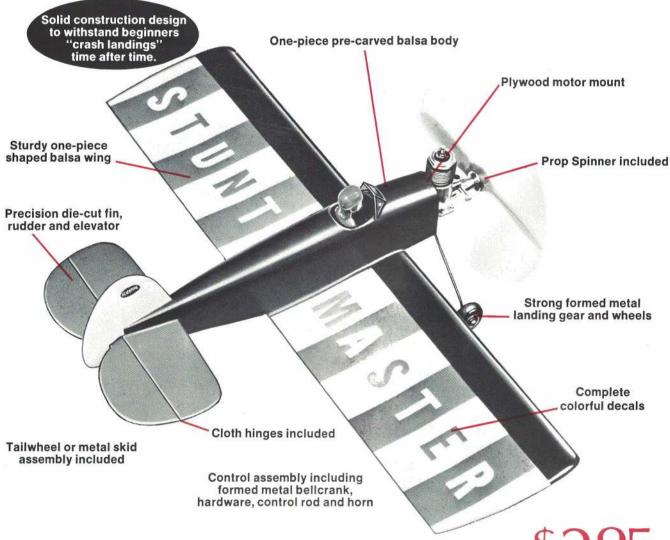


SCIENTIFIC

You're in

Control-Line

Buy it today...fly it tomorrow. They're almost ready to fly!



- Only the finest grade balsa and plywood used throughout
- Every kit specially designed for engines .020 to .049 by the world's leading modelers
- Complete, easy-to-follow assembly instructions included
- Precision die-cut and formed parts for perfect fit and easy construction

One look will tell you these Scientific kits are designed to get you flying F-A-S-T! That's because each one features our exclusive precarved balsa body and shaped one-piece wing construction (except Kit #72). All include the necessary formed metal parts and many include a control handle, windshield, formed plastic cowl, canopy and pilot.

\$395

STUNTMASTER KIT #25.
One of America's
most popular models
for sport or competition stunt flying.
18" wingspan.

the air fast ngModels

21 popular models to choose from at one low price. \$295



Kit 20 LITTLE STINKER, 18". Popular aerobatic speedster.



Kit 26 LITTLE MERCURY, 18". Easy to build and fly.



Kit 70 F-51 MUSTANG, 21". Famous WW II fighter.



Kit 72 SUPER STUNTMASTER 20". A built-up wing stunt sensation.



Kit 74 MESSERSCHMITT ME-109, 18". German WW II fighter.



Kit 60 STUKA DIVE BOMBER 18" Scale model of W.W. II fighter



KIT 95 PIPER CUB TRAINER 18" Famous private trainer



Kit 48 GOLDEN HAWK 18". A great



Kit 59 P-40 FLYING TIGER 18" Famous W.W. II fighter



Kit 30 RED DEVIL 18" Great train-





Kit 6 CESSNA BIRD DOG 18" Scale Mit 54 CESSNA "182" TRI-CYCLE model U. S. "Flying Jeep" High performance private plane





Kit 14 PIPER TRI-PACER 18" with Kit 28 LITTLE DEVIL 18" Fast, easy to fly, great performer



Kit 7 CESSNA "180" 18" Model has good looks, great speed



Kit 53 RED FLASH 18" Model has sleek looks, good control



Kit 8 PIPER CUB CRUISER 18" Most famous of all Piper Cubs



Kit 65 **ZIG ZAG** 18" A stunt sensation, great looks too Kit 18 **LITTLE MUSTANG** 18" Fast easy to fly semi-scale model



handling. Outside U.S.A. add \$1.00.



Kit 29 LITTLE BIPE Big 70 sq. in. wing area, 2 preshaped wings

HERE'S THE COUNTRY'S HOTTEST

rubber flying mod

Sky Master BIG 36 INCH WINGSPAN

Featured in the Movie "THE LONG FLIGHT"

YOU FLY IT A MILE . . . with truly amazing perperformance like you never thought possible. Big deluxe kit includes Hi-Thrust Propeller, Formed Leading and Trailing Edges, Formed Wire Parts, Pure Contest Rubber Drive, Colorful Decals and Full Size (44")

Easy to Follow Plans. **KIT 160** SEE YOUR DEALER. If kits are not available at dealer, you may order direct from factory adding 50¢ for postage and

Send for our big colorful catalog . . . only 25¢

Royal Apollo

New 2 CH

A first class system for airplanes, boats or cars-Individual Servos provide the same versatile mounting arrangement available in the Full House System. World Wide Service - Out of Site Range

TRANSMITTER

7-3/16" wide x 4-7/8" high x 2-1/16" thick.
Power required 9.0 Volts (6 pencell "AA") not supplied.
Vinyl clad case. RF power meter. Two single Axid
control sticks.
Frequency—26.995MHZ 27.095MHZ 27.195MHZ
27.045MHZ 27.145MHZ 27.255MHZ

2-1/4" long x 1-5/8" wide x 13/16" thick. Individual plugs for servos and power. Power 6.0 Volt. 4 pencells "AA" (not supplied).

SWITCH HARNESS

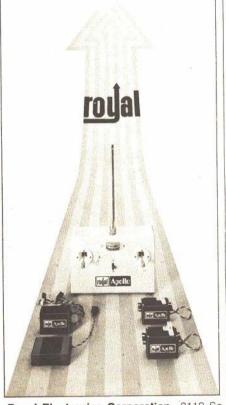
Separate switch harness, couples battery to receiver.

Hi Power. Excellent resolution. Size 2-1/16" long x 7/8" wide x 1-7/16" tall (excluding mounting ears). Weight 2.0 oz.

ROYAL APOLLO 2 CHANNEL SYSTEM

Transmitter, receiver, two servos, switch harness

Available through local dealer or direct Write Dept. 5M for catalog



Royal Electronics Corporation, 2119 So Hudson St. Box 22204, Denver, Colo. 80222

aircraft modeler

COVER PHOTO: During photo session for a Sunday Star (Washington, D.C.) newspaper article, Harold Flecknoe photographed this array of DC/RC Club members' planes at the Club's Fairchild-Hiller flying site.

EDWARD C. SWEENEY, JR.—EDITOR WILLIAM J. WINTER - PUBLISHER Thomas L. Murphy, Art Director

Anna Maria Nunez, Editorial Assistant Anne Fuhrken, Advertising Assistant

VOLUME 73, NUMBER 6	DECEMBER	197
Articles:		
FIREBALL, Bruce Lund		14
BROOKLYN DODGER, Robert Harrah		10
CANUS. Roy Foote		Z
AST BIPE FIGHTER, Don Berliner		Z.
HOW CHEAP CAN IT GET, Ed Sweeney		20
RC WORLD CHAMPIONSHIPS, Don LoweFOR THE TENDERFOOT: YAKO, Clarence Mather		3
Features:	ě.	
ON THE SCENE: EUROPEAN CL CHAMPIONSHIPS,		41
Steve Blake		2
WHERE THE ACTION IS		2
THE ROAR NATS, Wendel Green		э
THE FAST AND FUN 049 JEROBEE, Wendel Green and		Λ
Ed SweeneyAT THE FREE-FLIGHT WORLD CHAMPIONSHIPS,		🦘
Bob Hatschek		8
Academy of Model Aeronautics:		
NATIONAL RECORD REVIEWS		4
PRESIDENT'S MEMO, OFFICER BIOGRAPHIES		5
AMA NEWS BITS		3
AMA NEWS EXTRA		5
BOEING SCHOLARSHIP CONTEST		5
CONTEST CALENDAR		5
Departments:		
EDITORIAL-STRAIGHT AND LEVEL, William J.	Winter	
MODELER MAIL —LETTERS TO THE EDITOR		1
NEW PRODUCTS CHECK LIST 58 CLASSIFIED AD	VERTISING	9
2444 W 1915 BAR DE SAN		

This magazine has 90 pages, including pages 62A and 62B

Published monthly by Potomac Aviation Publications, Inc., 733 Fifteenth Street, N. W., Washington, D. C. 20005. William J. Winter, Publisher; Edward C. Sweeney, Jr., President; American Aircraft Modeler Business Manager & Secretary, Harrey E. Cantrell.

ADVERTISING DEPARTMENT

733 15th St., N. W., Washington, D.C. 20005 (202) 737-4288

Western Advertising Representative: Aaron D. Viller & Associates, 5311 Venice Blvd., Los Angeles, California 90019. Tel: (213) 939-1161.

Eastern & Midwestern Advertising Representative: Boynton and Associates, P.O. Box 551, Barrington, Ill. 60010. Tel: (312) 381-7726; offices also at 438 E. Washington St., Chagrin Falls, Ohio. Tel: (216) 247-7094.

Subscription Rates: In U. S., Possessions and Canada, 1 Year, \$7.50; 2 Years, \$14.00; 3 Years, \$20.00. Elsewhere, \$9.50 for one year. Payable in advance. Single copies, 75 cents. Six weeks are required for change of address. In ordering a change, write to American Aircraft Modeler, 733 Fifteenth Street, N. W., Washington, D.C. 20005. Give both new and old address as printed on last label.

We cannot accept responsibility for unsolicited manuscripts or artwork. Any material submitted must include return postage. When writing the editors address letters; Editorial Office, American Aircraft Modeler, 733 Fifteenth Street, N.W., Washingon, D.C. 20005.

Second class postage paid at Washington, D.C. and at additional mailing offices.

© Potomac Aviation Publications, Inc. 1971. All rights reserved. Printed in the U. S. A. Postmaster: Send Form 3579 to American Aircraft Modeler, 733 Fifteenth St., N. W., Washington, D.C. 20005.

FROM THE RELIABILITY LEADER

3233 W. EULESS BLVD.

HURST, TEXAS 76053 P. O. BOX 1015

(817) 283-4092

LOGICTROL CHAMPION SERIES

2-Stick, 5-Control

4 Servos.....

111/2 oz. airborne weight



"Amp-Pak" integrates servo amplifier and receiver-decoder. Electronic circuits are proven design made famous by Logictrol. Transmitter and receiver charger built into case. Ni-Cad rechargeable batteries.

LOGICTROL '71 SERIES

2-Stick* 5 Control

2-Stick* 6 Control

*Right or left throttle available

Single Stick 6 Control

System includes transmitter, receiver, four Super-Mini servos* (worlds smallest!), rechargeable Ni-Cad batteries and switch harness, transmitter and receiver charger.

*Optional Mini-Mite linear or rotary. Please specify.

LOGICTROL LRB SERIES WITH UNI-PAK LIL' RED BRICK

2-Control (LRB-2). \$11995 Less Batteries*

3-Control (LRB-3)

With 3rd servo. Less Batteries"...

3-Control (LRB-3-1)

Without 3rd servo.

Less Batteries*

HLRB



*Uses inexpensive dry cell batteries Ni-Cad battery pack available, extra





LOGICTROL PRO-SERIES

2-Stick 6 Control

Single Stick 6 Control

2-Stick, 10 Control

System includes transmitter, receiver, four servos (linear or rotary), rechargeable Ni-Cad batteries and switch harness, transmitter and receiver charger.

... TO SERVE YOU AND OUR DEALERS BETTER FACTORY TRAINED SERVICE PERSONNEL

LRB

Northwest Area MINICRAFT HOBBIES (206)-SH 6-0769 13, 165th Ave. N.E. Bellevue, Washington 98004

Chicago Area RADIO CONTROL CENTRAL Box 449, Elmhurst, III. 60126 Service (312) 545-9815 Sales (312) 832-4908

Southeast Area TATES MODEL ELECTRONICS 2530 Warwick Circle, N. E. Atlanta, Georgia 30345 (404) 633-6652

Kansas City Area (913) 631-3158 KEN'S R/C

10915 W. 59th Terrace Shawnee, Kansas 66203

Northeast Area

NORTHEAST R/C, INC. (617) 343-4827 340 Broad St., P. O. Box 437 Fitchburg, Mass. 01420

LRB

Mid-Atlantic Area

Leon Shulman & Associates 1114 Raritan Rd. P. O. Box 955 Clark, N. J. 07066 Service: (Don/Lee) (201) 381-1441 Sales: (201) 381-1440

In Canada

LOGICTROL OF CANADA 544 Ellice Ave Winnipeg 2, Manitoba

In Mexico **AEROMODELISMO** Calz, Guadalupe 602-A Mexico 14, D.F.



Write for Free Brochure

In Sweden BORG'S HOBBY Apotekaregaten 7 Linkoping, Sweden

For Benelux C.C.I./ TENCO Ave. de la Couronne, 358-362 B-1050-Brussels, Belgium Phone (02) 49.91.40

In France C.C.I./ TENCO Place de Stalingrad, 7-9 F-75-Paris- 10eme, France Phone (1) 205-8545

straight and level



WHAT EVER HAPPENED

TO THE SUN SHINING

THROUGH THE WINGS?

Once a person has built models long enough he finds that among the many that have come and gone there are some that stand out in memory. This especially holds true for the guy who has flown actively for tens of years. The chap who just recently put his ready-to-fly pattern job into the air will make comparisons as soon as he flies his second model.

Maybe a guy was just lucky with some models. Or maybe the aircraft merely survived some mental-block piloting techniques, wild out-of-phase stick pushing, or a seismographic contact with the olde sod. Everything that goes up does not always come down on two or three wheels, and the pilot-like the golfer who broke 100 the wrong way and dreams of the time he shot 77—fondly recalls that friendly bird of last spring or summer. It made him feel good.

When, so to speak, he has logged his 10,000 hours, things run together. There are crates long out of mind which suddenly flash back like the recollection of falling down the cellar stairs at age four. Or like a gaily-colored balloon drifting high into the sky while trailing its string. These things are recalled generally when the guys get to story telling. All these bygone birds had such phenomenal attributes! Or they did strange things, surviving incredible adventures. You always remember because, as you fly, you are alone with that speck in the sky, whether it be a Kwik-Fly, a Nobler, an old-timer Zipper, or a thermal-circling balsa glider.

Little things trigger sudden memories. The first dip of a wing tip that tells of the looming thermal. The hole in the sky called a downdraft-and that always happens in competition when you've got the meet sewn up! A glint of sunshine on a distant wing or a patch of metal foil meant to catch the timer's eye. A curious bird. That absolutely perfect touch-and-go. The emotional impact of a perfectly executed wingover against a bright blue sky. Enough of that and a fella gets restless. He may have the ultimate now. An opaque, glistening machine which he can control, just as a master aerobatic pilot knife-edging a 'Lil Stinker. But he still thirsts for something more. The world-wide interest in gliders is sufficient proof of that.

Every modeler has his thing. We've memories of a chap block running two homemade twins in a simulated setup for a Fairchild Packet he'd hopefully enter in Nats competition. An indoor man in his college dorm patiently sanding a prop—where a chuckle would bring disaster. Or sanding and rubbing a Neptune in exact scale right down to its grain-of-wheat lights. The sound of those twins roaring in perfect sync, going from low to high and throwing back the oily smoke. The glistening perfection of that Neptune in the hot late July sun as crowds watched in hypnotic silence. Those are memories to those guys.

An under-compressed Diesel zinging puffs

of white smoke high in the air on a chill November morn. A Live Wire just a speck half a mile away as its humming Mills sounded sweetly through that sound-carrying still winter air. A silk-covered original, directly overhead on a hot summer's morning, the sun shining through its wings. A crow following a duration model in never-ending circles for an hour on a cloudy, windy late afternoon, sniffing the Diesel fumes. The swift stoop of an infuriated hawk. Crowds of erratically swooping swallows following a sport model like Pups after London-bound Gothas, Models mistaken for real planes force-landing to shake up the spectators. Mistaken for border dope runners. Or overhead airline pilots misidentifying crazy pilots stunting over a crowd.

Models in trees. On roofs. Flying across the full moon like a witch on a broom. Lost models returned after 12 or 16 years. Shot at by farmers. Impacted in a bale of hay ejected from a reaper. Losing engines and battery packs in flight. Powering across a field after hand launching with a doorbell booster swinging underneath! The guy with the first reed set tuning and tuning with earphones on his head-when an auto horn blew loudly nearby. The first five-reedbank job with tin plate reeds (a self-welding machine) but, in his timidity, all five were connected to the rudder! Well, that's the way it goes, one thought triggering another. And now with Lord knows how many thousands of readers thinking their own thoughts.

For some, modern modeling is a diversion—weekend relaxation. What is there to talk about? For others it is a necessary creative outlet, a means of expression. For many, it is both. We have reached what temporarily passes for perfection. Thanks to marvelous modern radio systems you are in the cockpit of a hurtling craft as solid and as inflexible as any metal jet. You can't look out the window to see if the wings flex, but you can mount a camera to find out—if you are

that far gone.

Solid? Fast and precise. Like being on a busy military air base. Maybe it is the exaggerated scale speed that bothers us. SE-5's fly like Thompson racers. Hence all those gliders? Maybe it is whimsy, but the writer knows what he'd like to design-if he knew how. It would float on the tiniest puff of air. The sun would shine through the wings. The birds would chase it. It would fly in the parlor, the parking lot or on open prairies. It would wingover and sit in pristine glory in a display cabinet. It would vanish out of sight but always be easy to find. It would rise off the water like a smoothly skipping stone. It would be a soaring glider but have four props like that overgrown model, the Lockheed Constellation. It would be a Luton parasol, a Smith Miniplane, a Folkerts racer, or, wild man, a wonderful Gee Bee that could fly stably like a dream ship.

You there, don't come closer. Why are you all wearing white coats?

-Bill Winter.

Just because you're a hobbyist doesn't mean you have to use amateur tools.

X-acto tools look like professional tools because they are. They're precisely-made and precision-balanced to help a hobbyist turn out models with a professional touch.

Whatever your hobby may be—model boats, airplanes, railroads or cars—you'll find X-acto knives and tools that are just right.

Why settle for anything amateur? X-acto tools are reasonably priced, packaged in attractive gift sets and sold at leading department, art and hobby stores.

No. 88N Hobby Den Tool Cabinet. Sturdy woodfitted cabinet with sliding see-through cover shows off full assortment of X-acto hobby tools, knives, and blades against a blueprint silhouette background of each tool for easy replacement. \$35.00

No. 86 Knife and Tool Chest. A complete assortment of knives, blades, gouges, routers, and punches. Plus planer, sander, spokeshave, balsa stripper, and steel rule. In handsome fitted wood chest. \$16.95

> No. 75 Knife Chest. Index card-size natural-finish wood chest contains knife handle, 5 assorted regular blades, 2 3-inch blades, 6 gouges, 4 routers. \$6.50



No. 71 Deluxe Model Railroad Tool Kit. Contains needle files and handle, knife with blade, hammer set, long-nose plier, crossaction tweezer, screw driver, pin vise, and razor saw. \$15.00

No. 603 Deluxe Power Drill Gift Set. With 12V Mini Drill and 3 chucks, transformer, car cord, drill bit, starting punch, and tightening rod. \$17.50

No. 378
Soldering Iron
and Hot Knife. A 25-watt
soldering iron, plus hot knife, mounted on

a bubble card. \$4.25

130 EAST 33RD STREET / LOS ANGELES, CALIFORNIA 90011

THESE PRICES GOOD UNTILL DEC. 20 1971

TICK-TOCK TICK-TOCK TICK-TOCK TICK-TOCK

(4) PLANE SET INCLUDES (1) R.O.G. (1) CABIN MODEL AND (2) GLIDERS+ALL MATERIAL MIDWEST



HOBBY PEOPLE IS PROUD TO ANNOUNCE THE BIGGEST SALE EVER ON RADIO CON-TROL SETS. WE HAVE CHECKED THE COM-PETITION AND CAN GUARANTEE THAT OUR SALE PRICES ARE WELL BELOW-ANYONES - ANYWHERE ! ! ! ! ! ! !

WE MUST SELL OVER 1000 RADIOS BY THE YEARS END!

TO ACHEIVE THIS WE HAVE CUT OUR ALREADY LOW CATALOG PRICES EVEN MORE! MOST ALL NATIONALLY KNOWN RADIO SETS HAVE THESE DRASTIC PRICE REDUCTIONS!!!

DO NOT BUY A R/C SET Untill you have seen our prices. These prices cannot be advertised. DO NOT MISS THIS SALE - IT WILL NOT BE RE-PEATED !

WRITE TODAY AND ASK FOR OUR SPECIAL "HOBBY PEOPLE RADIO BONANZA SALE" And we will mail you the catalog by first calss mail immediately !

SALE GOOD NOVEMBER 1st. THRU DECEMBER 31st. 1971

SALE\$399 R/C

DESIGNED FOR THE BEGINNER

V.K. FOKKER TRIPLANE 47"span 49-60 disp. Reg. \$47.95	\$3787
52" span 45-60 disp. Reg. \$45.00	00.000
TOP FLITE SEMI/SCALE P-51 60"span 40-60 disp. Reg. \$40.00	\$3288
ROYAL P-38 TWIN 74½" span Twin 35-61 disp	\$5488
STERLING FOKKER D-7 59" span 60 disp. regularly \$44.95	\$3596
STERLING PIPER TRI-PACER 59" span 35 disp. Reg. \$21.95	\$17 76
STERLING STEARMAN P.T17 65" span 56-60 disp. Reg. \$47.95	\$3887

GLIDER DISCOUNT

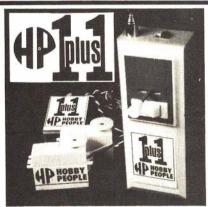
\$3699
\$1276
\$1999
\$476
\$2287
\$1696
\$476



HOBBY NEEDLE FILES

SET OF 12 PRECISION FILES
LION BRAND Needle Files are specially designed to meet the requirements of tool rooms, instrument makers, watch and jewellery trades. Made from the finest Sheffield steel. Handles are smooth polished steel. SET OF 12 Tapper flat, Hand, Half round, crossing, 3-square, knife, square, round, barrette, Round edge joint, slitting, pippin.

LIST PRICE \$5 99



1 PLUS 1 FULLY ASSEMBLED **PROPORTIONAL**

This system is for the sport flyer or beginner, wanting a true servo proportional control system. The 1+1 is complete with 9 volt transmitter, 2 servos, receiver, battery holder for 4 pencells, and a witch harnes. The surface shall be a switch harnes. switch harness. The system can be used SWITCH RISTNESS. The system can be used on single channel planes, gliders or boats. A button on the transmitter operates the second servo for 3 postions . . LOW . . . MEDIUM . . . HIGH. The set is fully assembled and ready to operate when the batteries are installed.

OFFER!!!!!!!

88



\$2100

Headmaster

R/C M Trainer & FOX 40R/C!



The FOX 40R/C in the R/CM Trainer, will give you an easy to handle, sport flyer. Reg. \$25.95

\$70.90

VALUE

63

REGULARLY \$79.95 INTRODUCTORY

48" Wing span for .10-.35 power. use proportional gear. Reg. \$14.95

TOP FLITE

SUPER SONANZA \$988



R/C M TRAINER, Designed by Owen Kampen. 44" span Foam Wing and foam stab. For Reg. \$9.95 construction. \$UPER \$44.99 .049 power.



SUPER \$499

DREMEL 5 Power Tools In 1

New Dremel Motor-Shop!

Deluxe



You can build accurate wings in half the time! Dihedral is fully adjustable and unit ratates 360°. Work up to a 6 foot wing or 12 foot panel. Regularly \$35.00°







DISCOUNT

ORDER IN TIME FOR CHRISTMAS





FANTASTIC \$188 88

- We want you for our R/C CUSTOMER
- Biggest beginners special ever offered
- ORDER NOW FOR XMAS

In the semi-kits the printed circut boards are factory assembled and tested leaving only the inter-wiring to you. PLUS, you get the finest instruction manual we've seen, to help you on your way to the flying field. NO ELECTRONIC... EXPERIENCE NEEDED I One servo completely assembled 4CH. 2ST. Set w/ nicad packs, charger, 4 servos and 4 CH. Receiver. LIST PRICE\$215.00

PLANE
YOUR CHOICE OF 1 PLANE
Choose one of these proven designs that fits your flying style
MIDWEST SKY SQUIRE 57" span Reg. \$31.95 **DUBRO CHEROKEE ARROW**

(Pre-Fab) 49" span Regularly \$39.95 ENGINE CHOOSE 1 ENGINE! The NEW McCOY .35R/C regularly The NEW FOX 40R/C regularly

NMcCOY Series 2 Now In Stock! No.8035 .35 Disp.

(STANDARD) Reg.\$16.95 .\$1356 No.8040 .40 Disp. (STANDARD) Reg.\$17.95 .\$1399 No.8135 .35 Disp. (THROTTLE) Reg.\$24.95 . \$1999

No.8140 .40 Disp. (THROTTLE) Reg.\$25.95 **\$207**

SALE

BY LINK TRAINER COMPANY BALSA WOOD FRAMED-UP

FROM R/CM PLANS

RCM NEW ERA

42" Wing Span 380 sq.in.

The NEW ERA is a small R/C Multi airplane that comes to you ready built out of balsa wood. The wing is joined—all you have to do is finish, sand, cover and hinge surfaces. Formed landing gear and stearable nose gear included. Reccommended for .15 to .23 engine size, and small proppr tional gear. This is an excellent Mini-Multi A BIG VALUE! that will perform the AMA patterns. Quanities limited because of hand labor.

ORDER EARLY! \$2999

LEWMIDWEST SPECIAL !



NEW from MIDWEST All Pre-formed wire, full size plans plus Micro-Oct balsa. LIST PRICE \$29.95 Plus you get KRAFTS / KP-2B 2 channel radio & receiver plus 2 servo/brick. LIST PRICE \$119.95

sale \$11999

EZ JUAN GLIDER PLANE ONLY ... \$2387

PACKAGE DEAL **MIDWEST PROFILE & FOX 35**



Radio Control! Ready-to-Roll!

jerobee gas-powered racing cars!

Completely assembled 1/12 scale models with engine and radio control systems.

comanda Or.

Formula car design with duoservo control system, scale speeds to 240 mph.

Batteries and fuel not included

FEATURES,
HIGH-IMPACT STRENGTH INJECTION MOLDED FRAME—INDEPENDENT FRONT SUSPENSION—ACKERMAN STEERING—AND
ACKERMAN STEERING—HEAVY DUTY REAR AXLE—RECIOL
PULL STARTER—CENTRIFUGAL CLUTCH—MAG WHEELS—&
RADIO POWER UNDER 100 MILLIWATTS (No FCC license regd.

CAMANDO REGULARLY \$109.95 \$8888 COMPLETE (Less batteries & Fuel . . . BANDERO

Herohee

COMPLETE with engine and uni-servo control system (Less batteries & fuel REGULARLY \$89.95 \$7296

Jerobee 1/12 SCALE R/C RACE CAR ASSEM-BLED WITH ENGINE (LESS RADIO GEAR)

COMPLETE WITH: COX .049 ENGINE—INDEPENDENT FRONT SUSPENSION—MAG WHEELS—BODY—FRAME-CLUTCH AND ACKERMAN STEERING.

COMANDO REG. \$34.95..... \$29.95 \$29.95 REG. \$34.95. BANDERO

R/C P-5TMUSTANG

R/C CONTENDER

U/C FLITE STREAK

U/C JR. NOBLER

R/C NOBLER

60"Span .40-.60 Disp, Reg.\$39.95

42"Span .15-.35 Disp. Reg.\$6.95

40"Span .15-.25 Disp. Reg.\$8.95 .

54"Span .29-.60 Disp. Reg.\$34.95 . . .

61"Span .35-.45 Disp. Reg.\$29.95

0

R/C 'LITTLE STIK' 46" Span .19-.23 Disp. Reg.\$22.95 ... \$17 87

R/C FLE FLI + 10 42" Span .19-.23 Disp. Reg.\$24.95 ... \$1888 R/C SKY SQUIRE \$2499 57" Span Multi-Trainer Reg.31.95 U/C 'SNORKY' 36" Span .15-,19 Disp. Reg.\$9.95 \$ 788 F/F 'SUPER SNIFFER' \$ 699 Wing 300 sq.in. for .049 Reg.\$8.95



21"Span for .049 power ERG

23½" Span for .049 Power

CANT WAIT?

CALL FOR

FAST C.O.D. SERVICE

(213) 233-4484



R/C SENIOR FALCON 69"Span ,35.45 Disp. Reg.\$34,95 . . . \$2787 R/C FALCON '56' 56"Span .15-.19 Disp. Reg.\$18,95 . . . **\$14** 99 R/C SKYLANE '62' 62"Span .19-.35 Disp. Reg.\$34.95 . . . \$2787 U/C LI'L JUMPIN BEAN %A Stunt for .049 U/C 'STUNT MAN 23'

\$ 317

FOR OUR LOCAL **CUSTOMERS!** HOBBY PEOPLES WAREHOUSE STORE OPEN TO THE PUBLIC

SALE

\$3288

\$2691

\$2387

\$ 576

\$ 699

Open Mon-Fri 8am To 4pm Open Saturdays 9am To 5pm

FOR OUR OUT-OF-STATE CUSTOMERS, when vacationing in California,



LY ILLUSTRATED

FINEST ALL-IN-ONE HOBBY CATALOG FEATURING SECTIONS OF MODEL AIRPLANES-ENGINES RADIO CONTROLED, PLANES-CARS BOATS-WOODEN SHIP MODELS-'O' -HO-N-RAILROADING-PLASTIC-MODELS-EDUCATION SCIENCE!!

Majl today

I enclose 50¢ for HOBBY PEOPLES newest hobby catalog. Please rush it to me today !

HOBBY PEOPLE

130 EAST 33RD STREET LOS ANGELES, CALIFORNIA 90011

NAME ADDRESS

POSTAGE & HANDLING

\$2.75

HOW TO ORDER60∉ \$20.01 TO \$30.01 ADD TO \$5.00 ADD \$5.01 TO \$8.00 ADD . . . 80¢ \$8.01 TO \$15.00 ADD \$1.10 \$15.01 TO \$20.00 ADD \$1.50 \$30.01 TO \$50.00 ADD **ORDERS OVER \$50.00**

PLEASE ADD CALIFORNIA RESIDENTS ADD 5% SALES TAX

HOBBY PEOPLES WAREHOUSE STORE OPEN TO THE PUBLIC: MON .- FRI. 8a.m. to 4p.m. OPEN SAT. 9a.m. to 5p.m

130 EAST 33rd STREET, LOS ANGELES, CALIFORNIA 90011 AREA CODE (213) 233-4484

Breiten TION COIL

& ANGLE BENDER for 5/32 wire \$9.95



NEW! 4 CELL REPLACE-MENT BATTERY BOXES

Flat pack \$1.95 Square pack \$1.95 For



\$5.95 Reads wind speeds accurately from 2 to 66 m.p.h.



SPECIAL - Weller 30 SECOND AUTO-MATIC GLUE GUN

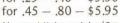
\$10.95 Until Nov. 30, 1971 we will send FREE with each order for a glue gun one box of 60 glue sticks worth \$2.59.





NEW! Tatone "CALUMET" MUFFLERS

for .09 - .19 - \$4.95for .29 - .40 - \$5.50



Unusual light weight (2 to 31/2 oz.) Meets most stringent noise abatement rules. Little or no power loss. Compact design.

NEW - D&R MINIATURE SERVO MECHANICAL **PARTS KIT \$5.99**

You can install the amplifier, motor, and pot element from a Kraft KPS-12 or Orbit

PS-40 Servo into this servo case and gear train. Also of interest to radio scratch builders. Gear train is fully assembled and will operate with cover off.

NEW - D&R BULK-**HEAD SWITCHMOUNT**

88¢ Mounts the standard digital propo airborne switch inside the airplane for operation by pushwire.



NEW - KDH DRAG CHUTE #2 for Glider hi-start \$8.95

This is almost a duplicate of the higher priced (\$13.95) chute that we've advertised before, but the \$8.95 price makes this #2 chute more appealing.



NEW - DuBro RIGGING COUPLERS 2 for 30¢

For adjustable bi-plane rigging using 1/32 cable or monofilament. Screw threads same as kwik links.

NEW - SUPER COVERITE 27" x 36"

\$2.95 Colors: White, red, yellow, blue, orange.



PENFORD "AUTO-START" ENGINE STARTERS

Starter without battery \$21.97 Starter with battery \$36.97



SPECIAL PRICE

Extra Special!! OS4 CHANNEL DIGITAL PROPORTIONAL List Price \$310.00



This is an unheard of low price for this famous, complete 4 channel system. We have a limited number of these available

at this low price, so please write or call immediately. This outfit is really deluxe and includes rechargeable nickel cadmium batteries in the transmitter and airborne system, 4 servos,

charger, full warranty. Price in effect until Dec. 30, 1971 as quantities permit.

USE YOUR BANK-AMERICARD OR **MASTER CHARGE** CARD

TRY US OUT: R. R. Did! "After a great deal of 'shopping' in Europe for radio equipment, I have come to the conclusion that your firm has the best values to offer - even considering the 50% duty imposed by France."

R. R., Couron d' Auvergne, France.





INTERNATIONAL

Route 3, Franklin Pike Circle, Brentwood, Tennessee 37027 24 Hour Telephone Ordering Service - 615/834-2323

modeler mail

Needs Boeing plan

I have been modeling for over 20 years, and during this time have read and collected most issues of your magazine, I must compliment you on a great publication.

The model industry has come a long way since I started with old Strombecker solids and Comet printed wood kits. All of the current plastics and fiberglass kits are good and the equipment is fantastic, as are some of the prices. However, I still like to build my own from sheet and strip balsa and a set of plans.

I would like to know if one of your readers can help me locate an old magazine. It would probably be an Air Trails from around 1949. The book will have full-size foldout plans for a Boeing L-15 liaison aircraft in it. This odd-looking bird was tested by the Army in 1949 and I can remember seeing plans for it in a model book about that time. I am interested in building a model of the ship and would be very grateful if someone could help me locate the magazine.

> Charles Eaton, 8008 Fort Hunt Rd., Alexandria, Va. 22308

Morton saga

I noticed in the June issue of AAM a letter in "Modeler Mail" from Phil Ellis requesting information concerning the Morton M-5 model engine. For the past 18 months I have been involved in a serious research of the entire Morton model engine effort, including a questionnaire which is in the process of being distributed to about 1200 persons with Old-Timer or model engine-collecting interests. I have been in contact with practically every former Morton Aircraft Corp. employee who participated in M-5 production. Only Jim Whitlatch, who test-ran the M-5 engines before shipment, remains to be located

I am presently working with the Burgess portion of the M-5 story and hope, before too long, that I will have researched this era of the story also. The last company to produce and service the M-5 was the M & S Engineering Co., Libertyville, Ill., but they ceased working with it about 1954. The former owners of this company have furnished me with a great deal of interesting data concerning their production and much original material, including photographs, some connected with the initial Morton era in Omaha.

I have been able to rescue and assemble considerable material, even original artwork used in the preparation of the early Morton ads in Air Trails, company brochures, etc. To assist in my research, I am attempting to locate and acquire specimens of Glen Morton's single-cylinder engines such as the early Challengers, Imp Intermote and Water Nymph, produced in the 1930's, and also the smallest engine that had been in actual production up till that time-known as the New Hurricane 066 in 1938. My plan is to write a series of articles for our model engine-collecting fraternity, covering the various phases of the Morton story from the early single-cylinder Morton Challengers of the 1930's through the various attempts to

produce and market the M-5.

With the help of Larry Hoffman, I am tracing various Japanese model magazines for possible leads on M-5 type engine production, rumored to have taken place after World War II in that country.

The only information of general interest concerning the M-5 was published in Air Trails Pictorial in Sept., 1947. I have had numerous requests similar to Mr. Ellis's and am reproducing one of the original Morton brochures for distribution to those who are kind enough to return my survey questionnaire. I would also like to reproduce the Air Trails article featuring the M-5 cutaway drawing for those seeking this data.

I recently acquired the remaining M & S parts residuals and will be making some of these parts available to M-5 owners who need them. There are many interesting angles to the Morton story-the M-5 is only one. I am afraid that I am not set up to answer a big flood of mail at present, as there is still so much to do on the research that I suspect it may be a year before it is squared away. However, this info may enlighten interested readers somewhat as to the present status of

> R.O. Knutson, Box 243, Austin, Minn. 55912

Model wife

As the wife of a model builder and flier, I've had all the gripes and complaints a wife could have. Then one day I woke up and realized what a great hobby modeling is, and that I actually liked airplanes almost as much as my husband. So much, in fact, that I soon hope to have my own radio set.

I don't understand those wives who are so busy complaining about their husbands' hobbies. If only they would stop complaining and begin getting interested, asking questions, and offering suggestions (on the trim and colors, perhaps). Even though you may be playing second fiddle to whatever model he happens to be working on at the time, encourage him. Let him know that you are proud of him-and his models.

Sylvia Hall, Kinston, N.C.

International exchange

I am looking for someone interested in exchanging plastic airplane kits (stamps, too) available in my country for airplane kits produced by Revell, Hawk, Aurora, Monogram, Lindbergh, etc. in the United States. My collection at present includes over 150 different models.

> Joseph Helpe, P.O. Box 200, Poznan 1, Poland

Stone Age propulsion

I would like to commend you for the Wallace Kulczyk article (Feb. 1971 AAM) on designing a ducted fan. This is exactly the sort of thing that could stand some attention, since a large percentage of desired scale designs are jets. Yet, after 25 years of existence, model jet propulsion is still in the Stone Age. The ducted fan holds all the promise as far as

(Continued on page 82)

Dee Bee CARDINAL R-T-F KIT



Please write or call for price.

Special – Devcon 5 MINUTE EPOXY Large size reg. \$2.25 Special Price - \$1.35 each. Price in effect 'til Nov. 30, 1971.



PRO-START ENGINE STARTER \$19.95



Very light weight with reduction gear box. Enough torque for all engines.

NEW - DuBro SKY-MASTER 600 R-T-F KIT List Price \$59.95 Hobby Lobby price \$49.97



621/2" span, 610 sq. inch area. Low wing contest - capable multi. Extensive hardware as in other DuBro kits.

"GLASKIN" WINGS \$29.95 To fit: Dragon Fli, Kaos, New Orleanian, Eyeball, Cutlass (MAN)

New - Banshee Wing

Cutlass Supreme, Triton, Sun Fli IV, Citron (Lanier), Intruder.

CONTROL LINE COMBINATION OFFER



Your choice of one of these \$10.95 Midwest Profile kits: P-51 Mustang or, ME-109 or, P-63 King Cobra and \$16.95 Fox 35 Stunt

Engine, Total List Value \$27.90. Special Price (Until November 30, 1971) Only \$19.97

CONTROL LINE COMBINATION OFFER

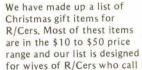
\$9.95 Midwest "SNORKY" Beginners' Control line kit.

36" span foam wings and \$9.95 Fox 15 engine.

TOTAL LIST VALUE \$19.90.

Special price Only \$13.97 (Until November 30, 1971)

CHRISTMAS GIFTS FOR R/Cers



us up every year for gift ideas for their husbands.

Please write or call up for this list right away because we do run out of some items just before Christmas.



TRY US OUT: G.P. Did! "I couldn't believe how fast you sent my last order. I received the order within 6 days from the time I sent it, and that included Labor Day week-G. P., Pueblo, Colorado.

World Engines S-4 SERVOS Blue Max 4 CHANNEL SEMI KIT



\$15.97 RS-4B KIT RS-4B SEMI KIT \$19.97 RS-4B ASSEMBLED \$23.97 S4C-D KIT \$16.97 S4-C SEMI KIT \$19.97 S-4C ASSEMBLED \$24.97 S-4D SEMI KIT \$19.97 S-4D ASSEMBLED \$24.97

World Engines S-4 SERVO Mechanics Kit \$2.95 Includes

The Blue Max SEMI kit is the least expensive way to acquire a reliable full house deluxe digital. Since the difficult assembly of the printed circuit boards has been done at the factory, you only have the mechanical assembly and p/c board interconnects to accomplish. Complete with

semi kits for transmitter, receiver, 4 servos, all ni-cds, charger, wiring harness, instructions.

ASSEMBLED KIT SHOWN

\$159.00

NEW - Dremel No. 219 SPEED CONTROL \$16.95 While this was

designed for use as a speed control for the Dremel Moto Tool, several other uses were suggested in Sept. RCM: 1. Reducing heat of soldering iron so it can be used for "close quarters" Monokot-ing, 2. Adjustment of

internal heat of glue guns, 3. Closer adjustment of Sealector iron heat.

case, screws, gears.

24 Hour Telephone Ordering Service - 615/834-2323



ROUTE 3, FRANKLIN PIKE CIRCLE, BRENTWOOD, TENNESSEE 37027

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 U.S. Post Office requires thal all shipments have your ZIP CODE. Be sure to use your ZIP CODE. Satisfaction guaranteed or money refunded. Phone 615/834-2323 Store hours 10 a.m. - 5 p.m. except Sun.

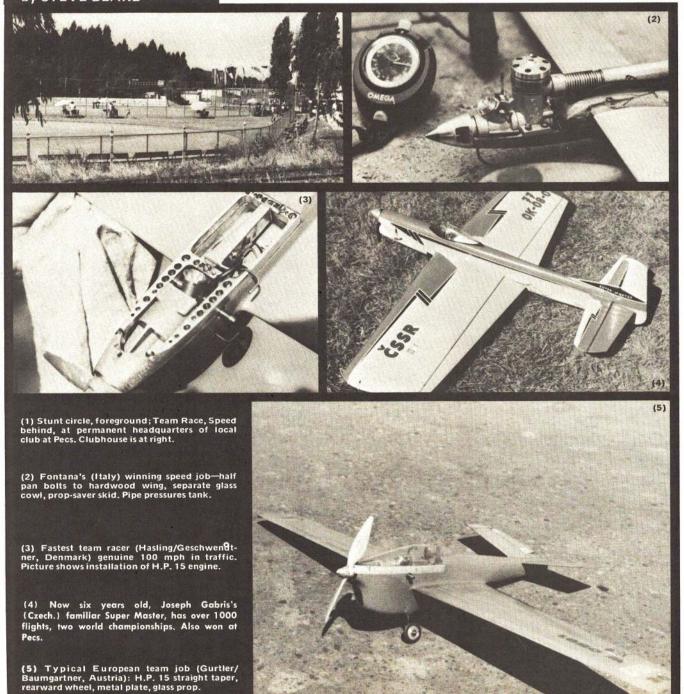
ON THE SCENE

EUROPEAN CL CHAMPIONSHIPS by STEVE BLAKE From 14 nations 101 competitors travelled to the southern Hungarian town of Pecs, to compete in the first-ever control-line championships of Europe. Superb flying facilities were provided by the local club at their permanent headquarters. The weather was excellent for the entire meet with high temperatures, clear skies, and light winds.

This was the first international competition in which silencers have been required for stunt models. Most fliers seemed to have followed the spirit of the new rule, by producing "guide" silencers, rather than "legalizers." The trend to large models flown on long lines is clear, there being only three or four Nobler-sized models in a field of twenty-two. Winner Joseph Gabris, Czechoslovakia, flew better than ever, his familiar "Super Master" looking smoother now that a silencer has been fitted.

With the Russians failing to compete in Team Race, the competition was wide open. As usual there was much controversy over the conduct of the event. A lot of whipping was allowed throughout the heats, contributing to some very rough flying. Fortunately, the semi-finals and finals were run strictly and produced some good racing. The winners, Nore/Eckholm (Finland), scored times which were slow as compared to the incredibly fast Russians.

Speed was perhaps the most significant of all three competitions, in that Europe now appears to have an answer to the T.W.A. in the Rossi. The availability of the relatively inexpensive Rossi engine has encouraged many new names to fly speed. With the Italians—Fontana took first—recording speeds over 149 mph in practice, next year's World Championships should be an intriguing confrontation.



CARL GOLDBERG

NEW! CG RETRACT GEAR

LOWEST PROFILE - Main Gears are only 1" high.

LIGHTEST - 2 Mains with 5/32" wire struts only 3 oz., Nose Gear, 2 Mains, and 3 struts, only 5 oz.

BROADEST BASED for best distribution of stresses, both fore and aft, and laterally.

- Made of rugged nylon moldings, best for absorbing vibration and stress. Large bearing surfaces.

SHORTEST TANK COMPARTMENT - Nose Gear needs only 51/2" for a typical "60" installation.

SIMPLEST - Main Gear has only 3 molded parts. 2 springs, 5/32" music wire strut, 4 screws.

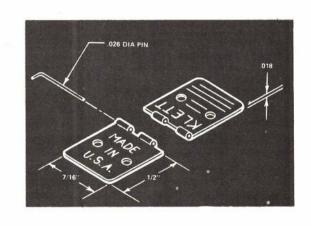
EASY Installation or Strut Removal, Low actuating force required - one servo can actuate all three units.

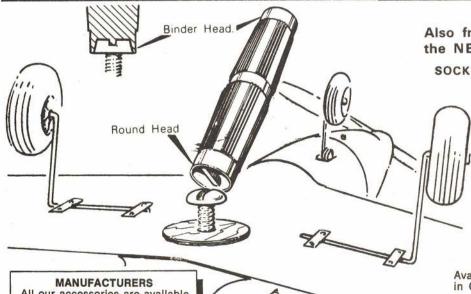
COST?? Unbelievable! But True! Special Low Introductory Price Pair of Main Gear Retracts - \$ 9.55 Set of Nose Gear & 2 Mains - \$19.95

KLETT NYLON HINGES-THE NEW BREAK-THROUGH!

Designed and Manufactured by Roy Klett, originator of the World-Famous RK Hinges!

When the RK Hinges were first introduced several years ago, they were instantly accepted by modelers everywhere as the answer for smooth operation of control surfaces. Very shortly they were copied by manufacturers in the U.S. and in other parts of the world. The quality, however, has never been equaled because of the exceptional care and attention to detail by the designer, Roy Klett. Now, he has designed and is manufacturing his new RK2 Hinges which are smaller and extremely strong - and so thin that all you need is a knife slit for them. Note the dimensions, especially the thickness. These hinges are the absolute top quality, yet the price is only \$1.95 for 15, and \$1.10 for 7. Exclusively marketed by Carl Goldberg Models.





Also from Roy Klett the NEW KLETT SAFETY DRIVER SOCKETS DOWN ONTO SCREW HEAD - CAN'T SLIP OFF AND DAMAGE YOUR WING!

> One end takes Round Head Screws, other end takes Binder Head.

> > KLETT SAFETY DRIVER

LARGE for 1/4" Nylon Screws)98¢ ea. SMALL for #10 Nylon Screws,

All our accessories are available at excellent O.E.M. bulk prices

Available in Canada

P.S. For best service, see your dealer for items you want. If not available, write direct, add 35¢ per item (75¢ outside U.S.). Minimum order \$1

CARL GOLDBERG MODELS

CHICAGO, ILLINOIS 60608 2545 WEST CERMAK ROAD .

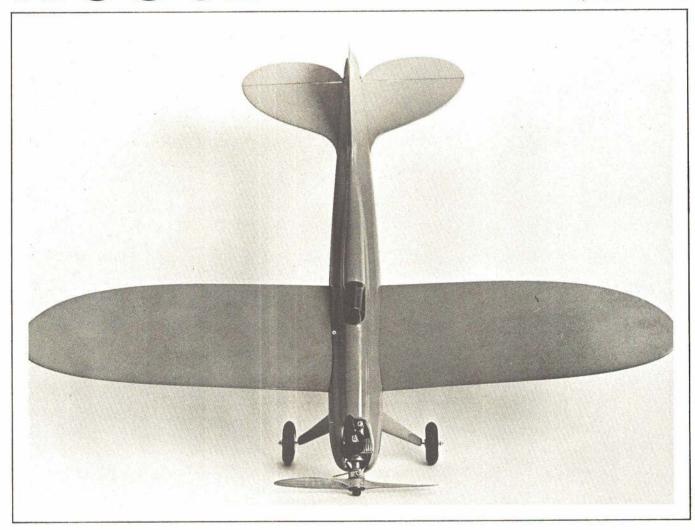
CARL GOLDBERG MODELS INC. 2545 W. Cermak Rd., Chicago, III, 60608

I am sending 20r for 8 pg. Illustrated Cata-log with "Recommendations in Starting in R/C," Basic Explanation of R/C Equipment, and Radio Control Definitions.

ADDRESS.

In 1940 the immortal Jim Walker turned the modeling world In 1940 the immortal Jim Walker turned the mupside down with the invention of U-Control. Here's authentic plans of the plane that did it—still a pretty fair stunter.

by BRUCE LUND



While rummaging about the attic for some items, I came upon something that really brought back memories. Covered with years of dust, but still recognizable, was my first U-control model-Jim Walker's Fireball. The dope was cracked and faded, the rubber wheels rotten and the canopy had turned yellow with age.

It had been almost thirty years since I had given up free flight to try this new-fangled type flying called U-control. It was so new that no one in our area knew anything about

As I remember it, this kit was of very good quality. The fuselage was rough carved inside and out, the tail was cut out as were all other parts. The parts were not die cut, but were saw cut. The wing skins were printed with rib locations. No plans were provided as such; however, a pictorial sheet was supplied showing each construction step, picture by picture. It was sufficient.

Flying UC in the early days was a real

challenge. Remember, this was before anyone thought of engine offset, weighted wing tips and wedge fuel tanks. Just getting this engine cranked was a challenge in itself. The old ignition engines could be real cantankerous at times. They were heavy and under-powered, had low rpm, and required the added weight of the coil, condenser, switch and batteries. Our fuel consisted of 70% white gas and 30% outboard motor oil.

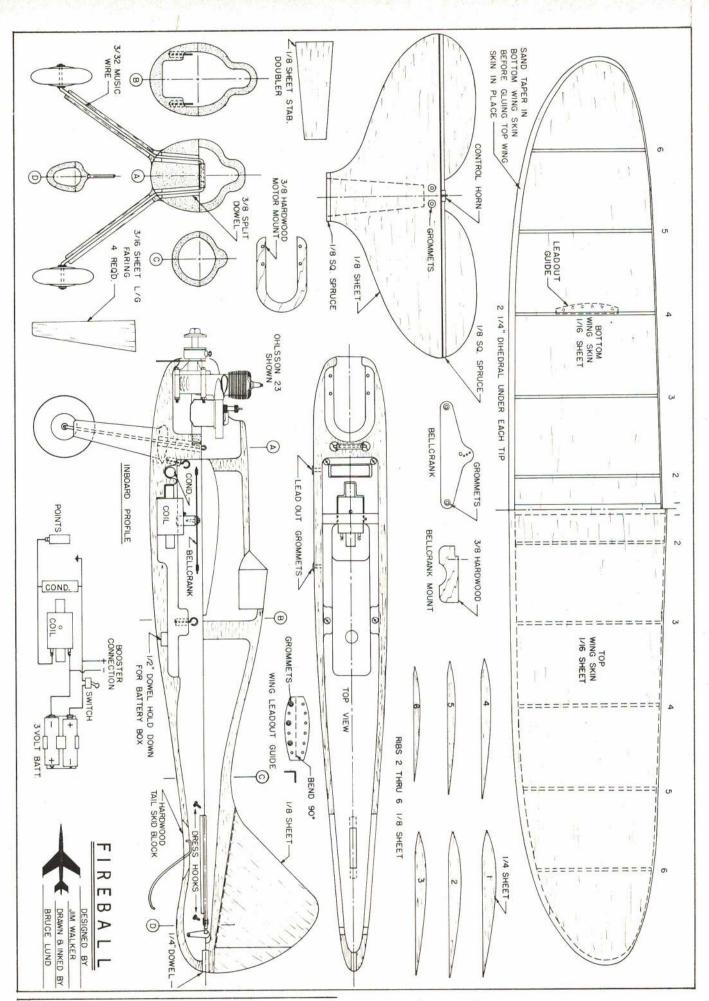
If one could get the engine cranked, take off, fly straight and level till the fuel was depleted and survive the crash landing, he had done something to be proud of. You may laugh, but I can remember when I won a contest by looping my Fireball.

As experience was gained, all of this changed. Jim Walker worked with the design for quite some time. When the two-speed engines became available, he started his "Sabre Dance" routine, letting the model hang by its prop and move back and forth at will. An even more unbelievable feat was

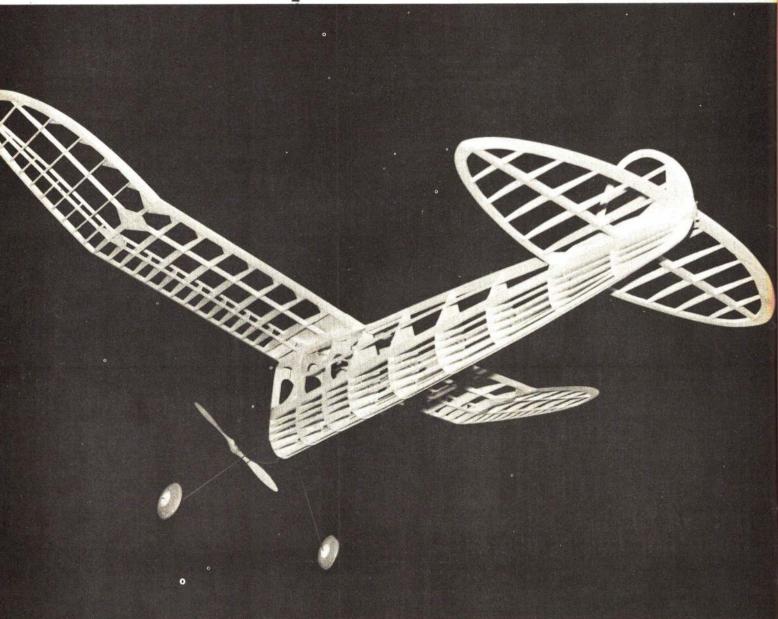
flying three planes at the same time-one in each hand and one tied to a football helmet. He also flew from water with single-float and twin-float Fireballs, Jim Walker really started something. It's too bad he isn't around today to see how model aviation has progressed.

While reminiscing with my friends, I found that some of them didn't know what a Fireball was-especially the younger fliers. Over the past few years I have noted several letters to the editor in magazines asking questions about this model. I decided it was time to do something about this and let the present generation in on a little model aviation history. It would mean disassembling my model to obtain patterns from which a set of plans could be drawn, but since the model was not flyable in its present condition-why not? If any of you choose to build the Fireball, it is sure to stir up a lot of discussion on the flying field.

(Continued on page 57)

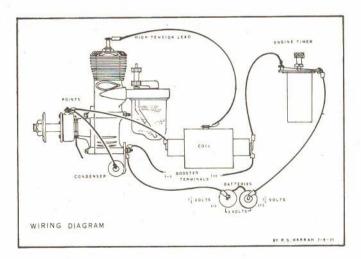


VIVELL-POWERED OLD-TIMER IS STRAIGHT OUT OF A RECENTLY FOUND ANTIQUE KIT. PLANS DRAWN FOR SCRATCH BUILDING.



dodger

by ROBERT HARRAH



In 1941, Sal Taibi designed this plane and named it "The Cadet." That same year Brooklyn went crazy when the "Bums" won the pennant. The Brooklyn manufacturer, H & F Model Airplane Co., decided to capitalize on the Dodgers' triumphant year by changing the name of the plane to "The Brooklyn Dodger."

This Old-Timer has a list of winners too long to mention and is still winning. Sal still flies one at all contests he enters, along with his famous Starduster 900.

The revised version has maintained all of the aerodynamic qualities of the original. The only major change is the addition of a DT (dethermalizer) and there are some minor structural changes as well. The Old-Timer that may seem so foreign to the modern builder is really not quite so outdated. This became especially noticeable when an effort was made to update what Sal had done thirty years ago.

Although it is no longer produced, I was fortunate to find one of the original kits which I used as a guide and then repacked for the collectors. This kit, complete except for the power system, was packed during World War II. The patriotic packaging—red, white and blue with a flag printed on the box— was a common practice during those years, as were the red fiberboard for the firewall instead of plywood, and corks substituted for the metal caps on the dope, glue and colored dope bottles. In this respect one could refer to that period as the good-old-days.

It may be that the old-timers are more aware of these changes, but I can remember how many *Liberty* magazines and others that had to be sold to buy a kit and engine. They sold for 5 cents and our profit was 1½ cents. When the end of each week came we would add up our pennies, go to the model shop and drool over the items we were saving towards, and then go out and sell a little harder. After

all was saved and the last penny counted out we would treasure every piece and part of our purchase. Then came the big disappointment—the kit wasn't complete, so we would sell some more to buy the extras. Maybe this is one of the reasons, besides its graceful and majestic flight, why an old-time plane is looked upon with such reverence.

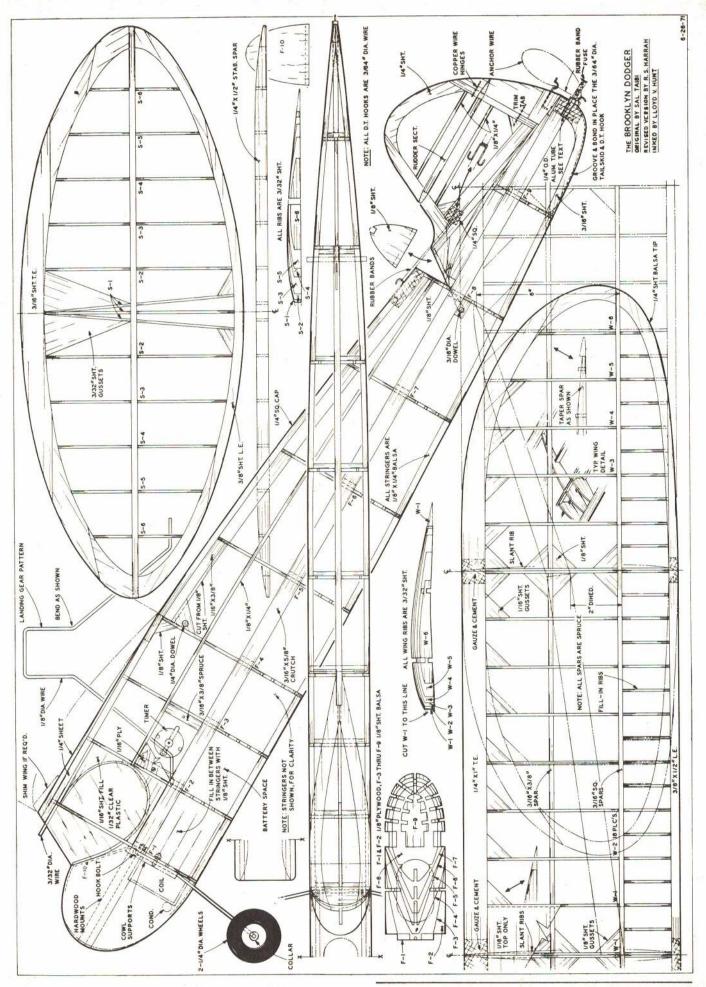
The other great disappointment of those days was the fly-away, unless it was at a contest and we won. I often wonder why none of us were smart enough to invent a DT. We used to brag how we would never build a kit. We felt we had to design and scratch build in order to be a real modeler. (There was some merit to this, but I think it was partly a defense because we couldn't afford a large kit.) Most of us in my area won our first big kits and new motors by placing with our scratchbuilt rubber models in contests. I still remember my first. It was on a foggy morning at Point Mugu (now Port Hueneme) and I won a Huskie Jr., class A engine and a class A Skyrocket Kit. And do you know what? I wasn't the least bit ashamed to build that kit.

Since this kit is not available I hope you are not ashamed to build a scratch-built. Before construction starts, better plan to do some searching at your local hobby dealer if you are going to use an ignition system and do not already have one. The wiring diagram shows all necessary parts. The Austin timer and battery case is still in production, the coil is still being made and condensers of the old type (Ford 11A18801) are plentiful. I like the new lighter types that are available at local electronic or radio supply houses-for small engines, 23-and-under, (6PS-P10±.1 10% 600DC). The original design of this ship was as a class B and C. The Ohlsson 23 was recommended for class B, but it was generally

(Continued on page 66)

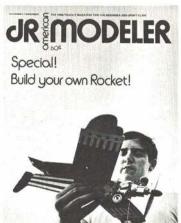


An Old-Timer is a sport model by today's standards of performance. Maybe this explains their renewed popularity.



By Popular Demand!





On November 1, Potomac Aviation Publications, publishers of the American Aircraft Modeler will release an entirely new magazine dedicated entirely to the beginning modeler, whatever his or her age, but focused primarily on the ten- to

sixteen-year-old group.

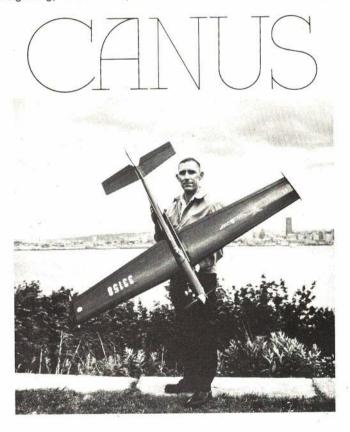
Entitled the JR. American MODELER, the new magazine will be a bi-monthly for the first six issues, at which point it will go monthly. First issue is November-December 1971, on sale through subscriptions, hobby shops, and other easy-to-find sources. Price will be 60 cents, a subscription for 6 issues will be \$3,00, for 12 issues \$6,00. Contents will emphasize model airplane building and flying but will include appropriate boats, cars, and a variety of interesting projects with educational and scientific value, Special attention will be given to all aspects of how-to-do-it,

JR MODELER

0
733 Fifteenth Street, N.W., Washington, D.C. 20005
I've enclosed [] \$3.00 for 6 issues, or [] \$6.00 for 12 issues. Please enter my subscription immediately.
NAME
ADDRESS
CITY STATE
ZIP
NOTE: The prices quoted above apply only to the U.S.A., Canada, APO's and FPO's. For foreign countries, add \$1.00 for 6 issues, \$2.00 for 12 issues.

An international plane for FAI pattern flying.

Although big, it is of simplified construction and builds quickly.

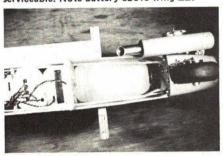


The Canus is designed for the FAI Pattern. It performs graceful international maneuvers with the smoothness and precision needed to win-increase the control surface throws and it will also win for you in the AMA Patterns. (If it suits your style, retracts may be added.)

The name Canus is also international, as it is a contraction of Canada and United States. The basic lines of this design are straight and simple, to be totally covered with Super MonoKote.

The vital statistics of the Canus include: (1) Wing span 66", (2) Wing area 675 sq. in., (3) Fuselage length 52" or 79 percent of the wing span, (4) Aspect ratio 6.4 to 1, (5) Airfoil NACA 0015, (6) Wing taper approximately 1/3 LE and 2/3 TE, (7) Tip chord approximately 65 per cent of the root chord, (8) Dihedral 1 1/4" under each wing tip, (9) Weight 6 1/2 to 7 1/2 lb. (The

A unique approach to front-end access is bottom hatch location. All innards serviceable. Note battery above wing LE.



maximum weight of this aircraft under FAI rules is 8 3/4 lb, including fuel.)

A muffler was included in the design of the Canus. If you don't use one, be careful—you could end up a little tail heavy. A long landing gear is shown on the plans for those of you who fly from deep grass or rough fields. It could be shortened for hard surface flying.

In flight the Canus is very groovy, but responds quickly and positively to control commands. Knife-edge flight is very easy; in fact, this plane knife-edge loops! It penetrates wind well-one reason it flies smoothly through turbulence, while other designs are noticeably affected.

The Canus has a realistic appearance and a quick, easy, light construction without sacrificing strength. With its moments, areas, shape and force setup, it is a superior performance pattern aircraft.

Construction

As the actual construction is typical of many pattern planes, it is not necessary to go into too much detail. No details are given for the installation of fuel tanks, radio systems, pushrods, etc. due to the large variety available on the market today.

Install spars, landing gear blocks, trailing edge strips, etc. into foam cores and cover with 1/16" balsa sheet. Join wing halves using ply spar joiners and epoxy. The dihedral is 1 1/4" under each wing tip. Wrap center section with 5" wide glass cloth. Then drill 3/8" holes for hold-down bolts. Insert short lengths of 3/8" dowel with predrilled 1/4" holes for

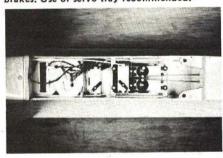
by ROY FOOTE

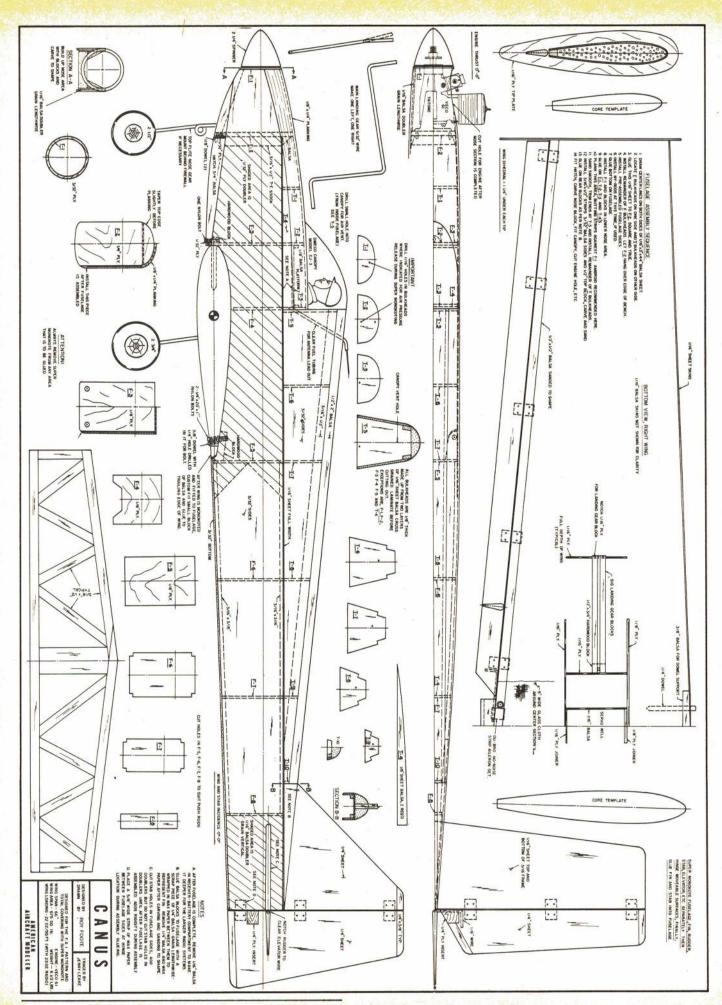
1/4-20 nylon bolts. Do not drill front dowel holes at this time. Cut and sand ailerons and tip plates to shape.

Most bulkheads are 1/8" thick, made up from two layers of 1/16" balsa sheet crossgrained. Laminate first; then trace and cut out bulkheads. The remainder of the bulkheads are plywood with thicknesses specified on plans.

Cut out fuselage sides including stab slots, Add 1/32" ply doubler up front and 1/16" balsa doubler in stab area. Do not cut slot in stab doubler at this time. Add 3/16 x 3/16" strips and the sides are ready. Draw a renter line on each side of the 1/16 x 3 x 44" balsa sheet crutch. Mark out "F" bulkhead locations on one side, and "T" bulkhead locations on the other. Before gluing any (Continued on page 74)

Radio installation is compact. The fourth servo operates the cable for nose wheel brakes. Use of servo tray recommended.





last bipe fighter

THE NAVY AND MARINES HUNG ONTO THEIR BELOVED GRUMMAN F3F SERIES ALMOST UNTIL PEARL HARBOR.



Of all the glamorous eras of aviation, perhaps none will ever surpass the middle 1930's, when the high-performance biplane fighter ruled the peaceful skies. The British had their beloved Hawker Fury, the Italians, their graceful Fiat CR.42, the U.S. Army Air Corps had its Curtiss and Boeing pursuits, and the U.S. Navy proudly brandished its wonderful Grumman biplanes.

It was a time of unreality, for the usefulness of the combat biplane was fast drawing to a close. Nimble, lightly armed and relatively slow two-wingers looked majestic as they wheeled in close formation over fascinated crowds gathered to watch impressive annual air displays at Hendon, Kelly Field and Pensacola. But soon the nations of the world would turn away from thoughts of gentlemanly air duels, to the deadly serious battles where speed and firepower counted far more than did the wind whistling through the guy wires.

Long plagued by tradition, the U.S. Navy was among the last to face reality and drop the biplane fighter in favor of what everyone else had observed was superior: the monoplane. The Army went first—to the fixed-gear, open-cockpit Boeing P-26 and then to the Curtiss P-36 Mohawk. The British were on their way to the Hurricane and Spitfire. On the other side, the German Messerschmitt Bf-109 and the Japanese Oscar and Zero were about to end any chance of the biplane remaining in vogue.

But the Navy hung on. It had been happy with earlier Grumman biplanes—the FF-1 and the F2F, and naturally went for an improved version of the F2F, ordered in late 1934. Basically, it was an F2F with a 650 hp Pratt and Whitney R-1535 Twin Wasp Junior engine. The new F3F, like its predecessor, was hefty, full of wires and struts, and as lovable as an old spaniel.

The first one flew on March 20, 1935, and disintegrated two days later in a test dive. A second XF3F-1 prototype flew on May 9, was delivered to the Navy's Anacostia Naval Air Station near Washington, D. C. on May 13, and crashed on May 17-failing to recover from a flat spin. So far, two airplanes had lasted a total of ten days, but enough had been learned to justify proceeding with the program, and the third prototype arrived at Anacostia on June 20, 1935. It began its Navy trials on July 10 and was accepted for service on August 1st, no time being wasted once the

original bugs had been eliminated.

Barely six months later, the first production F3F-1 was delivered to the fleet, and its successor was already on order. At first, the XF4F-1 was to have been a completely new biplane. Before construction was begun, however, Grumman engineers turned their thinking to two other ideas for an XF4F: an F3F with more power, and a totally new monoplane. The entire XF4F-1 plan was eventually dropped in favor of the XF4F-2, which was to become the famous Wildcat that ended Grumman's romance with two-winged fighter planes.

But that was still in the future, and Grumman was busy building biplanes. Between January and September of 1936, 54 F3F-1's were delivered—the first batch going to the U.S.S. Ranger to replace the Red Rippers' FF-1's and F2F-1's. In late July, 1936, the prototype XF3F-2 was delivered to the Navy, but troubles with its 1000 hp Wright Cyclone GR-1820 engine delayed acceptance for many months. Finally, in March, 1937, an order for 81 F3F-2's was placed with Grumman. The first one was received by the Navy in July and accepted for service in November.

The prototype XF3F-3 was delivered in October, 1938, and featured several changes aimed at increasing speed: a curved windshield, modified wing leading edges, and a new engine cowling. An order for 27 of the improved fighters was awarded, with the first being delivered in December.

In the meantime, however, the Navy had been proceeding with development of the monoplane fighter. In June, 1936, the prototype Brewster XF2A-1 Buffalo was ordered, and early in September, 1937, the Grumman XF4F-2 Wildcat made its first flight. The first Buffalo flew in December, 1937, followed shortly by the arrival of the prototype Wildcat at NAS Anacostia for Navy acceptance trials. In June, 1938, a contract was signed for 54 Buffaloes, and then, at the end of the month, the radical twin-engined Grumman XF5F-1 Skyrocket was ordered by the Navy. Things were moving fast.

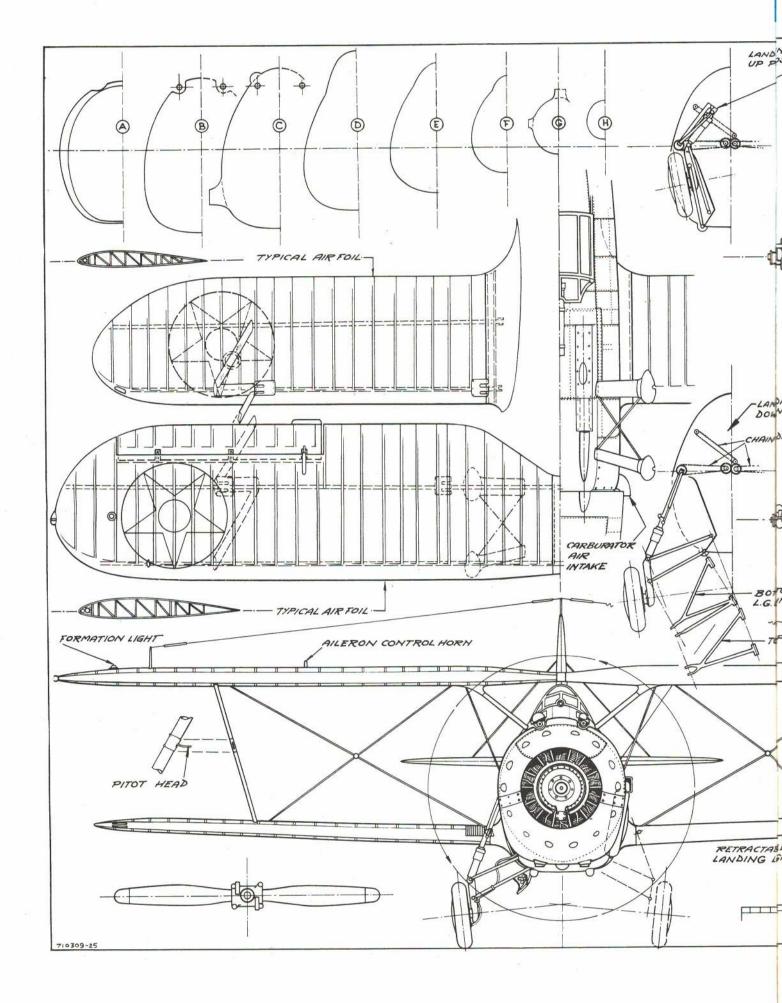
Still, the F3F's were moving down the assembly line onto the flight line-to every fighter squadron in the Navy and Marine Corps. Great aircraft carriers like the Saratoga, Yorktown, Wasp, Lexington and Enterprise all boasted squadrons of the jaunty

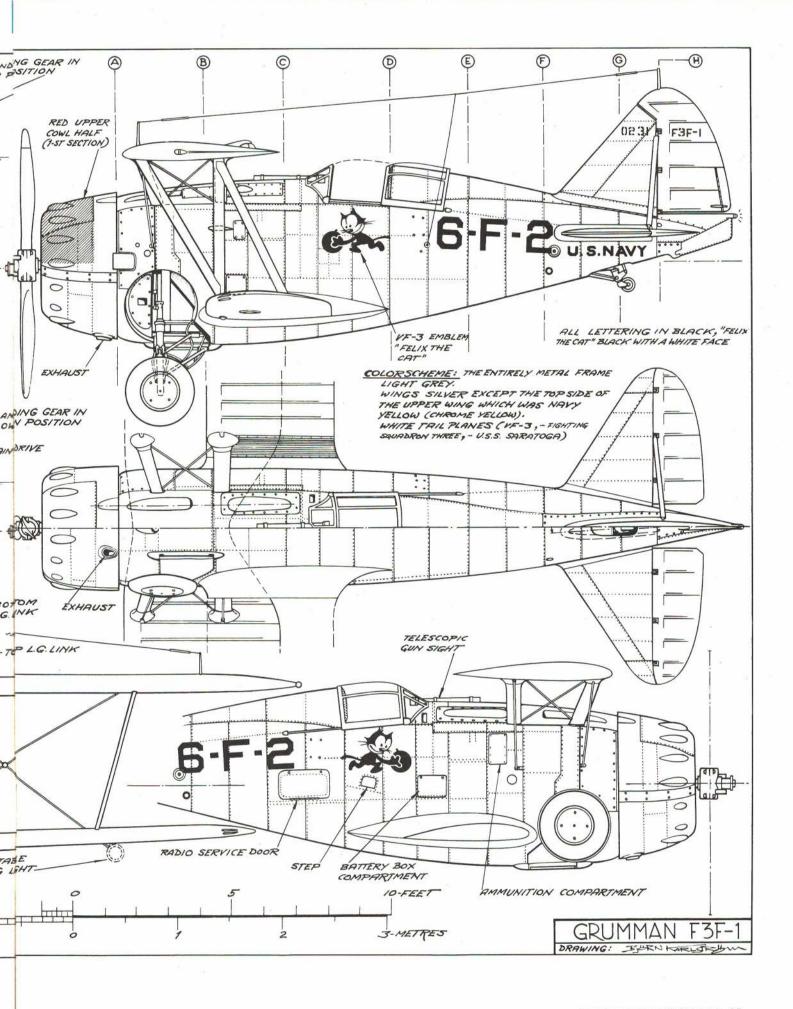
(Continued on page 80)



Wheels down to keep formation with a slower camera plane, an early F3F-2 with the then-sensational 1000-hp Wright Cyclone engine.

Photos by Smithsonian Institution





HOW CHEAP CAN IT GET

by ED SWEENEY



This glider was intended as a free-flight toy, but adapts easily to rudder-only RC. A fine and long flying combination.

This sport of flying RC planes is known for being expensive and complicated. Recently, there has been a revival of interest in single-channel equipment and rudder-only planes to offset the complications and expense of multi-digital. Rudder-only is relaxing, whereas digital is nerve wracking.

The simplest and least expensive form of RC seen yet is a glider manufactured as a toy by Eldon who markets it for about \$3.95; at some discount stores it costs only \$2.00. The radio set shown is the ACE R/O Baby Combo which retails for \$69.95—the lightest and smallest radio set of any kind available with a superhet receiver.

It took about two hours to work out and make the complete radio installation in the glider. Constructed entirely of solid styrofoam, the glider merely slides together. It should take the experienced modeler about 5 seconds to assemble; the least experienced might take 10 seconds. This is a true ARF. Using it for RC takes a bit more time, as it needs a rudder. The surface was cut out of the fin to leave adequate material to retain the stabilizer. We probably should have cut out the rudder to also have a counter-balancing area ahead of the hinge line, but it has not proven necessary—the little baby actuator moves it happily. Two Kavan pin-type hinges, which were selected for very free movement, were used to attach the rudder.

Through the fin, just under the rudder and above the stabilizer, a 1/16 ID aluminum tube was pushed through the foam to be the bearing for the rudder torque rod. This rod angles on to the actuator buried in the foam above the wing. Another tube was pushed through the foam just behind the actuator as the forward bearing. A "U" shaped hook was bent in the torque rod to engage the actuator output arm. A "U" hook on the rudder engages an arm of the torque rod for rudder connection.

There are four parts to the ACE Baby unit. A cavity was cut out of the foam front fuselage using a Dremel Moto Tool to accommodate each part. Specifically, the battery up front, then the switch, receiver, and actuator. The parts were taped to the fuselage first to establish proper balance. After locations were established, the holes were made to suit.

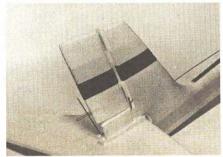
Actuator installation was simplified by also using the actuator's assembly bolt and nut to attach two plywood plates. The hole in the fuselage snugly holds the actuator in place by these plywood pieces. The output arm on the actuator must be bent to a new position so that the arm is parallel and in line with the arm on the magnet. Look at your actuator and this will make sense.

For nose protection and strength, a strip of

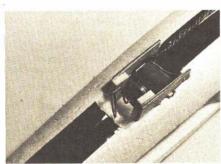
1/8 x 1/4 spruce was epoxied to the underside of the nose as a landing skid and tow hook mount. The strip of spruce must extend from below the middle of the wing to as far forward as possible. An adjustable wire tow hook screws in place on the spruce. It is positioned about one inch behind the wing leading edge. Move it back 1/4" for calm weather and forward the same distance for windy weather.

Last operation before flying is to use plastic 3M tape to decorate the glider and protect it. Wing leading edge must be covered with tape. I also used a strip of nylon packaging tape around the whole fuselage from nose to tail on each side. It takes the danger of breakage out of bad landings. When putting this nylon tape on, you can also straighten your fuselage (if it is warped from molding, as mine was).

Does it fly? Sure. Being so light it goes up with the slightest hint of lift; without lift its high drag brings it down steadily. I find I can get a tow launch of over 300 feet using light fish line. That's high enough for finding thermals.



Rudder shape and mounting shown here. Note location of torque rod's bearing thru fin.



Actuator installation is tight slip-in fit. Rubber seating tape limits actuator movement.



ACE Baby system is pure simplicity. The only plug is for charging. Excellent long range.



That's all there is to it. Four holes made in fuselage for each component. Charger is part of the ACE package. Can it be simpler?

WHERE THE AGTION IS

FREE FLIGHT

BOB MEUSER SPORT

Boeing Scholarship Contest: Marty Thompson, 16, of Livermore, California, beat 70 other contestants in the second annual Boeing Scholarship Contest, held in Seattle on June 19-20, to win the Grand Championship and the \$1500 scholarship that accompanied it. Marty took first place in Indoor Hand Lauch Glider, Indoor Easy-B, Design Craftsmanship, and Outdoor Unlimited Rubber. A few points behind Marty were Seattle-ites Phil Hainer and Rick Sironen, both 16 also. Rick, you may recall, won the 1970 contest, and a three-view of his winning Nordic towline glider appeared in this column in the March

1971 AAM. Rick won Nordic again this year. The format of the Boeing contest is rather unique, and obviously well thought out. There are three main categories: Free Flight, Control Line, and Specialty. Free Flight includes 1/2 A Gas, Unlimited Rubber, Hand Launch Glider, Cargo, Towline Glider (combined A/1 and A/2), and Helicopter. CL includes Stunt (Classes A, B, and C combined), 1/2 A Profile Proto Speed, CL Scale Racing (Goodyear), Navy Carrier (combined Profile and Class I), and Combined Speed/Record Ratio. (A model in any speed class may be flown against the existing AMA record for that class, and points are percent of the record speed.) Specialty includes Rocket-Class O Altitude, Rocket-Swift Boost Glide, RC Aerobatics (Class A Pattern only), Indoor Hand Launch Glider, Indoor Easy-B, and Design Craftsmanship. In the latter, the model must have flown in an event, and models are judged according to innovation, execution, quality, finish, accuracy, etc., as well as supplementary written material submitted by the contestant. Events are flown in accordance with the applicable AMA or NAR rules, and contestants must be members of those organizations, or of the Model Aeronautic Association of Canada. Contestants may enter any number of events; however, a maximum of three events in any one category will be scored. Points are scored on the basis of 25 for 1st, 20 for 2nd, etc. The contestant's best four out of nine possible events are counted toward the championship.

The contest is open to anyone who is less than 19 years old on July 1. If you cannot qualify for a scholarship by being a supergenius or super-athelete, you would do well to consider entering Boeing's 1972 contest; Boeing will even provide a home-away-fromhome for youngsters traveling solo. For info, write Boeing Management Association, P. O. Box 3999, Seattle, Washington 98124, Attn: Mermann Clegg, Org. 2-1009, M/S 85/48.

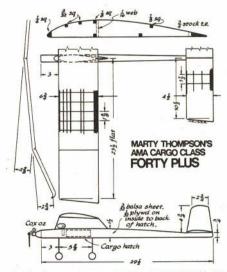
I Go Cargo: As readers of this column may



Four-wheel gear and one-blade prop distinguish Marty Thompson's Cargo model—thermaled two minutes at Boeing Scholarship Contest.

have noticed, we have a soft place in our headbone for the Cargo event, as it seems to have many of the virtues of Scale, Old-Timers, competition Free Flight, and sport flying all rolled into one. Besides, it is one answer to the flying-site problem.

The idea is to see how much gross weight you can put up for a 40-sec, flight on a 20-sec, engine run. Models are limited to a 48-in. span and a .025-cu. in, engine displacement, so a Cox Tee Dee 02 is the ticket—allup weights come out 15 to 25 oz. Getting them off the ground without ground-looping is a problem, and a conventional landing gear with a pair of rubber-soled wheels is a sure ticket to a ground loop. The old pros from the PAA Load and Cargo events of yesteryear say the cure to ground-loop-osis is a trike or

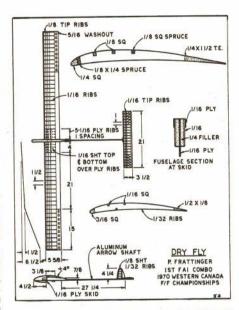


4-wheel gear, large wheels, especially if the takeoff area is rough, and wheels that will slide sideways instead of tripping. Wheels should be metal, plywood, or perhaps even teflon-rimmed or on casters. Configurations include—in addition to the conventional arrangement shown in the three-view of Marty Thompson's Forty Plus—biplanes, tandemwings, engines mounted in pods.

Caution: Marty's Cargo thermalled for two minutes on his last flight at the Seattle contest, so a dethermalizer is not as silly as it might seem! Based on Starduster 350 wing and tail planforms, but with Marty's own structural design and anti-vortex tips, the Forty Plus won the Design Craftsmanship award and placed second in Cargo, a "smidgin" behind Rick Sironen's winner at

BOB STALICK RUBBER AND GLIDERS

Thermal Glider: This month's featured A-2, with its light extremities, is an example of the "state of the art" in thermal-seeking Nordics. Along with the Dry-Fly is the full set of





coordinates for the highly-rated A-2 section, the GF-6, considered by many to be the best still-air airfoil in use. The drawing indicates the position of the outrigger turbulator, made from heavy monofilament or shirring elastic. These turbulators seem to be regaining popularity, but their primary drawback is a susceptibility to damage on landings. This can be solved by suspending the cord in front of the wing by means of soft metal wire, from a paper clip, so that hard landing damage can be repaired by simply bending it back to shape.

Thermal Seeking: Modelers who frequent the contest circuit these days are confronted with many forms of thermal-sensing devices—from fancy electronic gadgets to soap bubbles wafting in the breeze. One of the more foolproof and easily-read devices is a high (12 ft. or higher) pole anchored into the ground with a 20-ft. long thin mylar streamer fixed to the top. Standing downwind, the modeler can "see" the air as it approaches him. When the end of the mylar begins fluttering and jumping up, it indicates good air is on its way. If the air is good enough, it can be felt by the unpracticed newcomer. A fancy GF-6 airfoil isn't even necessary, for even the crudest of zip-zip foils will thermal for a max.

zip-zip foils will thermal for a max.
Free flighters who want to know more about thermal-seeking using the mylar streamer method should obtain a copy of the NFFS 1971 Symposium, edited by AAM Columnist Bob Meuser, from Annie Gieskieng, 1333 So. Franklin St., Denver, Colorado 80210 for \$3.50.

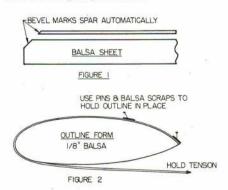
Spinning Out Of Thermals: The bugaboo of some models is their inability to stay in a thermal. Some, if designed and built properly, never have this problem. Look carefully at this month's plan—light wings and wing warps are built in. If spinning out of thermals has affected you, you may need wing warps, too. Lighter wings might be needed as well. Try warping the inside wing down first (the wing toward the center of the glide circle). Warp the trailing edge down a bit by heating the

panel over an electric plate and twisting. Start with small amounts—1/16" on a Nordic or Wakefield is a good starting point. You may need more, but you can find out via trial and error. After you've heated and twisted, then remove from the heat and quickly rub the wing panel over your leg to remove excess heat and set warp.

BUD TENNY

Prop Blades: Outdoor props are relatively heavy and rotate so rapidly that they must be closely balanced, but indoor props have a different balance problem. The weight difference between blades is not particularly important, but the structural strength of the blades must be closely matched.

Blade Outlines: Blade outlines are typically about .020" square, or .018 x .024". Such tiny wood is hard to keep track of properlyFig. 1 shows one method. The corner of the balsa sheet is bevelled before outline strips are cut from it; each outline theh has a small bevel which identifies which way the strip is turned while gluing it in place.



Blade Shape: Every indoor prop designer usually has a distinctive blade shape he prefers to use. The blade outlines are preformed to this shape by using a form such as that shown in Fig. 2. Pin the form to a flat surface, soak the outline strips in water, and wrap outlines around form as shown. Finally, bake the whole package 20 minutes in an over set to "Low."

It is important to remember two points: first, use the small bevel on each strip to get both strips turned the same way while they are wrapped on the form; second, pin the outline in place with balsa scraps to prevent damaging the outlines with pressure from the pins.

Matched Ribs: In keeping with matched spars and outlines, indoor props must have matched sets of ribs. After cutting several ribs in the usual manner, match them in pairs by size as closely as possible. Then, while building the first blade, cut ribs to fit at each station along the blade. Before gluing these ribs in place, cut the other one of the pair to the same length. By matching the ribs in length, identical blade shapes are assurred. With proper matching of all parts of the prop in this fashion, an even-running prop is almost guaranteed. Often, the blades of indoor props are distorted an incredible amount under high power. Under this kind of stress, lack of proper matching causes uneven running and wobbling.

BOB HATSCHEK POWER

Gentlemen, Start Your Engines: Today's top competition engines, which are revving at speeds of 25,000 rpm and even higher, were in evidence at the Free Flight World Championships held in Gothenburg, Sweden. Following the day of competition for power

models, an international engine-revving contest just seemed to grow out of the multi-lingual bull sessions.

Rossi engines on 7 x 3½ fiberglass props turned the fastest, with American Jim Taylor's turning nearly 26,000 rpm. Fellow New Mexican, Buzz Averill, had one that turned about 25,000, as did Thomas Koster (Denmark) and Paul Lagan (New Zealand).



Verbitsky's disassembled engine at FF World Championships; Schnuerle porting, drum rotor, piston ports. Much dental drill work.



Compact Russian inertia starter had 50:1 gear ratio. Requires assistant to operate crank.

While it didn't turn as fast—probably because it had a bit larger prop—the engine built by Evgueny Verbitsky (USSR) was even more interesting. For the record, his rpm was over 23,000, and when Taylor put Verbitsky's prop on his Rossi it didn't do any better. The Soviet engine is a Schnuerle-ported .15 with drum-type rear rotor, bypass ports through the piston, and a standard-type glow plug (rather than the widely-used modified Cox plug). Verbitsky did much of the internal work on the engine with dental drills, which are essentially miniature carbide router bits.

Winding Them Up: When engines are tuned to run at high rpm, they're just not as easy to hand crank as some of us might like. Also, when a hot thermal is indicated, or when you've only got a couple of minutes to get airborne in a flyoff, you want to start that mill right now!

To do this you need a starter—a rotating device powerful enough to turn an engine over at a couple thousand rpm. You stick the model's spinner into a rubber coupling (such as a short length of hose) and away you go.

Three types of power source are available:

Three types of power source are available: an electric motor, a gasoline engine, and a



Full-scale aircraft and bicycle parts were combined in SkyScraper Club inertia starter project, Used here by member Eric Hatschek.

hand crank with a spinning flywheel to store the rotational energy.

Electric starters can be purchased commercially, or they can be homemade. Automotive accessory motors (for electrically closing car windows and the like) are excellent for this purpose. They're small, powerful, and operate on 12-V batteries (auto, motorbike, or even NiCad packs have been used). They're also cheap at many local junkyards—with prices as low as \$3.00.

Tom Kerr's gentlemanly starter (he doesn't even have to bend over) is mounted atop a welded aluminum stand about 3½ ft. tall. A foot switch on the base feeds it the juice. Jim Taylor's simply mounts on his model box—fed current simply by pushing the spinner into it. About 1/16-in. of end play in the armature shaft is used to operate a Microswitch at the back end of the starter motor.

Gasoline engines suitable for the task can be found on old lawn mowers (Briggs & Stratton), small emergency generators (Honda), possibly an old chain saw (McCulloch), and a number of other odd items of hardware.

The final type is the inertia starter. What's required here is a five to six in. diameter flywheel, a gear box with a ratio of somewhere between about 20:1 and 80:1, and a hand crank.

The Russian power team at the World Championships had a neat, small inertia starter with a 50:1 gear box and a one-piece tubular stand. Because it was so light, it required a helper to hold it down while in use. He also kept cranking.

As a club project, the Brooklyn Sky Scrapers recently built an inertia starter using components from a full-scale aircraft inertia starter (Bendix Eclipse). As acquired, it was junk (all ball bearings had to be replaced), but with the planetary gearing, clutch, and low rpm output shaft removed, it provided the needed 26:1 gearing along with a totally enclosed flywheel. A bicycle crank with modified pedal for a handle and the freewheeling sprag clutch from a bicycle coaster brake made a dandy unit for winding it up. The photo shows Eric Hatschek feeding a ½A into it, but it handles engines right up to Class C with ease.

Walt Mooney SCALE

Scale Rubber Speed Contest: That most inventive of model clubs, the North American Flightmasters, has done it again. From the first place plaques, through the worst crash award (a model stuck through a brick wall),



to the award for the slowest qualifying time (a real live tortoise), its Scale Rubber Speed contest was really great.

An enthusiastic group of speed demons met at Russ Barrera's model museum in San Marcos August 8th and were taken to the local high school football field where the 88-ft, straight line speed course was laid out. Seventeen scale and eight non-scale entries were on hand. The Williams brothers were enlisted to work the electronic start/stop clocks and the race was on.

Astonishingly, some of the scale racers flew, and others crashed and crashed and crashed. A good lawn helped but not enough to prevent some of the models being reduced to kindling.

John Alcock's winning scale model was an all-sheet covered P-51 with a four-bladed mahogany propeller. Second was a beautiful Hughes racer by Jack McCracken. Bill Warner took third with a Caudron, and fourth was a P-38 in an all-red color scheme (except for its "Yippee" markings per the actual 5000th Lightning).



Entered in N.A. Flightmasters Scale Rubber Speed Contest, was McCracken's Howard Hughes Racer. Straight course was 88 ft. long.

Three magnificent Crosby CR-2's were entered by the SMART organization (San Marcos Air Racing Team) consisting of Granger Williams, Bill Hannan and Bill Pardoe, but were unable to qualify despite the gallant effort of Hannan's CR-2 doing slow rolls in a ballistic trajectory from start to a foot or so short of the finish.

foot or so short of the finish.

Eighty-eight feet in a straight line is tougher than it looks, although some models, notably Warner's Caudron and Mooney's P-38, went much further. Counter-rotating props help the straight flight characteristics and worked well on Warner's twin pusher non-scale entry also.

Launching the smaller models proved a problem. One Dayton-Wright racer crashed (several pieces) twice before and twice after a successful flight, which proved it was quite stable and fast if launched correctly.



SMART team entered three Crosby CR-2's. Williams brothers operated electric start/stop clocks. Best speeds about 40 mph.

Best speeds were about 40 mph, and flight durations of three to four sec. were the rule. Glides were generally straight down. All the non-scale entries qualified and nine

All the non-scale entries qualified and nine scale models managed to get through the traps. These included a Caudron, two P-51's, a P-38, a Dayton-Wright racer, a Waterman racer, the Hughes racer and two 1909 R.E.P. 2bis racers. Appropriately, one of the R.E.P.s had the slowest qualifying time and was awarded the Tortoise. (Walt Mooney immediately named the Tortoise, Robert Esnault Pelterie in honor of the occasion and is studying the airflow over the tortoise's shell to see if similar streamlining could be used to help win Scale rubber speed contests.)

CONTROL LINE

BILL BOSS SPORT AND SCALE

Giant Scale: We have all heard lots of stories about how big things are in Texas. Well, here's another that just about tops them all. Ray Schiveley of Houston, Texas tells us about his 61-lb. UC PT-19-that's right 61 lbs.! The plane spans 12 ft, and is powered by a 5 HP Tecumseh air-cooled outboard engine that swings a 28½ x 20" homemade fiberglass prop. Construction is of 1/8" plywood, spruce, and chrome molly tubing as was the original PT-19's. Covering is dacron-coated with butyrate dope and Sherwin-Williams acrylic auto enamel.

The plane reportedly flies very well with a top speed of near 40 mph. Takeoff speed is about 25 mph. Throttle control is achieved through the use of a three-line Roberts system made twice the normal size and three sets of .021 lines. Flaps are operated by relay-controlled reversible motors. In addition, the plane is equipped with lights, instruments and a CB Radio.

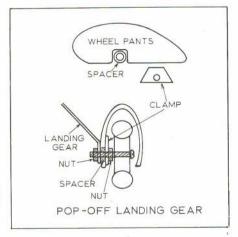
Ray also has a 1/3-size Geenies Teeny from *Popular Science* magazine and is planning a 1/3-size J3 to be radio controlled. The PT-19 and Geenies Teeny have been on the contest circuit of the Texas Gulf Coast for exhibition flying.



Sitting in Ray Schiveley's 12-ft. PT-19 is his grandson. Weighing 61 lb., ship flies 40 mph on Tecumseh engine.

Hobbypoxy Hint: Some people have complained that Hobbypoxy paint does not stick very well to a doped surface. The most frequent problem is the lifting of the Hobbypoxy when Scotch or masking tape is removed after the trim color has been added.

Bob Noll, Editor of the Aeroguidance Society Inc. Newsletter, has offered the following solution. After building up a good base with dope, allow the last coat to dry at least 24 hrs. Sand lightly and then brush on a coat of very thin Hobbypoxy filler. Thin the filler at least 75% with Hobbypoxy thinner. The final mix should not be much more than the consistency of the thinner. This coat will provide the necessary interface between the dope and Hobbypoxy colored paint. Now



sand the filler coat slightly and spray on one or two coats of colored Hobbypoxy. When thoroughly dry, the masking tape can be removed without fear of lifting the Hobbypoxy.

Flying Clinic: If your club is looking for a way to interest newcomers in model airplane flying, the Christmas season presents an excellent opportunity, as it is the time of year that many ready-to-fly planes are sold. All too often the youngster who receives a plane is discouraged when he is unsuccessful in flying it. Here's where club activity enters the picture—by providing the helping hand and experience necessary to make the gift a successful one.

A club can provide a great service to itself, and modeling as a whole, by planning a flying clinic for the ready-to-fly planes, advertising in the local hobby shop stating the time and place. Before flying, a short class on the procedures for starting engines and the operation of the controls would be in order. A little help from you will go a long way toward providing the spark that gets another airplane modeler on his way. There is no greater feeling than that of being successful on one's first time out.

Pop-Off Wheel Pants: Lt. Harold McClung Jr., a helicopter pilot in Viet Nam, states that he has ruined wheel pants that were permanently affixed to his models during rough landings. To solve the problem, he clamped the wheel pants to the landing gear. By notching the wheel pants, using a washer or two for spacers, and using a piece of light aluminum as a clamp, the wheel pants can be easily removed or installed. (See sketch for details.) With the wheel pants so attached they will pop-off if the landings get too rough.

Foam Wings: The June 1971 issue of AAM featured a construction article on the Crusader Stunter by Vic Macaluso. Since then there have been inquiries about the availability of the foam wing used in this model. For those that might have missed the information in the article, the foam wing cores are available from Foam-Flight, 628 W. 6th St., Mankato, Minn.

JOHN BLUM CARRIER AND PATTERN

1971 British Nats: Results are forwarded by Steve Blake on the May 30-31 British Nats. Amidst rainy, windy weather, 23 entries out of 37 flew stunt on the RAF station 60 miles west of London. Dave Day, flying a modified Thunderbird took first. Frank Warburton was second, using a Tony with OS 40; third went to Jim Mannall with his Nimrod; and fourth to Steve Blake with his original Starmaker.



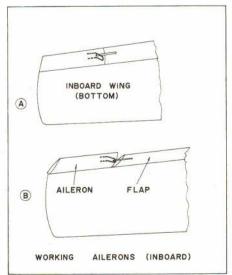
second-place Carrier winner British Nats. It had ST 40 with RC throttle.

Troublesome engine runs seemed to be the order of the day.

Navy Carrier does not have wide support

Navy Carrier does not have wide support there as it does in the U.S. And so, there were only four entries in the British Nats, none of which made a perfect arrested landing. Derek Bird took first with a K & B 40-powered Guardian (Netzeband Design) winning mostly on scale qualification, followed by Andrew Keeler with a Skyraider (built from AAM plans) using a ST 40. Top speed was about 80 mph.

Practice Deck: Low interest in Navy Carrier in England is blamed on the absence of Carrier decks. Many local meets in the States have been run with the deck laid out in the grass. Lime the radii edges of the deck and mark the ends with crepe paper, stake the cables and it works well. Three or four cables laid in the grass make a good practice deck. When you can pick up one out of four in practice, one out of ten in competition is easy.



Carrier Line Tension: This column in the October issue depicted the outboard aileron. This month's sketch illustrates a typical setup for the inboard wing. Figure A shows the aileron and flap in the high speed position. The flap and aileron can be hinged in any conventional method. It is important that the aileron leading edge to wing trailing edge joint be shaped similar to flap, to prohibit any upward trayel past neutral.

ward travel past neutral.

An approximately ½-in. long loop is formed from 1/32" dia. m.w. and imbedded in the alieron. A 1-in. length of 1/16" dia. m.w. is epoxied to the flap allowing about ¼-in. to protrude through the alleron loop. When the flaps are dropped for slow speed, the flap wire travels to the bottom of the wire loop and pulls the alleron into down position, as depicted in Figure B. The ½-in. length of wire-loop can be varied to acquire desired amount of down alleron.

Stunt Plane Look-a-likes: Thirteen-year-old Steve Eaton, of Schofield, Wisconsin, asks if most stunt planes are designed to give the same general appearance, citing two recently published examples. Some nostalgia may have been expressed in design, resulting in similarities to the long-famous Nobler, Ares, and the Jet types.

There is some food for thought here. This nostalgia is prompting modelers to develop semi-scale stunt aircraft. There will always be look-a-likes, since some features of design are advantageous in the stunt event.

HOWARD RUSH COMBAT

The Nats: Combat at the 1971 Nationals was swept by Ohioans. Tops in Open was Jerry Haupt from Dayton with his sturdy Wedge. Jerry and his dad Jack go for strong, simple planes. Good-natured guys, they take a lot of kidding about their maple machines, but they usually have the last laugh.

Bernie Varnau of Cincinnati has been flying only two years. Since I flew against him last season, I had been predicting that he'd win Senior Combat this year, and he did. Bernie's flying talents became more effective when he switched from a diamond airfoil ship to his original Motivator II, which motivates close to 120 mph with a sleeve-bearing Tigrefelter for power. This custom-built engine, a modification of the Supertigre 35C, is now available from John Gladfelter, 611 Hilltop Lane, Cincinnati, Ohio 45215.

Bob Baldus of Des Moines, Iowa broke his ankle in two places at the Nats on Tuesday,

Taking seconds in Senior and Junior Combat at '71 Nats were David and Philip Bush, flying original Dinosaur.



but flew in Open Combat on Thursday and scored a kill—crutch and all.

Engine Report: Speed men Roselle and Frye are working on a Schnuerle-port combat engine that will sell for about \$40 per copy. For information, write to RAF, 217 Wenger Rd., Englewood, Ohio 45322.

Supertanks: Tony and Joe Mickel of Chicago use a double-thickness pen bladder fuel tank for reliability and consistency. The Mickel tank is made by putting the inner bladder over a swizzle stick, pulling a slightly fatter bladder down over the first one, and then binding the inner bladder to the fuel tubing with copper wire or carpet thread. Sizes aren't critical, but look for bladders about 5/16" and 3/8" in diameter, both about 3" long. Pen bladders can be found in some pen or stationery shops and shouldn't cost more than five cents each.

I've been using these tanks for about a year and they are a great improvement over the single bladder. The double tank eliminates the problem of a change in needle valve setting from ground to flight and provides a constant fuel flow through maneuvers. It is stronger than a baby pacifier. Incidentally, if a pen bladder tank doesn't break during the first two or three runs, it will probably last a long time, so don't retire an old tank if it's still working.

JOHN SMITH SPEED AND RACING

NATS Notes: This year at the Nats was great—over 1600 contestants, with the biggest turnout in Speed and Goodyear in years. Half-A Day saw us process a fantastic 140 Proto and Speed models. There were more than 75 in A, B and C; Jet had a whopping number of honkers. The rumored times in C failed to materialize as the weather—generally bad, with 55 degrees on Wednesday—and the lack of running time on the new Wisniewski-Clary 60's kept the times low. However, a number of filers were in the 180-plus mph area, and all the excitement of a good Nats was present.

Many still can't figure out the rule book—found one contestant still using the old "T" end on his mono-line and a couple still thought they could fly on braided lines. The whippers were out in force early in the week—some still think the shortest and fastest way around the circle is with the hand twenty degrees ahead of the model. Over 115 Goodyear fliers showed up, keeping the officials

The Hard Luck Award Of The Week goes to Bill Keller, Dayton, Ohio, in the Rat Race circle. Seems Bill rolled a ring on his new R.A.F. (Roselle and Frye) engine at home just before the Nats. Jack Frye built him a new piston before he left for Chicago and Bill spent Monday and Tuesday at the Nats getting the new sleeve chromed and honed. Everything was "GO" Tuesday evening, but while turning in the low 12's in test flight, his up line broke. Instant kit!

This year also saw the first presentation of a CL Speed award—the First Annual Tin Ear Award. This trophy, a large tin kitchen funnel lettered for the occasion, was presented to the contestant showing the most consistent talent for getting bad needle valve settings. The lucky (?) winner was Big George Brown, of Staten Island, N.Y.

Navy Timers Do Excellent Job: The Navy help this year was top notch, with no missed times. The guys on one circle were within a tenth of each other all week long. When you consider they were "green," this performance was nothing short of great. The Navy Public Works gang also must be commended. They built new pylons on Monday when the old ones "disappeared," and were on the circle in



less than five minutes after being called to do a repair job (when the adjusting bolt thread stripped out of one pylon). All in all, it was a great week.

FAI Team Finals: Our next U.S. FAI Team should literally be a world beater. Help support the team—FAI patches and decals are available from AMA.

RADIO CONTROL

DON LOWE SPORT AND PATTERN

Feedback: For those seeking greater flying challenge I described a technique for performing the Lomcovak maneuver in the August 1971 issue. Patrick Potega, Editor of the "Marc Sparks" (Madison, Wisconsin) Newsletter, dropped a line to describe additional techniques.

"Apparently every plane does it differently—some with controls crossed, others with control deflections in the same direction. For example, the manual that comes with the Top Flite RC Nobler describes the maneuver as follows.

'Lomcovak: Nobler does it, but it takes timing. Enter from climbing flight (or left) turn at 45 degrees climb and bank. Use full throttle throughout. While climbing make left (or right) aileron/rudder/up-elevator snap roll so that the plane is spinning and still going up. After one good spin move elevator stick to down position while maintaining rudder and aileron directions. Plane will begin to tumble a moment later... After tumbling, which is the desired maneuver, release the sticks and recover. If the stick postions are held, the model will exit the tumble in an inverted spin.'

spin.'
"The Nobler does the maneuver so well that you get a queasy feeling in the stomach just watching it gyrate. Quoting further, this time from Air Racing & Aerobatics 1970, James Gilbert states:

'There are various methods of entry, but basically, you begin with the airplane going upward... at which point you apply forward stick as if to begin an outside loop. Then you add to this... full left aileron and full right rudder, to initiate an outside snap, and you hold it there as you embark on the wildest

Seen at DC/RC East Coast Championships, this brake was different, simple and effective.



ride of your aeronautical lifetime. At first, the nose will track around the horizon, while the airplane hovers; then, the axis of rotation changes and the airplane will begin to tumble end-over-end, rotating forward about the axis of the wings.'

"This article also illustrates the maneuver, for those who have doubts as to what the plane should be doing. I have done the Lomcovak with not only the RC Nobler, but also with a Taurus and a Trainermaster; each plane requires a different stick sequence and different timing. A lot of control deflection and persistence for hitting the right combination of controls seems essential for success. Once you've mastered the Lomcovak, you'll find it a real crowd-pleaser."

I must admit that I've never performed what I would call a true Lomcovak or tumble maneuver although I've tried it with several ships. Now, if we would just add it to the Class C or D maneuver schedule!



Members Tri-Valley RC Club, South Bend, have these ships, one on floats, for snow flying.

Safety Reminder: This tip might save you an airplane sometime. I'm sure that a lot of old-timers are aware of the necessity for checking electrical connectors on the airborne equipment, but it bears repeating for the newcomers and for the oldsters that tend to get careless. It's smart maintenance procedure to occasionally check the electrical connectors for tightness to insure good electrical continuity. This is particularly important for the aileron or battery connectors which are plugged in and out quite often, for even the best connectors tend to loosen over a period of time with use. Check those connectors that are not disturbed in normal operation upon installation and upon any occasion you may have to disconnect and reconnect. It is important to check each individual pin separately. A connector may appear tight but have a loose individual pin—and that's all it takes.

Over the years I've noted many instances of loose pins in my own and other equipment—in fact, I think that is what caused my latest bash. Tightening is a simple process of wedging a straight pin in the pin socket and bending the socket halves together. After bending recheck to assure snug fit.

Club FCC Licensing: The club FCC license is being employed by many clubs. It saves the individual a lot of money and the FCC likes it since it indicates the organized nature of RC modeling. Each club, however, must designate the limits, if any, imposed on its use by members. Clubs have placed varying restrictions, apparently as a function of their officers' willingness to accept responsibility for individual member's use of the privilege. The DC/RC Club of Washington D.C., for example, imposes the following restrictions as noted in their July Newsletter:

The club license is available only to (1) all juniors and (2) all new members for one year from date of joining the DC/RC and (3) any DC/RC member for six months after expiration of his individual FCC license. Further, the license will be valid only at DC/RC Club fields and events. Club members are enjoined by DC/RC to exercise care in the use of the license since error by one member can jeopardize the privilege for all. The club basically feels that all members should have individual licenses but is providing for financially burdened juniors and other temporary situations.

Retracts Revisited: Retracts are getting better as evidenced by some of the new products by

Pro-Line, Kraft and others. A cry comes from the "Oily Birds" June '71 "Squack Sheet" Newsletter for a ideal set after much difficulty, as well as concern about cost and complexity, with existing brands. The criteria established is as follows: (1) Three wheels, one steerable; (2) Light weight—maximum of 1½ oz. extra weight per wheel; (3) No additional equipment required other than perhaps a switch—no extra servos, no extra batteries, no linkage to install; (4) Must be operable from any brand of radio having a fifth channel; (5) Must be strong enough to withstand bashes without damage; (6) Must cost no more than \$25.00 for all units complete.

This may sound like a tough set of requirements but this hobby industry is ingenious. After accomplishing the development of sophisticated proportional equipment on a shoestring budget and with prices on same going down every year, the challenge of super-retracts doesn't sound so difficult, does it? How about another challenge—mufflers with no power loss, a maximum of 90 DB sound level at 20 ft. range, weighing not over 2 ounces for a 60 engine size and most importantly does not fall off the airplane or fail from vibration fatigue. It can be done with careful engineering and testing.

Groovy Motor Mount: Mike Donovan of Vicksburg, Miss. forwards an idea for a motor mount improvement. If you've had trouble with loosening of engines on hardwood mounts, it is primarily due to the wood compressing and deforming over a period of time. Retightening is only a temporary solution. What is needed is to spread the load out over a larger area. Mike does this by bolting ¹/₄ aluminum plates to the beams, drilling and tapping for the engine mounting screws. The Pilot ARF "Five Star" (distributed by World Engines) I have been flying employs this technique and so far it's as tight as can be.

Contest Report: From Pensacola, Florida comes news of the "Fiesta of Five Flags" RC Championships held June 12-13, 1971. The high point trophy was won by Art Azlin of Huntsville, Ala., with firsts in Scale, Pylon and Class D Novice. Understand he put on quite a realistic performance with his scale P-38 Lightening. (I have always had a thing for the P-38—such a beautiful bird.) Jim Kirkland of Valparaiso, Florida, took first in D Expert with his reduced scale Little Citron. Jim has his own design small scale retracts in this 40-size ship. Steve Hackney of Pensacola, Florida took Class B honors and Russ Spencer of Tallahassee, was Class A winner.

CLAUDE McCULLOUGH

Rest In Pieces: The crack-up attrition rate in RC Scale at the 71 Nats was much higher than usual and the results of hundreds of hours of beautiful craftsmanship were left scattered on the ground. In most cases some variation of the classic scale stall followed by a snap roll occurred—generally immediately after take-off. The sickening "stomped orange crate" sound of the impacts emphasized once again there are limits to which wing loadings can be carried with safety. Even more certain is the necessity for adequate engine displacement operating at peak efficiency. Too much power for scale-like flight can easily be handled by pulling back on the throttle, but on the take-off run of a heavily laden or drag-handicapped model there is hardly such a thing as overpowering.

Simple Solution?: The flying troubles of elaborate models and the high scale scores awarded to well-done versions of relatively uncomplicated subjects were not lost on scale enthusiasts at Glenview. Talk in the pits for future subject choices was of homebuilts and older types with a minimum of frills. Arguments before the Scale Contest Board meeting that this was a trend that would stifle variety, and the proposal that a difficulty score should



Cockpit of John Roth's Ross Twin powered Volksplane. Placed third at Nats, won spot on 1972 Scale team. Simple model can do well.

be given as an encouragement for models with features requiring extra work, were rejected for the second year in a row. So, simplicity may be a trend.

Factor No Factor: Despite use of FAI rules featuring a Complexity "K" factor award in each judging category, non-complex types captured the top places in this year's British Nationals RC Scale Event. Lunt's winning Chilton is a resolutely Plain Jane-looking design but, like Butcher's Fokker D-8 (second) and Terry Melleney's Moth Minor (third), it is an excellent flight score producer. It would appear that fears of the Complexity Factor eliminating simple types are premature at

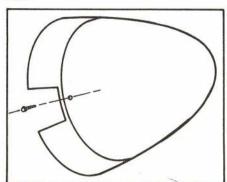
Boeing Boi-ing: Paul Martin's fine performing 707 at the Nats was aided by a clever flapactuating system that will prove useful for other similar design problems. Knowing that the flap segments staggered along the swept wing would have undesirable play if conventional bellcrank hookups were used to interconnect them, he developed a one-piece bowed torque rod made from a length of 3/32" spring steel wire. Hold the wire at each end and arch it into a natural curve, using nylon bearings at the wing roots, at the ends



Two ST 60's power Paul Martin's Boeing 707. Has 761/2-in. span, weighs 15 lbs. Martin built his own pneumatic retract gear.

and at each soldered-on flap horn, to hold it in the degree of curvature selected. Start with a perfectly straight piece of wire so it will not wobble when rotated and be careful not to bow it far enough to bend it. Paul's final touch was a slowed-down worm gear drive

Fig. 1. Self-tapping screws prevent spinner loss.



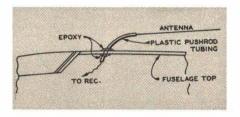
from the servo so that the flaps come down at scale speed.

Top-Flite P-51: This kit is ideal for the new stand-off judging Sport Scale Event, accepted for the AMA rule book by the Scale Contest Board at Glenview during their annual meeting. Builders should note that an error appears on the P-51 plans. In sketch 13 the alignment wedge is shown reversed, giving a wing built in this manner an incorrect 10 degrees of wash-out. The narrow end of the wedge should be located at the wing tip, the wide end at the root. The P-51 will soon be joined by a companion kit, the Curtiss P-40.

HOWARD MCENTEE FAI AND GLIDERS

Nats Glider Meet: Unfortunately unofficial, but better attended than many official Nats events, the Nats Glider Meet was held at "Miller Meadow," a huge flat field of closecut grass furnished by Cook Co. Forest Preserve. Fifty-four contestants entered 67 gliders in the meet, sponsored by S.O.A.R. and CDed by Dave Burt, who, along with Dan Pruss, started the whole idea in 1970. Spot landing points were awarded, but the "spot" was a 25 x 150' rectangle facing into the wind. Plenty of winches on hand for launching.

As last year, two events were flown: one for gliders to FAI specs; the other for those with 100" span or less. Top winners in 100" Class: 1. R. Smith (H.S.S. Club, Calif., Windward glider); 2. J. Nielsen (SOAR, III., Phoenix with short wings); 3. M. Smith (no info). FAI winners were: 1. J. Nielsen (Phoenix 130); 2. C. Carlsen (SOAR, III., Plain No. 1); 3. O. Heithecker (G.D.S. & H.S., Mich., Snoopy). Latter three will form team for informal glider competition at FaII RC World Champs. This is a most interesting affair, as it is about the only glider meet that brings together fliers from every section of the country.



Simple Antenna Attachment: Sketch shows system used by Bob Lopshire to bring antenna out of fuse. You would probably still want rubber band "shock absorber" at back end of antenna—also a knot in the wire to keep antenna from pulling through plastic tubing.

Airfoil Data Wanted: Jack Burns likes to tackle model glider problems the scientific way, and so has plotted model glider performance for several common airfoils, including that on the Lil' T (his first RC glider), the Clark Y and the NACA 6712. He is most anxious to obtain data on the Eppler E-385 and similar undercambered types. Write him at 827 S. East Ave., Oak Park, Ill. 60304.

More Stability: Note in the "Airfoiler" (Tullahoma, Tenn.), says that addition of 3" to each stab tip of the Sterling Schweizer 1-26 glider makes a big improvement in stability and flying characteristics. Elevators were left original size, addition was made just to stab tips. This suggestion by Lee Webster.

Windspiel Aileron Linkage: In August 1971 AAM, we had notes on difficulties encountered by several fliers with aileron linkage (from fuselage to wings) of this German kit glider. They were unable to keep the "universal joint" couplings tight enough. A recent letter from C. W. Hortzitz of Rowan (makers

of the kit) notes that they have had no such problems in the three years the Windspiel has been in use. It is suggested that the wing halves be fastened together by rubber bands or a spring through the fuselage, per the plans. If the aileron linkage clips are not tight enough, they can be reinforced by slipping a small piece of fuel tubing over the clips (as is done on control surface clevises). Hortzitz feels that flying without ailerons is a severe handicap to this glider. He notes that he has recently won the 1971 German Nats Thermal Soaring event with a Windspiel built according to the plans.

Active New Club: The Tidewater Model Soaring Society has already held several meets. Thermal meets were at Hampton, Virginia; Slope meet was held at the huge dunes around Nags Head, North Carolina. More meets are planned. Group has held the first open slope soaring meets on the East Coast; their biggest effort of the year will be a Nags Head Slope Meet on Oct 3. CD is Paul Byrum (242 Beauregard Hts., Hampton, Va. 23369).

BOB STOCKWELL PYLON RACING

Rules Vote: I'll not go over the Nats results here, since you saw them in the general coverage last month in AAM and in other model publications. There was, however, a major rules controversy at the Nats which you may not have heard about. As it will be decided by a mail vote of the RC Contest Board during the winter, this is an issue on which you can still make an impact if you want to write a letter to your district's CB member.

It all started with the NMPRA Opinion Poll last winter in RC News. One proposal was that engines should be stock as defined in existing rules, except that one would be free to remove any parts or material (without changing displacement); nothing, it was proposed, could be added or replaced with other than stock parts. Thus all engines would be stock, or customized only by "cleaning them up." The proposal was accompanied by a separate provision for inspection of engines upon posting of a \$25.00 forfeiture bond—so that the guy whose engine was protested would, if legal, get the bond for his trouble.

These proposals received broad support, but were vigorously opposed by Vern Smith who presented eloquent arguments, based on his years of experience in automotive racing, that the only enforceable rule is one which (a) specifies displacement, and (b) requires that the engine appear stock upon external examination.

At the CB meeting, Bror Faber presented the NMPRA position, and Vern Smith presented his own. A straw vote was taken, and the results indicated wide support of Smith's proposal. An official vote will be taken by mail (unless, as may happen, there is moratorium on all rule changes while the AMA updates the rule book).

Personally, I find the CB vote quite surprising. It is important to call attention to the fact that the only American engine manufacturer with a substantial financial investment in producing good engines for racing is K & B. I do not think we would be well-advised to go lightly against the strongly-held view of Johnny Brodbeck, Jr., that the Vern Smith proposal would be very damaging to the manufacture of good, cheap, readily-available racing engines. A rule does not need to be enforceable in a strict police-state sense: modelers are, with mighty few exceptions, men of integrity who are not going to violate a rule even if they know the average CD probably cannot prove they have violated it.

ably cannot prove they have violated it.
In short, even though I realize fully the advantages of Vern Smith's proposal with respect to enforceability, I think that the opportunites it would give to the engine specialists, and the potential it has for enormously hiking the cost of being competitive, make it most undesirable.

WILLE THE ACTION IS continued



Bob Violett, Cliff Telford, FAI Nats winners, with Supertigre P-51—PB Products fuselage, own wing, Bonetti retracts, homemade muffler.

FAI At The Nats: How did FAI work out this year? One thing was painfully clear—unless you're a first-class engine expert (as Cliff Telford is), you may as well forget it. As Bob Violett and Cliff Telford pointed out with some measure of irritation, the doors of engine modification (even machining from scratch) are absolutely wide open (except for displacement) in FAI. That means the cost of these birds can go up, and up, and up. They figure their Nats winner was worth about \$85.00—had a \$35.00 engine in it, not counting Cliff's labor. Retractable gear, with the additional servo, are part of the extra cost, but the engine/muffler combination is potentially a hair-raiser. When you can fly loose and still easily defeat Bob Smith, as they did in the fly-off for first place FAI, you speak with real authority, and the powers who made the rules would do well to listen. Part of their advantage was their efficient homemade muffler. It beat most of the commercial mufflers by at least three decibels, yet their time was fastest by five sec. and could have been even faster if pushed.

decibels, yet their time was latest by the sach and could have been even faster if pushed.

One has to wonder if the flavor of international competition is so pleasurable that we should live with such a wide-open event as FAI with respect to engines and retractable gear. But since we must compete internationally, we need to do something dramatic about changing the FAI rules to eliminate these problems (including the strange flagging system that Nats executives wisely ignored). The FAI course, however, is a good ideawider between pylons two and three—and probably should be adopted for Formula I and II.

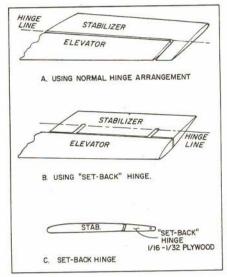


Diagram missing from Fred Mark's November Column.

special interest

FRED MARKS AERODYNAMICS, ELECTRONICS

The All-American Digital System: Occasionally a question is received asking which system (of the many which receive Blue Ribbon Reviews) is considered the best. The answer must inevitably be that there is no "best" system. Certain features are a matter of personal preference, and what one modeler likes someone else probably will not. Furthermore, there are specific features of some systems that generate a lot of interest.

However, it is interesting to consider the combination of features which might make up what could be called the "All-American" system, if one were starting a complete system design from scratch. Starting at the transmitter, use an external transformer isolated fuse protected charger with a fast charge duel output so that either pack may be charged independently and with separate indication for each. The reason? It can then be used to charge other batteries. The transmitter case could be styled and well-balanced, as is done for the MRC F710 system, but should be vinyl-covered so that it isn't cold to touch in winter. Stick assemblies are a compromise—open gimbals impart a better feel and more precise centering, but permit dirt to enter the case. So, a well-designed, closed stick gets the nod. The EK assembly with the small, easily-replaced ceramic pot element offers a convenient arrangement.

The encoder should utilize integrated circuit one-shot multivibrators to minimize parts count (one IC with two pots and two capacitors forms two channels). However, these IC's as yet are too expensive at around

The encoder should utilize integrated circuit one-shot multivibrators to minimize parts count (one IC with two pots and two capacitors forms two channels). However, these IC's as yet are too expensive at around \$10 each. A buddy system is a nicety which can contribute to reliability problems unless carefully designed and used. An RF section should be used which utilizes a stable, broad oscillator that can accommodate changeable crystals for at least three adjacent frequencies without retuning. An active antenna system, a new concept, is desirable to reduce antenna length to a few inches instead of feet. That will have to wait.

The crystal filter receiver used by Heathkit seems ideally to reduce parts count and tuning. Application of integrated circuit IF strips and front ends to receivers is still not practical, but give it time. Certainly, the application of IC inverters and gates can be used effectively for squaring and pulse stretching of clock and synchronization pulses for the decoder. The decoder would utilize a low-drain, high-reliability integrated circuit shift register or multiple J-K flip-flops. The plug and wiring harness which I find appealing is used by Larson; all the wires are routed to apc terminal block mounted to the back of the switch. Thus, there are no heavy individual bundles of leads to any one component. The wiring flows naturally to each component and nothing is wadded up. A plug block is almost equally good. Individual components (servos, receiver) are preferred over a brick because of the effect of the impact in a crash.

The servo should ideally have the flexibility of dual outputs, i.e., both rack and rotary even at the expense of size. The servo should incorporate a sufficiently inexpensive "throwaway" IC amplifier that can be replaced by the modeler at less than the cost of repairs to a discrete component amplifier; less

than \$10 is a good goal.

Finally, there are the batteries about which, it seems, almost nothing can be done.

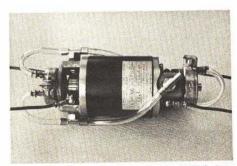
They continue to be the major cause of failures. Perhaps the only sure (but expensive) solution is to have a charger which will discharge and check the cells, warn of weakness, if any, and then quick-charge them. Certainly, the spot-welded metal strap intercell connectors should be eliminated in favor of flexible, soft multistrand intercell wiring, soldered to a carefully welded tab and not the cell. There are enough system manufacturers to develop a joint specification and procure, centrally if necessary, what is needed. Remember, people can be hurt badly by a battery failure. An industry that procures an estimated 125,000 cells per year should be able to demand something better.

RC BOATING

RC Model Boat Club: Originally a U-Control flying club, the Greater Hartford (Connecticut) Model Club took the unusual path into RC model boat racing, and now the flying portion has all but disappeared with a regular schedule of model boat racing having taken its place. Now boasting a membership of 18, the majority of its members are chasing hydros around the marker buoys on weekends and Wednesday evenings after work. Although hydros predominate, there are members who prefer sail, and some even electrics. Enjoying the privileges granted by the U.S. Army which the privileges grained by the Carlotte has control of all inland waterways, they have a huge lake in the Mansfield Dam area which is absolutely private—in fact, so private and removed from any nearby residents that mufflers are not even considered. It is about as close to a boater's paradise as possible. A locked gate, to which the members have been given the combination, makes possible those periodic cookouts in which all the families participate. The area is shared with the RC model aircraft hobbyists on a schedule that eliminates frequency mix-ups. This is a livewire Club and is growing fast.



Kroker's SeaWasp 12, draws only 5.3 amps for 11,000 rpm. Is ideal for monoplanes, scale. Holds World C record.



Kroker SeaRam showing plastic tubing to carry cooling water to bearings, brush caps. At 17,500 rpm, develops 3/8 hp.

More On Starter Motors: An additional note for those planning to use starter motor mentioned in last month's column—when starting the engine on land, set the throttle on low. If throttle is left partially open, the engine,

not having a load, will run wild. (A flywheel is not a load except during acceleration.)

A starter motor is an ideal purchase for a money-saving group or boat club, as each member has only to obtain an inexpensive "O" ring in order to use it.

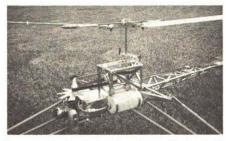
JOHN BURKAM HELICOPTERS

Successful Helicopterite: Gene Rock of Media, Pennsylvania has just flown his machine for the first time, reaching altitudes of 15 feet several times. Gene, who has been building all types of helicopters for at least seven years, finally achieved RC success with his 55-in., six-lb. model powered by a well-muffled Enya 45. Power transmission to main



Rock's 'copter flew last August. Enya 45 turns 55-in. rotor. The tail rotor is driven by 40 D.P. timing belts.

and tail rotors is entirely by timing belts with a centrifugal clutch on intermediate shaft. The Hiller-type rotor gives excellent stability and good control. Gene decided to forego tethered practice on his latest machine since its landing gear spread is greated than the rotor diameter. By late afternoon, after a collision with a tree, an inverted landing, and minor repairs, he was showing much better control over it. Congratulations, Gene!



Eugene Rock's helicopter has a timing belt transmission with 14-to-1 reduction ratio to main rotor. Weight: 6 lb.

More About Hiller Rotor: The collective pitch of the Hiller-type rotor, whose sketch was shown in last month's column (five degrees to the flat bottom of the airfoil) gives fairly good lifting efficiency, but will not permit autorotation even if the transmission has an overrunning clutch. Dieter Schluter uses about half that much collective pitch and his model autoratates as long as forward speed is maintained. However, in powered flight, his rotor gives only about half as much thrust per horsepower and turns at twice the rpm.

Hiller Rotor Stability: The heavy servo rotor paddles act as a gyro bar and tend to remain in a given plane of rotation. The cyclic pitch of the main rotor blades is controlled directly by the servo rotor and the main rotor responds more to the servo rotor attitude than to other influences (such as gusts or helicopter motion). However, tilting of the rotor shaft while controls are held fixed puts a cyclic pitch (angle varies sinusoidally as rotor turns) into the servo paddles which does tend



Flown in demonstrations, Horace Hagen's 'copter is capable of sustained hovering; translation for several minutes.

to make the servo rotor follow shaft tilt—but slowly. Thus the main rotor tip path plane also tilts slowly, following the servo rotor. The thrust vector or line of action of the main rotor thrust is perpendicular to its plane of rotation and is said to lag the fuselage or shaft tilt. This lagging thrust vector tends to damp out or retard the swinging motion of the fuselage because it is always tilted the opposite direction to the swinging motion of the fuselage. Control of the Hiller rotor is obtained by tilting the swash plate, which puts cyclic pitch into the servo paddles.

DEFINITIONS FOR THE HELICOPTERITE: Collective pitch—average angle of the rotor blades.

Autorotation—rotor is kept turning only by air flowing through it.

Overrunning clutch—a clutch which does not slip when the engine drives the rotor, but slips easily when the engine stops and the rotor keeps going (autorotating).

Cyclic pitch—angle through which blade changes as it makes one revolution.

Servo rotor—cross bar perpendicular to main rotor blades has paddles on each end. Cyclic pitch imposed on these servo paddles gets amplified by air forces acting on them, giving larger force to control cyclic pitch of main blades.

Tip path plane—plane in which the rotor blade tips rotate.

Swash plate—large ball bearing encircling the rotor shaft. One race does not rotate but is tilted by pushrods from the radio servos; the other race rotates with the rotor and is connected by pushrods to the main blades or to the servo paddles (in the case of the Hiller rotor).

Lagging thrust vector—the line of action of rotor thrust tilts the same direction as the shaft tilts but a little later in time.

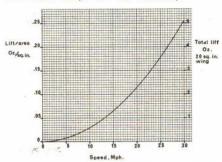
LARRY ROBBINS RC CAR RACING

Wings: The following, "The Ways of Wings," is an article on wings and the down forces they generate by Don Stauffer, of Florissant, Missouri. Any comments on this highly-controversial subject will be appreciated.

Do wings work on model race cars? Do they really improve handling? Why not? But the laws of aerodynamics operate on true speed rather than scale speed. Far-flung opinions range from the idea that wings are the panacea for all handling problems, to doubts that wings have any effect other than appearance. But the laws of physics are not black magic. It is time to take a rational look at just how much force a model car wing can produce

The force on a model car wing can be calculated by the same equation of aerodynamics that predicts the lift force on an airplane wing. I will continue to use the term lift, for the sake of our aerodynamicist friends, even though the model car wing produces a downward push. The lifting force for each unit of wing area is given by the equation: L/A is equal to ½CLIVZ, where Clis the lift coefficient, a measure of the efficiency of the wing, r is the density of air,

and V is the speed in miles per hour. A good high lift airfoil set at its optimum incidence angle should be able to achieve a lift coefficient of one or slightly more. The density of air can be found in standard tables (,00238 slugs/ft3). Although this equation is easy to solve and plot, I turned the job over to a Hewlett-Packard 9100 computer and plotter, just for the fun of it. The graph drawn by the computer shows the lift-per-unit area for any given speed up to 30 mph. Also shown on the same graph is the total lift on a wing with twenty sq. in. of area—this is a reasonable size for a model car (10 x 2" for instance).



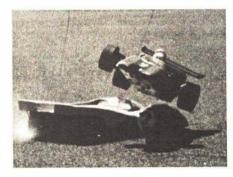
As you can see, the force does become appreciable at higher speeds. The lift at 30 mph increases the downward force on the rear tires by about 10%. In a sense, this force is for free. If we try to increase traction by adding weights, it is usually used up fighting the increased centrifugal force. The wing generally produces no side force, so the full down force is utilized to improve the handling. However, notice that the down force is very low at the lower speeds, as in a slow corner. Yet many drivers, after fitting wings, report a handling improvement even in slow corners, especially during acceleration. This effect could be due to weight transfer.

Many of these wings are heavy, being metal, or having a metal support, and this weight should not be ignored. It is not my intention to cover the physics of weight transfer in detail, but an example may be useful. Consider a car with the wing four in above the center of gravity (CG). Further, assume the car CG is four in ahead of the rear axle. Under maximum acceleration the inertial (weight transfer) forces can create an additional down force on the rear wheels nearly equal to the weight of the wing. Referring to the graph, we see that for one ounce wing, these inertial forces would predominate below about 13 mph. The aerodynamic forces would be more effective above that speed. Unfortunately, the inertial forces reverse under braking, and unload the rear wheels, tending to induce oversteer. So go easy on hanging a lot of weight up high.

The angle the wing should be set at is a compromise. As the angle is increased, more lift is produced—but the drag also increases. There will be an angle where the ratio of lift to drag is a maximum, however this will be as maller angle than the one where maximum lift is produced. The increased drag at the higher angles may be detrimental on a high-speed course, especially when running high-speed gears. So you have a choice, Run at the angle for maximum lift over drag if the loss of speed from drag is important. If handling is more important than top speed, the incidence angle can be increased to almost the stall angle, about 15 degrees for most airfoils. I have seen wings mounted with as much as a 30 degree angle, and wonder about their effectiveness. It would be nice to get some of our cars into wind tunnels and actually make measurements.

In summary, it is evident that appreciable forces can be created by a wing. But five oz. or so of down force will not make a Series 71 winner out of a dog in the hands of a poor driver. However, for a good-handling car, controlled by a good driver, a wing can produce the extra margin of handling needed in close competition.

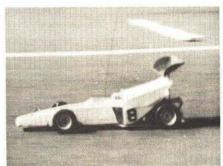
23

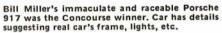




by WENDEL GREEN







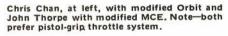


Ken Stevens' car takes the high road, while Rosengren's takes the low road. They just kept on racing.

Flanked by Miss Rev-Up and Miss ROAR, are (I to r) Schreindl, Chan, Rosengren, Thorpe and Campbell. These drivers were the main

John Thorpe's car in road course finals.

event road course finalists.



The Associated crew's pit, lots of cars and much effort. Plenty of consistent racing, too.

Three thousand seven hundred 1-1 scale miles, driven by 1/8 scale RC cars in perfect weather on a long, challenging course, summarizes the scene at the 1971 ROAR Nationals held at Langley High School in Virginia, July 2, 3 and 4, 1971.

The last minute change of site caused some delay in getting started on Friday and the early arrivals found themselves being drafted to lay down course-marker tape and set the loudspeaker and tables up, in addition to getting ready to run. Everybody that was there that day got in at least one practice session (ten minutes on both the road course and the oval course).

The entrants soon found that the long road course with its downhill, sweeping straight was one that demanded skill, as well as a fast car with good brakes. By track closing time Friday night, it was obvious that the overall winner in this event was going to be the driver capable of maintaining a

consistently fast lap time on both the road and the oval course.

The contest director managed to get the schedule rearranged Saturday morning, and, as soon as those people who had not yet practiced got their practice sessions, qualification began. Qualification heats were ten laps in duration and qualifying was based on the fastest average lap times. Each entrant got one qualifying heat on the road course and one on the oval course.

There was some real blood and guts racing during these qualifying heats. One outstanding ten-lap duel during oval qualifying involved Mike Morrissey and Peter vonAhrens. At the finish, these two cars were literally in contact nose to tail. After the oval qualifying on Saturday, those drivers who elected to sign up for a second qualifying attempt on Sunday morning voided their Saturday qualifying times. Likewise, at the end of the road qualifying on Saturday, some

drivers elected to try again on Sunday.

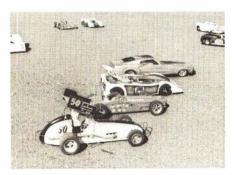
On Sunday morning at seven a.m., the second qualifying attempts were made on the oval course. At the end of qualifying, Bob Emott was the fastest, with an average lap time of 11.68 sec. for ten laps, followed by Rodger Curtis, 12.01 sec., Ike Hills, 12.04 sec., Mike Morrissey, also 12.04 sec., and Peter von Ahrens, 12.05 sec.

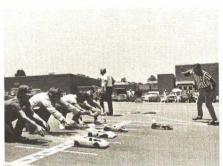
Each driver was timed and lap counts were made during the heats. The race was over when the first car completed ten laps and each car's time was stopped the next time he crossed the finish line after the winner. The time for each car was divided by the number of laps that car completed to arrive at the average lap times, which were the basis for qualifying and elimination.

After the road course qualifying, the fastest time was posted by Earl Campbell, 18.10 sec. average lap time for ten laps, followed by Rodger Curtis, 18.39 sec., Dell

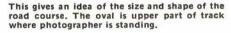
With a long challenging course for road and oval racing, well-prepared competitors made this the fastest and best car Nats yet.











These magnificent cars, entered in various events, show the variety of 1/8 scale RC racing.

Start of an oval course elimination heat.

CD of 1971 ROAR Nats, Wendel Green (at left), starter, Jim Dicky, and Monitor Bob Stevens at the mike.

Not sure what he's saying, but lke Hills is working out some detail on his fast MCE.

View of the oval course in action from behind officials' tables. Notice the track slopes and the length of the long road course straight.

Fisher, 18.40 sec., and John Thorpe, 18.45 sec. The top twenty-five qualifiers were then placed in ten lap elimination heats on both the road course and the oval course.

The main event on the oval course had to be split into two thirty-five lap races because of frequency conflicts, and when it was all over the National Oval Champion was Rodger Curtis, completing thirty-five laps in 6 min., 32.10 sec.; Bob Emott was second, Dell Fisher was third; John Thorpe, fourth; Ike Hills, fifth; and Peter vonAhrens, sixth.

The top five from the road course elimination presented no frequency conflicts, therefore the main event on the road course was a 50 lap race. The outcome of that event was Chris Chan, National Road Racing Champion, and on the same lap right behind him was Bud Schreindl, followed by Earl Campbell, completing 48 laps, John Thorpe, with 45 laps, and Rolf Rosengren, 34 laps.

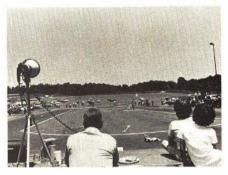
The drag race event was run on the



sudden-death elimination basis, each driver going head-to-head with another driver and the winner advancing into the next round. This proved to be quite a spectacular event—a few of the cars, because of their great speed, managed to get out of radio range before they were stopped. The sight of Mike Morrissey's Associated car going into a chain-link fence at full speed is a sight that the manufacturers of the low-powered radios should have seen. When it was all over, the 19-powered MCE dragster of L. Sabato proved to be the fastest in the 19 class drags.

The concourse winner was Bill Miller's beautifully-prepared Porsche 917. It has to be seen to be believed! No photograph can possibly do justice to the detail and overall effect of this car. The cars' general level of detail at the Nationals showed what this 1/8 scale RC racing can really be like.

The Grand National Champion was determined by adding qualification points on



both the road course and the oval course, the elimination heat points on the road course and those on the oval course, the points for finishing position in the main event oval and in the main event road course, the engineering points and, finally, the concourse points. When all of this was added up, the first four places went to: John Thorpe, 105 points; Rodger Curtis, 101 points; Bud Schreindl, 97 points; and Dell Fisher, 94 points. It must be noted that the 1971 Grand National Champion, John Thorpe, was the only driver to qualify for both main events.

The starter was Jim Dickey of the Washington RC Racing Association; the contest director was Wendel Green, President of the Washington RC Racing Association; the PA voice was Bob Stevens; chief sponsor, American Aircraft Modeler. Without the cooperation of Langley High School, Langley, Virginia and the Fairfax County Police force, the event would not have been possible.

RC World Championships



Photos by Don Lowe, Chuck Shade, Carl Wheeley, and Phil Edwards



GOOD WEATHER GREETED 60 FLIERS FROM 22 COUNTRIES FOR THE FIRST CHAMPIONSHIPS HELD IN AMERICA.

Doylestown, Pennsylvania was the scene of the Seventh Aerobatic RC World Championships held September 15-19, 1971. Sixty fliers from 22 nations completed 240 flight attempts for four flights each in two and one-half days of flying.

This was the first time that the World Championships have been held in this country. It was all made possible through a unique arrangement whereby the AMA, the hobby industry and the modelers of the United States helped defray the added expenses of foreign contestants' travel here. A site was selected to permit sufficient paid public transportation. This ruled out military sites and led to the selection of Central Bucks County Airport in Doylestown.

Ten judges from ten different nations worked continuously to score approximately 3500 maneuver attempts to select the new champions of the world. Our hats are off to these flight judges who had perhaps the most thankless task of all.

Practice flying for all contestants was held under sunny skies on a controlled, 10-minutes-per-contestant basis. The weather was unique in itself since Pennsylvania had been subjected to torrential rains and flooding before the meet. Many of the contestants were not in the best condition after the long travel and early Wednesday morning arrival by bus at Doylestown. Pierre Hoffman, Luxembourg, told me that he had been awake for 52 hours up to that point! Most contestants, however, availed themselves of the

opportunity to check their craft before the formal practice rounds began on Thursday morning. Thursday dawned under an overcast sky which prevailed through the contest without raining, until after the awards ceremony on Sunday. Though dark clouds threatened and haze on Friday morning delayed the start of flying, almost optimum flying weather conditions existed throughout.

The formal practice flights Thursday were run using the contest flight order and procedures. Thursday afternoon saw the beginning of official competition. Bruno Giezendanner, the current world champ from Switzerland, charged into an early lead by posting the highest scoring flight of the meet-7075 points (5 judges total score). Phil Kraft of the USA posted 6845 points for second highest score in the first round followed by J. Wester of West Germany with 6595. The other U.S. team members-Jim Whitley and Ron Chidgey-flew well in the first round, but were flying against tougher judges and scored substantially lower. It is interesting to note that Giezendanner, Kraft and Wester all scored significantly lower on their second round when flying against the other set of judges. This supports the contention that even at the World Championships there is a wide spread in scoring. This variation can be negated only by consistent judging by each judge, consistent flying, and each contestant flying against each set of judges.

Round one was completed on Thursday

morning. Warren Hitchcox of Canada posted the only flight early Thursday morning and skirted the fringes of the overcast to do it. In fact, he practically disappeared in his "Top Hat" and "Figure M" but posted his highest score of 6000. Along about 10:30 a.m. the clouds had sufficiently lifted to resume flying. The second round saw Wolfgang Matt of Liechtenstein receive the benefit of the judges switch and some fine flying to take over first place with a flight of 6925 points and a tworound total of 12,670 points. Phil Kraft remained in second with 12,425 and Giezendanner slipped to third by posting a score of 5295 points and a total of 12,370.

In round three, the judges were mixed and scores of the leaders reflected this by falling between their first and second round scores. Hanno Prettner of Austria was the exception, however, and made his move with a personal high score of 6515 points. The end of this round had Matt still leading with Bruno second and Kraft in third. The last round ended with Matt and Giezendanner putting in absolutely magnificent flights resulting in Bruno edging Matt for the best three-flight edge of 20,315 points to 20,275 for Matt. Phil Kraft followed with a best three-flight total of 19,455.

This reporter had a good ringside seat acting as a starter-timer along with Norm Page, Jim Grier and Rudy Black. It was a tremendous opportunity to observe and evaluate technique and design at very close range. Giezendanner's aircraft design and flying style

Team	Standings		Individual Standings					
Place	Nation	Points*	Place/Competitor/Nation	(1)	(2)	(3)	(4)	Total Best 3
1.	USA	56700	1. Giezendanner, B., Switzerland	7075	5295	6455	6785	20315
2.	SWITZERLAND	52140	2. Matt, W., Liechtenstein	5745	6925	6310	7040	20275
3.	GERMANY	51975	3. Kraft, P., USA	6845	5580	6230	6380	19455
4.	ENGLAND	51810	4. Prettner, H., Austria	6355	5735	6515	6225	19095
5.	AUSTRIA	51710	5. Wester, J., Germany	6595	4990	6255	6240	19090
6.	JAPAN	51075	6. Whitley, J., USA	5930	6405	5805	6415	18750
7.	ITALY	49515	7. Chidgey, R., USA	5585	6400	5695	6400	18495
8.	FRANCE	47595	8. Schaden, F., Austria	4825	6150	6065	6010	18225
9.	CANADA	46050	9. Sugawara, Y., Japan	6085	5110	6215	5860	18160
10.	BELGIUM	45025	10. Hardaker D. England	4960	6640	5655	5695	17990

^{*}Sum of individual contestants scores, best three flights for each.

was an interesting contrast with that of Matt, Kraft, Prettner, Wester and others. Bruno's airplane was rather large (772 sq. in.) of conventional old-fashioned bubble canopy configuration, with a low-wing loading. With this setup he flew a slow, tight pattern with great precision. His airplane's strongest suit was looping maneuvers and his spin was a thing of beauty. If any weakness could be found it was in rolling maneuvers due to lack of speed and fuselage side area. It must be pointed out, however, that Bruno is a very polished flier and extracted everything available from his craft. His repeat win was no fluke.

In contrast, Wolfgang Matt flew a shipmore to my liking-called "Super Star." The ship had 659 sq. in. and weighed over eight lbs, with fuel, Pulled by an HP 61F and equipped with retracts, it really moved and performed large maneuvers. Throttle was extensively used by Matt through most maneuvers to maintain constant speed. Even his turn arounds were throttled and performed with precision. The only weakness I could find in his maneuvers was the spin where he seemed to pull up and over on spin entry. I would suspect that except for this he might now be the new world's champion. Hanno Prettner flew a similar aircraft and with similar style, as did Wester of Germany.

An additional note of interest about these three concerns their transmitter. All three used a strap-suspended transmitter with extralong control sticks. Maybe this contributed to their extreme smoothness and lack of erratic flying. Matt's last flight was the most perfect pattern flight that I have ever witnessed, with every maneuver exactly as the book shows it and without an extraneous bobble. Jim Kirkland and I watched this one through and marveled at its precision. There is absolutely no doubt that foreign flying, equipment and technique is as good or better than our own. Most of their top fliers are young and are getting better. We will be hard-pressed to win from now on.

Without exception, fliers from the other countries used two-stick transmitters of mode one or two setup. The only single-stick transmitter at the contest was flown by Ron Chidgey of the U.S. team. The suspended

























(1) Bruno Giezendanner's contestant number lands after a practice flight. His plane is almost the same design as that he won with two years ago. (2) The individual winners were Bruno Giezendanner and Wolfgang Matt, here being congratulated by AMA's John Clemens, and Phil Kraft. Flying styles of these three fliers were completely different. This uniqueness is a tribute to their skill and the judges' ability to discern precision maneuvers. ability to discern precision maneuvers. (3) The American team in order of placing: Phil Kraft, third, Jim Whitley, sixth, and Ron Chidgey, seventh—being congratulated by Team Manager Dr. Jim Edwards. (4) Wolfgang Matt from Liechtenstein flew "Super Star II" to second place. The design was used by members of several teams. He is one of the fliers whose transmitter is fitted into a shoulder strap-supported platform. (5) Twenty-year-old Hanno Prettner of Austria with "Super Sicroly" design. Rossi 61-powered, fast, big, heavy model. Note whip antenna. (6) Josef Wester of West Germany also used Rossi power. Most used retracts, too. Note similarity of design with Prettner's model. There are definite aircraft design trends in Europe. (7) "Condor 71" flown by Ferdinand Schaden from Austria sports HP 61 engine and a Digi Fly 7 radio. It does not have re-tracts. (8) Lineup of "Flippers 3." Almost everyone had backup planes and brought both to the flight line just in case, but it never proved necessary. (9) Canadian Warren Hitchcox and wife with "Firebird IV" placed 18th. A fixed gear model, well flown. (10) Terence Cooper, manufacturer of Mid-West radio in England, flew his own design "Bulldog" powered by a Meteor 60 engine. Has longish tail moment. (11) Most planes were exceptionally well-finished and show extremely personalized design ideas. (12) Neatly cowled inverted HP 61 characterizes Gustaaf Cappuyns' "Tavi I". This Belgian flier used the Rowan "professional" radio system. A transmitter is common along with an angled antenna for good R.F. pattern (U.S. manufacturers take note).

The best aircraft designs seemed to center around 650-700 sq. in, with fairly high wing loading. Prettner's airplane weighed over nine lbs. with fuel. A modestly deep, narrow fuselage with a forward C.L.A. was preferred. There were some ships with an extremely deep fuselage, but these proved to be somewhat slower and showed no advantage in rolling maneuvers. Since little wind was present, there was no chance to observe aircraft performance in gusty conditions or a crosswind. It is presumed, however, that the faster, heavier ships would prove superior under these conditions.



Contestants exhibited a wide range of flying abilities. Each country is authorized a team of three competitors for the World Championships. Liechtenstein had a one-man team and South Korea's team was two people but only one flew. It was apparent that RC activity and proficiency in some countries was deficient compared to others. It leads one to believe that the U.S. team should be larger, in view of the considerably larger number of highly-qualified fliers in this country. There wasn't much question in my mind that our top 15 or 20 fliers could have placed very high and possibly in the top thirty places. As Tore Paulsen of Norway put it, Norway has limited activity with one major club (Vingtor

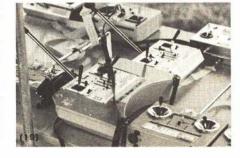
RC). He says that Poju Stephansen is always











first, Knut Aker is second and he is third in team selections. Incidentally, Tore had very tough luck this year-he bashed his best ship before leaving home and had only one complete flight at the championships due to tank troubles. He maintained good humor throughout however, and it was a real pleasure to chat with him.

The Japanese team was impressive in their flying and particularly for the beauty and quality of their ships. They should be strong competition in the future.

FAI Pylon and a Thermal Soaring International Competition were held on Sunday morning. These were not championship com-

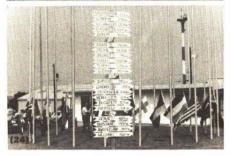
(Continued on page 57)















THE FAST AND FUN 049 JEROBEE

by WENDEL GREEN AND ED SWEENEY

The 1/12 Scale RC McLaren car, produced by Jerobee, is both a fun toy and a fine introduction to radio-controlled car racing. Sold completely assembled (less batteries), the package includes a 14-page driver's manual which reflects Jerobee's aerospace background as a division of Rocket Research Inc., and tells the new owner everything he needs to know to get the most enjoyment from his car.

. The radio control equipment is designed for license-free operation by virtue of the low-power output transmitter. Transmitter and receiver are digital systems similar to those found in much more expensive radios for airplane and car use, but range is limited because of the low-power output.

There are two versions of the Jerobee car product—one with a single servo radio and the other with two servo operations. We have only used the dual servo Comando radio/car system. The servos are very similar to those in the bigger airplane radio control systems—each is motor driven, has an amplifier and feedback potentiometer. Thus the servos faithfully follow the control inputs at the transmitter without wagging back and forth. Dual servo system gives independent steering and throttle controls.

The cars are powered by a Cox reed valve 049 engine with the exhaust throttle system and are equipped with a pull-chord starter, flywheel, centrifugal clutch, and spur-gear output. These little engines really turn up rpm's; the cars are light so there's plenty of speed. Construction is by injection molding plastic. The workmanship in the moldings is outstanding and the design is nearly indestructible.

The 1/12 scale car concept, its toy marketing and hobby appeal, and the manufacturer are the result of a unique set of cir-

cumstances. This car is not the currently popular larger 1/8 scale size. It is not designed for the hobby/modeling market. It is the lowest priced ready-to-operate radio controlled gaspowered car available anywhere. The radio system is designed and manufactured by E.K. Products, one of the major radio-control equipment manufacturers of digital proportional systems for model airplanes. The radio is produced for Jerobee, the manufacturer and marketer of the 1/12 scale cars. Practical 1/12 scale cars were developed by AAM Editor Ed Sweeney, and the Jerobee car is the result of his design concept. The idea of the 1/12 scale car was to create a high performance radio-controlled product for the toy market which would attract newcomers to modeling. Smaller cars are both safer, simpler, and much less expensive than their larger counterparts.

Two production Jerobees were driven for

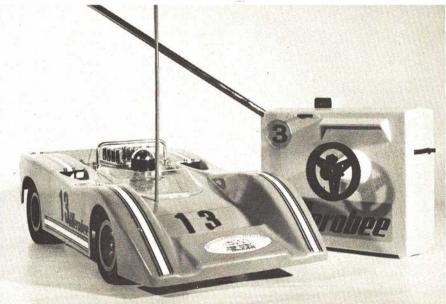


Jerobee and Auto World sponsor Oscar Koveleski's Can-Am Series McLaren M8b which is driven by Tony Adamowicz who holds a Jerobee RC model decorated to look like a Can-Am car.

Duane Lundal, Rocket Research/Jerobee man in Washington, D.C., went all-out to make this model like the Can-Am car. MonoKote trim sheets used throughout.

[Detail pictures are on page-64.]

The Jerobee McLaren decorated with the decals in the package is an attractive racer. Bodies are durable and colorful.





a total of almost 20 hours of running time. Operated by experienced RC car drivers, by adults with no previous RC car experience, and by children 8 to 17 years of age, the cars were driven hard—into curbs, out of range, into each other—and survived it all. After the period of testing, the cars were filthy dirty and the decals had been scrubbed off, but the model cars were as good or better as they were when new.

Handling: The Jerobee Comando with stock molded sponge tires did not exhibit any excessive under- or over-steer characteristics. With a little practice they could be driven fast around a parking lot road course without spinning out. The tires were round and well-balanced as they came out of the box; since they are soft sponge and the cars are light (under two lbs.) the models did bounce at high speeds, but not much can be done about it. When different tires were tried, the problem was only lessened, not eliminated. Less weight/harder tires would help.

As one should expect, the smaller the model car, the smoother the racing surface (Continued on page 62)





WHEN THE WING IS IN BACK AND THE STABILIZER IN FRONT, THE PLANE IS CALLED A CANARD.

THEY SEEM TO BE BACKWARD, OFFER UNIQUE APPEARANCE AND EXCELLENT FLYABILITY.

YAKO

A peppy little tail-first sportster, Yako provides a lot of fun and performance for a small investment of time and materials. With perhaps 300 turns cranked into the motor it will zip up over treetop height and then glide down nicely to a landing.

The tail-first or canard configuration has more stability than the more common tractor and presents a distinctive appearance. But it needs to be built closely to specifications for proper flight characteristics.

Construction

Yako should be constructed mainly of medium hardness balsa. (If you are new to balsa wood ask the shop proprietor for guidance.) Measurements can be made directly from the full-size plans. Parts can be traced onto sheet balsa by utilizing soft carbon paper. Single-edge razor blades work well for cutting balsa and a metal straight edge helps to keep true lines. A piece of fine sandpaper, perhaps No. 250, wrapped around a wooden block is useful for smoothing balsa edges. A dozen pins or so are needed to hold pieces at various stages of construction. A 6 x 18" piece of insulating board or soft wood can be used as a working surface. Fast-drying plastic model airplane glues can be used, but the slower-drying white glues are preferable as they are less likely to warp the surfaces.

Cut the wing out as a single piece and mark rib locations on underside. Glue the ribs into position and immediately place the wing on the work board and pin flat, placing a piece of waxed paper between the wing and the board to prevent the wet glue from sticking to the board. If necessary, use pins to hold the wing to the curve of the ribs. Forcing the surfaces to dry in the flat position helps reduce warps so repeat the same procedure for the stabilizer.

After the glue has dried thoroughly, remove the surfaces from the work board and cut in two down the center. Prop each tip up for the required dihedral and observe the gaps



Nice thing about canards—they can carry plenty of wing area for their size and fly all that much better as a result.

by CLARENCE MATHER

at the center joint. Take each half and cut and sand the edge carefully until the joint fits snugly. If high-shrinkage plastic glues are put into a poor fitting joint there will probably be warpage. Gaps can be filled with white glues with little danger.

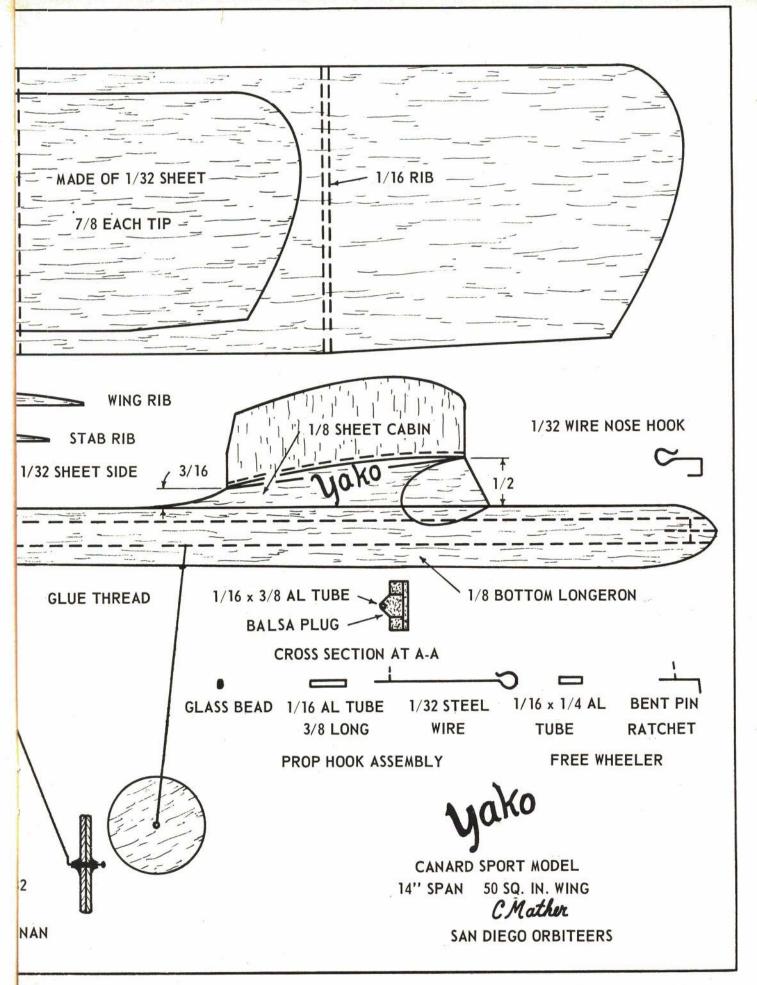
Glue the longerons to the fuselage side and add the cabin piece. Plug the front and rear spaces between the longerons to support the front hook and the prop shaft bearing. Shape the bottom of the wing center so the wing sets flush on the fuselage, as in the drawing. Then glue it into place making certain that the wing is square with the fuselage from the top view. Fit the stabilizer to the top of the cabin so that the leading edge is 5/16" higher than the trailing edge! Observe the structure from the rear and line up the stabilizer with the wing.

Round-nose pliers will facilitate bending the hooks for the rubber. Use steel "piano" wire. Bend the front hook and glue securely in position. Bend the rear hook, but leave other end straight. Cutting burrs should be removed with a file or a grind stone.

There are several types of plastic props on the market, but the red, square-tipped type is recommended because of light weight and high pitch. Obtain one of seven-in. diameter and cut ¼" off each tip. The hole in the prop is too large for the wire, so drill it to 1/16 size and plug with a piece of 1/16" aluminum tubing. The props come with a free-wheeling ridge on the wrong end of the hub, so cut and sand the front flat.

Cut a second piece of tubing for the fuselage bearing. A razor blade will cut aluminum tubing nicely if it is pressed firmly into the tubing and rolled back and forth. Nick the surface of this tube all over so that the glue will grip it securely. Slip the prop shaft through this tube, the glass bead, and then the propeller. Bend the wire shaft over at a right angle.

(Continued on page 78)





FIRST IN BALSA!

MORE NATIONALS WINNERS USE SIG BALSA THAN ALL

Finest Quality - Lowest Price!

AAA	AIRCRAFT BA	LSA
STICKS	SHEETS BLOCKS 36" Lengths 3" Lengths	BLOCKS 24" Lengths
36" Lengths 1/16 x 1/1604	36 Lengths 3 Lengths 1/32 x 2	1 x 1
1/16 x 1/805	1/16 x 227 1 x 2	1 x 2
1/16 x 3/1606	3/32 x 232 2 x 2	2 x 2 1.32
1/16 x 1/407	1/8 x 236 1 x 318	1 x 3 1.32 2 x 3 1.96
1/16 x 3/809 1/16 x 1/211	3/16 x 2	2 x 3 1.96 3 x 3 2.98
1/16 x 3/414	3/8 x 2	1 x 4 1.75
1/16 x 1	1/32 x 335 6" Lengths	2 x 4 2.65
3/32 x 3/32	1/20 x 335 1 x 3	3 x 4 3.95 1 x 6 2.52
3/32 x 3/1607 3/32 x 1/408	1/16 x 335 1/2 x 216 3/32 x 344 3/4 x 2	2 x 6 4.10
3/32 x 3/809	1/8 x 350 3/4 x 220	3 x 6 5.60
3/32 x 1/212	3/32 x 3 33 114 x 2 29	1 x 8 3.30 2 x 8 4.80
3/32 x 3/416 3/32 x 119	3/16 x 3	3 x 8 6.80
1/8 x 1/806	5/16 x 386 1/2 x 322	
1/8 x 3/1607	3/8 x 394 1 x 3 34	PLANKS
1/8 x 1/4	1/32 x 450 1½ x 342 1/16 x 450 2 x 342	36" Lengths
1/8 x 3/812 1/8 x 1/215	2/22 - A SS 4 X 3	1 x 1
1/8 x 3/4 ,18	1/8 x 470 3 x 3	1/2 x 294 3/4 x 2 1.17
1/8 x 1	3/16 x 4	3/4 x 2 1.17 1 x 2 1.39
3/16 x 3/16	1/4 x 4	11/2 x 2 1.66
3/16 x 3/813	1/22 - 6 100 1/2 x 4	2 x 2 1.93
3/16 x 1/218	1/16 x 6 1.08 2 x 4	1/2 x 3 1.15 3/4 x 3 1.55
3/16 x 3/4	1/8 × 6 1.29 1/2 x 6	1 x 3 1.90
3/16 x 1 25 1/4 x 1/4 15	2/16 × 6 1.20 3/4 × 6	1½ x 3 2.40
1/4 x 3/8	1/4 x 6 1.54 11 x 6	2 x 3 2.89 3 x 3 4.40
1/4 x 1/219	3/8 x 6 1.89 2 x 6 1.00	1/2 x 4 1.90
1/4 x 3/425 1/4 x 132	1/32 x 8 1.38 3 x 6 1.35	3/4 x 4 2.15
5/16 x 5/1617	3/32 x 8 1.48	1 x 4 2.45 1½ x 4 3.20
5/16 x 3/823	1/8 x 8 1.54 12" Lengths	1½ x 4 3.20 2 x 4 3.90
5/16 x 1/228 5/16 x 5/834	3/16 x 8 1.70 1/4 x 8 1.93 1 x 124	3 x 4 5.90
5/16 x 139	2/0 - 0 215 1/2 X 2	1/2 x 6 2.85
3/8 x 3/820	3/4 x 238 1 x 246	3/4 x 6 3.25 1 x 6 3.80
3/8 x 1/227 3/8 x 3/435	48" AAA Sheets 11/2 x 255	1½ x 6 4.90
3/8 x 3/4	1/32 x 350 2 x 266 1/16 x 350 1/2 x 342	2 x 6 5.95
1/2 x 1/230	1/16 x 3	3 x 6 7.50 1/2 x 8 3.10
1/2 x 3/4	1/8 x 3	3/4 x 8 3.95
1/2 x 1	3/16 x 3	1 x 8 4.90
5/8 x 1	1/4 x 3 1.08 2 x 3 98 3/8 x 3 1.35 3 x 3 1.48	1½ x 8 5.50 2 x 8 7.15
3/4 x 3/448	1/16 x 468 1/2 x 465	3 x 8 9.95
3/4 x 1	3/32 x 474 3/4 x 474 1/8 x 485 1 x 487	
48" Lengths	3/16 x 495 114 x 4 1.09	CONTEST BALSA
1/8 x 1/8	1/4 x 4 1.10 2 x 4 1.32	Very Light
1/8 x 1/411	3/8 x 4 1.45 3 x 4 1.97 1/16 x 6 1.44 1/2 x 6 95	4-6 Lb. Stock
1/8 x 1/218 3/16 x 3/1612	1/16 x 6 1.44 1/2 x 695 3/32 x 6 1.60 3/4 x 6 1.09	1/32 x 340 1/16 x 340
3/16 x 1/225	1/8 x 6 1.72 1 x 6 1.26	3/32 x 3
3/16 x 3/429	3/16 x 6 1.84 1½ x 6 1.76	1/8 x 3
1/4 x 1/4	1/4 x 6 2.05 2 x 6 2.05 3/8 x 6 2.42 3 x 6 2.80	3/16 x 3
1/4 x 1/227	1/2 x 8 1.05	3/8 x 3 1.00
5/16 x 5/1622	3/4 x 8 1.35	
3/8 x 3/827	BAGS OF BALSA 1 x 8 1.65	
3/8 x 1/234 3/8 x 3/446	Bags of Balsa	C-GRAIN AAA
1/2 x 1/240	TRIANGULAR CUT 3 x 8 3.40	8-12 Lbs.
1/2 x 3/453	BALSA 36"	1/32 x 229
	3/8 x 3/824 18" Lengths	1/16 x 232 3/32 x 237
LEADING EDGE	1/2 x 1/229 1 x 1	149 - 2 41
36" Lengths	3/4 x 3/4 39 1 x 2 70 1 x 1 54 2 x 2 98	3/16x 2
3/8 x 1/230	1 x 3 1.00	1/4 x 2
1/2 x 1/235 3/4 x 3/454	ROUNDED EDGE 2 x 3 1.50	1/22 - 3 39
1 x 1	PLANKING 36" 3 x 3 2.20 5/32 x 1/4	1/16 x 339
and the state of t	2 x 4 2.00	3/32 x 3 49
TAPERED TRAILING EDGE	ROUNDED EDGE 3 x 4 3.00	2/16 - 2 65
36"	AILERON & 1 x 6 1.90 ELEVATOR STOCK 2 x 6 3.00	1/4 x 3
1/8 x 1/219	1/4 x 144 3 x 6 3.90	
3/16 x 3/422 1/4 x 129	3/8 x 149 1 x 8 2.50	MERY HARD
5/16 x 11/434	1/4 x 2	1/16 x 340
3/8 x 1½40		3/32 x 348

36" TAPER CUT

ODDS & ENDS

IN THE WORKSHOP AND ON THE I

PINS



VERY SHARP, PLATED PINS IN EIGHT SIZES, PACKED IN INDIVIDUAL BLISTER PACKS Sizes 8-14-17-20-24-28-32 ANY SIZE - PACKAGE 15e ¼ Lb. \$1.15 Lb. \$3.95

MODEL-MAKER'S "T" PINS

INDIVIDUAL BLISTER PKG. 15e 1 Oz. Plastic Box 4 Oz. Plastic Box No. 16 "T" 79e No. 16 "T" \$2.85 No. 24 "T" \$1.95 No. 24 "T" 59e

PLASTIC HEAD PINS

Easy to push into or withdraw from work. ldeal for simulating throttle control knobs. Individual Blister Package 15¢

Box of 100 49¢ Box of 500 \$2.29

SIG WHEEL PANTS



CHIPMUNK 5-1/8" long \$2.00



CITABRIA 6-3/4" long \$2.50



RACING 8-1/4" long \$2.50 RACING 9-1/4" long \$2.50

RADIO-CONTROL HOOK-UP WIRE



TINNED COPPER VINYL INSULATED Eight 3-Foot Lengths in Eight Different Colors

.53

.62

.80

1/8 x 3

3/16 x 3

1/4 x 3...

3/8 x 3.....

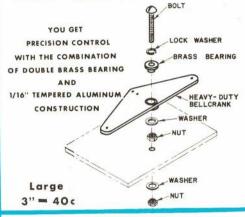
36" WING SKINS

1/16" Edge 36" WING SKINS 1/4 x 3 x 36 .82 1/16 x 12 ... 2.15 1/4 x 4 x 36 .95 3/32 x 12 ... 2.40

79¢ Per Package

SIG BELLCRANKS

TRY SIG'S COMPLETELY DIFFERENT **NEW** HEAVY DUTY BELLCRANK



NEW 1/2A BELLCRANK .030 TEMPERED ALUMINUM WITH BUSHING

SMALL - 2" - 25c

SIG HI-FLEX MUSIC

TOUGH, FLEXIBLE, SPRING STEEL MUSIC WIRE FOR LANDING GEAR, TORQUE RODS, PUCH RODS, ETC.

36" LENGTH	Packed in meta	al-capped tubes.
Size	No in Tube	Price
015	50 50	05
025	50	05 06
1/32 3/64	42 71	07
1/16 3/32	56 29	09 17
1/8	23	22 42
5/32 3/16	12	55

Tube of Assorted Sizes \$5.00



A Bond With TSIGF EPOXY GLUE

Is Forever!

OFF

Ea

Larg

GALL

PRES

SIG EPOXY IS EASY TO USE. Just squeeze out three equal pud-dles, mix and use. Pot life is apdles, mix and use. Pot lite is op-proximately 15 minutes. The re-sulting bond is the strongest you can make. Use for firewalls, in the engine compartment, landing gear mounts, etc.

11/2 Oz. Set 89c - 3 Oz. Set \$1.49

SIG CELASTIC

THE FANTASTIC PLASTIC COLLOID TREATED FABRIC For Patching - Molding - Building

DIPPED IN SUPERCOAT THINNER

WHEN DRY IT IS A STRONG, RIGID MATERIAL THAT CAN BE SANDED AND DOPED

9" x 18" SHEETS Heavy Weight.....\$1,15 Light Weight.......95

FLYING FIELD SIG MEANS QUALITY AND DEPENDABILIT

SIG PLASTINAMEL



FUEL PROOF FINISH FOR

FOAM WINGS

4 Oz. Jar. . . \$.69 8 Oz. Can. . . 1.25

PLASTINAMEL is a high gloss enamel de-veloped for painting Styrofoam wings. It will not attack the foam and is FUEL PROOF. It brushes easily and one coat covers, adding only a very small amount of weight.

SEVEN BRILLIANT COLORS White - Black - Red - Blue - Orange Yellow - Green

LARGE HEAD WING SCREWS AND MOUNTING BRACKETS



Both Wing Screws and Brackets are Molded of Nylon

Wing Screw Will Snap Under Impact.

Set of 2 Each 79¢ Wing Screws Only 4-49¢

FLAP OR ELEVATOR CADMIUM PLATED CONTROL HORN 450 C/L and OFFSET HORN

QUICK-FILL

The Fast, Easy Way to Fill







Insert tube in tank filler line, Hold finger aver pressure vent and give the bulls of two squeezes. When the tank is full remove finger from vent. Tank is filled in a matter of seconds with no wasted fuel.

BIRCH DOWELS

1/16 x 12	03	1/8 x 3608
1/3 x 12		3/16 x 36 .1
3/16 x 12	.05	1/4 x 3613
1/4 x 12	.06	5/16 x 3615
5/16 x 12	.07	3/8 x 3617
3/8 = 12	.08	1/2 x 36
1/2 = 12	.09	

GUY'S SELECT SPRUCE

36" Lengths	48" Lengths	
1/16 x 1/8 .0	3/32 x 3/32	
1/16 x 3/16 (3 32 x 1/8	
1/16 x 1/4 (3/32 x 3/16	
3/32 x 3/32 .0	3/32 x 1/4	
3/32 x 1/8	1/8 x 1/8	
3/32 x 3/16	1/8 x 3/16	
3/32 x 1/4	1/8 x 1/4	
1/8 x 1/8	/8 x 3/8	
1/8 x 3/16	1/8 x 1/2	
1/8 x 1/4	1/8 x 3/4	
1/8 x 3/8	3/16 x 3/16	
1/8 x 1/2	3/16 x 1/4.	
1/8 x 3/41	3/16 x 3/8	
3/16 x 3/16	3/16 x 1/2	
3/16 x 1/4	1/4 x 1/4	
3/16 x 3/81	/4 x 3/8	
3/16 x 1/2	1/4 x 1/2	
1/4 x 1/4	3/8 x 3/8	
1/4 x 3/8		
1/4 x 1/2 2		
3/8 x 3/8		

SIG BULK NYLON



CONSISTS OF TWO SMOOTHLY NYLON TELESCOPING TUBES

10 FEET - \$1.49

CAN BE MADE ABSOLUTELY STRAIGHT BY SLIPPING IT OVER 1/16" MUSIC WIRE AND RUNNING IT THROUGH VERY HOT WATER OR OVER A HOT

CONTROL LINE CONNECTORS



LARGE - 49 lb. Test - 2 for 10¢ MEDIUM - 22 lb. Test - 2 for 10¢ SMALL - 15 lb. Test - 2 for 10¢

CONTEST RUBBER

IN LIGHT-PROOF FIBRE CANS

1.8" × 50 ft.......

3. 16" x 25 ft.

1/4" × 25 ft. 1/4" × 50 ft. 1.20

One Pound Can 5.00

PLYWOOD WINGSKINS

1/64 x 12 x 12. 1/64 x 12 x 24. 1/64 x 12 x 48. 1/64 x 24 x 48.

x 25 ft. \$.35

.60

.65

POLYURETHANE SUPER FOAM



EXPANDS 25 TIMES SUPERFOAM CAN BE CAST IN MOLDS OR FOAMED INTO PLANKS

Can be used to stiffen plastic fuse-lage airplanes, leading edge of wings, foam nylon pushrads in place, and foamed flotation in boats. Many other uses.

CAN BE PAINTED WITH SUPERCOAT DOPE

1-8 oz. Can PART A \$339



VINYL WING CUSHION

PRESSURE SENSITIVE

A single-coated, soft but very tough, pressure-sensitive foam tape that makes an ideal wing cushion. White color will blend with most paint jobs or can be dyed. If thicked layer is desired, more than one thickness can be used. Protects wing paint.

> 1/16" x 1/4" x 36" - 39¢ 1/8" x 3/8" x 36" - 59¢



RACING LUBRICANT

ELIMINATES CARBON AND VARNISH

ENGINES RUN CLEAN AND COOL

PROTECTS YOUR ENGINE FROM LEAN MIXTURE OVERHEATING

Quart - \$1.60 1/2 Gallon - \$2.85 Gallon - \$5.50

CHAMPION C-L STUNT

Pint - 85¢ Quart - \$1.50 ½ Gallon - \$2.60 Gallon - \$4.95 CHAMPION RACING FUEL

Pint - \$1.10 Quart - \$1.85 1/2 Gallon - \$3.50 Gallon

SIG HEAT-PROOF FUEL LINE MEDIUM

For Engines .09 - .35 35¢ Per Foot in 1 Ft. Pkgs. 29¢ Per Foot in 25 Ft. Rolls



For Engines .40 - .80 45¢ Per Foot in 1 Ft. Pkgs. 39¢ Per Foot in 25 Ft. Rolls



Without doubt, the finest fuel line ever developed for model engines. Completely impervious to alcohol, aitromethane or castor oil. Test sections have been imersed in fuel for over a year without any ill effects. Will not melt. The line can rest directly on the cylinder head without trouble. High tear resistance. Unlike many fuel lines it will not easily cut resistance. Unlike many fu through on tank fittings, etc.

1/2A WHEEL RETAINERS



Pkg. of 4 19¢ FOR 1/16" WIRE

Send Only 50° Today for

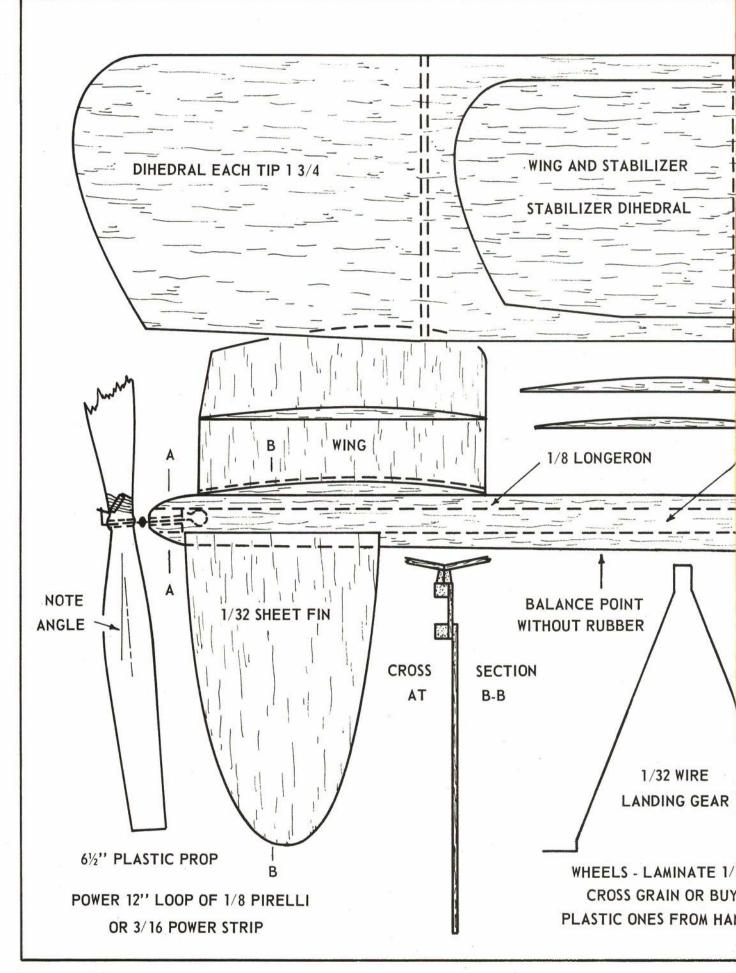


THE 1971 SIG CATAIOG is the greatest Model Airplane Catalog yet! Over 224 pages devoted exclusively to merchandise used in the building or fiying of model airplanes. Features the complete Sig Line, plus practically all other lines available. Hundreds of models are illustrated including gliders, sailplanes, rubber-powered flying scale, control line stunt and sccle, and every type of R-C model. Send 50c today for your copy or buy it from your local hobby dealer. You will agree it is the best bargain in the model airplane industry.

ORDERING INSTRUCTIONS

then order directly from our plant. We will ship promptly.
To Order, please add \$1.00 for postage and handling in the
U. S. Canadian orders please add \$1.50. Minimum order is
\$1.00. Please remit by bank draft, check or money order.
Print your name and address plainly. Sorry, No C.O.D. shipments. All prices subject to change without notice.

SIG MANUFACTURING CO.. INC **401S. FRONT STREET** MONTEZUMA, IOWA 50171



DECEMBER 1971

MODEL AVIATION

Official magazine



Academy of Model Aeronautics • 806 Fifteenth Street N.W., Washington, DC 20005

INTERESTED IN JOINING A.M.A.? Over 32,000 did in 1970. Membership details may be had by requesting FREE BROCHURE from above address

Reviews of National AMA Record Holders

FF C Gas national AMA record, Category I, Senior age class: 31 minutes, 6 seconds, established by Raymond Faulkner (AMA 45866), Claremont, Calif., on May 2, 1971.



Faulkner's model was designed by Robert Johnson. The wing has 79" span, 11" center chord, 10 percent airfoil thickness. The stabilizer is 36" by 8". Both the wing and stab have multi-spar construction. The overall fuselage length, measured from the firewall, is 50". The model was covered with Sig Jap tissue and finished with Aero Gloss dope; weight was 34 ounces.

Power was a K & B 40 Series 69F run on Faulkner's own mix fuel of 40 percent nitro, 25 percent castor and 35 percent methanol, carried in a Perfect No. 6 tank. The engine used a Fire Ball (cool) glow plug, Tornado 10"D x 4"P prop. Engine run was controlled by a Tatone Tick-Off timer, while dethermalizing was accomplished with Sig fuse.

FF ½A Gas national AMA record, Category II, Senior age class: 19 minutes, 47 seconds, established by Phil Hainer, Jr. (AMA 18389), Kent, Wash., on February 7, 1971.



١R

HAN

Power for Hainer's Starduster 350, a kit produced by Competition Models, came from a Cox TD .049, Cox Red-Can Racing Fuel, and a Cox gray prop of 5½"D x 4"P. The tank mount for the engine was produced by Competition Models. A Tatone ½A Tick-Off

A report of selected recent record holders highlighting the designs and equipment used.

was used for controlling the engine run, Mike clothes line fuse for actuating the dethermalizer.

The model was covered with Sig Jap tissue and finished with Fuller's nitrate dope and Aero Gloss fuel proofer. One construction change incorporated in the model was the addition of wing stress webs in the center sections, said to add terrific strength and warp resistence.

Indoor Paper Stick national AMA rcord, AMA Ceiling category I, Junior age class: 5 minutes, 56.5 seconds, established by Barry Pailet, Brookville, N.Y. on March 26, 1971.



The wing of Barry's model has a span of 24 1/2" and center chord of 4 1/2", producing a projected area of 93.75 sq. ins. The stabilizer, 11 1/2" span by 4" center chord, has an area of 34.5 sq. ins. The vertical fin is underslung beneath the stabilizer. The wing and stab airfoils have 7 1/2% and 6 1/2% thicknesses, respectively. The 14" prop was formed from sheet balsa warped around a 4" diameter jar at a 30-degree angle to produce a 26" pitch. Power was supplied by two strands of .063" Pirelli of 18" length-obtained from W.C. Hannan. The model used Micro-Dyne condenser paper covering, Micro-X prop bearing and teflon thrust washers, Sig rubber lube. The model basically was designed by Max Chernoff but with modifications by Jean Pailet.

On a previous date, February 25, Barry established an Indoor ROG Cabin record of 1

minute, 38 seconds in ceiling category I. The Cabin model used the same tissue-covered wing and tail as the Stick model. However, the Cabin prop was of 13" diameter and 22" pitch, and power was two 18" strands of .109" Micro-X Pirelli.

Indoor R.O.G. Cabin national AMA record, AMA ceiling category III, Open age class: 29 minutes, 22.2 seconds, established by Col. Robert R. Randolph (AMA 5848), Loma Linda, Calif., on May 16, 1971.



Randolph's model appears to be an adaptation of a Stick model with a "cabin" added to give the required cross-section area. The photo shows the takeoff gear in its retracted position—powered by a single strand of monofiliment nylon. An original design, the model is named Fat Cat IV.

The model's wing, 31" span by 5" center chord, is mounted off center. In plan it is similar to a reverse double ellipse, although the trailing edge is straight except for rounding at the tips. The elliptical stab is 14½" x 5". The motor stick is 13" long; the tail boom and the aft rudder make up an additional 13 inches.

The prop has 16" diameter and 32" pitch. Two 18" strands of .060" rubber allowed 2240 turns to be packed in. The model was constructed from Micro-X balsa; covering was Microdyne Type B microfilm. The much-flown aircraft weighed .034 oz. when first constructed, .041 oz. when the record was established.

FF ½A Gas national AMA record, Category II, Junior age class: 8 minutes, 17 seconds, established by Gerry Geraghty (AMA 37258), San Jose, Calif., on January 11, 1971.



Gerry's model is the Raider 310 which was published in Model Airplane News. It is powered by a Cox TD .049 using Cox Racing Fuel and 6"D x 3"P Top Flite prop. It used a Tatone tank mount for the engine, and Sig balsa and Ambroid cement in construction. Engine shut-off was by a Tatone ½A Tick-Off, and dethermalizing also was by a Tatone timer. The 6½ ounce model was covered with Sig Jap tissue, finished with clear nitrate dope.

On the same date Gerry established a Cat. II A Gas national record of 5 minutes, 42 seconds. This record was also set with the Raider 310 model, but with the aircraft powered by a Cox TD .051.

FF Coupe D'Hiver national AMA record, Senior age class: 9 minutes, 20 seconds, established by Marc Sexton, Seattle, Wash., on February 7, 1971.



The model is basically the design of George Batiuk, Sr., which was sketched in Dave Linstrum's column of Model Airplane News. Main modifications were to reduce the number of stabilizer spars and to use a prop of 16" diameter by 23" pitch, Montreal-type stop, RAF 32 wing airfoil. This design has a wing a 39" span by 4 3/4" chord, stabilizer span of 14" by 3 1/2" chord. The model weighed 83 grams.

The aircraft was powered by six 11" strands of 1/4" Pirelli which was lubed with Sexton's own mix of 50% glycerin and 50% boiled green soap. It was covered with Sig Jap tissue and finished with Aero Gloss clear dope. The prop front bearing was obtained from FAI Model Supply Co., and the dethermalizer was actuated by Sig fuse.

FF Unlimited Rubber national AMA record, Category II, Senior age class: 7 minutes, 58 seconds, established by Phil Hainer, Jr. (AMA 18389), Kent, Wash., on February 7, 1971.



Phil's model, an original design intended for Coupe D'Hiver, weighed 4.58 ounces. It has a wing of 38" span, 4 23/32" chord and original undercambered airfoil of 8 percent thickness. The stabilizer is 18" by 3 19/32". original 6 percent thick flat bottom airfoil. Both the wing and the stab are multi-spar. The overall fuselage length is 36", Warren truss construction; the rubber motor consisted of 8 strands of 1/4" Sig Pirelli 36" long, lubed with glycerin and green soap-carried within the forward 24" of the fuselage. The propeller, a two blade folder of 16" diameter and 19" pitch, was hand-carved. The front end thrust bearing assembly was obtained from FAI Model Supply Co.

An interesting design feature of the model is the locating of its low pylon wing mount off-center to the left. Hainer states that this allows the model to fly left under power and to use torque to good effect. A construction feature which he says adds great strength and warp control is a stress web system built into the wing.

The model was built from Sig contest balsa which was assembled with Titebond cement and Devcon five-minute epoxy. It was covered with Sig Jap tissue and finished with three coats of Fuller clear nitrate dope followed by a final coat of clear Mar-Lac laquer for high gloss.

FF A Gas R.O.W. national AMA record, Category II, Open age class: 3 minutes, 38 seconds, established by William H. Thompson (AMA 16572), San Diego, Calif., on January 3, 1971.



The model which set the record was the Strato-Streak design by Louis Garami published in the December 1941 issue of Air Trails magazine. It was equipped with sled floats for establishing the rise-off-water record. The wing has 39½" span, 6" center chord, flat bottom airfoil. The stab has 18" span and 5 3/8" center chord. The model weighed eight ounces.

Thompson rates this design as easy to construct. He used Sig Balsa, Glue-Bird white glue, Jap tissue covering and Aero Gloss clear dope. Power came from a Cox TD .051, K & B 1000 fuel and Cox 6"D x 3"P prop. Other products used include a Perfect metal fuel tank and Tatone engine timer.

Thompson relates that his trying for the R.O.W. record was possible only because the field used for the Record Trials by the San Diego Orbiteers happened to have water puddles that day, a rare occurence for San Diego.

Indoor HL Glider national AMA record, AMA ceiling category I, Junior age class: 45.0 seconds, established by Bruce Pailet, Brookville, N.Y., on March 26, 1971.



The model, designed by Jean Pailet, has a wing with 16 1/2" projected span and 3" chord; each panel is swept back 15 degrees. The wing is constructed from 1/16" sheet which is then warped to produce 1/16" undercamber; .008" music wire is glued to the wing leading edge for protection against nicks. The stabilizer, 6 1/2" span by 3" center chord, is of 1/32" sheet.

FF HL Glider national AMA record, Senior age class: 4 minutes, 29 seconds, established by Marc Sisk (AMA 46368), Albuquerque, N. Mex., on April 11, 1971.



Marc used three models in completing the series of flights making up this record, two of which were lost out-of-sight, plus two more gliders which were lost during practice. None of the gliders were equipped with a dethermalizer. Design used by Marc for most of the gliders flown in this record series was the Flash by Dick Mathis, published in Flying Models magazine and currently kitted by M & P Enterprises. The Flash has a wing of 17" span and 4" center chord. The models were constructed from Sig balsa and spruce, the latter for the leading edges of the wing and stab. Epoxy cement was used throughout. Marc also posted flight scores with an original design model.

PRESIDENT'S MEMO

A TIMELY REMINDER, AMA ELECTIONS. It is election time for many of the key AMA offices. District Vice-President will be chosen for the odd-numbered districts, namely Districts I, III, V, VII, IX and XI. We must also chose a Secretary-Treasurer. Only the AMA members within a given district, of those mentioned, may vote for their District Vice-President, but the entire membership will vote on the Secretary-Treasurer position.

Every AMA member has an investment in these officers, and so has a responsibility to help choose them. If you are a current adult AMA member your voting ballot should be received about the time this magazine appears, along with your membership renewal form. (Note: Jr. and Sr. members no longer vote in AMA elections.) Both of these documents are important, so as a GOOD AMA MEMBER, use them!

APPOINTED OFFICERS. In order that the AMA appointive positions be held by members who realize their responsibilities and serve accordingly, all appointive positions will be considered to be on a calendar year basis—reviewed at the end of that time for possible reappointment.

IDEA FOR "SUNDAY FLYERS". To make "Sunday Flying" more fun, and to give it a constructive "payoff" as well, why not put on demonstrations or air shows for the public! This could be anything from the simplest demonstration, for a small group, to



Three AMA presidents at the Spokane Internats: John Clemens, center, past President Cliff Weirick, left, and past President and current Executive Director John Worth, right.

a full-blown formal "staged" air show. Or it might be part of a full-scale air show. Model flying demonstrations are ALWAYS appreciated by the public. It relates easily, because secretly each one wishes HE was doing the flying.

You or your club can offer such services to all sorts of appreciative groups in your community. These groups include service clubs, schools, park and recreation departments, boy's clubs, Scouts, church or community carnivals, shut-ins, half-times at sports affairs, and lots more. You might mention your availability to your Chamber of Commerce.

Your flying in these demonstrations need not be professional, because just the flying of a model airplane, of any category, is impressive to the general public. And it is real "bait" for the youngsters who are spoiling for something worthwhile to do. I suggest that your demonstration be as informative as possible—through signs, a public address system, bull-horns, megaphone, or simple personal explanation. It is fun being an "authority"! Even more potent "bait" for the public is the offering of "training flights" on a good trainer-type model aircraft, for selected individuals among the spectators.

From personal experience I have found that the organizing of a Flight Demonstration Team is a lot of fun, with a wonderful feeling of prestige and with a great payoff in community service.

SAFETY, of course, should be your first consideration any time you fly, but it is even more important if you have attracted a crowd. If you are acting as a group, it is doubly important that your group be a chartered AMA club, or a section of a chartered AMA club, You will then be protected by the expanded insurance protection that covers the club, its individual officers, and the property owners where you are holding the activities. THIS SURE HELPS GET SPONSORSHIPS!

Help establish a good image for modeling! Show off model aviation!

> John E. Clemens AMA President

AL SIGNORINO

AMA District VI Vice-President (Missouri, Illinois, Indiana, Kentucky)

Albin R. Signorino started airplane modeling when he was 11 years old. Twenty five years later, at age 36, Al is serving in the very responsible position of District VI Vice-President for the Academy of Model Aeronautics. Strangely, he is far better known for one singular modeling accomplishment. Al is the designer, builder, and flyer of perhaps the most unique model airplane of all times, "Snoopy's Flying Doghouse."

The Signorino home is in the beautiful rolling hills of Maryland Heights, in the northwest part of Greater St. Louis, Missouri. Here Al and his wife, Phyllis, are raising Kim, age 11, and Butch, age 13. McDonnell-Douglas Aircraft of St. Louis is Signorino's employer. In serving this important aircraft company as a technical writer, Al's basic responsibilities are the writing of procedures for checkout of electronic equipment.

Al was born on June 22, 1935, in Wick Haven, Pa., about 30 miles south of Pittsburgh. His first 18 years were spent in Pennsylvania, with his education extending, through high school, two years of college, and an Associate Degree in Electronics at DeVry Tech. Most of his life has been involved in some manner with aviation, with four years having been served in the United States Air Force. He was an instructor in Airborne Electronics at Scott Air Force Base.

In addition to Al's present responsible position as an AMA Vice-President, he has been an RC Contest Director from 1966 to the present, and RC Contest Coordinator for District VI. He is a member of the McDonnell Radio Control Club and the Greater St. Louis

Modeling Association. He is editor of the McDonnell Club's newsletter, the Carrier Wave.

To point up Signorino's complete fascination in aviation, he has recently obtained his private license to fly full-scale aircraft, and is working now for his commercial license. He is a member of the Spirit of St. Louis Experimental Aircraft Association, Chapter 32.

Al is certainly best know for being the "father" of the radio-controlled "Snoopy's Flying Doghouse." This almost unbelieveable (until you see it fly!) reproduction of the flying doghouse of the popular comic strip character, Snoopy, opens up an entirely new facet of promotion and "image" for model aviation. Through the "Snoopy and the Red Baron" skit flown by Al and his fantastic model plane, children and adults alike relate to Snoopy's wonderful nostalgic World War I fantasies. Then they suddenly realize that this is being done with a model airplane. This demonstration is a public relations man's dream, and is a terrific tool in the establishing



Al Signorino, District VI V.P.

of a favorable and exciting image for model aviation. Modeling owes a debt of gratitude to Al Signorino for this contribution!

For those of a technical mind, Snoopy's Doghouse, Signorino version, is shaped exactly like a doghouse, and Snoopy sits on its roof as its pilot in flying regalia. It is powered with an Enya 60 gas engine, guided by a Controlaire Radio, and is supported in the air by a wing (actually the floor of the doghouse shaped in an airfoil, 27 by 28 inches) of about 756 square inches area.

As further tribute to Al's designing genius it must be mentioned that the Doghouse flew successfully "right off the drawing board," being flown in a model air show at Rheinbeck, N.Y., for its sixth flight. The Doghouse being flown at present is actually model number "4 1/2", with only one major design change having been made since the original. Snoopy now has about 175 flights of the Doghouse in his logbook, with only six crashes on the first three models, and only one on the present excellent version. That one was caused by battery failure.

The "Snoopy and the Red Baron" skit is flown somewhere almost every weekend, weather permitting. Sometimes two air shows are flown in different locations on one weekend. In Snoopy's logbook are about 50 air shows in twelve States and Canada in three years. Some of the finest demonstrations have been made at AMA's National Model Airplane Championships. A salute to Al and Snoopy, and "curse you Red Baron!"

Signorino has one more unusual side to his aero nautical interests. He is collecting "antique" radio control equipment. His collection of about three dozen "old-timer" RC rigs is at present just stored in boxes, Al feeling that it is not yet complete enough for public display. Al would be very pleased to

hear from anyone having equipment along this line that might add to this unusual collection. Contact: Al Signorino, 11959 Glenvalley Drive, Maryland Heights, Mo. 63043.

Looking at this dignified, quiet, darkheaded young man, and the thoughtful way that he conducts himself in AMA Executive Council meetings, one would never dream that he is the "flying instructor" for the swashbuckling Snoopy and his famous Doghouse.

EARL DENNY Office Manager AMA Headquarters Staff

Earl L. Denny, The AMA HQ Manager, started life out with a bang by being born on the Fourth of July. That was 41 years ago in a community which no longer exists—Darrow, Ill. Darrow was a community of one grain elevator, a railroad spur and four houses. Earl moved to a much larger town of 200 people. Since then Earl has been around the world with the military. He now lives with his wife, Willie Mae, in Woodbridge, Va., a few miles south of Washington, D.C., on the Potomac River. Earl is the father of three children, ages 13, 17 and 19.

Denny's career previous to his employment by AMA was 21 years of combined service and education in the military, retiring from the U.S. Air Force with the rank of Master Sergeant. He has shown a tremendous appetite for education, graduating from high school at Stockland, Ill., 90 miles south of Chicago, and attending the University of Florida, University of Arkansas; he is with the University of Maryland at the present time.



Earl Denny, Office Manager

Earl needs only one more course to earn a degree at Maryland. Sandwiched into all of this education were courses in the military which covered administration, intelligence, disaster control and management. Earl took first place in a speech contest in the Second Air Force Non-Commissioned Officers Academy (out of a class of 120 NCO's) at Barksdale AFB in Louisiana. Over the years Earl has also added correspondence courses on many subjects.

Travel is very educational, too, and during Denny's military career he traveled West Germany, Italy, France, Japan, Taiwan, the halls of the Pentagon, and many of the United States.

Earl's business experience outside of the military includes the filling of part-time positions as a news writer for a local paper (the Potomac News, Dumfries, Va.) real estate salesman in Little Rock, Ark., and a life insurance salesman in Jacksonville, Ark.

Denny claims as his primary hobby the completing of his education. Secondary interests follow the same pattern: reading, stamp collecting and service club work. Presently he is president of the Woodbridge Civitan Club which emphasizes support of programs for retarded children. He has been local president of the Toastmasters International (public speaking service group), winning several Toastmaster Contests. Earl serves as a decon and men's bible teacher at a local Southern Baptist Church, and is a member of the Marumsco Woods Citizens

Earl has been employed by the Academy of Model Aeronautics in the Washington head-quarters since August of 1969 as Office Manager. His duties include all membership processing responsibilities, the same for chartered clubs, directing of office personnel, and other related duties and functions. Earl's background and education serve him very well in his present duties for AMA. He is an excellent organizer, and his experience as a speaker allows him to express himself well in handling personnel and communicative problems. In working with Earl one always gets the feeling that he is eager to serve and anxious to get it right.

Denny is one of the few people connected in any way with the AMA who has had no experience in model airplaning beyond throwing a few gliders as a kid. This serves AMA well because, different from most of us, Earl's attitude is all business, not diluted in any way by an inflated love for modeling. In serving AMA, his friends and his community, Earl's most powerful tool is a big cheerful round-faced smile, making Earl Denny a pleasure to work with.

AMA News Bits

VFSS RC Pilot Qualification

The AMA chartered Valley Forge Signal Seekers (Pa.) are now utilizing a Pilot Qualification Program which was worked out by VFSS Vice-President Tom Jarick (AMA 16675) to insure safety to all flyers (members and visiting non-members) who use the VFSS flying site.

To receive the club's "Safety Qualified" tag, a pilot's model is first inspected for any obvious violations of construction which might affect airworthiness. Then the flyer must demonstrate his ability to safely control the model on the ground and in the air.

The qualifying flight consists of a takeoff or a hand launch, a climb to safe altitude, a circle around the field, and a controlled landing in the mowed area. The flyer is expected to advise the examiner beforehand if he is going to circle to the right or left after takeoff and when he is going to attempt landing. According to the VFSS rules, flight must be relatively smooth and without close calls or near misses. If, upon completion of the demonstration, the examiner is satisfied that the flyer meets the minimum standards of competence, the flyer is issued a "Qualification Tag" which he must display at all subsequent flying.

Good program.

More Hlaa FLYing

The interest of youngsters in Airplane models continues to grow, as was indicated by the turnout of over 200 contestants in the Centre Region Indoor Model Aircraft Meet earlier this year. The meet, sponsored by AMA chartered State College Radio Control Club (Pa.) and the State College Park and



Cliff Telford and Bobby Violett flew Clary-Wisniewski 60-powered RC Speed model in September DCRC FAI Trials—clocked 198 mph into wind, but timers missed best downwind passes, Record is 198.8 mph.

Recreation Department, included competitions for Delta Dart models (featuring the HIaa FLYer model) and for tissue-covered rubber-powered models. Featured were demonstrations of two microfilm models and Bill Brown's (AMA 72439) small CO-2 powered models. It is interesting to note that sex had no bearing in this contest as two of the eight first and second place winners were young ladies.

Contest Director Albert Niessner, Jr. (AMA 19108) is appreciative of the Hobby Industry Association of America for having supplied the Delta Dart Models as well as the prize ribbons and certificates. He looks forward to another contest next year.

AMA chartered clubs can still participate in the AMA-HIAA Delta Dart Program and obtain the Delta Dart model kits plus publicity and prize package. If the Application for Delta Dart Sanction (previously distributed to chartered clubs) has become misplaced, write to AMA HQ and request another one.

Powerful Starter Batteries

John Laird recently built a box to completely enclose his electric starter battery since he accidentally discovered its tremendous energy when a screwdriver somehow shorted it out. Fortunately, the chance shorting occurred on the flying field where the smoke created brought it quickly to his attention; just imagine the potential for fire if it had occurred in a closed car trunk. John's starter battery is now completely isolated in his field box. The leads for both

the starter motor and battery charger are connected by jacks in the side of the field box. This information came from Low Passes, newsletter of the Long Island (N.Y.) RC Society.

Ask Questions

Milt Stevens (AMA 71333) of the AMA chartered Capital Area Radio Drone Squadron club (Lansing, Mich.) realizes that RC flying is not an innate talent: "none of us was born with this knowledge," The only way to achieve RC success and minimize one's mistakes is to ask questions and learn to do things properly. "Steve" dedicated his column in The Bee Line, the CARDS' newsletter, to new members who are just getting started in RC. He says, "It is far better to do it properly than to arrive at the field and have your instructor tell you that your plane is incapable of flight...there are always problems, and there is always someone to answer them."

So ask; ask questions and reap your own rewards!

For RC Retracts

"Retracts will sure educate you fast." "I don't think I'll ever build another pattern ship without them." These are quotes taken from Squawk Sheet, newsletter of the AMA chartered Port Arthur Radio Control Club of Nederland, Tex., alias "The Oily Birds." The newsletter editor admits that retracts are a pain, "but in the air, they're worth all of it!" He made this evaluation one Sunday when he experienced the sensation of his model easing into each maneuver without any apparent effort. Retracts, he says, cause quicker and more positive reactions resulting in fewer corrections being necessary.

RC Wing Saddles

An idea suggested in the newsletter of the AMA chartered Acadian RC Club, Lafayette, La., uses silicone sealant to produce an excellent, resilient, form-fitting wing mount. First, the fuselage is cut to allow 3/16" to 1/4" space between the fuselage and eventual wing position. Then the wing center is covered with waxed paper, and the fuselage is masked to within 1/32" of the edge of the saddle. Finally, the wing is mounted to the fuselage in its proper location, and a heavy bead of silicone is run along the joint, then forced inside the joint with a finger, forming a small fillet along the outside at the same time. The last step, once the silicone has cured, is to form a fillet on the inside of the fuselage where the first application of silicone overhangs.

What started out as a Christmas gift for young Rick and Mike Rasmussen turned out to be an enjoyable experience for mom and dad, too. The family's first plane was the Cessna Skylane which was under construction by Rick in photo at right. The whole family, Mike, Bob, Mary and Rick, are shown below with the plane. The Skylane is powered by an OS Max 35; control is by 4-channel Kraft Series 70. Latest plane is a Trainermaster. The lady of the family soloed in just three flights, with the assistance of a "Buddy Box". All AMA members.





No Generation Gap

Mrs. Robert R. Rasmussen, an enthusiastic Napa (Calif.) fan of modeling, and mother of Rick (AMA 87374) and Mike (AMA 87373) Rasmussen, two very enthusiastic modelers writes:

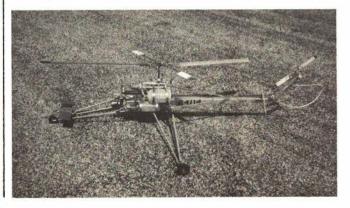
"As parents in this day of the 'generation gap' we can really appreciate this hobby that has given us an exciting common interest to share with our boys.

"We have noticed something else about the sport—the kind of people you meet at the flying field are the kind of people you are happy to have as friends. They are always ready and willing to help the other guy—a trait which is all too lacking in this day and age." Mrs. Rasmussen wrote that the boys had been flying Control Line for only about a year before the "RC bug" bit them. Af first the parents were dubious because of the cost, but finally they relented last Christmas, foregoing the color TV they had planned on. Now, her words are, "I can honestly say we have never made a better investment in family fun." By the way, mom and dad as well as Rick and Mike have all had turns at flying the family's first plane, a Skylane 62. A Trainermaster was under construction when she wrote.

Old-Timers Want New Design

The Society of Antique Modelers, the oldtimer and antique model group, is holding a

Below Left: Though many world records were tried for at Sept. DCRC FAI Trials, the only success was had by Gene Holt. His helicopter was flown to 650 feet altitude for a new record. Below Right: Well known FF Scale flyer, and editor of Flightmasters Newsletter, is Fernando Ramos. Diesel-powered Free Flight Sopwith Racer shown. Bill Hannan photo.





contest to develop a new SAM symbol for use in the society's literature, on T-shirts, etc. The winner of the design competition, which closes Dec. 1, 1971, will be awarded a good "flying" engine donated by SAM President Bill Ladner (AMA 30252) of Whittier, Calif.

SAM offers a complete set of old-time flying rules and a one year membership for \$2. Send to Woody Bartelt (AMA 11222), Secretary, Society of Antique Modelers, 5250 Lucerne, Kalamazoo, Michigan 49004.

Free Is No Good?

Dick Franco (AMA 54801), editor of the AMA chartered Southern Alameda County (Calif.) RC'ers newsletter, offered his club members free silk-screening of the club emblem on their white shirts. Imagine only two takers, both new club members! Later on Dick said he realized he could have made the job seem worthwhile simply by charging members, but being the good Samaritan he is,

he decided to provide his labor for free—a rare thing these days but a great way (when the members cooperate) to create club identity.

Church Promotes Modeling

"Another junior club is on the scene," writes William P. Beck (AMA 26718), a World War II veteran and former member of the prewar Quaker City Model Airplane Association of Philadelphia, Pa., also a former AMA junior Committee member. Using the 1st Presbyterian Church's parking lot (Lakewood, Colo.) as his flying site, Beck's flight with a Guillow Fairchild 24 inspired Rev. John Holzman to ask him to help organize a flying club for juniors.

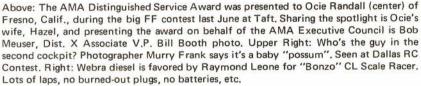
Already the new Lakewood Eagles has begun to make progress. The club has held one contest using the simple Delta Dart rubber-powered model, with the plan being to increase the degree of difficulty as the

youngsters gain experience and improve their skills. The Church purchases the modeling supplies with money collected from the 25 cents dues that the 8 to 13-year-old modelers pay weekly.

Publicity Guide

"If only I had had the above-mentioned Publicity Guide about six months ago!" wrote Dick Satterleee (AMA 84988), secretary of the AMA chartered Harbor Soaring Society in California. He was speaking of the frustrations he had experienced in promoting the club's big Western R/C Soaring Championships last June and of the help that the AMA Publicity Guide had been—once obtained. Which reminds us to say that obtaining the AMA Publicity Guide is one of the benefits of AMA club charter. Free club charter information is available from AMA HQ, 806 Fifteenth St., N.W., Washington, D.C. 20005.



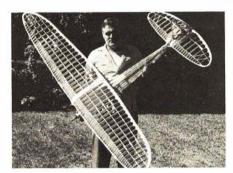












Some of the models for the North Jersey RC Club RC Oldtimer meet last July. Left: Woody Woodman's Taibi Hornet. Above L: Framework of Richard Tanis' 90" Flying Quaker. Above: Comet Sailplane by Russ Glasgow. Right: This Flying Quaker was by Danny Sheelds. The contest's change of pace proved to be popular. Photos submitted by Joe Beshar.



AMA News Extra....

RC WORLD CHAMPIONSHIPS--GIEZENDANNER REPEAT WINNER

Bruno Giezendanner of Switzerland took an early first round lead in the Seventh Aerobatic World Championships for RC models at Doylestown, Pa., September 15-19. There was no certainty that the reigning World Champion's lead would be maintained, however, because it was known that the five judges at Site 1 were, on average, awarding higher points than those at Site 2. Giezendanner was among half the contestants whose first flight was at Site 1, and he recorded the highest single score of the meet--7,075 points (total for five judges). The big question, whether Giezendanner's flying was far superior to all the others, would be answered during Round 2 when he and contestants up to number 31 would be flying before the judges at Site 2, and contestants 32 through 62 would be flying before the judges which had awarded the high score to 25-year-old Giezendanner.

The contest wasn't "in the bag" by any means. Both U.S.A.'s Phil Kraft, in second place in Round 1, and Liechtenstein's Wolfgang Matt, 9th place in Round 1 before Site 2 judges, pulled ahead of Bruno during Round 2--Matt to first place, and Kraft continued in second. During Round 3, when the judging teams were regrouped for this round and also Round 4 (which seemed to result in more even scoring at the two sites), there was only minor shifting in the top positions: Matt stayed on top, but Giezendanner moved up to second while Kraft went to third. And young Hanno Prettner of Austria as well as our own Jim Whitley were pushing the leaders, only 375 points separation from first to fourth.

Round 4 pressure was intense! An extraordinary flight by any of the runners-up could result in victory. Of the leaders, Hanno Prettner was first to fly--6,225 points at Site 2. This was better than one of his previous flights, bringing his best three-flight total (counted in final scoring) to 19,095 points. Next among the leaders, also at Site 2, was Giezendanner. Seemingly with nerves of steel he skillfully piloted the Marabu model, designed by he and brother Emil, through the 15 maneuvers of the FAI Aerobatic schedule: 6,785 points for a three-flight total of 20,315. Late in the day Phil Kraft was putting in his fourth flight at Site 2 while at about the same time Wolfgang Matt was flying at Site 1. Here was the last chance for the U.S.A., or any other country, to unseat the champion. But this was not to be. Matt turned in his best score, and the second best score of all the flyers, of 7,040 points for a grand total of 20,275 for second place. Kraft also produced an excellent flight, the second best scoring of his four rounds. When contest tabulation had extended the judges' scores by applying the K-factors, it was found that the flight had earned 6,380 points for a total of 19,455 and third place.

American team members Jim Whitley and Ron Chidgey were applying plenty of pressure on their own. They were 5th and 7th, respectively, for Round 1; 4th and 6th at the end of Round 2; 5th and 7th at the end of Round 3; and their final finish positions were 6th and 7th. Both performed outstandingly, and coupled with Phil Kraft's 3rd place victory, this assured the Team Championship for the U.S.A. Switzerland was second place in team standing.

International Pylon Race & Soaring Contests

Immediately following the Aerobatic World Championships there were International Contests for FAI Pylon Racing, which attracted flyers from seven nations, and FAI Thermal Soaring, in which six nations competed. The Telford-Violett team, which had previously won the event at the National Contest, was the winner in Pylon Racing; the team was awarded the new Sir Thomas Sopwith perpetual trophy. The International Thermal Soaring Contest winner was Sandy Pimenoff of Finland. Pimenoff, who is president of the FAI Committee for International Aero Modeling and who was Finnish team manager during the Aerobatic World Championships, flew to first place a glider which he had just completed during the few days before.

By special arrangement with the publisher this page is produced at the very last minute, just before the magazine is printed, to bring you the latest news concerning current Academy of Model Aeronautics events of national significance.

BMA Scholarship Contest

Marty Thompson (AMA 26406) of Livermore, Calif., was the big winner of the AMA sanctioned 1971 BMA Model Aeronautics Scholarship Contest for young (18 or under) modelers. The contest, the second of these annual events, was held at the Boeing Space Center in Kent, Wash.

BMA is the Boeing Management Association of The Boeing Company. It sponsors these contests in a marvelous effort to encourage young people in the design, construction and flight of model airplanes and rocketry. In addition to the more typical, but excellent, contest award trophies, the winner receives a \$1,500 college scholarship.

Another reason for the participation of the Boeing Management Association in modeling is to add encouragement and incentive for budding young aerospace engineers and scientists to develop modeling skills and experience and, thereby, learn more about the field of aeronautics and aerospace.

A new feature this year was a "fly-forfun" event for those too young or too inexperienced to enter the schólarship competition. The BMA provided Delta Dart kits and also provided instruction for building the

models. Likely these youngsters will be future Scholarship Contest entrants.

Seventy-one contestants from California, British Columbia, Idaho, Oregon and Ohio entered the 1971 BMA Scholarship Contest, and an estimated 7,000 spectators witnessed the two days of model flying in Indoor, Outdoor Free Flight, Control Line and Rocketry classes. Event prizes consisted of 86 trophies and over 30 other awards!



four events he entered, an outstanding record that gave him the title of Contest Grand Champion and the \$1,500 scholarship. Phil Hainer (AMA 18399) from Seattle was runner-up, and Rick Sironen (AMA 71549), also from Seattle, was second runner-up. Next year's contest is being eagerly

Marty Thompson, age 16, won each of the

awaited by young model builders, especially those on the West Coast. The BMA is giving them a tremendous opportunity to get involved in competition and truly to profit by the experience.



Below: BMA Scholarship winner Marty Thompson (ctr.) and runners-up Phil Hainer (L) and Richard Sironen (R). Above Middle: CL Scale Racing entrant Ken Klinger of Tacoma, Wash, Middle Right: Another entrant in popular Scale Racing event was Dave Monroe, Springfield, Ore. Top and Bottom Right: Scholarship Contest flyers in FF Helicopter and Payload.







CONTEST CALENDAR Official Sanctioned Contests of the Academy of Model Aeronautics

NOV. 7—ODESSA, TEX. Odessa Prop Busters RC Club Fun-Fly. Site: Prop Buster RC Park. S. Hood CD, 4110 E. 37th, Odessa, Tex. 79760. Sponsor: Odessa Prop Busters

RC Club.

NOV. 7—PHILADELPHIA, PENNA. (AA)
Flying Bucks AA Indoor Cat. II Meet. Site:
Philadelphia. J. VanSant, Jr. CD, 337 Parkview Ave., Penndel, Penna. 19047. Sponsor:
Flying Bucks of Levittown.

NOV. 13-14—TAFT, CALIF. (AAA) San
Valeers Annual FF Meet. Site: Taft. H.
Thompson CD, 24001 Archwood, Canoga

Park, Calif. 91304. Sponsor: San Valeers.

NOV. 21—SACRAMENTO, CALIF. (AA) Northern Calif. FF Council FF Meet. Site: Weagel Field. R. Fallon CD, 2667 61st St.,

Sacramento, Calif. 95817. Sponsor: Stockton

Sacramento, Can., 144th St., Hawthorne, Calif. 90250.

NOV. 21—ROCKLEDGE, FLA. 4th Annual Scale RC Meet, Site: Club Flying Field. G. Jordon CD, Box 3331, Cocoa, Fla. 32922. Sponsor: Spaceport RC'ers.

NOV. 28—NEAR KERMAN, CALIF. (A) Fresno Monthly FF Gas Meet (Cat. I). Site: Near Kerman. F. Gallo CD, 1725 Kenmore W., Fresno, Calif. Sponsor: Fresno Gas

Model Club. NOV. 28-VAN NUYS, CALIF. 3rd Annual Jumbo Rubber Scale Meet. Site: Van Nuys (Basin). C. Hatrak CD, 3825 W. 144th St., Hawthorne, Calif. 90250. Sponsor: N.A.R. Flightmasters.

DEC. 26—NEAR KERMAN, CALIF. (A) Fresno Monthly FF Gas Meet (Cat. I). Site:

Near Kerman. F. Gallo CD, 1725 Kenmore Dr., W., Fresno, Calif. 93703. Sponsor: Fresno Gas Model Club.

DEC. 26-28—TUCSON, ARIZ. (AA) 1971 Winter RC Nationals. Site: Marana Air Park. R. Angus CD, 6640 N. Columbus, Tucson, Ariz. 85718. Sponsor: Tucson Radio Control Club.

DEC. 31-JAN. 1-2-3-WINTER PARK, FLA. (AA) Tangerine International RC Championships. Site: R.C.A.C.F. Field. W. Schoonard CD, 2080 Sharon Dr., Winter Park, Fla. 32789.

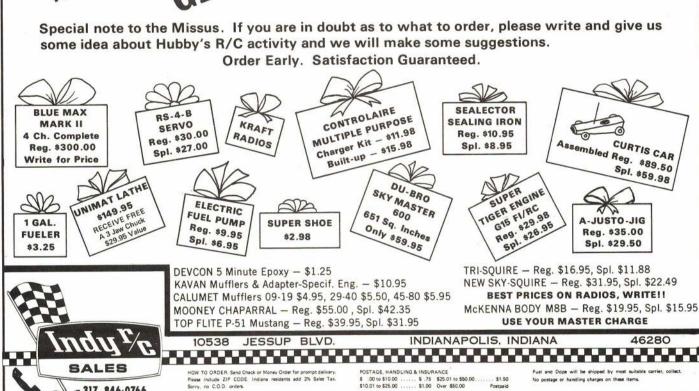
AMA OFFICER DIRECTORY

The most recent complete directory was published in the October AAM, page 64.

seasons Greetings

MAKE A MODELER HAPPY WITH AN R/C HOBBY GIFT





R/C World Championships

317 846-0766

(continued from page 41)

petitions and used provisional rules established for the events. Seven countries entered the Pylon event. After four rounds of flying, the USA National champions, Telford/ Violett, emerged victorious on the basis of four wins and better time than A. Mann of England, who also had four heat wins. T/V flew their Mustang retract-equipped, St. 40 ABC-powered ship which they had also used to win the Nats. Their win was the result of careful preparation, fine flying and an extremely fast airplane. A. Mann did well and his ship seemed fast, but his flying was not as smooth or tight as Bob Violett's. American Terry Prather also used a Mustang-like design with retracts and S.T. ABC 40. He suffered the misfortune of a collapsing gear in one heat, however, and got a big fat zero. He had the best time of the meet-1:53.6. Second best time was T/V at 1:57.5. Bob Smith had some engine difficulties which bogged him down.

A thermal soaring event completed the formal competition on Sunday. Sandy Pimenoff, the current president of the FAI Committee for International Aero Modeling (CIAM), was the eventual winner after two rounds. Sandy started building his craft on the flight over and completed it after arriving! A real plus for prefabricated kits.

Flying demonstrations were meshed into the schedule during breaks and following completion of competition on Sunday. The most impressive was that of the Kavan factory team and their Huey helicopters-hovering, formation flying, wing overs, etc. performing with great precision. Practical helicopter design has finally arrived. In addition, demos were put on by Maxey Hester with his Natswinning Ryan S.T., Norm Page and his Avenger, Tony Bonetti, Al Signarino and his Doghouse, this reporter and others.

It was an experience of a lifetime, never to be forgotten, chock full of good flying and good fellowship with modelers from around the world. I only hope that we can arrange another championship in this country at a future date. Our hats are off to all those who invested so much volunteer time and effort to make the event possible. It is easy for some to criticize for small irritations, but in overall perspective it was simply a heck of a job. Well

FIREBALL

(continued from page 14)

Construction

The original kit supplied the fuselage blocks carved to shape but rough. A good sanding inside and out was needed to clean them up. For your model, select two 3 x 3 x 24 1/2" long blocks of soft balsa that will lend themselves to carving. Don't let the idea of carving a fuselage from solid blocks scare you off. It is quite easy if you have a band saw and carving chisels. If not, it is still easy-it just takes longer.

Lay out the top profile on both blocks. Cut along this profile with the band saw. When this is done, lay out the side profile and cut this on the band saw. You now have two blocks that are beginning to resemble a fuselage. Tack-glue the two halves together. Be sure to use very little glue-as soon as the outside is carved to shape you will have to cut the two halves apart. After the glue has dried overnight you are ready to carve. Do not start until you have established the centerlines and template lines. Use hard cardboard for the templates. A file folder works find.

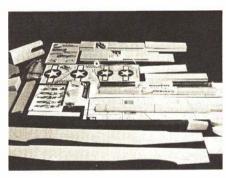
Start carving at the template lines first. Keep fitting the template in place until you get the correct profile. When you have all the template lines cut to shape, finish carving by removing the material between the template lines. By now it should be resembling the finished fuselage. Sand the two halves thoroughly before cutting them apart. When the two halves are separated, draw the area on each that is to be hollowed. Here again templates will help. Don't try to gouge out a big hunk of balsa to get the job done fast. Carve slowly and be very deliberate with each move, checking the depth with a template

If you study the inboard profile on the plans, you will see that the fuselage bottom can be hollowed out by layers. The first is one in. deep. The depth of the next layers depend upon their location. The area for the battery box, coil, condenser, and engine should be hollowed last. Be sure to leave enough balsa in the area of the rear wing hold-down hooks. While cutting out for the hardwood engine mount, be sure to get a good fit.

Set the bottom half aside and hollow the top half, being careful by using templates. When you have finished hollowing the top half, cut a 1/8" wide slot 1/8" deep for the rudder. Be sure to stay on the centerline that was established. The cutout for the wing and stabilizer may be made now. Be sure to fit the

new products check list

by FRANK PIERCE













Top Flite/P-51B Mustang. Stand-off scale kit designed by Dave Platt is so close to actual scale model that only a ruler can tell the difference, 60"-span plane has no tricky handling characteristics, flies like any RC sports model. Built-up construction of high quality pre-cut balsa, kit comes complete with nylon hardware, formed landing gear, canopy, etc. Full-length machine-cut fuselage sides, fully sheeted wings, finished ailerons, flaps add to ruggedness and accurate appearance. Detailed finishing and painting information provided. Approximate cost: \$40. Shown in the photo are new Olive Drab and Dove Grey Super MonoKote rolls which are authentic colors for the P-51. Available separately at \$1.35 per running foot. Top Flite Models, Inc., 2635 S. Wabash Ave., Chicago, III. 60616

Model Engineering/Cover Cutter. Professional quality tool for cutting nylon, Silkspan, MonoKote, etc. Balanced sharp stainless steel blade allows cutting and trimming in otherwise inaccessible places. Protective cap included. \$2. Model Engineering, 3655 Calumet Rd., Decatur, Ga. 30034

ting heads. Compact size means no storage problem. For additional data, write Dremel Mfg. Co., 4915 21st St., Racine, Wis. 53401 World Engines/Sky Knight sport RC. Designed to operate with compact full-house RC systems, ARF kit uses engines in the 30 to 40 class. Beautiful pre-finished fuselage, wings, tail, even pre-hinged rudder. Pilot-line Sky Knight is 42" long, has span of 51", wing

area of 650 sq. in. Can be carried "all-up" in

most car trunks. \$49.95. World Engines, Inc.,

8960 Rossash Ave., Cincinnati, Ohio 45236

power takeoff on motor which drives either

buffing wheel, sanding disk, grinding wheel,

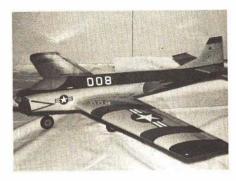
or flexible shaft with wide application of cut-

Kaiser Models/Wing-Mounts. "E-Z Wing-Mounts" consist of two birch blocks with spurred aluminum inserts which won't vibrate loose in flight. Inserts threaded to take 1/4" nylon wing bolts. 50 cents per pack of two. Kaiser Models, 1216 Juneau Drive, Billings, Mont. 59102

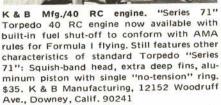
C & F Mfg./Scale racing drivers. Realistic scale drivers for 1/8-scale racing cars wear Bell "Star" helmets with clear visor. Head and shoulders with 4 x 4" equipment-cover base, 60 cents; head, arms, seat back, wheel, instrument panel with 5 x 6" base, \$1.29. Easily painted for extra realism. C & F Mfg. 617B Fashion Park St., Orange, Calif. 92666











Kavan/Unusual 61 engine. One of the highest performance engines on the market, Kavan 61 uses Schnuerle-type scavenging. Large fins provide cooling. For RC with rear-mounted carburetor. For additional information, write Franz Kavan, Lindenaststrasse 56, 85 Nuernberg, W. Germany



Guillow/Hawker Typhoon. Flying scale model of RAF attack aircraft of WW II. 18" span, ample wing area and dihedral make flights up to 100' possible. Special lightweight plastic cowlings and canopies make all planes in this series look more realistic without adding excess weight. All-balsa built-up construction, colorful insignia sheets. \$1.30. Paul K. Guillow, Inc., Wakefield, Mass 01880

Mini Flite/RC trainer. Unusual in appearance "Square Bear" is an ABS plastic ARF kit which is designed to operate on small fullhouse RC systems. Excellent handling characteristics for the beginner, plane can be converted from taildragger to trike gear by reversing the main gear and adding a nose gear. For 19 and 30 power. Available in December. Mini Flite Co., 48 Princeton St., Red Bank, N. J. 07701



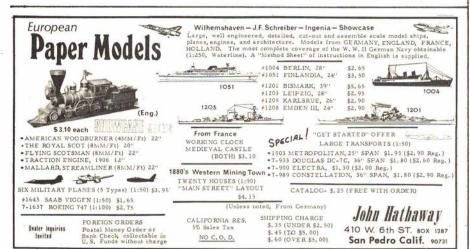
Fliteglas Models/Gladiator. 60-powered fiberglass fuselage, foam core wings, and design inspired by Navy strike aircraft make Gladiator an outstanding value at \$60. Kit contains fiberglass fuselage (16 oz.), foam wings with fiberglass tips, balsa, detailed plans. 68" span, wing area 730 sq. in., flying weight, about 7 lbs. Fliteglas Models, Box 98851, Des Moines, Wash. 98188

Tern Aero Co./Flying Model Series. "Gone Goose," rubber-powered for indoor/outdoor flying, span 17 in., \$1.50. "Starduster Sport-plane," inherently stable high-wing parasol with clean lines for sport flying, span 161/2 in., \$1.75. Both kits contain high-quality balsa strips and sheets, Jap tissue in two colors, 6-in. plastic propeller, plastic balloon wheels, Delrin self-lubricating plastic propeller, and 1/8-in. rubber for power. "Traveler Sailplane," \$1.50, is 24-in, graceful flying towliner. Balsa strips and sheets, Jap tissue in two colors, predetermined nose balance weight, hardwood tow hook, wing attachment dowel, plastic for cabin windows. Tern Aero Co., P.O. Box 66398, Chicago, III., 60666



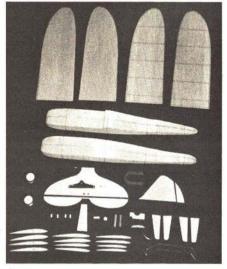
GIVE ... so more will live HEART FUND





wing cutout to the wing so it won't be too large. The top half should now be complete except for the engine cutout and cockpit.

Return to the bottom half and carefully drill four holes for the wing hold-down hooks and two holes for the landing gear. Cut out for the tail skid hardwood block. Now you have reached the point you would have been if you could have purchased a Fireball kit. If you have made it this far, it's all down hill from here.



This is about how the kit would have looked.

Glue the hardwood engine mount into place, making sure that you have inserted the engine hold-down bolts first. Now cut two 3/8" dowels 1 1/2" long, drill a 3/32" hole through both, and split them lengthways. Bend and insert the landing gear wires through the fuselage, insert the wire ends into the brass tube, apply glue to the dowels and slip them down into the fuselage around the landing gear wire, Install the tail skid wire and hardwood block. Insert the wing hold-down hooks using split dowels as you did with the landing gear. The hardwood bellcrank support can now be cemented in place. Glue four dress hooks in place to hold the stabilizer in position. Landing gear fairings can be added if desired. Use 3/16" sheet balsa. The addition of a canopy and rudder to the top half of the fuselage will essentiality complete this phase of construction.

Cut the stabilizer from 1/8" sheet balsa. Note that the front of the stabilizer is reinforced with a piece of 1/8-in. sq. spruce. The two elevator halves are glued to 1/8-in. sq. spruce, Add the 1/8-in sheet doubler to the bottom of the stabilizer. This will keep it in alignment with the fuselage. Drill two holes in the trailing edge of the stabilizer for two grommets. The rubber bands that hold the stabilizer in place will pass through these grommets. The addition of the elevator horn and cloth hinges will complete the stabilizer.

The rudder is cut from 1/8 in. sheet balsa. Sand to shape and cement to the fuselage top, being sure to offset the rudder to the right.

Note that the 1/16 in, wing skins are not identical—the top skins have more cord due to the airfoil shape. Cut out two top wing skins and two bottom skins. Mark rib locations on the bottom skins. Pin these to a flat board and glue the ribs in place. Block up the leading edge with scrap balsa. When they are dry, remove them from the building board and taper the edges with a sanding block. Apply glue to the rib tops and edges and set

if you want some fun ... then go out and get yourself one or more of these

And are they simple! Kits contain from 6 to 9 die-cut Balsa parts as well as the metal engine mounts, complete Control System (less lines and

KIT S-35 BEGINNERS THUNDERJET 2.95



KIT S-37 BEGINNERS EINDECKER 2.95



KIT S-36 BEGINNERS SUPER CUB 2.95



S-30 BEG. RINGMASTER 2.95



S-32 BEG. RING. BIPE. 3.50



IN CANADA

PRICES SUBJECT TO CHANGE WITHOUT NOTICE



S-34 BEG. SPITFIRE 2.95

Address



nifty little Control Line models.

handle), Landing Gear, Wheels, authentic Decals, etc., all ready to use, which makes assembly a cinch

Almost any .049 Engine can be used

that they're practically damage-free. By the way, Engines from most readyto-fly plastic models can be used, so if you have one, don't waste it. It might require a little modification

Plans are easy to read and complete.

all about 21" wing span; and all the tools you need are generally found around

They even have a run-down on beginners' first time flights.

There are six models at \$2.95 and one Bipe (double winger) at \$3.50,

... so get over to your dealer's

and take a look . . . at \$2.95, you'll find they're the MOST

> . . . for your fun . . . for your money.

IN ONLY MINUTES!

to install, tho.

the house.

S-31 BEG. MUSTANG 2.95

STERLING MODELS . BELFIELD AVE. and WISTER ST. . PHILA., PA. 19144 STERLING MODELS • BELFIELD AVE. and WISTER ST. • PMILA., PA. 19144

In odealer available, direct orders accepted—with 10% additional charge for handling and shipping. (60c minimum in U.S., \$1.25 minimum outside U.S.)

Catalog of entire line of airplane control line model kits, R/C scale and Trainer kits, boat model kits, accessories; etc. 25c 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 preflight, soloing, the control systems of Control Line and Carrier Flying." Including preflight, soloing, the control systems of Control Line and Carrier Flying." Including preflight, soloing, the control systems of Control Line and Carrier Flying." Including preflight, soloing, the control systems of Control Line and Carrier Flying." Including preflight, soloing, the control systems of Control Line and Carrier Flying." Including preflight, soloing, the control systems of Control Line and Carrier Flying." Including preflight, soloing, the control systems of Control Line and Carrier Flying." Including preflight, soloing, the control systems of Control Line and Carrier Flying." Including preflight, soloing, the control systems of Control Line and Carrier Flying." Including preflight, soloing, the control systems of Control Line and Carrier Flying." Including preflight, soloing, the control systems of Control Line and Carrier Flying." Including preflight, soloing, the control systems of Control Line and Carrier Flying." Including preflight, soloing, the control systems of Control Line and Carrier Flying." Including preflight, soloing, the control systems of Carrier Flying." Including preflight, soloing, the control systems of Carrier Flying." Including preflight, soloing, the control systems of Carrier Flying." Including preflight, soloing, the control systems of Carrier Flying.

	stunting,	Carrier	ruies	and	regulations,	Carrier	flying	hints	and	contr
	line insta	Illation i	instruct	ions.	25c enclosed					
N	ame									



KYOSHO R/C CARS

Reg. \$59.95 McLARREN
 PORSCHE · LOLA Complete Kit -(Less Engine & R/C Unit) **Special \$29.95**

Include \$5.00 postage for car. Any overage will be refunded.

HOBBY SUPPLIES

CHRISTMAS SPECIAL

Add \$1.00 per pair for postage. 3018 Jericho Turnpike East Northport, L.I. N.Y. 11731 Phone (516) 864-7166

the top wing skins in place. They can be held together with masking tape. When dry, sand each half to shape. Sand the center ribs to make the dihedral angle. Glue the two halves together. Wrap a three-in, wide piece of open-weave cloth around the center section

True to its age, the engine is an ignition O&R 23. Tiny gas tank gives very long flights.

and glue into place, working the glue through the cloth with your finger. Sand the entire wing again. Then add the lead-out guide to the bottom of the left wing.

Final Assembly

Add the ignition system, bellcrank, control horn, and pushrod. The wing is held into place with rubber bands as is the

stabilizer. The fuselage top can be held to the fuselage bottom with rubber bands or screws. The engine is set in place and the top fuselage cut to clear the engine cylinder and exhaust,

I have tried to show you how the Fireball was made. If you are a purist and want to build it the way we did thirty years ago, it must be made with cellulose glue and dope. After all, that's all we had back then. If you wish to improve the old model, then I would suggest using Titebond glue and epoxy,

If you decide to go modern all the way, you can use a good glow engine, commercial bellcrank and elevator horn. Because of the increased power produced by modern engines, it would be wise to consider gluing the two fuselage halves together making a one-piece airplane.

Some of you may remember the Fireball, but not as I have drawn the plans, This could be true, as after World War II a second version was kitted. The basic change was a lower profile fuselage top with a bubble canopy-the only change made, to the best of my knowledge.

Good luck with your Fireball and keep the antiques flying!

KARLSTRÖM DRAWINGS . **ACCESSORIES** • SUPPLIES • CO2 · PEANUT SCALE PLANS WHEELS • PIRELLI RUBBER MANY MORE! SEND A QUARTER FOR OUR CATALOG! W. C. HANNAN, GRAPHICS . BOX A ESCONDIDO . CALIFORNIA 92025

Blue Ribbon Review (continued from page 42)

required. Don't expect the Jerobees to handle the rough parking lots where larger model cars handle the bumps. If your racing surface is rough, add weight in the form of lead bars taped to the chassis. The bouncing will be reduced at total weight of about three lbs., but acceleration suffers.

Construction: The cars are indeed rugged. The body will not shatter under the impacts expected from an inexperienced beginning driver. The body mount is a clever hinging system-the hinge pin may exit from the molded hinge slot only when the body is lifted all the way forward. Hence, the body is easily removeable.

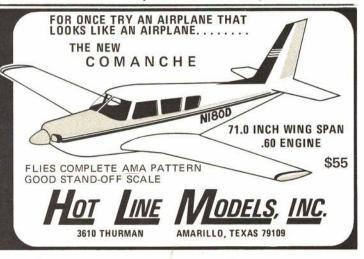
The roll bar was the only part that fell off the cars during testing, so don't pick up your car by the stock roll bar! Sooner or later it will drop. The antenna tube was not completely satisfactory. Be careful to secure the tube in the chassis every time you remove the body. A coat of valspar will protect the decals during normal usage. Note that for decorating the body, other than the supplied decals, MonoKote works well, as evidenced by the Jerobee McLaren model in the photos which was detailed with MonoKote.

The addition of a brake (as shown in the photos) is a worthwhile modification, for it makes the car easier to drive and is a valuable safety feature. In the near future Jerobee will be offering a similar brake as an accessory.

A right-handed owner should take special precaution when starting the motor because

why bother...

or invest your time, effort and money in anything less than the best. HLM kits are perfectly crafted of all balsa construction. The parts sawn and sanded — Unique wing jig - Ideal for retracts. Kit includes: clevises, formed landing gear, bell cranks, control horns, nose gear, bearing block, steering arm and other related accessories.



LEARN TO FLY!



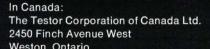






Testors designed their Silver Wind and Cosmic Wind trainers especially to make engine powered, U-control flying easy, fast and fun. Crash proof, virtually indestructible, rubber band assembly allows parts to separate on impact without breakage. They're the perfect planes for new pilots.

The Silver Wind and Cosmic Wind trainers are powered by the reliable Testors/McCoy .049 engine and each plane comes with the best step-by-step, illustrated flying manual around. See them at your hobby/model dealer. Then, go fly a Testors!

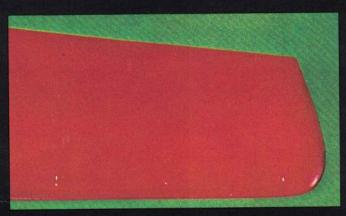




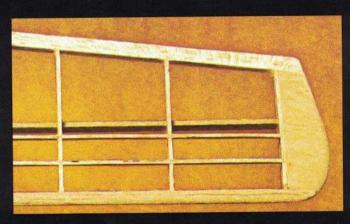
FROM START... TO FINISH... AND EVERYWHERE IN BETWEEN

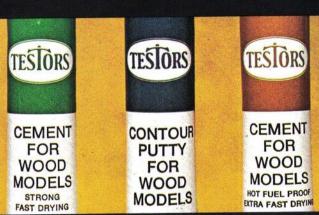












Whatever you do in model building, Testors helps you do it better. The Testors name means championship engines, trouble-free fuel, quality finishing materials and tough, quick drying cements.

It's been that way for over 40 years. Just ask your father, or his father, or ask your hobby/model dealer. He stands behind what Testors stands for.

In Canada: The Testor Corporation of Canada Ltd. 2450 Finch Avenue West Weston, Ontario



The Testor Corporation 620 Buckbee Street Rockford, Illinois 61101 U.S.A.

MARKII IC VERSION



TRANSISTORS

MAX

WORLD ENGINES DIGITAL

DI WILLIAM
Digit Migit Single Ch. Propo 69.00 Digit Migit 3 Channel Proportional with Nickel Cadmium batteries in the flight pak and 1 servo
Digit Migit 3 Channel with 2 servo Brick, dry Tx.—Rx Nickel Cadmium batteries pack and charger 139.98
Deluxe Migit 3 Channel with 2 servo Brick and 1 S-5 servo—12 volt Tx Nickel
Cadmium batteries—Rx pack and dual charger
Nickel Cadmium batteries— Rx pack and dual charger199.98 Pro Digit 4 Channel Proportional Nickel
Cadmium batteries in the flight pak, 2 servos
System Assembled Proportional 300.00 4 Ch. 4 servos 300.00 5 Ch. 4 servos 315.00 6 Ch. 4 servos 330.00
MK I Blue Max System Semi-Kit 4 Ch. 4 servos 215.00 5 Ch. 4 servos 230.00 6 Ch. 4 servos 245.00
MK I Blue Max System Full Kit 4 Ch. 4 servos 200.00 5 Ch. 4 servos 210.00 6 Ch. 4 servos 220.00
S-4 Servo mechanics Less amp, motor and pot. 30.00 S-4B Servo Assembled. 30.00 S-4B Servo Semi-Kit. 22.98 S-4B Servo Full-Kit. 18.98 S-4B Servo Semi-Kit
5-4B Servo Semi-Kit board only

OS R/C EQUIPMENT

OS 3 Ch. 2 servos, dry Tx Batteries	.149.98
Nickel Cadmium batteries in the Tx and Rx.	.310.00
Deluxe OS Diamond Series 4 Ch. 4 servos	330.00

SERVICE EXPERTS

The service experts listed in this advertisement are, for the most part, people who have been working with Digitrio and other kit systems in the various areas mentioned. They have all put together an M.A.N. System from a raw kit and have agreed to stock parts that are compatible with World Engines Systems. They have been given schematics of World Engines Systems and current OS Digital Proportional Systems. Many of these service experts service other makes of equipment other than our own. Consider these people for repair work or for help in matching up people for repair work or for help in matching up our flight packs.

WORLD ENGINES R/C RECOMMENDED SERVICE EXPERTS

NORTH EAST

CONNECTICUT

Ed Grening Jr. Rfd. 3 West Hill Rd. Winsted, Conn. 06098 Tel. 203-482-6422

MARYLAND

J. M. Lawrence, Jr. 8451 Glendale Rd. Greenbelt, Md. 20770 Repairs & modifications on all makes of Controlaire Equip.

NEW HAMPSHIRE

Dembros Hobbies Inc. 58 Lake St. Nashua, N.H. 03060 Low low prices on R/C equipment plus fast repair service.

NEW JERSEY

J. A. Deneke 526 Doremus Avenue Glen Rock, New Jersey

For same day service ship entire system with fully charged batteries.

RJL Control Systems P.O. Box 280 Denville, New Jersey 07834 Assembled MAN Systems with service and crash ins. policy. Write for details.

NEW YORK

Andy's Hobby 36 Main Street Elmsford, N.Y. 10523

Larry's Hobby Center 115-13 Jamaica, Ave. Richmond Hills, N. Y. 11418

Radio Electronic Model Shop 800 National Ave. Winchester, Va. 22601 Phone 703-667-1730 Complete sales and service Kits and equipment.

SOUTH EAST

FLORIDA

E. W. Bryant R/C Box 416 Punta Gorda, Fla. 33950 We service all types of R/C gear—also build radio kits to your spec's.

GEORGIA

Tom Huckaby 1615 Boulderwood Drive Atlanta, Georgia 30316

KENTUCKY

X-Cell Products 504 ½ Euclid Avenue Lexington, Ky. 40502

SOUTH CAROLINA

S & R Hobby Crafts

794 Piccadilly Drive Charleston, S.C. 29407 Phone 803-795-1559

142 Camelot Drive Camelot vill. Hanahan, S.C. 29405 Phone 803-553-4890

Charleston's only Digital Propo repair service at reasonable charges.

TENNESSEE

Aerotronics 109 Chatham Lane Oak Ridge, Tenn. 37830 R/C equipment—Service—repair—trade R/C problems? Free consultation and

advice for beginners or experts.

MIDWEST

ILLINOIS Stanton Hobby Shop 4734 Milwaukee Chicago, III. 60630

Walker's Hobby Shoppe 101 E. Main St. St. Charles, III. "Everything you need in Model Crafts". Kits, tools and raw materials. Experts in R/C.

Controlonics Karr Mfg. Div. Box 92 Thomasboro, III. 61878

MICHIGAN

Walt Glemser 6829 Shenandoah Ave. Allen Park, Michigan Phone 381-5708 Ist Class Comm. Licensee for Legal Transmitter Repair and Freq. Verification/System alignment.

J. H. Krauer 22626 Petersburg E. Detroit, Mich. 48021 Service on all brands of R/C equipment quickly, efficiently.

Lakeshore Electronics 5750 James Drive, Stevensville, Mich. 49127

Try us for FAST service by qualified engineers Phone area 6/6-429-9333

MINNESOTA Al Schwartz 2787 Fernwood St. Paul, Minn. 55113

MISSOURI C. W. Reed

5408 Woodson Road Raytown, Mo. 64133 Contact Charley for quote on Blue Max Systems Supertigre and O.S. Max Engines

OHIO

Country R/C 12450 Amity Rd. Brookville, O. 45309

4 mi. so. of Interstate 70 We repair most R / C equipment Gerald L. Peters. prop.

Town & Country Hobbyland 55 Country Road Columbus, O. 43213

Neal's Hobby & Sport Shop 4409 Mahoning Ave. Warren, Ohio 44483

OKLAHOMA

Tulsa R/C 1241 S. 105 E. Ave. Tulsa, Oklahoma PH 836-5425 R/C Equipment Sales—FAST Service—Mail or Direct

TEXAS

Flite Line Products 3207 34th St., Lubbock, Texas 79410

Wilson's Hobby Shop 2205 West Beauregard San Angelo, Texas 76901

*Custom built units by Eldon Wilson, All parts, stocked for MAN, Blue Max, Complete repair for all W.E. radios".

WEST

ARIZONA

R/C Engineering 6907 E. Monterey Way Scottsdale, Arizona 85251 Tel. 602-949-5700

CALIFORNIA

E & L Models 2216 Sunset Drive, Los Osos, Calif. 93401 You fly them & we'll fix them with the best R/C equipment G.E. Lyman Phone 528-1158

COLORADO

Hood Electronics & Hobbies 5310 Johnson St. 80002 Arvada, Colorado Sales Installation and repair of all makes of R/C Equipment. Phone 303-424-4045

ORFGON

Strictly R/C 11841 SW 23rd Avenue, Portland, Oregon 97219

FOREIGN

AUSTRALIA William D. Malcolm Berkley St. Forbes N.S.W. 2871 Australia

DENMARK

Silver Star Models Mollebakken 45 DK 9500 Hobro R/C and model airplane specialists. Largest selection of R/C articles in Scandinavia

ENGLAND

World Engines of England M. J. Wilshere 97 Tudor Avenue Watford, Herts

GERMANY

Heinrich Haferland. Hanover Herrenhausen Morgensteinweg 8A, Germany

JAPAN

Ogawa Model Mfg. Co., Ltd. 83 Hiranobaba Higashisumiyoshi Osaka, Japan

SOUTH AFRICA

Sean B. McCullagh 18 Avon Road Deep River Cape Town, South Africa



AT LAST.

A TWIN THAT'S EVERYTHING A TWIN IS SUPPOSED TO BE.



The Northfield-Ross Twin 60: Compact, Lightweight.

And – most important of all – so vibration-free that it cannot possibly cause radio failure.

It's the first twin-cylinder engine that actually performs the way a twin-cylinder engine should perform.

And it does because famed engine-designer Louis Ross has developed an entirely new design, and has joined forces with a company known for high-precision manufacturing, the Northfield Precision Instrument Corporation, to produce what Peter Chinn in *Model Airplane News* called a "fascinating piece of work."

All the fascinating details are contained in a new brochure we'll be happy to send you absolutely free.

Just write to Northfield Precision Instrument Corp., 4400 Austin Blvd., Island Park, N.Y. 11558.



of the pull-chord starter. It is easy to cut your finger holding the pull-chord knob since the adjacent castings have sharp edges. (This is being corrected, we are told.)

Driving Impressions: The transmitter fits nicely in the left hand and is comfortable. The trim lever for steering is in the center of the wheel and is easy to adjust even while driving. Mechanical action of the steering wheel is smooth. The car is surprisingly fast and will tax the skill of any driver without being too sensitive for the novice. The transmitter layout helps in the learning process.

The Jerobee product uses a license-free under-100-milliwatt transmitter. The operating range is less than we have with the 1/8 scale cars equipped with high-powered radios. Because the 1/12 scale car is smaller, one can't actually see the model at a distance further than 200 ft. and therefore effectively drive it. The range suits the scale.

In order to avoid driving out of range, it is advisable to establish the range limit for your Jerobee car and mark your regular driving site to keep within this distance. If this is done, the Jerobee radio is quite suitable for use in a 1/8 scale car—the servos are certainly powerful enough.

To compensate for this limited range is the fact that a smaller car can do much more racing in a confined area than a larger car. A 1/12 scale car with a high-powered radio driven on a track for 1/8 scale cars looks awfully small at the far corners. Sweeney's prototype looked silly racing beside the 1/8 cars and could be driven flat-out all the time because corners for the 1/12 model seemed large; for the 1/8 models they were tight.

The Jerobee models have been well-accepted around Washington, D.C. When you find another Jerobee car driver, get a club started. Don't try to horn in on the 1/8 scale modelers. Remember, you don't need their huge parking lots and the 049 is much quieter. In fact, your Jerobee cars could be driven in a large indoor site if you can find one. Next year Jerobee will begin introducing some accessories. Look for racing tires, brakes, new bodies, hop-up parts for the engine, heat sinks for the cylinder head so it

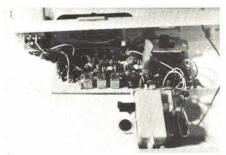
can handle high-nitro fuels, etc. A hopped-up Jerobee is frighteningly fast.

Plans are developing for an association for RC car racing—by either associating with ROAR (Radio Operated Racing Association) or by forming a separate association for these smaller models with the low-powered radios,

In all probability, the hobby market aspect of 1/12 scale cars will develop following wide use of the Jerobee product. The Jerobee radio will certainly find other uses too.

We don't know if it will fly a plane; we doubt it. However, it could guide a small boat. Perhaps a license-required version of the transmitter could be used in a plane. All this is for the future. Kids who have started in RC with a Jerobee car will probably become hobbyists—the car is too unique and challenging for just casual take-it-or-leave-it use.

Meanwhile, for the toy market here is an exceptional value at \$109.95. It should develop new hobbyists and modelers and afford much enjoyment.



One PC board handles all components of the receiver/servo unit. Servo mechanics are from E.K.'s multi-digital systems, tiny and durable.



Transmitter, like receiver unit, is compact and mass-producible. Simple circuits and low component count.



Homemade brake is stiff brass pivoting on screw beside pull-starter and bearing on clutch, Note link to servo.



		Coverite	Silk
1.	Can be ironed on	Yes	No
2.	Can be finished to any color	Yes	Yes
3.	Time to cover 60" wing	29 minutes	65.3 minutes
4.	Price per yard unfinished	\$2.95	\$1.50 to \$2.25
5.	Weight per yard unfinished	1.2 ounces	½ to 1 ounce
6.	Unfinished appearance	Semi-gloss, non-porous	Dull, porous
7.	Finishing coats needed	3 to 4	10 to 15
8.	Price per yard to finish	\$0.85 to \$1.25	\$2.50 to \$3.75
_	Effect on structural strength of model	Great	Slight
10.	Receives decals—all types	Yes	Yes
	Type of covering	Woven Dacron fabric	Woven Silk fabric

The magic of DuPont Dacron brings you the most authentic model airplane covering in the world

The magic of Duront Dacton b	ings you the most authorite model unplane covering in the most
Available at your dealer's or clip	and mail to Coverite, 119 York Rd., Jenkintown, Pa. 19046
Please rush me the following Super Coverite @ \$2.95/pak.	Here is my favorite dealer's name so Coverite can credit his accoun
paks of redpaks of whitepaks of yellow	My NameAddress
paks of blue paks of orange	City



lindco IS DIFFERENT

Why? Unlike many mail order dealers, lindco actually stocks every one of the more than 400 airplane kits, engines, and accessories shown in our brochure. lindco doesn't take your money and then go out and try to buy what you ordered while you wait. If lindco is out of stock, your money is on its way back to you immediately. In-stock items are shipped within 12 hours.

FREE DISCOUNT CATALOG lindco

BOX 543, SOQUEL, CA. 95073

Brooklyn Dodger

(continued from page 17)

accepted as not quite enough for good performance. The Forrestor 29 was the one most accepted; for sport flying either of these plus many others will work well. I have been using the Vivell 35 because they are quite common and easy starting. In fact, there should be quite a few new or near-new available. Precaution should be taken if you are venturing into the ignition engine field for the first time. There are a lot of good engines available and good guys who will help you. However, beware of what is known as the horse trader. Parts are around for most engines, but be on guard against the engine without points.

When planning your engine mounting, 29's-and-under perform well with a little left thrust. The 35 needed about five degrees left, The fuel usually used by most old-timers is three parts white (unleaded asoline to one part SAE 70 lubrication oil (available at motorcycle repair shops). For new engines castor oil can be added for better lubrication. and to preserve the engine a little better. Either can be added at contests for easier starting and a few more rpm's. Modern fuels will ruin your engine unless it has been converted to "glow." Should you desire to put in a glow-type engine, a standard 15 will be more than enough and a hot 09 will do a good job.

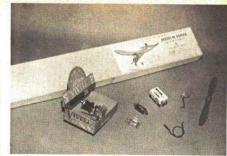
The competitive builder, picking his wood, can keep the weight to about 26 to 27 oz. The Vivell version shown came out at 30 oz. The weight of a glow version will be much less and every effort should be made to keep the back portion of the plane as light as possible. A lot of things make a plane fly and a light plane can make some poor designs fly; however, nothing can make a heavy plane fly well. As a very general rule the following helps as a starter: short motor run (10-15 sec.) glowtype free flight should be seven oz. per sq. ft. of wing area or less (for this model it would mean a total weight of 23 oz. or less; the 20 to 25 sec. motor run for ignition-type engine should be 8 oz. per sq. ft. or less (or 27.5 oz. or less); in the case of the "C" version, which means a heavier engine, nine oz. per sq. ft. or less (or 29.75 oz. or less).

There are many lighter planes per square foot of wing area that are floaters and there are glider types that are heavier per square foot, designed for penetration. These are only meant to be guidelines to start with, and will produce respected planes that can be competitive and the top performing sport type. One thing most everyone agrees on is that sandpaper helps the plane fly better! So shape and sand all parts as shown on plans.

Construction

A good flat working area (approximately 30 x 45") with a Celotex or similar top, pins, a few rubber bands to use as clamps, X-acto saw, some sharp blades and you are ready to go. Your plans can be protected by a waxed paper covering. Use whatever glue is your favorite. I used Ambroid because it would be more compatible with Silkspan and dope. Water-base glues are good also, especially if you plan to MonoKote.

Cutting out all parts accurately is well worth the extra time spent. Parts that don't fit look badly, are structurally weak and waste time trying to make do. I like to cut a little at a time, mostly while the glued parts



Dodger was a Sal Taibi design whose recommended engine was an ignition 35. A 19 would be a glow equivalent.

are drying, so I don't get tired of cutting and become careless.

This is a fun design, Crutch-type construction is one of the quickest, but demands that you start right. The key is to build the crutch first, being very exact. When thoroughly dry, all formers can be added, making sure they are perpendicular (90 degrees) to the crutch. The top and bottom longerons can now be added. Recheck alignment again and put in stringers, cabin top and engine mountings. The cowling can be made from a solid block or built up as desired. Follow the plans for dowel placements and landing gear. The timer, battery coil and condenser areas used are shown. These were established after the model was complete to prevent adding any weight to the nose or tail. There is plenty of room to shift weight around, so I would suggest the same for you. The only modern changes made to the fuselage were wrapping the coil and batteries in foam instead of anchoring solid, and adding the DT fuse tube.

The undercambered wing is of standard construction and aerodynamically the same as the original. I used and recommend using spruce spars. I also used larger gussets and placed them flush with the top of the rib—to strengthen and minimize warps, and particularly to help stop the common downward warping of the trailing edge that is hard to prevent on undercambered wings. The angular-type reinforcement at the dihedral and polyhedral joints is something I have been doing for many years and I do not understand why more do not use it. Spar bracing helps—adds tremendous strength, because of compound bracing, and holds down warping.

The sequence I used for building is as follows. First layout leading, trailing and tip edges, then glue in ribs. When dry, glue in bottom spars using shims or wedges to hold in place (made out of scrap), then add riblets and top spars. Add bracing and dihedral and be a little modern by taping and epoxying the joints. Sheet in center for strength when hold-down rubber bands are attached.

Stab and rudder are as shown on plan. The only precaution I use in elliptical-type construction is making sure all joints match and are well-glued (one of the best safeguards against warp). Spars should be shaped ahead of time to give good sanding guide. Ribs are better oversized, as it is easier to sand off than add on. The plan shows 3/8" sheet used for leading edges—later kits used ½" (the latter preferred by Sal Taibi).

After each unit is completed, they are joined as shown. The gap or angle allowed for the DT is 45 degrees. This is more than enough, (usually 42 or 43 degrees is optimum), but allows for a few degrees of up elevator trim if needed. A stop anchor has



KWIK-FLI III . . . World and twice Nats. winner. Designed by Phil Kraft. Span: 60" Eng.: 45 to 61 Kit RC-12 Includes T.A.C.—Ready made wing fixture



S.E.5.a Never before has a R/C scale model been designed with such attention to the most insignificant detail. Wing Span: 52'' Eng.: .45 to .60 Kit RC-13 \$45.00



THE CONTENDER—The first all-balsa R/C model you can build in just 8 hrs, Wing Span: 54" Eng.: .29 to .60. Kit RC-15 \$34.95



R/C NOBLER—Radio version of the winningest stunt model of all time. Wing Span: 51" Eng.: .35 to .45. Kit RC-14 \$29.95

WINNER OF THE 1962 NATIONALS

. Span-70" Eng .- . 45 Kit RC-7 TAURUS . TAURUS WING KIT-RC 7-W 13.95

TAURI . . . NOW includes ailerons & fittings. Multi channel trainer, Span-57" Eng.-.15-.45 Kit RC-4 23.95

SINGLE CHANNEL R/C COMPACTS



HEADMASTER . . . Galloping ghost and proportional gear.
Includes T.A.C.—Ready made fuselage. Span: 48" 14.95 Eng.: .09-.35 Kit RC-11

TOP DAWG . . . Galloping ghost and proportional gear. Includes T.A.C.—Ready made fuselage, Span: 39.5"
12.95

SCHOOLMASTER... Single or multi channel with rudder, elevator and engine control.
Span-39" Eng.-.049-.090 Kit RC-8
8.95 SCHOOLGIRL . . . Span 32" Eng.: .020-.049 Kit RC-9 7.95

Schoolboy . . . Span-29" Eng.-.010-.020 Kit RC-3 4.95 ROARING 20 . . . Span-191/4" Eng.-.010-.020 Kit RC-5 4.50

CESSNA Span-30" Eng.-.020-.024 Kit RC-6 5.50 RASCAL Span-27" Eng.-.010-.020 Kit RC-2 4.50 TOP FLITE

FLYING MODELS

for those who insist on the

SCALE MODELS

PREFORMED FUSELAGE SHELLS FOR FAST STURDY



9.95 Span-28" Eng.-. 15-. 29 Kit S-1

P-47 THUNDERBOLT Span-27" Eng.-.15-.29 Kit S-2



9.95

MUSTANG P-51 . . . A standoff scale model that only a ruler can tell from a true scale plane. Wing Span: 60" Eng.: .40 to .60. Kit RC-16 \$39,95 \$39.95

SEMI SCALE STUNTERS



HAWKER HURRICANE Span-42" Eng.: .19-.35 Kit S-51 7.95



CURTISS P-40 TIGER SHARK 7.95 Span 42" Eng.: .19-,35 Kit S-50

/2A FORM-FLITES (SCALE U/C)



If not available at your dealer . . . order direct. Add 10% postage and handling. (35¢ minimum.) Outside U.S. 15% (60¢ minimum.)

CONTROL LINE • STUNT PLANES



REPEATED NATIONALS AND WORLD CHAMP. NOBLER . . . Winningest plane of all time. Span-50" Eng.-.19-.35 Kit N-1 14.95



PEACEMAKER . . . Superform for fast construction, exceptionally durable. Span-46" Eng.-.15-.29 Kit N-7 9.95 9.95

FAMOUS FLITE STREAK FAMILY



CONTROL LINE COMBAT MODELS



COMBAT CATS Two complete models in one box.
Span-39½" Eng.-.19-.35 Kit N-8 7.95
(2-models)

COMBAT KITTENS -221/4" Eng.-Kit N-9 4.95 (2-models)

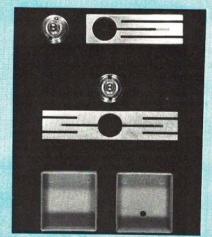
, INC.

2635 S. WABASH CHICAGO 16, ILL



NEW KRD ITEMS

Last month we introduced the KRD Aluminum T Motor Mounts and the Heat Sink and Exhaust Pipes for a Veco .19. This month we are introducing some other new KRD items which should prove of real interest to the modeler.



UNIVERSAL HEAT SINK & PLUG

Designed for the Cox series of engines, this package contains the High performance head and a Heat Sink for items like the Sea Bee Boat, and other applications where not enough air gets to the engine while running. Helps keep fuel cool and from boiling. Also saves your engine by avoiding overheating. The Universal Heat Sink must be used with the specially machined plug (included). Plug is also available separately as a replacement item.

No. 16L138—KRD Universal Heat Sink \$3.75 and Modified Hot Plug

JEROBEE HEAT SINK & PLUG

This heat sink is used as a heat dissipator and is designed to fit the Jerobee series of cars. It has a modified Cox glow plug which will fit all of the Cox series of engines, and so if the dimensions are applicable it may be used in other applications beside the Jerobee. The KRD Heat Sink and Dissipator will really take care of excess heat where there is an insufficient flow of air, and keep your fuel from getting hot and bubbling. Measures 3½" long by 3/4" wide by 1/4" thick. Center mount. From these dimensions you can tell if you can use it in your application. It is designed specifically for the Jerobee cars. but there may be other uses that you can fit it into. Will work only with the specially modified glow plug which is included in the combo package. The glow plug is of the high performance type.

No. 16L136—KRD Jerobee Heat Dissipator/Modified Hot Plug

KRD BATTERY CASES AND PACKS

This battery case is especially designed to hold four of the new Gould Nicad 225 SCL type batteries. This cylindrical battery measures .650" in diameter, and is .660" tall. As used in this case, it makes a flat pack. The outside dimensions of the flat pack are $1.7/16 \times 1.1/2 \times 13/16$ ". Weight of bare case without batteries is 8 grams. Offered in three versions.

No. 38K50—KRD Battery Case for 4 \$1.00 225 SCL cells. No. 38K51—KRD 4.8 volt center tapped 13.00

No. 38K51—KRD 4.8 volt center tapped 13.00 battery pack less plug, weight

less than 2 oz.
No. 38K52—KRD Battery Pack, as above 15.00 but with EK plug.



Dear Friend:

R/C Modelers have been having a ball with our Mini Foam Wings-designing and scratch building their own ships.

One is shown above. This is Romey Bukolt's Bipe-patterned after an EAA plane. Uses two of our taper wing and an unusually easy cabane structure. It is being completely wrung out with both 2 and 3 channel rigs. Romey wants it to be "just so." Knowing Romey as we do, it will be that way too. We'll keep you pasted.

"just so." Knowing Romey as we do, it will be that way, too. We'll keep you posted.
Our Skampy plans, which use a taper wing for an .020 Goodyear type racer, having been enjoying a boom. This Kampen design is unlike many planes of this type-transition from flight to glide must be seen to be believed.
We're making a special offer right in this

We're making a special offer right in this column. Order our catalog No. 13L266 for \$2.95-and we'll send you a set of taper foam wings AND a free set of Skampy plans. Offer is limited.

Fred Reese has come up with a Sopwith Triplane, using three of our constant wings, Normally, you'd expect a Triplane to be hard to build, but Fred has some ideas to really simplify it. Scheduled for publication in early 1972 in RCM.

Comments are pouring in on our Ace High kits; its general appearance and go-togetherability; plus its extremely good flying characteristics. Very heartwarming.

In 1971 we introduced three Mini Foam Wing kits. Our plans for 1972 include several more of the same high caliber. Just keep watching our ads for announcements on them. We won't advertise prematurely! We are also going to make more Rudder Only PLANS available-built up jobs as well as foam wing ships.

built up jobs, as well as foam wing ships.
With 1972 just around the corner, we'd like
to express to you our deepest appreciation for
making this past year a great one for Ace. We

will try to continue to merit your approval.

Several great new items to be announced soon! Stay on our frequency!



Canadian Commander Manufacturer

All Canadian customers for the Commander. R/O Pak should contact H & W Enterprises at Box 972, Regina, Sask., Canada.

JEROBEE CARS LESS RADIO

JEROBEE offers their famous chassis, with choice of either of two bodies, for the thrill of 1/12 scale racing. This scale does not require so much room; yet is large enough to allow you to use almost any two channel brick, or two servos of almost any digital system for control.

Don't let the low price fool you-this is quality all the way through: High-impact strength injection-molded frame...Independent front suspension...Ackerman steering...Heavy duty rear axle...Centrifugal clutch...Realistic MAG type wheels...Cycloac high-strength body. COMPLETE WITH COX .049 engine with

recoil starter, installed and ready to run-except for radio and finish decals.

Two models--the Comando and Bandero. Completely assembled--these represent a real break through in scale autos.

No. 39L4—Jerobee Comando, less radio \$34.95 No. 39L5—Jerobee Bandero, less radio \$34.95



ACE HIGH SAILPLANE KIT

Kampen Designed--For Rudder Only Pulse

The Ace High kit features a matched set of foam wings. The constant chord section forms the cutter, and the taper section forms the outer panels for a graceful, easy to build, strong but flexible, high aspect ratio, wing. This method of construction overcomes the biggest single stumbling block for the beginner to the fine art of soaring. The polyhedral span is 70".

Fuselage and tail assembly is straight forward construction. Balsa and plywood is precision band sawed, and dimension sanded of the

highest quality wood available.

Parts for power pod are included (Cox Babe Bee .049 recommended). Those living in the soaring areas of the country can leave off the power pod and locate hooks for high start or tow line launch.

The kit also contains step by step assembly details, matched foam wing sections, hinge material, torque rod and link parts, nylon tubing, and installation hardware for Rudder-Only Pulse Commander. (Standard Commander 10G16 recommended).

Extensively test flown for well over two years.

No. 13L104-Ace High Sailplane Kit \$14.75



DICK'S DREAM PLANE KIT For the Beginner or Expert! (Designed especially for pulse)

This kit of the Dick's Dream, designed by Owen Kampen, has been extensively test flown in various parts of the country. It has several innovations which are for the small breed of airplane specifically, and with the foam wing the beginner is assured of overcoming a big drawback to success. Features crutch type fuselage construction to assure line-up and accuracy.

Full step by step instructions to assist in building this gem of a kit, AND ultra simple installation shown for the Commander R/O Baby or Baby Twin!

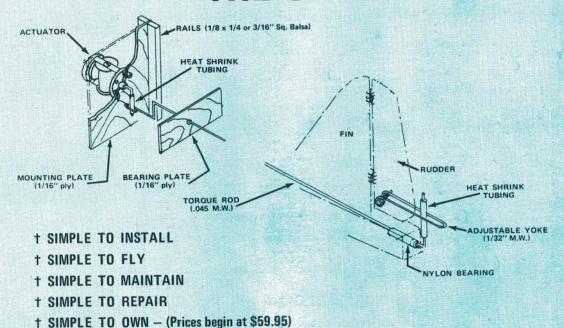
Span is 34" (cut from the Ace taper wing foam sections), 5½" chord, length is 25 inches. Weight with R/C gear is 12 to 14 ounces. With a Pee Wee .020 and a Commander R/O

With a Pee Wee .020 and a Commander R/O
Baby you have a docile performer and excellent
trainer. If you want something hot, Tee Dee
.020 with the Commander R/O Baby Twin will
do the job--it'll do everything in the Rudder
Only book!

No. 13L100—Dick's Dream Foam Wing \$5.95
Airplane Kit

-JUST FOR FUN!-

THE SIMPLE SYSTEM --



PULSE PROPORTIONAL .. Best Choice for You!

RUDDER ONLY PULSE IS:

- * FULLY PROPORTIONAL
- * LIGHTEST WEIGHT--2.5 oz. for the Baby w/225 ma nicads.
- * LOWEST COST--begin at \$59.95! (less batteries and charger).
- * SIMPLEST--only one moving part, easily serviced and maintained; noise free.
- * VERSATILE--Arrange to suit your particular installation. You can go up or down in size without obsoleting your receiver or transmitter. Simple changes of battery packs and actuators allow change at will. Or add Motor Control to Standard or Stomper--using same battery pack.
- * GREAT for Beginners--FUN for Experts.

ALL UNITS ARE COMPLETELY WIRED, TESTED, GUARANTEED



COMMANDER R/O PULSE COMBOS With Airborne Nicads & Charger

Our Commander R/O Pulse Combos are available in 4 sizes for most sporting needs from the smallest to the larger aircraft-or boats.

The Baby is for .010 to .020 jobs. Has two 225 ma Nickel Cadmiums and the regular Baby Adams. Airborne weight is 2,5 oz.

The Baby Twin is for hot .010 to .020 jobs. As above, except uses Baby Twin actuator. Airborne weight is 2.9 ounces.

The Standard uses the Single Adams for more power for .049 to .07 size. Uses larger capacity nickel cads. Airborne weight is 4.5 oz. The Stomper uses the Twin Adams actuator for up to .15. Airborne weight is 4.9 oz.

No. 10G15—R/O Baby Combo
No. 10G15T—R/O Twin Baby Combo
No. 10G16—R/O Standard Combo
No. 10G17—R/O Stomper Combo
26.995, 27.045, 27.095, 27.145, 27.195 mHz
Specify frequency desired

9 V. Transmitter Battery Extra

SEE YOUR DEALER FIRST! If he can't supply you, order direct from the factory. Quick Service. Minimum order \$3.00. Remit by Money Order, bank draft or check.

BEST SELLER

We're on the THIRD Printing of our 1971 Handbook Catalog! The demand exceeded expectations. One of the reasons is that it contains the most comprehensive information and data for Pulse Rudder Only published anywhere. Send coupon and \$1.00 today. Refundable on your first order.

Don Dewey says: "This should be in the library of every modeller!" Walt Schroder says: "An exceptionally well done job."

NEW	HAN	0800	K-CAT	ALOG
10	amala	talu C	lawiend)	

Our NEW Handbook-Catalog has been completely revised to make it easier to focate items you are looking for. More items on less pages, to save you time.
Also contains complete info on what makes Pu'se Rudder Only work-and why

it is your best bet.
Price is just \$1.00 via THIRD CLASS
MAIL. Refundable on your first order of
over \$5.00.

ACE RADIO CONTROL, INC * BOX 301 * HIGGINSVILLE, MO. 64037

CITY		STATE	ZIP	ZIP	
QUANTITY	STOCK #	NAME OF ITEM	PRICE	TOTAL	
				200	

SUDDEN SERVICE PLANS

Full-Size Plans — Shipped First Class Mail Within 48 Hours — No Extra Charge

No. 0894, Voltswagon — Trainer and stunter by Marsh for electric tether flying with slot-car motors. Plans for the pylon included. Great club activity. \$1.50

No. 0794. Skimmer Airboat — Sledtype fun watercraft by Paul Hook. .09 engine, R/C rudder, throttle. \$2

No. 0991, Flashby ! — Rakish-looking all-balsa ROG by Wayne Brown. For the Tenderfoot. Tricycle gear. \$1

No. 0992, Fouga Cyclone — Scale model of jet-assisted French saliplane, by Nick Ziroll. Gains altitude easily on 09 engine. A two-piece 7-ft. wing. For R/C. \$3.50

No. 0993, La Joilita — Profile 15powered Goodyear C/L racer by James Kloth, fast, groovy. On mild fuel and engine does 85 mph. \$1.25

No. 0892, Taylor Cub F-2 — Sport, F/F, scale, .020. Stick-and-tissue. By Schreyer. \$1.75

No. 0893, Martin MO-1—Rare WW-1 era monoplane, carrier fighter ideal for Class 1 Carrier. Allerons keep lines tight at low speed. By Reeves. \$\$1.50

No. 1181, Junkers D-1 — Joe Tschirgi 1918 fighter, proportions for perfect R/C scale. .45 engine. Low-wing has 500 sq. in. \$2.50

No. 0191, Curtiss-Wright Jr. — Robert Hawkins transformed open-cockpit pusher of thirties for single channel. First step into RC scale. Span 44". Use .049. \$2.50

No. 0192, Skyraider — Mottin's Navy Carrier, fast, light, .40's or .60's. Easy construction. \$2.50

No. 0193, Cutie Coupe — Coupe d' Hiver F/F by Dave Linstrum. Quick to build with all-sheet surfaces. Your first rubber contest model. \$1.75

No. 0291, R/C Nobler — Ed Sweeney's conversion of famous C/L stunt ship. A highly maneuverable R/C. Only .40 for all AMA/FAI stunts. \$2.50

No. 0491, Emeraude — Duke Crow reduced famous home-built to R/C size (65"). 40 to .60, does stunt pattern. Gentle. Two sheets. \$3.75

No. 0591, Small Fry Special — Mottin's C/L trainer for Tenderfoot. Easy to build. An .049. \$.75

No. 0592, Messerschmitt Bf. 109E — R/C, semi-scale by Munninghoff. Mean look of efficient fighter. Two sheets. \$3.75

No. 0593, Manta — Howard Kuhn's Boost Glider for model rockets easy to build from sheet. A winner. \$.75

No. 0691, Jr. Sky Squire — R/C sporttrainer by Jess Krieser, .09 to .19. From Galloping Ghost to multi-digital proportional. Span 48" (416 sq. in.), 3 lbs. \$2.50

No. 0692, ½A Sky Squire — Small version famous Sky Squire. 1 ch. rudder-only, or rudder, elevator and motor on Galloping Ghost. Only 22-28 oz. \$2

No. 0693, Mustang — Rabe's great near-scale C/L stunt. Files pattern with ease. ST 40. Over 57". \$2 No. 0792, Rivets — Speedy, responsive R/C. Owen Kampen design for .020. Adams Baby Actuator, rudderonly. \$1.75

No. 1183, Corrigan — James Wilson's unique ½A C/L stunt model. Flies tail first! Stable like big stunt ships. Easy to build, 23". \$1.75

No. A693, Sweeper — Windy Urtnowsky's glant, C/L stunter, 78" span. .60 up front. Many trim adjustment features. \$2.75

No. A695, Lady Maxley—Brian Donn's A/2 Nordic towline. Davis 3 foil. Ritz construction. \$1.50

No. A697. Dwarf Dip III — Easy to fly, rubber Coupe de Hiver by Charles Sotich, a winner! For small fields. Warp-resistant. \$1.50

No. A691, E A A Biplane — Nick Ziroli's scale R/C uses .40 engine, full house gear. 38" wings, semi-symmetrical foll, box-and-stringer fuselage. Two sheets. \$2.50

No. A692, Miracle Worker — John Blum's C/L trainer, Combat, carrier, stunt. Easy-to-build profile. .35 engine. \$1.50

No. 1291, Demon Delta — Fast, mild-stunting C/L for 35-45. Looks like modern fighter. Attract attention for demonstrations. By Jerry Farr. \$2.50

No. 1292, Dolphin II — Czechoslovakian R/C for pusher, 09-15 mounted at rear under T-tail. Rudder/motor, good slope soarer. \$1.75

No. 1293, A/Wonder — Simple allbalsa A-1 towliner by Bob Stalick. Ideal for beginners at towline events. \$1.50

No. 0201, Cardboard Cutie — Inexpensive all cardboard C/L for Tenderfoot. 049. Two sheets, \$1.25

No. 0202, Push-Air — For Brown's tiny CO2 engine. Simple F/F by Ehling, like Curtiss-Wright Jr. \$.75

No. 0203, Ole Tiger — Bob Morse's swift Formula I R/C of Bob Downey's famous racer. K&B 40. \$3.50

No. 0204, Classical Gas — Haught's C/L stunt for 35, for flyers graduating from profiles. \$2

No. 0205, Kestrel — Dave Boddington's delightful R/C rudder-only soarer with 02. \$1.50

No. 0302, Bearcat — Al Rabe's stunt C/L was talk of the 1966 Nats. Aldrich customized ST 46. \$2.00

No. 0301, 1916 B&W — Biplane on floats was Boeing's first airplane. Beautiful R/C job by Francis Reynolds, uses a 60 Two sheets. \$4.50

No. 0304, M. K. Sportster — Ho Fang-Chiun's cute cabin free-flight takes 049 power. \$1.25

No. 0401. D-H 88 Comet — Scale twin by Skip Williams from Jan. '69 centerspread for .20's. Fast, stable, can fly pylon rules. \$3.75

No. 0402, Lively Lady—World Championships winning Nordic by Elton Drew. Well detailed plan. All weather flyer. \$3.75

No. 0404, Sweapea — C/L Goodyear by Williamson for club project also is

tough trainer. For 35 engine. Balsa cutting guide incl. \$2.50

No. 0502, Mod Pod — All - purpose model, F/F, R/C, or tether — glider or power. Fiberglass pod, arrow-shaft boom. \$1.75

No. 0503, Royal Marine — By Yuji Oki of Japan, magnificent seaplane with 6' wing. Two 40's or one 60. Graceful lines, smooth flyer, handles easily on water. Two huge plan sheets, every part shown in detail. \$8.00

No. 0601, Flower Power — Sport/ stunt full-house RC with a 40 engine. All-balsa, simplified structure. Plugs generation gap. \$2.50

No. 0602, 8 kyralder — Profile or built-up fuselage shape Navy Carrier job for 35-60 engine. A winner or a trainer all-in-one. \$2.00

No. 0603, Waco — Delightful bi-plane, stick and tissue, rudder-only RC on 09 to 020 for FF. Very well detailed plan. \$2.50

No. 0701, Suds — Nimble RC for sport or competition. One-piece construction, 40 to 60 engines. Build fast from standard balsa sizes. By Joe Dolan. \$4.25

No. 0702, Contender — Military-like RC, also Sport/Stunt type for 35-60. Tri-gear, removable no-dihedral wing. Fast building. By Dave Platt. \$4.25 Special Offer: Get both Suds and Contender plans for only \$7.00

No. 0703, Ironsides — Record-holding CL jet speed model. Metal or wood model shown. Uses Dyna-Jet. By Jerry Thomas. Two plan sheets. \$1.25

No. 0704, Cessna AW — Delightful stick and tissue FF of great private plane of years ago. Indoor or outdoor version possible. Peanut Scale too. \$1.50

No. 0801, Winnie Mae — Spectacular RC Vega for strong 60 engine in 2"-1' scale, foam and balsa, lots of details. By Monty Groves. Two big sheets. \$4.50

Also, special 1½"-1' version for FAI scale, 40 thru 60's. Two sheets. Order as No. 0802. \$4.25

No. 0803, Thermal Dart — Enlarged and improved rubber-powered beginner's delight by Frank Ehling. \$1.00

No. 0804, BV-141 B — Asymmetrical WW II fighter bomber in profile for 049 engine by Terry Aldrich. Easy to make, good fiyer. \$2.00

No. 0901, Sorcers — Pee Wee 02powered, free-flight flying saucer uses sheet wing, easy to make by Tenderfoot builder. \$1.00

No. 0902, Cloud 9 — Intricate contest winning Wakefield by Roger Gregory. Plan shows streamlined prop/hub design, \$3.50

No. 0904, Antoinette — Signorino/ Zundel RC. 98" wing, nearly scale, flies well on .36, like powered gilder. Plans 3 huge detailed sheets. \$9.00

No. 0905, Mini Cat—Bud Atkinson scaled down the Cat series, for pulse or light digital and up to 19 engines. Easy to make RC sport flyer, \$2.75

No. 1001, Phantom — Well-engineered RC Dyna-Jet-powered scale fighter by Ralph Saldivar is practical but noisy model. Highly detailed plane. Jet installation shown, \$4.00

No. 1002, Hobbit — Simplified Nordic Al by Bob Stalick is steady on tow, all-weather fiyer. \$1.50

No. 1003, Charger — ½A powered sweptwing stunter does full pattern on long lines safely. \$2.00

No. 1101. Autogiro—Simple 049-powered model builds fast and gives unique performance. Pusher prop or motor. \$1.25 No. 1102. Aerobile—Large scale CL or RC of a famous Waterman roadable.

RC of a famous Waterman roadable plane. Uses 45-60 motor. Wing detachable, car drivable! Large single-sheet plane. \$4.00 No. 1103, Akromaster—RC scale/stunt

No. 1103, Akromaster—RC scale/stunt model or real aerobatic plane for 45-60 engine. Fast and responsive, easy to make, simple shapes. \$2.75

No. 1104, Tardon—Formula II semiscale pylon racer or stunt plane for 40 engines. Won event at 1969 NATS. Groovy filer. \$3.00

No. 1201, Stiletto—Unique 3/2A proto model uses much-extended motor shaft for clean prop thrust and speed. \$1.00 No. 1202, King Kong—Huse flat-land soarer for competition use has 12' wing of glass, foam, and balsa. By Sarpolus. \$3.25.

No. 1203, 10-HI—Six-foot span, 049powered flying wing is high-performance model with sporting flair. Huge plan, \$3.50.

No. 0111. Dragonfil — Fast graceful competition stunter by Phil Kraft. Uses blg 60's and retracts. \$4.00

No. 0112, Toothpick — Long thin winged combat CL ship is both fast and quick turning. For hot 35's.

No. 0113, Luton Minor — Delightful 10-powered semi-scale RC for three light servos is high-winged parasol monoplane. \$2.25

No. 0211, Cobra—Steve Wooley's great, smooth-flying CL stunt ship for 35's. Light model, ideal for both FAI and AMA patterns. \$3.50

No. 0212, Voodoo—Converted Goldberg kit for streamer-towing RC combat, by Ed Sweeney. Two servos with 19 engine. For new event. \$2.75

No. 0213, Guillotine—Modified from CL for RC combat. Maneuverable, fast, responsive, and fun. Glides well. For two servos and 19 engine. For new event. \$2.75.

No. 0312, EKKO—A compact FAI pattern and sport model for 35 engines. All wood low-winger. \$3

No. 0311, Skydancer — Two-channelequipped RC boost glider using alleron and elevator control. Lofted by new, powerful rocket motor. \$2

No. 0411, P-51 Mustang—Semi-scale 60-powered with ARF Lanier or Dee Bee wing on balsa fuselage. Realistic and quick construction. \$3.25

No. 0412, Grouper—Unique in appearance, oval balsa fuselage hides a big 60 engine. Easy-to-make stunter for commercial ARF wings. \$3.25

No. 0413, Dauntless—Low-wing scale profile FF model for sport flying on inexpensive 020 engine, \$1.50

No. 0414, Nesmith Cougar—Accurate scale CL model of boxy homebuilt. Fine beginner's scale model using 19. A winner with detail. \$3.50

No. 0511, Fire Wagon—Contest free flight model for ½A, by James Clem. Diagonal-ribbed wing resists warps. \$1.75

No. 0512, Platypus—Unusual-looking RC aerobatic seaplane, made with balsa-covered foam blocks. Uses a 60. \$3.00

No. 0513, Troop Glider and Tug—Two models, one a twin-engine, 19-powered C-46 Profile, the other a scale CG-15 troop-carrying WW II glider. Both on one large plan. \$2.75

No. 0611, Phantom Stunter—Very realistic jet-like model of Blue Angels plane with typical stunt moments and airfoil. For 35-45 engines. \$2.75

AMERICAN AIRCRAFT MODELER 733 Fifteenth St., N.W. Washington, D.C. 20005

Please send the following plans by First Class mail, at no extra charge. I enclose \$_____ for payment.

Address _____

_____State ______Zip ____

	PLAN NO.	COST	170
#		\$	
#		\$	
#		\$	
#		\$	
#		\$	
#		\$	
	Total: \$	*	

No. 0612, Crusader Stunter—Anhedral wing, ventral fins and full array of missiles and drop tanks. It is a unique but truly competitive flyer on a 35 or 40 engine. \$3.00

noisy

ordic

ered

per-1.25

10 able ich-heet

40

TS.

aft .00

ınd

By

40-

ige

ft.

ast

ol

nd

No. 0613. Simple-Fly—Semi-symmetrical CG airfoil low-wing on box fuse.

Performance for beginner on 29 or novice contest ship with a 50. \$2.50

No. 0614, Sopwith Pup—Single or multi-channel, nearly-scale model for 10 to 19 power. Highly detailed plans. Stable flyer. \$3.50

No. 0615, Santana—Jon Davis' contest-winning towliner A/1. Uses fiberglass boom, stiff warp-resistant wing.

No. 0711, Phoenix 5—Don Lowe's latest in a series of swept-wing competition stunters for 60 and retracts. \$3.00 No. 0712, Bonanza/Debonair—Build either V-tail or conventional version of this popular fast light plane for full-house radio and a strong 60. Fine-flying ships, foam wing construction.

No. 0713, I.F.O.—Would you believe a FF 020-powered flying saucer which really flies? Built-up construction looks real. \$1.00

No. 0714, Helldiver—Semi-scale CL model of WW II torpedo bomber builds fast and is rugged. \$1.50

No. 0811, Douglas Mailplane—Large FF scale of Western Air Lines M-2 bipe, For 09 power. Could fly with light radio. \$3.00

No. 0812, Hot Canary—Unique Formula II/FAI racing biplane by Bob Sigelkoff. Although unusual-looking, it is fast and quickly bullt. \$3.25

No. 0813, Pogo—Model of Owl Racer for Formula I features midwing, low stab, non-cheeked cowl. Very stable and plenty fast. By Bob Morse. \$3.50. No. 0814, Flying Fortress—Not a scale plane, but a novelty CL flying medie-val castle for a 19, \$2.75

val castle for a 19. \$2.75

No. 0911, Fietcher—McCullough's magnificent tri-geared, low-wing crop duster scale job for 60's. Generous area and moments. All balsa. Highly-detailed plans on 2 sheets. \$7.50

No. 0912, Killer—Fast, responsive combat plane. All-balsa for 35's has many wins. \$3.00

No. 0913, ACE High—Featherweight 049-powered RO glider uses a set of ACE R/C foam taper and constant chord wing sets. \$2.25

No. 0914, Sakitumi—Highly-developed 40-gram Wakefield plane by Brian Donn features latest trends in gadgets and design. Well-detailed plan. \$3.00

No. 1011, FAIMan—Competition FAI
free flight job for screaming 15's.
Simplified construction with warppreventing wing. Build a winner. \$2.75

No. 1012, Peregrine—All-out BC slope soaring racer for allerons and ele-vator. V-tail, laminar wing; aerobatic, too. Balsa fuselage with foam wing. \$3.50

No. 1013, Hi-Pro—Highly proficient slope/thermal soarer. Build several versions from these plans. Balsa wing and glass fuselage. \$3.50

No. 1015, Marut—Named for the Wind Spirit. Designed for windy weather CL contests. Large-size jet appearance uses 45 engine. Two sheets. \$4.50

\$4.50
No. IIII. Longster—Large-size free flight scale ship for 09 power, also ideal as small RC. Construction similar to real plane. \$2.75
No. III2. Buster—Built-up profile Goodyear racer well-streamlined and a winner. For hot 15's. \$1.75
No. III3. Bippi-Bipe—Delightful scale-like rudder-only or GG model for single channel and 09 engine. A fun plane. \$2.75

THIS MONTH'S PLANS

No. 1211, Fireball—Jim Walker's great design presented as it was by Bruce Lund. For ignition 23's or smaller on glow. \$2.00

No. 1212. Brooklyn Dodger—Sal Taibi's great old-timer FF job presented as it was by Bob Harrah. For ignition 23-35 or smaller glow engine. \$1.75. No. 1213, Canus—Sixty-powered and large-size FAI aerobatic RC plane. Very quick building, \$4.00



OUNCE & GRAM SCALE

\$350

Measure both ounces 7 grams. Just the thing for weighing out those wings, stabs, rubber motors 7 small R/C units. Great for weighing balsa wood.

9 Oz. or 250 Grams Capacity.

/ AMP STARTING CELL

ONLY \$595

KOH PELLETS 50¢

BROWN



Our regular \$4.95 7 AMP. Nickel-Cad starting battery plus the new Dubro "Kwik-Glow" cord set . . . \$2.00.

\$6.95 value..... ONLY \$5.95

SCALE SPOKED WHEELS

9 SIZES 1/2"-5/8"-3/4"-7/8" 1"-11/8"-11/4"-13/8"-11/2"

At last a light and strong scale spoked wheel for both indoor and outdoor rubber scale models as well as light gas jobs. Each wheel will support 3 lbs. static pressure yet weighs

less than 1 gram. Made of silk thread and balsa wood with teflon bearings.



\$385

JUNIOR CO₂ ENGINE \$2495 LOAD-N-LAUNCH

GUN \$5.95 GON \$5.55 Light weight, in-stant starting engine for use on indoor and light weight out-door models. Electric starter not recommended on this engine. CO2 CAPUSULES BOX OF 10 \$1.70

KOSMIC

K/15 Glow w/Tuned Pipe K/15 Glow FAI K/15 Glow Marine w/Tuned Pipe K/15 Diesel Marine Gear Box Spare parts in stock.

\$32,95 \$29.95

> \$36.50 \$29.95 \$16.95

4 Ch. Factory Assembled \$199.50 4 Ch. Semi-Kit \$159.50 4 Ch. Full Kit \$149.50

PRO-START ELECTRIC STARTER



12V BATTERY \$15.00

Has exclusive Posi-Grip Driver unit. Fits most popular size spinners especially the "Pro Posi-Lok" listed below, from the smallest to the largest.

3 LINE **BELL CRANK AND HANDLE**



Combines motor speed control with elevator on U-Control models. HANDLE......\$6.95 B'CRANK-UP. OR INV. \$3.50

PRO POSI-LOK SPINNERS



Pro Posi-Lok Spinner are molded with Snap-Lok tabs so that front cap is simply snapped on for trouble free electric or manual starting. Red—White— Blue—Black—Yellow.

1½"-95¢ 1¾"-\$1.25 1½"-\$1.05 2"-\$1.35 21/4"-\$1.55

Add 50¢ for postage, \$2.00 Deposit on C.O.D., Closeout List 25¢

> MASTER CHARGE BANK AMERICARD AMERICAN EXPRESS

TELEPHONE 283-6446 area code 312

ELECTRIC FUEL PUMP



2 Yr. Guarantee operates on 1 ½ V to 4.8 V Battery. Fully reversible.

\$995

Stanton Hobby Shop Inc.

4734 NORTH MILWAUKEE AVENUE CHICAGO, ILLINOIS 60630

G&K's NEW Flight Box Kit

Designed for every "at the field" need. Features: Portable box, front and rear doors, easy assembly. No measuring or cutting. Sturdy lock in groove construction. See three photos below.



We make Basic Plane Kits, too

Fiberglass Fuselages, Foam Wings.

F4U-1 CORSAIR \$49.50 56" span, for 61 engines. Semi-Scale Stunt.

COBIA III...... \$39.50 682" area, for 61 engines. Contest pattern winner. Nats Design Winner

1937 Beechcraft Staggerwing. 50" span for 61 engines. Semi-Scale Stunt. \$49.50

ORDER BY MAIL

Send check or money order for quick delivery. Satisfaction guaranteed. (California residents add 5% sales tax.) Out of state residents add \$3.00 per item for handling and shipping. INTRO. PRICE \$19.50



G & K's ORIGINAL

Ready

To Use

Flight Box

Completely Assembled & Finished \$39.95



Write for Free Literature! FULLER G&K PRODUCTS

3521 TREVIS WAY CARMEL, CALIFORNIA 93921 PHONE (408) 624-3296

BROOKLYN DODGER

(continued from page 66)

been incorporated on the DT because the unit may overpop on this type of design even though there is a stop. Enough rubber band tension should be used to just slightly lift the unit in a parallel position. Make sure the keeper band around the fuse holds the tail pops to safely drop out of a thermal. This can be hard to adjust, as a slight movement will not get the plane out of a strong thermal. Therefore, I try to allow the plane to come down with as much speed and as steep as I think it can structurally stand at impact. Usually a steep drop with a slight spiral is preferred. To save the plane, I like to short fuse during trim flights as well as short motor run. I have seen many make a short motor run test and lose their plane out of sight because the DT wasn't adjusted.

It is quite a problem today to choose a covering, as there are so many. The originals used Silkspan and bamboo paper. Silk is a bit stronger and Jap tissue is a bit touchy if you can get it. MonoKote-type coverings have been accepted in most Old-Timer meets. I was able to find some old colored Silkspan, and so I used that. The trim pattern in the pictures is the same as the original and the color was white with red trim.

Flying

The center of gravity was not called out on the original, but it has been generally accepted to be 50%. As with most Old-Timers, adjustments during test glides are very important. Always glide with the nose slightly down and try to be at flying speed-a pretty good run. I prefer to ROG old-timers, advancing the throttle only enough to get it up. I then advance throttle a little each test while make thrust first and then trim adjustments.

Please remember to light the fuse so you do not have a fly-away. This has been one of the great Old-Timers and hope you enjoy it as much as I have.

World's Finest Unit is backed by the World's Finest Service

R/C Service (Sune Jonsson) Lavendelvägen 30 58258 Linkoping, Sweden

RCS Engineering (Jerry Pullen) 11015 Fenway Sun Valley, California 91352 Phone (213) 768-1519

Kraft Southeast (Bill Johnston) P. O. Box 2572 1429 Flamingo Lane Montgomery, Alabama 36105 Phone (205) 288-9726

Kraft Northeast (Tony Bonetti) 161-175 Linden Street Hackensack, New Jersey 07601 Phone (201) 343-5008

G. G. Electronics (Gary Garabian) 497 Central Ave. Seekonk, Mass. 02771 Phone (617) 761-6268

AUTHORIZED SERVICE STATIONS:

Redleys Box 10095 Johannesburg South Africa

Omega Systems (Steve Baxter) 10643-59 Street Edmonton, Alberta, Canada Phone (403)-466-7479

R. C. Electronics Repair Center (Loren Tregellas - Mike Murray) P.O. Box 2077 Wichita, Kansas 67201

Control Engineering (Denton Birch) P.O. Box 2700 485 Greenway Satellite Beach, Florida 32935 Phone (305) 262-6175

Antonio Baptista Rincon Calle 79 No. 17-77 "Quinta Claret" Maracaibo, Venezuela, South America Phone 70772

Kohlman Co. (Dennis Kohlman) 8213 N. 29th Avenue Phoenix, Arizona 85021 Phone (602) 997-0656

Midwest Model Supply Co. 6929 W. 59th Street Chicago, Illinois 60638 Phone (312) 586-7101

Wintronix (Ivor W. S. Winby) 622 Miller Avenue San Jose, California 95129 Phone (408) 257-2461

Geoff Franklin 98 Grasmere Street Leicester, England

KRAFT SYSTEMS FUROPE S.A. (Marcel Van Gompel) 35, Rue, Neuve Huy, Belgium

Neal's R/C Service (Neal Strutzenburg) Manson, Iowa 50563 Fhone (712) 469-2427

KRAFT SYSTEMS AUSTRALIA (Barry Angus, Brian Green) 23 Retreat Rd., Hampton 3188 Victoria, Australia

Northern Virginia R/C Service (Hal Peterson) 6501 Oakwood Drive Falls Church, Virginia 22041 Phone (703) 256-6665

Dwight's R/C (Ken Dwight)

Write for Free Catalog

Kato Model Aircraft Co. Ltd. No. 8-1, 2-Chome, Esaka Cho. Suita, Osaka, 564, Japan Phone (06) 384-2654

Sankyo Radicon Factory No. 19, Ohara Cho, Itabashi Ku, Tokyo, Japan Phone (03) 960-7466

TV Central (Roy Hauser) 40 N.E. 28th Ave. 40 N.E. 28th Ave. Portland, Oregon 97232 Phone (233-6328)

Kraft Great Lakes (Jack Yarger) Akron/Canton Airport P.O. Box 2113 North Canton, Ohio 44720 Phone (216) 499-8310 (24 Hours)

Kraft South Central (John Swanson) 2601 Lincoya Drive Nashville, Tenn. 37214 (615) 356-1225



450 WEST CALIFORNIA AVENUE, VISTA, CALIFORNIA 92083 World's Largest Manufacturer of Proportional R/C Equipment

72 December 1971



Up to four participants actually drive these neatly detailed ½2 cars on a slotless track. Each racer has independent steering, acceleration and deceleration. Drivers can move to the inside or outside to pass, drift through corners, even turn around completely and backtrack. Never before has an indoor layout so faithfully challenged individual operating skills.

A totally new control concept makes it all possible. Each M.A.R.K.-IV car is driven by two motors, one at each rear wheel. Each of these motors has its own control circuit which responds to a specific predetermined frequency. The signals originate in hand-held controllers that plug into the 13 VDC power supply. The supply sends the independent signals through the track and to the cars via brush contacts underneath the vehicles. When the steering wheel on the controller is turned, it slows the motor at one wheel while speeding up the other, causing the car to turn. The throttle control increases or decreases the speed of both motors simultaneously.

The Heathkit GD-79 M.A.R.K.-IV raceway includes enough track for an 8'x4' oval with guard rails; safe, low-voltage power transformer (13 VDC) that can be wired for either 110 or 220 VAC; two authentically-scaled cars (Ferrari and Ford J); two handgrip controllers with identification decals to match cars; two frequency modules that plug into power supply. Extra track sections and cars are available to expand your layout to form figure eights, banked ovals or dragstrips with up to four independently-controlled cars.

Order your GD-79 M.A.R.K.-IV raceway and come in out of the cold for the hottest new idea in indoor road racing. Assembles in approximately 15 hours.





Accessory package...includes one car, one controller and one frequency control board that plugs into power supply. GD-79 power supply accepts up to four frequency control boards.

Kit GDA-79-1, 3 lbs.21.95*



	Write
	for FREE
72	Catalog

	HEATHKIT
HEATH COMPANY, Dept. 80-12 Benton Harbor, Michigan 49022	Schlumberger
☐ Enclosed is \$, plus shipping.
Please send model(s) Please send FREE Heathkit Cat	alog.
Name	
Address	
CityState	eZip
Prices & specifications subject to *Mail order prices; F.	change without notice. O.B. factory. GX-240

MORE MANEUVERABLE THAN ALL OTHER COMBAT PLANES!



Combat V UC Guillotine for 35 engines \$6.50 (Kit only) UC 1/2A Guillotine .049 to .09 engines \$3.50 (Kit only) Kit C102

COMBAT V
WINNER OF 6 TROPHIES AT THE
1970 and 1971 NATS



We use Sig balsa in all our kits

C.M.I. 945 65th Street, Des Moines, Iowa 50312

From Ancient To Modern



DRAGON International Racing Class. 31" long. Complete with fittings— \$30.00

Prom Billing ——— DENMARK'S FINEST MODELS

All Billing Boats scaled from originals, Planked hull construction, hardwoods, Turned Brass Fittings, Authentic Replicas.



With A Billing Boat Kit



VIKING SHIP KIT, Complete. This exciting new kit by Denmark's Finest Models features planked hardwood hull, and is an authentic reproduction, scaled down to 26" long by 61/2" wide.—\$16.00

* Or leave this advertisement where someone may get the hint. If you want to see more favorite Billing Boat kits look at our November two page spread in this magazine. We have all of these boats in stock right now.

KAYEFF, INC. 511 Campesina Road Arcadia, Calif. 91006 See Your Hobby Dealer . . . Or send 25¢ for illustrated catalog. If dealer does not stock, send check or money order for direct, prompt shipment. California orders must add 5% sales tax. Satisfaction guaranteed.

Canus

(continued from page 20)

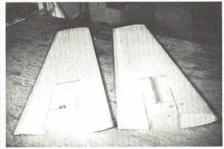
bulkheads in place, predrill as many holes as possible for Tatone mount, nose gear, pushrods, etc. Glue all F bulkheads in place (except F-1). Install fuselage sides to F bulkheads. Place a small piece of waxed paper between fuselage sides at rudder lower hinge location, Install F-1 and lower nose blocks.

Next, glue in place T-1, T-2, T-3 and the two T-4's. If you have one of the larger size radio systems, as I have, place a 1/8" balsa platform between T-2 and T-3, as shown on the plans. After fuselage is completed, the 1/16" balsa crutch can be removed from this area, and you have a deeper receiver-battery compartment. Plank this area with $1/8 \times 1/4$ " strips, butting them against F-1. Sand smooth and trim ends at T-3. Glue on remaining T bulkheads, $3/16 \times 1/2$ " strips, 3/32" sides and finally the $1/2 \times 2$ " balsa plank.

To complete the upper structure, glue two blocks onto the fuselage with a piece of scrap 1/4" balsa (wrapped in waxed paper) between them to represent the fin. Prepare a block of balsa for the hatch cover and you are ready to carve and sand to shape. Now cut engine hole, glue in wing hold-down blocks, cut stab slots in doubler, etc.

Next step is to locate wing on fuselage. Mark dowel locations on LE of wing through dowel holes in F-3, which should be 9/32" in size. Mark location of hold-down bolts on hardwood blocks. Install dowels and drill hardwood blocks with a No. 10 drill and tap with a 1/4 x 20" tap.

If you have not tried Super MonoKote, give it a try; it's not as hard as it would seem. Each roll comes with a good set of instructions. It's a very quick way to get a good-looking, smooth, fuelproof and waterproof finish. It is also much lighter than a silk and dope finish.



Wing cores with landing gear blocks installed. Note use of LE and TE spars. Edges of servo cut-out already planked.

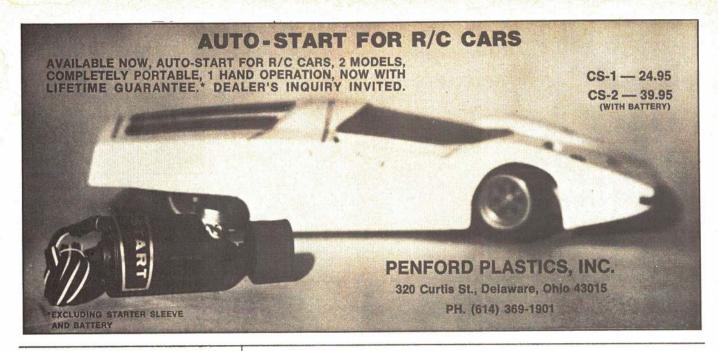
Sand the entire model smooth with a fine grit sandpaper. No primer or sealer is needed for Super MonoKote. Fill all cracks and dents though—the Super MonoKote finish is only as good as the surface it is covering.

If this is your first attempt at Super MonoKoting, read the instructions and cover the wing first. This will give you some smaller pieces that can be used for ailerons, tip plates, stab, elevator, fin or rudder. After all those have been covered, you should be ready to tackle the fuselage which is a little harder.

Start the fuselage by covering the bottom area from wing TE to rudder. Cover only to the corners, not around onto the side area. Next, cover the front side of T-5, which would be the pilots headrest area. Make sure that the canopy vent hole is there!

Now the big step. Place a sufficiently large





piece over the top of the fuselage, making sure it will cover the entire length and down around to the bottom. Tack and then seal the Super MonoKote down the top of the fuselage from T-5 to the back end. Work it down around the sides and just overlap about 1/4" onto the previously installed bottom piece. Cut carefully in the cockpit area and wrap it just over halfway around the nose area top and bottom. Repeat with the other side, but stop on center of nose area top and bottom. A 1/4" or a little more overlap is

In the wing and hatch openings, run the covering in about 1/8". Cover the hatch and you are almost done.

Final Assembly

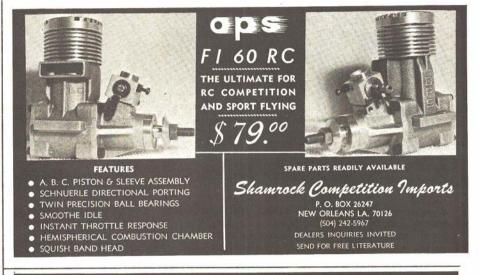
Cut slots and hinge the ailerons to the wing. Stand the wing on end on one of the tip plates and carefully cut around the tip of the wing. Remove the piece of Super MonoKote from the tip plate and glue to the wing. Formula II Hobbypoxy makes dandy little fillets around a joint such as this-same applies to the fin and stab joints.

Now with the wing bolted to the fuselage, custom fit the small block of balsa that fills in the remaining opening in the fuselage. Remove some Super MonoKote from the wing TE and epoxy in place. Cover the block and the wing is finished.

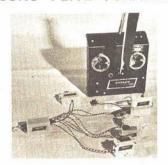
Hinge the elevator to the stabilizer and locate in fuselage slot; remove the Super MonoKote from center section and glue in place. Repeat with fin and rudder.

To mount the pilot's head, cut off his shoulders, fill in the nick with balsa, and use 1/4" dowel to pin him to the fuselage.

One method of attaching the canopy to the fuselage is as follows. Trim the canopy to fit, drill 1/16" holes about 3/16" apart around the edge of the canopy from about mid-point between T-2 and T-3 to T-5 and over the top. Drill the holes about 1/8" from canopy edge. Clean off the burrs and hold in place on the fuselage with a rubber band. Now, using a prick punch, punch holes through the Super MonoKote in each of the drilled holes in the canopy. In the forward-half of the canopy where there are no drilled holes, prick-punch the Super MonoKote right at the edge of the canopy



INTRODUCTORY OFFER Cannon Electronics model E530-44A We are offering this high quality 4 ECONO-FLITE 4 CHANNEL



SUPER-FLITE SYSTEM SHOWN



AREA CODE 603 / 882-6422

For fast service send M.O. or Bank check. We allow personal checks to clear before BANKAMERICARD and Mastercharge interbank number (lower left hand corner).

channel, assembled, ready-to-fly radio for a limited time only at the very low introductory price of

\$199.95

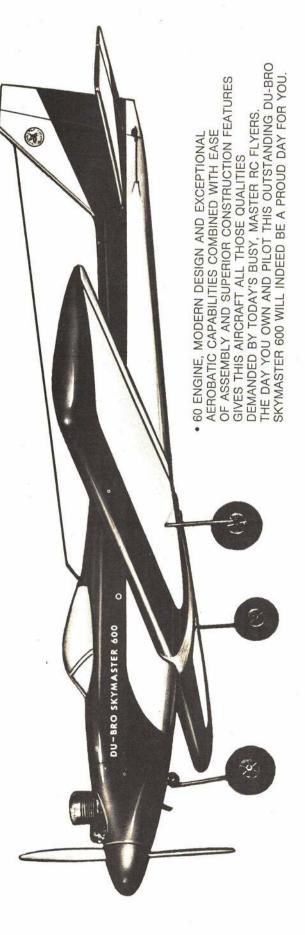
Check the fine features listed below with other makes-THEN, MAIL YOUR ORDER IN.

*Complete full house system, 4 channel, 4 servos *High quality components used throughout *90 day factory warranty *750 MW output 27 Mhz .*D527-E (KEK) servos, standard *Built-in charger *Nicad rechargeable batteries standard *Meter *Provisions for Buddy Box installation *Vinyl clad Transmitter and Receiver *72 Mhz available add \$10.00 *Single Stick available add \$15.00 *Other servo options available at extra cost, Descriptive folder of all Cannon systems mailed on request.

MASTERCHARGE accepted.

DU-BRO SKY MASTER 600° A.R.F.

AN OUTSTANDING RC AIRCRAFT FOR THOSE WHO PREFER THE BEST . . . ONLY \$59.95



designed and manufactured by DU-BRO PRODUCTS INCORPORATED wauconda, illinois 60084

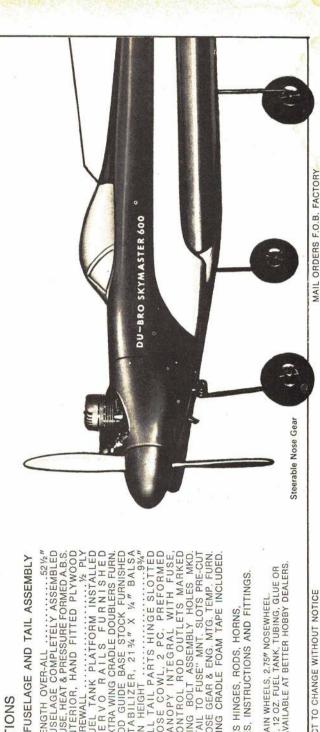
SPECIFICATIONS

WING	SPAN CHORD AT ROOT CHORD AT TIP RAEA_TAPERED CURVE CURVE COURVE FOIL, PERCENTAGE AT ROOT FOIL, PERCENTAGE AT TIP FOIL, PERCENTAGE AT TIP SPARS CORE SPARS FULL LENGTH, MOLDED IN SPARS SUB SPARS AND JOINER UNITS IN TRAIL EDGE, 9/16" SLOTTED BALSA TIPS COVERING, PRESSURE APP., HEAT SET ALLERONS THE SHAPED, SLOTTED ATTACHMENT, LEAD EDGE, DOWEL

ALL TAIL PARTS HINGE SLOTTED NOSE COWL, 2 PC. PREFORMED CANOPY INTEGRAL WITH FUSE. CONTROL ASSEMBLY HOLES MKD. "TAIL TO FUSE" MNT. SLOTS PRE-CUT NOSE GEAR & ENG. MTG. TEMP. FURN WING CRADLE FOAM TAPE INCLUDED

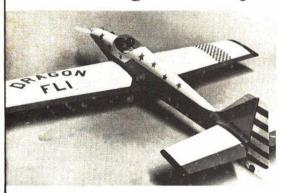
ENGINE MOUNTS, LANDING GEAR, LINKAGES, INSTRUCTIONS AND FITTINGS. ELABORATE HARDWARE PACKAGE INCLUDES HINGES, RODS, HORNS,

RC GEAR. 60 ENGINE. THROTTLE CABLE. 3.25" MAIN WHEELS. 2.75" NOSEWHEEL. DC-532 COLLARS, 2½" SPINNER, 12" PROPELLER, 12 OZ. FUEL TANK, TUBING, GLUE OR DECORATING MATERIALS NOT FURNISHED ... AVAILABLE AT BETTER HOBBY DEALERS.



PRICES AND SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

New Fuselage with Improved Performance



DRAGON FLI II

\$79.95

Kit contains white, orange or blue fiberglass fuselage and vinyl-covered foam wing and stab. All hardware included. (was Reddi-Flite Prod.)

> W. E. Tyson 2068 Bunnell Road Warrington Ind. Park Warrington, Pa. 18976



3145 Bordentown Ave., Parlin, N. J. 08859



Start your Glow Plug Engines From a 12 Volt Battery.

wood and water proof

Very compact unity 1 ½x1 3x4

Shipped complete leads Glow

Pug chp and cigarette lighter plug

Tomco Box 4403 Little Rock, Ark. 72204



(continued from page 76)

about every 1/8". Epoxy canopy in place with Formula II. Then hide the holes and epoxy with a narrow strip of Super MonoKote.

Install engine, radio, tank, landing gear, etc. and you're ready to go.

Flying

Balance the Canus on, or in front of, the CG location for first flights. The position shown seems to work the best, but may vary a little from airplane to airplane. You will enjoy the ease with which the Canus does all the

Yako

(continued from page 44)

On the first Yako the shaft was bent over past a right angle so that it would catch on a blade. During the glide, the prop would stop and the model would wander about depending upon the rudder effect of the particular prop position. This model was lost in a thermal. The second Yako has a free-wheeling prop (sketched on plan) which reduces drag and allows a constant glide circle. The small piece of tubing is glued to the prop and lashed with thread. The ratchet is bent so that it flips free when the prop turns clockwise by the slipstream, but catches the bent-over shaft when turned by the rubber. Attach the prop assembly to the fuselage by gluing the nicked tubing to the rear balsa plug and wrapping with fine thread a few times. Take care not to get any glue into the shaft-tubing joint. Angle the prop as shown in the side and top viewsthe right tip of the prop should be about 1/4" closer to the wing than the left side. These angles help keep Yako in a smooth climb.



Just because it looks backward, doesn't make it tough to build or fly. Climb is straight ahead with a slow right-turning glide.

Bend the landing gear and secure in position, lining it up so that the model sets level. Wheels can be built up or purchased-plastic wheels are heavier but they work well.

Purchase enough rubber for several motors, as they break, wear out, etc. To make a secure knot, first tie it loosely then work saliva into the knot by chewing. Now pull the knot tight-right to the breaking point of the rubber. Rub some castor oil, glycerin, or



TAKE OFF WITH R/C MODELING!

Take off to new horizons of hobby pleasure with Kalmbach Books! R/C PRIMER is a basic book for beginners that fills the gaps of manufacturer's instruction booklets. Propo Primer explains proportional control — how to make models perform the way prototypes do. How To Build Radio-Control Models details the combinations of vehicles and control systems and how to put them together. Get all the adventure of R/C. Order today!

	OSC KALMBACH PUBLISHING VENTHST., MILWAUKEE, WI5323
Send me	copies of Propo Primer copies of R/C Primer copies of How to Build Radio Control Models
Check	encfosed. Bill me.
Name	
Address	
City, State.	Zip

EMBEE 75 DIESEL ENGINES Ideal power for free flight scale

\$12.95 Postpaid

Know the wind speed

For more information

Dept. AA

DWYER WIND METER \$6.50 Postpaid HOBBY HIDEAWAY, Delavan, III. 61734







MIDWEST PRODUCTS CO. Hobart, Indiana

MESSERSCHMIDT

Profile control liner.

Wing Span-33" Wing Area-224 sq. ins. Engines-.15 to .19

\$795





NEW NITRO X RACING FORMULA More

More nitro content

Hotter than ever \$650 gallon



NEW NITRO PLUS ADDITIVE

For those who want even more power and speed \$395 pint





by itself!

commercial lubricant into the rubber so that it appears moist. Slip the rubber into the hooks with the knot at the front.

Observe the model from the rear to check for warped wings or stabilizer. The trailing edges should be parallel to the leading edges of each surface. Small warps will probably be tolerable, but large ones should be reduced or removed. Hold the wood between the thumb and forefinger, then pinch and bend opposite the warp. Apply the process over an area rather than in one spot. If a warp is persistent, one of the regular, fast-drying model airplane glues can help remove it. To bend the wood down, rub a thin layer of glue under the area. If the wood needs to be bent up, rub the glue above the area. Hold the wood in the bent position while the glue sets. The rear part of the fin should be bent to the right about 1/32" to produce a right turning tendency.

This will counteract the left turning effect of the propeller.

Flying

Test fly Yako over the softest area you can find. At our San Diego flying site that means picking the spot where the rocks are smallest! Select a time when the air is near calm such as early morning or late evening. Wind the motor by turning the prop counter-clockwise about 100 times. Launch Yak with flying speed slightly nose up and just to the right of any wind. The model should climb at a shallow angle with little or no turn.

Learning the correct launch speed may require some practice. If launched too fast Yako may zoom up and stall; if launched too slow it will dive. If either condition persists small adjustments can be made on the sta-

bilizer. (It is assumed that the wing and stabilizer angles and the model balance point were checked during construction.) The outer part of the stabilizer can be bent down to correct dives or up to correct stalls by the methods described to remove warps. Any sharp turning tendencies should be countered by bending the rudder opposite the turn.

When the flight pattern is satisfactory, put more turns into the rudder and observe closely as models often require additional trimming under the higher torques. The number of turns that can be put into the rubber depends upon its quality. Most motors will take 300 hand turns. When fully wound our Yako climbs steeply, then rolls into a climbing turn to the left. As the torque lessens, the model flies nearly straight then glides in a large right circle. Occasionally we use a long motor-perhaps 18"-and stretch it out and wind it with a winder. With such power this model has climbed to surprising heights. If Yako seems sluggish, it may be due to low torque rubber-try a larger size. Keep the prop shaft and bearing well-oiled.

72 Series Hirtenberger Engines

The most powerful muffler equipped R/C engines in the world!









HP ENGINES...THE NEW BREED!

Muffler as part of integral design
World Championship performance with handling qualities so gentle they are ideal for sport flying
Schneurle ported for competition power
Lowest vibration of any high powered 61
Coolest running of any 61 engine
Old World craftsmanship and care throughout

ALL HP PARTS CARRIED IN STOCK-IMPORTED BY



NELSON MODEL PRODUCTS

6929 WEST 59TH STREET • CHICAGO, ILLINOIS 60638 • (312) 586-7101

Last Bipe Fighter

(continued from page 23)

little biplanes from Long Island. War clouds were gathering, but America knew it ruled the Pacific, and paid little attention to the stories of fast, maneuverable fighters with which Japan was sweeping across China. The first monoplane Brewster Buffalo bowed in with the fleet in December, 1939, when war was still two years away; honors for the first change from biplanes went to the U.S.S. Saratoga's VF-3 squadron.

Little by little, the replacements came on board to relieve the old-timers of their proud duties. F4F-3 Wildcats shoved the rest of the F3F's out of service in late 1940 and early 1941. An airplane with a top speed of just over 250 mph simply wasn't capable of performing the important tasks which were then coming into focus. The Buffalo could top 300 mph, but even it wasn't up to the challenge.

The last Navy combat units turned in their F3F-3's in June, 1941, while the Marines hung onto theirs until October, barely eight weeks before the attack on Pearl Harbor. The biplanes then went to training squadrons, where a steady stream of rookie pilots, and then mechanics, methodically reduced them to scrap. The last of 164 airplanes in the series-F3F-2 No. 0983—was removed from the Navy's list of serviceable airplanes in November, 1943. Sad to say, not a recognizable piece of a genuine F3F is known to exist.

Yet, all has not been lost. Three civilian airplanes quite similar to the F3F were built, and two of them are still around. A single-seat Model G-22 became the "Gulfhawk II" for display/aerobatic pilot Al Williams, who flew it from December, 1936 through World War II, demonstrating it before hundreds of thousands. In October, 1948, it was flown to Washington and presented to the National Air Museum, and is now on loan indefinitely to the EAA Museum in Hales Corners, Wisconsin.

A pair of two-seaters were built in late 1938. One was the Model G-32 "Gulfhawk III" NC-1051, which became the USAAF's C-103 No. 42-97044. The other was the Model G-32A NC-1326, which was used as a company airplane until it was drafted in 1942

to become C-103 No. 42-97045. Both served as VIP transports out of Bolling Field, Washington, D. C. until May, 1943, when they were transferred to Miami to be used for training. The first was lost in the Florida Everglades, while the other was returned to civilian ownership after the war.

Ben Bradley, of Ft. Lauderdale, Florida, eventually got hold of NC-46110, completely restored it to Navy colors and had it relicensed N7F. After flying it in air shows for several years, he sold it to Chicago industrialist Bill Ross, who has offered it for sale for \$50,000. Not bad for the nearest living relative to an old biplane.



SCALE PLASTIC & BALSA MODEL AIRPLANE KITS rog - Airfix - Hasegawa - Guillow's - Kaye Cleveland Kits, Plans & Printwood ACCESSORIES & MODELERS SUPPLIES

rie/Risley Paints Badger Air-Brushes * MANY SPECIAL OFFERS

Letreset Decals
* Micro Scale Decals
* LOWEST PRICES

Send 25c for new 28-page catalog #MA-2A

There's more to do...



Give More to Christmas Seals



OTS and WHEELS that add...



SMOOTH CONTOUR

SMOOTH CONTOUR TYPE

VINTAGE AIRPLANE

The Contour Type Wheels, popular from the late '30's to World War II are equipped with Nylon bearings and semi-pneumatic tires. The Vintage wheels are typical of the high pressure tire used during World War I and up to the mid '30's. They are fitted with semi-pneumatic tires.

34," Dia. MS-1 ...\$ 1" Dia. MS-2 ... 11/4" Dia. MS-3 ... 11/2" Dia. MS-4 ... 21/4" Dia. SC-1 ... 23/4" Dia. SC-2 ... 33/4" Dia. SC-3 ... 33/4" Dia. SC-4 ... 41/4" Dia. SC-5 \$.55 .65 .75 .95 .1.85 .2.65 .3.65 .4.75

9/4" Dia. MV-1
1" Dia. MV-2
11/4" Dia. MV-3
11/2" Dia. MV-4
11/8" Dia. VA-1
21/2" Dia. VA-2
31/8" Dia. VA-3
33/4" Dia. VA-4
43/4" Dia. VA-4 2.39 3.65 4.75

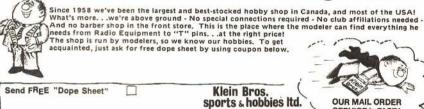
VINTAGE AIRPLANE TYPE

LLIÁMS BROS

SEND 25¢ FOR CATALOG 181 B Street Dept. A

San Marcos, Calif. 92069

ARE YOU CANADIAN? 🛛 🌞 🛚 .. then you should be dealing with us!



Name Address

496 LAWRENCE Ave. West, DEPT. A , TORONTO 19, ONT. CANADA.

OUR MAIL ORDER SERVICE is FAST!

SCHWEIZER 1-26

Molded of Solid Expandable Polystyrene

TUFF-N-LITE

Engineered with utmost care to enable you to assemble and have in the air an extremely docile flying machine in two hours or less.

SPAN: 6' 6"



CANYON PLASTICS 1014 TRAVIS . AMARILLO, TEXAS 79101 FUSELAGE:

Aluminum tube molded lengthwise in the fuselage. Power Pack and Servo Units require no adhesive, as specific places are molded for these. Holes for placing push rods have been molded through the fuselage lengthwise for rudder and elevator control.

WING SECTION:

CANYON,

A full length aluminum wing spar has been interlocked with a rear secondary spar in such a manner that it cannot be turned or pulled out of wing.



Modeler Mail

(continued from page 11)

safety and ease of handling go-Kulczyk's work offers the most easily fabricated fan, as well as a common-sense attitude towards its construction. I am looking forward to similar articles exploring other possibilities.

Lt. T.E. Arnold (USN), Tra Vinh, Viet Nam

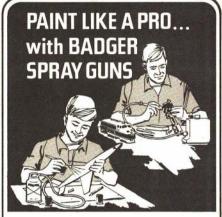
Kudos

I am what you would call an "unexperienced sport modeler" (RC and UC). I have just read your editorial "Straight and Level" in the August issue. The new JR. American MODELER magazine sounds great! You people have my backing on this magazine focusing on beginners in the modeling hobby.

John Gapinski, Niantic, Conn.

I just read about your plans to publish a new magazine, JR. American MODELER. I think this is a fine idea, and I hope the magazine is successful.

Younger boys live on my block and whenever I'm out flying my planes (small gliders and helicopters) these boys are almost always cheering me on. I think if they had a good magazine that they could understand and that told them how to build and fly simple model planes, they would have the same keen interest in modeling that I have. I hope JR. American MODELER will be such a magazine,



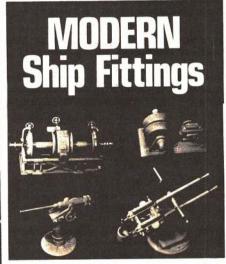
They're the greatest for professional results in custom finishing models, detailing, blending, shading and fogging. Make designs, textures, patterns, stencils, etc.

ADVANTAGES:

NO COMPRESSOR NEEDED/SMOOTHER THAN SPRAY CANS/MIX YOUR OWN CUSTOM COLORS/WILL WORK WITH ANY PAINT, LACQUER, SHELLAC OR VARNISH/ EASY TO USE

For amateur or professional, hobbyist, craftsman, handyman or do-it-yourselfer, Badger has the products for you. Badger's spray guns start at \$6.95. Available at most hobby stores. While there, ask to see Badger's Bench Top Power Tool with flexible shaft. Designed for the modeler and hobbyist, it cuts, grinds, deburrs, routs, drills, etc. If your local store does not stock Badger products write direct to: Dept. AAM



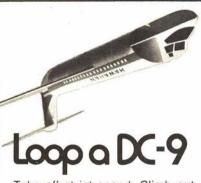


Steingraeber now brings you a complete line of plastic and metal fittings for ship builders. Perfect for modern ships, including war ships. Over 100 different exact scale fittings. Ask your dealer or send for Catalog today.

Steingraeber Ship/Fitting
Catalog & Handbook \$2.00
Constructo Ship Catalog \$3.00
Boyd Models new '71 Catalog \$.75

BOYD MODELS

810 East 14th St. Los Angeles, Calif. 90021



Take off at jet speed. Climb out. Roll out. Loop. Glide. And land ready to go again.

Do your stuff with the Dumas Douglas DC-9 catapult launch jet glider. Unmatched for acrobatics — 19" long, 15" span. Balsa wings. Adjustable ailerons and elevators. Plywood nose absorbs punishment.

EASY TO ASSEMBLE, COM-PLETE WITH HAWAIIAN AIR-LINE MARKINGS . . . \$1.95



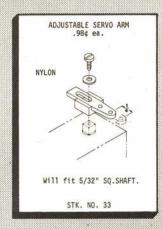
If not available from your hobby dealer, add 10% for postage and handling and order direct.

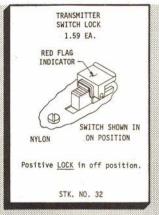
A DIVISION OF DUMAS PRODUCTS, INC

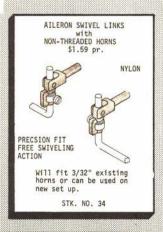
DUMAS PRODUCTS, INC. 790 S. PARK AVE., TUCSON, ARIZ. 85716

herb abrams rand sales

box 20059, columbus, ohio 43220











Include 25¢ for postage and handling. 5 or more accessories sent postpd.

Stk. No.	Description	Price	Stk. No.	Description	Price
01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20	Standard Control Horns Long Control Horns Mini Control Horns Mini Control Horns Easy Action Wheel Brakes Aileron Links Push Rod Ends Push Rod Ends Push Rod Exits Steering Arm Shock Absorbing Steering Arm Missing Link Missing Link w/o hardware Dual Output Servo Screw Quick Mount Servo Tape Throttle Eze Bellcrank for Orbit Servo Connector Locks Override Device (Kraft) Override Device (World Eng.) Override Device (World Eng.)	.79 ea. .79 pr. .59 3 .79 yd. .98 ea. .98 ea. .79 4 .59 ea.	22 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38	Aileron Swivel Links w/Horns Safety Back Razor Blades Servo Output Arms (Kraft)	.59 ea .59 pr .59 4 1.29 ea 1.59 pr .59 12 .98 2 1.59 ea .98¢ ea 1.59 pr

OUR COMPLETE LINE OF ACCECORIES

I had to learn the long way-trial and error. I started with small gliders two years ago, and now am in the middle of a Sterling Fokker D-7. Hopefully your new magazine will explain the ups and downs of flying, and also how to do a better, neater, cleaner and more precise job on all types of flying craft in a shorter period of time.

Doug Gardner, Age 14, Covina, Calif.

Up, up and away. . .

After seeing Bill Watsons Rogallo wing machine in "Tail-less Tale" (July 1971 AAM), I decided I had to have a flex-wing aircraft too. This was my first attempt at designing a model plane, so I decided to keep the cost low, just in case I was unsuccessful. The finished plane had a 45" wing span and was Cox 020 powered.

After the model and the usual test gliding procedure were completed, it was ready for powered flight. Since I didn't think it would get off the ground, I completely filled the engine's tank. After a graceful hand launching, the flex wing slowly climbed to an altitude of about 100 ft. while doing tight 50-ft. circles. It was surprisingly stable and flew at a fairly slow speed.

When I discovered that the engine didn't seem to want to quit, I began to get impatient. Finally it stopped running and the plane suddenly shot skyward and out of sight. It seems that the engine downthrust was holding the plane down while under power, I never did recover it after its first-and lastflight.

Thomas Black, Carmichael, Calif.





Catch up. Read Zaic's Year Books. Now available, Postpaid: 1935-36-51-50, 1937-52-50, 1938-53.00, 1951-52-53.00, 1957-58-53.00, 1955-56-53.00, 1957-58-53.00, 1959-61-55.00, and 1964-65-55.00. Also, MODEL GLIDER DE-SIGN-53.00, CIRCULAR AIRHOW -53.00. Hoffman's BOOK-52.00 Find out what you missed. Order today, Read for ten days. Return for refund if not happy.



MODEL AFRO PUBN . Box 135 NORTHRIDGE e CAL 91324

DEAVASP

Record holding precision electric motor for model boats, 13 oz., efficiency to 80%, 2"dia. x 3"L., balanced 12 pole armature, precision ball bearings, water/air cooling.

\$39.50 (to 8vdc, 17000rpm) SeaWasp 6 SeaWasp12 \$41.50 (to16vdc, 18500rpm) postpaid, guaranteed, water cooling \$4.00 extra

NEW PRODUCTS SOON

ABS LOW WING ARF "FUN"

TRAINER, THE SQB

WATCH FOR ALL NEW BALSA 54" BUCKER-JUNGMEISTER KIT AND OTHER BALSA KITS SOON

MINI-FLITE CO.

48 PRINCETON ST. RED BANK, N.J. 07701



R/C SCALE PLANS: FOKKER D VII. 2": \$4.00. 1½": \$3.00. 1": \$1.50 FOKKER D VII. 2": \$4.00. 1½": \$3.00. 1": \$1.50 FOKKER D VIII. 2": \$3.00. 1½": \$2.50. 1": \$1.50 FOKKER E III. 2": \$3.00. 1½": \$2.50. 1": \$1.50 SE 5a. 2": \$3.00. 1½": \$2.50. 1": \$1.50 NIEUPORT 17. 2": \$3.25 1½": \$2.50. 1": \$1.50

Complete list, plans, books, photos: 25c

BOB HOLMAN · P.O. BOX 741M San Bernardino, California 92402

TOP PERFORMANCE!

USE

/IBRA-TAK Slide Rule Tach.

Check the RPM's of your



Dealer inquires invited VERDELL INSTRUMENT SALES CO.

motor accurately. Instantly know what peak your mo-tor is operating . . . get top efficiency and smooth running power. Engineer proven, VIBRA-TAK is a professional instrument built of polished, high stress aluminum. Carry it in your pocket or toolbox.

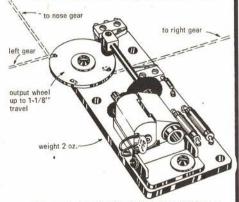
- CHECKS MOTOR SPEEDS INTERNAL COMBUSTION **ENGINES**
- ROTATING & VIBRATION EQUIP.
 GIVES DIRECT READINGS FROM 2000 TO 21000

P.O. BOX 212, EL CAJON, CALIF. 92020 American Aircraft Modeler 83

NEW RETRACT POWER SERVO

HAVING TROUBLE RETRACTING THOSE MECHANICAL GEARS?

WING solves your problem with the most powerful & reliable landing gear servo available. Developes more thrust than three regular servos. No critical counterbalancing necessary, will not slip during cycle. NOW YOU CAN USE LONGER STRUTS AND LARGER TIRES!



Will operate all types of mechanical gears. Can be actuated from extra channel or coupled to motor trim on four channel sets.

Comes in kit form & all you need for assembly is a soldering iron and small screw driver. Two hour assembly time.

Kit includes geared power driver, chokes, capacitors, limit micro switches, wheel output & large bearings, universal driver pivot, thruster, base & all necessary screws & wiring.

KIT ONLY ... \$17.95

WING MFG. BOX 33 CRYSTAL LAKE, ILL. 60014 Send 35¢ for complete Wing catalog



GLASKIN

MAKES THE DIFFERENCE

UNIQUE SKIN OF EPOXY GLASS & FOAM LAMINATE Strong, Light, Mirror Finish Wings Complete with Aileron & Gear Blocks

Available For These Models: Californian

Eyeball Banshee-Strip Kaos Sun Fli 4 Dragon Fli-Strip Cutlass Supreme A-6 Intruder New Orleanian

MAIL ORDERS Filled Promptly Dealer Inquiries invited. \$29.95 etracts-Add \$2.00

Retracts-Add \$2.00 Calif. Residents add 5% Sales Tax

A. R. FLIGHT

23326 Ladrillo Street (213) 883-7999 Woodland Hills, California 91364

YOU'VE LOOKED AT THE REST, NOW BUY THE BEST!

"JET START"
The Geared Engine
Starter

FREE
BROCHURE

Propeller-only adapter and flywheel adapter available separately at \$4.95 each.

Smallest • Safest • Most Powerful
 Reversible • Most Economical

.049 to .80 engines and twins. Available at your local hobby shop now: If not, order direct. Standard "Jet Start" has spinner-cone adapter.

\$29.95 \$44.95 with battery

Add \$3.50 for postage; balance refunded to individual. New York state residents add 5% sales tax.

Patchogue Hobby Center

ON REQUEST

240 Medford Avenue Patchogue, L.I., N.Y. 11772 Ph (516) 475-8856

EAGLE - 1847 Maine Topsail Schooner Model Shipway's latest kit, of this handsome coasting freighter. The kit is on 3/16" scale (hull length 16½"), plans by Zakambel, includes machine carved pine hull, cast fittings, brass, cordage, wood materials, plans and instructions. Postpaid, \$30.25.

For all modellers, beginners and experienced, a fine 60 page booklet, 8½" x 11", by George Campbell, M.R.I. N.A., profusely illustrated, The Neophyte Shipmodellers Jackstay, Postpaid \$3.10.

Send 50 cents for our 52 page catalog showing many scale model kits, fittings, plans books, tools.

Model Shipways Co., Inc. 39 West Fort Lee Road Bogota, New Jersey 07603

AT THE FREE-FLIGHT WORLD CHAMPIONSHIPS

by BOB HATSCHEK

When one sandwiches six 180-sec, maxes around a "bad" flight of 179 sec., he expects to place fairly well in most free-flight meets. That's just what New Zealander Paul Lagan turned at the World Championships, and he placed 20th in the power event—just 1 sec. out of the 19-man flyoff. The point is simply that no meet in the world is like a World Championships. When the three best men in each of three events are representing their 32 nations, virtually anybody is capable of winning—or losing.

When the meet (June 30 - July 6) is held in a place like Gothenburg, Sweden (latitude 580 north, about the same as Juneau, Alaska), you can expect general conditions to be somewhat different than those found at a typical U.S. contest—and they were.

The first five rounds were held each day from 4:30 a.m. until 10:00 a.m. (about the time the sea breeze came up) and the last two rounds were held from 6:00 p.m. (when the breeze eased) until 8:00 p.m.—then the flyoffs. Overall, the weather was beautiful, and the U.S. team members seemed to aclimatize quickly to the 3:00 a.m. dawn and daylight until 11:00 p.m. Sleeping was done in two shifts: three or four hours at night and a similar afternoon siesta.

But the odd hours and the low-angling sun generated thermal conditions that were quite alien to the Americans. In general, lift and downdrafts were both gentle and difficult to detect—in spite of the great number and variety of thermal-sensing equipment used by several countries. These included bubble-generators and long Mylar tapes elevated on poles (one watches to see if the bubbles or Mylar drift up or down), and sensitive temperature-change detectors using thermistors and electronic circuitry to indicate either temperature change or rate of temperature change.

Another item of equipment almost universally used was Citizen's Band handy-talkies for communication with downwind retrieving crews. The Babel of languages coming in included all accents of English, French, German, Russian, Czech, various Scandinavian tongues, and others.

Technical trends and innovations worth noting included high-revving engines (up to 26,000 rpm) without pipes, in power models. The U.S. team's high-climbing models used Bartels fiberglass props based on the Cox 7-3½. Extensive use of autostabs and autorudders—and an auto wing tab (about six sq. in.) on Verbitsky's left wing just inboard of

the polyhedral break. A flapped-wing model, changing airfoil for the glide, was flown to second place by Thomas Koster.

Auto-rudders and autostabs were almost as widely used on Wakefields as on power models. Most of these were actuated by timers, but others were actuated by tension or torsion of the rubber motor. Most unusual gadget on a Wakefield was the delayed-action prop start on one of the models by Reiner Hofsass. He javelins the model into the air with its prop blades folded and one to two seconds later a timer releases the prop. This gives him about 15 feet of extra altitude and makes sure that the timer (which also operates autostab and rudder) is running. If the prop doesn't release, the model comes in at under 20 seconds, and another chance is given under the rules.

Tow techniques and tow hook gadgetry took the limelight in the Nordic developments. Anti-falloff mechanisms (which release the line after a heavy pull) and circle towing techniques allowed some fliers to keep their gliders on the line for as long as 20 minutes while looking for the extremely elusive lift.

When the results were tallied, Pavel Dvorak of Czechoslovakia, headed the list in Nordic with 1260 plus 168 in the flyoff. Austria headed Team with 3619. In Wakefield, Josef Klima, also from Czechoslovakia. was first with 1260 plus the flyoff 232; Team went to Denmark with 3762. Sweden took top honors for Power in both individual and Team. Rolf Hagel added 240, 300, and 328 to his perfect 1260. Team ran up 3780.

What of the U.S.? In Nordic the top place, 17th, went to Dennis Bronco, but we showed fairly well with a third in Team, behind Austria and Russia. It was better in Wake where Bob White came in a fairly close third in the flyoff; and there we were 7th in Team. In Power the best we had, Jim Taylor, came in 29th-but that was only 23 under the list of 1260 all-maxes. It was 13th in Team,

International camaraderie is still another aspect of a World Championship meet that makes it unique-and there were 222 entries from 32 countries, plus helpers and hangerson, at Gothenburg. They came from every continent on earth. With only a few exceptions (such as the very aloof North Koreans, who put in an outstanding performance for a first-time effort) the world-wide competition stresses the similarities among people rather than the differences in their politics. And thermals recognize no man's flag.





Winning by 7 sec. in 3rd flyoff round was Rolf Hagel, here launching power job. All three Swedes maxed out for perfect score.

DIGITAL PROPORTIONAL

SERIES 2000

Introducing the Larson Series 2000, with an all new transmitter to complement the superb 5RS airborne system. Better weight and bal-ance, and softer, smoother stick assemblies provide greater comfort and precision of operation. This is one of the most powerful trans-mitters available, with 720 milliwatts output.

The 5RS system is still the smallest and lightest first-line equipment in the industry (9.5 oz. total with 500 mah battery) and has proven through countless hours of operation to be unexcelled in performance and reliability. The secret lies in simplicity of design with fewer parts through extensive use of integrated circuits, meaning less repair and maintenance costs.

We invite your comparison. Write for free brochure.



All New Transmitter-5 or 6 channel

5 RS system \$349.95 /

6 RS system (with "retract" switch)

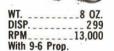
\$364.95

Complete facilities for service on all BONNER radio equipment.

lectronics 22891/2 SO. GRAND AVE. SANTA ANA, CALIF. 92705



of Tulsa, Oklahoma to win first place at the 1971 Nationals in Class B free flight. Jim believes in Fox power because of easy starting plus the fact that the Fox 29X is dependable, rugged and light in weight.



Jim Clem is shown at right with the winning Witch Doctor 570, one of his own designs, which Sig plans to kit under the name ABC Scrambler.



FOX MANUFACTURING COMPANY 5305 TOWSON • FORT SMITH ARKANSAS 72901



	SIZE	PAIR	PRICE
	inches	supports	per pair
	8 x 11	11 #	\$ 2.98
	12 x 21	4	3.98
A.B.S.	151 x 2	61	4.98
Super Light plastic	18± x 3	8	6.98
Super Light Plastic	211 x 31	10	9.98

WITH HARDWARE ARS PLASTIC

now in kit form

size	supports	wt/pr.	price
19"	1-12 lb.	10 oz.	3 5.50
24	2-3%	16	8.50
29	4-7	20	12.50
35	8-10	28	14,50



GLEASONDALE IND. PARK

STOW. MASS. 01749

cast aluminum **ENGINE MOUNTS**

Engines run smoother and cooler on Tatone Engine Mounts. The cast aluminum absorbs engine heat and provides a solid support for better engine performance. Tatone mounts are one piece and easy to install and are most often specified on magazine plans and in kits. For your convience, we make a mount for 98% of all engines made and always in stock.

Short or Long -- \$1.75 Short only Short or Long --Short or Long --2.25 .29-.40 Short or Long --2.50 .45-.59 Medium only .40RV Long only 3.00 Short only 3.00

Long only

NOTE: Specify engine, model number and displacement. We will drill mount for you

engine at no extra charge if requested, undrilled otherwise

for McCoy 21 series engine



TATONE PRODUCTS 4719 MISSION STREET SAN FRANCISCO, CALIF. 94112

HOBBY HELPERS **FULL SIZE PLANS**

Group Plan 465 3 oz. 60 cents

Jimmle Mattern's record-breaking Lockheed Vega— modeled as control line beauty by Walter Musciano. Spans 50"; length 34"; for .45-size or similar power.

Simplified control line autogiro—designed by Ole Dan Nielsen. Rotor diameter 34"; length 37"; takes .45 to .65 size engine with motor control.

6 01.

Group Plan 966

\$1.10

Lockheed Lightning P-38. Semi-scale stunt control-line model by Lew McFarland, uses twin .19's with throttle control for shooting landings.

Therp Tiger, Famous home-built aircraft in radio control model form by Jess Kriesser, Takes a .35 engine.

Group Plan #953C 1.oz.

Focke-Wulf FW 190 German World War II control line flying scale fighter model by Walter Musciano. 3/4" to 1' scale; takes engine from .14 to .29 cu.

A/2 Viking Nordic Towline Glider by British Champ Bill Farrance. These are HALF-SIZE plans with full size ribs and cross sections.

Group Pian #166 6 oz.

\$1.10

"Interceptor Five" by Harold deBolt. Latest in famous designer's series of outstanding R/C Multi Class planes. Spans 671/2 inches; 50 inches long; uses .61 size engine.

For Special Handling Plans only

8¢ per oz.1st Class 11¢peroz.AirMail United States and Possessions only

Catalog send 15¢ cover

HOBBY HELPERS

1543 STILLWELL AVE. • BRONX, N.Y. 10461

The AUTHENIC KOLLY TIME OF MODELDOM
Yes, there's nothing else to compare with C.D's, as we spend endless thousands of hours researching—designing and re-designing, all of which is very costly, but most worth it we feel.

50, if you are a newcomer to modeling, or an old timer, you must get a copy of our latest catalog to review the old and to see the great many new designs we have been adding through our "volunteer organization" in the last few years. You'll be very pleasantly suprised. We guarantee if!

CATALOG SUBSCRIPTION 50°C; 2 YRS, 51 BILL
SENDING A CHECK OR M.O. ADD 10¢ PER ORDER
EXTRA CATALOG COPIES NOW 50¢ EACH
MOST ORDERS SHIPPED IN 2 TO 6 HOURS
CLEVELANID MODEL 6 SUPPLY C
10307B Detroit Since 1919 Cleveland, Ohio 44

ization in the last rew years. Four the very preasanth supprised. We appropriate Vinitage 3 ons
BECOME A FIETE OWNER "IN MINIATURE".
NOT JUST ONE OR TWO DESIGNS
They're highly respected everywhere for their great
wealth of authentic detail by museums, prototypes,
owners, millitary and cirline pilots and others.

Fight emphysema. tuberculosis, air pollution







CHRISTMAS 1971 O GREETINGS 1971

There's more to do...

Give more **Christmas**

Seals. 🕏

It's a matter of life and breath.



Purposeful Pavel Dvorak, Czechoslovakia, brings his Nordic to flyoff site. Shortly thereafter he had beaten all contenders.



Free Flight simple? Koster's (Denmark) had programming panel for flapped wing, autostab, autorudder. Note hinged hatch.



Latest in Russian Wakefield technology. Aluminum meter tubes, with rubber-tension operated autorudder and autostabilizer.



Averill, U.S.A. using Taylor's electric starter and light-sensitive Heathkit tach. Averill, Taylor both exceeded 25,000 rpm.



CANADA

ACADEMY A PRODUCTS



EVERYTHING FOR THE MODELER

Canadian Modelers:

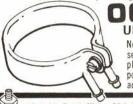
Write for an ACADEMY CATALOGUE. 75 cents, Postage free. Wholesale only.

Canadian Dealer Inquiries Invited.

ACADEMY PRODUCTS LIMITED

51 Millwick Drive, Weston, Ont., Canada.

Convert your model airplane engine for marine use . . . easily . . . instantly . . . neatly . . . with the OCTURA KOOLKL



UNIVERSAL WATER COOLING JACKET No disassembly of engine required . . . installs in 30 seconds . . . efficiently converts any air-cooled model air-plane engine to R/C boat use. Proven performance. No possibility of water leaking into engine. Glo-plug readily accessible. Vibration proof . . . corrosion resistant.

postage and handling

only

Adjustable-Depth Water Pick Up and Outlet-\$1.65



ENGINE Super Tigre 15 & 19 Super Tigre 29 Super Tigre 60 & 65 Veco 19 Veco 29 & 35 Enya 15 & 19 Enya 60 K & B 19 12 4 7 K&B29&40 OS Max 15 Rossi 60

To determine the size of Kool Klamp for engine not listed: measure diameter of cylinder head and the no. of 1/16's over 1" is the size to order.

OCTURA MODELS

If dealer cannot supply you, order direct. Add 10% for postage & handling. Illinois customers include Sales Tax. 8148 N. MILWAUKEE AVE., NILES, ILLINOIS 60648



Recording temperature system using ther-mistor senser belonged to U.S.A.'s Allen. Air conditions unlike those at meets at home.



Quaint East-European dance beneath gliding Nordic attemped to break loose a thermalstarting bubble. But did it do any good?

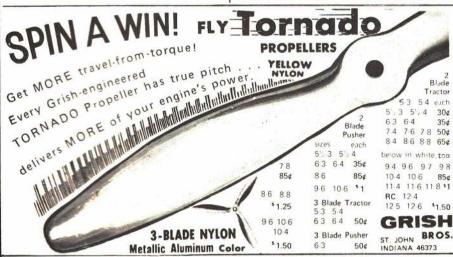


One of several types of thermal detectors in action. When bubbles went up, so did flyers. The kids loved all those bubbles!

Koster, Denmark, claims 7 min. on 10-sec. run in still air. He used auto flaps as well as autorudder and autostabilizer.









IMPROVED \$37.50

*SCALE BODY SHELL *TWIN BELT DRIVE *NEW HUBS

*NEW FOAM TIRS *HEAT SINKS

AUTODYNE-II

WHEN NOT A VAILABLE FROM YOUR DEALER ORDER DIRECT FROM US POSTPAID AT THE PRICE SHOWN MASS RESIDENTS MUST

INCLUDE 3% SALES TAX DEALERS - WRITE FOR TRADE DISCOUNT with cog belt drive and many other advanced features

ONLY \$57.50

(617) 245-5210 PRODUCT INNOVATION PO Box 24 Wakefield Mass, 01880 Blade

35¢

85¢

Look for the NYROD trademark on every Push Rod!



"THE Flexible PUSH ROD"

PLAINFIELD, ILL, 60544

SLIM PAK - packaged straight - & COIL PAK AVAILABLE





PRICESI

DISCOUNT CATALOG 25¢





Be different! Do a good turn!

UNITED WAY

Changing Address?

Please let us know in advance - five weeks notice would help! For fast service, attach current mailing address label in space provided. Then PRINT full name and address below.

> Check correct box and enclose payment

ATTACH LABEL HERE

Your subscription label helps to quickly identify your records. Enclose it when writing to us about your subscription.

WANT TO SUBSCRIBE OR RENEW?

☐ One year \$7.50 ☐ Two years \$14.00 Three years \$20.00 Renewal

Name _ Address

OFFER LIMITED TO U.S.A. AND CANADA

_ State _ City

AMERICAN Aircraft MODELER

733 Fifteenth St. N.W.

Washington, D. C. 20005

ZONA SAWS



F.A.I. Model Supply 1112 W. Mission Lane Phoenix, Ariz. 85021



SHIPS NEVER BEFORE AVAILABLE IN KITS AS PAPER MODELS

SHIPS NEVER BEFORE AVAILABLE IN KITS AS PAPER MODEL
BATTLE CRUISER ALASKA 27 IN., C8
C ALIFORNIA—TENNESSEE BATTLESHIP, 1944, 21 IN. \$2.75
PORTER CLASS DESTROYER 19-3
ATLANTA, JUNEAU CLASS, LIGHT CRUISER,
HEAVY CRUISER HOUSTON CLASS, BUILT IN 1930's,
HAS TRIPOD MASTS AND AA ARMAMENT ADDED IN \$1.70

COLORADO WEST VIRGINIA CLASS BATTLESHIP. 1940 \$2.50
DESTROYER SUMER CLASS, 1944
WICHITA HEAVY CRUISER, CA 45, 21 IN.
H. G. WATKINS — WATERLINE WARSHIPS
E.O. BOX 907. PARAMOUNT, CALLE, 90723

NDEX TO ADVERTISERS

INDEX TO ADVERTISERS	(4)
Herb Adams Rand Sales	82
Academy Products Limited	86
ACE Radio Control, Inc 68-	69
A.H.M	8/
A.R. Flight	
Badger Air Brush Co	
Canyon Plastics	
Cleveland Model & Supply Co	86
CMI Quality Kits	74
Coverite	65
Dembros Hobbies, Inc	76
Du-Bro Products, Inc	77
Dumas Products, Inc	82
EK Products, Inc	5
F.A.I. Model Supply	88
Fox Manufacturing Co	85
G. Products Co	85
G.K. Flightbox	72 43
Carl Goldberg Models, Inc 13, Grish Brothers	87
Paul K. Guillow, Inc.	88
John Hathaway	60
W.C. Hannan, Graphics	62
Heath Company	73
Hobby Helpers	86
Hobby Hideaway	78
Hobby Lobby International 10 Hobby People	8-9
Bob Holman Plans	83
Hotline Models	62
Indy R/C Sales	57
Indy Flite Sales	90
Kayeff Inc	74
Kalmbach Publishing Co	78
Klein Brothers	81
Kraft Systems, Inc 72, Cover	111
Kroker Engineering & Development K & S Engineering	83 87
	62
Larry's Hobby Supplies	85
Lindco	66
Midwest Products Co	79
Miniature Aircraft	81
Mini-Flite Co	83
M-n-M Radiomodels	88
Model Aero Publications	83 IV
Model Shipways	84
Nelson Model Products	80
Northfield Precision Instrument Co	64
Octura Models	86
Patchogue Hobby Center	84
Penford Plastics	76
Polk's Hobby Department Store	89
Product Innovation	87
Proline Electronics	60
Rocket City R/C Specialties	83
Scientific Models, Inc Cover Shamrock Competition Imports	76
Sig Manufacturing Co	10000
Squadron Combat Colors	78
Jack Stafford Models	66
Stanton Hobby Supply	71
Sterling Models, Inc	61 88
The state of the s	85
Tatone Products	88
The Testor Corp	a,b
Tomco	78
Top Flite Models, Inc.	67
W. E. Tyson	78
Verdell Instrument Sales Co	83
Waterline Warships	88
Williams Brothers	81
Wincek Variety & Hobbies	89
World Engines, Inc.	63
X-Acto, Inc.	7
A Rely like 111111111111111111111111111111111111	
	-



HOBBY CATALOGS

AIRPLANES \$1.50

MILITARY 1.00

Ships (wood) 1.00

RAILROAD 1.75

CRAFTS 1.00

Raceway, Science

& Rocketry 1.00

Dealer Inquiries Invited 314 FIFTH AVENUE N. Y., N. Y. 10001 2072 FRONT STREET E. MEADOW, L. I., N. Y. 197 Woodbridge Center Woodbridge, N. J. 512 MILBURN AVENUE MILBURN, N. J.

WINCEK HOBBIES

THE ONE STOP FOR ALL YOUR RADIO CONTROL AND CONTROL LINE NEEDS

Sig Dealer

KRAFT BOATS
M.R.C. ENGINES
O.S. HOBBY CRAFTS
ESTES MODEL ROCKET DEALER

Open Monday thru Friday, 10 a.m. to 9 p.m. Saturday, 9:30 a.m. to 6 p.m.

WINCEK VARIETY & HOBBIES Irving Park Road and Route 53 (next door to Sears)

Itasca, III. 60143

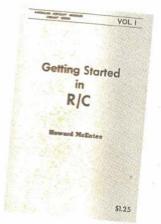
Phone 773-1617 Area code 312

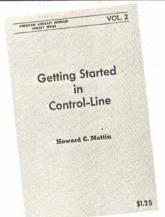
AMERICAN AIRCRAFT MODELER LIBRARY SERIES

Getting Started in R/C?

START TODAY—order Howard McEntee's

"GETTING STARTED IN R/C." Nineteen chapters of this informative series are now in a single volume at the low price of \$1.25 ppd. Use this book as a firm foundation for a start in Radio Control. Use the coupon below.





Interested in Control-Line?

START OFF with Howard Mottin's "GETTING STARTED IN CONTROL-LINE."

It's Vol. II in AAM's library series for the novice and the expert. Chapters cover all aspects of C/L—where to start, how to build, trim and fly plus a thorough review of competition events. \$1.25 ppd. Use the coupon below.

\$1.25 each or Order Both for only \$2.00

AMERICAN AIRCRA	FT MODELER V., Washington, D.C. 20005	
	for copy(s) of Mottin's	GETTING STARTED IN
CONTROL-LINE. (Price: I've enclosed \$	\$1.25 each). for copy(s) of McEntee's (GETTING STARTED IN R/C.
(Price: \$1.25 each). I've enclosed S f	or set(s) (One each of above)	, at \$2.00 per set.
RUSH TO:		
ADDRESS:		
CITY	STATE	ZIP

QUALITY HOBBY SHOPS

Quality Hobby Shop spaces are sold on a six-month hasis at \$7.00 per month, payable in advance. All insertions must be consecu-tive. No mention of mail-order business is permitted. Closing Date: 10th of third pre-ceding month. ceding month.

OHIO-CLEVELAND

We carry the most complete line in Ohio for your model airplane hobby. Also large HO train dept., Boats, R/C, motors, parts, supplies, dope, balsa, tools, books, magazines, etc.

NATIONAL HOBBY, INC.

5238 Ridge Road

(216) 749-4750

MASSACHUSETTS-CAMBRIDGE

Model planes, motors, railroads, ships, radio control equipment and accessories—also slot racing supplies. Open 9:00 AM to 5:30 PM daily & Thurs. evenings.

CROSBY'S HOBBY CENTRE

1704 Massachusetts Ave. (617) 547-4389

MICHIGAN-DETROIT (FERNDALE)

Trains, planes, stamps, coins, R-ways. Over 50,000 items for hobbyists. Mich. largest antique train collection. Look for our 55' RR crossing sign. Arnold Rapido.

MODELS HOBBY CENTER

22524 Woodward Ave. (Zip 48220) LI-3-2242

GEORGIA—DECATUR
HO Railroads, Planes, Model Car Racing. Open
11 AM to 10 PM. Metro Atlanta's Friendly
hobby shop.

HOBBY HOUSE DECATUR SPEEDWAY

130 E. Ponce de Leon

378-2253

HONG-KONG-KOWLOON

HONG-KONG—KOWLOON
The most complete stock of aeromodeling and
hobby supplies in the Far East. Sole agents for
Graupner, O.S. and Min-X and agents for Vernon, Frog, Solarbo and many others.

RADAR CO., LTD.

2 Observatory Road Kowloon, Hong Kong

K-680-507

NEW YORK-BUFFALO

NEW YORK—BUFFALO
Factory authorized Orbit and Micro-Avionics
sales-service center. New Orbit and Micro radio
systems at very best prices. Complete stock of
parts and accessories. Immediate service on all
Orbit and 1970 Micro systems. Guaranteed reconditioned previously owned Orbit systems always available.

ORBIT NORTHEAST

3833 Harlem Rd. 14215 Ph. (716) 836-6860

NEW JERSEY-IRVINGTON

The oldest established hobby shop in New Jersey. Everything in trains, ships, planes and rocketry. Hours 10 to 7 daily, 10 to 1 on Sun-

THE HOBBY SHOP

758 Springfield Avenue (201) 372-6211

1:p.m.

PORTLAND—OREGON
Portland's Headquarters for Radio Control
Equipment, all major brands, all at discount
prices, "Shop American," "The Friendly Shop."

AMERICAN PET & MODEL AIRPLANE

SUPPLY COMPANY

4308 S.E. King Rd. in the Disco Mart Ph.: 654-8777 Zip: 97222

shopping center.

SOUTH CAROLINA-BEECH ISLAND Near Augusta, Georgia. Headquarters for Radio Control Supplies—kits—motors and hard to get items. Building of kits or custom model. Open 9:a.m. till 11:p.m. plus Sundays till

MILLER'S HOBBY SHOP

(803) 822-0565 315 Laurie Drive

COLON, REPUBLIC OF PANAMA

The only hobby shop in the country. Model Planes, Motors (radio controlled), ships, H.O. and N. Gauge trains, complete stock of parts and accessories.

KELNIA S. A.

Front Street, Colon, P.O. Box 2086, Zone 3, Telephone, 47-7040. Warehouse in the Free Zone of Colon.

AVONDALE ESTATES, GEORGIA

Southeastern factory repair center for Micro Avionics and Orbit systems. Complete stock of parts. All work guaranteed. Parts in stock for parts. All work guarantees.
Blue Max and most systems.
HOBBY DISTRIBUTORS

4 Avondale Road. P.O. Box 102, Avondale Estates, Georgia 30002

CLASSIFIED ADS

Rates: 30c per word (including name and address). Minimum-14 words. Send remittance with copy and order to: AMERICAN AIRCRAFT MODELER, 733 Fifteenth St., N. W., Washington, D. C. 20005.

BALSA WOOD! 35¢ Savings. Popular sizes. Send stamped envelope for FREE SAMPLE and price list. TYRO MODEL AND SUPPLY, P.O. Box 11511, Pale Alto, Calif. 94306.

WORLD WAR II SCALE PLANS. %"-1' Scale Drawings with COCKPIT DETAIL; FW-190A5/A6 Bf-109G, P-51B/C, P-28L, Mark I Spitfire and F4U "Corsair", \$3.00 each from SUPERSCALE, Box 201, Arlington, Texas 76010.

COLORED #64 RUBBER BANDS, ¼ lb. post paid \$1.00. Red, blue, yellow, black, white, tan. MEISTER, 711 Main St., Keokuk, Iowa 52632.

MODEL ROCKET PORTFOLIO, \$2.00 four issues, 10 plans. Catalog 25 cents. ROCKETS-f, P.O. Box 7274, Long Beach, Calif., 90807.

WORLD WAR I HEX-CAMOUFLAGE, 4 colors, individually cut pieces, \$2.95 pkg. 1"-1' and 2"-1' scale. VINTAGE MODEL AIRCRAFT, Route 3, Box 219. Coos Bay, Oregon 97420.

FREE CATALOG—1,000 aviation books. Many with scale drawings and 3-views AERO PUBLISHERS, 329 M Aviation, Fallbrook, Calif. 92028.

INDOOR KITS AND SUPPLIES. Nichrome wire, Micro-film, parts, scale plans, indoor balsa. Send stamped addressed envelope for FREE literature. MICRO-DYNE, Box 2338, Leucadia, Calif. 92024.

CUTTING TOOLS for Unimat, Maximat and model-makers machines. End & horizontal mills, reamers, short drill bits, saws, carbide tools, more. Your machine and these cutting tools makes model mach-ing a snap. Catalog 25¢, RED, WHITE & BLUE, Box 654, Flagstaff, Arizona 86001.

BACK ISSUES AIRTRAILS, Air Progress, Aerodigest, Flying, Flying Aces, Popular Aviation, Aeromodeller, Airnews, M.A.N., all model, pulps, etc. AVIATION MAGAZINES, 24248 Crenshaw Blvd., Torrance, Calif.

MONEY? Save lots of it! We know of nobody who beats our prices. Write for free R/C-Kits-Supplies list. PUGET SOUND R/C ELECTRONICS, 1547 Hoff Rd., Bellingham, Wash. 98225.

Beilingham, Wash. 98225.
FLITE BOX PLANS BY INKY—Why not build your own at a fraction of the cost. A real beauty with folding legs, drawer and cradles; light and sturdy. Detailed, easy-to-follow plans, only \$2.00 or send self-addressed, stamped envelope for brochure on plans and built-up boxes. INKY, 10436 W. Rae Ave., Milwauker, Wisc. 53225.

KRAFT GOLD MEDAL SERIES w/KPS-lo's. Also, PCS (identical to Kraft Series 70) w/KPS-10's. Both w/buddy-box setup. \$225 each. ALLEN E. GRAVES, 1815 Devoe, Lincoln, Nebr. 402-389-9407.

RON'S HOBBIES—Specializing in Radio Control Supplies at discount prices. Write for free list. 43 Midcliff Dr., Columbus, Ohlo 43213. 614-861-3067.

RARE, USED, NEW items ads wanted, Sell, buy, trade thru ME, 1970 Orbit w/PSfD's \$250.00; used OS .15R/C \$8.00; EB wire wheels \$22.00. Many other items. List 25¢. Your ad & list 50¢. Modelers' Exchange, Box 73, New Lenox, Ill. 60451.

DARP CLASS "C" MAGNESIUM SPEED PAN. 71 Nationalts open winner, 20" long; cast integral skid. \$9.95 plus 50¢ postage in USA. NYS residents add 6% sales tax. NICK ARPINO, 301 Woodacres Rd., East Patchogue, N.Y. 11772.

17 FUEL FORMULAS for Glow, Diesel, and Ignition. \$1.00 FRED JAMIESON, 4966 4th Ave., Delta, B.C.

SELLING PRIVATE COLLECTION—Aeronautical Books, Magazines, and Model Magazines. Send for FREE List, LARRY PETERSON, 7366 Viar Ave., San Diego, Calif. 92120.

THE AIRPLANE THAT NEVER WAS: THE BOEING MODEL 2707 SET (COLLECTORS ITEM) DETAIL PLANS \$3.00, MAIL TO: "PLANS" P.O. Box 66446. Seattle, Washington 98155.

ACTUAL BALLOON FLYING experiences. Fifty pages better than fiction. \$3.00. R. PARK, Harper, Kan-

OLD AIR MOTORS WANTED—OTT, IMP, MAC-FARLANE, CAMPUS, etc. JOHN BROWN, 9611 Hill-view Rd. Analieim, Calif. 92804.

IGNITION ENGINE SALE! List 25¢. 3707 Vista De La Bahia, San Diego, Calif. 92117.

STINSON 108-2 "Voyager." Plans for R/C. Plans 2-36" by 72" sheets. 87.50 ppd. Many others available. List and sample 25e. CUSTOM PLANS SERVICE, 2331 S. E. Maple, Hillsboro, Oregon 97123.

RADIO CONTROL ENGINES. Supertigre 23: \$19.00; OSMax 19: \$15.00; DONS SALES & SERVICE, P.O. Box 224, Ft. Thomas, KY. 41075.

FIVE DOLLAS CAN SAVE YOU HUNDREDS, Self-addressed, stamped envelope for FREE details. DICK'S HOBBY SHOP, Box 41, Swampscott, Mass. 01907.

MODEL AUTO RACING SUPPLY, Box 547A, Bill-erica, Mass. 01821. Latest R/C auto racing catalog

AEROTEC MODEL ENGINEERING COMPANY, Box 116, Lincolndale, New York 10540 SCALE 2" to 1' MODEL PLANS YOU BUILD FROM, NOT JUST DRAWINGS

Plans Only

Rib & Former

Kits & Plans Boeing P-26-A (Peashooter) fighter S.P.A.D. 13 Fokker Triplane Albatros DV/DVa (full kit 7.95 26.95 7.95

79.95 this month) 7.95 28.95
Triad—three-in-one airplane, low wing, bi-plan parosol. Full Kit 46.

from

Don't Throw Out Your Broken Plastic ARF*R/C Airplanes

Repair them stronger than new with FIXUM

Use FIXUM to Repair - Modify - Strengthen Stop Cracks from Growing

> FIXUM is Fuel Proof - Sandable Dopable - Paintable

See Your Dealer or Send \$2.00 For 4 Ounces (Enough for a Bunch of Crashes)

INDYFLITE SALES FAIRLAND, IND. 46126

R. R. 3. BOX 208

Indiana Residents Add 2% Sales Tax

Works Great On Plastic U/C Planes



I'm putting my ads in the perfect place . . . AAM's **CLASSIFIEDS!!**

FREEFLIGHTER ARISE

Get a monthly news magazine that's 100% freeflight. A full size plan service. A united voice in the AMA for freeflight. Membership card and 2 color decals. Dues are \$3.50 a year for AMA members and \$4.50 a year for non AMA members. Write Annie Gieskieng, 1333 S. Franklin St., Denver, Colo. 80210

PERFEGT

FOR CARS, BOATS, GLIDERS AND SIMPLE AIRCRAFT

Quality without compromise. A proud addition to the world renowned Kraft line of proportional radio control equipment.

KP-2B two control digital proportional system.





Total airborne weight — 8.75 ounces

Airborne unit dimensions — Height-1½16 Width-1½22 Length-2¾2

Designed for economical, convenient Dry Battery operation (batteries not furnished)



\$11995 COMPLETE

Write for Free Catalog

450 W. CALIFORNIA STREET, VISTA, CALIFORNIA 92083
World's Largest Manufacturer of Proportional R/C Equipment





Our First Place Record Speaks For Itself.
World Champion — 1971 (FAI Pattern)
U.S. National Champion — 1971 (Class C Expert)
World Champion — 1969 (FAI Pattern)
And so it is with MRC-Webra, in competition after
competition, Sunday flight after Sunday flight, MRC-Webra engines
quietly take top honors with their winning ways.



These very same handcrafted MRC-Webra engines, used by the champions, in sizes .048 - .61, are available at your local hobby dealers.