance to restart hot especially on the smallest size props. Generally, it was not helpful to suck-in (still less to prime through the port) as a preliminary to hot restarting and we found it better to open the needle-valve slightly before restarting and to then close it down when the engine was running again. This gave just that extra bit of fuel to prevent the engine from cutting but without making the starting mixture too rich for a hot restart. Of course, to the average R/C flyer reasonable cold starting characteristics (which the Enya has) are generally more important than quick hot restarts, since the motor usually has time to cool off between flights anyway. In this connection, we found that there was little risk of the Enya cutting out while the needle-valve was being tuned, i.e. it began to slow down if leaned out too far, giving ample time for one to open up the needle again.

As is often the case with R/C engines, the throttle control improved as the engine became broken-in. By carefully adjusting the air-bleed in conjunction with the idling screw, we obtained idling speeds in the 2,500-3000 rpm bracket, with a figure of 2,800 rpm on a 9x4 Top-Flite nylon. A prop of this size would seem to be about right for extracting the maximum performance from this particular engine. Response to mid-range throttle positions was good.

The maximum power output obtained with our 19-IV TV was nearly 0.27 bhp at 12,500 rpm using an Enya No. 3 glow-plug and our standard R/C test fuel containing five percent pure nitromethane. This is quite good and well up to average for a .19 cu.in. R/C motor. Adding the muffler cut output to just over 0.24 bhp at between 11,500 and 12,000 rpm but with a useful degree of muffling and at a slight reduction in fuel consumption.

Summary of Data

Type: Single cylinder two-stroke cycle with crankshaft rotary-valve and plain bushed main bearing. Throttle type carburetor. Optional muffler.

Weight: 5.9 oz. (7.5 oz with muffler).

Displacement: 3.216 c.c.—0.1962 cu.in.

Bore: 16.0 mm. (0.6299 in.)

Stroke: 16.0 mm. (0.6299 in.)

Stroke/Bore Ratio: 1.00 : 1

Specific Output (as tested, less muffler): 1.37 bhp/cu.in.

Power Weight Ratio (as tested, less muffler): 0.73 bhp/lb.

Price: \$14.50 (Muffler \$2.95 extra)

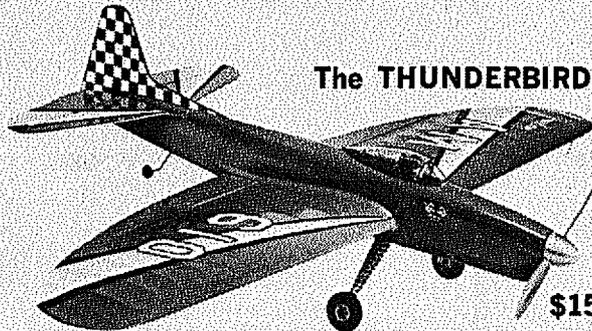
Manufacturer: Enya Metal Products Co. Ltd., Tokyo, Japan.

U.S. Distributor: MRC-Enya Co. Inc., 5300 21st Avenue, Brooklyn, New York 11204.

VECO PLANES

are BACK IN THE AIR!

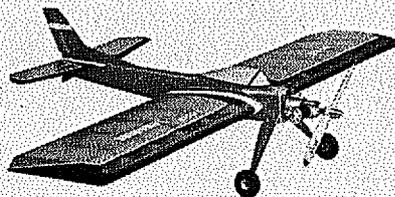
And once again your favorite Veco model is now available. Take your pick from these and many more in the Veco line of kits for the beginner and for the competitor.



The THUNDERBIRD

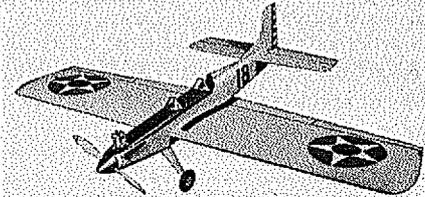
\$15.95

It has won more than its share of national and international contests. Wing span 56", area 610 sq. in. Recommended engine .35 Stunt.



The TOMAHAWK.....\$6.25

Easily built profile plane for combat or learning to fly. Wing span 40", area 338 sq. in. Recommended engines .19 to .35.



The CHIEF.....\$11.95

Super stunt model with world-wide reputation for top performance. Wing span 54", area 595 sq. in. Recommended engine .35.

Easily assembled from Veco's finely engineered plans and die cut contest grade balsa, plywood and hardwood, each plane is perfectly balanced for best flying characteristics. There is a Veco control-line model for stunt, combat, sport or training, in a size for virtually any engine from .049 through .45.

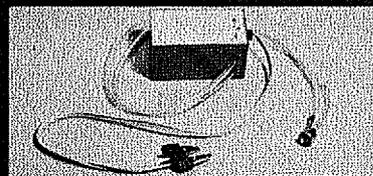
For fun or trophies, pick up a Veco kit from your dealer now, and be ready for the flying season.

dumas
planes

A DIVISION OF DUMAS PRODUCTS, INC.

P. O. BOX 6093 TUCSON, ARIZONA 85716

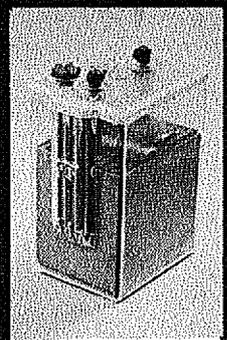
RARE SURPLUS ITEM!



FIELD TESTED AND PROVEN!

ANDY WRIGHT ELECTRIC FUEL PUMP
Thousands of these reliable pumps are now in use. Self priming. Reversible-fills or empties. Works off starting battery or 1½ to 4 volts DC. Fuel filter included. Rugged and compact. Only \$8.95 Postpaid, or available at your local dealers.

NEW Willard 2 volt, 20 amp. hour wet cell battery. Dimensions: 3" x 4" x 5½". Unexcelled as a starting battery, or power supply for electric fuel pumps. Uses regular battery acid obtainable at your local garage. \$5.00 Postpaid
RESISTOR for reducing battery voltage to 1½ volts \$5.00



ANDY WRIGHT PRODUCTS 16 Woodfield Terrace
Tarrytown New York 10591

WE'RE EXPANDING NOW...

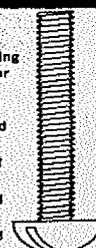
GOODIES are GOODIER

1 Oz. Fuel Primer—leak proof, easy access for priming.
#210
29¢ ea
6 pk/cd



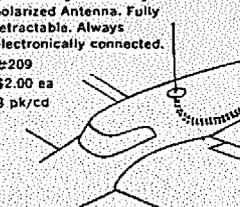
Engine Mounting Kit—pan head, self-tapping machine screws of #7 x 3/4" length. Simply drill 7/64" hole in mount and tighten screws securely. No lock washers required.
#222
29¢ per set
12 sets/cd

Nylon Screws—Used for servo mounting, wing mounting, engine mounting etc. Available in 4 popular sizes.
#227 4/40 x 1/4"
35¢ set of four 6 sets/cd
#228 8/32 x 1/4"
40¢ set of four 6 sets/cd
#229 10/32 x 1/4"
49¢ set of four 6 sets/cd
#230 1/4-20 x 2"
59¢ set of four 6 sets/cd

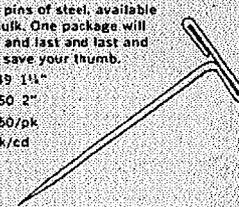


Single Pak Hookup Wire—Now, buy only 8' of the specific color you need. No need to buy an expensive large package. Available in the following colors:
#237—brown #242—orange
#238—red #243—green
#239—black #244—gray
#240—white #245—violet
#241—yellow #246—blue
15¢ per pk 6 pk/cd

Anten-Away—Vertically polarized Antenna. Fully retractable. Always electronically connected.
#209
\$2.00 ea
3 pk/cd



Modeler's "T" Pins—Finally, "T" pins of steel, available in bulk. One package will last and last and last and will save your thumb.
#249 1 1/4"
#250 2"
\$1.50/pk
6 pk/cd



warehouse full of every manufacturers kits including their own and some of the old Berkeley kits. I could spend a day just sorting through the kits.

Maxey Hester had me up and down stairs, looking into ceiling wells, smelling dope and cements, watching decals under-way and then concluded in the printing establishment which is completely under his wing, from the photography to the finished printing. Self-sufficient is the best way to describe Montezuma, Iowa's principal industry.

If somehow you manage to pass through this picturesque midwest town, make it your business to visit with the Sigs. It will be the best and most profitable time you have ever spent.

Prototype Pattern Event

(Continued from page 37)

today's pattern competition? Do they also worry you just a little bit tearing over at 80 + MPH? My Phoenix has been clocked at 85 MPH. Do you yearn for model aircraft that are just that and furthermore fly like their full scale counterparts? How many times have you thought or had the idea expressed to you, "Wouldn't it be nice to have a model that looks and flies like an airplane?" In my own experience, this has occurred many times, so—why not do something about it?

If you agree with this philosophy and yet have no stomach for the labor of love required for competition in today's R/C scale event, be of good cheer. I propose for your consideration an event which will give you a good fun airplane for leisurely Sunday flying and yet capable of competition when the spirit strikes you. I would issue a warning, however, for what I propose will be extremely demanding in piloting skill, more so, I believe, than the current pattern events.

Have you ever tried to do a slow roll with an airplane of limited power holding it on axis with aileron, elevator and rudder? Have you ever performed a Lazy "8", mixing all controls, including engine, throughout the maneuver, or have you tried a chandelle? Have you ever performed a true barrel roll around a point maintaining coordinated positive g's throughout the maneuver? How about a side slip to a landing? These are all beautiful maneuvers of extreme difficulty with limited power and they require tremendous pilot "feel" for the airplane speed and control response. If you have witnessed Dick Schramm, the "Flying Professor," wring out a standard Piper Cub J-3, doing seemingly impossible things, you have an impression of what I'm trying to convey. It's an expression of maximum performance effort with minimum equipment.

In the final analysis, what we are after in our competition is an assessment of pilot against pilot. So why not fully exploit the tremendous capabilities of our modern proportional equipment in concert with models that look and fly like airplanes (Hooray! R/C Ed.) and at the same time increase the demand of piloting skill?

If by now I have convinced you, or you are at least interested, please read on. I list for your consideration the following general requirements for such an event:

a. The aircraft shall be patterned after a full scale aircraft. Appearance shall be judged in a fashion analogous to Goodyear Pylon and Points 0-15 awarded. Judges shall stand at least ten to fifteen feet back in judging aircraft and shall make no measurements other than wing area. Less than five points disqualifies ship from competition. Contestant must furnish three views of full scale aircraft.

b. Prime requirement is that aircraft
(Continued on page 68)

THESE ARE JUST SOME OF THE NEW GOODIES...WATCH THIS MAGAZINE EACH MONTH FOR MORE OF THE NEW AND COMPLETE LINE OF GOODIES BY

MORE-CRAFT
MORE PRODUCTS FOR MORE ENJOYMENT
More-Craft Products Company
Higginsville, Mo. 64037
Mo. Residents add 3% Sales Tax
Dealer Inquiries Invited

ALL-AMERICAN Hobby Accessories Since 1937

NEEDLE VALVES
No. 437 Universal
No. 436 Uni-Flex
No. 433 Tiny Uni-Flex

FUEL PUMPS
America's most popular fuel pump. All metal—built to last!
No. 003 1/2 Pint size
No. 004 Pint size
No. 005 Quart size

GLUE GUNS
For fast, neat application of glue, cement or lubricants. Finger-tip control.
No. 545 A/C Standard
No. 565 NEW Compact
No. 560 Deluxe Gun with Pins, Medium & Coarse Tips

4 WAY WRENCH
Protects plugs, porcelain and cylinder fins. Four sockets—5/16", 3/8", 7/16", 1/2"
Cat. No. 227

A-C TIMERS
No. 331 Large Timer 1/2" x 1 1/2"
No. 329 Baby Timer 1/2" x 1 1/4"
No. 330 Timerette 1/2" x 1 1/2"

A-C FUEL-OFF TIMER
cuts off fuel supply on 1/2 A, A, B, and even C motors.

BATTERY HOLDERS
a size and type for every need.

No. 106 Pencils
No. 107 Med. Cells
No. 110 Lge. Cell
No. 108 Lge. Cells

"TEETER-PROP"
for settle-smooth performance of all model airplane engines... Easily, quickly, expertly, balance wood or plastic propellers. Also, balances racing car wheels and motor armatures.

Catalog on Request
AUSTIN-CRAFT CO.
P. O. BOX 207 / KINGMAN, ARIZONA.

Field Trip

(Continued from page 21)

nor Glen told me of this since it was discovered during the course of our doing a bit of navigating for Hazel on a flight into Des Moines Airport.

Like most small businesses, Sig started in one building and as its fame grew, so did the facilities but in a spread out way. Instead of enlarging the existing building, new buildings went up. They now have seven separate buildings to house their facilities. Present plans are to purchase lot and private home immediately adjacent to the main plant and, for the first time, add on to an existing building. This will be a Fall project and should relieve expansion pressure.

There is no need to elaborate on the flying proclivities of both Sigs but at the Toledo conference, Hazel had informed us that she had purchased a Piper Cub and plans on shortening the wing to make it a stunter capable of the same performance as the Flying Professor "Dick Schramm". She'll do it, too! The loops in the Cessna 120 prior to our departure attest to her flying capabilities and aplomb.

Sig wears two hats in our business, first as a manufacturer of a good line of kits and supporting sundries and second as one of the principal distributors of the complete hobby package.

A trip through their plant shows that it is a veritable paradise of everything in modeling. Name it and you can see it. I found a completed folding rubber prop which was just what we needed to get Number Three son Anthony's Goldberg Ranger to put out to the best of its abilities. We found balsa wood all over the place as can be seen from the photos. There were carloads in bulk form and it would seem the same amount in processed form. A

Sterling
MODELS
BELFIELD AVE. & WISTER ST.
PHILADELPHIA, PA. 19144

FOKKER D-7



The Ultimate in Precision and Fidelity to Scale.

58½" OF RC* SCALE MAGNIFICENCE!

GERMANY'S GREATEST WORLD WAR I FIGHTER

The Fokker D-7 was so greatly feared and respected by the Allied Powers, that it was specifically singled out in the Armistice Agreement Article, that they were to be surrendered. The tremendous popularity of WW I aircraft in general and the FOKKER D-7 in particular resulted in untold numbers of requests by modelers for this authentic super-scale model. The excellent flying abilities and full aerobatic capabilities of this FOKKER D-7 will be welcomed by all RC modelers. It can also be built as a control line model, all details on plans.

There is no deviation from true scale in the outline shape of the model from the full-size plane. Even the rib spacing in the wings and

tall, the stringer spacing and construction of the fuselage, the distinctive FOKKER-style wood leading edge covering (die cut) is faithfully reproduced. Scale wing taper and dihedral. Highly detailed scale plastic Mercedes engine and Spandau machine guns. Authentic scale World War I decal insignia. Nylon screw-wood nut fastening — no rubber bands.

UNUSUALLY COMPLETE AND PREFABRICATED—Finest quality Balsa sanded to micrometer tolerance and densely graded. Accurately and cleanly die cut Balsa and plywood parts. Shaped leading and trailing edges for wings and tail surfaces. Maple wing spars, motor mount, etc. Formed 3/16 wire landing gear and 3/8 wire

center struts. Detailed scale plastic Mercedes engine and Spandau machine guns. Steel cowl. Complete hardware pack includes all screws, nuts, washers, blind nuts, landing gear clamps, 1/4-20 nylon screws and special hardwood wing mounting nuts, nylon horns, etc. Authentic World War I insignia. Two Giant-sized (35 x 45) plans with full-sized layouts and step-by-step assembly drawings and instructions. Special nylon pushrods for all Aileron, elevator, rudder and throttle controls. Wire Strips. Sheet balsa covering, etc., etc. *Can also be built as a control line model, details on plan.

Send 10c for complete catalog.

Kit FS-21
Wing Span: 58½"
Length: 45"
Engine: 45 to 65
Scale: 2" = 1 ft.

\$39.95

Prototype Pattern Event

(Continued from page 66)

perform maneuvers at scale speeds and in a scale manner. An additional zero to ten points are awarded for judges impression of scale speed at full throttle conditions. (Now you're talking! R/C Ed.)

c. Maneuvers shall be entered in a scale fashion, i.e., where necessary to dive to gain speed, this is permitted, and no points are deducted for this maneuver entry. Maneuver will be judged from level flight in pull up from dive entry. Dive must be straight and final recovery must be level.

d. Judges will take note of evidence of uncoordinated flight. It will be necessary on some aircraft to coordinate aileron and rudder for coordinated turns as in full scale aircraft. This factor will be considered where appropriate in judging maneuvers. Control linking to automatically assure coordinated maneuvers is not permitted. The intent is to test the pilot's ability in this regard, as in full scale aircraft.

e. There is no limit on size of aircraft (Except to be within AMA and FAI limits) but a maximum engine displacement of .61 in.³ is permitted.

f. Modification of full scale aircraft airfoils is permitted but you will note that negative "g" maneuvers are not required except for inverted flight.

g. Aircraft of a type that obviously are not capable of aerobatic flight, such as twin engine transports, are not eligible for competition.

h. Much soul searching and consultation with fellow modelers and design "experts" has led to the conclusion that we need wing and power loading limits to insure flight realism. Figure 1 is intended to show these proposed limits. I have also spotted

some typical aircraft on these curves to illustrate probable design combinations. The solid curve on the left hand, weight vs. wing area plot, represents the maximum permissible wing loading of 18 oz/ft². Anything to the right of that curve is okay such as the dotted 16 oz/ft² curve. In other words, it's okay to build it lighter but don't exceed 18 oz/ft² or about 5.4 pounds for a 700 sq. in. airplane, for example. This is light by comparison with today's multis but is absolutely required to slow the airplane down and to permit good maneuverability with low power. You will note that the right hand plot (wt. vs. engine displ.) shows a permitted engine displacement of about .33 in 3 for the 5.4 pounds airplane. The same airplane at 16 oz/ft² or 4.8 pounds would be allowed a .29 engine. As a matter of interest, Sig advertises their 70 in³ Piper J-3 to weigh from 5 to 5 1/2 pounds with power from .19 to .35. Also spotted on the curves is Ray Nugen's Krier Kraft at 1300 in² which weighs 10 pounds and flies exactly the way we want it to with a St.60 G Series engine.

i. I also propose a minimum wing thickness criteria of 12% to keep strength and lift up and speed down.

A set of maneuvers intended to combine precision and aerobatics with minimum emphasis on power requirements and negative "g" capabilities are as follows: zero to ten points per maneuver is the scoring system:

1. *Unassisted R.O.G. with Traffic Pattern Departure*—Intended to counter the problem with wind and conventional geared high wing models. Straight take-off, climb to 50° or more 90° climbing left or right turn followed by 45° turn out.

2. *Two 360° Left and Right Level Turns*—Steep, precision turns with 45° bank angle minimum, performed in Figure 8

pattern and repeated once. Not necessarily performed overhead.

3. *Descending (glide) 270° Turns Right and Left*—A power-off (not dead stick) maneuver with a constant descent rate and equal diameter moderate bank angle turns. Pattern overlaps to look like Figure 8.

4. *Stall Turn, Right or Left*—Performed like old AMA wingover.

5. *Chandelle, Left or Right*—A coordinated maximum performance climbing turn with 180° change in direction. Starts from level flight. Turn and climb rate must be constant throughout maneuver. Aircraft should roll out on reverse heading having gained maximum altitude without stalling.

6. *Lazy "8" (2)*—A maneuver in the shape of an 8 in plan form with about 45° crossover. Performed by pulling up into an exaggerated wingover without stalling, maintaining coordinated flight. Wings are vertical at top of maneuver. One complete maneuver consists of an exaggerated wingover both right and left with 45° crossover at bottom.

Requires coordination of all controls throughout maneuver.

7. *Cuban 8*—performed in standard fashion.

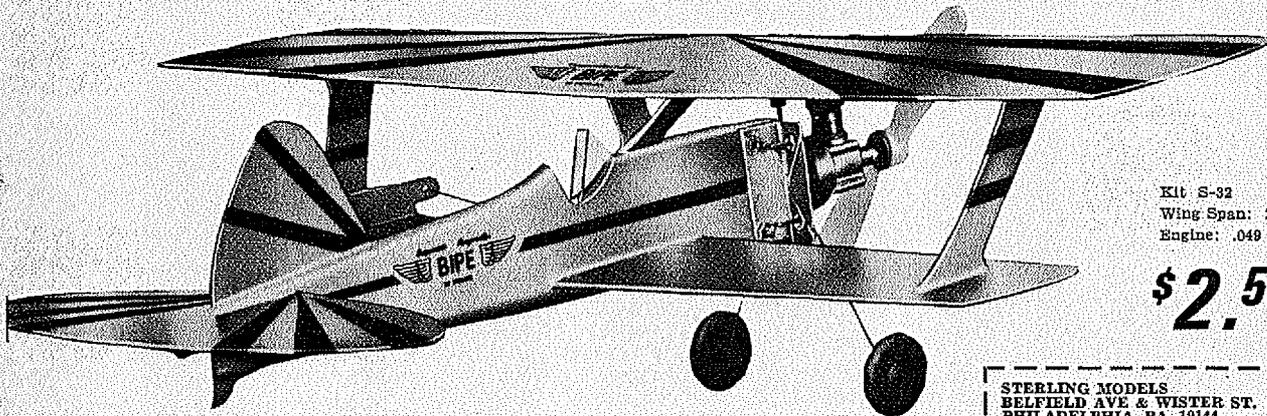
8. *Split "S"*—performed like old AMA maneuver.

9. *SNAP Roll right and left*—A horizontal spin, stalled flight maneuver. Full maneuver performed in same flight direction with a pause between snaps to regain flying speed and establish heading.

10. *Barrel Roll, Right and Left*—A coordinated control, positive "g" maneuver, with aircraft performing roll around a point on the horizon. Pause between right and left roll to establish heading. Axis of fuselage does not remain horizontal through maneuver.

BEGINNERS RINGMASTER BIPE

THE WORLD-FAMOUS RINGMASTER DESIGN — NOW AMAZINGLY SIMPLIFIED FOR BEGINNERS!



Kit S-32
Wing Span: 21"
Engine: .049

\$2.50

Easy Flying . . . and it does every stunt in the book!

ONLY MINUTES TO ASSEMBLE—JUST 15 DIE CUT PARTS—This beautiful little profile Bi-plane can be assembled in a snap by any beginner. **NO TISSUE COVERING.** In addition to the all die-cut Balsa and plywood parts which makes assembly a matter of minutes, the kit contains formed wire landing gear and wheels, wire for pushrod, decals, etc. Complete hardware pack includes metal motor mounts, metal bell crank, metal control horn, etc. Simple plans show easy step-by-step construction and also lists materials and tools required. Included is a detailed description of "how to" first-time solo fly. Plans and instructions are so clear and easy to understand that assembly is completed swiftly and expertly by anyone.

STERLING MODELS
BELFIELD AVE & WISTER ST.
PHILADELPHIA, PA. 19144

MAN-7

If no dealer available, direct orders accepted — with 10% additional charge for handling and shipping. (\$50 minimum in U.S., \$100 minimum outside U.S.)
 Catalog of entire line of airplane control line model kits, R/C scale & trainer kits, boat model kits, accessories; etc. 10c enclosed.
 "Secrets of Model Airplane Building," including design, construction, covering, finishing, flying, adjusting, control systems, etc. 25c enclosed.
 "Secrets of Control Line and Carrier Flying," including pre-flight, soloing, stunting, Carrier rules and regulations, Carrier flying hints and control line installation instructions. 25c enclosed.

NAME _____

ADDRESS _____

CITY _____

STATE _____

ZIP _____

11. *Slow Axial Roll, Right and Left*—At least three seconds per roll with pause between rolls to establish heading. Requires mixing of all controls including top rudder to hold fuselage level. Performed like AMA roll.

12. *Inverted flight*—Roll inverted, fly straight and level five seconds or more and roll out on same heading.

13. *Three Inside Loops*—Like AMA maneuver.

14. *Three Turn Spin*—Like AMA maneuver.

15. *Vertical Reversement*—A maneuver performed by entering a steep turn, right or left, followed by stall while in turn and a sudden rotation in the other direction. Wings are vertical at stall and aircraft rotates to vertical bank in opposite direction. Objective is 180° change in direction from point of initial stall to roll out in opposite direction. (If you understand that the first time you read it, you're cheating!)

16. *Touch and Go Landing*—Performed like AMA maneuver except wheel landing permitted in windy, weather conditions (Tail need not drop but aircraft must not be airborne for at least three seconds at slow speed).

17. *Overhead 360° Landing Approach and Landing*—Approach directly over runway on landing heading and perform a moderate constant rate descending turn at reduced power right or left and roll out at least 10 feet above ground on final approach. The last 100 feet of approach should be straight flight. Proceed to landing and spot. No taxi return required. A side slip on the final approach is required for maximum points (is worth at least two out of ten points). A side slip is a crossed control (aileron and rudder) maneuver which permits a rapid rate of descent without increase in airspeed. Used on full

scale aircraft not equipped with flaps for short field landing. Maneuver is entered in glide by banking aircraft and simultaneously applying opposite rudder to hold aircraft straight on glide path. Pitch attitude is adjusted to maintain airspeed. Maximum degree of bank angle and fuselage yaw desired for maximum drag condition and rate of descent. Care must be exercised not to stall aircraft. Aircraft is straightened out at last moment for landing flare.

One of the aircraft used to test this idea is the scale Krier Kraft owned and built by Ray Nugen of the W.O.R.K.S. Club. This airplane is large, having 1300 square inches total wing area and weighing 10 pounds Power is a St.60 'G' Series swinging a 14-6 prop. Control is by Controlaire Digital-5. Flying characteristics are absolutely beautiful; as close to full scale realism and feel as I've ever flown. It is easy to fly and many people, including rank beginners, have flown it. This airplane is flown just like the real thing due to the definite power limitation and requires rudder mixed with aileron for lots of maneuvers. It is slow and yet responds with exceptional feel right down to stall conditions. Wingovers, loops, Cubans, spins, snaps, slow rolls, etc., must be seen to be appreciated. Ray has fitted a smoke generator for added realism. Ray has another Bipe, a large Sperry Messenger which flies very much the same way. Needless to say, this type of airplane is always the center of attention and is the greatest crowd pleaser.

Other suitable aircraft in kit form that come to mind are Sig's Piper J-3, Goldberg's Skylane 62, and Vic's Custom Model line of semi-scale aircraft.

What do you think? Do you feel this is worthwhile? What have been your experiences in this regard? I would appreciate

comments and constructive criticism on this idea. If the response is favorable (as it has been so far from people with whom I have talked), I plan to propose it as a provisional event to the AMA R/C Contest Board.

Meyers OTW

(Continued from page 15)

One feature that attracts all eyes is the simulated metal covering. This is three mil mylar with vacuum deposited aluminum on one side and adhesive on the other. Pin holes are used to indicate rivets. The mylar is attached over one thirty-second thick balsa fuselage covering in several separate pieces and the seam overlaps and pinhole lines make a very effective simulation of the real plane's metal fuselage.

The fuselage is probably the most difficult part to make, so start here. The fuselage is composed of a top and a bottom keel and a series of formers. Cut out the keel pieces and formers making sure the former notches are accurately cut for a snug fit and properly aligned on the keels. Cement the formers to the keels. Note that the keel should continue across the cockpits. They will be cut away when the cockpits are cut out of the covering.

When cement holding the formers to keels is thoroughly dry, add short pieces of one sixteenths by one eighth balsa between former B and former C where the cabane struts will later attach. Then by trial and error, make up bond paper patterns of the fuselage covering in three pieces for each side from keel to keel. One piece goes from A to B, one from B to E, and one from E to H. When you are satisfied with your patterns, select a soft sheet of "A" grain one thirty-second thick balsa for covering sheets. "A" grain has the grain crossways to the thickness of the



Guilow's

Build-by-Number

FLYING MODEL KITS

Six exceptional models with a rare combination of quality contents and skillful designs . . . plus the Build-by-Number fun method of model building that everyone can understand.



KIT 701 FAIRCHILD
25" wing span
\$2.50



KIT 702 ARROW
28" wing span
\$2.50



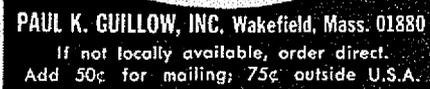
KIT 602
PIPER SUPER CUB 95
20" wing span
\$1.50



KIT 601
CESSNA 180
20" wing span
\$1.50



KIT 603 JAVELIN
24" wing span
\$1.50



KIT 604 LANCER
24" wing span
\$1.50

PAUL K. GUILLOW, INC. Wakefield, Mass. 01880
If not locally available, order direct.
Add 50¢ for mailing; 75¢ outside U.S.A.

balsa sheet and is therefore easier to wrap around the fuselage formers. Even so, you may find it necessary to wet their outer surface to bend enough to fit the smaller formers. Cement the covering in place.

After cement is dry, carefully cut out the two cockpit openings. Also cut out the opening for the horizontal tail. Note tail to allow some tail angle adjustment.

Block for the combination noseblock and cowl can be laminated from several thin layers of balsa or it can be carved from a single block of the required thickness. The original was turned on a hand drill using medium sandpaper for a lathe tool. So do this, your block must be exactly circular to start with. Then you put a screw through the exact center of the block, tighten a nut on the far side, and chuck the assembly in the hand drill. Use the sandpaper carefully to get the correct contour on the front of the cowl. A corner of the sandpaper can be used to undercut the front face of the cowl.

Cement a rectangular piece of balsa on the back of the cowl to just fit in the opening in former A. Use a length of one sixteenths diameter aluminum tubing for a propeller shaft bearing and using some freely fitting wire make up the front hook and install the propeller.

The mylar covering will stick better if the covering of the fuselage is first given a coat of clear dope and is then sanded to remove the surface roughness. Most of the existing OTWs have been painted so the mylar is not really necessary but it's so nice. In larger cities, it should be available at plastic retailers. Perhaps you can even get a sample large enough for this job. Use your paper covering patterns to cut out the mylar and be sure to allow about a sixteenth of an inch of overlap.

Carve the headrest from a piece of three-sixteenths by three-eighths balsa. Sand it smooth and cement it to the top center line of the fuselage. Carve the tail cone from balsa and fit it in place but do not cement it until later.

The wings use egg-crate construction. This is only slightly different from standard procedure in that the spars and the ribs are both full depth and notched about half way through where they intersect so that they interlock when assembled. Each wing will have to be built one side at a time because the spars are continuous full span and therefore only one side can be pinned down to the work board. Because of the division necessary to fit full size on two pages of Model Airplane News, the wing and spars appear to be in two pieces; they are not, cut the spars out of a single piece of one sixteenths thick sheet balsa. Note that the front one is constant depth except at the tip taper but that the aft spar is cut down in the area of the wing cut out. The spar braces should be hard balsa.

Both the top and bottom wing are identical. The leading and trailing edges are one sixteenths by one eighths balsa strip with the trailing edge flat and the leading edge set on edge.

After assembly, the wing structure should be carefully sanded to remove all roughness. The leading edge should be rounded and the trailing edge tapered to the section indicated in the side view. Round off the edges of the wing tips and the wing cut outs.

Both the vertical and horizontal tails are built one sixteenths thick on the top of the plan. Then, soft one sixteenths square pieces are added on top and bottom of the tail ribs. These are sanded to give the typical tail section shown.

Cover wings, stabilizer and rudder with light weight tissue. Spray lightly with water to shrink the covering tight. Then, when

they are dry, give them one coat of clear dope thinned about half and half with thinner. If you like numbers on the wings, add them now. Either cut them from tissue and dope them in place or use decals. The original model has white tissue wings and empanage and uses black trim and black decal numbers. The surface outlines are easy to put on at this point before assembly with the fuselage, (the old prof. always forgets until later), so add them. India ink makes nice lines but a thin black felt pen or ball point can be used. The ailerons only go on the bottom wing.

The wire struts are bent next. These must be accurately done if the model is to assemble correctly. One thirty-second diameter or thinner music wire should be used. Note that only the left landing gear Vee and cabane strut are shown. The right hand ones should be bent in the opposite direction.

Poke holes, with a pin, in the fuselage where the struts fit and assemble the struts to the fuselage. Note that the long landing gear strut sticks through the loop in the Vees. Make landing gear fairings from stiff paper carefully wrapped and cemented around the wires.

Cement the cabane strut wires in position and add the one thirty-second thick sticks to fair them and the one thirty-second by one sixteenth stick to make the slanting part of the "N" of the cabane struts.

Carefully cut the notch in the bottom of the fuselage for the lower wing. Put the horizontal tail in the correct position and check to see that it and the lower wing are aligned properly.

Cut windshields from thin clear plastic and cement them in place at this point. If you wait until after the upper wing is installed the forward one is a little difficult to install.

Now cement the lower wing in place. Now check the spread between the horizontal wires of the cabane wires and cement the upper wing in place on them. Four small "x's" on the wing plan indicate where the cabanes go under the ribs R-1 at the outer end of the wing cutout. Check your model to see that the wings are exactly parallel to each other especially from directly below.

Now cut out the interplane struts from one sixteenths by one eighth hard balsa and sand them to a streamlined section. Install them between the wings at the "x's" under the spars and the ribs R-2 third from the wing tips.

Put the horizontal tail in place, but do not cement it. Cement the tail cone in place being careful not to get any cement on the horizontal tail. Cement the vertical tail in place and add the one thirty-second by one sixteenth tail brace struts between the vertical and horizontal at the "x's".

Obtain or make your main wheels and install them. You can retain them with a drop of cement placed carefully on the end of the axle wire. If your wheels have aluminum tubing bushings through them, you can use my favorite method which is to squeeze the end of the wire with a vice-grip pliers to squash the wire wider and so retain the wheel.

Make the tail wheel from five layers of one thirty-second sheet laminated and sanded to shape or use a wheel and wire if desired. There is no real reason for it to turn and, if it does not, the model is less likely to roll off work benches. Cut a small hole in the mylar covering and cement it in place.

Install a lubed loop of one eighth flat rubber, retaining the aft end with a straight pin pushed through the fuselage sides just aft of former G. When you try this, you'll

(Continued on page 72)

BOATS! BOATS! BOATS! BOATS!

IN NEW YORK CITY

BROWN'S WONDERFUL WORLD OF BOATS!

IN STOCK! THE WIDEST CHOICE OF BOATS ANYWHERE—including Sail, Steam, Gas and Electric powered designs. **PLUS** a full stock of Steam, Gas and Electric Engines and Motors . . . Fittings by Bliss, Fisher, Octura, Stinger, etc . . . Wood and Fibreglass Kits . . . All the hard to get accessories needed to float your model!

BY SUCH FAMOUS MAKERS AS GEM, OCTURA, FISHER, BLISS, STUART STEAM, CAMERON, DUMAS, STERLING, MODEL SHIPWAYS, WESTEE, MARINE MODELS, ARISTO, GRAUPNER, TAS, O&R, TAYCOL.

ALSO IN STOCK—ALL TYPES OF R/C SYSTEMS FOR BOATS!

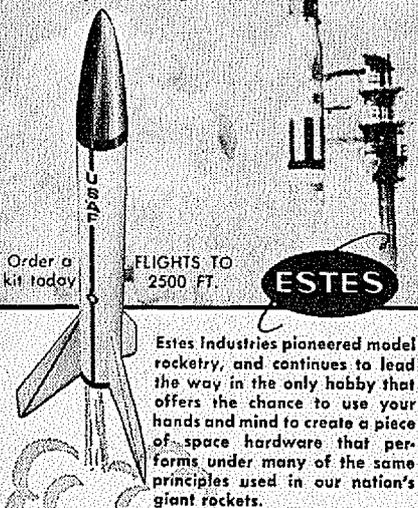
BROWN'S HOBBY CENTER

6031 BROADWAY, BRONX, N.Y. 10471
One Block North of 242nd St. "E1" Station
Opposite Van Courtlandt Mansion
TELEPHONE (212) 548-5422

Closed On Wednesday and Sunday.

Model Rockets

**Challenge of
the space age**



Order a
kit today

FLIGHTS TO
2500 FT.

ESTES

Estes Industries pioneered model rocketry, and continues to lead the way in the only hobby that offers the chance to use your hands and mind to create a piece of space hardware that performs under many of the same principles used in our nation's giant rockets.

Over 30 Estes model rocket kits for you to build and fly.

Try this starter special:

Includes Astron Alpha kit, 2 engines, design manual, full instructions. DSK-20 . . . \$2.00
Same as above, PLUS electric launcher. DSK-65 . . . \$6.50

New, fact-filled illustrated catalog . . . \$25¢
(free with order)

ESTES INDUSTRIES

Dept. 9 Penrose, Colorado 81240

Meyer's OTW

(Continued from page 70)

find the biggest disadvantage of this design, it's dark down there in the fuselage.

Make sure the center of gravity is at the arrow shown on the plans. My model required a piece of clay pushed into the face of the noseblock for flying. Now put a thin sliver of balsa above and below the leading edge of the horizontal tail across the fuselage notch to wedge the tail in place.

Test fly the model indoors preferably, or outdoors if it is calm, by making all your flights R.O.G. working up from about fifty hand winds. If the model climbs or dives too steeply, you can adjust the tail setting by changing the thickness of the slivers of balsa above and below the tail. If the model turns too tightly some side thrust is in order. Some right thrust is shown in the top view of the fuselage. If more is required, shim the side of the nose block for flying.

Best flight time for the original model is about 55 seconds indoors. It will probably do better than this but I haven't had many opportunities indoors. There has been one horrifying five minute flight outdoors—I was afraid it was gone and I didn't have photographs yet. Almost anything will stay up in a thermal, at least for a while. Incidentally O.T.W., I've been told, stands for *Out To Win*. So use your Meyers that way.

Field and Bench

(Continued from page 42)

about twenty minutes to make up. We did not agree with the sequence of construction steps for this. The completed harness consists of a switch, from which two neatly twisted cables emerge, terminating in three-pin Medco type connectors. Each cable contains a black and a red wire which are soldered to certain terminals of the 12 lug switch. The third wire, white, does not connect to the switch, but continues, unbroken from one connector to the other, following down one cable, past the switch, and out the other cable to the second connector.

At the switch, all wires are folded neatly toward one end, and tied with thread or string to the switch frame. If the wires are folded and tied *after* one connector has been soldered to them, per instructions, you'll undoubtedly end up with one wire being too long and looping out of the cable. Fold and tie all three wires to the switch first, *then* snip the wires off evenly, twist, and add connectors. A minor point, maybe, but in R/C, neatness is next to reliability.

Now let's build a servo. As you must know, the servo kits are for the "Potless" Kraft KPS-9. The sequence of building the transmitter, then the receiver, and finally the servos, has a purpose. As you progress from transmitter, to decoder, to receiver, to servo you find the P.C. boards getting smaller and/or more compact. On the servo P.C. board, most all of the components are rubbing elbows, and not only that, the parts can neither hang over the edges, nor extend more than 5/16 inch above the board. The one exception is the two larger switching transistors 2N2430 and 2N2431. By working your way from large board to small, it's not so bad when you get to the servo.

Speaking of transistors, there are nine in all on each servo board and, as in the receiver, seven of them look alike but are different. Check numbers carefully.

The one main variation in soldering technique between the proportional R/C kit and most other electronic devices is in the handling of the component leads. The

system used with the transmitter is pretty much common practice; stuff the leads through the board, solder to the lands, and snip off the excess. However, in receiver and servo construction, you are instructed to bend each lead over flat along the foil, or land (that's the area of copper around the hole through which the particular lead extends), and snip it off, leaving about an 1/8 inch of wire holding the component in place. This is done because of the amount of shock and vibration to which the receiver and servo may be subjected.

On the servo board, this technique becomes somewhat like the neatest-trick-of-the-week, and by the time you've succeeded in completing a servo, you're ready to take on the guy who prints the Pledge of Allegiance on a grain of rice! The main idea is to plan ahead. Where a lead comes through, examine that particular land and note the location and distance to other holes in the same land. Make the bend in the direction that will leave the most room for future leads. In many cases, an 1/8 inch is about twice as much as you can afford to leave after cutting.

There is one other consideration to keep in mind as you bend and snip. The greatest sin of all, while soldering, is to bridge across two lands with solder. When lands are no more than a 1/32 to 1/16 inch apart, it's all too easy for this to happen. The direction in which you bend the leads will often assist in avoiding this calamity.

Getting back to that 5/16 inch maximum height. In order to accomplish this, the transistors must be forced down within a 1/16 inch of the board surface. By the time they're all in place, you'll have a pocket in the tip of your thumb. The transistors also have a nasty habit of favoring one lead wire. This one tends to stay straight, and the other two bend. The result is that the transistor may not end up in the correct position, possibly making it difficult to install a neighboring component.

We were able to ease this situation by bending the transistor leads outward until they were almost flat, making the transistor look like a spider doing the split(!). Then, about a 1/16 to 3/32 inch out from the base, the leads are bent downward. Now their spread is about equal to the hole spacing on the P.C. board.

Another helpful idea is to go through the resistors and line them up in the order of installation. This will not only save time in the long run but will also provide a double check on the proper color code selection.

Although most all of the resistors are 1/4 watt size, the manufacturers probably vary, and on some, the color coding is not as clear as on others. In the receiver, for instance, there are five resistors with the last ring being brown, indicating ohms in the hundreds, and about 22 resistors with the last ring being orange, indicating ohms in the ten thousands. On those made by one manufacturer, the brown and orange were very similar. By preselecting the resistors, you can by process of elimination be sure of putting the right one in the right place.

Seriously, if you are aware of having any kind of a color blind situation, it is highly recommended that you have someone assist in interpreting the resistor coding.

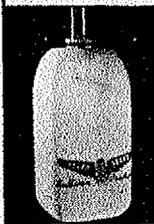
The first servo took 2½ hours to complete to the point of checkout. The others, not yet built as this is being written, should take about two hours apiece. Total time is not much out of line with the advertised twenty hours for construction. Incidentally, although we didn't use the spring type clothespin idea for holding

(Continued on page 74)



for the **FINEST** in
RADIO CONTROL
ACCESSORIES

NOW! RST FUEL TANKS



IN **4** NEW SIZES

Your gratifying response to our first RST NEV-R-LEAK fuel tank has now prompted us to add four more sizes to the line. Now RST fuel tanks are available in the five most popular sizes. End leaky fuel tank problems . . . Sullivan's exclusive screw-mounted rubber gasket expands to insure perfect seal . . . cap can't pop off in flight . . . neckless design eliminates waste space. 19 shapes and sizes to fit your need . . . every one **GUARANTEED** not to leak in normal use or you return it to the factory for replacement. Tested and acclaimed by top modellers at recent Nationals.

- RST (round back end, square middle, tapered front)
- 4 oz. (RST 4)1.50
- 6 oz. (RST 6) or 8 oz. (RST 8)1.75
- 10 oz. (RST 10) or 12 oz. (RST 12)1.95
- Round Type, 1 oz., 2 oz., or 4 oz. (Code R-1, R-2, R-4) each1.25
- 6 oz. or 8 oz. (Code R-6, R-8) each1.50
- 10 oz., 12 oz. or 16 oz. (Code R-10, R-12, R-16) each1.75
- Cylinder Type, 4 oz. (C-4) each1.25
- 6 oz. or 8 oz. (Code C-6, C-8) each1.50
- 16 oz. (Code C-16) each 1.75
- Oval Type, 2 oz. (Code OV-2)1.25
- 8 oz. (Code OV-8)1.50

New at your dealer now. Tubular nylon push rod sets, per set **85**

PYLON BRAND

Sullivan Products

535 DAVISVILLE RD.
WILLOW GROVE, PA. 19090
PHONE (215) OL 9-3900

Field & Bench

(Continued from page 72)

the receiver and decoder boards, it sure was handy and much of a time saver when making up cables and connectors from the receiver and servos and for holding the small, lightweight, and jumpy servo P.C. board.

Now comes the most surprising part of the kit project. With transmitter, receiver, and one servo completed, and with batteries charged, you are about to become a pseudo electronic wizard by testing, tuning, and aligning your own digital proportional radio. Sounds a little improbable, doesn't it? Well, just keep AOBO in mind and you'll come through in flying colors.

Without going into the why's (We couldn't anyhow. That will be left up to some of the more electronically inclined writers who are also, no doubt, reviewing the Heath propo.), let's go through the transmitter checkout.

First, you tack solder a black lead to the negative lug of the little transmitter meter which is not yet installed in the case. Then you solder a red lead to the plus lug, and solder an alligator clip to the other end of each lead. Rough, huh? Alligator clips and lead wire included in the kit.

Now you clip the black meter lead to designated lug on the RF circuit board and the red meter lead to the free end of a red wire which has so far had nothing else to do, and also comes out of the RF circuit board. Next, you pull out just the largest section of the antenna until it hits the stop without extending any of the other telescopic sections.

At this point, while observing the meter, you turn on the transmitter. The needle should deflect to a little more than half of the meter scale. If it does, you have a working transmitter with the required output. If it doesn't, a list of check points are given in order to help you find a possible error in your work.

We'll discuss the "In Case of Difficulty" business later. For now, let's assume that you're "putting out."

Now you are told to solder an 82,000 ohm resistor (furnished) to that same lug mentioned above. To this, you again clip the black lead from the meter. The red lead is clipped to a designated lug on the elevator control pot. When the transmitter is turned on, the meter should deflect to a little less than half scale. If it does, the manual indicates that your multivibrator is functioning properly. How about that!

Next, a 15,000 ohm (brown-green-orange) resistor (also furnished) is soldered to that same busy lug on the R.F. circuit board, the black meter lead is clipped to it, and the red lead is clipped to a designated lug of the aileron control pot. Now, and get this, you adjust *not* the aileron pot, but the *elevator* pot (while keeping the stick at neutral) until the meter needle deflects to about the second dot from the left. (Ain't we scienterrific?) Then you move the red meter lead to a designated lug on the rudder control pot and adjust the *aileron* pot for a similar deflection.

You then proceed to adjust the rudder pot while the meter is on the throttle control, the throttle pot while the meter is on the auxiliary control, and the auxiliary pot while the meter is on the collector lead of a transistor on the encoder circuit board.

Moving the black meter lead back to the free end of the 82,000 ohm resistor, you check two more points for proper needle deflection and, then, believe it or not, your transmitter is checked out! The foregoing took us about ten minutes.

Next comes alignment of the receiver

for maximum sensitivity, using the transmitter as the signal source, and that little ole meter as a peaking indicator. It was at this point that we hit our freakish stone wall, and this seems to be as good a spot as any to bring up that "In Case of Difficulty" business again.

Throughout the tuning, aligning, and adjusting portions of the manual, there are continual lists of trouble shooting points to cover each situation. How much one can do to solve a problem that may come up will vary with each individual. Speaking only to those who, like myself, manage to squeak along on a bare minimum of electronic knowledge, check through the list of "Possible Causes" at the point of your particular difficulty. If this doesn't turn up anything, by all means don't try to go on, you'll just compound the trouble.

My solemn advice at this point is that you take your set to a qualified Heath service center or pack it up and return it to Benton Harbor. A week or two of lost time in which the problem will definitely be solved is nothing compared to the troubles you could get into by taking it to the local "expert." This is not to say that a double check of your work by another, and possibly more qualified individual, is not a good idea. It definitely is. But don't let him go any farther!

Another thing, as Bill Hanna, Product Manager in charge of the propo kits, points out, 99 percent of the trouble in returned sets of all kinds over the years, has been in the soldering. This is no joke! Check every solder connection for a cold joint or missed wire. You'd be surprised how many experts solve "complex" electronic problems by this method.

Going back to the adjustment procedures, we won't go into any more detail of the steps followed to check control outputs, align transmitter to servos, adjust servo travel, adjust centering and so on. If you have already owned a digital rig before building the Heath set and used it without knowing what was happening, you will be quite fascinated with the understanding picked up as you proceed through the various steps of construction and checkout.

The bonus is that, many times, when you subsequently have operational difficulties, you will now be in a position to effect some of your own repairs rather than having to "send it back."

The purpose of this article has not been to go into great detail and electronic analysis (that's pretty obvious) of the Heath Proportional Radio, but rather to emphasize the fact that assembly and adjustment of the set is not out of reach of the average R/C model builder. Not only is it within reach from the required skill point of view, but also from the financial angle. A complete set may be purchased, or individual components may be obtained one at a time, or the whole thing can be put on Heath's time payment plan which permits monthly payments of around \$20.

Unfortunately for licensed technicians, 6 meter equipment will not be available until the first of next year, and at present, only 27 m.c. frequencies are being used. The 72 m.c. sets will also be along later, but actually, except in high outside interference areas, there has been such a swing to the 72 frequencies that many are finding the 27's are more desirable from an available air time point of view.

One final warning. Assembling the Heath propo is just like reading an exciting book for the first time. Once you start, you don't want to stop. The toughest job in the whole procedure is forcing yourself to unplug the iron and go to bed fore you've finished. If you get one, don't start on it 'till Friday night . . . and good luck!

Foreign Notes

(Continued from page 6)

full disk web, a 1/4 in. journal and a 1/8 in. crankpin. The cylinder is of leaded steel and the piston and contra piston are of Meehanite. Diametrically opposed exhaust ports are used, consisting of a pair of circular holes on each side. The bypass ports are in the front and comprise a pair of smaller holes fed from a small volume passage formed between the outer wall of the cylinder and the surrounding casting. As on the Mills, these are uncovered by a small deflector step machined in the otherwise flat piston head. The intake ports, again a pair of small circular holes, are at the back of the cylinder where they line up with the intake orifice into which the carburetor assembly is screwed.

We ran some tests on one of the first production examples of the Embee and found its performance to be much in line with its vintage appearance. As one might expect of a long-stroke side-port engine with somewhat restricted intake and bypass porting, the engine is at its best at relatively low revolutions. Maximum power on test, in fact, was obtained at 8,500 rpm (the output being just under 1/30th hp) corresponding to the approximate in-flight revs on a 7x4 prop. The Embee will turn bigger sizes quite happily (e.g. 6700 static on an 8x3 1/2 Top-Flite, 5800 on an 8x5 Power) but there is not much point in using anything smaller than a 7x3. We tried a number of smaller sizes, including a 5 1/2 x 3 Tornado nylon on which the Embee managed to struggle up to 11,200 rpm, but here the output had dropped to 1/40th hp. Our tests were carried out during a spell of chilly weather so we made a point of checking the starting qualities outside where the air temperature was only two degrees above freezing point. The Embee started

easily enough under these conditions.

The Embee is not the engine to buy if your only interest is sheer power. Old Timer enthusiasts, however, may find it of interest. If you fancy building a typical small European free-flight of the immediate post-WW-II era, the Embee is, among current engines, just about as near as you will get to an authentic power plant of the day.

The address of the makers, for the benefit of anyone interested, is: Moore & Bailey, Rookery Lane, Groby, Leicester, England. **Contest News**

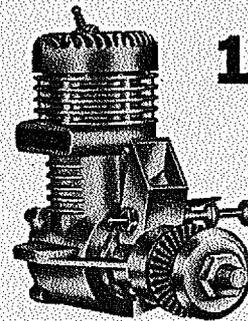
For 1968 and for the first time ever, the British Nationals will include a U-control Carrier event. Rules will be based on AMA regulations and the Royal Navy has built an angled flight deck complete with ar-rester gear for the event. Usually hosted by the R.A.F., the Nationals are, this year, being held, instead, at the Royal Naval Air Station, Yeovilton, Somerset.

Another new event will be "Mouse Racing". This, dreamed up last year by the R.A.F. Model Aircraft Association, is, as you might guess, rat-racing in miniature. Engine size is limited to 0.9 c.c. (.0549 cu. in.) and there are two classes. The first is restricted to the hotter 049's and 051's: specifically, Cox Tee-Dee 049/051, Space-Hopper, Thermal-Hopper and Space-Bug 049's, Fox FAI 049 and Holland Hornet 049/051. In the second class, any motor up to 0.9 c.c. can be used. Line lengths are 35 feet and two .010 in. lines must be used. For the Nats event, heats will be of 72 laps with one compulsory pit stop and the finals will be over 144 laps with a minimum of two stops.

Another novelty contest, preceding the Nationals and part of the 1968 SMAE North-Western Area Rally, is a "Chase the Prop" event as part of the R/C program. Briefly, the rules (which call for up to

FOX 36X BB

1995



BORE 800
STROKE 715
DISP. 36
WT. 7 1/2 OZ.

A motor for GO and SHOW. Set up with all the tricks of Xpert combat artists. Crank port reamed and milled. Oil relieved - rod drilled for oil. Piston O. D. honed. Case milled to relieve exhaust port. Head milled for higher compression and true gasket surface. Pressure fitting installed in rear cover. Castings polished. Every motor individually run in before shipping.



***** Serving The R/C Hobbyist Since 1953—Prompt Delivery Our Specialty *****



PULSE PROP IS HERE

ACE IS THE HEADQUARTERS—for single channel proportional—dependable performance—very easy on the pocket book. We have our GG package, the new Simpro III, the Rand Decoder and other systems. Check our American Modeler ad for more listings than shown here. . . . We've been supplying the hard to get items to the hobbyist since 1953. If you are interested in Quality and Service—We're here to serve you.

COMMANDER TRANSMITTER KIT

Designed by Phil Kraft. It is essentially the same as the KT-1 which sells for \$29.95 when assembled. Over 500 mw input. Requires Class C CB license. Domestic antenna, base loaded, removable with power packed non-directional punch! This unit uses one 9 volt battery of Mallory 16G5 type for long economical operation. May be used with Commander Pulsar Converter. Kit for proportional. Completely ready for easy assembly. Just add battery and you're ready!

NO. 11KD41
\$19.95

COMMANDER PULSER CONVERSION KIT

This Kit enables you to convert your present Commander for a rudder only pulse . . . The normally off pushbutton switch can be used for escapement flying. Rudder only pulser features unijunction and silicon transistors for complete temperature stability. This pulser with a Commander transmitter will let you get rudder only with auxiliary motor control flying. Pulsar may also be used with KTXL Kraft single channel transmitter. Convert now to Real Flying Pleasure!

NO. 15K51
\$8.50

MARKS BASIC VERSAPULSER KIT

The Versapulser is a revolutionary design as up to date as tomorrow. Features a rate adjustment that allows it to be used with ANY pulse system that is on the market today. It is linear over the entire range and no interaction pulse rate is completely variable from 2 to approximately 80 pulses per second. This means it can be used with magnetic actuators, Rand and other types of actuators, Rand Dual Pops, Simpro, and other decoders that require the faster pulsing, including the ones that use feedback servos. No other pulser is available today that is as capable of its broad rate change, and yet still feature complete linearity and less interaction than any pulser in use. . . . Secret is a linear stabilizer, which was developed by Fred Marks, and which is an Ace exclusive priority design. . . . Basic kit is offered two ways so it may be easily adapted to any existing tone transmitter. With tone key in negative side (Nule, etc.), you need Model NPN. With keying in positive leg (Commander, Kraft, etc.), you need Model PNP. . . . Basic kit contains all components such as resistors, capacitor, printed circuit board, all transistors and diodes. Basic measures 1 1/2 x 1 1/16 inches, so it may be fitted into a very small space inside your case. Uses same 9 volt battery. Versapulser Kit does not contain Pops, switches or stick assembly. Pops required for the stick are 2.5K for width, 10K for rate, and 5K is required for rate adjustment. . . .

NO. 15K49—Marks Basic Versapulser Kit, NPN, \$12.25
NO. 15K50—Marks Basic Versapulser Kit, PNP, \$10.75

PROVEN WINNER! ACE VARI-CHARGER

IN KIT FORM OR ASSEMBLED

Will charge nickel cadmium batteries—20 mils to 150 mils. Capable of charging up to 12 volt packs. Indexed dial & simple chart for correct millampere rating for charging different size battery packs. Completely isolated from AC line supply. An extra deluxe item: New transformer of highest quality. UL approved line cord. On-off switch. 500 millamp diode. Full instructions.

No. 34K21—Ace Vari-Charger assembled . . . \$9.95
No. 34K22—Ace Vari-Charger Kit . . . 7.50

NEW! SMALL! ADAMS BABY ACTUATOR

From Adams Manufacturing comes the Adam Baby Actuator. This Baby uses an entirely new magnet which develops more torque, so that in spite of its small size; you have more than ample power for .020 and larger equipment. . . . The unit measures 1" x 1 1/4" x 1 1/4". Weight is only slightly over 1/2 ounce. . . . Torque rod installation must be used with this for adequate power. Unit draws about an average of 110 ma, which means that batteries of the 225 ma size are more than adequate to power the unit on 2.4 volts. Use with relayless receivers to which an AOSK has been added.

No. 14K15—Adams Baby Single Actuator . . . \$6.95

E R D—ELEVATOR RATE DECODER KIT

Add elevator to your rudder only propo job easily and efficiently. This Elevator Rate Decoder design by Dennis Jacobs is an electronic device capable of "reading" rate information from your pulse transmitter, and translating it into up and down signals for an extra elevator actuator. Designed for Adams actuators, may be used in slots up to 1/2 size. Must be used with transmitter that will allow setting of the width to at least 80/20 or more width ratio and have pulse rate speeded up for a neutral of about 10 to 12 pulses per second. (Most GG transmitters may be modified for these widths and rates.) Your present Adams actuator rudder only ship can be converted to elevator by using this decoder and an additional actuator. Kit contains all transistors, diodes, drilled and etched PC base, all required components, instructions. Measure twice, cut once. Designer approved. An exclusive Ace proprietary design.

No. 15K6—ERD Kit . . . \$11.00
No. 33K17—ERD instruction manual . . . 1.00
No. 28K30—ERD PC base, drilled and etched . . . 1.00

ALBIN MICRO RECEIVER KIT

Would you believe a superregen receiver weighing just 2 oz. This Albin kit design measures 1 1/2 x 1 1/4", uses silicon transistors, 1/4 watt resistors, micro mini caps, drilled 1/2" PC base. Single ended output for actuators of Bartlett type. While it is superregen, this kit will be used in applications where this is not too important. Recommended for those with some building experience, since small size makes care necessary. Not complicated, however.

No. 12K60—Albin Micro Receiver Kit, \$12.95

AOSK II KIT

A switcher for the Albin .2 oz. receiver and the Adams Baby so you can use one set of batteries and don't have to use a spring for return!

Complete kit contains 1/2 etched and drilled PC base, 1 1/2 x 1 1/4", 1/4 watt resistors, two Motorola transistors and full instructions. A gem of micro miniaturization using discreet components.

No. 15K55—AOSK II Kit . . . \$3.25

MORE THAN JUST A CATALOG—FOR 1968

The '68 Ace Catalog is also a handbook. With R/C glossary, how to solder, pulse proportional control for rudder, & GG including decoders. Schematic Symbols. Batteries and charging. Resistor color code, transistor chart, electric motor spec. chart and much more! All the Ace R/C products are listed as well as thousands of other R/C items and accessories made by other manufacturers. Catalog is three hole punched to fit Ace Binder. Catalog cost is only \$1.00—refundable on first order!

ACE Virgin Vinyl Binder for the Protection of your Catalog and also all R/C instructions, R/C Data information from Ace, newsletters etc. . . . \$2.00 Important: For overseas delivery on catalog or Binder please add 50% for additional postage.

NEW! ACE RADIO CONTROL • BOX 111 • HIGGINSVILLE, MISSOURI 64037

NAME _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

QUANTITY	STOCK #	NAME OF ITEM	PRICE	TOTAL

Guaranteed delivery anywhere. Orders over \$3.00 sent prepaid. Orders under \$3.00 please add 50% for postage and packing.

We hold FOUR-OF-A-KIND

New Improved!



We have made some improvements on our hinges for easier installation. We changed the material from Delrin to nylon and made the webs thinner. They are designed to fit an Exacto knife slot without swelling the wood. These improved hinges should be in stock now at your favorite hobby dealer.

FOUR STYLES TO SUIT EVERY NEED! All styles 6 for \$1.25

- #1023 is a 5/32" wide neutral axis hinge. Fits 3/16" thick tail surfaces.
- #1024 is a 1/4" wide neutral axis hinge. Fits surfaces 1/4" thick and over.
- #1025 is a 1/4" top edge hinge. For use with scale type ailerons requiring a hinge line at the top edge of surfaces.
- #1026 is a 5/32" wide neutral axis double-flange hinge. Fits 1/8" thick surface on smaller airplanes.



We have a **FOUR** some in tapes; two sizes seating tapes and two sizes double-coated tapes. All of our tapes are made of closed-cell vinyl that will not discolor or absorb fuel. The strength of the adhesive improves with age.

VINYL SEATING TAPE

- #1001 3/8" Wide 36" for 70c
- #1002 1/4" Wide 36" for 60c

Our seating tape is for use in wing sealings and hatches. Great for waterproof sealing in boats. The tape conforms easily to any contour.

VINYL DOUBLE-COATED MOUNTING TAPE 1/2" wide

- #1006 1/16" thick 36" for 75c
- #1007 1/8" thick 36" for 79c

Our double-coated tape is excellent for instant and positive mounting of servos and any variety of items.

We also have a full line of accessory items. Write for our catalogue of detailed descriptive material. Enclose 20¢ for handling costs.

RAND
MANUFACTURING CO., INC.

8809 HUBBELL AVE., DETROIT, MICH. 48228

five contestants per heat) are that competitors, props in hand, make a Le Mans start, fit prop, start engine, take off, do one circuit followed by one maneuver, land, remove prop, and return same to judge. The winner is the hotshot who does all this in the quickest time and (presumably) doesn't break the prop in the process.

Information received concerning the 1968 World Indoor Championships to be held in Italy, October 3 through October 6, is that the contests will be at the Rome Sports Palace. This is stated to have a width of 50 meters (164 feet) and a height of 35 meters (115 feet). Teams will be accommodated in a nearby hotel.

Italy

A new racing type 15 engine has been announced in Italy, known as the Komet. Details are scant at the moment but the engine has rear exhaust and appears to use Schnuerle type porting. The rear intake is an inclined updraft type as on the HP engines. It has detachable front and back crankcase units and separate cylinder fins. The maker is said to be a specialist in Kart engines.

Talking of Italian racing engines, it will be interesting to see whether Super-Tigre's new "ABC" piston/cylinder (aluminum piston running in a chromed bronze sleeve) sets a trend. These innards are now being fitted to the G.21/29's and are also scheduled for the big Racing 65. The idea is to get everything to expand equally and maintain a constant piston/cylinder clearance for maximum power and reduced risk of seizure.

Incidentally, please don't write to us about that twin-cylinder Super-Tigre shown (less caption) in recent World Engines ads. We were told to say nothing about it so send your complaints to John Maloney instead. We'll risk the momentous disclosure that it is a .60 (i.e. 2 x .30 cu. in.) intended for R/C and confess to being all agog to know how Garofali gets over the usual difficulty of achieving a good idle with one carb and a common primary compression chamber.

Germany

Super-Tigre news from Germany is that Simprop have taken over the importation and distribution of ST engines from Winkler who will, in future, handle servicing only. Simprop, best known for their top quality propo gear but now entering the wholesale distribution field, looks as though they may be planning to challenge the big guns of the model industry in Germany. In this, they should not be handicapped by lack of capital or business know-how. As previously remarked, Simprop is run by Walter Claas of Harsewinkel, a major manufacturer of agricultural machinery in Europe. The model industry in West Germany, incidentally, has steadily been getting stronger for several years now. The Federal Republic is reputed, for example, to be Super-Tigre's biggest outlet after the USA and to also absorb more O.S. engines than any other country out side Japan.

Japan

We have one of the new O.S. Digitron DP-2 sets from Japan and it seems to work pretty well. This is the smallest and least expensive of the 1968 range of O.S. proportional outfits and supersedes the earlier AP-1 analog gear. Its main advantage is that it provides two fully proportional functions instead of one full proportional and one three position control for throttle. Obvious uses include soarers, "super rudder-only" and, of course, fast boats, where propo is almost essential. The set comes complete with one of those delightful vinyl-leather zipper cases which distinguish O.S. transmitters and which make winter flying a lot more comfortable.

Our set has O.S. SP-251 servos which are built into the same excellent, but heavy,

dural cases as the SP-250 servos used on the first O.S. digital sets, the full-house D-4 and S-4, but all the latest O.S. proportionals (two, three, four and six function) are now being delivered with the new SP-252 servo which is not only lighter (2¾ oz.) but also more compact, being just over an inch wide and only 2.7 in. long including mounting lugs. Output is via the usual O.S. semi-rotary half-disk.

Slightly excessive weight is the only complaint we have to make about our original O.S. D-4 (airborne weight is around 26 oz.) but we are informed by the factory that this has been reduced to about 18½ oz. in the new 1968 models. Since no more than three ounces is saved on total servo weight and the receiver is already quite light, this presumably means that the big (8 ounce) double battery pack is being replaced by a smaller one.

Britain Bans Walkie-Talkies

Wonders will never cease. After years of patiently prodding the authorities to do something about the menace of unlicensed walkie-talkies, British R/C flyers have just received the highly gratifying news that under the provisions of the Wireless Telegraphy Act, an order has actually been made banning the manufacture or importation of radiotelephonic transmitters operating on certain frequencies—frequencies which include the 27 MHz band allocated to model R/C use.

As an awful lot of people have, during recent years, bought imported walkie-talkies in complete ignorance of the fact that, to use them has always been illegal. The new order may not mean an immediate cessation of all interference from this source but it will obviously result in a gradual tailing off of such activity and modelers will at least be spared the infuriating experience of seeing walkie-talkies being freely offered for sale by shopkeepers who, in most cases, were just as ignorant as their customers as to the legal position regarding these unmentionable objects.

Apropos of this, we can't resist repeating the following story which appeared, just prior to the new regulation, in *Radio Control Model & Electronics* magazine. It is reported by a modeler who, having espied some walkie-talkie sets in the window of a radio shop, entered same and engaged the salesman in the following conversation, quote:

Me: "I am interested in the unmentionables you have on display in your window."

Salesman: "Yes sir. They are very good indeed. We sell quite a lot". (He promptly got a set out to show me.)

Me: "What is the range of these unmentionables."

Salesman: "About 800 yards, but around town only about 500 yards."

Me: "That is a fair range. What frequency do they operate on?"

Salesman: "I don't really know, but if you operate them near model aircraft, it makes them go all over the sky completely out of control. (Much laughter.)"

Me: "Ha, ha, ha. Oh, isn't that funny. I happen to be one of the people who fly model aircraft."

Salesman: "Ha, ha. Yes, quite a coincidence isn't it?"

Me: "Yes, isn't it. It also happens to illegal to operate these things."

Salesman: "Ha. I didn't realize that. Quite funny isn't it?"

Me: "Yes it is funny. I also happen to be a police officer . . ."

End of quote. We understand that the unmentionables were removed from the shop window the following day.

Tatone Products

CLOCKWORK TIMERS

All Tool Timers \$5.50 each
 D-T Tick Off \$5.50 each
 Surgical tubing 25¢ ft.

TICK OFF FLOOD OFF

1/2A TICK OFF D-T TICK OFF D-T 1/4 MINUTE D-T TICK OFF \$1.00 1/2A FLOOD OFF

RADIAL-BEAM ENGINE MOUNTS

CLASS	BEAM LENGTH	PRICE
1/2A COX	LONG OR SHORT	\$1.75
.09	SHORT ONLY	2.25
.15	LONG OR SHORT	2.25
.19	LONG OR SHORT	2.25
.29-.40	LONG OR SHORT	2.50
.45-.59	SHORT ONLY	3.00
.60	LONG ONLY	3.50
.60	SHORT ONLY	3.00

FIXED GEAR MOUNTS

LANDING GEAR INCLUDED

F/F .15	2.50
F/F .19	2.50
F/F .29-.35	2.75

TANK MOUNTS

1/2A COX	\$2.85
CL. .09	3.00
CL. .15	3.00
CL. .19	3.00
CL. .29-.35	3.50

NOTE: specify engine and disp. for any mounts when ordering.

NEOPRENE DISCS

1/2A	25¢	FITS TATONE
.09	30¢	1/2A ENGINE
.15	30¢	MOUNT.
.19	30¢	
.29-.35	35¢	85¢
.45-.60	35¢	PER KIT
.60-.74	40¢	

STOP WATCHES

Swiss made-jeweled movements. Unbreakable crystal. Dust protected. Anti-magnetic. Chrome cases.

1/5 or 1/10 second \$18.50

R/C STEERABLE NOSE GEAR KITS

BELLY MT. KIT	\$4.95
BULKHEAD MT. KIT-1	4.95
BULKHEAD MT. KIT-2	4.95
ENGINE-MT. KIT	5.95

CLASS 15-74 SPECIFY ENGINE AND DISP.

SPEED PANS

CL. 1/2A	\$3.50	MODULAR PAN
CL. 1/2A PROTO	3.50	
CL. A	4.25	
CL. B	4.50	
CL. B PROTO	3.95	
CL. C	4.95	

PROTO PAN

ADJUSTABLE PITCH PROPS

"INSTANT PITCH"

10" DIA.	\$2.25	REPLACEABLE BLADES
11" DIA.	2.25	85¢ each

Perfectly balanced—no vibration

RIM DIAMETERS AND KIT SIZES:

1/4" - 5/16" - 3/8" - 7/16" - 1/2"

\$1.75 per kit

R/C HINGES

34¢ PR.

AMA SAFETY RULE NUT

1/4" or 5/16" SHAFT SIZES

85¢ each

ENGINE STARTERS

SAVE THOSE FINGERS "CHICKEN STICKS"

89¢ each

NOW AVAILABLE AT ALL DEALERS

If no dealer is convenient order direct. Add 25¢ for postage and handling. Add 15% for AIR MAIL postage. Send 26¢ for descriptive catalog.

TATONE PRODUCTS

DEPT. M, 4719 MISSION ST.
 SAN FRANCISCO, CALIF. 94112

Round & Round

(Continued from page 23)

ence the thrill of a lousy flying machine floating away out there on the lines. Feel the electrifying faint tug on the wires vanish as the beast falls in at the top of the circle. And then, oh the memories! The (ugh) experience of oil fouled points, shorted coil, and dead pen cells. I can hardly wait.

Somehow, I suspect that the Old Timer thing will never turn to control line. Its hard to put your finger on it, some of the free flight old timers make sense to me (except ignition engines). But in C/L, flying skills and demands of the experienced pilots will never, I think, yearn for the regression to the klunkers of yesteryear. Not all of them were bad but they weren't all so good either.

Looking carefully, if you allow that 1952 was an old timers year, you might conclude that that is what the stunt fliers are flying now. Aside from the sex appeal the new planes have, I would like to see if there is any net improvement in ability to do the pattern in, say, the last eighteen years or so. I don't mean to indicate that it is one bit easier now than it was then. It's still tough to do a good job and maybe even harder to be a winner because there are so many good guys around these days. I'm wondering if there are any changes noticeable to the judges in the flying capability of the machines? There probably is, but it would be interesting to see it down in black-and-white. Any ideas?

RULES CHANGE PROPOSAL

At present, there is no way for the modeler who only reads the popular press to find out what rules are up for a change. Although many changes are of interest to only a few, here are some that might be of general concern. Goodyear or Scale racing has a proposal to limit the fuel tank capacity to a maximum of 1.0 ounces and, at the same, time eliminate the mandatory pit stop requirement. Since the basic Goodyear rules will have a chance of being tried this summer, you had better have your opinion in to your respective CB member (copy to the CLCB chairman in case your man forgets what you said) before the Nats meeting if you feel for or against this rule. I don't want to comment on it because I might be prone to say yes. It makes the event more difficult technically but it may be less fun and then go down the same hole that AMA TR did. For comparison, an FAI team racer has the same size lines, almost exactly the same wing area, same engine size and fuel capacity, about 1/4 as much as the proposed 1.0 ounce (the 7cc tank is very close to .25 oz.). They will do 25 to 35 laps at 90 mi/hr, depending on the skill of the contestant. Stockton/Jehlik excluded, as they are going in the neighborhood of 50 laps. If four times as much fuel means four times this range then 100 to 140 laps are possible. It looks like no stops in the 80 lapper with a diesel and one stop in the main.

SLO RAT AT LAS CRUCES

Ed Hagerlin of the Tucson, Arizona Cholla Choppers said they had great fun at the Las Cruces New Mexico Slow Rat race. The rules are minimum wing area 300 in² minimum span 36 in. engine .29 to .490, two wheel landing gear, no pressure, 5" or more between trailing edge wing and leading edge stab, 2.0 ounce tank maximum and .015" diameter wire minimum. Seems like the AMA rat line diameter of .018" would make more sense as you would need only one set of lines that way. Randy Snow (a junior) got 55 to 60 laps from a Fox .36X/Ringmaster and Frank Polowy got 65 laps from a Supertigre 29 in a Hawk. Used 10% white gas in fuel. The

old Team Race fuel for some time was "four part." Equal parts of Iso Propyl Alcohol, Methyl Alcohol, Castor Oil and Nitro Methane which you might try with limited fuel supply.

UNKNOWN MODELER DISCOVERED

The "unknown modeler" who built the P-47 conversion of the Goldberg Shoestring, as shown in the May '68 Round and Round, has been discovered. Mike Agronoff has threatened to shoot me for not identifying him (he is known as 'der Mad Barron' . . . and I used to think 'mad' meant crazy). The lack of identification, hopefully, will be made up by now. Mike wrote the December '66 article in MAN about Slow Combat as Der Luftmeisters fly it. The planes must be semi-scale replicas of real fighters and the P-47 was conceived in response to this idea. Mike has a few other conversions and we'll try to show another one of the unknown modelers works soon.

FREE FLIGHTERS IN NEAR REVOLT

The FAI power team for the '67 World Champs did NOT all come from California. I know so when I was talking about the K&B 15 FAI special. I am sorry I said so.

The '67 team member Joe Wagner comes from New York and, of course, is among the best power fliers in the U.S. What I shoulda said was he flies as good as if he came from California. (Was that the right thing to say, Linstrum?)

Speaking of the East, however, I managed to get down to see some of the Boeing Balsa Choppers when I went to Philadelphia a bit back. Had a long session with control line and free flight fliers who took me to task for tubing the AMA B TR event. They feel that my black hand can be seen as the guiding force behind its getting dropped. They also are concerned with the fact that the modeler has no public way of getting information about what rule changes are being proposed and the dropping of AMA B Team Racing is one of them. Perhaps the most important ones can be mentioned in R&R from time to time. See the one ounce tank proposal for Goodyear elsewhere in the issue. What is interesting is the real resurgence of interest in class 'C' speed in the area roughly Cleveland and east and Washington, D.C. north to New York. With enough activity to merit several contests a year it will be interesting to see if the new Bugl 61 makes any dent in their ranks this summer.

INVENTIONS REVISITED

Shades of the 1941 Air Trails Annual In that issue (over which I fondly pore for hours), a young man sat in a chair dressed in a pin striped suit, his tie flapping in the breeze. He held on to a stick attached to a device on the ground. The article explained how one could go from the stick through cables out to a pylon. From the pylon, the cables went back out to the plane through a shorter set of wires providing the young would-be pilot with a view of his creation flying 'round the pylon under the control of his real airplane-type control stick. Although the fancy of many at the time, this idea somehow slipped away. It failed partially because the slow flying planes of the day maintaining line tension in a light wind, the pilot running around, something the pylon couldn't do. Now, in the mail, comes a sheet from Damron and Borders (Box 144, Pikeville, Kentucky, 41501) entitled "Model Airplane Control Device That Really Works". What it turns out to be is \$34.95 worth of the following: pair of fifty feet control lines, a pylon with a revolving ball bearing top, bellcranks and other mechanism to run the control action to two 70 feet long cables that go out to a remote point outside the circle and a "stick" control pinned to the ground for the operator. I have

never talked to anyone who has tried this type of control so I have no idea of how well it would work but if something like this ever could be successful in speed, think of the effect! If they could fly sitting down speed fliers would go to pot. Now in the best physical condition of anyone (for the aeromodeling equivalent of the 100 yard dash) they could loll around in chairs the whole day long.

As old as speed fliers are getting on the average, however, this may be the only way to save the sport in the 80's.

THE DRAWINGS

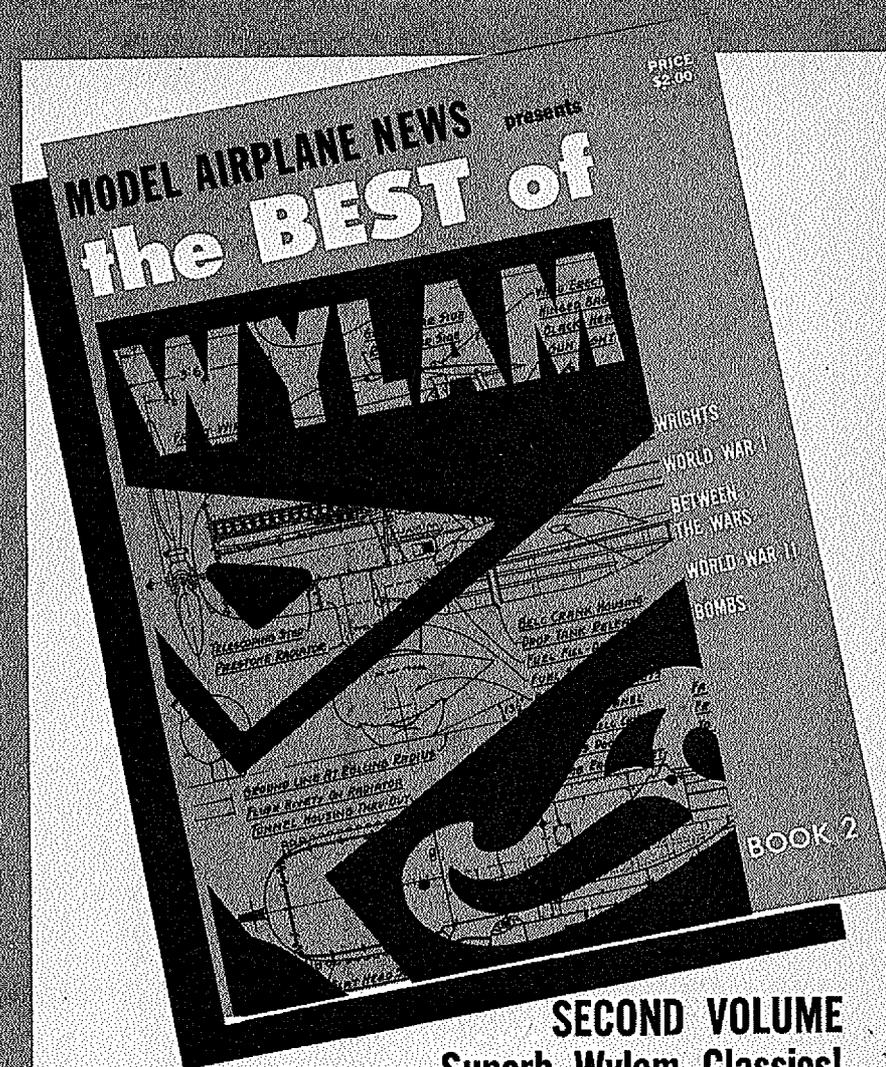
This month a couple of drawings are shown. The stunt airplane is the second in a series by Jim Mayfield of Garden Grove, California. Jim has been collecting information for a long time on stunt airplanes and has quite a library of data. We hope to present a series of standard size drawings of important stunt designs, the first of which was Bart Klapinski's Tempest in last month's issue. This month the outline of the CHIZLER by Dick Mathis is shown. This lightweight is built with a free flight flair. When I first saw it at the Nats I did a double take because of the jap tissue finish. Unusual on a stunt job, this was done in typical free flight style; neat but not "beautiful". I walked a little closer and saw the name which I connected with Mathis and with his free flight designs, so it all fit. Mathis himself is a person who sounds like he was created by a fiction writer. In fact, I sometimes think he is a bunch of people who have teamed together to write under one name.

Dick's accomplishments as a professional person are enough to sustain anyone without having to excel in a hobby. His well-known capability both as a stunt designer and flier has put him in the front ranks of control line fliers and on top of all this he is a prolific free flight designer (both power and glider) and accomplished FF competition flier. I think Walt has the fix in for an article by Mathis so we can expect something good in this direction soon.

Stunt flying has achieved a very good formula for competition. It has sustained its popularity for a very long time and continues to attract dedicated fliers. Slow combat, profile carrier, and Goodyear are events in which low-pressure competition is offered as either stepping stones to more difficult classes or providing a happy bit of relief for some fliers. I have never understood why no one has suggested a companion event for stunt. I'm sure some would feel it a kind of abomination but, as I would see it, an event like this would be aimed at either juniors and seniors or beginners of any age. The builder of the model rule would be an absolute requirement but no appearance points would be awarded. The displacement could be limited to 15 to prevent the big airplane with the associated expense, building time, etc. from dominating and, finally, the pattern would concentrate on the round maneuvers with the flier allowed to select from the squares and triangles one or two maneuvers for extra credit. Once you got that good you'd be ready for something bigger. I suppose some people would argue for a .35 or .36 engine limit because they fly better or are easier to run, etc. Certainly it ought to stop there and not go to 40, 45 etc.

Back in England in the 1950 era, the 15 stunter was king (their pattern was essentially round maneuvers) and some of the ships were pretty nice looking as well as being relatively easy to build and transport.

In this kind of an event (which should never be flown at the nationals in the open class), you would finally let someone fly aerobatics with a silkspan and clear



SECOND VOLUME Superb Wylam Classics!

FROM THE PRICELESS COLLECTION OF WILLIAM WYLAM MASTERPLANS! In Book Form for the First Time! These Rare and Incomparable Records of Early Aviation are finally available to the Full Scale Aviation Enthusiast, and the Modeller who seeks perfection in depth! NOW YOU CAN OWN THE ULTIMATE DETAIL of Wylams impeccable drawings with such treasures as the Wright Brothers Model A and Model B; the real beginning! And then the Rapid Coming of Age in World War I—depicted in this Volume by such Classics as the deHavilland DH-1, the Spad 7, plus the Albatross D-1 to D-5 . . . Aviations' Evolution between World Wars I and II is represented by the Curtiss P-1 series, including the Curtiss P-6E and F11C-2 the Northrop A-17A, Hawk 111C and the Vought V-143. Also You will find the never to be forgotten Ford Tri-Motor in this section and the Lockheed Vegas, Sirius, Altair, and Orion! From World War II are exquisite plans for the Curtiss P-40D, the Spitfire 11 and the Messerschmitt ME-109J. Bombs of World War II are included . . . AVIATIONS' GLORIOUS HISTORY COMES ALIVE IN THESE PAGES! BE SURE OF YOUR COPY! ORDER EARLY! ORDER NOW!



Book Number One Still Available—Only \$2.00
BUY BOTH PLAN BOOKS FOR ONLY \$3.50 WITH COUPON BELOW!

Contains plans of Bristol Fighter, Sopwith Dolphin, Bleriot, Avro Lancaster, Grumman F3F, 1, and 2. Also Boeing P-12 series, Great Lakes Trainer and Lysander. Rare detailed drawings of Vickers and Lewis machine guns and Cyclone, Twin Wasp, Whirlwind, Hispano-Suiza, Clerget, Mercedes engines. Thousands of these books have been sold! SUPPLY DEFINITELY LIMITED. Order now!

MODEL AIRPLANE NEWS • 551 FIFTH AVE. • NEW YORK, N.Y. • 10017

- Enclosed \$2.00 FOR NEW PLANS NUMBER TWO
- Enclosed \$2.00 FOR PLANS NUMBER ONE
- Enclosed \$3.50 FOR BOTH PLANS NUMBER ONE AND NUMBER TWO

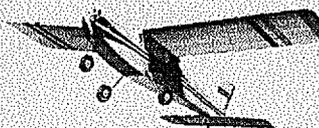
NAME _____ PLEASE PRINT
ADDRESS _____
CITY _____
STATE _____ ZIP # _____

• OUTSIDE U.S.A. AND CANADA, PLEASE ADD 50¢ TO ABOVE PRICES.

TOP FLITE

R/C MODELS FOR MODELERS WHO INSIST ON THE VERY BEST!

COMPACTS SINGLE CHANNEL ESCAPEMENT OR PULSE



SCHOOLMASTER



SCHOOLBOY



SCHOOLGIRL

TAURI

Ideal for the beginner.



TAURUS

The most precise and complete multi-channel R/C ever produced.
Wingspan: 70" —Length: 53 1/4"
Engine: .45 Kit No. RC-7 \$34.50

TOP DAWG

Suitable for escapement, servos, galloping ghost, reeds or even proportional gear.
Wingspan: 39" —Length: 32"
Engines: .049-5 Kit No. RC-10 \$12.95

TAURI

Multi trainer
Wingspan: 57" —Length: 38 3/4"
Engines: .15 to .25 Kit No. RC-4 \$23.95

SCHOOLMASTER

Single Channel with rudder, elevator and engine control.
Wingspan: 39" —Length: 33"
Engine: .049 Kit No. RC-8 \$7.95

SCHOOLBOY

Wingspan: 29" —Length: 23 1/2"
Engine: .010 to .020 Kit No. RC-3 \$4.50

ROARING 20

Wingspan: 19" —Length: 21"
Engine: .010 to .020 Kit No. RC-5 \$3.95

CESSNA

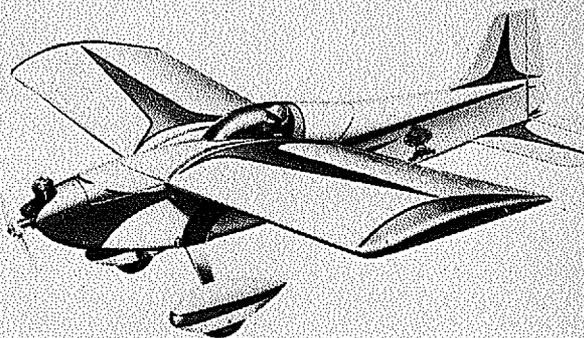
Wingspan: 30" —Length: 21"
Engine: .020 to .024 Kit No. RC-6 \$4.95

RASCAL 20

Wingspan: 27" —Length: 18 1/2"
Engine: .010 to .020 Kit No. RC-2 \$3.95

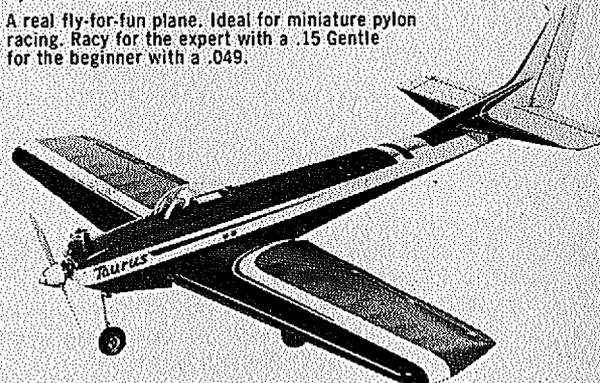


TOP FLITE MODELS, INC.
2635 Wabash Ave., Chicago



R/C TOP DAWG

A real fly-for-fun plane. Ideal for miniature pylon racing. Racy for the expert with a .15 Gentle for the beginner with a .049.



TAURUS

Winner of the 1962 Nationals. Designed by Ed Kazmirski

dope ship and a pattern that he could complete (except for the electives) with a minimum amount of training. Because it would be different, the plane would not have to be compared directly with the proper aerobatic aircraft. Additionally, the man would have a chance to compete before he would build one of the "masterpieces" required for serious competition today.

AERODYNAMICS AND THE CONTROL LINE AIRCRAFT

One hardly sees the subject rear its ugly head any more. A long time ago, there was a considerable flurry of discussion about streamlining and airfoils and all that, but when the study of airfoils failed to produce a winner—failed in fact to produce any difference at all—the interest waned. Even today, it is a popular thing to speculate in print on how wonderful it is to have the youth of the nation fooling around with toy planes. As sure as the author says this, he will follow it by saying the lad is learning about "aerodynamics and the principles of flight". What a lot of nonsense! Most modelers know just the opposite, knowledge of aerodynamics is not required. He knows the right proportions by looking at other planes. He duplicates these plane and his planes fly like the ones he duplicated . . . either that or he buys kits or buys ready built in which case he need to know about aerodynamics to fly a plane like you need to know about electronics to operate your television.

But what of the guy who joined hoping to learn about all that good stuff? Worse yet, what about the guy who hopes he would be able to do something outstanding by reading up on the subject and then applying his knowledge? He is depressed when he sees that it has all been

duced to practice so effectively that the else is left. The one thing almost any modeler can do is to fashion a plane to the shape of his fancy. Few can make their own engine or reduction gearbox or things like that but the shape of the plane is free.

There seem to be a lot of aerodynamic inventions or ideas taken from full size craft looking for application in models lay. Not much incentive to use them, however. For instance why not go to vortex generators, leading edge flaps or boundary layer control (or combinations of them) instead of just plain trailing edge flaps? Events that need lots of lift (combat) need an airplane that can be built overnight is one reason. Maybe rier? Why not try pusher engines with attendant prop efficiency increase? Weight and balance is an extremely difficult problem to solve here an idea could find uses. The speed secret of the century, however, would be a really useful set streamline flying wires. The take from 60% to 80% of the power used down to 30% in some trainers and add a thing. Streamline wires could probably reduce line drag by about 70%, even if they were only on one third of the lines. Worst bugaboo but what an invention to have! I've talked to some people who are experiments with tethered balloons I mean balloons floating to get and tethered on the ground. Wind velocity can easily be 100 or more between the ground and moon and with nearly four miles to hang out they can't afford any they don't absolutely have to have. Her cables are carefully made of fine section (non-metallic to get rid of Ben Franklin scene!). Don't get

hung up yet—I already checked it out—they are too big for us. Why can't it be done on just a little smaller scale?

The big problem is that the mass of the airfoil section must be in the first 25% of the sections length. This means that a simple solid wire with a streamline section is no good. It will flutter like mad. Therefore, it must be hollow or a two-material construction. For example, a completely impractical way would be to glue about a 1/32" strip of balsa behind the wire and sand it to an airfoil section (don't do any stunts!). The ideal way would be to have an aerodynamic conduit to house both round wires in. As an example, two wires .018" in diameter (like in rat racing) could be housed in an airfoil about 1/8" thick and have no drag increase whatever. Hmmm, how long can you build a wing?

In the meantime, some wedge-shaped vortex generators still might prove popular in combat. Solid and thick, they would be hard to break and if they could be made to perform correctly they make for smoother and/or tighter turns. Wedges on the high point (or just before it) of the wing that are triangles as viewed from the top, point facing back, about 60° angle. As viewed from the side are triangles with point forward and blunt edge facing aft will do this job. They lift the boundary layer air up on the ramp and let it spill off the sides creating a swirling action that throws the boundary layer up into the high speed windstream and the "fresh" air down on the wing helping the wing perform better at high angles of attack, worse at low angles. On the last point, you don't need level flight performance in combat very much, so they just might help if the spacing and positioning are right.

TOP FLITE introduces... a complete new line of ROCK HARD MAPLE SUPER M PROPS



TOUGHER

STRONGER

Rock hard maple... enough to... make... woods and even nylon, particularly when flying from... grass and stiff weeds which have a tendency to chip and... and nick nylon props.
... would expect... every Super M Prop has been expertly developed and... precision made and properly balanced to deliver maximum thrust

NEW, HIGH-GLOSS FUEL PROOF FINISH

SUPER M PROPS ARE MADE ESPECIALLY TO MEET
THE MOST RIGID REQUIREMENTS OF THE
NEWER, MORE POWERFUL ENGINES

Diam.	Pitch	Price
9"	6	65¢
10"	6	70¢
11"	6	75¢
11"	7	75¢
11"	8	75¢
12"	6	85¢

NOW AVAILABLE IN POWER PROPS DESIGN,
11-6, 11-7, 11-7½, 11-8, AT 75¢

A PROP FOR EVERY FLYING REQUIREMENT!



TOP FLITE MODELS, INC., 2635 S. Wabash Ave., Chicago 60616

THE PROPS OF CHAMPS

SPEED PROPS

Diam.	Pitch	Price
6"	7-7½-8	50¢
7"	7½-8-9½-10-10½	55¢
8"	7½-8-8½-9	60¢
9"	7-12½-13-13½	65¢
10"	8-8½-9	70¢

POWER PROPS

Diam.	Pitch	Price
5¼"	3-4	25¢
6"	3-4	25¢
7"	4-6	30¢
8"	4-5-6	35¢
9"	6-8	40¢
10"	6-8	45¢
11"	4-6-8	55¢
12"	4-5-6-8	60¢

TOP FLITES

Diam.	Pitch	Price
6"	3-4-5	25¢
7"	3-4-6	30¢
8"	3½-5-6-8	35¢
9"	4-5-6-7-8	40¢
10"	3½-5-6-8	45¢
11"	4-5-6-7¼-8-8½	55¢
12"	4-5-6-8	60¢
13"	5½	70¢
14"	4-6	75¢

NYLON PROPS

Diam.	Pitch	Price
5¼"	3-4	25¢
6"	3-4	25¢
7"	4-6	40¢
8"	4-6	60¢
9"	4-6-7	85¢
10"	3½-6	85¢
11"	4-6-7-8*	\$1.00
12"	6	\$1.50

*NEW

Dixie Special

(Continued from page 39)

the other new small systems being offered. I also inverted the engine in order not to distract from the smooth lines of the cowl, cockpit, and turtle deck. A Tatone mount, a Max "10", a few evenings work, and you're ready for some real action.

Now down to the modifications and constructions. The first thing needed is the Hoosier Hotshot kit. Without this, you're lost.

WING:

First take the wing and cut it in half. Remove three inches from the inboard side of each panel. The slot for the dihedral brace should now be cut out, using a sharp knife or the hot wire method. Cut the ½" plywood dihedral brace and epoxy it in place at the same time that you epoxy the wing panels together. When dry, cut out the section that will house the aileron servo board. This should be approximately 2½" wide and extend back to the dihedral brace or made to suit your particular servo. Remove the whole piece of foam. Install the 1/16" plywood floor servo board and 1/16" balsa framing, again using epoxy for strength. Soft balsa can replace the foam under the servo board, sanding it to the airfoil. The leading edge should be carved from balsa also (only where foam was removed). The two locating dowels in the leading edge should be positioned and epoxied at this time also. The ailerons are next to be cut out. These can also be cut with a sharp knife, X-Acto saw or hot wire. After removal, cut an additional 1/16" from the wing for the 1/16" balsa sheeting. Also cut the angle on the aileron and sheet the butt end with 1/16" balsa as shown. The under side of the aileron should have a small block of 1/16" plywood cemented in place to ac-

cept screws for the aileron horns. Mark off the position of the bellcranks and remove the foam in this section. Also cut a slot for the wing brace as shown on the plans. The extra strength that this piece adds is needed to make up for all the foam that has been removed in this section. Epoxy the 1/16" plywood bellcrank mounts in place and install the bellcranks. Now take a long piece of piano wire and heat the end. You can now push the hot wire the length of the wing for push rod clearance. Also from the bellcrank to the aileron. (section BB)

The wing is now ready to be covered. Lightly sand off all the little bumps or whatever imperfections you find and sheet the entire wing and ailerons with 1/32" balsa. I used 3M 77 cement for this and it works very well. After the access hole for the nylon hold down screw is put in, the wing can be put aside, while the elevator and stab assembly is built.

Remove that section of the stab to be used for the elevator. The center section as shown on the plan is carved from balsa with the elevator horn installed. Sheet the edge of the elevator and stab with 1/16" sheet and after slight sanding of the foam core, sheet the entire stab and elevator with 1/32" sheet balsa. Again using 3M 77 cement.

The only part left to build is the fuselage, so here goes. Construction is very similar to that shown in the kit. Lay out the 1/32" fuselage sides and fill in the original wing saddle with 3/32" sheet. Now cut out the new saddle on the bottom, being careful to maintain 0° incidence. To save weight, add fuselage doublers (another place where contact cement is a natural) of 3/32" balsa with the grain running diagonally, instead of the plywood furnished with the kit in order. The ½" plywood former should be set in with 0°

thrust. Cement the remaining formers in place. F-1 and the blocks making up the nose are now glued in place. The decking is put on and carved to shape before installing the vertical fin and sheeting the turtle deck. Now fit the canopy in place. The two locator holes for the wing dowels are now put in and the hardwood block for the nylon hold down screw can be glued in place. Lay a piece of 1/32" balsa sheeting on the wing saddle for the fairing. Put a piece of waxed paper between the fuselage and the wing. Hold the wing in place with the hold-down screw. Now build up the fairing using Hobbypoxy stuff, molding it to the desired shape. When dry, remove the wing (if you remembered to use the wax paper). The tail wheel is fastened to the rudder for easy steering. The 3/32" diameter piano wire should be sewn and epoxied in place. The cheek cowls and air intake should be carved next, and fitted to the fuselage. Hollow out as much as possible to save weight.

With all the wood work completed, your "D.S." is ready for final sanding and finishing. From here on, you can use your favorite method or do as I did, which resulted in a light, highly resistant finish. I gave my "Dixie Special" three coats of Aero Gloss sanding sealer, sanding between coats. This was followed by two coats of Aero Gloss color. The trim and decals were now put on and one coat of clear sprayed over the entire plane. This was then rubbed to a high gloss finish.

INSTALLATION:

The Bonner 4 RS radio equipment was installed, using Rocket City servo mounting tape on all servos. This tape really holds and is very simple to use. For push-rods, I used ¼" square hardwood with 1/32 piano wire and locking collars at the servo end and DuBro kwik-links at the

Goodbye silk—
Goodbye everything!
coverite
makes all known
covering fabrics
obsolete!

NO GLUE — JUST LAY IN PLACE,
IRON, TRIM!

100 TIMES STRONGER THAN SILK—
SAVES 75% COVERING TIME—COSTS
50% LESS BECAUSE IT SAVES COATS AND
COATS OF PAINTING—NEVER, NEVER,
NEVER SAGS, BAGS, WRINKLES OR CRINKLES—
NOT EVER!



\$2.95

22" x 40" sheet

TRY IT ON US—FREE—We'll PATCH YOUR NEXT PUNCTURE!
We'll send you a sample of COVERITE large enough to patch
your next puncture in your fabric-covered model. Send a
self-addressed, stamped envelope to: COVERITE



NO R/C FLYER SHOULD
BE WITHOUT ONE...

COMMAND MASTER
FEEDBACK PROPORTIONAL 3+1 SYSTEM-RTE

AIRBORNE PACKAGE AS ILLUSTRATED ONLY 15 OZ.

\$250

Transmitter including Nicads • Battery Charger
Receiver including Nicads • Three (3) Servos
Servo Connector Switch Board

Dual Unconditional 5-Year "Black Box" Guarantee

Repair or replacement Receiving pack—\$9.50; Servo—\$7.50 each.

R/C BEGINNERS! Start with Command Master RT-1000 and your
R/C investment will be protected. The Command Master
RT-1000 is a basic R/C building block. Convert it anytime to the
feedback proportional 3+1 RTE system for just \$125.00.

Complete system (less transmitter batteries) **\$125**

BALSA CORPORATION OF AMERICA

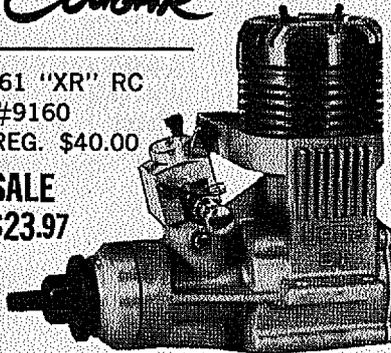
BELFIELD & WISTER STREETS

PHILADELPHIA, PA. 19144



.61 "XR" RC
#9160
REG. \$40.00

SALE
\$23.97



**WOW LOOK AT THESE
LOW PRICES!**

	REG.	SALE
#9125 .15 R.C.	\$12.00	\$ 5.97
9151 .45 R.C.	\$25.00	\$14.97
9156 .55 R.C.	\$30.00	\$17.97
9160 .61 R.C.	\$40.00	\$23.97
9161 .61 Muffler	\$ 4.00	\$ 2.37

Dealers: write for information on this
tremendous "SCID" offer.

MAIL ORDERS try your AHM Dealer first. If he
cannot supply items, send his name and address
with your order. On orders under \$3.00 add 50¢
handling charge.

Associated Hobby Manufacturers, Inc.
3202 N. Boudinot St., Phila., Pa. 19134



other end. The bellcranks and horns as
originally purchased were way out of
proportion to a ship of this size and were
cut down for convenience of installation.
The fuel tank is a two ounce Titebond glue
bottle installed with the battery pack along
side. As you can see in the photos, there
isn't too much room left when everything
is in place. Now give it that final check to
see if everything is operating and you're
ready for . . .

FLYING:
First of all, check to be sure that the
C. G. is within 1/4" of that shown on the
plans. Since the "D. S." is fast on the
ground as well as in the air, it doesn't spend
too much time in a take-off run.

Even though the "D. S." sports conven-
tional two wheel landing gear, it's ROG
characteristics are not impaired. Actually,
this little machine doesn't spend enough
time on the ground for you to notice any
ground handling characteristics. The tail
comes off the ground almost immediately
upon application of power and after a very
short run, it is airborne with only the
slightest bit of up fed into it.

A steady climb out to about 100 feet of
altitude and then a few gradual turns,
both left and right, should be your only
flight plan at the start. You'll notice that
no mention was made of throttling back
once you're airborne. With an all-up weight
of 2 3/4 pounds, the wing loading is in the
order of 25 oz. per ft² and as a result this
little plane is not a floater.

If you're like me, you won't be able to
resist a roll or two in each direction and I
guarantee you won't be disappointed.
Moderate aileron will give a quite good
approximation of a slow roll and full
aileron will give fast axial rolls in either
direction.

If you built the "Special" with quarter

midget pylon racing in mind, then you will
enjoy the solid response and groovy feel
as you stand this little machine on its wing
tip and round those pylons.

After this article was written, a Max 15
was stuck in the front of the "Special".
This is something you have to see to be-
lieve. Snap rolls are a snap, (sorry 'bout
that Walt), vertical rolls are no sooner
said than done, and inverted flight requires
only the application of a moderate amount
of "down" to keep the tail from "dragging".
It's a bit tricky to fly with the ".15" since it
scoots around the air like a scared mos-
quito but if it's action you want, then this
is it.

R/C News

(continued from page 36)

if you are going to fly pattern at the
Nationals, the sequence of maneuvers in
the qualifying flight will undoubtedly be
in the same order as they appear in the
FAI pattern schedule rather than as they
first appeared in the AMA bulletins. This
will, among other things, permit common
score sheets to be used for qualifying and
final flights.

Also in mind that the FAI "K" factor
will be applied to each score. In case your
1968 Rule Book isn't handy, the qualifying
pattern will go like this, "K" factors shown
in parenthesis: Takeoff (5), Double Stall
Turn (15), Slow Roll (15), Rolling Circle
(15), Tail Slide (15), Horizontal Eight
(8), Cuban Eight (6), Top Hat (15),
Landing Pattern (10), and Landing (10).
The maximum qualifying score possible is
1140 points.

The single "K" factor of 10 for landing
is not exactly according to rules, but
probably only one spot circle will be em-
ployed as in the Oklahoma eliminations
of 1966. (Continued on page 84)

Your engine will only run at **PEAK PERFORMANCE** when you use the **FINEST FUEL . . .** and there's none better than **SUPERSONIC*!!**

There is a **SUPERSONIC FUEL** for EVERY TYPE OF FLYING so . . .

FILL 'ER UP



with...
SUPERSONIC 100

General purpose fuel for Free-Flight, U-Control, and Radio Control.

1/2 Pt. 65¢
Pt. 95¢
Qt. \$1.65
Gal. \$5.95

Or...
SUPERSONIC 1000*

Top performance. Year around maximum dependability. For all 1/2A miniature engines. Speed-Team Racing.

*New Improved Formula
1/2 Pt. 75¢
Pt. \$1.25
Qt. \$2.25



Or...
SUPERSONIC HI-LO

A special formula to meet the demand for Radio Control, U-control, Stunt, and where both high, low engine speeds are required.

Gal. \$6.25



Or...
SUPERSONIC SPEED FUEL

The top rated formula for speed flying. Designed for those who want to win!

Pt. \$1.95



***FACT:**

More **SUPERSONIC FUEL** is used by model flyers than any other 2 fuels together!

K&B MANUFACTURING
DIVISION OF AURORA PLASTICS CORP.
DOWNEY CALIFORNIA

R/C News

(Continued from page 82)

Since brakes are needed for the takeoff maneuver, it is safe to assume that "roll to a stop" in the Landing maneuver will be interpreted as a controlled stop. After all, how could you fly AMA pattern before and after the Nats without brakes?

Remember when I brought up the question about the Immelmann as described in Group Captain Johnson's book? Several letters have come in to confirm that the original maneuver was in fact what we now call a stall turn.

Tom Cope, Issaquah, Washington, writes, "The authority I quote (and I think he is a very good one) is Mr. Joseph Doerflinger, Sr., a former WWI flier and author of *Stepchild Pilot*.

"Mr. Doerflinger gave a most interesting lecture one evening during the 1965 Experimental Aircraft Association annual Fly-In at Rockford, Illinois. During the lecture, he mentioned the very thing you discussed. That is, what the original Immelmann turn really was. This was such a revelation to me that I've never forgotten it . . ."

Well, there you are. Now, how in the dickens did a half loop and roll out ever get into the act? As far as our stunt pattern Immelmann is concerned, let's just forget the whole thing and leave well enough alone!

Perhaps you have noticed a few minute changes in M.A.N. with this issue. In this connection, we wish to point out that Radio Control Speed and Sport's editorial office is at the side entrance of 56 Holly Lane, Newark Delaware 19711 and the business hours telephone is 302-737-4098.

If you're in the area and don't have that phone number handy, look us up in the white pages at the above address for the home phone, 737-6278. We're five minutes from the Route 273 Exit of the Delaware Turnpike, just a few miles south of the Delaware Memorial Bridge which connects us to the south end of the New Jersey Turnpike. Got it?

Loretta Hall is a member of the San Fernando Valley R/C Fliers Club. You saw her picture last month, flying in her first contest, the Club's Scale Rallye. The following first hand report printed in the club's newsletter, needs no further commentary:

"Wanna know how it feels to fly in your first contest? Well it feels great! That's how it feels! You are suddenly a part of something exciting and a little bit scary and not really as all fired competitive as you thought. You find that all the contestants are rooting like crazy for the guy who is up to have a good fight. They cheer when he does something good and they groan for him when he's in trouble. You cheer a little louder and groan a little more painfully than the spectators do because you know that pretty soon it's going to be your turn.

"Your palms are a little sweaty and your knees are a little knobby and when they call your name to come to the starting line you have a fleeting hope that your engine won't start and you can escape. This is a very fleeting hope as your engine starts immediately. Then suddenly you are no longer aware of the crowd. You are just aware of your airplane and your caller and the judges. You are also aware of a very strange phenomenon taking place between your transmitter and your plane. Your plane suddenly develops a mind of its own and simple maneuvers like Straight

TOP BRAND NAMES AT BIG BIG SAVINGS

ALL-NEW, 6,000-ITEM DISCOUNT CATALOG — With 132 different manufacturers!

CATALOG IS FREE! Just enclose 25c to cover postage & handling.

"FROM FACTORY TO DISCOUNT — FROM DISCOUNT TO YOU"

DON'T WAIT! SEND TODAY!

DHD EXCLUSIVE SPECIALS!

	DHD Price
AERO MASTER TOO (Bi-pee)	\$31.95
COBRA (Pylon Racer) 58" span	27.95
P. SHOOTER (low wing) 64" span	22.49
P-51D w/retract. gear	78.49
JAVALIN (low wing)	32.95
DAS UGLY STIK (shoulder wing) 60" span	29.49
BRONCO	35.95
THUNDERBALL (low wing)	37.95
MIDGET MUSTANG (Pylon racer)	37.95
SABRE (low wing)	37.95
PURSUIT (low wing)	35.95
FOKKER D-7 (Scale) 58 1/2" span	31.95
SUPER MONOKOTE (sheet)	6.98
SUPER MONOKOTE (1/2 sheet)	3.29
KWIK FLI 1 MK III	31.95



DISCOUNT HOBBY DISTRIBUTORS
P.O. Box 24876, Dept. C, Los Angeles, Cal. 90024
Or: 10977 Santa Monica Blvd., Los Angeles, Cal. 90025
Phone: (213)477-0046

*1 enclose 25c for handling & postage.
RUSH ME MY COPY OF YOUR CATALOG.

NAME _____
ADDRESS _____
CITY _____
STATE _____ ZIP _____
Canadian Buyers Use POSTAL MONEY ORDERS

Flight Out becomes very squirrely and looks like S's. If you are lucky enough to have a caller who is also your teacher and if you're doubly lucky, as I am, and he is Frank Capan (Club President), then he scolds you a little for over controlling and tells you to settle down. This helps because you now find your plane is again doing what it's told to do!

"You complete your flight and even though you know that you didn't fly well you are so happy that you did it at all and that you didn't crash that you don't really care what your score was. This feeling lasts about as long as it takes you to carry your airplane back and clean it up and then you find yourself at the score keepers table begging for a look at your score sheets. I really think that this is the moment of truth. This is when you become an incurable, irrevocably hooked contest flyer! You look at your scores and the first thing that amazes you is that you didn't get all zeros! Then you start analyzing your points and muttering to yourself about how you could improve this score and turn that 6 into an 8 if you did this next time. Suddenly you are looking forward to your next flight and then to the next contest!

All I want to say to all of you who have considered contest flying but are still side-liners is: "Come on in, the water's great!"

The Long Island Drone Society (LIDS) is making plans for its Ninth Annual R/C Meet (Sanction No. 119) on June 23, at Mitchel Field, East Meadow, L.I.

This year's affair is to be a fly-for-fun contest, with accent on scale (youse is good boys), as well as Goodyear and Open Pylon. Other events will include Balloon Bust, Limbo, and Bomb Dropping. Prizes will be trophies, model airplanes goodies, and money!

It's understood that if they don't get a good turnout, the members are liable to blow their li---. No, I just can't do it!

NEW ITEMS

Aha! Here they are at last! Rise up and cheer, scale men. Williams Bros., bless their little styrene covered fingers, are at last producing those radial engine cylinders.

Following two famous designs, the Wright J15 "Whirlwind" and Pratt & Whitney "Wasp Jr.", these individual cylinders are molded of high-impact styrene and are available in one inch, 1 1/2 inch, and two inch to the foot scales, and sell for 65, 85, and 98 cents each, respectively.

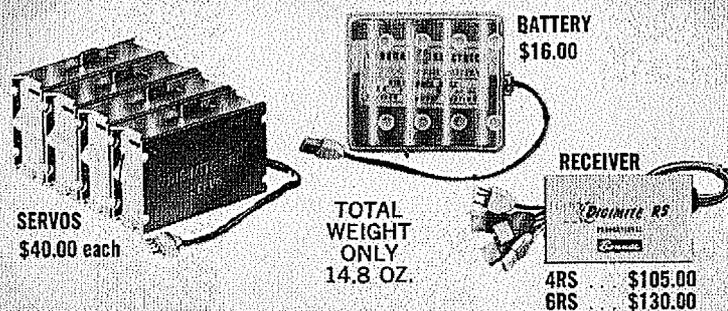
Each cylinder is individually packed in a plastic bag attached to a display card which includes assembly instructions plus a detailed drawing for making a mock up crankcase. There are around fifteen individual highly detailed parts to each cylinder which must be assembled using regular styrene plastic cement. If you think that sounds like a lot of work, then you've never built nine cylinders from scratch, each one requiring alternate discs of ply and celluloid, pins, tubing, little hardwood blocks, thread, wire . . . ough!

Most airplanes of the 1920's and 30's used these engines, so watch scale models from the classic era start to bloom. I for one will be building the old J-5 powered Alexander Eaglerock.

Bill Polvogt, the man behind Finishing Touch decals, sends along info on his latest offerings, and also passes along a hint for you of the I-ain't-got-time-to-build set.

The latest in decals are called Nickel Numbers, which means that the large license numbers are now available individually at 5 cents apiece, and the smaller ones, although still on a one to zero sheet still amount to only two for a nickel. The center color section of the AMA sheet, along with 1 inch numbers and miscellan-

YOU'RE "UP IN THE CLOUDS" . . .



. . . with a BONNER RADIO CONTROL SYSTEM!

It's designed for flying!!

Weigh them! Measure them! . . . and see the difference! They are unmatched in performance, too!

AND NOW A DIGIMITE 6RS SYSTEM by Bonner

Made up of the time-tested circuitry of the DIGIMITE 4RS which has proven itself in hundreds of thousands of flights. It has been augmented to incorporate a 6 channel system for greater control capacity.

6RS SPECIFICATIONS

Full 12V 500 ma/Hr. Nicad Transmitter Power Supply, Total Airborne Weight with Receiver, 4 Servos, Battery and Switch Harness 14.8 oz.
All R/C Frequencies are available

PRICE: System, complete with 4 Servos \$435.00

DIGIMITE 4RS SYSTEM

PRICE: System, complete with 4 Servos \$389.00



SPECIALTIES, INC. 9522 W. JEFFERSON BLVD. CULVER CITY, CALIF. 90230

ous stuff such as instrument dials, "Experimental", etc., are packaged separately for 98 cents each.

Bill passes along the following hint for making his decals stay on those plastic fuselages, such as Dee Bee, Lanier, Lazott, etc.

Spray the area to be decaled with Krylon Crystal Clear Spray. This seals the plastic and stops the microscopic amounts of oil that fresh plastic emits (who'd think it? This is why the decals won't stick). The decals are then applied and will stay on.

Bill goes on to point out that if you wish to, you can cover all of the plastic with Krylon spray which will then allow you to spray (not brush) the whole thing with dope, as it will now have something to hold on to.

Citizen-Ship has joined the move to smaller digital radios with their new 4 channel system which is to retail for \$400 on 72 mc and \$375 on 27 mc, both less a nickel (or one large Finishing Touch number decal).

The systems are complete with transmitter/pack/charger, receiver airborne pack, four servos, and switch harness.

The transmitter is available with throttle control on left (AER) or right (AMR) stick and has non-stick-moving trim on all controls.

Receiver uses integrated circuits for the decoder, weighs only three ounces complete with cables and plugs, and may also be used with the three and five channel transmitters already available.

Servos are three output, nylon geared and cased, with mounting lugs on the center of gravity for vibration protection. They employ hot molded carbon feedback pots and use integrated circuitry for the reference generator. Servos sell separ-

WIN WITH WARNER!

- 1st Class II 1967 Florida R/C Championships
- 1st Class II 1967 Mid South R/C Championships
- 1st Goodyear-Pylon Indianapolis 1967
- 3rd Class I Nationals 1967

NOW AT NEW LOW PRICES

NEW WINGS

- | | |
|---------------------|-------------------|
| \$8.95 Aristo-Cat | \$6.95 Sky Squire |
| 8.45 P-Shooter | 6.45 Tri Squire |
| 7.45 Jenny | 6.45 Tauri |
| \$8.95 Zeus Mark IV | |

SEE THEM AT YOUR DEALER'S TODAY

Cores come ready to be covered.

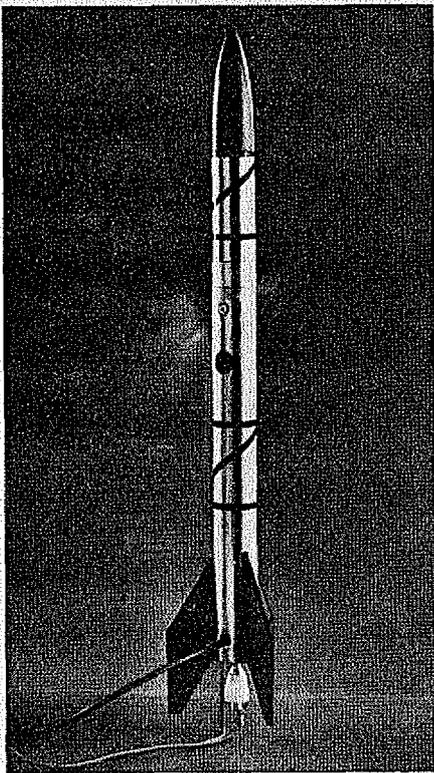
Including:

- Precut dihedral angles • Bellcrank or Servo cut-outs • Landing gear cut-outs and mounts where applicable • Control line wings drilled for load-out; no breaks in surface • Fiberglass reinforcing cloth • Instructions.

CONTROL LINE	RADIO CONTROL
\$7.45 Nobler	\$11.45 Candy
7.45 Skylark	10.45 Kwik Fli II
6.45 Stuka (Ambrold)	9.95 Cherokee
6.45 Ringmaster	9.95 Sweet Taurus
6.45 Magician	9.95 Regular Taurus
	9.45 Beachcomber
	8.95 Patriot II

Wholesaler and dealer inquiries invited. 8.45 Sr. Falcon 7.45 Instructor 6.95 Falcon 55

warnar industries, inc.
259 hosack street
columbus, ohio 43207



New Valkyrie-2 Rocket!

Now . . . build your own space program around the new Valkyrie-2 Flying Model Rocket, developed by a group of America's leading aerospace engineers to bring the excitement of a Cape Kennedy countdown right into your own back yard! The Valkyrie-2 is not a toy—it's an authentic, sophisticated piece of high performance hardware!

- Not a firework! Mailed anywhere in the U.S.A.
- Electrically fired non-toxic liquid propellant
- Re-usable; fly it again and again
- Parachute recovery, big payload capacity

Attitudes of over 1,000 feet!

VASHON INDUSTRIES, INC.
Box 309-1, Vashon, Wash. 98070



Gentlemen: Please send me, postpaid:

- Valkyrie-2 Rocket Kit (patent pending), complete with Rocket engine, firing mechanism, separator, parachute nose cone and fins, launch stand and accessories, propellant for 3-4 launchings. **\$15.95 ea.**
- RP-100 Liquid Propellant & Initiator. **\$2.25 ea.**
- Catalog of rockets and accessories. **25c ea.**

Total* enclosed _____

*Washington residents add 4.5% Sales Tax

NAME _____
STREET _____
CITY _____
STATE _____ ZIP _____

ately for \$39.95 and are interchangeable with the earlier DPC units.

Rand Mfg. Co. has added several new items and one humanoid to its line of R/C products.

Pete Waters, through not being offered in a plastic bag nor on a display card, has become a new member of the company. In case you're not aware, Pete is a duty free import from England and is a former British National R/C Champ. He has participated in three World's Championships and has been diddling with R/C since 1948.

Pete's first project with Rand was to develop packaged units of the electronics used in the GG and Dual Paks so that hobbyists may make their own conversions if they so wish. The five packets available include a switcher kit for \$9.95, switcher assembly for \$14.95, decoder kit for \$14.95, decoder assembly for \$21.95, and an elevator actuator with decoder for \$32.00.

Also of interest is the fact that a significant change has been made in the Rand hinges. The material has been changed from Delrin to nylon and the webs are now thinner. An Exacto knife slot is all that's needed and will allow web insertion without producing a bulge in the wood.

The Veco .61 R/C, now a product of K & B Mfg., Downey, California, will soon be available again in hobby shops. Retail price to be \$55.95.

Engine now includes K & B's exclusive no-tension, single ring and low expansion aluminum piston. If that means it won't take six gallons of fuel to break it in, Hooray! Additional features include linear control carburation from idle to maximum R.P.M.; heat-treated steel shaft; a one-piece, die-cast aluminum alloy case; hard chrome plate cylinder sleeve; and two Fafnir precision ball bearings.

Come Roar with Us

(Continued from page 46)

versal joints, engines, transmissions and suspensions. We also publish construction articles to help the neophyte who does not know anything about soldering or epoxy but has a keen desire to build a race car.

The second popular request by new members is, "Can you put me in touch with enthusiasts in my area?" There are local ROAR representative in every major city who are quite willing to spend an hour or two with a beginner, tell him of happenings in his area, and steer him on the right track.

Each local group is encouraged to form a club of its own. ROAR is the national clearing house but the individual groups have to look after their own races, etc.

Our rules are quite simple at the present time. The goal is to have many cars running with basic specifications which do not limit individuality but encourage experimentation and ingenuity. The ground rule is that as long as the car is built to 1/8 scale (1 1/2 inch to the foot) and it looks like a real racing car or could be built full size for racing, it is accepted. There are not enough commercial bodies available yet and it would be foolish to pick on small details such as adherence to the actual color and minor details of the actual car. Plastic GT bodies (e.g. Monogram's Corvette) have good detail but when a hobbyist has to hand carve his own body out of balsa wood and lay up fiberglass on it, it is impractical to expect him to be able to duplicate everything to the last screw. Many new body styles, not necessarily exact replicas of existing cars, have been seen on local tracks. We do, however, insist on a body for a car (no "things" here) and a driver's upper torso in the cockpit.

The body must have a racing number on it.

A useful accessory which every ROAR member is recommended to build is the official toolbox. This can be built up from plywood and serves as a field box and carrying case for cars being transported to the track. At the same time, when several of these boxes are placed on the ground side by side, they resemble a "pit straight" such as seen in Sebring or LeMans. The front section of the box resembles the counter of the full size pit and it is actually a separate compartment for small parts.

Racing is usually done on parking lots behind industrial plants on Sunday afternoon. Most plants have large enough areas free of obstructions and smooth enough so that the cars do not bounce. The average track occupies a space of about 100 feet by 250 feet, has one or two hairpin turns and one long straight with gently winding high speed turns in between. A lap length is approximately 400 feet. Lap times are in the 12 to 15 second range. Many types of tracks can be laid out simulating an Indy type oval or a twisty road course. We are presently looking for city parks with undulating narrow walkways bordered by neatly trimmed grass. Such a course would simulate present day Grand Prix courses and would be great fun to drive on. On larger tracks, visibility becomes a problem. A 17 inch car becomes quite small at 1/8 of a mile. In such situations, it is possible to have two drivers for each car, each driver being stationed on opposite corners of the track. At a predetermined point, they switch their Tx sets on and off respectively to avoid interference. (You're kidding—Ed.)

The future is very bright for this hobby. We foresee custom-made tracks for road races, dirt track racing, hillclimbs, night long distance races where compulsory pit-stops will not be necessary if the driver is willing to take an hour's worth of fuel on board. At the present time we lay out the race course by placing canvas strips on the ground, weighted down every four feet or so. Thus, if a car runs over the dividing line, it is not damaged at all, unlike hitting a retaining wall. The "canvas border track" can be changed at will from race to race in a matter of minutes.

Most members prefer GT cars or Formula I or Indianapolis type of races. Whatever their fancy, they are a great bunch of guys to race against. The challenge of fast driving and dangerous turns is ever present. Is there a better sport for man without having to spend thousands of dollars and chancing bodily injury?

Membership in ROAR costs only \$3 a year. We are presently working on obtaining insurance for our members so that they will be covered in the event their car should damage bystanders or their own cars.

To find out more about ROAR and to obtain a Membership Application Form simply send 25 cents in coin to R.O.A.R., (Suite 20); 625 So. Euclid Avenue, Anaheim, California 92801. It'll be the best three bucks you will ever spend if you ever wanted to build and race model cars without guides or slots of any kind. A true challenge for any MAN indeed!

M.A.N. at Work

(Continued from page 3)

was at a Cherry Hill contest in 1940. Now he's getting his feet wet in R/C.

Speaking of wet feet, this seaplane flying is quite a ball. Crazy watching Nick Zirolri getting his Eidekker off the water without a water rudder. Too much torque just spun the plane around in ever tightening circles, release throttle and rudder and it would straighten out again. His persistence was incredible. He managed to take off and put on spectacular flights. Also

found out that you can hit obstructions in the water as well as on land. Dick Aggers, flying his Marvelite float equipped Taurus, was putting on a good show and on one touch and go he hit a buoy stake and shattered his wing. Lots of pieces flying around.

Funniest sight of the day was the PARCS fier who did not have a water rudder on his Cherokee and while taxiing out for take-off had some steering problems. One wing tip contacted a piling and locked on and the Cherokee went round and round that piling until it was finally rescued by the club boat.

And then there was Don, better known to his buddies Dick Aggers and Don McGovern as the "Animal", doing flat, inverted spins with a bit of tumbling thrown in that were just unbelievable. He used that water as anyone would use a driveway, landing strip, etc., taxied around, brought it against the pilings for a throttle adjustment. Absolute control at all times. If flying fields are a problem, never lose sight of those great huge bodies of water, better known as lakes, that are all around us. It can be become a way of life if it becomes a case of survival.

Next big moment, for me at least and it's hardly big, was a tap on the shoulder. I turned to see a chap of about 40 or so who asked "Do you remember me, Mr. Schroder?" I allowed as how I didn't but this was not unusual. He introduced himself as a Mr. Bonjourno at which point I remarked as to the beauty of the name and a good morning to him. He then stated that he thought I would not remember him since he had been a small boy whom I had helped (many years ago) to fly his free flight plane in Warren, Connecticut. Having just celebrated (?) a birthday only two days before and having quite recovered from the pain of it, it didn't help to have this fortyish chap ask me to remember him as a boy. I may be wrong about the age, forgive me if I am, Mr. Bonjourno. Off the record, it was nice meeting you and I hope to see more of you with Dick Aggers and his group.

The boys of Red Bank and Bob Peru deserve congratulations for a good show. This undoubtedly is to become an annual affair.

Promised a progress report for Butch's Heath kit project. Well, it's completed and works beautifully on the bench. I don't think anything reached me as much as his grin when he fired it up the first time and it worked. It was a grin of complete satisfaction and a private message for Pop to let him know that maybe 15 is young in numbers only.

He hasn't had chance to get it into an airplane as yet but I'm sure that it will perform there as well as it did on the bench. It just has to. We watched Nick Zirolu flying his Eindecker at Red Bank. He had his Heath system installed in the plane and it performed flawlessly.

Age, unfortunately, has become a part of my column and I promise to cut it off after this last notation. Last month, I spoke of finally meeting a modeler older than myself. Then, while reading Dave Linstrum's July column, I noted that the West Coast's famous Ocie Randall celebrated his 67th birthday on March 9th. To you, Ocie, a very belated birthday greeting with best wishes for many more from all of us modelers.

Received an interesting piece from a 15 year old who felt he was best qualified to tell the Junior story. So with his permission I am using excerpts from Paul Huffman's opus.

"Steve Cline is the typical lost lamb type. His dad is not a modeler as my dad is. Steve is continually getting wild ideas



ONLY \$1.59

Amazing Low Price KAVAN SUPER GLOW-PLUG CLIP

The calculated resistance of this 37" wire permits the use of 2.2 volt Aristo-Craft or other wet cells without fear of burning out glow-plugs. Connects to any standard glow-plug with snag fit for perfect electrical and vibration-free contact — yet it disconnects easily and quickly. The phosphor bronze contacts and the neoprene sleeve are self-adjusting, permitting perfect contact even on non-standard glow-plugs.

FIBER GLASS PROPELLER \$2.49



For 49-.51 R/C and U-Control engines. Weight, pitch and diameter calculated to get maximum power for larger displacement glow engines. Specially formulated fiber glass prevents prop twisting, pitch change and high speed flutter at high RPM. At least 500-1000 RPM increase can be expected at full horsepower with 500 RPM lower idle for precision touch-and-go or other low speed maneuvers. Special process prevents silver plating from peeling in normal use. Prop feels and looks like metal.

STANDARD FIBER GLASS PROP \$1.59 Same size, specifications and features as metalized version.

SOLD THRU DEALERS AND WHOLESALERS OR ORDER DIRECT

neto! kavan

custom-crafted accessories

An Aristo-Craft Exclusive — the "F.K." family of accessories were designed to fill a specific need for the fastidious modeler. Manufactured with great care and precision and precisely made for the critical high performance demands of contest flying. Tailored for the expert, but so economically priced, that even the week-end flyer can afford these precision accessories. Our continuous research program, quality control, field testing and exclusive employment of first quality materials assures modelers of trouble-free, "safety-first" products. Without fail, Aristo-Craft "F.K." products will do the job every time. Your full function Hobby Dealer stocks and sells the complete range of Aristo-Craft products with pride and confidence. See him first for your hobby needs.

SUPER "K" LINK — 40¢ ea. / Spare Connector Ends 30¢ ea.

NOT a copy or "knock-off" of any similar product BUT a completely new quality concept of a much needed item. Machine cut threads allow absolutely accurate adjustment, eliminates sloppy end-play wobble. The spring steel connectors, with burr-free smooth sides, prevents drag on nylon or fibre control horns. The shouldered machine turned stud on which the control horn rides, has a safety-lock feature that prevents the connector sides from becoming mis-aligned and locks control horn into the connector without binding or drag. Flated parts for easy soldering. Overall length 5 3/4".

STANDARD "K" LINK — 25¢ ea. / Spare Connector Ends 20¢ ea.

Same quality concept as the Super "K", but designed as an economy link for applications not requiring the exacting or the locking feature of the Super "K". Threads are precision rolled. Spring steel connector is burr-free. Overall length 5 3/4".

ADJUSTABLE CONNECTORS — 98¢ Pair

Same as used on Super "K" Link — but a specially machined, hollow, adjustable stub shaft, with a lock-nut, is used so that flexible cable can be inserted into the hollow and securely soldered. This makes it possible to fabricate any length flexible push-rod assembly for specific installations.

PUSH-END RODS — 40¢ Pair

Special plated metal fitting converts hardwood, hard balsa or fiber glass tubing into lightweight push rods easily and safely. Coat the end of the hardwood or fiber glass with epoxy cement and slip push rod end on. For additional security, drill through push rod end and insert supplied collar pin. Insert "K" Link in small opening and solder into position. No. 5 (3/16" inside dia.) No. 6 (1/4" inside dia.) Same procedure as No. 5.

ENGINE MOUNTING BOLT AND BLIND NUT SET 49¢ (SET OF FOUR)

Hi-torque, precision steel machine screws with large head for maximum surface holding area. Conical serrated washer caps tremendous locking force that safely withstands violent vibration conditions. The SQUARE PLATED STEEL blind mounting nut has the advantage of being located tightly against a bulkhead or motor mount. Sharp steel prongs bite securely into hard or soft woods without bending or stripping. MM/3 (approx. 3/32" dia.), MM/4 (approx. 1/8" dia.)

RBM SERVO MOUNTING KIT & RBB SERVO BOARD MOUNTING KIT 55¢ (Set of 4)

Helps absorb high shock loads of vibration, rough landings and crashes preventing damage to radio-control equipment. Machined metal inserts prevent crushing of rubber grommets when machine screws are tightened, thus insuring the shock absorbing qualities of the rubber grommets. The machined, plated steel blind binding nuts securely bite and hold into any hard or soft woods. RBM Kit same as RBM, but rubber grommet has wider groove for extra thickness of complete servo board. Use RBM & RBB together for maximum protection.

AILERON DIFFERENTIAL — \$1.29 Per Pair (Packed in poly bag)

A most needed accessory as it permits precise aileron adjustment. For the FIRST time the modeler can adjust one aileron to move a greater amount than the other, hence the word "differential". This accessory eliminates bending wires or other "hit or miss" methods "in the field". This is most important for accurate control of rolling type maneuvers.

KAVAN-KUSTOM R/C CARBURETOR-NOW \$9.95 (FORMERLY SOLD AT \$14.95)

Also Excellent for U-Control Engines

OUTSTANDING FEATURES: Improved Throttle Response / Higher Power / Better Mixing / Reduced-Fuel Consumption / Positive Running On All RPM / Individual Idle Screw and Air-Bleed Adjustment. Each Carburetor fitted to specific engine. Indicate engine and displacement when ordering.

AVAILABLE FOR THESE ENGINES: O.S. Max 19, 30, 40, 50, 58, 60 / Marco 35, 49, 61 / Super Tigre G 19/20, G 21/29-46, St. 51, 55, 60, G 60, G 60 FI / Enya 45, 60 / Rossi 60 / Veco 35, 45, 61 / K & B 40 front, 49 rear, 45 / Webra 60.



Send Self-Addressed and Stamped Envelope for Free Literature.

ARISTO-CRAFT DISTINCTIVE MINIATURES DEPT. MA, 314 FIFTH AVE., N. Y., N. Y. 10001

MAJ. RAOUL LUFBERRY'S Nieuport 17

This Nieuport is a refinement of the one so many modelers liked at Rhinebeck. It performs all War I maneuvers. Kit is highly prefabricated with special dies, etc. Many new functional features 1 year in development.

3 GIANT FULL SIZE PLAN SHEETS INCLUDING ISOMETRIC VIEWS
FINISHED COWL
FINISHED HARDWOOD LEADING & TRAILING EDGES
SPRUCE LONGERONS & SPARS
MACHINED WOOD PARTS
DIE CUT PLY, BULKHEADS, BALSA WING RIBS, ETC.
DIE STAMPED LANDING GEAR SHOCK PLATES
NYLON RUDDER, ELEVATOR & AILERON BELLCRANKS
ALUMINUM TORQUE RODS
BLIND NUTS, WOOD & MACHINE SCREWS, BRACKETS, ETC.
FLYING WIRE MATERIAL

TENTATIVE PRICE RANGE: \$45.00

SEND STAMP NOW FOR LITERATURE

MODEL AIRCRAFT CO.
12072 Main Rd., Rt.#5
Akron, N.Y. 14001

SCALE 2" = 1'
WINGSPAN 64"
DESIGNED FOR .46 - .51 ENGINES

AUTHENTIC 5 COLOR DECALS
SOUX INSIGNIA & ESCADRILLE
LAFAYETTE & MAJOR LUFBERRY'S
AIRPLANE NUMERAL MARKINGS

POXY POINTERS

Hello again!

Before I get started, I gotta pass along a really unique use for Hobbypoxy Formula 1 glue. John Hunton of Annandale, Virginia sent me this, "I use Hobbypoxy glue to repair my wife's broken fingernails when I am not using it on model airplanes!" Now, I ask you, can any other product claim such versatility? I wonder if he clamps her in a vise while the glue is curing? Just goes to show you that 'quickstickability' lets you glue anything to anything!

Now to get on to more commercial items. This month the subject is the Hobbypoxy 'Easy-Does-It' scraping blade. Many of you have tried the various easy methods we have been plugging for filling balsa with glue or Hobbypoxy Clear. But, you say, it is not so easy to scrape. And in almost every case you tried using an old regular style razor blade. It's not going to work! Regular razor blades are very thin and have a hollow ground edge. They break up. Would you believe, that's the reason we developed our own special 'Easy-Does-It' scraping blades. They are specially honed for scraping — not shaving! They are much thicker than regular blades, and have an edge that will stand up to repeated use without chipping. They are available at your local model emporium or direct from us. The price is right too, just 5 for 80¢. And while you are at it get one of our blade holders for only 40¢; saves lots of wear and tear on the fingers.

Now that you have found out how easy the 'Easy-Does-It' method really is, here's an idea for using the scrapings you have all over your workbench. Just scoop them up, mix them with some fresh Hobbypoxy glue, and presto, a putty for fillets, cracks, dents and the spot where you whacked the fuselage against the corner of your table. The advantage of mixing the scrapings into the glue instead of other materials, is that you set a putty of pure epoxy. It's sort of like mixing epoxy powder with epoxy glue! Have to pass this along to you who don't think too much about the value of epoxy and foam aircraft. Would you accept the fact that there is a full size plane that uses a molded epoxy fuselage, foam wings covered with epoxy, with fin molded right into the fuselage, etc.? No kidding, that's the way they put together the Windecker Eagle 1, a new plane now undergoing flight testing. Wonder if they have a copy of our 'Easy-Does-It' brochure...

Don't forget, we have a special deal going for you mail order types. Just get your next order to us to total more than \$10, and I'll personally include a FREE 'Easy-Does-It' kit. Everything's there: glue knife, our cloth, those good scraping blades and holder, balloons, instructions, and a set of new and better than ever free-flowing Formula 1 Glue. Wow! how can you resist?

Your erstwhile epoxy envoy,

John E. Poxey
John E. Poxey

HOBBOPOXY PRODUCTS
A Division of Pettit Paint Co., Inc.
507 Main St., Belleville, N. J.

■ MANUFACTURERS OF HOBBOPOXY PRODUCTS ■ EPOXY ENAMELS ■ FILLER ■ STUFF ■ EPOXY GLUES ■ SATIN HARDENER ■ EASY-DOES-IT SUPPLIES

like building flying saucers and hovercraft. He has one good qualification though—he lives on a farm with a beautiful pasture."

"A propaganda flying session at his place is on my agenda. You can sell Cline anything if you try."

"If you want to make someone really look sick, bring along a well-trimmed ship on his test flight. My Dad's fancy single channel plane spiraled in on its first flight because of hash while I logged 25 or more good flights with my veteran chuck glider without damage. (We don't talk about the 26th flight)"

Enough for this month, will have some of Paul's pearls of wisdom next month.

Have an appeal that I know that our readers will respond to with their usual enthusiasm.

John W. Grenough, refugee officer for the Province of Phong Dinh, Republic of Vietnam tells us that he has many kids in the camps and hospitals who are without recreation and toys. He asks that any of our readers and fellow enthusiasts who care to box up and send a plastic kit and a small tube of glue would do much for the morale of these displaced youngsters.

Your package can be air mailed to: PROJECT AIRPLANE c/o John W. Grenough, CORDS/Refugee, IC CTZ, APO/96215. He knows that the kids sure would get a kick out of it and enclosed a photo of a group of the youngsters (see page 2). Hopefully, his next picture will include models as well as the kids.

Had an interesting letter from Richard Beckman of 1009 South Peach Street, Medford, Oregon 97501 and pass on his thoughts.

"I have a couple of other things on my mind. First, I have acquired, through several weeks or horse-trading, an Ohlsson-Rice spark ignition engine, about size .19 or .23. The size plate is missing from the engine, it is in excellent condition, good compression, and has been kept well oiled. If any of your readers are interested in this engine, they can contact me. I have no particular use for it, just hated to see it end up in a collection of engines owned by one who is not a modeler.

On page 2, we have a photo of fuel powered Dusenberg racer that was sent to us by Bill Webb of 868 Bellevue Avenue, Columbus, Ohio. He offers the following specs for the machine. Weight 7½ pounds, length 17 inches, engine Dennyrite, drive front wheel, suspension four wheel (torque bar), ball bearings rear wheels, body cast aluminum, and made by Dusenberg Die Cast, Elkhart, Indiana. Photo caption tells you the good part of the story. It will be interesting to see who gets there first.

The following information is a bit late but I felt our readers should know. At the last meeting of the RCIA (Radio Control Industry Association) in February of this year, the following officers were elected; President, John Maloney; Vice President, Herb Abrams; Treasurer, Phil Kraft and Secretary Bill Welker. The RCIA underwrote the traveling expenses for John Patton and Bill Northrup, when they attended the FAI judges school in Germany in April. From what Bill tells me the course was extremely valuable and should set a new standard of judging at FAI R/C International championships. The thanks of the radio modelers should go to this forward looking industry association for their foresight in underwriting such a worthwhile cause.

Incidentally, watch for the details for the Tournament of Masters Contest sponsored by the RCIA. From all indications this will be the big annual bash for R/C—something for all you R/C'ers to watch and strive for!

ADVERTISING INDEX—JULY 1968

Ace Radio Control	75
Ambroid Company	53
America's Hobby Center	4, 5, 6, 7
AMT Corporation	71
Aristo-Craft Distinctive Miniatures	87
Associated Hobby Mfgs. Inc.	82
Austin-Craft Co.	66
Balsa Corp. of America	82
Bonitron, Inc.	62
Bonner Specialties	85
Brown's Hobby Center	72
Centuri Engineering Co.	62
Citizen-Ship Radio Corp.	63
L. M. Cox Mfg. Co.	60
W. S. Deans Co.	52
Discount Hobby Distributors	84
Dumas Products Inc.	65
E. K. Products	83
Estes Industries	72
Finishing Touch Decals	77
Fox Mfg. Company	75
Carl Goldberg Models, Inc.	55, 57
Grish Bros.	64
Paul K. Guillow, Inc.	70
Hallco Products, Inc.	73
Heath Company	49
Hobby Lobby International	3
Jerry Johnson "The Motor Man"	58
K & B Mfg. Corporation	84
Kraft Systems, Inc.	24
Lanier Industries, Inc.	61
Lazott Plastic Corporation	52
Micro-Avionics, Inc.	67
McLachlen Associates	54
Midwest Models Mfgs.	59
Midwest Products Co.	55
MRC-Enya Co., Inc.	2nd Cover
More-Craft Products Co.	66
Myers Models	54
Octura Models	64
Official Products/Publications Inc.	3rd Cover
Orbit Electronics	1
Pettit Paint Co.—Hobbypoxy	88
Polk's Model Craft Hobbies	10
Proportional Control Systems	9
Rand Manufacturing Co., Inc.	76
Scientific Models, Inc.	50, 51
Sig Mfg. Co., Inc.	44, 45
Stanton Hobby Shop, Inc.	58
Sterling Models	68, 69
Su-Pr-Line Products	64
Sullivan Products	74
Tatone Products	78
Top Flite Models	80, 81
Vashon Industries, Inc.	86
V K Model Aircraft Co.	87
Warner Industries	85
Williams Bros.	59
World Engines	4th Cover
Andy Wright Products	65