MODEL AIRPLANE NEWS

JUNE 1950 • 25 CENTS

WHAT'S THE SCORE IN STUNT?

See Page 14

SAN FRANCISCO · DENVER · CHICAGO · NEW YORK
ESTABLISHED 1931 NEW ORLEANS

A generation in the model business guarantees our service and your satisfaction. Our business depends on pleasing you. Your business should be sent to us because:

1950 LARGEST MODEL & SUPPLY FIRM IN AMERICA

FREE! FREE!

50 items with gas engines, incl.:

Twith diesel or glo engines, all needed items are given!. Items include ● Quality Coil ● Everlast Condenser ● 3-way Plug Wrench ● Hi-Tension Wire ● Stranded Ignition Wire ● Insulated Coil Holder ● Correct Size Prop ● Presto Engine Starter ● Complete Instructions ● Plug Gauge Set ● Battery Box ● Slide Switch ● 24 pg. Engine Manual ● 4 Mounting Bolts ● 4 Mounting Nuts ● 4 Wiring Lugs ● Champion Spark Plug ● Identification Tags ● Motor Cover ● Speed Indicator ● Log Book ● Trouble Shooting Chart ● No. 70 Oil ● Membership in Modelcrafters of America ● A H C Guerentiy ● 64 pg. Giant 2-color Catalog ● Plus Free Postage, Packing & Insurance

12 items with gas planes, incl.:

● Correct Rubber Wheels ● Pro All-Metal Knife ● 72 pg. Construction Manual ● Speed Indicator ● Log Book ● Complete Full Size Plans ● Insignia ● Membership in Modelcrafters of America ● 64 pg. Giant 2-color Catalog ● Plus Free Postage, Packing & Insurance if ordered by mail — on Planes selling at over $1.50 only —

1. FREE one year subscriptions to Model Airplane News, Air Trails and Flying Models to our regular customers.
2. 14-Day Money Back guarantee on unused purchases.
3. Unused purchases exchangeable.
4. No postage or packing charges—we insure safe delivery.
5. 24 hour service. New York, Chicago, San Francisco, Denver and New Orleans addresses to serve you faster. If it's advertised, we can supply it.
6. Most complete model stock in America—gas, rubber, solids, etc.
7. Competent understanding of your modeling problems.
8. No "minimum" orders. Any order is welcome.
9. FREE Coil, condenser, prop, wire, etc., etc., with gas motors. 50 ITEMS WORTH OVER $7.00 AT NO EXTRA COST. SEE BOX ON LEFT.
10. FREE rubber wheels, knife, etc., etc., with gas planes. 12 ITEMS WORTH $3.50 AT NO EXTRA COST. SEE BOX ON LEFT.
11. FREE membership in "Modelcrafters of America," the club that keeps you up to date on gas modeling and SAVES YOU MONEY ON YOUR PURCHASES.
12. FREE illustrated giant 2-color 64 page catalog with every order.

N. Y. CITY MODELERS

Largest retail stock in N. Y. -- 4-story building to serve you. Near all subways. DROP iN FOR YOUR MODELING NEEDS. Bernard B. Winston, modeling author and expert, always here to help you with your problems. Complete store of engine parts and service.

ENGINES

GAS ENGINES

Air-O Mighty Midget	(C)	$16.75
Anderson Spitfire	(D)	24.95
Arden .099	(A)	9.75
Arden .199	(A)	10.75
Cannon 300	(B)	19.75
Cannon 358	(C)	21.50
Circle 30	(B)	14.95
Cobra 45	(C)	12.50
Contestor	(D)	11.95
Delong 30	(B)	18.50
Dennymite	(D)	6.95
Dooling 61	(D)	35.00
Forster 29	(B)	10.95
Forster 306	(C)	10.95
Forster 99	(E)	19.75
Fox	(D)	29.95
Hornet 60	(D)	10.95
Hornet 199	(A)	19.50
Judco Kit	(B)	6.95
K & B Torpedo 29	(B)	18.50
K & B 24	(B)	16.50
Ken	(D)	12.50
McCoy 19 Redhead	(A)	10.95
McCoy 29 Redhead	(C)	10.50
McCoy 40	(C)	25.00
McCoy 60 Redhead	(D)	27.50
Mohawk Chief	(B)	9.50
Ohlsson 19 Rotary	(A)	10.95
Ohlsson 19 RV Deluxe	(A)	11.95
Ohlsson 23 Rotary	(B)	10.95
Ohlsson 23 RV Deluxe	(B)	11.95
Ohlsson 29 Rotary	(B)	13.95
Ohlsson 60	(D)	11.95
Ohlsson 60 Kit	(D)	10.95
O.K. Bantam	(A)	9.95
O.K. Super 29	(B)	11.95
O.K. Super 60	(D)	11.95
O.K. Twin	(E)	49.00
Phantam P-30	(B)	18.95
Pierce 'J'	(B)	9.96
Pierce 'R' Kit	(B)	6.95
Pierce 'R'	(B)	12.95
Ram	(B)	6.75
Rogers 29	(B)	9.95
Super Champion	(D)	14.50
Super Cyclone Dual	(D)	13.96
Super Cyclone	(D)	12.95
Thor	(B)	9.95
Thor Kit	(B)	6.95
Triumph 49	(C)	15.96
Triumph 61	(D)	15.95
Wasp Twin	(D)	29.50
Wensen	(B)	15.00

DIESELS

Aero Diesel	(B)	16.50
Micro Diesel	(A)	14.95
Mite Diesel	(A)	12.50

AIR ENGINES

Campus A-100 Incl. Tank		5.96
Campus Bee. Incl. Tank		4.96
O.K. C 02		4.98

GLO PLUG ENGINES

Arden .099 Glo	(A)	9.75
Arden .199 Glo	(A)	9.75
Dooling 29	(B)	14.95
Forster 29 Glo	(B)	10.95
Forster 305 Glo	(C)	10.95
Forster G. 29 Glo	(B)	11.75
Forster G. 61 Glo	(C)	11.75
Fox 29	(B)	11.95
Fox 35	(C)	11.95
Glo-Devil	(B)	12.50
Glo Mite	(A)	7.95
K & B Glo Torp 24	(B)	14.95
K & B Glo Torp 29	(B)	14.95
K & B Glo Torp 32	(C)	14.95
McCoy 9	(A)	7.96
McCoy 19 Glo	(A)	8.95
McCoy 19 Race	(A)	10.95
McCoy 19 Redhead Glo	(A)	10.95
McCoy 29 Glo	(B)	9.95
McCoy 29 Redhead Glo	(B)	14.95
McCoy 49 Glo	(C)	19.95
McCoy 60 Redhead Glo	(D)	22.50
Mighty Midget GP	(A)	14.75
Mohawk Chief Glo	(B)	8.50
Ohlsson 19 Glo	(A)	9.95
Ohlsson 19 Glo Kit	(A)	8.95
Ohlsson 19 RV Deluxe	(A)	10.95
Ohlsson 19 RV Deluxe Kit	(A)	9.96
Ohlsson 23 Glo	(B)	9.95
Ohlsson 23 Glo Kit	(B)	8.95
Ohlsson 23 RV Deluxe	(B)	10.95
Ohlsson 23 RV "Kit	(B)	9.95
Ohlsson 29 Glo	(B)	12.95
Ohlsson 29 Glo Kit	(B)	11.95
O.K. Bantam Glo	(A)	7.95
O.K. Cub .099	(A)	5.95
O.K. Hot Head	(B)	9.95
O.K. Super 60 Glo	(D)	9.95
O.K. 60 Race Glo	(D)	12.95
Sportsman Jr.	(C)	14.95
Sportsman Sr.	(C)	16.95
Triumph 49 Glo	(C)	12.95
Triumph 61 Glo	(D)	12.95

JET ENGINES

Dyna-Jet	24.50
Dyna-Jet Redhead	35.00
ME. W. 307	15.00
Minijet	35.00

FREE-FLIGHT PLANES

American Ace 36" A	1.50
American Ace 54" B	3.95
Brigadier 38" A	1.50
Buccaneer 36" A	1.50
Buccaneer B Special 54" B	3.95
Buccaneer C Special 72" C-D	6.95
Buccaneer Std. 66" C-D	5.95
Buccaneer Super 96" D	9.95
Cavalier 60" C-D	5.95
Cavalier Custom 108" D	17.50
Cavalier Cust. Twin 108" D	20.00
Champion A	3.95
Comet Interceptor 42" A-B	3.95
Corsair 46" A-B	2.50
Good News 60" B	3.95
Humdinger 52" B	3.95
Luscombe Sedan 76" D	7.50
Luscombe Silvaire 48" A-B	3.00
Musketeer 42" A	2.50
Musketeer Std. 72" C-D	5.95
Playboy Sr. 70" C-D	6.00
Powerhouse 42" A	3.95
Powerhouse 56" B	4.55
Powerhouse 62" C	5.95
Sin-Jet 24" A	1.00
Skybe 66" C-D	6.95
Skyhuggy 42" B-C	3.95
Skyrocket 36" A	2.95
Spook 48" A-B	1.95
Stanzel Interceptor 58" A-B	2.98
Sunduster Spec. 88" D	4.95
Super Brigadier 58" B	3.95
Trixter Cub 29" A-B	2.00
Varsity 50" B	3.50
Wanderer 84" B-C	3.50
Zipper 32" A	2.50
Zipper 54" B	5.95

U-CONTROL PLANES

Aeronca Sedan 36" A-B-C	4.95
Atomic 14½" B	3.50
Baby Cinch 30" B-C	2.50
Baby Era 18" A	2.50
Baby Misbehave 24" A-B	2.95
Baby Sky Box 36" A-B	2.95
Baby V Shark 20" A-B	2.95
Beechcraft 40" B-C-D	9.95
Beechcraft 24" A-B	5.95
Ben Howards Pete 30" B-C-D	6.95
Berkeley Controliners:	
Bat 32" C-D	2.00
Bearcat 35" C-D	3.95
Bee 24" B	1.50
Bug 17" A	1.00
Buster 24" B-C	2.50
Hawker Sup. Fury 24" A-B	2.50
Key 29" B-C	4.95
Lil Duper Zilch 42" A-B	3.95
Minnow 22" A-B-C	4.95
Navion 26" A	2.50
P47 Thunderbolt 40" C-D	3.95
P51 Mustang 37" A-B	4.95
PeeWee Zilch 32" A	2.50
Super Duper Zilch 52" C-D	5.95
Super Zilch 52" C-D	4.95
Swee' Pea Racer 24" A-B-C	2.50
Big Cut-up 48" B-C	5.95
Bipe Stunt Train 22" B-C-D	3.95
Brave 36" A-B-C	3.95
Butch Trainer 28" B-C-D	3.65
Cessna 36" B-C	4.95
Chief 51½" A-B-C-D	5.95
Chupp Autogiro 34" B-C-D	4.95
Cyclone 36" B-C-D	4.95
Di Doe 28" A-B-C	3.95
Dmeco Spl. 24" C-D	7.95
Dmeco Spl. Jr. 16" A-B-C	3.95
Dynastreak 26" A-B	3.50
Dynastreak 24" (Jet)	7.95
Flivver 24" B-C	3.95
Fly Boy 24" A-B	1.00
Flying Circus 28" B	2.75
Flying Clown 28" A-B-C	1.95
Flying Saucer 18" A-B	1.95
Freshman 9 24" A	2.48
Freshman 19 30" A	2.98
Freshman 29 36" B	3.48
Hell-Razor 18" D	6.95
Hot Dog 17" A-B	2.00
Howard 'Ike' 24" B-C	2.95
Invader A 11"	6.95
Invader B 17"	7.95

NEWEST IN MODELING!!

AA ENGINES

Baby Spitfire (.045)	5.45
Infant Torpedo (.020)	4.95
K&B Torp. Jr. (.025)	8.50
O.K. Cub (.049)	5.95
O.K. Cub (.074)	5.95

AA PLANES

Baby Ace 18" UC	3.50
Baby Clown 22" UC	1.50
Baby Di-Doe 21" UC	1.75
Baby Era 18" U.C.	2.50
Baby Era Bipe 16" UC	2.50
Baby Phoenix 36" F.F.	1.75
Baby TC-2 Trainer 18" U.C.	1.98
Baby Zephyr 15" F.F.	.98
Civy Boy 24" F.F.	1.50
Civy Boy 31" F.F.	1.95
Cub Special 29" F.F.	2.00
Fly Boy 24" U.C.	1.00
Flying Circus Jr. 16" U.C.	1.50
Hawk 27" F.F.	1.50
Infant Wagon 20" U.C.	1.75
Lil John John 18" U.C.	1.95
Little Schmoe 17" U.C.	1.50
Maverick 24" U.C.	1.00
Mini-Zilch 16" U.C.	1.25
Pee Wee Pup 17½" UC	.75
Pee Wee Pursuit 16" U.C.	1.00
Pony 15" U.C.	1.95
Powerhouse 33" F.F.	1.50
Primer 18" U.C.	1.25
Profile Powerhouse 24" F.F.	1.00
Puddle Jumper 19" U.C.	1.00
Pup 25" F.F.	1.00
Shadow 32" F.F.	1.50
Sniffer 29" F.F.	1.50
Speedster 12" U.C.	2.25
Sport Prince 35" F.F.	1.95
Stunt Runt 16" U.C.	1.00
Termite 26" F.F.	1.00
Trixter Babe 20" U.C.	1.00
Trixter Cub 29" F.F.	2.00
Trixter Pixie 26" F.F.	1.00
Wing Ding 18" U.C.	2.00
Wing Dingus 16" U.C.	2.00

AA ACCESS.

AA Shut-off Valve (State engine)	.65
EZ Minimount	.85
Propellers	.28 & .35
Pylon .004 or .006 2.36" lines	.35
Spinner (state engine)	.60
Tanks 50c, 65c, 75c	

BURIED IN THIS AD are most of the new items. Sometimes there isn't time or space to include them. But, if available, we have it.

Streamliner 25" B-C-D	4.00
Stunt Ace 40" A-B-C	3.95
Stuntmaster 40" B-C	4.95
Stuntwagon 30 44" B-C	4.95
Stuntwagon 58" D	7.50
Super Bipe 28" B-C-D	4.95
Super Cinch 36" B-C	2.95
Super Sky Box Stunt 47" C-D	4.50
Super Snorky 40" C-D	3.50
Super Solution 18" A	2.25
Super Squirt 21" (Jet)	4.95
Taylorcraft 35" A-B-C	2.50
TC-2 Trainer 21" B	2.95
Texan Jr. 28" A-B	2.50
Texan Sr. 36" C-D	2.95
Topper II 16" A-B	2.25
Topper III 20" B-C	3.00
Trail Blazer 24" B-C-D	2.95
Trixter Invert Jr. 40" A-B	2.95
Trixter Profile 32" A-B	1.95
Trixter Profile 38" B-C	2.95
Trixter Twin Profile 47" B-C	3.95
Tuckette 36" C-D	3.95
Waco 33" B-C	4.95
Warrior 36" A-B-C	3.95
Whirlwind Sr. 30" B-C-D	7.95
Wildfire 23" B-C-D	1.95
Wing Dingus 16" A-B	2.00

ACCESSORIES

FUELS (Continental U.S.A. Only)

For Ignition	Pts	Qts
Ohlsson #1, #3	.75	1.40
Power Mist #6	.70	—
Reg. Pink	—	1.25
For Glo		
Ohlsson #2, #4	.75	1.40
Ohlsson AA	.75	—
Ohlsson #2 Econ, #4 Econ	.40	—
Powermist Glo	.80	—
Powermist Spitfire	.80	—
Ranger Glo	.80	—
Red Devil	.60	1.10
Testors 30	.75	—
Thimbledrome Cox	.75	—
Dynaglo	.75	—
Ranger AA	.80	—
Spitfire AA	.80	—
OK Cub	.75	—
For Diesel		
Drone	—	1.00
Ranger (Fluted Head)	1.00	—
Ranger (variable head)	.85	—

Pouring Spout For pint cans .10
Hot Fuel Proofer .25, .35 & .45

PROPELLERS

Buzzard 9", 10" in 12", 14" p
11" in 10", 12" pitch five for 1.00
Excell 3-blades 8, 9, 10, 11" in 8p; 8, 9" in 10p. 1.20
Rite Pitch Stunt 8, 9, 10, 11, 12, 13, 14 in., 6 and 8 pitch .85
Rite Pitch 8, 9, 10, 11, 12, 13, 14 in., 6, 8, 10 or 12 pitch .35
Super Spl. 8", 9", 10", 11" in 6 & 8" p. .25
Also all sizes of Ohlsson

RUNNING & TEST BLOCKS

E-Z Running Stand 1.25
Madewell Test Block 2.25
Universal Running Blocks 1.50
Weight Test Block 8.95

METAL GAS TANKS

Dale Tanks—All Sizes .65
#1—1½x1½x⅜ Stunt
#2—2¼x1¼x⅜ Stunt
#3—2¼x1⅞x1 Stunt
#4—¾x1¼x⅜ Stunt
#6—1½x1⅜x1 Stunt
#12—⅝x1x⅜ Half R.
#15—2¼x1¼x⅜ Half R.

Froom: 1½x1½ or 2 hor. or ver. .75
1¼x1¾x2 Sq. .80
1¾x ⅝x2⅝ Wedge .90
1¾x1x2⅛ ½-RndStunt .90
1¾x1x1⅛ ½-Round .85

Masco .65c & 1.00

FLYWHEELS

A & B—1.00; C & D 1.50
DeLuxe 3/16" shaft—1.25; 1/4" shaft—1.50; 5/16., 3/8" sh. 1.75

IGNITION COILS

Aero Featherweight 2.50
Aero Qual. 3.00 Regular 1.50
Arden 2.50 Rogers 2.00
O.K. 1.50 Spitfire 1.50
O.K. Twin 3.50 Wilco 1.95
Winston 2.00
Smith; Competitor—1.95, Firecracker 2.75—Dual 4.50

CONDENSERS

Regular—.20 Smith Metal .35

SPARK & GLO PLUGS

Arden Glo (V2 or V3) .65 & .85
Arden AA .49
Champion Glo V, V2, V3 .75
Champion V, V2, V3, VR1, VR2 .50
Infant Glo-plug (spl) .85
McCoy Hot Point .49
Ohlsson Glo (V, V2 or AA) .65
Ohlsson Economy V3 or AA .50
O.K. Glo-plug (V2 or V3) .49
Plug washers .05

IGNITION ACCESSORIES

6 ft. Hook-up wire .25
Alligator clips .10
Arden Booster Jack 1.25
Austin Booster Plug-in .30
Midget Switch: slide—30c Turn .50
Ohlsson Snap-Pack .35
Arden Battery Cord Kit .35

PROP SPINNERS

Adapter Nuts (state eng.) .20
⅝"—20; 1¼" .65
1¼"-.85; 1⅝"-.90; 12"-.95; 2½"-1.00
3" Needle Nose 1⅝" dia. 1.15
2" 1.20
Plastic 1½" .20
Scamper Plastic 1½", 1¾", 2", 2½" .45

WHEELS

Semi Pneumatic (pr) 2" .35
2½"—1.00, 3" 1.50
Sparky Tail Wheel Assembly .25
Sponge Rubber, Dural hub (pr)
⅞"—20c, 1 1¼"-25c; 1¼", 1⅜"-30c
1⅞"—45c, 2¼" .60
Sponge Rubber, Wood Hub (pr)
2"—40c, 2½"—50c, 3½" .60
Tail Wheels ⅝"—10c; 1⅛" .15
Trexler Pneu. (pr) 1¼" or 1½" .40
1¾", 2"—50c; 2¼", 2½"—60c; 2¾" 1.00
3"—1.25; 3½"—1.50; 4½"... 1.75

FLIGHT TIMERS

Austin metal 1.50
D-E Shut Off Valve 1.00
Fuel Pump 65 & .69
Hillcrest Plastic .25
Stutter-off Valve .75

MISCELLANEOUS

Batt. Box Pen. and Medium .40
reg. .60
Brass Tubing 1/16", 3/32", 1/8" .15
Coil Holder .15
Copper Tubing 1/8" OD, per ft. .20
Fill-It .45
Finger Guard .40
Fuel Line Filter .35
Fuel Pump .65 & .69
Metal Motor Mounts, Sm—30c; Lg. .50
Metal Pump Can .75¢ & 1.50
Needle Valve Exten. flexible .35
Neoprene Tubing, per foot .30
Transparent .15 AA Transparent .20
No. 70 oil, 3 oz.—.35¢; pint .60
Plastic Fuselage 10" set of 2 .50
Plug Wrench, 3-way—15c; 4-way .25
Plywood (6"x12") 1/32" .20
1/16"—.25; 1/8"—.30; 1/4" .35
Silk per yard 1.50
Silkspan, light 18"x24" (white) .05
heavy 24x36" (white) .10
Red, Blue, Yellow 24"x20" .10
Socket Plug Wrench, 4-way .50
Soldering Set 2.25
Spinnet Starter 5.00
Tissue (most colors) 20"x24" .05
Universal Needle Valve .50
Flexible .75
Vibratac 2.00

U-CONTROL ACCESSORIES

Adjustalink Control Handle
5" or 6" .39
Adjustable Push Rod set .25
Aristrol Plastic Handle .75
Bellcrank 2"or 3"—10¢, 4" .15
BERKELEY control lines
.008, .011, .014 2-70' .65
2-150' 1.00
Stranded .015, .021, .25 .75; 70' 1.00; 200' 2.75
Berkeley Metal Flight Reel 1.25
Berkeley Metal Handle 1.00
Elevator control horn .10
Plastic Balsa, 4 ozs. .70
Thinner, 4 ozs. .45
BERKELEY DOPE
Clear Dope 4 oz. 30c, pint 90c
Colored Dope 4 oz. 35c, pint $1.60
In: Light Blue, Dark Blue, Silver, Green, Yellow, Gray, Black, White, Red, Olive Drab, Brown, Cream and Orange.
Banana Oil or Thinner 4 oz. 30c
Cement or Thinner pint, 90c

2 Ready-to-run Leaders

FREE PREMIUMS INCLUDED

THOR B $9.95

Everything you want in your engine. A REAL POWER PLANT!! .29 displ., 1/6 horsepower, weight 4 ounces. Class B

IN KIT FORM $6.95

RAM $6.75

With features that step-up power, give longer life with lighter weight Class B, .292 displ., 1/6 h.p. 6800 rpm, weight 4¼ ozs.

DUAL RAM INCL. GLO PLUG $6.95

IDEAL BEGINNER'S KIT

only $1.98

For only $1.98 you get a 118 page fully illustrated book on building and flying rubber powered models PLUS materials and plans for building 5 well designed gliders PLUS 3 fine rubber powered flying ROG and hand launched models PLUS one flying scale model PLUS one display model PLUS metal knife PLUS large tube cement PLUS clear dope PLUS 30 feet rubber.

Everything needed to construct 10 planes and gliders in a complete beginner's course for only $1.98.

Elevator hinges 4 for	.10
E-Z Plastic Control Handle	.85
Luxon Clips A, B, C or D Pr	.10
PYLON control lines .006, .008, .010, .012, .014, .016 dia. 2-52' lines	.60
.010, .012, .014, .016, .018, .020 dia. 2-70' lines	.65
Flexible 2-52' 1.50; 2-70'	1.95
Pylon Control line Reel	1.00
Reel Pal Reel	1.00
Simplex Handle & Reel	1.25
Stunt Bellcrank & Elev. Horn	.25
Swivels, small 15¢ pr.; large	.20
Take-off Delly kit	1.00
U-Reely Contr.—7.50; cable	8.50
U-Reely Remote	12.50
Veco Bellcrank .20 &	.25
Wood Control handle	.25

CEMENT & DOPES

Cement in tubes .10, .15 & .25
COMET DOPE: (.10 and .25)
Fire Red; Sunshine Yellow; Horizon Blue; Jet Black; Regal Maroon; Silver; Gloss Top Coat; Thinner; Olive Drab; Midnight Blue; Radiant Orange; Bright Green; Snow White; Dusky Gray; Rich Gold; Aircraft Cream; Sanding Sealer; Clear Dope; Banana Oil.

AERO GLOSS

Colored Dope, 4 ozs. .60
Silvaire Aluminum; Taylorcraft Cream; Corsair Blue; Fokker Red; Lambert Gray; Cub Orange; Stinson Green; Swift White; Stearman Red; Cessna Gray; Cub Yellow; Cessna Green; Jet Black; Waco Maroon; Curtiss Blue.
Clear Dope, 4 ozs. .55
Balsa Fillercoat, 4 ozs. .60

MODEL BOATS

Chris-Craft Cruiser 26" C-D	5.95
Chris-Craft Express 25" BCD	5.50
Chris-Craft Runabout 25" BCD	5.50
Harco 26" B-C-D	5.50
Owens Yacht 26" B-C-D	5.50
Vinyard 25", BCD	5.50
Dumas Electric Drive Unit for 6 above ships	4.00
Buckeye prefab. 17" A-B-C	4.95
" Cabin Cruiser 17" ABC	5.95

16 DIFFERENT GAS POWERED BOATS LISTED IN OUR CATALOG

THIMBLEDROME

Cox. 15 or .099 Engine only	7.95
Cox .199 Engine only	7.95
Cox car ready to run with engine	12.95
Cox Dirt Track	2.00
Champion car ready to run with Cox Engine	16.95
Thimbledrome Race Car	3.49

ALSO ALL COX UNITS

RACE CARS

McCoy Midget	7.50
McCoy Complete	16.95
Ohlsson Race Car	4.95
Ohlsson Complete	19.95

DECALS

Black or Yellow: Any Numeral or A, M, N, R, C, X 1" 4 for .05; 2" 2 for .05 3" 2 for .10
Trim-film—3 x 12 Booklets .25
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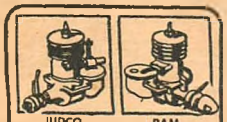

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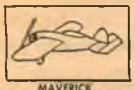

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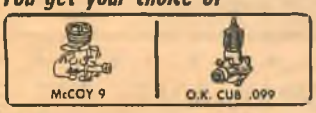

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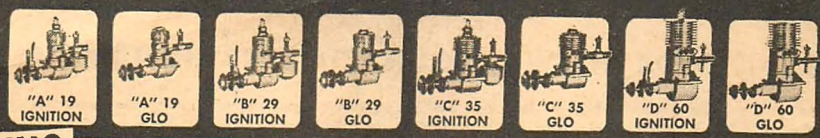

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IT'S THAT B-36 AGAIN, this time with Air Force plans to make it not only the longest-flying airplane in the world but the world's fastest and highest-flying strategic bomber. The Air Force has revealed plans to add sweepback wings and supersonic propellers to the B-36 to bring its top speed up to about 550 mph and its operating altitude to 55,000'! The standard B-36 already has about 15° sweepback in the wing leading edge, but this is for stability not for speed; and the outer wing panels are to be swept back about 35° to increase the critical Mach number of the airplane. The supersonic propellers are simply conventional propellers with thin, supersonic blades to permit them to rotate efficiently at supersonic speed. (Propeller tips have been operating at supersonic speed for 20 years!)

THE DECISION TO try out such improvements on the B-36 is part of a general Air Force review of its future bomber program. The huge Boeing XB-52 turbo-jet-powered bomber has long been scheduled as the "B-36 replacement," but the Air Force recently admitted serious doubts about the ability of a turbo-jet bomber to operate at ranges in the vicinity of 10,000 miles, as can the B-36. Since turbo-jet engines use just twice as much fuel as reciprocating engines, a jet bomber flying at the same speed as the B-36 would have to carry twice as much fuel and 42,000 gallons of fuel would weigh about 300,000 lbs., which means that the bomber carrying that load would weigh more than *half-a-million pounds!* So its no wonder the USAF is looking more towards improving the present B-36 than it is towards the incredibly difficult design problem of a 10,000-mile turbo-jet bomber!

YOU CAN ADD another number to your list, this time the F-95. It is the new North American F-95A all-weather fighter that was formerly designated the YF-86D and features a solid nose with the air intake located scoop-fashion under the radar housing. It's a slightly modified F-86 *Sabre* fighter. Whereas it appeared earlier that the YF-86D and the North American F-93A were in competition for USAF all-weather fighter orders, observers point out that the assignment of a "whole number" to the YF-86D is certain indication of USAF procurement plans. Air Force has already placed an order for 122 F-86D (now F-95A) but indicated that some of these might be switched to the F-93A pending outcome of tests.

WHILE THE EYES of all U.S. helicopter enthusiasts are on the "New York Helicopter Case," now being studied by the Civil Aeronautics Board in Washington, news comes that the British are going to steal a march and inaugurate the world's first passenger helicopter service **June 1.** And, of all things, the new service will be operated by Sikorsky helicopters! About a dozen firms have applied to the CAB for permission to operate passenger helicopter service in the New York metropolitan area and the Board is now studying their arguments but a route award is not expected to be made until late this year at the earliest. Meanwhile, British European Airways has completed plans for a regular scheduled passenger service using Sikorsky S-51 helicopters between Cardiff, Wales, and Liverpool, England.

PLANS HAVE DEVELOPED for the quantity production of the *Helioplane,* one of the most talked-about airplanes in recent years. An agreement has been reached between the Helio Corporation and Aeronca Aircraft Corporation by which the latter will produce the airplane but the former will retain engineering and sales direction of the program. The *Helioplane* was developed by Lynn Bollinger and Otto Koppen as the answer to the personal aircraft problem and its slots, flaps, huge, slow-turning propeller, etc., give it amazingly short take-off and landing run. CAA certification tests are being planned for the airplane and should be completed by early Fall. Helio will assemble the first group of planes from Aeronca-built parts but later Aeronca will assume complete production of the airplane.

A NEW LEASE on life for the Martin 2-0-2 transport is the purchase of 35 new model 4-0-4's by Eastern Air Lines and 30 of the same type by Trans World Airlines, thus ending more than five years of sales effort and company studies of twin-engine aircraft by these two air lines, the last "holdouts" among companies having a serious need for the type (United Air Lines does not plan to replace its DC-3's by twin-engined types at present). The new 4-0-4

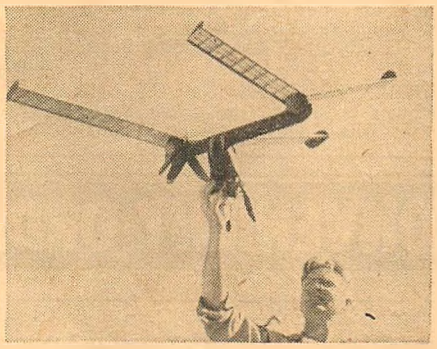
(*Turn to page* 61)

REPORT FROM THE WEST

by Jim Saftig

IT'S rather amusing to be an eavesdropper around a bunch of modelers. For instance, we're out at the *San Diego Aeroneers'* Field and the free flight boys are trimming tabs, adjusting timers, etc. Critical eyes are pointed skyward as a ship leaves for the wild blue yonder. The engine cuts, the pull-out is made, and the ship is on its own. Now it's "yak yak" time. Engines are orally torn apart, airfoil sections are "pro'd and con'd," and there is just a general rebuttal of anything and everything pertaining to model planes. Big beef started? No! This is just a regular sport flying session that takes place every Sunday (unless that man who sends up those big white balloons brings the wind and the rain). Guess we all have listened and most of us have taken part in these general discussions. This is not just a bunch of useless talk. Right here on fields such as that mentioned, the new model trend is taking shape. In the West (and we are not alone) the ½A class has moved in en masse. These sport and contest jobs are really making their bid for popularity. Denny "Hogan" Davis has been putting his ½A jobs way up there, and many of them have gone over the hill. Ray Acord, Lud Kading, Jack Butler, and many more of the "wheels" are out in the starting circle with the ½A models while the big stuff stays in the car. They're not abandoned, but Junior is feeling his oats so he is getting in his licks.

Let's drop over to the U-control circles and see what's going on. Sure enough, there's that ½A Class again. Scale, stunt,



Something different! Ernie Wrisley tests Canary; it's very stable with exceptional glide

speed, and team racers—they're all there. The "yak yak" session is on here, too. Boil it all down and what do you get? The ½A engine has arrived, it's getting more popular, and it's going to *stay!*

We had the opportunity of taking in the Hobby Show held at the Shrine Auditorium in Los Angeles. The weather man had stepped in with a bit of that dismal wet stuff, but it didn't seem to dampen the spirits of the crowd or exhibitors. Displays ranged from 49'er relics to the latest in kitchen cutlery. The model railroaders gave the spectators a look at some very nice lay-outs. The model plane enthusiasts had a small circle at their disposal, to demonstrate the little ½A engines. Maximum line length was limited to about 10'. Our good friend Bob Palmer shrunk the lines on his *McCoy 9* Powered *Papoose* and proceeded to cut capers. Believe us, the wire fence encircling the flying area was snatching at the wing tips of any of the jobs that took off. The demonstration periods took place every hour on the hour. The junior type racers burned up the track. "Hobby Bobby" Enright fired up a Mac job; the sound effects were fine but you couldn't see much of the car as it was really eating up the track. We certainly missed our good friend Jim "Ceiling Walker" Walker. It seems that Jim couldn't make it due to the expansion program at his factory. Everyone had hoped to see him perform with that "Sabre Dancing Fireball," and with his radio job. We were all inquiring about you, Jim. Everyone enjoyed the big assortment of *Ceiling Walkers*, gliders, etc., that you sent down for the spectators. We sincerely hope you

Dick Everett gives us a look at his new Wakefield job *El Dobo*

can find time to make the Hobby Show next year.

The *San Diego Airliners U-control Club* is rolling once again. We all remember the excellent Annual Contests that this club put on in Balboa Stadium. Cliff Potts wields the gavel at the meetings, ably assisted by Harold Ledington, secretary, and R. J. Van-Lannen, treasurer. The Club boasts about 50 members and is planning to continue the tradition of having an Annual each year. *The La Mesa Airfoilers*, under the guiding hand of Johnny Slater and Merv Becker, have gone into a huddle with the *Airliners*, and the results have been mighty fine. The two clubs have purchased a very nice perpetual trophy which is for the mythical county championship meet. These meets have been scheduled quarterly, and the club that wins the "mug" three times consecutively keeps it permanently. The contest is strictly stunt and team stunt. The points are figured according to classes, and whether the pilot is a junior-beginner or advanced, senior-beginner or advanced, and so on. This is very similar to the point system used by Hank Bourgeous at the all-stunt meet held in Santa Ana by the *Thunderbugs*. Everyone seems pleased with this type of meet. The *Airliners* managed to to squeak through with a win at the first contest, but believe us, the *Airfoilers* were closing fast. This type of meet has really brought the ships and flyers out for practice sessions on weekends, and modeling down South has had a shot in the arm. The next contest is scheduled for sometime in May.

Frank Cummings, Bill Atwood, Ernie Wrisley, Dick Everett, and a host of other Wakefield men are busily engaged in build-

(*Turn to page* 60)

Ed Rominger (pres. of the *Aeroneers*) and son Dave check ships before flight

"Rite Pitch"

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☐ 8"— 6	.35	☐ 11"—10	.35
☐ 8"— 8	.35	☐ 11"—12	.35
☐ 8"—10	.35	☐ 12"— 6	.35
☐ 8"—12	.35	☐ 12"— 8	.35
☐ 9"— 6	.35	☐ 12"—10	.35
☐ 9"— 8	.35	☐ 12"—12	.35
☐ 9"—10	.35	☐ 13"— 6	.35
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☐ 10"—10	.35	☐ 14"— 6	.35
☐ 10"—12	.35	☐ 14"— 8	.35
☐ 11"— 6	.35	☐ 14"—10	.35
☐ 11"— 8	.35	☐ 14"—12	.35

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☐ 8"— 8	.35
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☐ 9"— 8	.35
☐ 10"— 6	.35
☐ 10"— 8	.35
☐ 11"— 6	.35
☐ 11"— 8	.35
☐ 12"— 6	.35
☐ 12"— 8	.35
☐ 13"— 6	.35
☐ 13"— 8	.35
☐ 14"— 6	.35
☐ 14"— 8	.35

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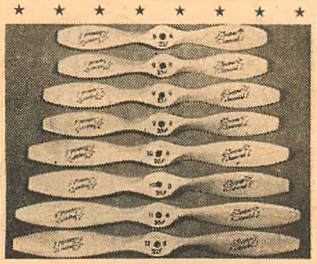

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☐ 8"—8	.25
☐ 9"—6	.25
☐ 9"—8	.25
☐ 10"—6	.25
☐ 10"—8	.25
☐ 11"—6	.25
☐ 11"—8	.25

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☐ No. 13 Small .. .60 ☐ No. 14 Med. .. .60
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☐ No. 16 Baby .. .60 ☐ No. 17 Junior - .60
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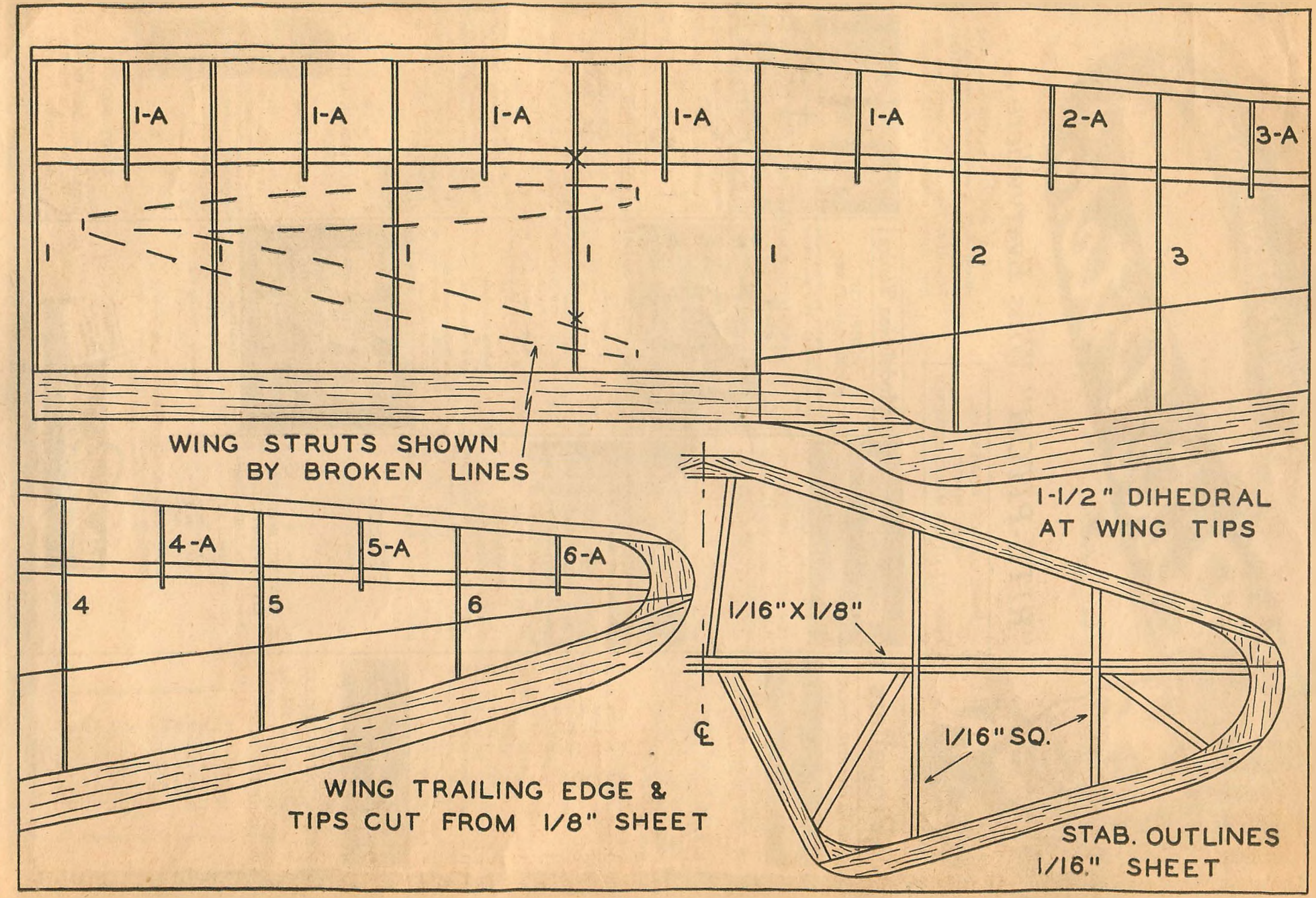
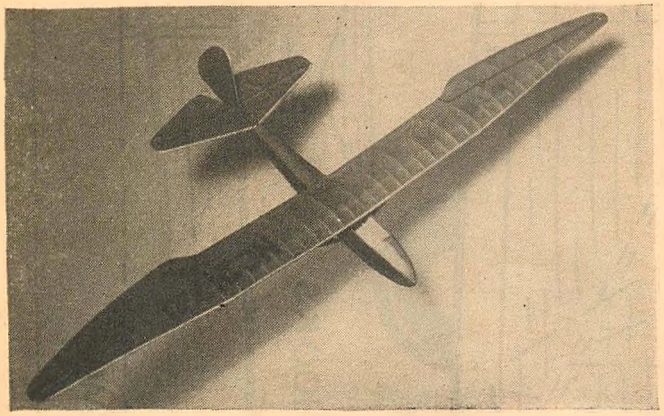

1-A
1-A
1-A
1-A
1-A
2-A
3-A
1
1
1
1
1
2
3
WING STRUTS SHOWN
BY BROKEN LINES
1-1/2" DIHEDRAL
AT WING TIPS
4-A
5-A
6-A
4
5
6
1/16" X 1/8"
℄
1/16" SQ.
WING TRAILING EDGE &
TIPS CUT FROM 1/8" SHEET
STAB. OUTLINES
1/16" SHEET

THE WOLF

An attractive towliner of simple construction and fine performance



By A. L. CLEAVE

THIS model sailplane offers a welcome change from run-of-the-mill contest type gliders, in that it combines exceptional flying qualities with the beauty of a real-life sailplane. Originally built in Germany, a few of these ships have made their way into this country and have become well liked by every pilot who was lucky enough to fly one. The model closely follows the lines of the original, yet turns in flights that are above average for a flying scale ship. To date several flights have been made of 2 to 4 mins. duration, under circumstances that were not the best; and under ideal conditions, much longer flights should be easily obtained by the model *Wolf*. Construction has been kept as simple as possible, and any details not explained on the plans are described in the text.

The entire fuselage is covered with sheet balsa to represent the plywood covering of the full size *Wolf*, but on the plans certain portions of the sheet are omitted in order to show a little more clearly the formers and other general construction details. The sections of sheet shown and labeled as *1/32" sheet fuselage sides* are the basic framework of the fuselage, and these two sides are cut from fairly hard sheet as the first step in constructing the model. The "stiffener" pieces shown are strips of 1/16" sq. cemented to the inside of the fuselage sides to strengthen them. Next, cut the formers from a rather soft grade of 1/16" sheet, and join the two side pieces with them as shown on the top view, starting at the widest point and working toward either end of the fuselage. After the glue has dried thoroughly, use a small sandpaper block and a piece of very fine paper to sand the formers and bevel the edges of the sheet sides in order to insure a smooth and permanent joint when the rest of the fuselage is covered with balsa.

Now, pick out a piece of soft 1/32" sheet and proceed to cover the remainder of the framework, with the exception of the cockpit, and the points where the wing and stabilizer are attached to the fuselage. Incidently, it is a good idea to sand all the sheet balsa before it is cemented to the fuselage. If the sanding is not done in this manner, it will be non-uniform, since there is a tendency to sand through the sheet in the spots where there is some framework underneath. After all the sheet is in place and the cement is dry, trim off excess wood, then select a medium-hard block of balsa to be used for the nose block. Trace the shapes shown on the side and top views and cut the block roughly to shape with a coping saw. Cement the block securely to the front of the fuselage. When the cement has dried well, use a sharp knife and trim the block to its exact shape, finishing up with sandpaper so that the block and fuselage join together smoothly.

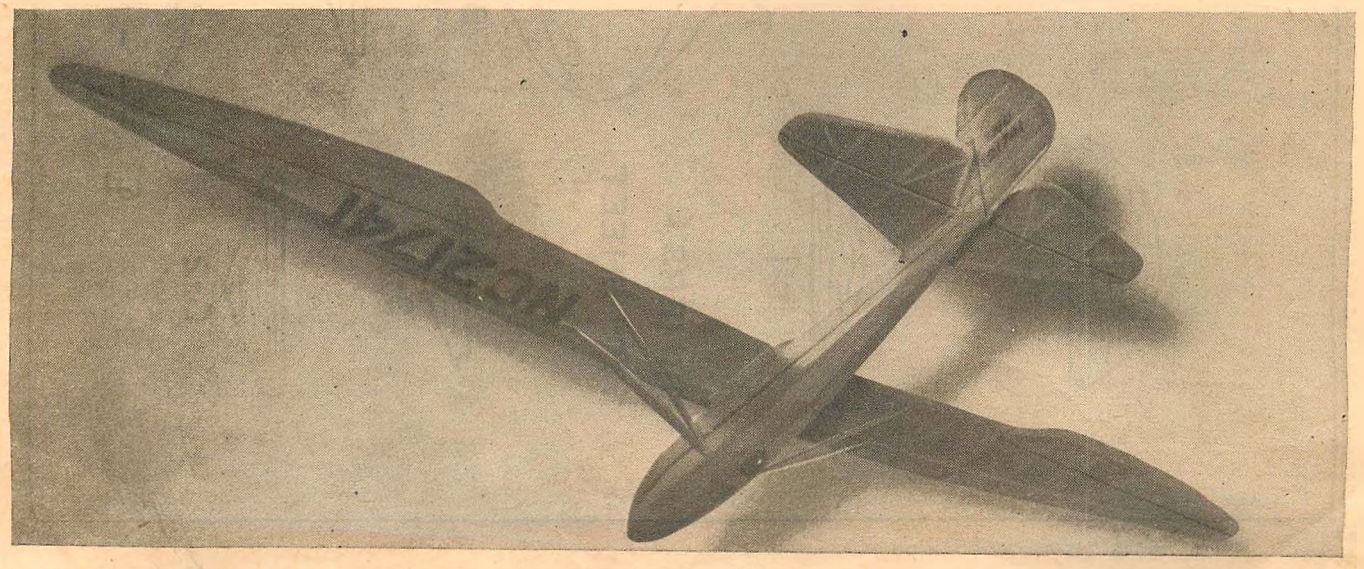
Begin constructing the wing by cutting out twelve ribs marked No. "1" and twelve nose ribs marked "1-A." Two of each of the remaining ribs and nose ribs are required. Cut the spar and leading edge to the sizes shown on the plan from 1/8" sheet, and cut the trailing edge and tips from the same size stock. Trace the wing plan from the magazine pages so as to show the complete structure and work directly over this drawing. Pin the spar to the plan and cement the ribs to the spar in their correct positions. Then add the leading edge, tips, and trailing edge; when the cement has dried, lift the structure from the plan. Repeat the procedure for the other wing, and when dry it may be lifted and both wing halves trimmed and sanded. Use a sandpaper block on the top of the wing to insure smoothness and an even taper of the ribs of the outer panels. Join the two wing halves with 1-1/2" of dihedral at each tip.

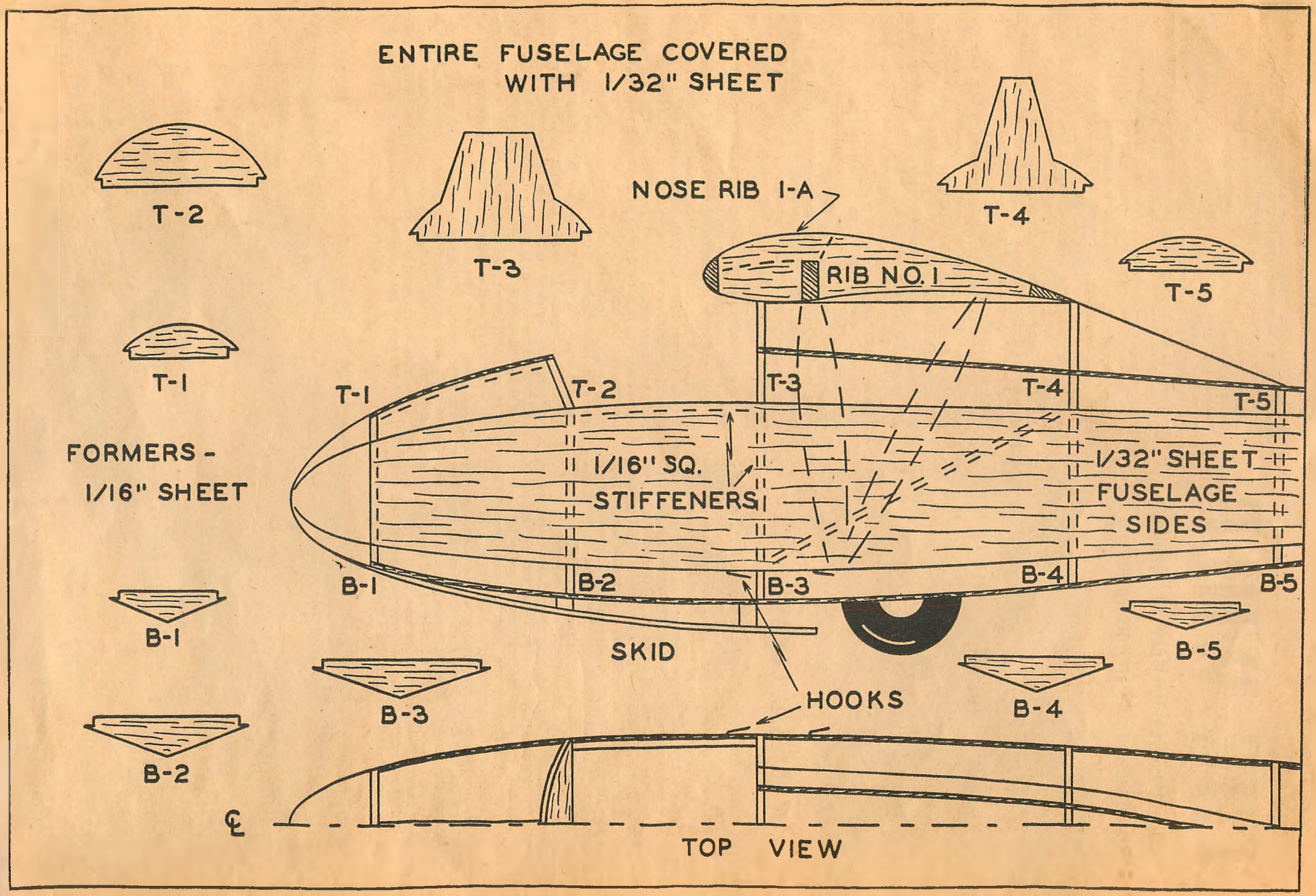
The outlines of the tail surfaces are cut from a medium grade 1/16" sheet and pinned to position on the plan. Cut the spars for both rudder and stabilizer from 1/16" x 1/8" stock, and the crosspieces from 1/16" sq. strips. When the cement has dried, lift the frames from the plan and cement soft 1/16" sq. strips over the crosspieces to serve as cap-strips; then sand the entire surfaces to an airfoil section. Lightness in the entire model is important, but it is doubly so in the tail group, so try to keep construction as light as possible.

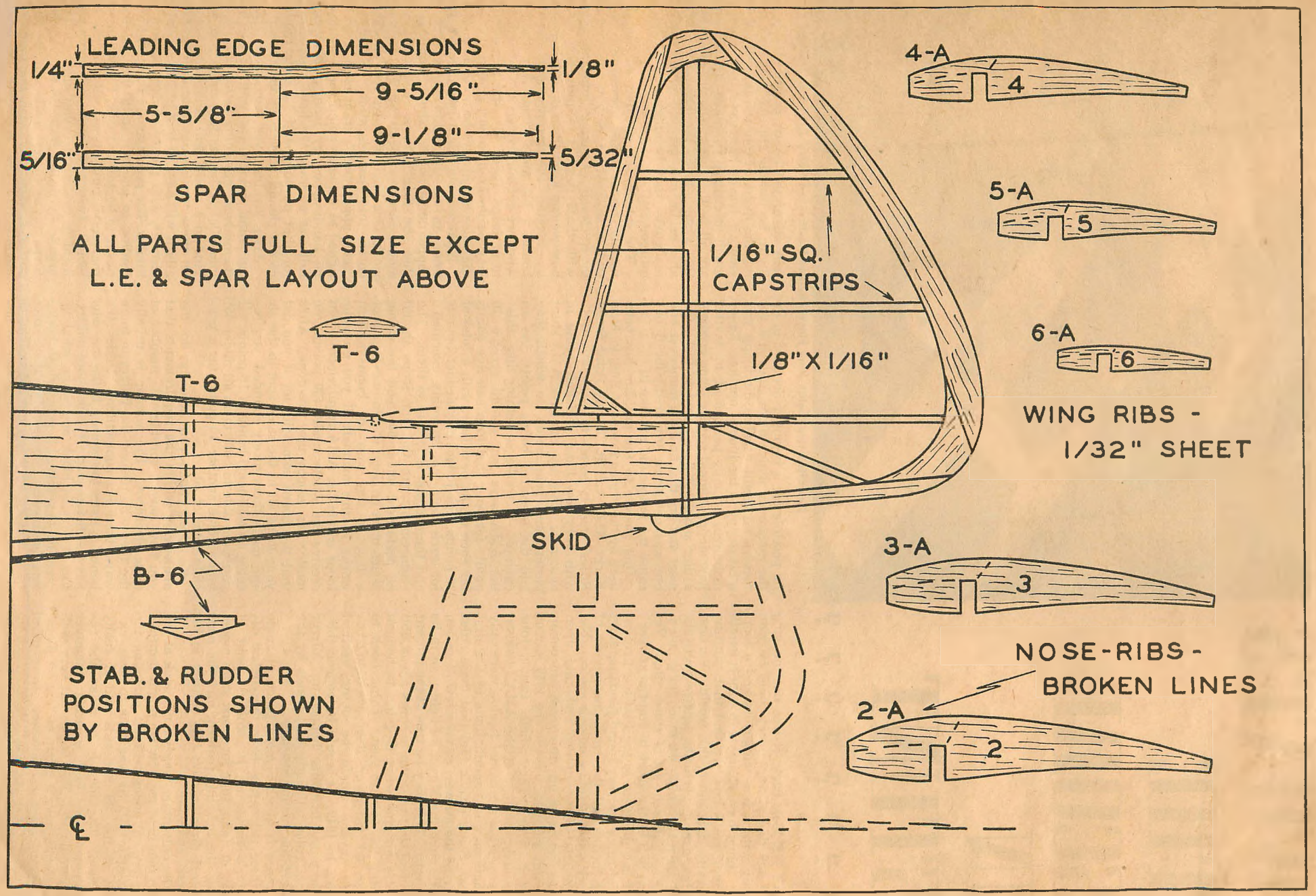
Cover the entire model, sheet fuselage included, with a good grade of light tissue. Care should be taken in covering, as many a neat job of building has been ruined by a sloppy finish. It is advisable to add the thin strips of black tissue to represent the control surfaces before assembling the various parts. License numbers, trim, etc., should also be applied at this time. Assemble the model, taking care to have everything in correct alignment; and while the cement is hardening, cut the wing struts to the shape shown by the broken lines on the wing plan. Sand them to a streamlined section and attach them to the wings at the points marked with small "X's." Cut the nose skid from either bamboo or hardwood and cement it to the bottom of the fuselage as shown on the side view.

The balsa wheel may be mounted on an axle in the fuselage if desired; but to save weight, the original model had merely

(*Turn to page* 59)

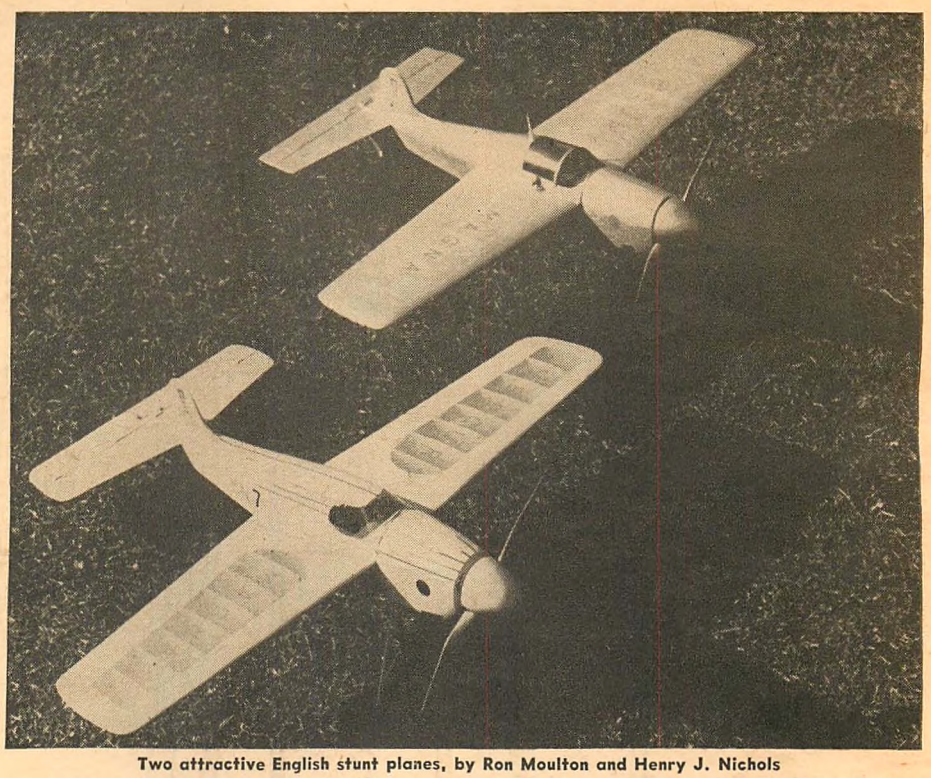



ENTIRE FUSELAGE COVERED
WITH 1/32" SHEET
T-2
T-3
NOSE RIB 1-A
T-4
RIB NO. 1
T-5
T-1
T-1
T-2
T-3
T-4
T-5
FORMERS -
1/16" SHEET
1/16" SQ.
STIFFENERS
1/32" SHEET
FUSELAGE
SIDES
B-1
B-2
B-3
B-4
B-5
SKID
B-1
B-5
B-3
B-4
HOOKS
B-2
℄
TOP VIEW


LEADING EDGE DIMENSIONS
1/4"
1/8"
9-5/16"
5-5/8"
9-1/8"
5/16"
5/32"
SPAR DIMENSIONS
ALL PARTS FULL SIZE EXCEPT
L.E. & SPAR LAYOUT ABOVE
1/16" SQ.
CAPSTRIPS
1/8" X 1/16"
T-6
T-6
B-6
SKID
STAB. & RUDDER
POSITIONS SHOWN
BY BROKEN LINES
4-A
4
5-A
5
6-A
6
WING RIBS -
1/32" SHEET
3-A
3
NOSE-RIBS -
BROKEN LINES
2-A
2
℄

WHAT'S THE SCORE IN STUNT

? ? ? ? ? ? ? ?



Two attractive English stunt planes, by Ron Moulton and Henry J. Nichols

AS WE look back, it was not too long ago that a stunt meet could be won easily with a few wingovers and a loop. Yes, things have changed in a short length of time, until now we find that stunting is really right out of this world. Vertical eights, double verticals, square verticals, etc. are all taken pretty much for granted, as is our present set of stunt rules. Yet what will be the score in stunt next year?

It is quite plain to see that our present set of rules are very sound fundamentally and include *all* the basic maneuvers of which our controline models are capable. It is true that you can elaborate upon them and come up with some concoction such as the rules used in the 1949 Mirror Flying Fair. They had twenty-four maneuvers instead of the AMA's twelve; however the additional twelve were only variations and combinations of the first ones. Some people feel that these rules may be the answer, as very few fliers can go through the Mirror's Flight plan in its entirety. This may be true at the present moment, but we have to think ahead and try to imagine what is going to happen during the coming year. Think back to those old "wingover" days; we didn't believe anyone would be doing vertical eights in 1949. It would be conceivable, then, to say that this "hopped up" Mirror set of rules will only be *peanuts* by the end of the coming season!

There is another more practical angle to these rules, too—from the contest director's viewpoint. It requires about 14 mins. of flying time for a *fast* stunt model to go through this pattern; pity the poor contest director with fifty entries in his meet!

The only other way we can look at the situation is to see how we might improve our present rules without changing the maneuvers. This was done to some extent at the '49 nationals and it really worked! The idea is to make the requirements for each separate maneuver more difficult. This works out very well when you have a group of "expert fliers" in your contest. However, in general practice, it may leave a little too much up to the judges' interpretations. It would be possible for a beginner actually to do the maneuver under these rules and yet receive *no* credit because his flying was a bit sloppy in the judges' opinion. Every maneuver actually performed, no matter how sloppy, should receive some credit—a flier shouldn't be allowed to leave the meet and say that he did a maneuver and but was not given any credit for it because the judges did not like it!

One answer to the problem has been used by the *Flying Bisons* of Buffalo, New York. They call it "Bonus Point Stunt Rules" and it seems to work out well, with very few close decisions being in evidence. They use the basic AMA stunt pattern and point setup, to which they add the so-called bonus points. As an example, it works something like this: the AMA says you should receive 10 points for your first loop and five points for each of the next four, with a total of 30 points. The judges may deduct 2 points for each loop "not smoothly executed," and the decision is left up to them. The requirements are that the loops should be performed under 60°, and the whole series must be done within one-fourth of a lap. In this case the bonus system works in this manner: if you do your loops *within* the AMA requirements, you receive the whole credit (30 points) no matter how sloppy they are done. After that the bonus comes in, for if you did your loops all in the same spot in the air and made them nicely rounded, you receive an additional bonus of 10 points. If you were able to hold them all under 45° you receive another 10 points for a possible total of 50.

So many fliers can actually do the maneuvers within the requirements that you now have a considerable number of *close* decisions. The winner is usually the flier who pleased the judges in more ways than his competitors. Under the bonus system, the winner is the one who has the better aircraft, plus more ability. For it says in black and white what he must do to receive his points, both basic- and bonus-wise. In operation these rules have created very few close decisions as it is extremely difficult for a flier to obtain all of the bonus points in any one flight; he usually slips at least once during the flight. From the judges' point of view, it leaves him clear, as he has no tough decisions to make himself—they are all in the rules. On the other hand, this system gives the beginner a break also as he can get full credit for any maneuver that he does within the requirements!

The whole set of rules showing the various bonus points are printed at the end of this article so you can visualize them clearly. Looking into the future, with these rules it is quite easy to see how we can keep them up to date simply by making the requirements for the bonus a bit more rigid. For example, when we get our models so they will perform loops under 45°, the requirements may be lowered to 30°, and in that way the rules can always be up to date.

Whatever our flight requirements continue to be, it would seem that the "appearance points" should continue, so that the flier with a really well-built model receives credit for his additional work. One angle that we feel should not enter into consideration, however, is "scale appearance"; stunt models are designed to *maneuver* and they should not be handicapped by having to resemble full size aircraft. We have a scale event for that purpose, and all scale requirements should remain in that event!

After looking over some of the tricks our stunt models (as well as the fliers themselves) are going to have to do, one immediately begins to wonder just what kind of a model will be able to perform all these "inside-out" maneuvers. Actually it will have to be a highly specialized aircraft, with plenty of development behind it. The problems are many, with one leading to another, until the end seems never to be within reach. First, you work the model until it will turn in its own length (which is quite an accomplishment in itself); then you discover that it practically disintegrates *in the air*! Sharp turns mean heavy loads on the flying surfaces, especially with the high-speed models that are becoming so popular

by GEORGE WILLSON

Stunt fliers are getting better, stunt rules tougher; where are we headed? The writer offers a proven set of rules that give everybody a chance

today. So it becomes a matter of aerodynamic design, plus structural engineering, before you can have a completely successful model.

I believe that at this time I have a model which fills the bill, at least as well as any other. Perhaps if we run over its basic design, the fundamental requirements will become somewhat clearer and a bit of the "fog" can be cleared away. What we are actually looking for is the "ideal stunt model," one which would be stable in level flight, extremely maneuverable, rugged enough to last for at least one season, and yet pleasing to look at! Yes—that is a lot to ask for, but it is not impossible to obtain if you go about it in a systematic way.

Let's see what can be done by starting from the flying end, or aerodynamic design. Foremost in our needs is a tight turning radius and ability to perform maneuvers in the smallest possible area. This is governed by several things, among which are the wing loading, flying speed, moment arm length and total drag.

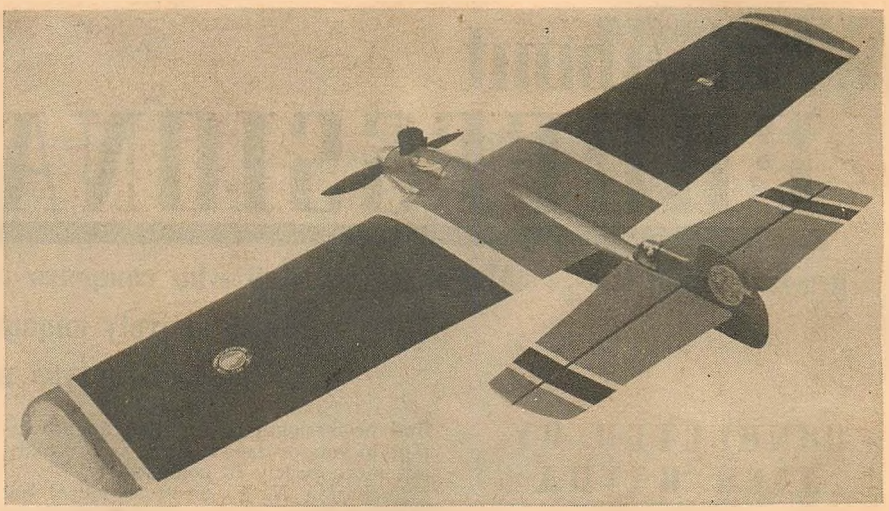
One of the essential assets is a relatively high flying speed, as this allows the model to snap around tight corners without stalling out or loosing its speed. At the same time it must stay on the end of the lines without allowing them to become slack. Therefore, all features we use in the model must be of a low-drag nature, with every part as clean as we can possibly design it.

With a high-speed flying, an extremely short tail moment arm will be an asset, allowing us to turn sharply. If this arm is too long, it will tend to dampen out the effect of our control surfaces, so that the model will go around in a sweeping arc, instead of the nose chasing the tail around, so to speak. The short moment arm has another advantage too—it helps keep the size of the fuselage to a minimum, which in turn reduces over-all weight. Above everything else our model must be short-coupled.

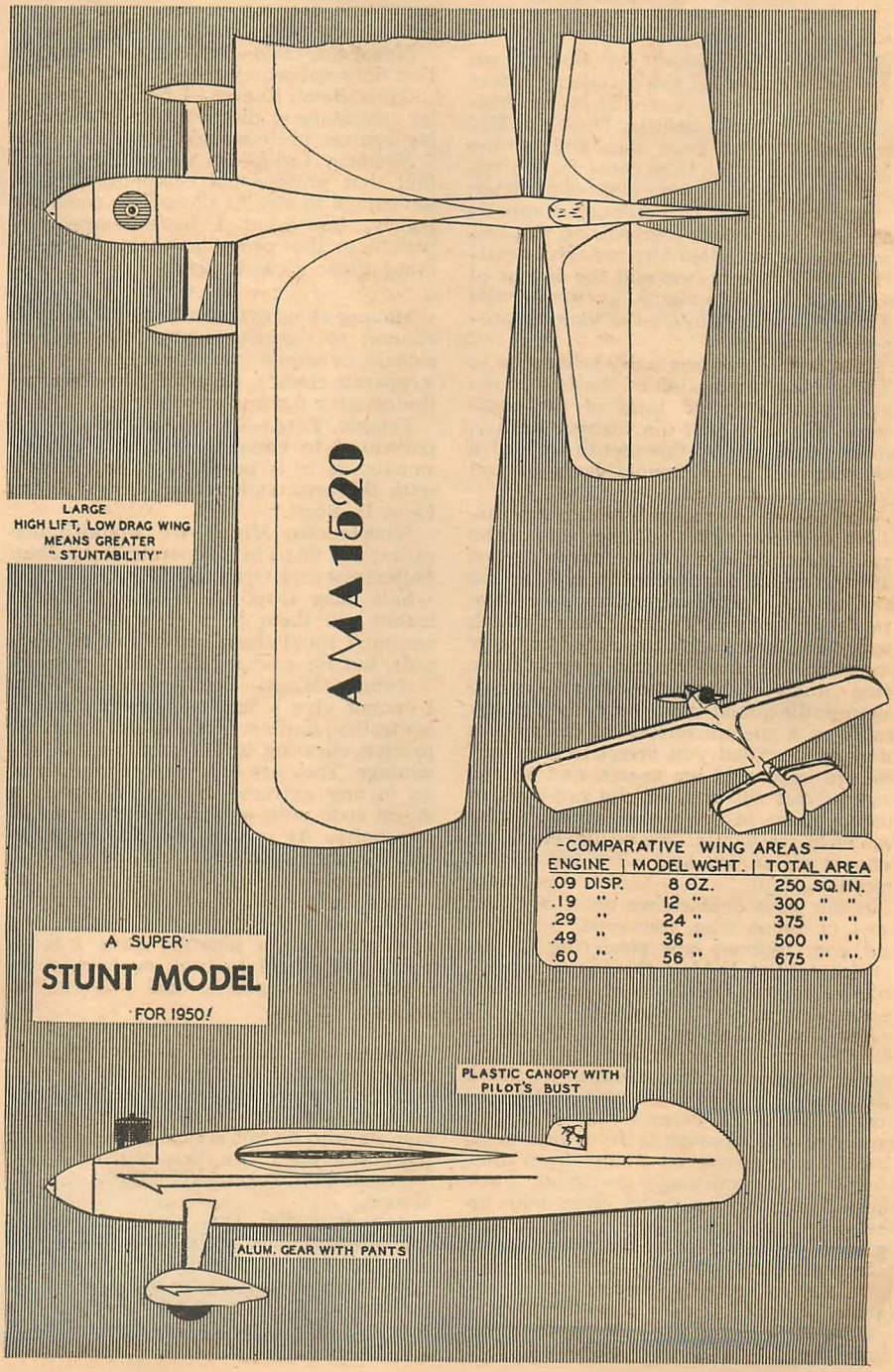
We now have a model that will turn sharply at a high speed, but we find that it looses speed in consecutive maneuvers, which is not good from the appearance standpoint, nor is it easy to fly in this manner. Experience has shown that this trouble can be traced directly to wing loading. In figuring wing loading we must use the *total* weight our wing must lift, that is, the weight of the model ready to fly *plus* the weight of the lines used.

In designing the wing, we really should not consider it by area, but by *total lift generated*, for it is lift, and not just area, that must offset the total weight. This lift is generated by an airfoil, and airfoils vary to extremes—some develop tremendous lift and others have practically no drag. We are looking for one which produces a great amount of lift to offset model weight; at the same time, however, it must not create too much drag, or our flying speed will fall off. So we choose one with medium lifting powers, and which

(*Turn to page 46*)



Typical American stunt plane with short fuselage and huge surfaces



What About PROFESSIONALISM?

pro-fes'sion-al-ism . . . Model Flying. One who competes against amateur model builders while actively engaged in the manufacture or sales of the specific type model or engine in competition.

CONDUCTED BY JACK BAYHA

PART THREE

WE REALLY asked for it, but we never expected the deluge of letters which have daily appeared at MODEL AIRPLANE NEWS. From Seattle, Wash., to Miami Beach, Fla., from one end of the nation to the other they came in. We received letters from every class of modeler, from utter novice to hardened competitor. The comments received and the answers to the questionnaire are most gratifying; your Moderator and the Editor of M. A. N. wish to thank everyone who answered our call to air the issue of professionalism.

This article was originally scheduled to have been a summation of the letters received, and a grand total of the comments. We have just too many letters to work it that way, so this month we'll give you some of the comments, both *for* and *against*.

We received so many letters congratulating us for bringing out the facts in the professionalism case that we haven't space to list them all. Just accept thanks for the kind words. On the other hand, we have one letter from Galveston, Texas, which read, "The arguments presented in your magazine thus far—for and against, have done much to hurt modeling in small communities, and you may feel justly proud of a magnificent bit of destructive propaganda. Glad you aren't in Russia?" We are very glad we aren't, and as our angered fan will see, we did not consign his comment to the waste basket, as he was sure we would. We really intend to present *all* angles and *all* sides of this question.

In our own defense we must say that most of those who answered, both pro and con, feel we are rendering a real service to the hobby; the majority will rule, since this isn't Russia, and we will continue with our forum.

Actually, it has been very difficult to classify the comments sent in by the model builders of the nation. We have tried to take as big a cross section as possible. In some cases we have had to group several comments from one area, since we received so many from that vicinity. It is particularly gratifying to see the advisers of the model clubs take up the cudgel in this discussion; surprisingly enough, they favor both sides.

In most of the answers given here, we have had to greatly shorten the comments, because of space considerations.

Here are a few of the answers to Question One (As a model builder, do you find professional competition an advantage to you, or does it cause you to make out more poorly in contests?):

Rochester, N. Y.—Professionalism has kept me from even attempting to enter contests. I just fly for fun. I cannot afford to burn up a motor in one flight by using one drop of oil per quart of fuel, as I have seen done. Milton Benz.

Mansfield, Ohio—Professional competition does not worry me. M. Petrovic.

Great Bend, Kansas—I find no particular advantage or disadvantage in competing against professionals. Wm. B. Roosa.

Newman, Calif.—As a model builder, I find that professional competition is an advantage to me. At times I *do* come out poorly, but what I have learned by watching the pros has helped me at other times. Francis Rogue.

* * *

Moving along to Question Two (Are you content to compete against the professionals, or would you rather see them in a separate class?), we again travel around the country for our answers:

Temple, Texas—I am happy that I am permitted to compete with the professionals. It is a privilege to participate *with* the pros, rather than against them. Leon H. Scott.

Minneapolis, Minn.—We would much rather see them in a separate class. John Setterberg and Graig Stout.

Salt Lake City, Utah—I would much rather see them in a separate class. I wouldn't mind them competing for records, but for prizes, NO! Noall Cornwell.

Auburn, Wash.—Being a free flight fan, I cannot give a true answer to this. In controline, that's something else again. At present cheating is the pros biggest advantage. They are out for blood, and will go to any extreme to win. We need a moral code with *published* infractions as a penalty. At present no one dares to dispute the word of a big wheel. Ted Enticknap.

East Aurora, N. Y.—I don't think you will accomplish a thing by putting the professional in a separate class. I think it is a big thrill to beat, or even come close, to the professional. George E. Willson.

* * *

Across the **country** we got equally mixed reactions to Question Three. (Do you feel more friendly towards those professionals who do not compete against you, or who do not accept prizes, than to those who do?) The fliers say:

San Angelo, Texas—YES! Sgt. James M. Moore.

Arlington, Va.—One would think that the professionals would be intelligent enough to detect resentment, and take it upon themselves to make the proper corrections without the matter being brought out publicly. Since it *has* been brought out, some of the duller individuals still seem unable to take it in, and stay awake nights to figure out feeble excuses for their actions. Robert O. Goodwin (V.F.W.), Senior Adviser, *Arlington Aero Modellers.*

Albany, Oregon—I don't care if they take prizes, but I don't think they should compete for prizes that they donated, or that the company they are affiliated with donated. John Ribey.

* * *

Question Four asked: Would you be for, or against, a ruling prohibiting the professional from active competition? Some answers were:

Flushing, N. Y.—I am against prohibiting professionals from competition. Robert L. Hatschek.

Utica, Mich.—Definitely against such a ruling. Earl W. Natzel.

Lexington, Va.—I think the best solution for the professional problem would be an AMA board to decide whether a man was a professional or not. (Name withheld at request.)

Falls Church, Va.—I am absolutely opposed to professionalism in amateur competition. Francis E. McGee.

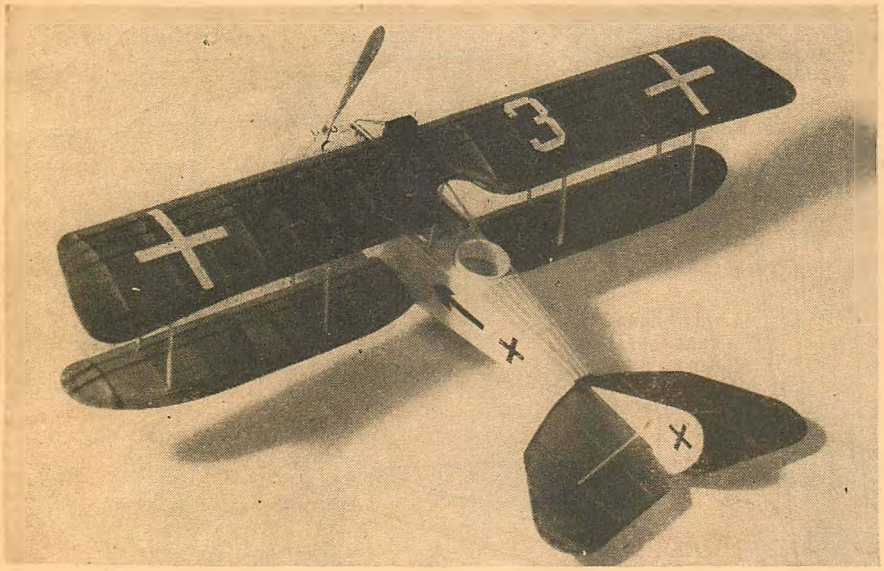
* * *

Question Five (Is our definition of professionalism a fair one?) received a rather one-sided answer. Almost all the contributing model builders thought it to be fair.

Question Six, relating to any particular experience the flier may have had while competing with a professional, got a rather interesting reaction. We found the names of certain prominent "pros" mentioned in many of the letters, usually in rather unfavorable terms. Readers said:

Salt Lake City, Utah—I think men like Jim Walker do a world of good for the model industry, but people like ——— ——— are ruining it. (Name withheld.)

(*Turn to page* 60)



RUMPLER C-5

by WALTER MUSCIANO

OUR Rumpler averaged 2 mins. and 20 secs. duration time for 8 flights in non-thermal weather (early evening calm). A few days later a high time of 4 mins. and 35 secs. was reached. This fine performance is attributed to the careful selection of model construction material and the inherent stability of the full scale design, i.e.: plenty of dihedral, sweepback, long landing gear, large-diameter propeller and moderately long nose. The only item that does not maintain true scale outline on our model is the horizontal stabilizer; however it was decided to sacrifice here, in order to attain flights of good duration. The wing area is over 210 sq. in. which also improves performance. The prototype model used an undercambered airfoil which resembles the original full scale airfoil, but a "Clark Y" type should not decrease performance too much.

Used for observation and light bombing missions in late 1917 and 1918, the Rumpler C-5 was standard equipment in the German Imperial Air Service. One fixed Spandau machine gun was mounted on the right side of the engine, while the observer was armed with a ring mounted Parabellum machine gun. Although the Rumplers performed their duties with excellence, they could not be compared to the strength and durability of the D.H. 4, nor the maneuverability of the Bristol two-seat fighter.

Before we construct this famous plane the plans must be drawn full size. In view of the fact that these are presented half size, doubling all dimensions is all that is required.

Keep the model as light as possible without impairing its structural strength. Sand all the balsa, before assembly, until all the nap on "hair" is removed. Cut the wing trailing edge to a rather sharp edge. One thick or two thin coats of dope are sufficient for good finish; added doping just cuts duration.

Select medium hard 1/32" sheet balsa and cut out two fuselage sides. Cement the 1/16" hard strips to the inside of these sides as the plan indicates. Cut the formers at this time as well as the 3/32" medium hard bottom crossbraces. Join the fuselage sides at the rear and insert the former and crossbrace at station "E." The landing gear can be bent while this is drying. Install former "C" and then hard nose piece "A," being sure to cut out for the nose plug. The remaining formers and crossbraces can be now installed. Bind the landing gear to crossbraces with fine thread and cement well. Cover the fuselage top from station "E" forward with 1/32" medium balsa, and when dry cut out the cockpits. The ring mount is also 1/32" sheet (note the grain direction). Add the 1/16" medium strips to the turtle-deck and the soft balsa block to the bottom of the cowl. Carve the latter to shape when dry. A fairly hard balsa nose block is now carved to shape. It should be remembered that the nose block must be removable; therefore cement a plug to this that will fit the hole previously cut in the 1/8" sheet nose piece, "A." Sand the fuselage lightly and cover the open frame with fine Jap tissue. (We used white.) Clear dope once.

The rudder is cut from 1/32" sheet balsa—note the grain direction. Lay out the stabilizer directly on the plan using the material specified, and cement all joints well. Make this structure in one section. Sand the frame and cover both sides with red fine Jap tissue, using dope as the adhesive. Pin the stabilizer to the workbench and water-spray lightly. When dry apply one coat of clear dope and remove when thoroughly dry. Repeat this procedure for the other side. Cement in place on the fuselage and add the fin and rudder.

Both wings are made with right and left panels. First lay the trailing edge on the workbench, blocked up to the proper angle, and pin the ribs in place. Attach the spars, followed by the leading edge. Add the wingtip and cement all joints firmly. Sand the structure with fine sandpaper and cover with red tissue. It is suggested that the bottom of the wings be covered first, to make sure the tissue is well attached to the rib underchamber. When completed, pin the wings to the workbench and water and dope in the same manner as the stabilizer. Join the two upper wing panels with the required dihedral.

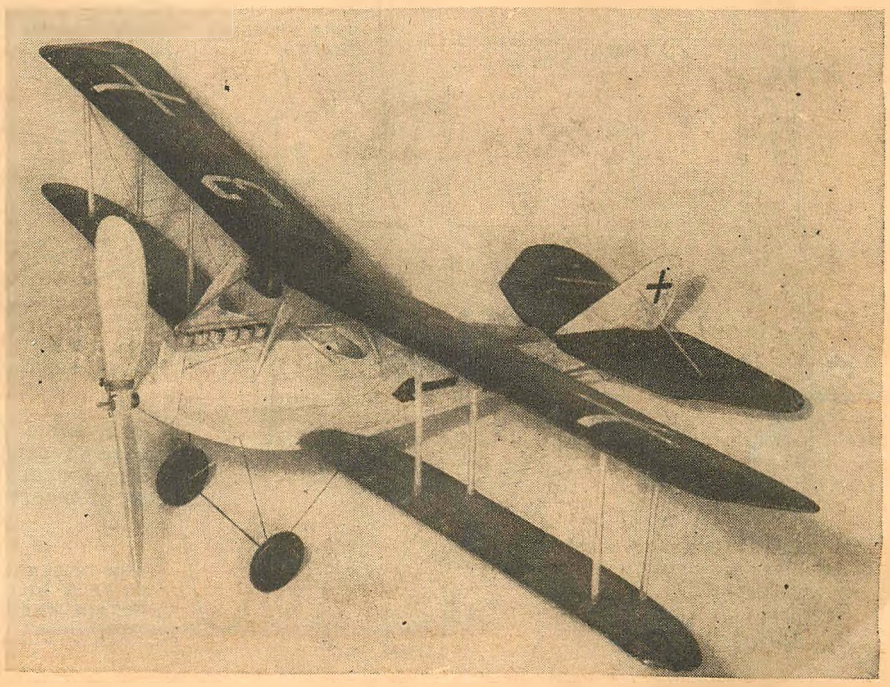
Cement the lower wing panels to the fuselage, checking for the correct amount of dihedral and incidence. Cut the cabane and interplane struts from balsa and sand smooth. Mount the struts in place on the fuselage and lower wing. Now the upper wing can be firmly cemented in place to the correct angle of incidence. Add the 1/16" square tail struts.

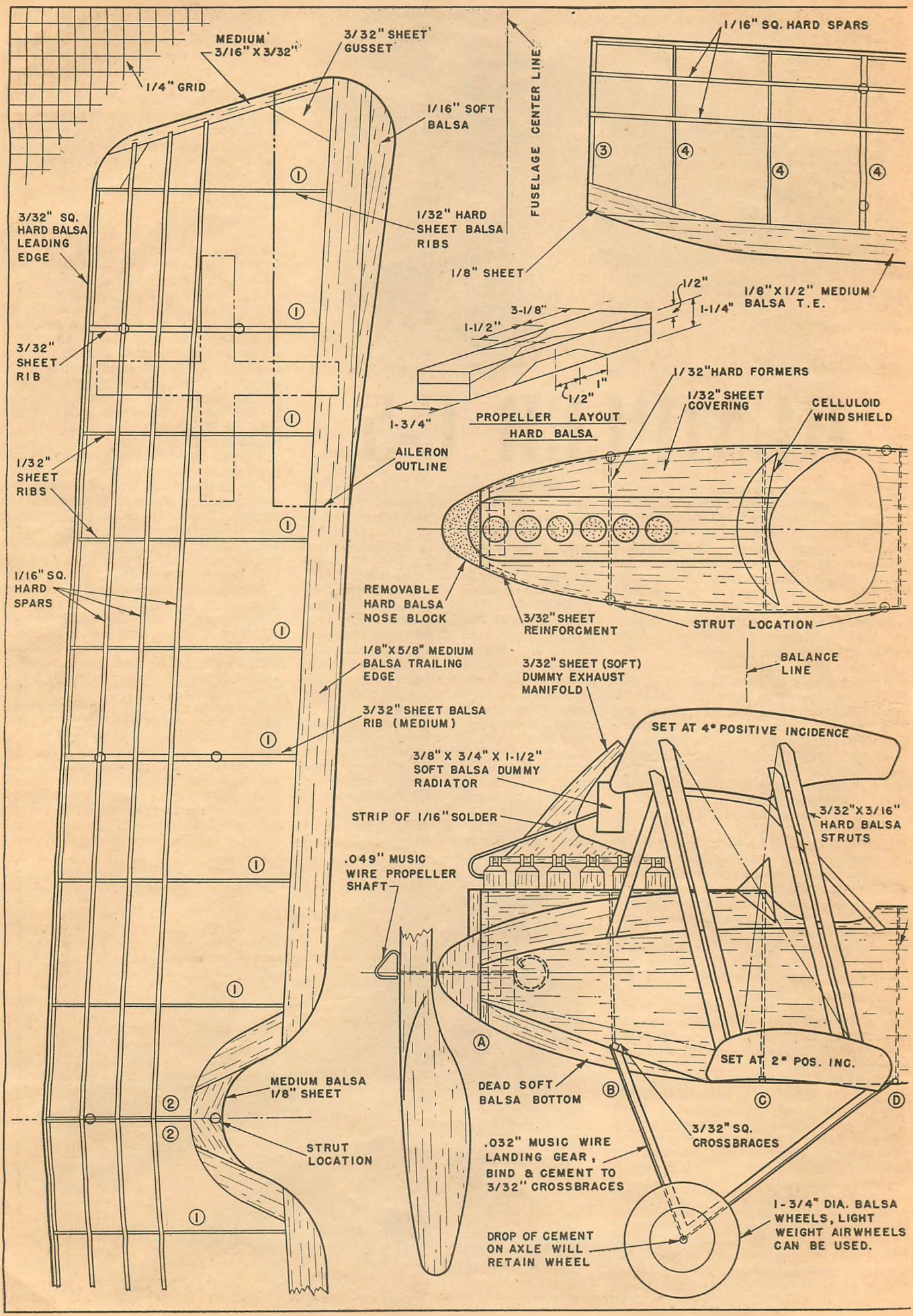
Rigging wires not only give the model that "ancient look" but add considerably to the model's strength. Using fine grey silk thread, the best method is to sew the thread on right through the struts and wings. When this operation is completed a drop of cement should be applied at the thread joints.

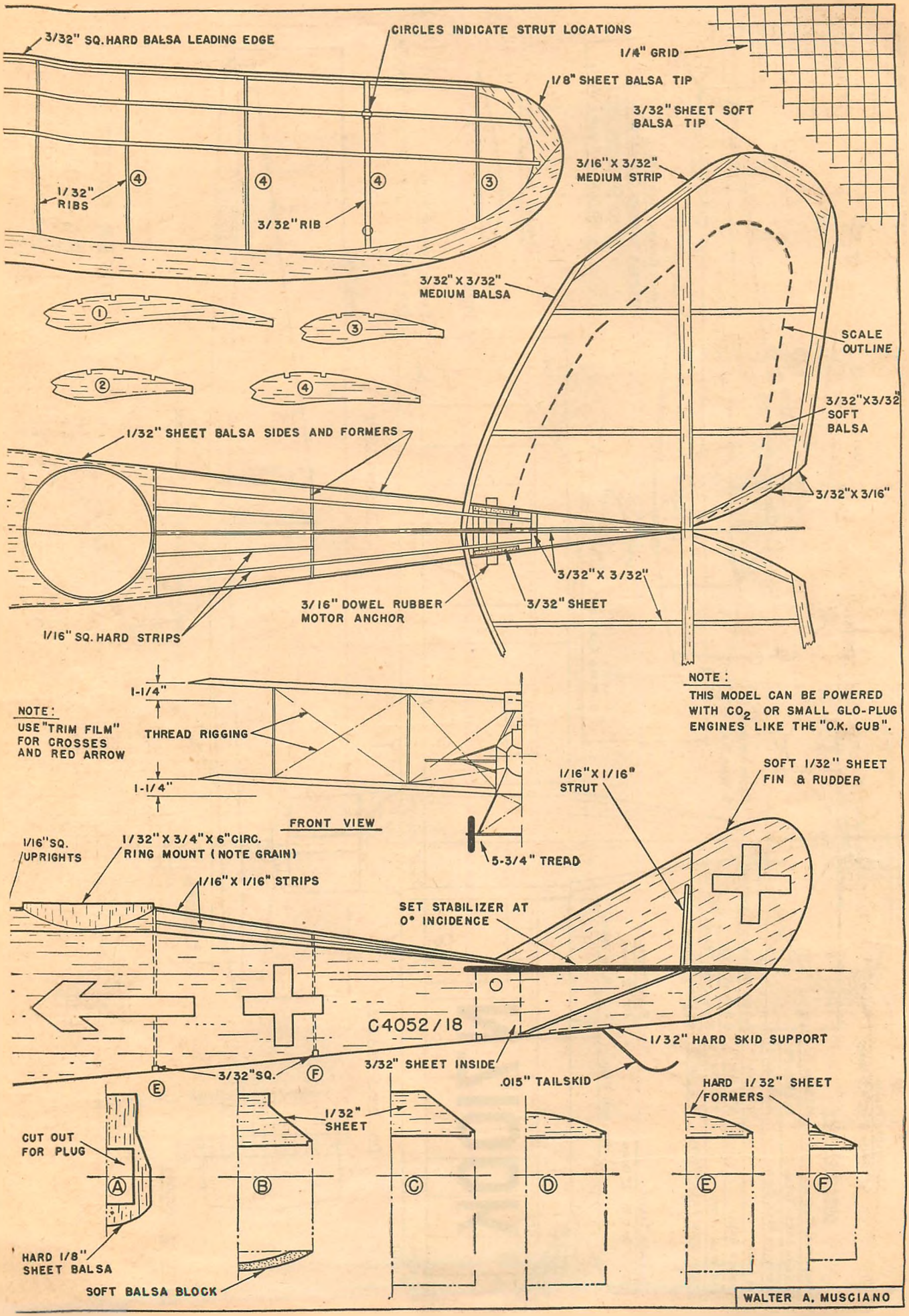
The crosses and red arrow can now be added along with the serial numbers. We found *Trim-Film* to be ideal for these items.

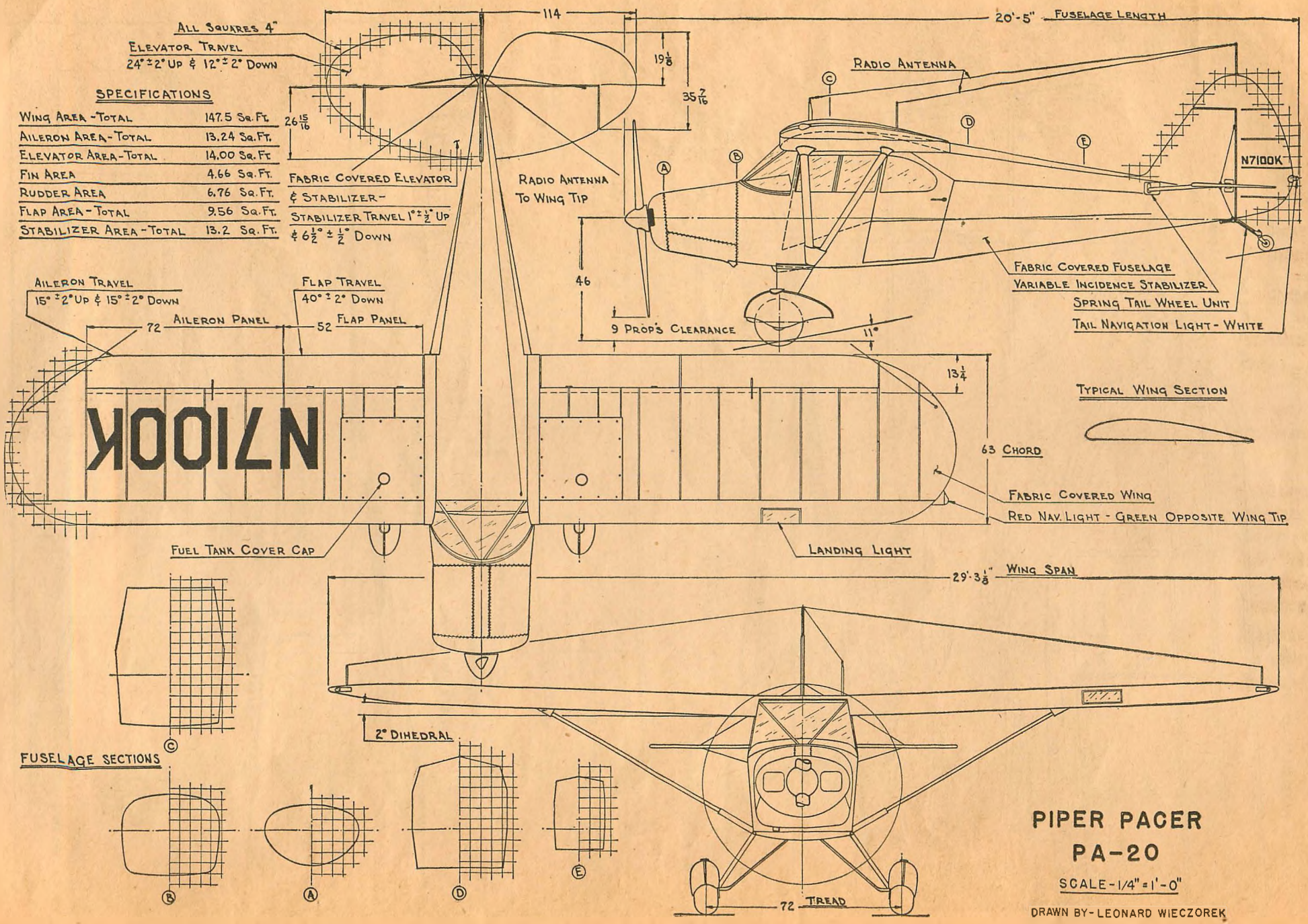
It seems that carving propellers is one job that the average modeler dislikes. This, quite frankly, surprises us because in view of the fact that the propeller often determines the success or failure of a rub-

(*Turn to page* 60)




MEDIUM 3/16" X 3/32"
3/32" SHEET GUSSET
1/4" GRID
1/16" SOFT BALSA
FUSELAGE CENTER LINE
1/16" SQ. HARD SPARS
3/32" SQ. HARD BALSA LEADING EDGE
1/32" HARD SHEET BALSA RIBS
1/8" SHEET
1/8" X 1/2" MEDIUM BALSA T.E.
3/32" SHEET RIB
1/2"
3-1/8"
1-1/2"
1-1/4"
1"
1/2"
1-3/4"
PROPELLER LAYOUT
HARD BALSA
1/32" HARD FORMERS
1/32" SHEET COVERING
CELLULOID WINDSHIELD
1/32" SHEET RIBS
AILERON OUTLINE
1/16" SQ. HARD SPARS
REMOVABLE HARD BALSA NOSE BLOCK
3/32" SHEET REINFORCMENT
STRUT LOCATION
1/8" X 5/8" MEDIUM BALSA TRAILING EDGE
3/32" SHEET (SOFT) DUMMY EXHAUST MANIFOLD
BALANCE LINE
3/32" SHEET BALSA RIB (MEDIUM)
SET AT 4° POSITIVE INCIDENCE
3/8" X 3/4" X 1-1/2" SOFT BALSA DUMMY RADIATOR
STRIP OF 1/16" SOLDER
3/32" X 3/16" HARD BALSA STRUTS
.049" MUSIC WIRE PROPELLER SHAFT
SET AT 2° POS. INC.
DEAD SOFT BALSA BOTTOM
MEDIUM BALSA 1/8" SHEET
STRUT LOCATION
3/32" SQ. CROSSBRACES
.032" MUSIC WIRE LANDING GEAR, BIND & CEMENT TO 3/32" CROSSBRACES
1-3/4" DIA. BALSA WHEELS, LIGHT WEIGHT AIRWHEELS CAN BE USED.
DROP OF CEMENT ON AXLE WILL RETAIN WHEEL


3/32" SQ. HARD BALSA LEADING EDGE
CIRCLES INDICATE STRUT LOCATIONS
1/4" GRID
1/8" SHEET BALSA TIP
3/32" SHEET SOFT BALSA TIP
3/16" X 3/32" MEDIUM STRIP
1/32" RIBS
3/32" RIB
3/32" X 3/32" MEDIUM BALSA
SCALE OUTLINE
3/32" X 3/32" SOFT BALSA
1/32" SHEET BALSA SIDES AND FORMERS
3/32" X 3/16"
3/32" X 3/32"
3/32" SHEET
3/16" DOWEL RUBBER MOTOR ANCHOR
1/16" SQ. HARD STRIPS
NOTE:
THIS MODEL CAN BE POWERED WITH CO_2 OR SMALL GLO-PLUG ENGINES LIKE THE "O.K. CUB".
NOTE:
USE "TRIM FILM" FOR CROSSES AND RED ARROW
1-1/4"
THREAD RIGGING
1-1/4"
FRONT VIEW
1/16" X 1/16" STRUT
SOFT 1/32" SHEET FIN & RUDDER
1/16" SQ. UPRIGHTS
1/32" X 3/4" X 6" CIRC. RING MOUNT (NOTE GRAIN)
5-3/4" TREAD
1/16" X 1/16" STRIPS
SET STABILIZER AT 0° INCIDENCE
C4052/18
1/32" HARD SKID SUPPORT
3/32" SQ.
3/32" SHEET INSIDE
.015" TAILSKID
HARD 1/32" SHEET FORMERS
1/32" SHEET
CUT OUT FOR PLUG
HARD 1/8" SHEET BALSA
SOFT BALSA BLOCK
WALTER A. MUSCIANO

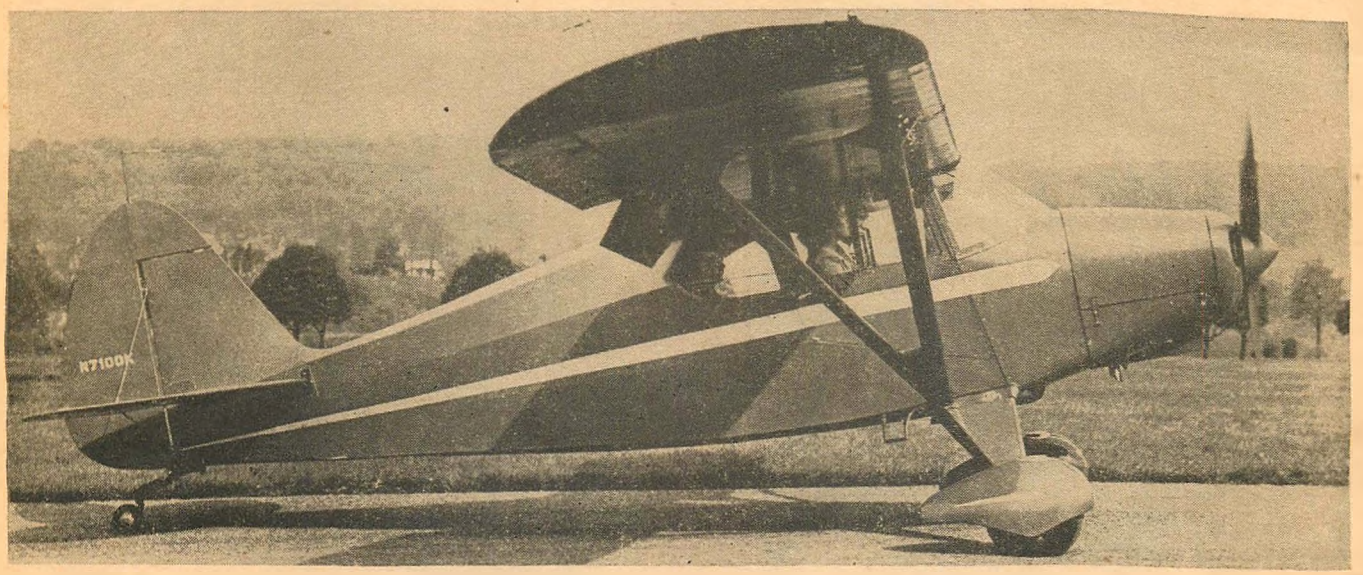


PIPER PACER
PA-20

SCALE - 1/4" = 1'-0"

DRAWN BY - LEONARD WIECZOREK

PIPER PACER



by ROBERT McLARREN

THE name "Cub" is inextricably linked with private flying in America. To the layman, all small airplanes are "Cubs," and when a light airplane passes overhead or the family drives past a small airport dotted with parked lightplanes, someone is bound to say: "Oh, look at that little *Cub* airplane!" It is amazing how this single word has come to symbolize all private flying in the United States and yet among those in the industry few words have been more fought-over, have been the subject of more law suits, or have been the subject of so many tedious explanations as the simple word *Cub*, which actually has no connection whatever with flying or the sky in its literal meaning!

It all began way back in 1930 when Taylor Brothers Aircraft Corporation was formed to develop the simplest and cheapest airplane possible, the long-sought "everyman's airplane." But unlike literally hundreds of other dreams both before and since 1930, the little monoplane designed by C. G. Taylor was a dream come true. It made its first flight in 1931 and was an instant success. Taylor Aircraft Company was formed and a small plant placed in operation near Bradford, Pa. The price tag on this little monoplane was only $1,325 making it the lowest priced two-seat airplane in the nation (only the single-seat Heath *Parasol* at $1,074 was cheaper!). This simple high-wing monoplane had a span of 35′ 3″, was 22′ 3″ long, weighed only 525 lbs. empty and 925 lbs. fully loaded. It had a top speed of 75 mph and cruised at a fast 62 mph. And, believe it or not, it landed at just 26 mph!

This was the little airplane dubbed the *Cub* by C. G. Taylor and the Taylor *Cub* quickly became a byword in American aviation. Orders poured in to the little factory, orders attracted by that low-price tag, which, even as today, began to inch up and by 1934 had reached $1,425. But the Taylor *Cub* was still the lowest-priced, the simplest to fly, and the easiest-to-build airplane in America. But even these advantages weren't great enough to combat the depression years of the early and mid-thirties, and the Taylor Aircraft Company found itself in increasingly desperate straits. By 1937, despite the excellence of the *Cub*, the financial handwriting was on the wall. In that year the firm was reorganized by William T. Piper and moved from Bradford down to Lock Haven, Pa.

It was a combination of three factors that transformed the Taylor *Cub* from a badly slipping lightplane into the world-famed Piper *Cub* of today: (1) energetic, hard-driving Bill Piper put new capital and new management efficiency into the *Cub;* (2) a general re-design of the E-2, virtually unchanged from its 1931 prototype to its 1937 production model, produced the J-2 *Cub Sport* of vastly improved appearance; and (3) the private flying business began to shake out of its doldrums. In 1937 Piper Aircraft Corporation produced 707 *Cubs* in less than a year and in 1938, the first full year of production, a total of 737 *Cubs* was delivered. Acceleration of production, stepped-up sales, and a resurgent private flying business enabled Piper to deliver 1,806 airplanes in 1939 and in 1940 the astonishing total of 3,016 airplanes was produced.

It takes two ingredients to become a successful manufacturer in the personal aircraft business: hard-headed business management and a genuine love of the game. Hundreds of aircraft company presidents have had only one of these attributes and their companies have failed, but Bill Piper has them both in precisely the right proportion as the brief but spectacular history of his company illustrates. His management side has always told him that production costs must be held down to rock bottom and that means a minimum of design changes in the product. But his love for the game has tempted him often to stray into the rocky garden of "dream airplanes," romances which have invariably cost him money but interludes which

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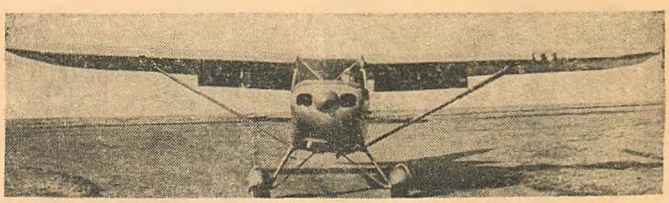

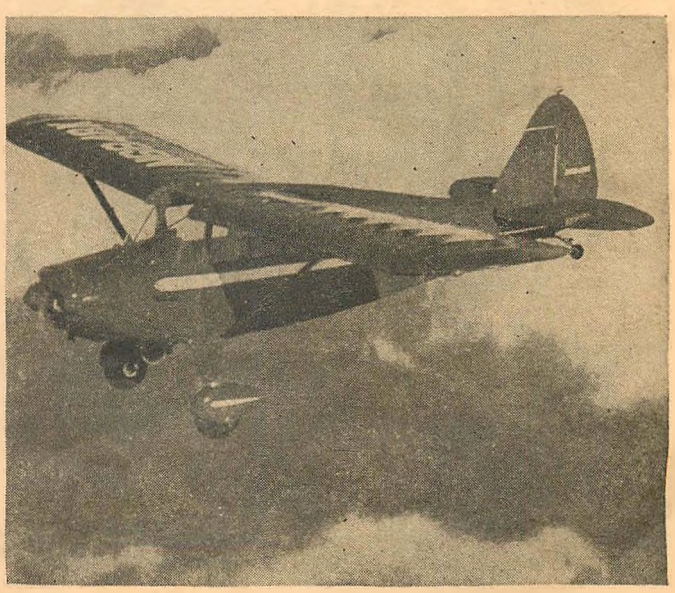

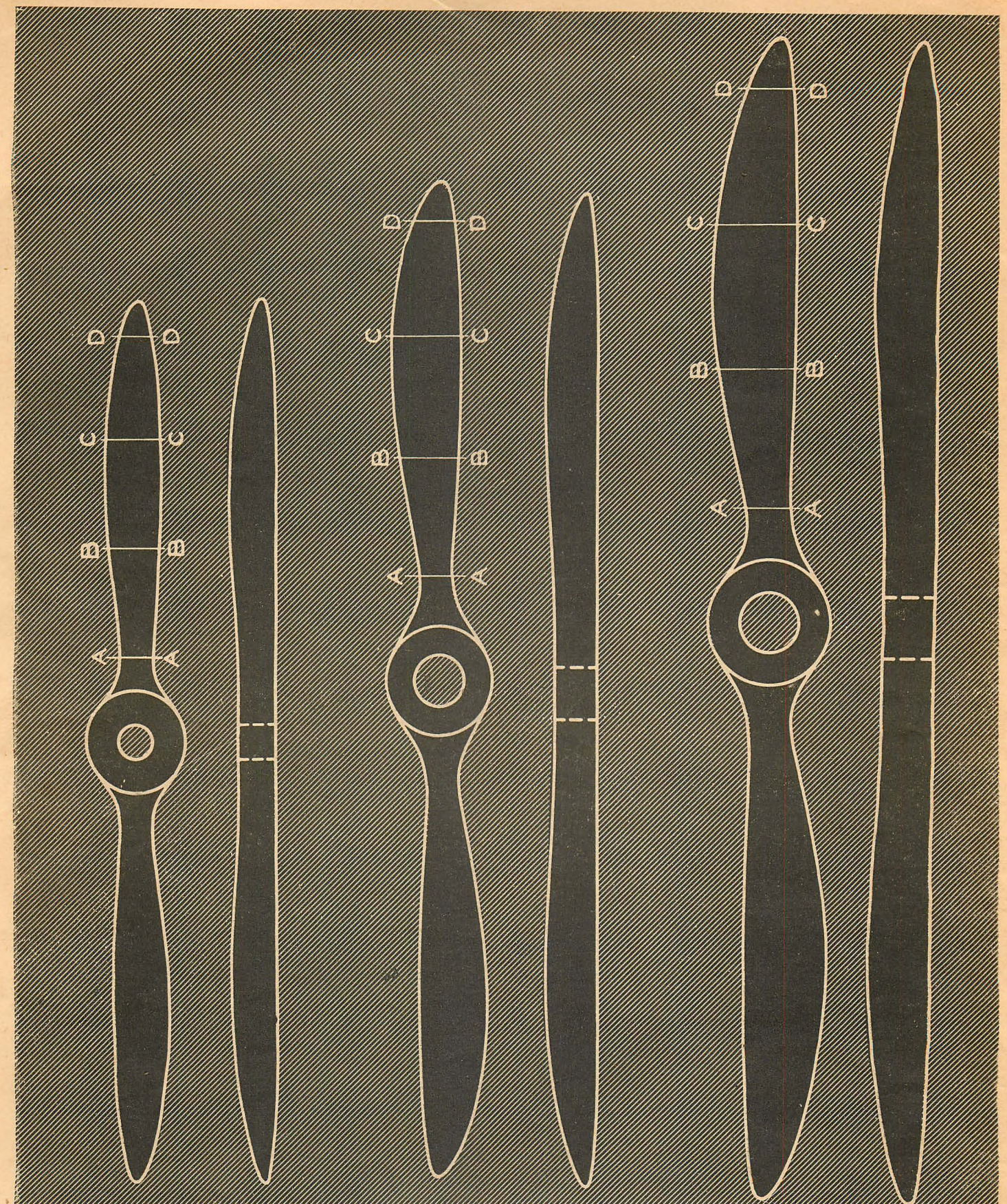
D
C
B
A
Class A 6 ¾" Dia.
7" Pitch
Class B 7½" Dia.
9" Pitch
Class C,D 8¾" Dia.
11" Pitch
A A
B B
C C
D D
TYPICAL AIRFOILS not to scale

ADD 10 MILES TO YOUR SPEED

PART TWO

by LEW MAHIEU

as told to Bill Sweet

Here are more speed tips, including data on the all-important propellers; cut your props to the full size patterns shown. See you in the winners' circle!

LAST month you learned some of Lew's secrets in speed flying. We discussed plane design, engines, and fuels. This month we will give you information on propeller design, test flying, and contest flying. As in Part One, we will cover the subjects in detail, for the beginner as well as the expert.

One of the most talked-about subjects among speed fliers for many years has been propeller design, because it is well known that the propeller plays a major part in the speed of any plane; hence, we will devote a good portion of this article to that subject.

In order to stress the importance of propeller design let us go back a few years and see what made some of the old-timers in speed tick. Most of their success was largely due to their experience in carving props. Don Newberger and Wally Wallick were among the first on the West Coast to find the key to faster speeds, by spending much of their time experimenting with propellers. This was proven when they took first place in Class B and C, respectively, at the 1946 Nationals at Wichita. The Allen and Kitchens team, along with Keith Storey, then came up with two different theories on propeller design which enabled them to set new records, and to give Don and Wally a rough battle. The two theories evolved among this group of fliers concerned progressive pitch and true pitch. When Lew became interested in speed flying, he was a good listener and learned from the experience of others. He took what he considered the best points from each of these theories, incorporated some of his own ideas, and came up with the following design, which enabled him to increase his speeds from 3 to 8 mph.

The essential thing to keep in mind when carving your own propeller is to allow your engine to operate at the rpm which will deliver the peak horsepower as specified by the manufacturer. The rpm of the engine is governed by the diameter, pitch, and blade area of the prop.

There are six factors to be considered in the design of an efficient propeller. They are: diameter, pitch, blade area and shape, stiffness, airfoil, and finish. As you will see by the drawings, Lew uses various diameter props for the different size engines. These diameters have been proven to be right; they allow each engine to perform at its peak. For shaping your blade, we refer you to the drawings which are given full size. Bear in mind that you should endeavor to maintain as much blade area as possible when carving this type of sweepback blade. Lew has been using props with pitches of 7", 9", 11-1/2", and 11-1/2", for Class A, B, C, and D, respectively. A word of warning: most speed fliers have a tendency to use too much shift to progressive pitch at the tips. This slight alteration is the engine by not allowing it to operate at its peak horsepower rating. It is better to have *too little* pitch than *too much* —more prop efficiency is obtained by using less pitch. Lew is a firm believer in the true pitch prop; yet at times they may shift to progressive pitch at the tips. This slight alteration is made to fit the particular airplane design.

Lew always starts with a stock speed prop which can be purchased at any hobby shop. He recommends *Tornado, Rev-Up, Suprscru* or any similar propeller that is available. When choosing his props he is very careful about the stiffness of the blades. You should obtain the stiffest prop possible because it has less tendency to flex when in motion. If your prop flexes, it increases its pitch, which must be avoided. Also, the grain of the wood should be carefully noted. The most desirable, of course, is a perfectly straight grain; this means that the grain of the wood should run the full length of the blade.

The airfoil on the prop should be as near in size as possible to the ones shown on the drawings. You will notice that Lew uses quite a thick airfoil because it helps maintain the stiffness of the prop. The reason he uses the slight sweepback at the tips is that it also helps the rigidity of the prop, which retards tip flutter. Remember that the prop tips are approaching the speed of sound, which is the reason we stress the point of stiffness.

The finish of your prop is quite important. By the finish we do not mean the surface finish only, but also the all-over contour and balance. In order to make a good prop, you should be willing to spend no less than two hours of work. Start carving your prop with the thought in mind that the next flight you make will be your last official flight at the Nationals. If you do this, you will make a diligent effort to carve the best prop possible. It is important that both blades of your propeller be as near symmetrical as they can be made. Also, be sure that the prop is perfectly balanced.

Some of the tools used in altering stock props are: knives, wood files, and various grades of sandpaper. The knife is used to cut the prop to the proper length and cutting the general blade shape. The wood file is then used to obtain the approximate airfoil shape, and next comes use of the various grades of sandpaper.

In order for you to prove that the above changes in a propeller will definitely increase you speed, it is suggested that you purchase four speed props. Keep one in its original state to be used as a basis of comparison. Carve the second one, making the above changes. Since it takes experience to carve propellers you will make a few mistakes; correct these mistakes on the third prop. From the last one of the four you should be able to make a prop that will give you several extra miles per hour. After you have finished your propellers, take them out to the test field. Put on the stock prop and check your speed very carefully. This should be followed by flights with the second, third and fourth ones. If you have followed instructions correctly, you will notice a definite increase in speed with the altered props. Number four should prove to be the fastest because of your increased ability to carve them.

Finally, if you desire that glass-like finish on your propellers, it can be obtained by using several coats of dope (of course, sanding after each coat with very fine paper) followed with a coat of good wax. This coat of wax is important. If you do not use it and a drop of fuel should accidentally be spilled on the prop, it will dissolve the dope, causing quite a mess.

We are now ready to start test flying. This is an important part of speed work, because you must be satisfied that your plane is ready for a contest. There are several things that you must bear in mind in test flying. Remember that your plane and engine will decrease in efficiency with each flight, therefore make each test flight *count*. That is the reason that we suggested that you take so much time in carving your propellers. Do not do any more test flying than is absolutely necessary. With this thought in mind, you should see to it that everything is as near perfect as possible. When you are satisfied that your gear is in order, do not be impatient to test your model. Wait for a good calm day and pick a good smooth test field. Those of you who are not fortunate enough to have a good test field available will have to be extra cautious. Many speed fliers have lost interest in speed flying because they built a good speed ship but failed to make a proper dolly or pick a good field for testing, thereby washing out their plane on the first flight.

This brings us to the subject of dollies. Some of those having dolly troubles may get a hint from this suggestion: your dolly should be constructed so that the front wheels are no farther back than the propeller. The wheels should be large enough in diameter so that they will turn freely in grass. If they are

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DESIGN FORUM

by CHARLES H. GRANT

HOW do you choose your wing section for the model you are building? Are you concerned chiefly with graceful lines and the structural elements because these are visual factors? Do you ignore the importance of the airfoil section because aerodynamic effects are not so obvious, or do you realize that the cross section of your wing has a decided effect upon the performance of your model? Many who understand the importance of this, turn to full scale aviation for a solution. Only too often they choose one of the popular full scale wing sections and use it on their model. Perhaps the plane flies well, but would it fly better with some other section? Most modelers assume that a wing section which gives excellent results on a man-carrying airplane should give results of equal efficiency on a model; nothing could be further from the truth. We have heard that airfoils give entirely different results at slow speeds than at high speeds. However, though the speed of flight has a great deal to do with the efficiency of a wing section, there are other important factors which have an equal bearing upon your choice.

Let us go back about forty years and sweep some of the cobwebs from the experience of your *"Design Forum"* author. In 1911, after flying models for approximately two years, the importance of a model's wing section became very apparent to him. Unlike today there was little data to refer to, so if accurate information was to be obtained, experimentation was the only answer. Wind tunnels were practically unknown at that time, at least to the average man and model builder. Consequently in 1911, a series of intensive experiments were begun. At first, the simplest sections were used, such as the curved sheet of balsa wood, Fig. 1. Tests were made on these wings with the maximum camber well forward and again with maximum points farther back from the leading edge. Results were not what one would expect. According to the full scale sections used at that time on Curtiss, Bleriot, and Wright airplanes, the maximum camber should have been approximately one-third back from the leading edge. Such wings flew very well but during the model tests, they flew no better than wings with the maximum camber at the mid point, Fig. 1A.

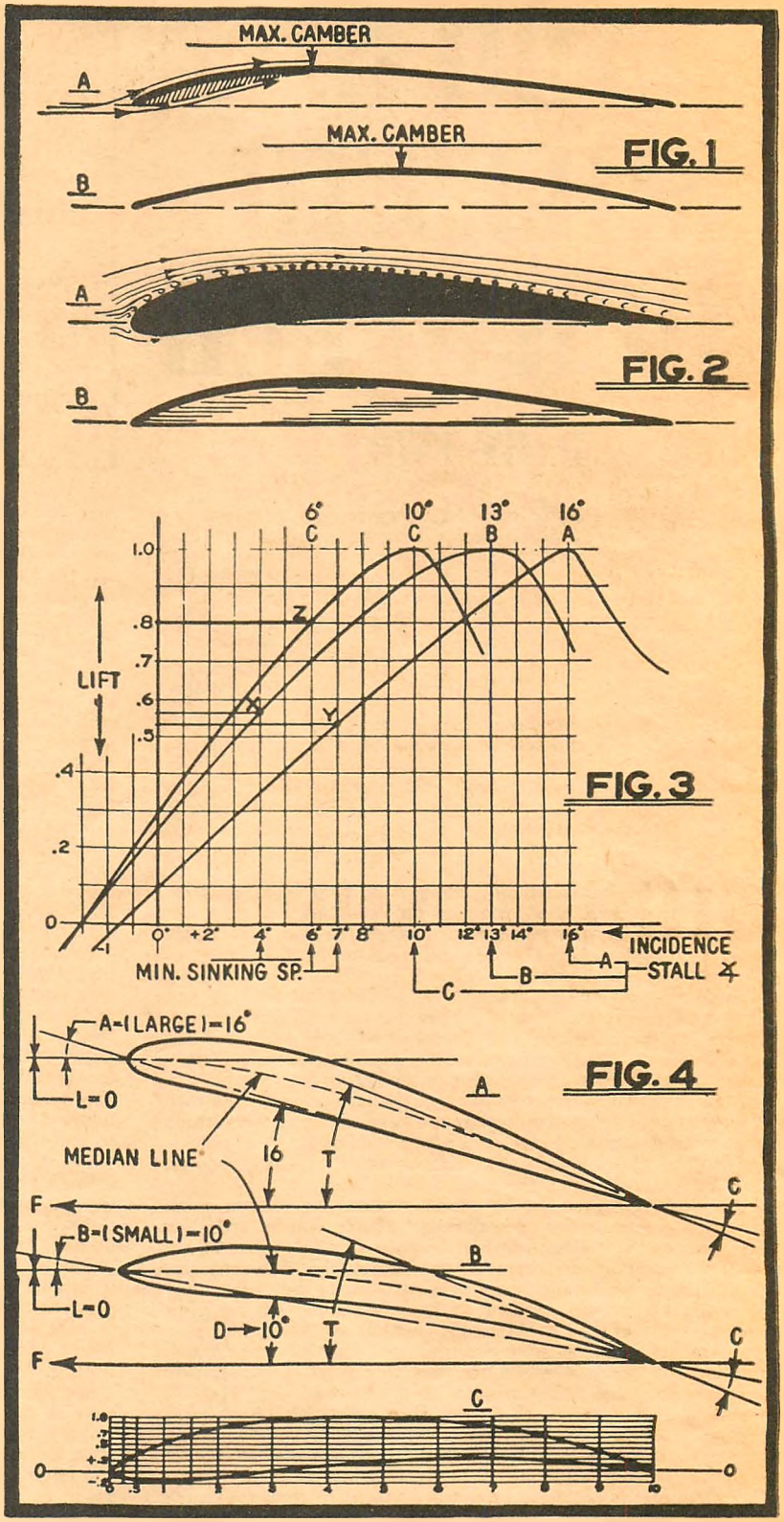
It became a case of the more you understood, the less you knew. At least, the mental confusion was greater. In order to achieve better results at contests, considerable study was given the matter of determining the influencing factors. In succeeding experiments greater care was taken to have the model wings conform to the most efficient sections used on full scale airplanes. Here one of the outstanding differences was the more blunt, rounded leading edge, Fig. 2. These experiments only added to the confusion, however, because such wings flew no better; and in most cases, they did not fly as well as the "single surface" sheet balsa wings.

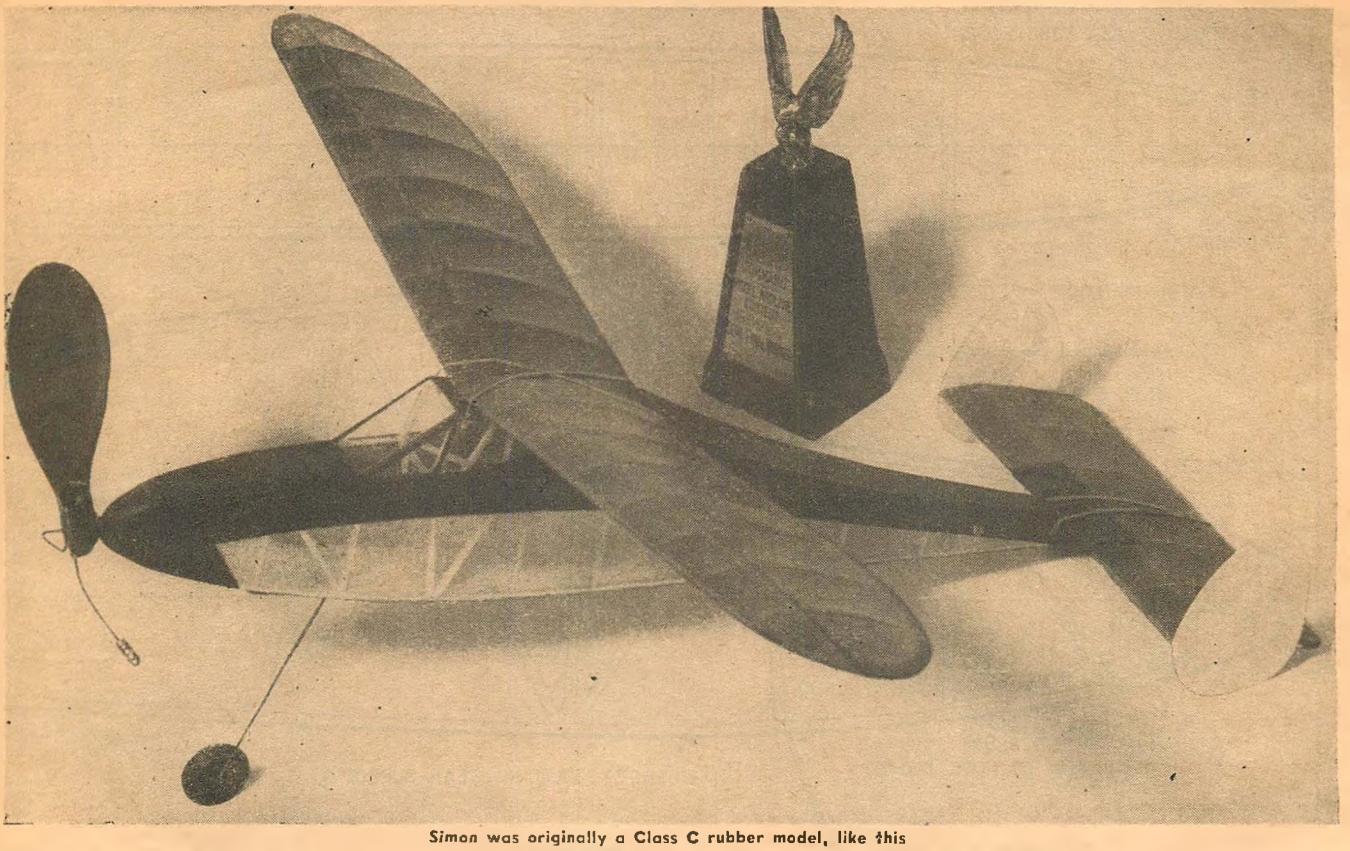
Not having previous data and articles by model and other experts to refer to, it was necessary for the experimenter to think for himself and work out his own problems thereby becoming his *own* authoritative expert. This led to hundreds of other tests in order to track down the elusive facts.

One of the first experiments that brought real results was a test in which the section resembled a full scale section in most respects except that the leading edge was *sharp* instead of rounded, similar to Fig. 2A. The wing was, in fact, a sheet of curved balsa wood covered on the underside. Later data showed that efficiency was increased because there was a reduction or elimination of the sudden upward curve of the undersurface immediately to the rear of the leading edge as in Fig. 1, (shaded area). Since then it has been found that with a section as shown in Fig. 1, considerable drag is caused by the upward curve of the under surface. Flattening the surface, as in Fig. 2A, increased the smoothness of flow and reduced the drag. This was only part of it, however. Results of later experiments indicated that a sharp leading edge is much superior (on a model) to a rounded one. This conclusion was reached about 1916.

Since that time, thousands of models have been built and

(*Turn to page* 50)





Simon was originally a Class C rubber model, like this

simple simon

by D. A. NEWELL

This "Sport Model" can win prizes too! See photo of rubber version

EASE of construction and contest-winning ability are the attractive features of this rubber powered Class C cabin job. Three similar models have been built and all have flown beautifully. The first was lost during test flights the day before a contest and the second was built that evening in six working hours! After two test flights it was clocked at 8 mins. 12 secs. for the first flight and over 22 mins. out-of-sight for the second flight to take first place.

The model has a box-type body with no formers or stringers at all. A cabin adds realism to the appearance. Two spars take the main wing stresses. Although the leading surfaces are not sheet covered no loss in wing efficiency was noted, this is partially due to the comparatively thick airfoil (Eiffel 400). The stabilizer is also of two-spar design and incorporates a lifting airfoil. Single wheel landing gear was used on ships one and two, and a retractable undercarriage was installed on the latest model. So far we fail to detect any marked improvement in the performance.

The first step is to enlarge the plans either by redrawing them, following the dimensions; or, if you have some extra "dollars," have them photostated to size. In this latter procedure only photostat the side view and wingtip, the remainder of the wing is made up of straight lines and the plan view of the fuselage is only used for the crossbrace dimensions.

Select fairly hard balsa for the fuselage. Pin the side frames in place and when the cement is thoroughly dry they can be removed from the workbench. Apply cement to both sides of the joints, and while this is drying the crossbraces can be cut to size. Cement the two sides together at the rear and fit the widest crossbrace. Hold in place with modelling pins until the cement is dry. Now install the remainder of the crossbraces. Sand smooth when dry and cement the celluloid to the cabin. Add the undercarriage (either retractable or fixed) then cover the entire fuselage with Jap tissue. Water spray and set aside.

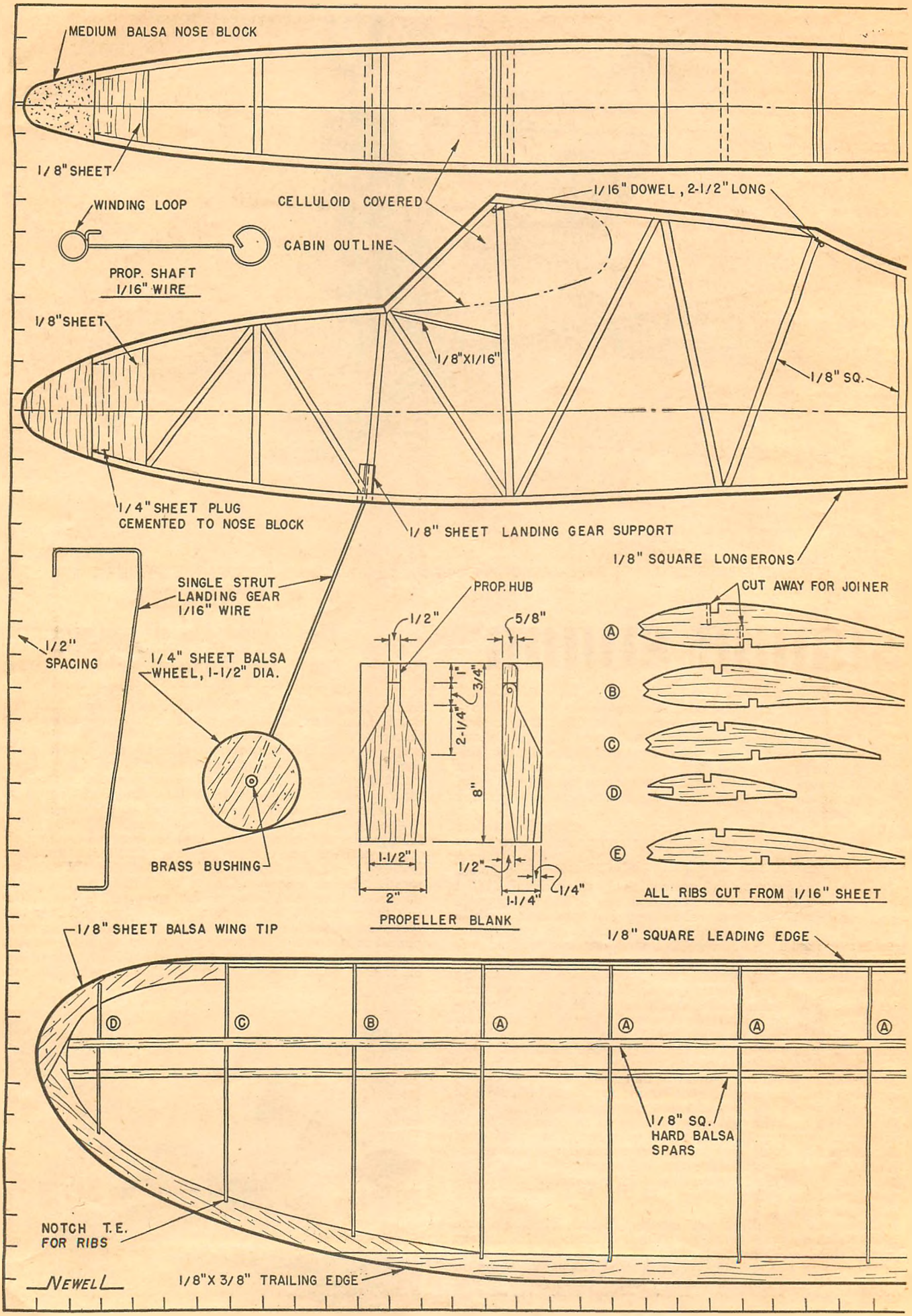
Carve the propeller from medium balsa. First, saw the blank to shape, then carve the pitch and camber with a sharp knife. Sand well, and dope until glossy. The hinge for folding shown on the drawing is not original, having appeared on models in the past, but it is simple and efficient, which is what counts. Metal from a tin can will do the trick. Do not use aluminum or any other unsolderable material because the counterbalance arm must be soldered to the hinge hub. Lead weight is used to balance the propeller. Be sure to sweepback the counterbalance arm in order to eliminate vibration. The propeller shaft is bent as shown, after the nose block has been completed. Use a ball-bearing washer for efficiency.

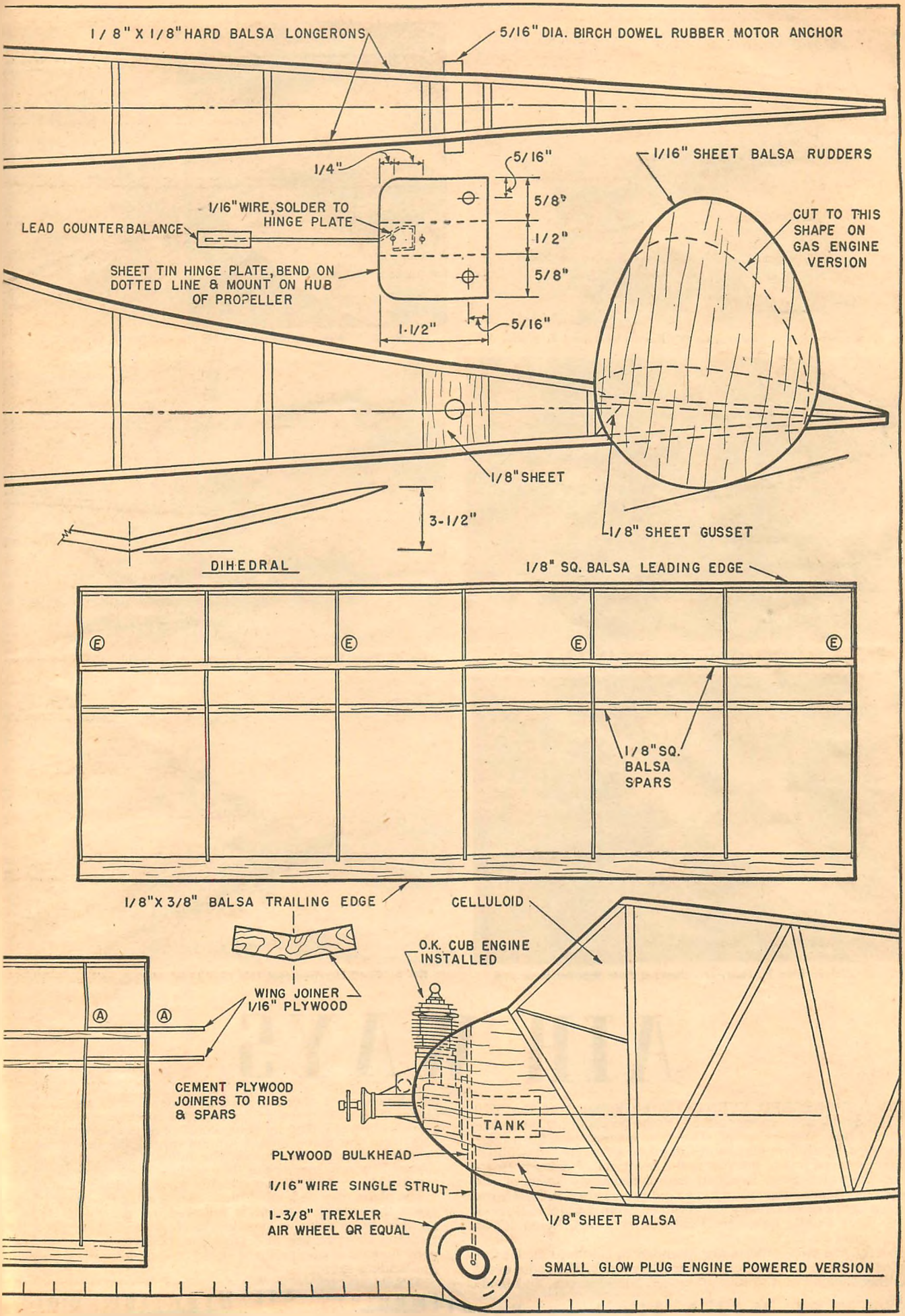
Cut the wing and stabilizer ribs from medium soft balsa and sand smooth. Both units have the same construction procedure except that no tips are required on the stabilizer. Pin the lower spar over the plan and cement the ribs in place followed by the upper spar. Add leading and trailing edges (note: notches) and tips on the wing. Sand structures lightly and cover with Jap tissue. The wing halves must be fastened together before covering. Make the joiners as the plan indicates and cement between the spars. This automatically sets the required dihedral; notice that polyhedral is not used. Water spray the wing and tail covering while the frames are pinned securely to a flat surface, in order to prevent warping.

Apply four coats of clear dope (add a few drops of castor oil to each ounce) to all tissued surfaces, checking for warps

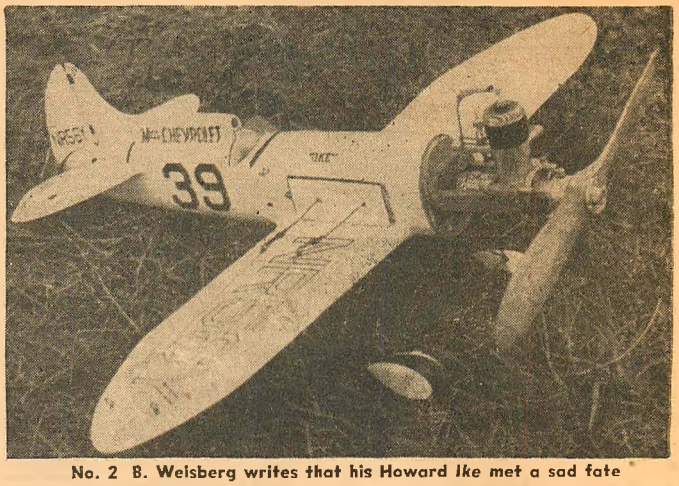
(*Turn to page* 62)

Simple Simon ready to "glow." Any medium ½A engine can be used

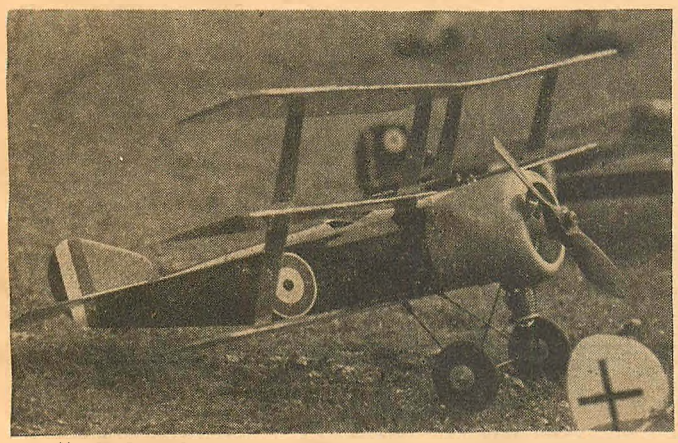

MEDIUM BALSA NOSE BLOCK
1/8" SHEET
WINDING LOOP
PROP. SHAFT
1/16" WIRE
CELLULOID COVERED
CABIN OUTLINE
1/16" DOWEL, 2-1/2" LONG
1/8" SHEET
1/8"X1/16"
1/8" SQ.
1/4" SHEET PLUG
CEMENTED TO NOSE BLOCK
1/8" SHEET LANDING GEAR SUPPORT
1/8" SQUARE LONGERONS
SINGLE STRUT
LANDING GEAR
1/16" WIRE
1/2"
SPACING
1/4" SHEET BALSA
WHEEL, 1-1/2" DIA.
BRASS BUSHING
PROP. HUB
1/2"
5/8"
3/4"
1"
2-1/4"
8"
1-1/2"
2"
1/2"
1/4"
1-1/4"
PROPELLER BLANK
CUT AWAY FOR JOINER
A
B
C
D
E
ALL RIBS CUT FROM 1/16" SHEET
1/8" SHEET BALSA WING TIP
1/8" SQUARE LEADING EDGE
D
C
B
A
A
A
A
1/8" SQ.
HARD BALSA
SPARS
NOTCH T.E.
FOR RIBS
NEWELL
1/8"X 3/8" TRAILING EDGE


1/8" X 1/8" HARD BALSA LONGERONS
5/16" DIA. BIRCH DOWEL RUBBER MOTOR ANCHOR
1/4"
5/16"
5/8"
1/2"
5/8"
5/16"
1-1/2"
1/16" WIRE, SOLDER TO HINGE PLATE
LEAD COUNTER BALANCE
SHEET TIN HINGE PLATE, BEND ON DOTTED LINE & MOUNT ON HUB OF PROPELLER
1/16" SHEET BALSA RUDDERS
CUT TO THIS SHAPE ON GAS ENGINE VERSION
1/8" SHEET
3-1/2"
1/8" SHEET GUSSET
DIHEDRAL
1/8" SQ. BALSA LEADING EDGE
1/8" SQ. BALSA SPARS
1/8" X 3/8" BALSA TRAILING EDGE
CELLULOID
O.K. CUB ENGINE INSTALLED
WING JOINER 1/16" PLYWOOD
CEMENT PLYWOOD JOINERS TO RIBS & SPARS
TANK
PLYWOOD BULKHEAD
1/16" WIRE SINGLE STRUT
1-3/8" TREXLER AIR WHEEL OR EQUAL
1/8" SHEET BALSA
SMALL GLOW PLUG ENGINE POWERED VERSION

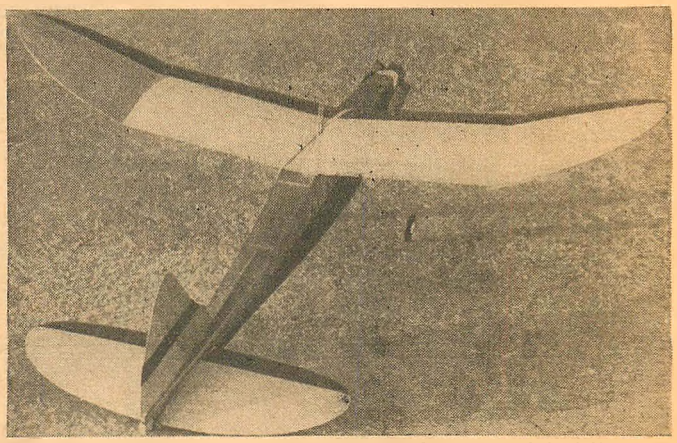
No. 1 A super-finish is apparent on this *Navion* by Robert B. Wolfe, Jr.



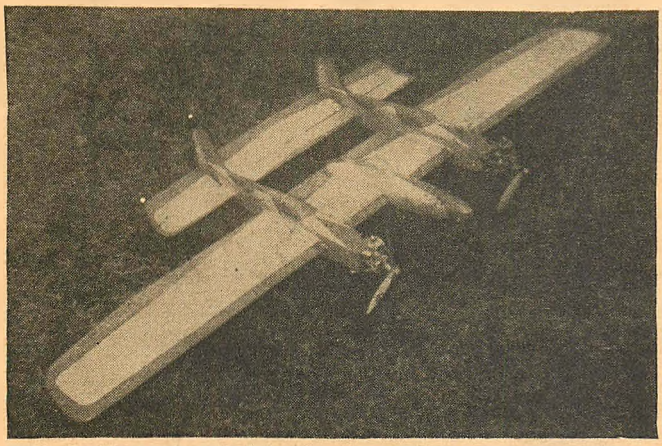
No. 2 B. Weisberg writes that his Howard *Ike* met a sad fate



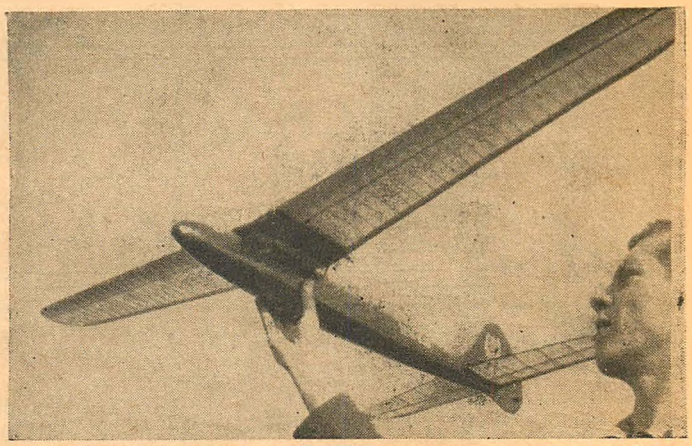
No. 3 Scale Sopwith *Triplane*, prize winner owned by P. Cock



No. 4 Sheet balsa wings are featured in Wakefield of Carl Hermes



No. 5 Picture from H. Fake, Jr., shows a *Twin Warrior* stunt ship



No. 6 Geoff Harrison sent this view of W. Morgan and *Igo* sailplane

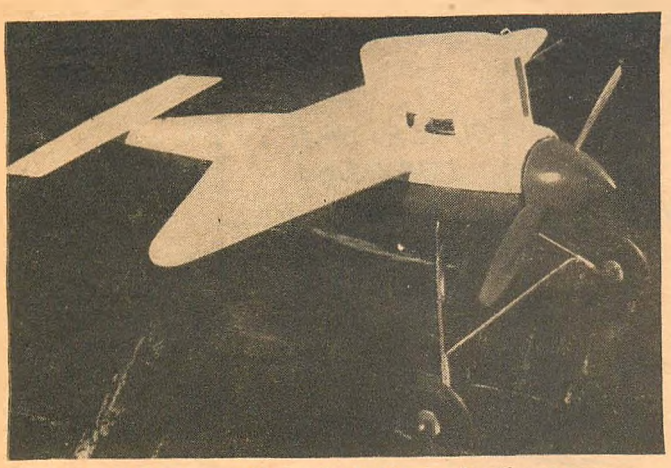
AIR WAYS

NAVY-SPONSORED EVENTS, to be initiated at the 1950 Nationals, were announced at Olathe last summer, and suggested rules were released. The two events, one for radio-controlled bomb dropping, and the other a "carrier controline" contest, caused lots of interest and a few cries of dismay. However, the rules were modified as suggested by some of the more experienced fliers, and have now been issued in final form. Copies of these rules may be obtained from Lt. John Burton, U. S. Navy Public Relations, Pentagon Building, Room 4C742, Washington 25, D. C.

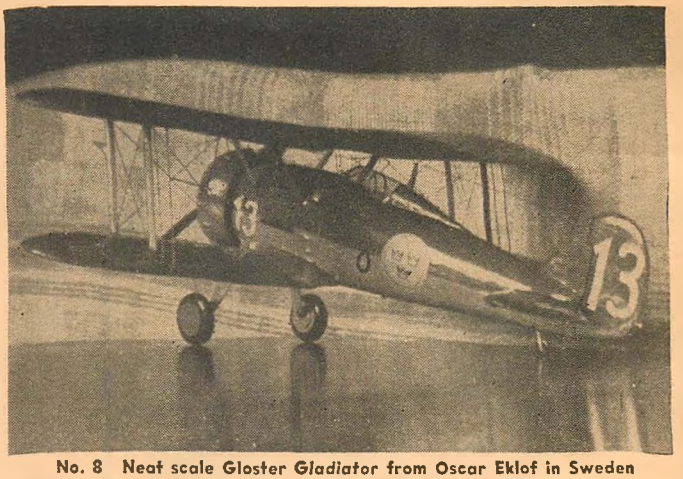
Briefly, the two contests are intended to simulate model flying of a pattern followed in regular Navy work. The radio event has three main point groups: take-off, bombing run, and landing. Since most Naval bombing is done with carrier-based planes, a short take-off run is awarded most points (jet-assistance is allowed). The bombing consists of dropping three missiles from the plane onto a ground target, the first missile to be released by radio control; the following two may then be released by any means the flier wishes. Needless to say, scoring in this group is based entirely upon accuracy.

The plane may be landed immediately after the bombing, and again the carrier concept is followed, as the model is to be brought in as close as possible to—*but beyond*—a given line. Landing short of the line (the line, of course, represents the near limit of a carrier flight deck) means loss of all points in the landing group.

News of Model Airplane Experimenters All Over the World

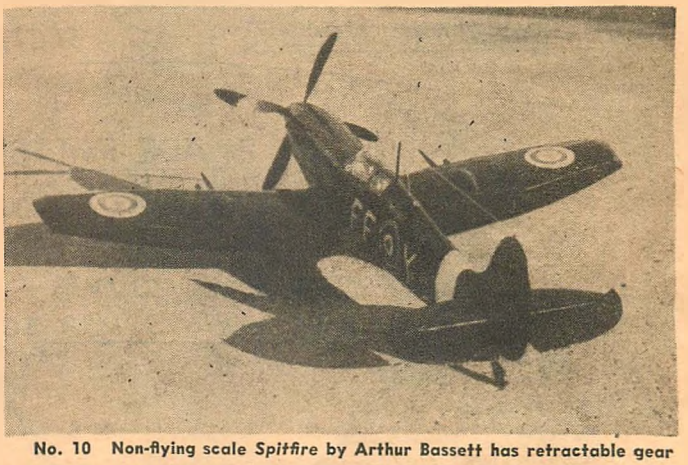


No. 7 Original speed ship by Jim Larkin, Jr., has *Hornet* power



No. 8 Neat scale Gloster *Gladiator* from Oscar Eklof in Sweden

No. 9 R. B. Spencer's *Custom Cavalier* R. C. plane using audio tone control



No. 10 Non-flying scale *Spitfire* by Arthur Bassett has retractable gear

No. 11 Scale specialist Ced Galloway sent this shot of WWI midgets

No. 12 Wakefield ship built in Philippines by Celso Piamonte

Each contestant is allowed 15 mins. for competition, after being called by the judges, and can run off as many flights as possible within his time allotment.

The carrier contest brings even closer simulation of carrier plane operation; operating on 70′ lines, the model is required to take off from a 6″ raised platform, 40′ long and 5′ wide. The platform is curved to conform with circular flight and will be provided by the Navy. Starting from take-off, the model will immediately be timed for six laps at high speed. The contestant is then allowed a few laps to slow his model down and, upon his signal, the judges time the plane for six low-speed laps. The plane may then be landed (on the carrier deck platform) and provisions are to be made for arresting gear to slow down and shorten the landing run.

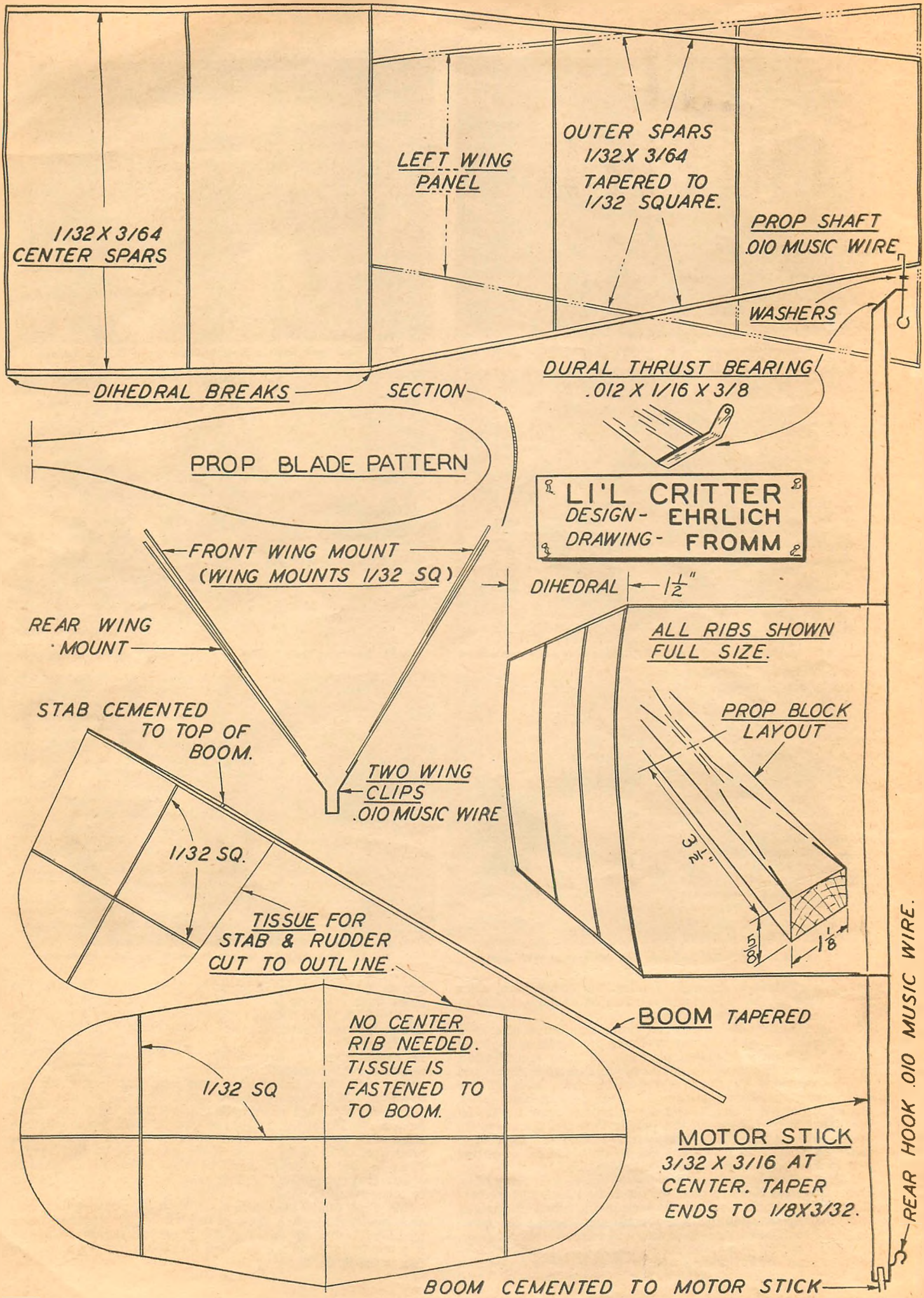
Both events offer extra consideration for models resembling planes in active Navy service; for the radio event, such resemblance is "desirable" and would presumably affect the judges' decisions, especially in the case of contestants with a like number of points. The carrier event flier will receive a big 100-point bonus if his ship is a "true scale replica of any military aircraft." As an aid in building such scale craft, don't forget that the Navy has a set of eight authentic three views of Naval planes, which may be obtained gratis from Lt. Burton. The plans were listed on page 31 of the February, 1950, issue.

SEVERAL NEW IDEAS for intra-club contests have come to light, which we feel might interest other clubs. Bob Hatschek, of the Long Island, New York, *Prop Spinners Club*, writes that his organization has been holding "before-the-meeting" contests for rubber models of under 50 sq. in. area. They have gotten such a kick out of these little jobs, that they would like to see an AMA category in this size for regular contest flying.

The tiny ships are often made entirely from balsa, and range from 5″ to 18″ spans. Flights of over 8′ have been had with ships of 30 sq. in. or less. They propose just two rules: maximum area of 50 sq. in. (some of the group are holding out for 75 sq. in., but we feel it would be wiser to keep it down to 30 or so), and compulsory landing gear. No weight, cross section, or other complications.

The *Tech Model Aircrafters*, of M. I. T., run regular scale and novelty contests; a photo of one winner, an Aeronca *Sedan* by Lloyd Licher, appeared in *Air Ways* last month. Points up to a maximum of 50 are awarded for scale accuracy. Added to this is the R. O. G. flying time in seconds. A beautiful S.E.5A,

(*Turn to page* 56)


1/32 X 3/64
CENTER SPARS
LEFT WING
PANEL
OUTER SPARS
1/32 X 3/64
TAPERED TO
1/32 SQUARE.
PROP SHAFT
.010 MUSIC WIRE
WASHERS
DURAL THRUST BEARING
.012 X 1/16 X 3/8
DIHEDRAL BREAKS
SECTION
PROP BLADE PATTERN
LI'L CRITTER
DESIGN - EHRLICH
DRAWING - FROMM
FRONT WING MOUNT
(WING MOUNTS 1/32 SQ)
DIHEDRAL
1½"
REAR WING
MOUNT
ALL RIBS SHOWN
FULL SIZE.
STAB CEMENTED
TO TOP OF
BOOM.
PROP BLOCK
LAYOUT
TWO WING
CLIPS
.010 MUSIC WIRE
3½"
5/8
1/8
1/32 SQ.
TISSUE FOR
STAB & RUDDER
CUT TO OUTLINE.
BOOM TAPERED
NO CENTER
RIB NEEDED.
TISSUE IS
FASTENED TO
TO BOOM.
1/32 SQ
MOTOR STICK
3/32 X 3/16 AT
CENTER. TAPER
ENDS TO 1/8X3/32.
REAR HOOK .010 MUSIC WIRE.
BOOM CEMENTED TO MOTOR STICK

LI'L CRITTER

Most modelers are "afraid" of indoor ships—they should try this one and see how easy it is

by BILL ERLICH and WALLY FROMM

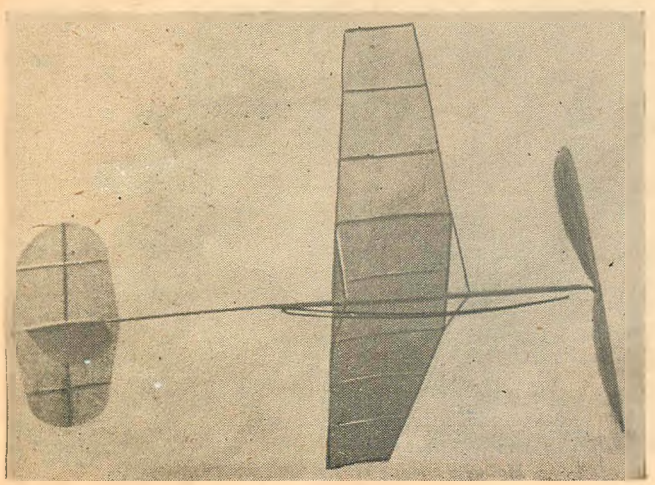
THIS *Li'l Critter* was originally laid out as a first project for the Novice at indoor flying, and has since proven to be worth its weight in U-235.

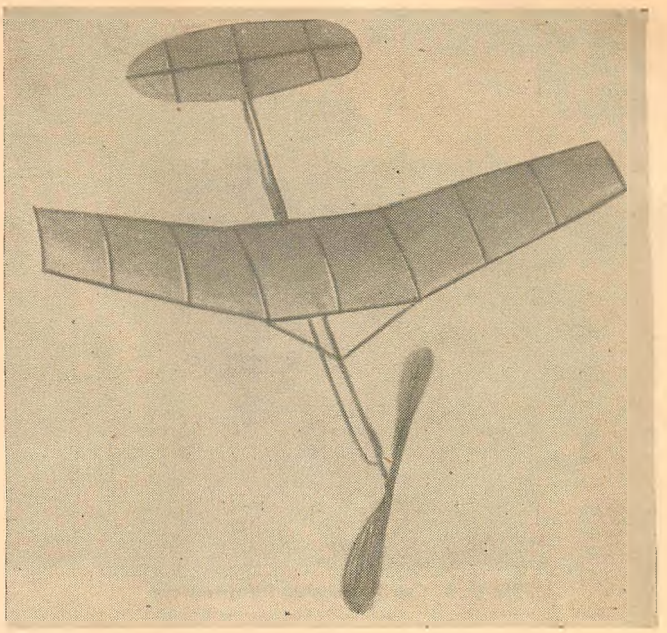
The first model is generally a tissue-covered affair, good for 2 mins. in the average-size living-room and over 4 mins. at the nearest large hall. Some of these models have nudged an 80' ceiling in the process of the longer flights—all of them have flown well when made with a modicum of effort. If there is no large area in which to fly the *Critter,* we recommend making a half-size copy and flying it in the linen closet!

After picking up a bit of confidence in handling the light stuff, a follow-up model, covered with microfilm and made of more carefully selected lumber, will run up over 6-1/2 mins. when swinging an 8-1/2" prop. This, of course, calls for access to the local armory or some building with a similarly high roof. If, in the process of handling, you should happen to knock off one of the propeller blades, simply balance what is left with a small blob of clay and continue flying. The times will remain close to the above stated values. There was a long and lazy session when the original was flown in this manner with great success.

Since the plan layout is full size, building is a simple matter. All members are dimensioned where need be, and the only tricky deal is that of the right wingtip being shown in phantom lines in the upper right-hand corner. Make the wing first. Cut all the spars and ribs from light and soft (5-lb. stock) 1/32" sheet. The tips are formed by the last rib in the panel, in case you wondered what happened to them. (A word on making the ribs—use a bit of heavy manila paper, celluloid, or metal, and cut a template of the top curve of the rib. Cut your balsa sheet to the length of the largest rib. Make the first cut of the rib, using the template, then move the template down 1/32", and make another cut. You now have a rib; each successive cut results in another rib, and there are only nine needed.) The center panel of the wing is left flat on the table. Outer panels are cemented to it and each tip raised 1-1/2" for dihedral. Use the cement sparingly.

Tail assembly is simpler yet. Using the pattern for the wing ribs, cut two more ribs, then chop enough off the trailing-edge





of each to make them fit the stabilizer. Cement the ribs to the 1/32" sq. stabilizer spar. A single piece of 1/32" sq. acts as a rib for the rudder. Now chop the tail boom from 1/16" sheet—it's 6" long and tapered to 1/32" x 1/16" at the end. Cement the stab spar to the rear of the boom, 1-1/2" from the small end. Cut a piece of superfine, or Jap, tissue to the outline given and affix it to the stab frame with a few drops of thinned dope. The paper forms the outline of the stabilizer. On the bottom of the boom, opposite the stab, cement the butt end of the rudder spar. Cut its outline from superfine, or Jap, tissue and affix it as with the stab covering. Presto! a tail assembly, and you used only six slivers of wood.

The wing should be dry by now. Cover it, too, with superfine, or Jap, tissue, using one piece for each of the three sections. Now that the wing and tail are covered, *absolutely refrain from attempts to tighten the paper.* You'll find yourself with a balsa-framed pretzel if you try any tightening process at all.

The motor stick is cut from a sheet of light, soft 3/32" stock. Note: the stick is 8" long, 3/16" deep at the center, and tapers to 1/8" deep at either end. Get hold of a piece of .012 dural, or something similar, and drill a tiny hole in it. Sand the burrs off the hole, then trim around the hole to make the thrust bearing. Make the single bend, and cement it to the front of the motor stick. Other wire fittings—propeller shaft, rear hook, and wing clips—are made from .010 controline or other music wire. Cement the rear hook in place, and the stick is complete.

Make up a set of wing struts from 1/32" square, to size shown, and cement the wing clips to them, directly over the plan. You will then have a pair of wing mounts, the longer one of which is cemented to the front spar, the other to the rear spar, thus satisfying the incidence needs of the model. The open ends of the mounts are cemented to the spars at the dihedral breaks. The clips, fitting snugly on the stick, allow for the movement of the wing when adjusting. Then cement the tail boom to the end of the stick, placing the rudder on the same side as the rubber.

The toughest and most important of any model is the propeller. Care not taken elsewhere in the construction should be used here. Get a soft block, dimensioned as shown, and try also to get the end grain as shown. This setup will result in the best prop. Just draw an "X"—two diagonals—across the face of the block, and leave a 3/32" wide section at their intersection for the hub. Trim the block to shape then carve in the under-camber. Notice the section shown near the blade outline. After the undercamber has been cut and sanded smooth, carve the top camber reasonably close. Then lay the blade on a bottle that has a curve quite close to that of the undercamber and apply the sandpaper. The end result should be a prop 3/64" thick at the hub and tapering to 1/64" thick at the tips. This definitely will not be the case with the first propeller you make, but don't worry—simply make it as thin as you can. After cutting the blades to shape, balance the prop by wiping the dust off the heavier blade with your fingers. The prop shaft is then mounted, *not run through the hub, but lying alongside it and cemented there.* Slip your smallest washers on the shaft and hang the prop on the model. Use a 10-inch loop of 1/30" x 3/64" *T56 Brown Contest* rubber for a start at power. Lubricated and winder-wound this motor is good for 1,600 turns.

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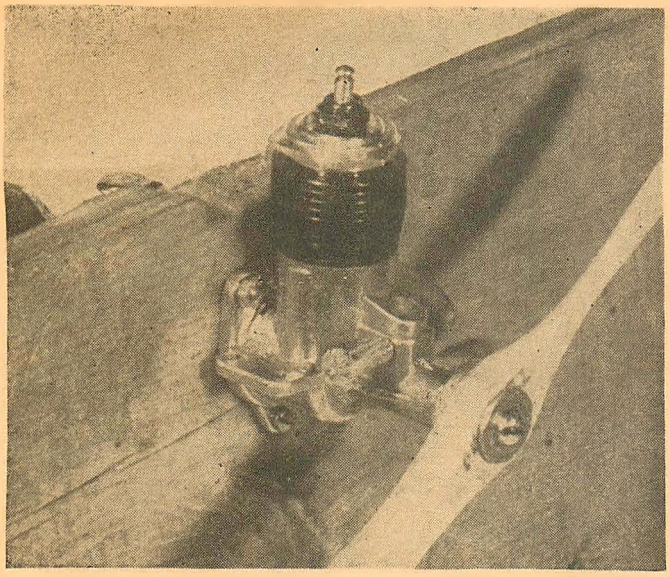
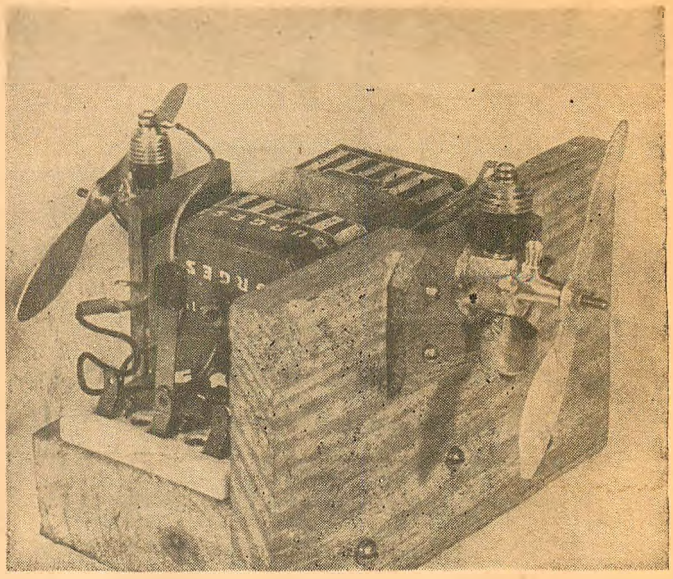


The O. K. Cub 74 mounted for a test run



K & B Infant, left; and Torp Jr. at right

THE MIDGET ENGINES

by EDWARD G. INGRAM

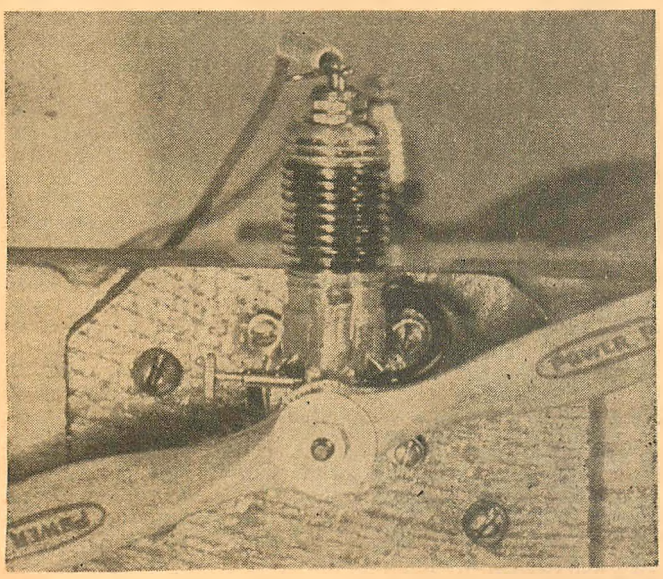
IT IS not much over a year since the first midget model engine was introduced—the *K & B Infant*—yet during this short period a great many similar engines have been made and sold, and interest in midget engines still appears to be growing rapidly. Relatively few manufacturers are producing the midgets at this time, but there are indications that more are preparing to enter the field.

Midget engines have been variously spoken of as "sub-Class A" engines, "½-A" engines, "baby" engines, etc. The first midget engine placed on the market had a displacement of only .020 cu. in., but soon larger designs were introduced. First, the Mel Anderson Manufacturing Company brought out the *Baby Spitfire* with a displacement of .045 cu. in., and the Herkimer Tool and Model Works, Inc., followed with the *O. K. Cub* which has a displacement of .047 cu. in. Later K & B added the *Torp Jr.* with a .035 cu. in. displacement, and Herkimer added a larger *Cub* engine with a displacement of .047 cu. in. The smallest Class A engine in regular production before the introduction of midget engines had a displacement of .097 cu. in. Recently the *McCoy 9*, with a displacement of .098 cu. in., and an *O. K. Cub* model with a displacement of .099 cu. in. have been introduced. From the standpoint of displacement, neither of these latter engines can be considered to be a midget, but both are considerably lighter in weight than the smallest previous Class A engines and they will be discussed in this article.

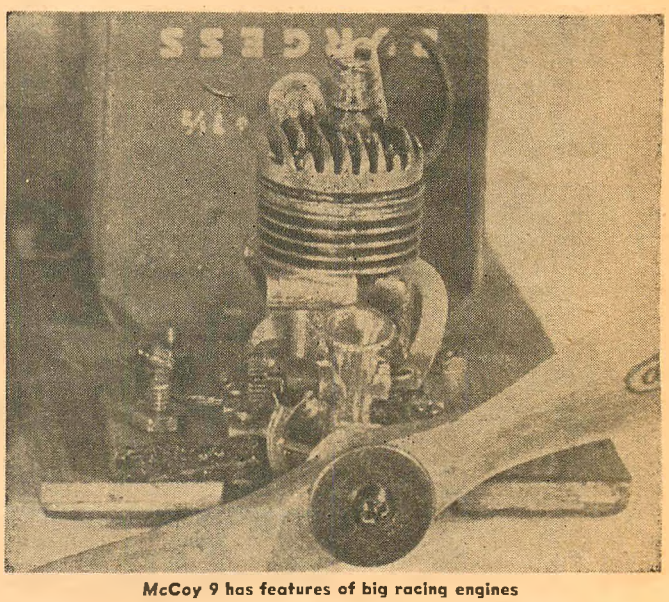
I have tested the .074 cu. in. *O. K. Cub* engine set up on a small stand and find it has a surprising amount of pep. As this engine does not have a built-in fuel tank, I made use of a tank from a Class B engine, on which the *Cub* will run for quite a while without refilling. The manufacturer's instructions call for a needle valve opening of from 3 to 4 turns, but, of course, the exact setting varies with different engines. In starting this engine, care should be taken to prevent flooding. I open the needle valve about 2-1/2 turns, put my finger over the air intake, and turn the prop just enough to fill the transparent fuel line. I then put a little fuel in the exhaust port with the piston at the bottom of the stroke and flip the prop. If the engine starts and then stops quickly, I open the needle valve a little more and repeat operations. As soon as the engine is running, the needle valve is closed down until full speed is reached and the glow plug is disconnected from the battery. The engine operates well on any good grade of fuel. I have been using *Testor 39* fuel recently with success.

I broke in the engine on a 7" diameter, 3" pitch *Rite Pitch* propeller and then ran it on a 6" diameter, 3" pitch *Flo-Torque* propeller. Speeds of 8,000 rpm with the former and 10,000 rpm

(*Turn to page* 42)

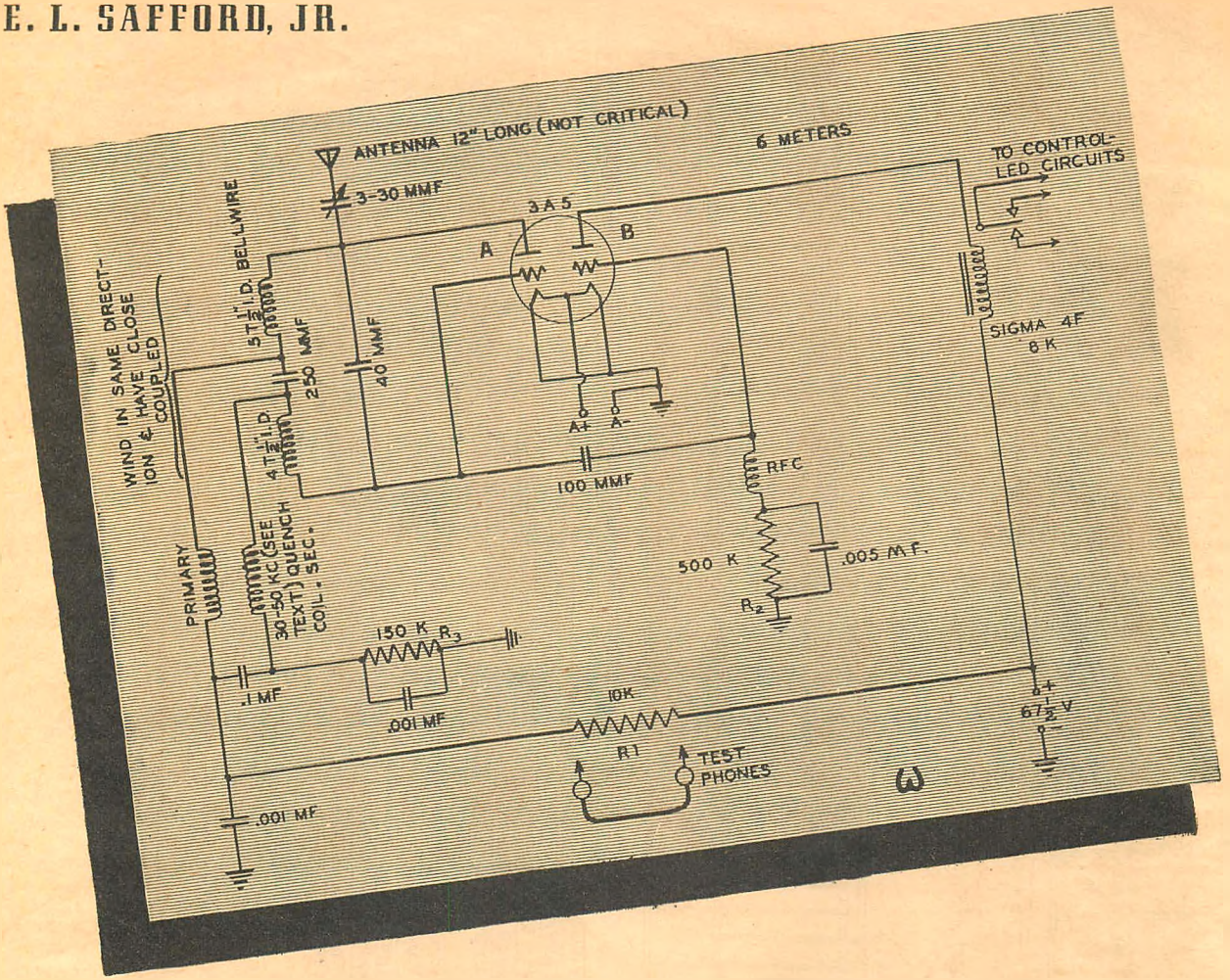


The Baby Spitfire is a real flyweight



McCoy 9 has features of big racing engines

by E. L. SAFFORD, JR.



IMPROVED R. C. RECEIVER

THE author has several times tried to construct a Good Brothers type radio control receiver, using a standard Sigma 4F relay instead of the special polarized relay which comes with the set as it is purchased. The results have always been very disappointing. This set is designed to work with a relay which operates with around 1/2 ma. plate current change, and such relays are not readily available on the market. However, after analysis of the circuit and some serious contemplation, a modification was theorized which makes this set operate a standard Sigma relay, and gets the set away from the "criticalness" which has always characterized it. In the author's opinion, this new setup is one of the simplest to construct and adjust of any known at this time.

The modification consists simply of coupling the second half (B) of the 3A5 tube to the super-regenerative stage (A) in such a manner that in the absence of signal, 3A5-B draws moderate current, on about 2 ma. at 67-1/2 volts plate supply. This current drops to zero when a signal is transmitted.

The circuit is illustrated herewith, and operation is as follows: the 3A5-A works as a normal self-quenched super-regenerative detector. When it is in the super-regenerating condition, there is a certain amount of R.F. energy present in the tank circuit. This R.F. energy is coupled to the grid 3A5-B by means of the 100 mmf. condenser, and because the grid and filament of this second half act as a rectifier, a negative grid voltage is developed across resistor R_2. The R.F. choke is necessary to prevent short circuiting of the R.F. energy to ground through the .005 mf. condenser.

When a signal is received, it adds a small amount of energy into the tank circuit of the 3A5-A. This energy is amplified through the feedback action of this tube until it becomes a large value. This increased amplitude signal is presented to the grid of 3A5-B, causing the bias on this half to increase and its plate current to drop to zero.

In operation then, 3A5-A is caused to super-regenerate by adjusting the grid resistor R3 and also by having the correct connections to the quench coil. (A pair of earphones clipped across the resistance R_1 will make the hiss audible; if no hiss is heard, either the primary connections *or* the secondary connections to the quench coil—but *not both*—should be reversed.) With the values of components shown in the diagram, the grid resistance R_3 should be varied until the relay in the plate circuit of 3A5-B *just closes*. This means that with the normal amount of R.F. energy present in the tank circuit, only a small amount of bias is being developed in the grid circuit of the second half of the tube (1/2 volt across R_2, as measured with a 10,000 ohm-per-volt meter).

Now if a signal is tuned in, the additional energy will cause the grid bias of 3A5-B to rise to about 4 volts, which is enough to cause the tube to "cut off" and the relay to open. The author found that if the relay (Sigma 4F) was adjusted to pull in at about 1-1/2 ma., and to drop out at a 1/4 ma. roughly, it needed no readjustment when placed in the circuit. The armatures should be free and not sticky, and the gap small, for it to operate under these conditions.

Once the set is constructed and thus adjusted, almost any length antenna may be used as long as it is not resonant, which would cause the first half of the tube to cease operation. The set is not the least bit critical and no body effects have been noticed. Long leads have no effect, nor do variations in the supply voltages. Four things might be remembered to make operation easy:

1. Listen for the super-regenerative hiss with earphones across R_1; reverse connections to the quench coil (one side only) if the hiss is not heard.
2. Keep the two halves of the high frequency tuning coil close together and make connection to the outer end of each with the plate and grid.
3. Adjust the grid resistor R_3 to a value which causes the relay to close. Listen to be sure that the set is still super-regenerating when this occurs.

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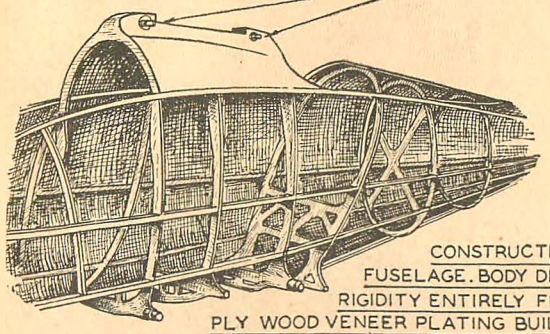
VIEW OF CENTER SECTION RIDGE AND RADIATOR INSTALLATION.

WING ATTACHMENT FITTINGS.

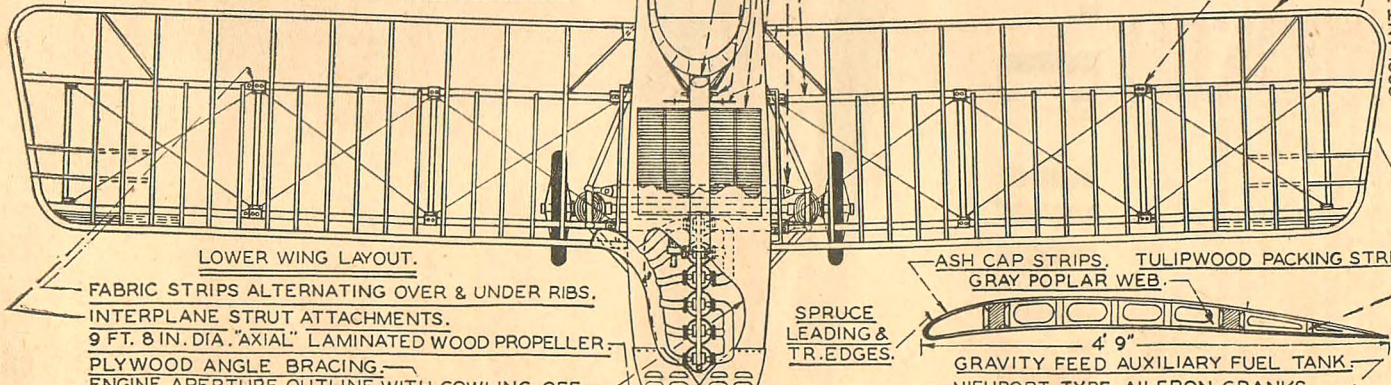


CONSTRUCTION OF FUSELAGE. BODY DERIVED RIGIDITY ENTIRELY FROM SIX PLY WOOD VENEER PLATING BUILT IN HALVES AND JOINED AT TOP AND BOTTOM AND COVERED WITH DOPED FABRIC. TOTAL THICKNESS 13/16 INCH.

VIEW OF ROLAND D-2 COCKPIT

STABILIZER & VERTICAL FIN BUILT OF 3 PLY WOOD.
ELEVATORS & RUDDER OF STEEL TUBING.
REAR VIEW MIRROR.
MAINPLANE AFT ATTACHMENT "Q.D." FITTINGS.
RADIATOR CORE INSTALLATION.
REAR GUNSIGHT FRAME.
SEAT.
LANDING GEAR SHOCK CORD.
SPREADER BARS ENCLOSED IN STREAMLINE CASING.
BOTH WINGS SWEPT BACK 1 1/2 DEG. NO STAG. NO DIHED.
SPRUCE MAIN SPARS.
STEEL TUBING COMPRESSION MEMBERS.

EXPANSION RESERVOIR.
WING TANK.
AILERON CRANKS.
AILERON CONTROL RODS.
STEEL TUBE STRUTS ENCASED IN WOOD STREAMLINERS.
COOLANT TEMP. GAGE.
TWIN SPANDAU M. GUNS.
FORWARD GUNSIGHT FRAME.
AILERON HINGES COVERED BY VENEER & FABRIC.

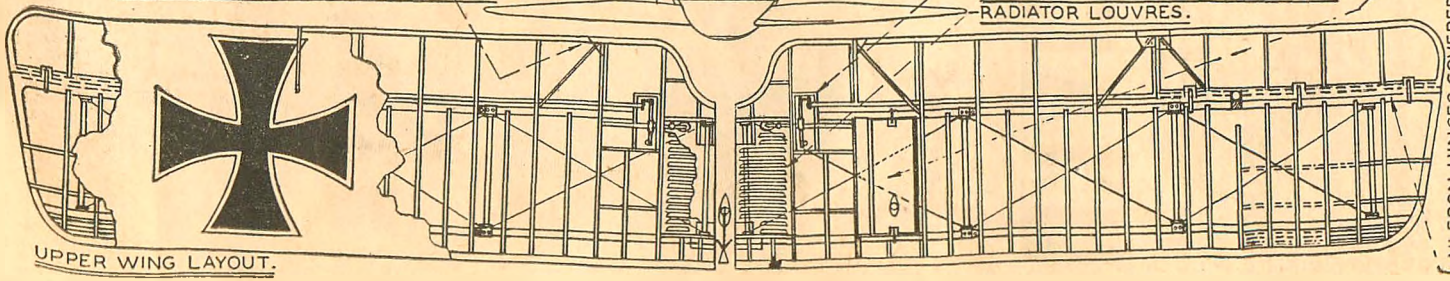


LOWER WING LAYOUT.

FABRIC STRIPS ALTERNATING OVER & UNDER RIBS.
INTERPLANE STRUT ATTACHMENTS.
9 FT. 8 IN. DIA. "AXIAL" LAMINATED WOOD PROPELLER.
PLYWOOD ANGLE BRACING.
ENGINE APERTURE OUTLINE WITH COWLING OFF.

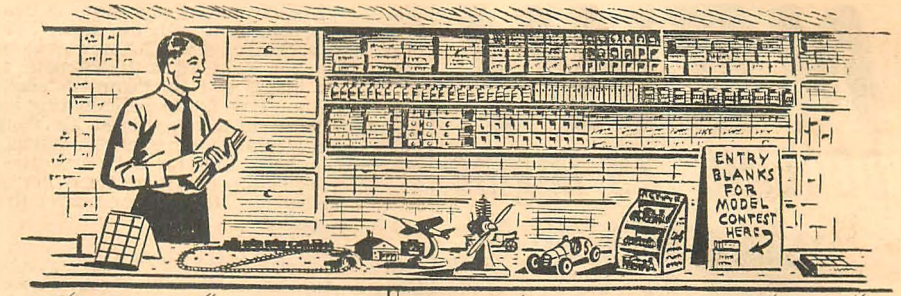
ASH CAP STRIPS. TULIPWOOD PACKING STRIPS.
GRAY POPLAR WEB.
SPRUCE LEADING & TR. EDGES.

4' 9"
GRAVITY FEED AUXILIARY FUEL TANK.
NIEUPORT TYPE AILERON CRANKS.
RADIATOR LOUVRES.



UPPER WING LAYOUT.

AIR AGE INC. 551 FIFTH AVE. NEW YORK, N.Y.	
SCALE: 1/4" - 1'0"	GENERAL ARRANGEMENTS. GERMAN L.F.G. ROLAND PURSUIT OF 1917. TYPE D-2.
DATE:	
DRAWN BY: Joseph Nieto	



HOBBY COUNTER

Conducted by THE TRADE OBSERVER

SO MANY readers of Model Airplane News are under the impression that those Testor (Testor Chemical Co., Rockford, Ill.) controline kits, *Freshman*, *Soph*, etc., are a rehash of the old *TC-2* trainer theme, that they are doing themselves out of a treat. While the old *TC-2* would correspond with the *Freshman 29*, any further resemblance is about as superficial as that between, say, the old Curtiss P-36 air-cooled fighter and its younger brother the liquid-cooled P-40.

The grand plan behind the Testor flock of "ukie" jobs is praiseworthy. A few of the good points: as the names imply, each design is created especially for a purpose, its dimensions and construction tied in nicely —the *Freshman* an all-wood job for getting started, the *Sophomore*, also wood but with a semi-built up wing and shorter moment arm for stunt training, the *Junior* a straight stunter and the *Senior*, a super stunter. Each is available in three entirely different sizes for the three popular engine classes, .09, .19, and .29; and all are known as "complete kits" in the trade, which is to say that you can build them from what you get in the box. Cement and fuel is needed, natch, and Testor sells them too! All four jobs are designed around the *McCoy* engines.

In my shop are a number of other Testor items which are quite popular, though with the fanfare for the *Freshman*, etc., series, you hardly know they exist. These include a nifty little all-wood free flight for the *Infant*. Called the *Baby Zephyr*, it sells for only 98c, and is exceptionally well prefabbed, showing what a manufacturer can do when he tries! The wing is finished to outline, section, deeply cambered, and even scored for the polyhedral joints. Believe it or not, the fuselage is one piece, hollow, really a tubular section and is fully formed with just the seam to be cemented. The pylon is die-cut, as is the tail. Being small, the *Baby Zephyr* will be hot as a pistol with even an .02 engine, and suggests itself as a corking number for informal contests —clubs take note! We find the kids are going for the 25c *Piper*, a little die-cut job from sheet balsa. Everybody says *Stay* is the last word in dope and fuelproofing. It does both with one operation (hence really saves money), is tough, patches neatly, and does resist hot fuel.

* * *

Interested in a deal for U-control landing gears? Something that stands up, looks good, and isn't just old-fashioned wire? Something perfect for semi-scale, sport, team racing? Then try the semi-scale landing gear (25c each) by General Hobby Specialties, (80 Clifford St., Providence 3, R.I.). Made of tempered steel or spring dural, each landing gear leg as holed for the axle, ready bent to shape, and has two holes at the upper end where it bolts or screws onto the fuselage or wing. By overlapping the upper ends of these legs it is possible on thin fuselages (like profiles) to attach both legs with just two machine screws. When you come in, ask for a *Xflex* landing gear kit for Class A & B. The same company has a dandy control horn assembly, made of brass, retailing at a thin dime. The horn consists of two pieces, a U-channel piece that goes over the edge of the flipper (about 2" long) and the sheet brass horn proper, with two holes for push-rod adjustment. These parts are brazed together. Gerry Morvillo, who designed the items, is a modeler from way back.

* * *

To all our customers who ask if their old *Forsters* can be brought up to date with installation of the improvements that are included on the new glow engines, the answer is "no." Forster Brothers, (Lanark, Ill.) state the *G-29* and *G-31* are entirely new engines and none of the parts are interchangeable. By no means send the old job to the factory expecting to get these changes made. Lots of people did this without even getting an answer from the manufacturer as to whether the changes could be made or not—they cannot.

Forster is swamped with questions. Here are the answers: the spark ignition *29* and *305* are being continued at the same price, $10.95. What many modelers don't seem to realize is that Forster equips spark ignition engines with a two speed timer at the factory at a moderate price increase. the two-speed job selling for $12.75. Walt Good used one of these engines to win first place in radio at the 1949 Nationals.

Forster Brothers urge all modelers to purchase glow fuels of well-known brand names and not to mix their own concoctions. They add further that not all engines can be run on glow. This includes their own *99*. Standard equipment on this famous power plant is a two-speed timer; with glow operation, the advantage is completely lost. The spark ignition *29* and *305* can be run on glow but were not designed for it, while the *G-29* and *G-31* will run only on glow. Everything clear, now?

* * *

Virtual supply house for every radio control need is Control Research, Model Division, (P.O. Box 9, Hampton, Va.) offering supplies (battery stock, tubes, meters, parts, etc., equipment (complete control systems in kits or assembled), and info (hints on construction and design, circuit diagrams, instructions for home building of transmitters, receivers, control mechanisms). For 50c you can subscribe for six months to their mailing and catalogue service. Firm offers complete set, transmitter, receiver, and escapement, with needed tubes, as kit for $21, or fully assembled for $36.

An important item not heretofore available at reasonable cost to R. C. fliers (but of vital importance, nevertheless) is a simple and accurate frequency meter. Control Research offers this item, which is usable with any radio control equipment operating in the 50-50 mc. band. The meter is placed adjacent to the receiver tank coil, the meter dial knob rotated until maximum plate current rise is noted on the regular receiver milliammeter, and the frequency noted according to the dial setting. Also can be used for checking transmitter frequencies and for solving off-frequency difficulties.

* * *

Minnesota Engine Works, (387 University Ave., St. Paul 3, Minn.) has introduced the

M.E.W. 601 miniature jet engine at $15. This is not to be confused with the *M.E.W. 707* miniature rocket engine. The new jet engine is 26" long, weighs 8 oz. Its diameter is 1" and its thrust is 1 lb. Features: starts with any flame type ignitor, eliminating ignition systems; uses compressed air from inflated inner tube or spare tire for starting purposes; built-in lugs for easy mounting; has flame arresting device to keep flames away from valves. Nothing needed for flying but a gas tank.

* * *

Briefs. Scheduled for July 1 delivery, new *Douglas Skyrocket* (59c) by Strom-Becker Manufacturing Co., (Moline, Ill.) is a 1/6" = 1' scale job of famed Navy research plane. Kit will come ready with display stand. full-color decal insignia and trim and plastic pilot's canopy . . . Insulated clips for U-control, featuring a safety link to provide insulation against electric lines, announced by Walter Lewis, manufacturer of True-Arc Products, (P.O. Box 6793, Philadelphia 32, Pa.). Can be used with any handle, also for speed control; 4" long, in stock at 25c . . . Latest Froom U-control tank is #19 for the .09 motors. Made of rust proof tin plate, it is 1/2" deep, 7/8" wide, 2" long. Froom Manufacturing Co., (718 E. Colorado, Glendale, Calif.) . . . Scale fans, especially World War I bugs, note that Cavacraft Model Airplanes, (1526 N. 5th St., Philadelphia, Pa.) has new *Fokker Triplane* kit, a 1/4" solid scale job at 50c. All parts completely shaped of western pine, complete hardware, colorful decals, wheels . . . *Berkeley Key-Det* (Berkeley Models, Inc., 140 Greenpoint Ave., Brooklyn 22, N.Y.) a junior team racer on the *Key* theme for .09 engines, expected during May at less than $3.95; also a *North American T-28* trainer with one-piece aluminum cowl, completely shaped; a scale boat. the *Runabout*, for *.045 Cox* power unit, with reduction gear to prevent stalling, built-up mahogany veneer outer skin . . . American Junior Aircraft Co. (1166 N.E. 31st Ave., Portland 12, Oregon) the *Hoppi-Copter*, takes up where *Ceiling Walker* left off. Hits ceiling, descends to floor, hits ceiling, etc., until exhausted. Walker's ready-to-fly *Firebaby* is name of his completely finished gas model for .035 engines, fully painted and decorated, with rubber wheels and metal mount. Their new "contest" plane is rumored to be an "egg beater" type with winder . . . Carl Goldberg, of American Hobby Specialties, Inc. (2900 S. Michigan Ave., Chicago, Ill.) *Lil Rascal*, $1.50, free flight or U-control, all sheet covering . . . The *Rhody Special*, a prefabbed profile U-control with built-up wing (WCL Specialties, 108 Wentworth Ave., Edgewood 5, R.I.) priced at $3.95. has a preconstructed 32" wing, pre-cut fuselage and die-cut *Tekwood* side panels.

Scrap Box

(*Continued from page 2*)

having a whirl at free flight. In at least one major city (no, we won't tell!), the hot shot pilots have been vanquished temporarily by warps and adjustments. Free flight's lighter construction—to say nothing of the absence of wires—may seem tough at first. The best way to learn the free flight tricks is to build yourself a 150 sq. in. *Spit* or *Cub* job, a pylon with plenty of pep and lots of duration. Little jobs are less vulnerable, but offer the same problems as the big jobs. The *K & B .035* is another engine that is really hot in combination with 130-140 sq. in.

A sign of the times is the "cross-country team racing" deal, dreamed up by the *F.A.S.T.* club, of Pasadena. These models are free flight, powered by rubber, CO2 (one tube only), solid fuel jet (also one unit only), or ½A gas of less than .050. Two or more models are flown simultaneously over a course of 150' in length and 75' in width. All models R.O.G. from the starting line. Each model has the chance to fly in three heat races during the meet. Ships accumulating the highest number of points in the heat races are flown together in the semi-main and main events. This sounds like real fun! Now, how would you go about designing a free flight to fly fast, low, and straight without piling in. Mortimer—another basket please!

Does anyone remember the Sunday night that Orson Welles put on a radio play about men from Mars—claimed they landed in New Jersey—and scared half the country out of its wits? Whole neighborhoods were thrown into a panic. What's this got to do with the price of bacon? Well, it seems that hundreds of would be radio prospects took to the hills when they read the recent articles on the *Citizen* by yours truly. Those who had their first R.C. flights behind them knew the articles would save lots of builders the mistake that you can fly anything, anywhere, any time, just because it has a radio in it. While the articles had been concerned mainly with adjustments and flying, a semi-detailed page plan of the *Citizen* had been included. Quite a few advanced builders became interested in the design. Since it was just a one-quarter scale plan, some young hopefuls missed the usual construction details. To anyone trying R.C. for the first time, we suggest that the *Rudder Bug*, the 1949 Nationals winner, is a simple-to-build airplane for which detailed plans are available (see M.A.N. for May and June, 1949). If you can make a ship fly straight on power and in the glide you are in business. It really is that simple. The *Citizen*, by the way, is still flying steadily, now on a *Good Brothers* radio. Our controline friends drop dead when they see it climb, big batteries and all, on that little .09!

Would you like to get into a real brawl? Then what's your opinion on the four-minute Wakefield question? Can a Wakefield model do 4 mins. in *dead* air? For a year now occasional sharp shooters have let us have it because of statements that such a model can do 4 mins. Now, while Wakefield jobs have done up to 4:45 that we know about, it develops that the crux of the matter is the word *dead* air. Stokes and Wood from the Northwest have been carrying on a lovely discussion with the *"Scrap Box."* Wouldst sit in?

"Will a Wakefield do 4 mins. or better in 'dead air'?" asks Wood. "My answer is yes, but I qualify that by asking—what is dead air? It should be cold, lifeless, lacking buoyancy due to risers, thermals, and favorable currents. This is not 'still air.' Still air has risers, weak thermals, and favorable currents. The same model, trimmed the same way, and flown under the same power will appear a hot model in still air, and a very poor model in dead air.

"I do not doubt that Warring did 4:45 average in *still* air but doubt very much if it was *dead* air," Wood continues. "His total time at the last Wakefield finals wasn't much over 4:45. Granted the weather was terrible but what good is a fair weather model in bad weather? In the eliminations the *Jaguar* had three five-minute flights, under nearly ideal conditions, but at the finals performed like an underpowered American-style model. I am not knocking these fellows, but am trying to make the point that dead air and still air flying are two different things.

"The average European model depends on relatively slow climb, while we go in for the sky-rocket climb. Note that power in the English style models, even on 18- and 20-inch props, rarely goes over 16 strands of 3/16" Dunlop (black rubber). This is fine in relatively calm, warm air—it gives a long smooth flight. Try this on a windy day and the model is blown all over the sky and very rarely does it get up out of the ground turbulence. Another big problem of low power is the prevention of drift. I don't think it can be done. The model just hasn't the power to turn back into the wind and keep climbing."

Both Wood and Stokes go further into the question but the show has to go on. Wood gets good results with high power expended at a slow rate. Here's another angle: Hal Roth, of the L.A. *Thermal Thumbers*, has a stick job that does 3:50 on 550 turns in 14 strands of ¼" black rubber, 36" long. Motor run is 35 secs.

"I thought to myself," said Roth, "that, if the darn thing would fly that long on

(*Turn to page 38*)

those few turns I would boost the turn capacity to 1,000 turns and boost duration immeasurably. So I made up a 48" long snake and wound it to 800 turns for a one-minute run. Did the duration go up? No, it came down because the 25% increase in motor weight ruined the glide. So I shall go back to the 36" length. Following the evidence from Roth, Stokes and Wood, our next Wakefield will probably have a shorter motor.

"There was an extra on page 1 of the March '50 issue that got me plenty worried," tees off a chap named "Ship" from Pine Lawn, Mo. "It stated that the National and local Exchange clubs will begin a sponsorship this year that is expected to continue for several more years. Now I consider myself to be just an average builder who is glad when the National comes each year.

"It is the only big meet we boys with two or three ships can go to," Ship goes on. "We don't win but we have a good time. We watch the 'pros' to see what we can learn. I never qualify or get a trip to the Plymouth meet. I could never qualify for the Nationals. But I go and hope to get a 10th place or so. If the Nationals get like the Plymouth, I won't go to fly. Just left home waiting for M.A.N. to tell me how good a meet it was. My big thrill is going to the Nationals, paying my fee, and trying to beat some expert."

That flood you see, son, is an old man's tears! "Ship," if you were a lawyer, even an ax murderer would go free. But we agree with you. Time was when we were for eliminations. For making free flight tougher. And so on. Now we are for all the fun we can get out of it and that means keeping things on a level where anyone can get into the act. Eventually, there may be too many entrants for the Nationals and then eliminations may have to be resorted to. Let's hope that won't happen. Well, in a way at least. Eliminations would mean that the hobby was growing, which is the important thing. The Nationals should not be run on a first come, first served basis, as is done by jammed-up sectional meets, like the New York Mirror jamboree. For a Nationals couldn't be a Nationals without having all the hot shots there for the rest of us to try and beat. But, "Ship," Exchange sponsorship doesn't necessarily mean elimination. If it does, the two of us can hold hands while we wait for next issue of M.A.N.

Will some wide-awake secretaries of clubs in the Northeast drop a line to Charlie Perkins, 197 Hale St., Beverly, Mass., secretary of the *Beverly Sky Jockeys*? This club is spoiling for a go at other outfits in the same section but after contacting all known sources of information hasn't been able to establish contact with any clubs in New York State and New England. "Not a bunch of experts," says the Bay State man. "Just like to fly and meet some of the rest of this modeling bunch of nuts. If nothing else, will settle for letter swapping to break up the bedlam on meeting nights." Come to think of it, many clubs could get together on telegraph or mail meets, held on the same day, with results exchanged as quickly as possible.

For almost as long as we remember, June Dyer, Brisbane, California, has been one of those rare people mentioned earlier, the kind that likes to help others have the good time. Anyway, June mentions a few things about local activities that have bearing on the Nationals scene.

"Dethermalizers are a must out here," remarks June. "The pop-up tail is used by most everyone, though a few use a parachute. Regarding dethermalizers, quite a few use a burning string instead of a timer. I think something should be done about this; it is very dangerous in dry weather and should be outlawed completely. I just don't want to see something tragic result, then it will be too late and we would be banned from every field in the country."

June isn't just crying wolf. Around here you need a fire permit most of the year, even to burn papers and, if you let a fire get on the next fellow's property you pay

a really walloping fine. You can wind up having to pay the labor of all the men involved in fighting a fire. In other sections of the country a wild fire can be a far more serious thing. Fuses have burned ships. This isn't a cure, but June mentions that some local builders go in for semi-scale free flight, since fewer ships are lost, and that this is better than dethermalizers. Only yesterday we were free flighting our radio job in a field less than 400' across. Why is it that a free flighter would rather take up stamps than make a model that won't fly for minutes on end, cause county-wide steeplechases, plus frequent lost flights? The only guys who get real fun out of free flight seem to be the ones who know the least about it. They get out and fly all day without ever hearing about a thermal. If they ever get into a contest, their fun will be gone forever. When some free flighter tells you the speed flier is a lame brain, you can bet your boots he himself dreams of nothing but 13 and 14-6's on his *Mayhem .60.*

L. Symons, secretary of the *South African Model Aeronautic Association*, has been telling us about various new events, rules, and so on. They have two new events this year: U-control flying scale and *Jetex* free flight. Anything goes in the latter, with no restrictions on size or design and any sized *Jetex* unit is permitted. The idea is to see what happens and then introduce more specific rules. Flying scale points are awarded for flying and for scale, appearance, etc. You can get points for speed or stunting, but not both. The system is devised (they hope) to keep any one type of scale job from having an advantage over another. The South African variation of the PAA-Load theme is a dilly.

The way they do it, the event will consist of three R.O.G. flights, the first being a straight power-glide ratio effort, and the second, a limited time flight. On the third flight, each model will carry within the fuselage, weights equal to 20% of the models normal flying weight. The power-glide ratio for this flight will be worked out, and the two ratios applied to get a sort of efficiency ratio for each model. "Frankly, we are proud of this brain child (some of us are, anyway) and think it superior to your own PAA-Load event as it needs no division into classes." One interesting point is that South Africa, like most of the rest of the model world, seems to be adding to the complications of their events while over here the motto is "If it delays processing,—no wings permitted." The African boys have added two more classes in open rubber: A, up to 150 sq. in. and B, over 150 sq. in.

Some months ago there was a contest in Pretoria. As the wind was a bit high, eight models of various types disappeared over the horizon into one of the bad recovery sectors. One was found about a week later, but as time went on the other unlucky souls gave up hope. Let Symons take it from there.

"Quite recently, one of our teams—two youngsters who are twins—got a telephone call from a farmer about 40 miles away, who said that his native farmhands had a model with the boys' name on it. The older brother took a trip out in the car and sure enough the natives produced the model—a *Floater*—a bit smoke blackened and with a few holes where fingers had tested the covering, but substantially undamaged.

"A reward of five shillings (about one dollar) caused the finder to state that they had, over a period of about a year, found quite a few models. 'Where are they,' he was asked. His reply was: 'Well boss, it was like this. Some of these things had small engines, and some didn't but they all had writing on them. Now we can't read so we kept them until a boy came here who could read, and we asked him what the writing said. He said that the writing said the things came from Roberts Heights (our main defense base and air field) and that if the police found us with these things, there would be big trouble. So we burned them all and buried what was left!" L. Symons, yours is the free subscription for the best tall but true story of the month.

Let's Have Another Look At Speed Records

By James P. Trebes

IS A controline model clocked at 160 mph traveling at a faster rate of speed than a model clocked at 150 mph in another part of the country? The answer is—not necessarily. Yet with the present system of controline speed measurement, the 160 mph model would be looked upon as the faster model.

Just what is a speed record? Basically and foremost it is a comparison of the top speeds of a group of models in a certain class. This is true not only for speed records but also for other types of performance of model and full scale aircraft. For any comparison, a common ground must be established. Unfortunately, there has been no basis of comparison for controline records. The matter of air density ratio has been overlooked. In the case of full scale aircraft, the common ground or basis of comparison is the NACA standard day. The NACA day is one on which the temperature is 59° F. and the barometric pressure is 29.92" Hg. This day is a purely arbitrary standard which is seldom realized. Nevertheless, it makes for a logical and sensible means of comparing performance.

When flight tests are run on an airplane, whether it be a maximum speed run, take-off and landing run or rate of climb performance, the results are corrected to the NACA standard day. For example, in the case of a maximum speed test, the corrected data gives the speed the airplane would fly with maximum power if the temperature were 59° F. and the barometric pressure 29.92" Hg.

Consider for a moment some of the factors which affect the maximum speed of a full scale airplane or a speed model. Of utmost importance is the horsepower output. The horsepower output of an engine is affected directly by the air density which in turn is controlled by barometric pressure and temperature. Lift and drag are both influenced by air density. It is obvious that atmospheric temperature and pressure play a big part in the top speed that can be attained by a model.

Naturally, barometric pressure and temperature are quite beyond the control of the model speed flier. Should then, the speed modeler be penalized for these two factors? In the opinion of this writer, definitely not. But that is exactly what is happening at the present time. Unknown to them, some modelers are starting their speed runs with two strikes against them. Air density can change considerably between morning when the contest starts and late afternoon when the last model is clocked.

The correction to standard conditions is simple. The clocked speed of the model is multiplied by the correction factor or density ratio. σ (Sigma). Sigma is found from the following expression:

$$\sigma = (P/P_0)\ (T_0/T)$$

where

P is the barometric pressure in inches of mercury at the time of flight.

P_0 is the standard barometric pressure, 29.92" Hg.

T_0 is the standard temperature 59° F. This must be converted to the Rankine scale by adding 460 to 59. Thus T is equal to 519.

T is the temperature at the time of flight plus 460. Thus $T = t + 460$.

The corrected speed is found as follows:

$$V_s = V_m \sqrt{\sigma}$$

where V_s is the speed at standard conditions and V_m is the measured or clocked speed of the model.

The use of the above equations can best be shown by examples, examples which will also show the type of error that can exist in controline speed records.

Consider a speed contest held in Florida. Assume the temperature is 90° and the barometric pressure is 29.7" Hg.

Then $\sigma = (29.7/29.92)\ (519/90+460) = 0.96$ and the square root of 0.96 is 0.98. Suppose a model at this contest is clocked at 150 mph. The corrected speed is then 0.98 (150) or 147 mph.

Now let us look in on a contest held in Denver, Colo. This time assume the temperature is 80° and the pressure is 24.4" Hg. Bear in mind that these assumed temperatures and pressures are not uncommon in the localities mentioned. The density ratio on this contest day in Denver is then (24.4/29.92) (519/80+460) or 0.784. The square root of 0.784 is 0.886. Suppose a model at this contest was clocked at 160 mph. Corrected, his speed would be 0.886 (160) or 142 mph!

Under the present basis of model speed records the Denver modeler would be the top man; but actually if the two models had been flown at the same time and location, the Florida man would have come out ahead. Obviously, this can be a serious discrepancy and as controline speeds continue to climb, the error will become even more serious.

Of course, the above examples are extreme cases but they show the possibility and magnitude of an error that is completely ignored. The correction to standard conditions would cause very little difficulty to contest officials. The computations can be made rapidly on a slide rule. The temperature and pressure readings for each flight can be made with a thermometer and a barometer at the contest site.

The mathmetical proof and theory of the equations in this article have been omitted for clarity. The writer would be glad to furnish this to any interested reader or the reader may find further information in any textbook on aerodynamics.

Add 10 Miles to Your Speed

(*Continued from page 23*)

good enough in grass, they will be adequate for other surfaces. Also, your dolly should track straight, or slightly away from the center of the flying circle. Never try to launch your plane if your dolly tracks toward the center of the circle. Another tip—do not make the tread (distance from one front wheel to the other) any wider than the wingspan of the plane. The length of the dolly should be slightly greater than the length of the airplane. The width of each wheel itself should be fairly small, otherwise it will give you too much traction. Your dolly should have adequate support for the plane, so that the plane will not have a tendency to lift out of the dolly before full flying speed has been attained.

It is desirable to have your own battery or inertia starter. This will make it unnecessary for you to rush around trying to borrow one from your fellow modelers, and you won't have to start your engine by hand. You *can* start racing engines by hand but it is not desirable. You may not only break one of your special props but may injure your hand or fingers as well.

Maybe you have seen a speed flier suffer the misfortune of having his plane wind up the lines on take-off. This is caused by trying to get the plane airborne before flying speed has been attained, and is a common fault with new fliers. Never fly a speed plane with sticky controls. Be sure that you can move your control surfaces easily with your control handle before the airplane is launched. This means that you must be able to move the elevator both up and down from the center of the flying circle while the plane is still in the dolly. Many speed jobs have been wrecked because the pilot could not control his plane.

You are now ready for the big event, the day of the contest. The plane has been built, props carved (with at least three spares), the necessary test flights made, and you are convinced the ship is ready for that record flight. Upon arrival at the contest field, choose a place for your gear that is not too close to the processing table nor too near the flying circles. The first thing to do is to officially enter the contest, and have the plane processed. It is not necessary to make a test flight—this was done before coming to the meet. Usually the best flying weather is at the beginning of the contest, therefore try to make your first flight as soon as possible. Use a standard fuel for the first flight (see discussion of fuels in previous article). Place the plane so that its tail is pointing

(*Turn to page 42*)

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Now Ready!

Our new booklet, "Contest Fuel At Its Best," containing a wealth of valuable information for every user of model engine fuels is now ready for distribution. We are sorry that the problems incident to getting New Blue Blazer ready for this season's market delayed its publication and apologize to those who have had to wait for their copies. If you haven't yet requested one of these interesting fact-filled booklets, ask your dealer or write direct.

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directly into the wind, because it takes about one quarter of a lap for the ship to become airborne, which means that as soon as it leaves the dolly the wind is on its inner side forcing it away from the center of the circle. By the time it comes into the wind it will be under full control on the first lap. It is a good idea to have a spare glow plug and propeller in the equipment you take to the starting circle because in an AMA met you have only 3 mins. to get your ship into the air. This leaves no time to be running back to the pits to get a plug or a prop. If you have prepared yourself properly for this contest, it will not be necessary to make a second or third flight. However. it may be necessary, in order to try out a slight alteration in fuel mixture. (See Part One.)

Your helpers at a contest can be a terrific aid to you. so pick some friend who is interested in speed flying and has some knowledge of the game. You will find that a few accessories will be no end of help to you; carry such items as a six-volt soldering iron, hand drill and drills, spare set of lines, extra glow plugs, prop spinners, fuels, pliers, wrenches, and a sheet of canvas or similar material on which to place your planes and gear.

In closing there are a few tips that we would like to pass along to you. Lew has found that it has been considerably helpful to keep an accurate log of each of his planes. including data such as the date, time of day, weather, prop used, speed, needle valve setting (rich or lean), and fuel used. This enables him to know what he can expect from each plane.

I would like to note in closing that Lew, after reading these articles, is really worried about his records for 1950, as he is sure the information he has so willingly given will make competition exceedingly keen this year. However, I know Lew is not selfish. which is the reason these articles were written. Lew joins me in wishing you the very best flying this year and he will be looking forward to seeing many new faces in the winners' circle.

The Midget Engines

(*Continued from page 32*)

with the latter were obtained, as checked by a *Vibra-Tak*. The *O. K.* glow plug supplied with the engine functioned perfectly.

Because the parts are so small, great care must be exercised when taking apart a midget engine. For example, if it is necessary to remove the cylinder of the *O. K. Cub*, the cylinder should not be held in a vise, nor should pliers be used, as this will result in serious damage to the cylinder, and piston and rod assembly. For the removal or reinstallation of a cylinder, the manufacturer produces a special clamp ring which is bored accurately to fit the outside of the cylinder. It is stated, however, that removal of the cylinder should be avoided, as it tends to disturb the piston seating.

The exhaust ports take up most of the circumference of the cylinder on *Cub* engines, but there are three bridges spaced 120° apart. The three cylinder intake ports (upper transfer ports) enter at these bridges. The patented port design provides radial fuel injection. With this porting, no baffle is required and the piston has a flat head. The special porting is claimed to provide higher turbulence, more effective scavenging, and therefore greater power. On all *Cub* models, a shaft type rotary valve is used on the *.074*. The steel cylinder with integral fins, which is very nicely machined, is threaded and screwed to the die cast aluminum alloy crankcase. The cylinder head is aluminum alloy and the piston is hardened steel. The connecting rod is fabricated from aluminum alloy. The cylinder bore is .478" and the stroke .415", on 87% of the bore. The engine weighs 1-5/8 oz. and is designed for beam or radial mounting.

The .099 cu. in. *O. K. Cub*, which has a cylinder bore of .515" and a stroke of .480", is similar in design to the two other *Cub* models, and the materials used for the component parts are the same. The crankshaft is fabricated from steel, hardened and ground. The V-3 (1/4"-32) *O.K.* glow plug has a platinum element. One slight variation from the smaller models is that a special bracket is supplied for radial mounting. With this bracket the engine is interchangeable with radially mounted .049 and .074 cu. in. models. The beam mounting holes are the same distance apart in all three *Cub* models. Easily replaceable screws are used for mounting the propellers.

A test run of the *Cub .099*, equipped with a *Flo Torque* 7" diameter, 4" pitch prop, showed a speed of 11,500-12,000 rpm. This engine, however, was not run-in, because of the short time available for tests, and the above test run was made with the engine "right out of the box."

The *K & B Torp Jr.* is not just an *Infant Torpedo* with a larger bore, but an entirely new engine with a larger steel cylinder, larger aluminum alloy crankcase, and a built-in fuel tank of larger capacity. The bore and stroke are .348" and .380" respectively, as compared with .281 by .381 for the *Infant*. The stroke-bore ratio is 1.11 to 1 as compared with 1.18 to 1 in the *Infant*. Both engines have a compression ratio of 8.00 to 1.

The piston of the *Torp Jr.* is steel, heat treated and ground. I found you cannot turn the engine through the compression stroke by spinning the end of the crankshaft between the thumb and finger, which shows how well the piston is lapped to the cylinder. The connecting rod is made from 24S-T aluminum alloy and the upper end of the rod is provided with a ball and socket joint as in the *Infant*.

The *Torp Jr.* is designed for radial mounting, and the engine mount ring is independent of the back plate, leaving it free to swing. When the engine is hung on the firewall with two wood screws, it will freeze in position when the screws are tightened. The screw holes do not have to be bored so the engine will be in a vertical position, as it may be turned to the correct position and then clamped there by tightening the screws. Both the *Torp Jr.* and *Infant Torpedo* have the mounting screws the same distance apart so that the engines may be interchanged.

I have found both these engines unusually

easy to start. Despite their small size, they do not flood easily and, in fact, require the needle valve to be well open until the engine starts firing. Five to seven turns (clockwise) of the needle valve from *completely out* is recommended for starting. A little fuel introduced into the exhaust port and intake venturi will assist starting, but I found that after the engine is warmed up it often can be started simply by placing the finger momentarily over the intake venturi while spinning the propeller. After the engine starts, the needle valve can be turned way down, which, of course, speeds up the engine. The large needle valve opening is necessary for starting because the fuel is not sucked up easily at the speed you can turn the engine by hand.

At first, the engine may slow down after running a short time in which case it is necessary to increase the needle valve opening to supply more fuel and oil. When the engine will hold its rpm at the leaned-out setting, it may be considered broken in.

Fuels recommended by the manufacturer as particularly suitable for the *Torp Jr.* include *Supersonic Ultra Glow, Supersonic 1000, Ohlsson and Rice AA, Arden Glo Flite*, and *Testor 39*. Fuels found suitable for the *Infant Torpedo* are the above mentioned *Supersonic* fuels, *Glo Flite, L. D. Glo-fuel, Ohlsson & Rice No. 2* (only), and *Supersonic 1000* with an added 10% to 20% *Liquid Dynamite, TNT* or *O & R 30 Plus*. Both the *Infant* and *Torp Jr.* are provided with special *K & B Hot Point* glow plugs which are removed by removing the cylinder head with a 7/16" wrench in the *Infant* and a 3/8" wrench in the *Torp Jr.*

In speed tests, using a *Vibra-Tak*, I found the *Infant* would turn the 4" diameter, low pitch aluminum propeller supplied by the manufacturer at 10.000 rpm. The *Torp Jr.* turned the same prop at 13,500 rpm. Despite the fact that this prop is too small for the *Torp Jr.*, most of the running-in was done with it, and no trouble was experienced. I found the *Torp Jr.* would turn a 6" diameter, 3" pitch *Flo-Torque* propeller about 7,750 rpm. It turned a *Power Prop* with the same diameter, but 4" pitch at 8,000 rpm. This propeller has a narrower blade than the *Flo-Torque*, which probably explains why the speed was greater, despite the higher pitch.

The *Baby Spitfire* is an unusually light engine for its displacement of .045 cu. in., weighing only 1 oz. without the glow plug. The steel cylinder has a 3/8" bore and a 13/32" stroke. It is machined from bar stock and screws into the die cast aluminum alloy crankcase. The by-pass or transfer passage is tubular in shape and the fuel mixture is transferred from the crankcase to the combustion chamber around almost the entire cylinder periphery. The cylinder head is machined from aluminum alloy. A compression ratio of approximately 10.00 to 1 is used. A feature of the *Baby Spitfire* is the bronze main crankshaft bearing, which is cast into the crankcase. The alloy steel piston is hardened and lapped to the cylinder. A ball and socket joint is used at the

upper end of the steel connecting rod. The fuel tank is built-in, and this is a rotary valve engine. The glow plug provided is built by the manufacturer, but the engine will take standard glow plugs. The manufacturer recommends a needle valve opening of approximately five turns for starting.

After only a little running-in, I tested the *Baby Spitfire* with a 6" diameter, 3" pitch *Flo-Torque* propeller and obtained a speed of 8,000 rpm. With a 6" diameter, 4" pitch *Power Prop* 9,000 rpm was obtained. Using the 4" diameter, low pitch aluminum propeller supplied with the *K & B Infant*, a speed of about 13,500 rpm was obtained with the *Baby Spitfire*. All speed readings were taken with a *Vibra-Tak*. The manufacturer states that best results will be obtained if a propeller is selected which will allow the *Baby Spitfire* to turn between 10,000 and 12,000 rpm, and that for free flight, a 6" diameter, 2" pitch propeller will provide maximum thrust. A 5" diameter, 3 to 4" pitch prop is suitable for U-control.

By mistake, the glow plug on the *Baby Spitfire* I tested was left connected to the battery all night; yet when the battery was replaced, the plug operated perfectly.

The *McCoy 9* is novel and very interesting because it is a "hot" engine, incorporating many of the design features found in large racing engines, including an aluminum alloy cylinder with steel liner, an aluminum piston with what is said to be the smallest piston ring ever produced, a built-in exhaust stack, and a large by-pass leading from the crankcase to the cylinder.

Unlike other very small engines, the aluminum alloy cylinder head is attached to the cylinder with four 3/16" Phillips-head screws, instead of being threaded and screwed to the cylinder. This avoids the danger of the cylinder head screwing off when you try to remove the glow plug. The cylinder and crankcase are cast in a unit, which eliminates a joint where leakage may occur, and the crankcase front-plate is attached with four screws.

It must have been a delicate task to develop a piston ring for a cylinder with a bore of only 1/2". It is stated that the work was carried out with the cooperation of Perfect Circle piston ring engineers. The piston head is provided with a baffle. The cylinder compression ratio is 8.00 to 1. The stroke is the same as the bore, that is, 1/2", and a shaft-type rotary valve is used in conjunction with a large air intake. The upper end of the die cast aluminum alloy connecting rod turns on a bronze wrist pin, and a very interesting feature of the engine is that the crankshaft turns on a special oil-impregnated iron bearing. A built-in metal fuel tank is provided. A needle valve opening of from 1-1/2 to 2 turns is recommended for starting. After the correct running setting has been found, it is suggested that the operator leave the needle valve set and try starting the engine by priming it through the exhaust. It is also suggested that during the first hour of break-in a few drops of oil placed in the venturi and exhaust port will protect the engine and aid starting.

After very little running-in, the *McCoy 9* I tested turned a 7" diameter, 4" pitch *Air-O* propeller 12,000 rpm.

One manufacturer warns against the use of fuels containing nitro-benzol because they corrode aluminum and magnesium rapidly. It may be mentioned that benzol, or benzene, is an aromatic hydrocarbon obtained from coal tar in which the atoms of the molecule are arranged in the form of a ring or closed chain. Nitromethane is used in most of the good methanol-base glow plug fuels, and also in racing fuels. Methane is one of the paraffin hydrocarbons in which the atoms are arranged in the form of an open chain. It also may be mentioned that it is particularly important to avoid breathing the exhaust fumes of all nitrated fuels, and that engines should be operated either in the open, or only for short periods of time indoors—with all windows *open*.

As nitrated fuels tend to irritate the skin, so the hands should be washed after handling them. After an engine has been operated on nitrated fuel, it is advisable to pour a little denatured alcohol in the exhaust opening and air intake, revolve the shaft a few times, and then turn the engine over and empty it. A little castor oil may then be put on the piston skirt by way of the exhaust port, and the engine covered with a cloth to prevent dirt from getting into it. Castor oil is a wonderful corrosion preventive and lubricant.

Trouble shooting is simple with midget engines because there is so little to go wrong. Starting trouble may be caused by failure of the glow plug, a weak battery, stoppage in the fuel line, improper fuel, or, where a separate fuel tank is used, by the tank not being located at the proper level in relation to the needle valve. It is desirable to locate the top of the tank about level with the needle valve, but some engines, such as the *K & B* models have the tank located well below the needle valve, yet they start very easily. Engines with attached fuel tanks have the advantage that

(*Turn to page* 46)

SPECIFICATIONS OF VERY SMALL MODEL ENGINES

	Displacement, Cu. In.	Cylinder	Cylinder Attachment	Cylinder Head Attachment	Crankcase	Piston	Conn. Rod	Crankpin Bearing	Wristpin Bearing	Crankshaft Main Bearing	Bare Engine Weight, Oz.	Weight Per Cu. In. Disp., Lbs.	Cylinder Bore And Stroke	Stroke—Bore Ratio	Cylinder Comp. Ratio	Recommended Prop. Dia.	Recommended Prop. Pitch.	Revolutions Per Min. with Recommended Prop.	Type of Mount
K & B Infant	.020	Steel	Thread.	Thread.	Al. Alloy, 24S-T	Steel	Al. Alloy, 24S-T	No Bush.	Ball & Socket	No Bush.	1.00	3.12	.281 x .331	1.18	8	5	2	9,500	Radial
K & B Torp Jr.	.035	Steel, Alloy	Thread.	Thread.	Al. Alloy, 24S-T	Steel	Al. Alloy, 24S-T	No Bush.	Ball & Socket	No Bush.	1.06	1.89	.343 x .380	1.11	8	5	3	11,500	Radial
Baby Spitfire	.045	Steel, Alloy	Thread.	Thread.	Al. Alloy, Pr. Cast	St. Alloy, Hardened	Steel, Hardened	No. Bush.	Ball & Socket	Bronze Bush.	1.00	1.39	.375 x .406	1.08	10	6 5	2 4	10,000-12,000	Radial
O K. Cub	.049	Steel	Thread.	Thread.	Al. Alloy, Die Cast	Steel, heat treated	Al. Alloy, Die Cast	No Bush.	No Bush.	No Bush.	1.50	1.91	.390 x .415	1.06	....	6	3	.....	Beam-Radial
O. K. Cub	.074	Steel	Thread.	Thread.	Al. Alloy, Die Cast	St., heat treated	Al. Alloy, Die Cast	No Bush.	No Bush.	No Bush.	1.62	1.37	.478 x .415	.87	....	6½	3	.....	Beam-Radial
McCoy 9	.098	Al.-St. Liner	Integ.	Screws	Al. Alloy	Al. Alloy, 2 Rings	Al. Alloy, Die Cast	No Bush.	Bronze Pin	Iron, Oil Impreg.	2.25	1.43	.500 x .500	1.00	8	7	4	12,500	Beam
O . K Cub	.099	Steel	Thread.	Thread.	Al. Alloy, Die Cast	Steel	Al. Alloy	No Bush.	No Bush.	No Bush.	1.87	1.18	.515 x .480	.93	....	7	3½	.....	Beam

This chart was prepared from information supplied by the engine manufacturers. All engines listed are Class A, single cylinder, with shaft type rotary valves, and aluminum alloy cylinder heads.

they are easy to install. On the other hand, an advantage of the separate tank is that a larger one may be used when prolonged operation is desired. In any case, it is important to see that the fuel tube reaches to the bottom of the tank. Fuel which tends to gum up the engine should be avoided.

Glow plug engines may be started on one 1-1/2-volt dry cell, but if the engine is hard to start or if it is desired to make frequent starts, it is better to use two cells connected in parallel, that is, with the two positive poles conneced together and the two negative poles connected together.

With a weak battery, starting trouble will be experienced even though the plug element is incandescent. When the glow plug is working properly, look through the exhaust port with the piston at bottom of stroke, and you will find that the interior of the cylinder is lighted brightly.

Another method of checking the element with the plug in place is to connect one battery lead to the body of the plug and the other lead to the screw portion of a 1-1/2- or 2-1/2-volt flashlight bulb. If the bulb lights when the bulb base is touched to the top terminal of the glow plug, the plug is all right.

When the battery is weak, special conditions may determine whether the glow plug will or will not start the engine. I had the peculiar experience recently of finding a battery which was too weak to start one of the larger midget engines, yet would start the *Infant Torpedo* easily. Probably there was less heat dissipation in the very small cylinder of the *Infant*.

The accompanying illustrations show some of the setups used for testing midget engines. One picture shows a *K & B Infant* and a *Torp Jr.* setup so that either may be connected to the Burgess battery located between them, by simply throwing a knife switch to the proper pole. The *Baby Spitfire* was installed on the same stand in place of the *Torp Jr.*, for testing. Separate setups were used for testing the *Cubs*, and the *McCoy 9*.

Some places where I believe there is room for further refinements in the design of midget engines may be mentioned. All midget engines now being produced have shaft-type rotary valves, which place the needle valve so close to the propeller that it is very difficult to make adjustments without getting a finger in the path of the revolving blades. Some attempts have been made to reduce this difficulty. In the *Infant* the needle valve is set at an angle to provide a little more room for the fingers. The needle valve of the *Baby Spitfire* is made to turn so easily that you can roll it around with one finger instead of having to grasp it between two fingers, yet it is so designed that it will not vibrate around when the engine is running.

Because of their small dimensions, it is difficult to adjust the needle valve of a midget engine without getting the fingers in the path of the hot gases from the exhaust, specially on those types where no exhaust stack is used.

It would seem that where built-in fuel tanks are used, they could be made a little larger to advantage as the engines do not run very long on a filling with present tanks, though the latter are, of course, adequate for full flight use.

It would be an advantage if all manufacturers supplied midget engines with full equipment, including fuel line, mounting bolts and nuts, a propeller suited for the engine, etc., as often the purchaser is in a location where these parts are difficult to obtain.

What's the Score in Stunt?

(*Continued from page 15*)

also creates the least amount of drag.

With the airfoil chosen, the next step is to lay out our wing planform so that it provides enough lift at all times to offset the flying weight and maintain flying speed. This is done by choosing a wing which has a large amount of lifting surface—this large wing gives the required lift and yet has a low-drag ratio, due to the carefully chosen airfoil. To give any sort of a formula which would tell how much area to use for a given weight, would be beyond the capabilities of the average modeler, as well as my own. However the areas indicated on my *"Super Stunt Model"* drawing have proven out in practice, and seem to be correct at this time.

One other item to bear in mind when choosing wing sizes is the power the engine develops. Most fellows like to use 70' lines no matter what size engine used (excepting for the small bore jobs, of course). This must be taken into consideration if we are to obtain equal results with all engines. When making comparisons between our Class B model and the 60's, remember that the weight and drag of the lines stays fairly constant. Therefore, if we are to have equal success with all size models we must use more wing area by comparison, on our Class B models, than we do with the larger ones.

Now that the wing problem is fairly well settled, about all that is left is the horizontal tail surfaces and fuselage. Once again we can let experience work with us in determining tail area; 25% of the wing area seems to work well with short-coupled aircraft, the longer moment armed jobs require less, due to the mechanical advantage obtained with the additional moment arm. Also, the stabilizer should constitute 45% of the total tail area; with such a setup there is very little chance of the tail blanking out completely, no matter what attitude the model gets into. Weight is a factor here and it should be held to a minimum.

The fuselage is actually nothing more than a means by which we tie the whole works together. Therefore, it is here that we should concentrate on good looks; at the same time drag should be held to a minimum. The best way to start is to lay out the desired location of the engine with its fuel tank and design the fuselage around it. Everything should be done to keep it as streamlined as possible and yet it should possess plenty of strength. Careful attention should be given to motor mounts so

(*Turn to page 48*)

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that they are anchored firmly enough to absorb the engine's vibration. This will provide a longer lasting model and at the same time it will allow for more consistent engine runs due to the reduction of "boiling" in the fuel tank. With a well laid out fuselage on the drawing board, the basic design problems are pretty well covered and about all that remains is to get the model built.

To get an idea of how all this shapes up, let's look over the drawing of my model, and see how it ties in with all that has been said.

Beginning with the engine, I am inclined to use the most powerful one that I can get; it always seems better to have too much available power than to have too little. The most potent engines of course are the glow plug 60's; the glow fuel contains the power and the .60 allows us to use most of it. I use the *Atwood Glo-Devil;* to get a long consistent run, this engine requires a tank of about 4 cu. in. in capacity with the true wedge type working as well as any. A baffle in the tank or a loop in the fuel line will help to maintain a constant flow of fuel during all sharp maneuvers. These engines seem to develop their peak power on 12" props with a pitch to match their different power curves. The exact pitch can only be found by experimenting.

The wing is of tapered design for both appearance and efficiency. The airfoil is one which has proved to have a tremendous lift and yet it seems to have very little drag. A speed of over 100 mph can be expected from the model. The wing is nearly 5' in span with a total area of 670 sq. in. With the high speed and the huge wing there will be no slowing down or stalling out with this aircraft. The construction of the wing includes plenty of balsa with both spars and sheet covering being used. This has been found to be very necessary due to the terrific loads imposed upon it during sharp turns and maneuvers; previous models which had a lighter wing construction actually folded in mid-air! The controls are also located in the wing where they have a good solid anchorage.

The horizontal tail is almost the size of some wings, therefore it had to be given considerable thought. It was kept as thin as possible to reduce drag and yet by using a built-up construction, weight was held to a minimum and the strength was enhanced.

With such large flippers on a really high speed model such as this, extra attention must be given to the hinges and control horn. In this case they are made from metal and heavily reinforced. It is also necessary to use a push rod of at least 3/32" music wire to prevent flexing under load. The actual movement used in ordinary maneuvers is relatively small, about 10° in either direction; however, it is always a good idea to have more for emergencies, when an additional foot of altitude may prevent a crack-up.

The fuselage in this model is of sheet balsa construction, faired with balsa blocks. The sheet gives extreme strength, especially when laminated in highly stressed areas; lamination is used around the wing joint and the motor compartment. The contours of the fuselage are held to the minimum in which the engine and tank can be fitted; at the same time every effort has been made to attain the maximum in streamlining. The large spinner on the nose with the partially cowled engine allow these contours to flow smoothly from the nose to the tail. The characteristic rudder-cabin on the design is a compromise whereby good looks can be had with the least amount of additional drag and weight.

An additional touch of originality can be had by making a simple form block and moulding a plastic canopy to use as the cabin. A pilot's head, with an instrument panel and controls add a nice touch to the inside of this canopy and actually require but little extra time to install.

I have been using aluminum gears on all my stunt models this past year, for several reasons. They add a nice realistic touch for one thing, and have proved to be very rugged. Installation is simplicity itself; they are screwed to the bottom of the motor mounts which makes for a solid fastening. Then, too, no firewall as we know it is necessary with them, which keeps the gear out of the way of the fuel tank. The wheel pants are the only doubtful addition—they certainly add looks but just how practical they are remains to be seen. They are fastened to the gear with small metal brackets by means of plywood which is imbedded in the balsa pant.

One of the paramount items in a successful stunt model is balance. It is the root of all evil and at the same time it is the stepping stone to success. With this model as an example and using the front line as a reference point, we can change the ship from an *extremely* stable flier to one which is practically impossible to fly. The farther forward we locate the C.G., the more stable the model becomes; the further aft from the front controline that we shift the C.G., the more maneuverability we get until a point is reached where instability sets in. Actually the safest and best compromise is to have the balance point or C.G. right at the front line, especially with the short-coupled type of model. My C.G. is always located slightly behind the front line where the point of maximum maneuverability lies; if any instability shows up, I simply add a bit of weight to the nose until it disappears. Actually, the best method to use no matter what type of model you are using is to locate the C.G. where indicated (if you are building a kit model) by checking balance carefully while installing the wing. It takes a bit longer to put all the parts in their correct places and actually locate the C.G. where it belongs while you are building, but it really gives you the utmost in performance, once the model is completed. If you build kit models, this is even more important. With the prefabrication that is in use today you can get into trouble very easily; the manufacturer locates his wing cutout where it proved best on the test models. However, balsa varies to extremes in density which means that the actual center of gravity in your model can be considerably different from that in the original.

Suppose the aft part of your model is built from very heavy wood as an example, while the original had wood of the other extreme. Your C.G. could come out quite a bit farther back, which would mean that your wing should be moved aft no matter where the cutout for it lies.

I believe this all goes to show that stunt flying has really grown up, until it now has become as much of a science as are all the other phases of modeling. One nice feature of it all is that a fairly rank amateur can take one of the new-type stunt models and in a short time master most of the maneuvers; it's much harder to fly these new jobs into the ground as it takes far less altitude to recover from abnormal positions. These advancements are a boon to the seasoned flier too, for he can now build a model which is really nice to look it, and know that performance will be something he has always dreamed of. The built-in ruggedness and stuntability mean that he can have that much more flying time during which he can really polish up his technique and know that his every flight will be one of near perfection!

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3. LEVEL FLIGHT. (2 laps at 6' altitude.) *Rough—1; Wavy—3; Smooth—5.*

4. CLIMB. (At least 15' measured vertically, with a precise change of direction into and out of maneuver.) *Vertical climb—10 points.* Bonus: 60° angle —5; 90° angle—10.

5. DIVE. (At least 15' measured vertically, with a precise change of direction into and out of maneuver.) *Vertical Dive—10 points.* Bonus: 60° angle—5; 90° angle—10.

6. WING-OVER. (Vertical climb and dive with model passing directly over flier's head, cutting the ground circle in half.) *Wing-Over—15 points.* Bonus: Square entrance & exit—10; 90° angle—10.

7. CONSECUTIVE INSIDE LOOPS. (Entire series should be done within 1/4 lap with controlines at an angle of 60° or less to the ground at all times during maneuver.) *1 loop—10 points; 2nd to 5th incl.—5 each.* Bonus: Smooth and round—10; Under 45°—10.

8. CONSECUTIVE OUTSIDE LOOPS. (Entire series should be done within 1/4 lap with controlines at an angle of 60° or less to the ground at all times during maneuver. Loops may be entered from inverted or normal flight, so long as complete loops are made.) *1st loop—10 points; 2nd to 5th incl.—5 each.* Bonus: Smooth and round—10; Under 45°—10.

9. INVERTED FLIGHT. (Must start and end with model in normal upright position. Flight direction must be opposite to that of take-off. Model should be flown at a 6' altitude.) *1st lap—10 points; 2nd lap—10; Recovery—10.* Bonus: Under 6' altitude—10; Recovery under 45°—10.

10. HORIZONTAL FIGURE EIGHT. (Should be done within 1/2 lap, with controlines at an angle of 60° or less to the ground at all times during maneuvers.) *1st eight—20 points; 2nd and 3rd—10 each.* Bonus: Within 1/4 lap—10; Under 45°—10; Well rounded—10.

11. VERTICLE FIGURE EIGHT. (Controlines should not exceed an angle of more than 90° to the ground.) *1st eight—20 points; 2nd and 3rd—10 each.* Bonus: Under 60°—10; Well rounded—10.

12. OVERHEAD FIGURE EIGHT. (Center of figure to be directly over flier's head. Controlines should not be at less than a 30° angle to the ground at any time during maneuver.) *1st eight—20 points; 2nd and 3rd—10 each.* Bonus: Not less than 60°—10; Well rounded—10 points.

13. SQUARE LOOP. (Horizontal flight portion of maneuver should consume at least 1/4 lap. Corners should have a radius of approximately 5'. Angle of controlines to ground should not exceed 60° at any time during maneuver.) *1st corner—5 points; 2nd—5; 3rd—10; 4th—20. Corners with greater than the approximate 5' radius specified—0.* Bonus points: Under 45°—10 points.

14. SPECIAL MANEUVER. (Must be described in detail to judges prior to flight. Only one such maneuver may be made, and must be an aerodynamic or mechanical maneuver of the model itself; not a stunt of the contestant alone.) *Best special maneuver to receive 15 points, with those of other contestants being graded in proportion.*

15. LANDING. *With gear; Nose-over—3 points; Rough—5; Bounce—10; Smooth—15; Without gear: 2 touches—3; 1 touch—5; Smooth—10.*

Design Forum

(*Continued from page 24*)

flown by this experimenter, all using the sharp rather than the rounded leading edge and the majority of these were contest winners. (An excellent example of such an airfoil was given in the September, 1949, issue, Fig. 1, page 13.) This type of section won every contest in which it was entered. Although the flying capacity of the model may not have been entirely due to the wing section, this particular section materially added to the flight.

One of our "old-timers" saw the drawing in the September issue and used this airfoil section on one of his planes. In fact a letter recently received from him prompts our comments here. He is Mr. Barney Snyder, of 11921 South Western Avenue, Los Angeles, California. Barney was flying models before many of our present-day experts saw the light of day and he has won many a contest. He writes: "You ran a new airfoil some time ago in M. A. N. suggesting it be tried. You said it was for rubber models, but it looked good so I put it on a new *Cub*-powered pylon model, (I still don't like pylons). To make the story short it was a one flight job, *up and gone*. I wanted to see what kind of a glide it had but it never got low enough to find out. I hear the Commies shot the model down ten days later. They thought it was a new secret bomb!" We wonder whether others have tried this section with the same results.

Probably the best way to throw some light upon how to choose a good model wing section is to consider some of the *requirements* of model flight. Let us start with a full scale section and see why a model section should differ from it. The shape of a full scale section is governed by what a large airplane has to do. It takes off in straight-away flight and *climbs* at reasonably small angles-of-attack, seldom above 5 or 6°, unless some unusual maneuver at reduced power is executed. During *glide*, where a slow descent is required, at the lowest sinking velocity, the angle-of-attack may be higher (6 or 7°) than this amount. While *landing*, it is desirable to fly as slowly as possible, therefore, the plane is maneuvered to an angle-of-attack which will develop the maximum lift of the wing. This in *full scale operations* is approximately 15 to 16°. So, we see then that an *angular range from zero to 16° is required* (Fig. 3. curve A).

What about a model? There is no pilot in a model to increase the angle-of-attack for landing. Maximum duration, especially in contest work, does not require such a maneuver. For model duration we are concerned chiefly with two things: *fast steep climb and the lowest possible sinking velocity during glide*. A maximum climb results, with average wing sections, at angles-of-attack below 6°, because above this the drag is too high relative to the lift, and therefore climb would be slower. Maximum climb usually results when the wing angle of attack is from 4 to 5°.

During the glide *sinking velocity* is the problem. You wish your model to drop as few feet per second as possible. The angle-of-attack during this maneuver is seldom over 7° and the glide continues at this angle until the model lands. *In other words, at no time during the model's flight is a high angle-of-attack advantageous for what the model has to do.*

In this fact lies the reason why a sharp leading edge is better than a blunt, rounded one for models. The rounded leading edge induces a rolling boundary layer in which the air particles spin and roll like ball bearings (due to the slowing down effect caused by the blunt nose) along the upper wing surfaces. Fig. 2. This phenomenon prevents the tendency of the boundary layer to separate. Consequently, the air flow over such a wing will be smooth up to a higher angle-of-attack than one in which this rolling or rotary boundary layer *does not exist*, or at least does not exist *to the same extent*. In other words, the rounded leading edge makes it possible for any given wing to fly at a *greater angle-of-attack before stalling results*. This device is used by full scale designers because a large angle-of-attack is advantageous for landing; because they require very high lift to land slowly, even though the drag also is high.

At angles-of-attack suitable for normal straight-away fast and efficient flight, this rounded leading edge contributes nothing and is unnecessary. In fact, it creates more drag at low angles-of-attack than the sharp leading edge. It must be tolerated, however, to obtain the required landing qualities in full scale planes. Model planes do not need such landing qualities and fly only at relatively small angles-of-attack. Consequently the greater drag caused by the rounded leading edge, can be eliminated by making the leading edge sharp. This sharp leading edge allows a greater velocity of air flow over the wing at small angles, and these angles are not great enough to induce separation and stalling. Consequently, we have a smooth, faster flow at these small angles-of-attack, with more lift and less drag. When such a wing does stall, the point of stall is usually sharp—the wing stalls suddenly (Fig. 3A). This has some disadvantages in a model, when the wing reaches the stalling angle during climbing flight. This angle, however, is *much greater* (8 to 10° in a model, 14-16° full scale) than the angle of maximum climb (4 to 5°) and such stalling will take place only as a result of improper design or adjustment for maximum climb.

This brings up another point. If possible, this sharp leading edge wing should be designed to stall *gradually*, in spite of its normal tendency to stall suddenly due to the sharp leading edge. This may be achieved by using sufficient camber, because wings with relatively high camber, stall less suddenly than low cambered wings. Fig. 3 shows two lift curves that illustrate this: one has a sharp break at the top (A), the other a gentle tapering off of lift (B). The latter is a curve which is typical of wings with *higher camber*. The other curve with the sharp break at the top is typical of a thin wing. Incidentally the higher camber wing attains maximum lift at a lower angle-of-attack, when the Reynolds number is low (at model speeds). However, since a model need not fly at an angle-of-attack greater than 7°, if we use a full scale section where maximum lift occurs at 16°, the lift per unit area at only 7° will be much smaller. This is wasteful and inefficient. If a section is devised that gives maximum lift at 10°, for instance (stalling at this angle), then the actual lift of a given wing area will be much greater at a minimum sinking velocity angle of 6° (Fig. 3C).

Merely raising the camber, however, sometimes lowers the sinking velocity angle (for example, to 4° at X, curve B) so the lift at this angle will be only slightly greater than Y, curve A, especially if the angle of the section median line with the chord line at the nose is large, as at A, Fig. 4A. But, if the *trailing edge* angle is greater (C, Fig. 4B), maximum lift will usually occur at a smaller angle-of-attack D. Fig. 4B, and there will be much greater lift at minimum sinking velocity angle-of-attack; note Z on lift curve C, Fig. 3.

In order to develop such a section, first consider the section at Fig. 4A. This is a full scale section, and has its stalling and maximum lift angle at 16°. The angle of the trailing edge with the line of flight F is labeled T. Now lay out a chord line of a second section at 10° angle-of-attack, as at D in Fig. 4B. Draw in a trailing edge at the same angle T. to the line of flight as was the trailing edge of the section in Fig. 4A as shown by the dash median section line at the trailing edges. Add to this trailing edge the forward part of your new wing section B. with the same camber height as you had in section A, and with the leading edge at the same angle L, to the line of flight, as in section A. This results in a section with the maximum camber point nearer the trailing edge as shown. This section should give much greater lift with a lower *proportional* increase in drag at 6° and a minimum sinking velocity angle. You will note that the resulting sec-

(*Turn to page 52*)

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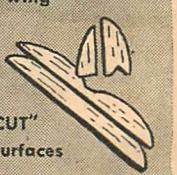

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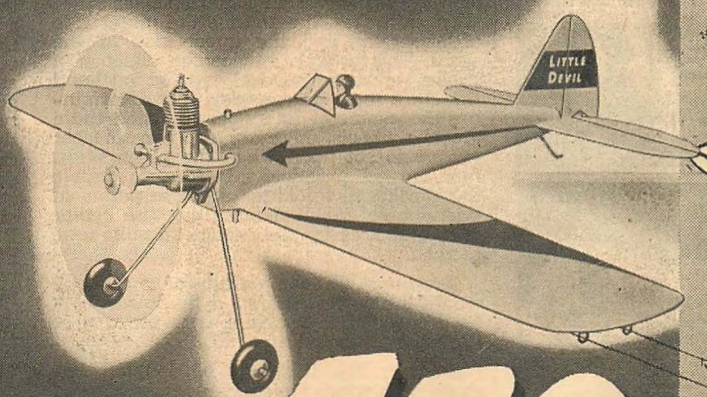

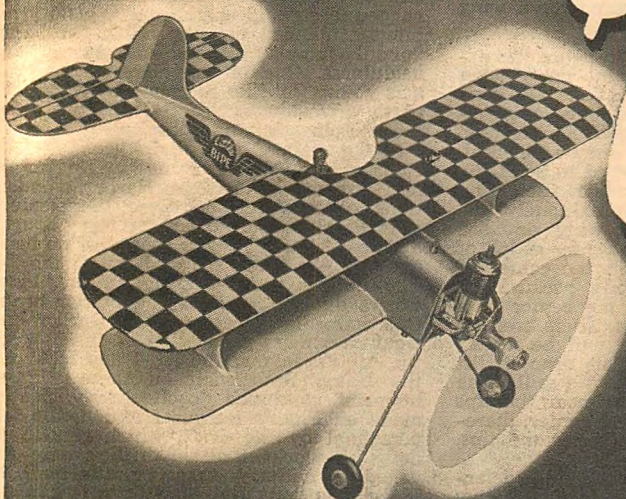

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tion is similar to some high-lift full scale, slow-speed glider sections, in which low sinking velocity is important. So in models, the maximum camber can be moved further toward the rear, thereby gaining better results *for flight at small angles*. In spite of this, however, it is more important to sharpen the leading edge and have the correct maximum camber, than it is to concern yourselves with the *position* of the maximum camber, but a section with a *sharp leading edge* and *maximum camber toward the rear* should give best results.

We suggest you construct and try a wing with this type of section, Fig. 4, C, if you have not already done so. Your comments on results may be valuable to other readers and will help to improve the science of low-speed flight.

We have received many questions from readers, a few of which we shall answer now. William F. Gwynne, of Hill Street, Huntington Park, California, asks the following:

Question: "In your method of determining the center of lateral area, you state that the projected area of the wing and landing gear should be doubled in thickness. What is the reason?"

Answer: In a dihedral wing there are two turned-up wing tips upon which *air acts laterally* when an airplane skids or sideslips. In a skid, the air hits the under side of one wing and the upper side of the other. This produces twice the effect of a single upward vertical projection and therefore must be considered in determining the center of lateral area. When there are two wheels, there are also two surfaces for air to act upon when the plane skids. It is correct practice, therefore, to double the cardboard thickness at these points of lateral area, when determining the center of lateral area by the cardboard silhouette method.

Question: "In the design of a biplane would the projected area of the lower wing be doubled if it coincides with the rest of the total projected area?"

Answer: Yes, it should be doubled, because both wings are surrounded by air and any lateral motion has a lateral pressure component on both wings.

Question: "In your diagrams you establish a point and call it the center of lift. On any wing having dihedral, is the center of lift considered to be on a line that connects the mid point of each wing panel? Also, how would it be figured for a wing with polyhedral?"

Answer: It is impossible to figure the exact center of pressure point on a wing without careful wind tunnel tests. The center of lift can be figured only *approximately* on a dihedraled wing. For average angles-of-attack and with simple dihedral, the center of lift is considered to be at the center of a line joining points on each wing half these points being approximately 40% of the length of each half wing, outward from the wing center. The center of lift of each half wing is never in the center of each half on normal airfoils, because the lift is greater at or near the center of a wing than it is at the tips. Therefore, the resultant lift of each half will be nearer the center than the tip. This drop in lift toward the tips is caused by "tip spill." The air flowing across the wing near the tips turns outward away from the center, thereby reducing the pressure under the tips, consequently lowering the lift.

It is a very complicated matter to determine the center of lift of a polyhedral wing; the lift on the upturned tips relative to the lift near the center cannot be accurately established without careful tests in a wind tunnel. Even estimates may be very inaccurate. Probably the center of lift will be not more than 30% of each half wing length outward from the wing center. In other words, with *simple dihedral*, the center of pressure of each half is further from the wing center than with *polyhedral*.

Remember to send your questions and ideas to MODEL AIRPLANE NEWS, "*Design Forum*," 551 Fifth Avenue, New York 17, New York.

Piper Pacer

(*Continued from page 21*)

his practical sense has always cut short on the brink of disaster.

To the non-technical observer the modern Piper *Cub* may appear a far cry from its early prewar antecedent but Piper has carefully managed to see that underneath all the neat wheel pants, the smoothly-formed engine cowling and the door arrangement, his Cub has the same old wing and fuselage produced by the available jigs and fixtures that were turning out these assemblies a decade ago! We told you that the 1931 *Cub* had a wingspan of 35′ 3″ and you'll find that it is precisely this dimension given for the new 1950 *Super Cub!* We said that first Cub was 22′ 3″ long and the present welded-steel tubing structure still retains this basic dimension, modified slightly by a different engine installation! That is the hard-headed side of Bill Piper that has kept production costs on the floor and held his sales prices well under anybody who cares to compete with him.

Piper has provided a classic demonstration of what can be done to "dress up" the same basic package for the salesmen. For example, his initial prewar success was gained by offering the J-2 *Cub Sport*, with the same Continental A40 engine as used in the original *Cub;* the J-3 *Cub Trainer*, with a 50 hp Continental A50 engine; the J-4 *Cub Coupe*, with a 75 hp Continental A75 engine and featuring side-by-side seating; and the J-5 *Cub Cruiser* with the 75 hp engine, but permitting a pilot forward and two passengers aft. This gave the prospective customer a wide range of models to choose from, but underneath it all lay the standard spruce spars, aluminum ribs and steel tubing fuselage, all fabric covered and all built on the same tooling investment! But the resulting economies placed the Piper *Cub* in all its models well within the reach of anyone eager to fly his own airplane.

Like all other aircraft manufacturers, Piper Aircraft went to war 100%. But unlike most of the others, Piper was not invited in, he had to *fight* his way in! In 1940 anyone who suggested that the Piper *Cub* had a brilliant war future would have been laughed at, and that's what happened to Bill Piper when he first broached the subject to the Army Air Forces! At his own expense he furnished several *Cub* airplanes to the Army during their maneuvers in Louisiana and Tennessee in 1940 and 1941 and by some of the most exhausting and rugged flying and operations in history his pilots convinced the Army that the lowly "puddle-jumper" did, indeed, have military usefulness. One of the officers convinced was young Col. Ike Eisenhower, whose reports to Washington glowed with praise for the usefulness of the lightplane in war.

In September, 1941, Piper delivered four *Cubs* to the Air Force and in November, only a month before Pearl Harbor, an additional 40 *Cubs* were delivered. Immediately after Pearl Harbor struck, the Navy bought all the J-3 *Cub Trainers* Piper had on hand and the Air Force snapped up all the J-4 *Cub Coupes* and J-5 *Cub Cruisers*. Piper was ready with a military adaptation of the *Cub* immediately after Pearl Harbor and went into mass production of the L-4 for the Air Force, and the NE-1 and HE-1 for the Navy. Production on these "Grasshoppers" continued despite heavy inroads made on Piper's technical and production personnel by the draft, which refused to defer his workers, although they were engaged in military aircraft production. In 1942 Piper delivered 1,855 *Cubs*, in 1943 a total of 1,319, in 1944 a total of 1,904 and production continued right up to V-J Day, when it ceased with 819 deliveries during the year, or a grand total of 5,941 Piper *Cubs* produced during the war!

Piper had been well aware that his military production would be stopped suddenly someday and his staff made completely detailed plans for conversion to the tremendous pent-up demand for civilian *Cubs* following the end of hostilities. These plans were so complete that the first civilian Piper *Cub* manufactured since Pearl Har-

(*Turn to page 54*)

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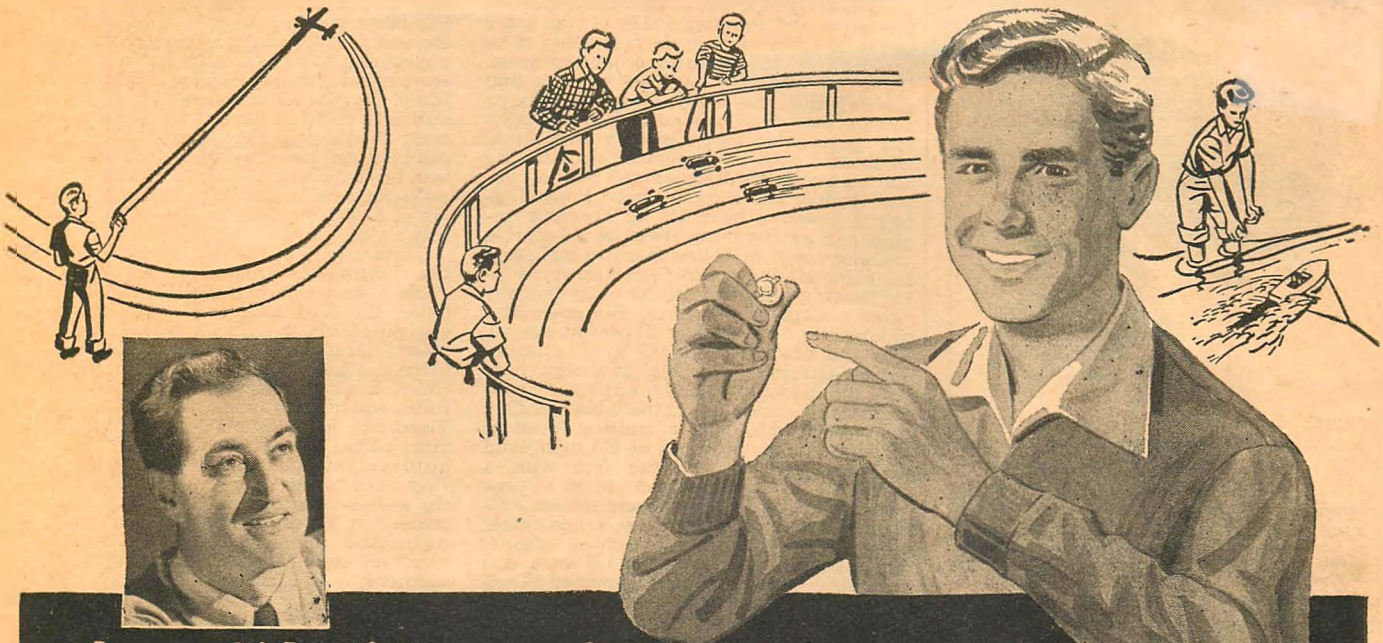

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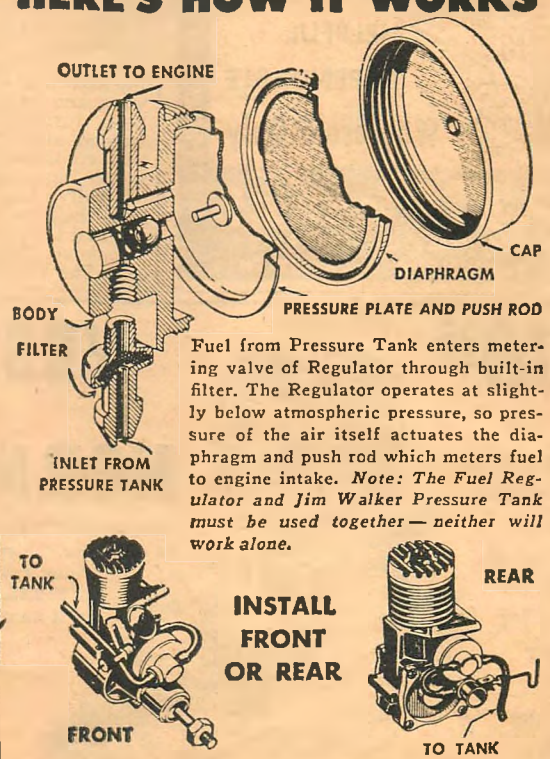

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bor was completed on August 14, 1945, the same week that military production was ordered halted! And between August 14 and December 27, 1945, Piper delivered 1,000 PA-11 *Cub Specials* to civilian purchasers, whose orders were pouring in faster than production could keep pace!

We said earlier that Bill Piper combined hard-headed business sense with a love for the game and this latter side of him came out in full force late in the war—only to be quashed by his realistic economic sense. Piper set aside his business acumen and decided that the lowly *Cub* had run its course, that what was needed in the postwar personal aircraft picture was sleek, all-metal, high-performance aircraft. He and his engineers designed and built a two-seat tandem low-wing all-metal Piper *Skycoupe*, powered by a 130 hp Franklin engine, and having a top speed of 150 mph, a cruising speed of better than 135 mph, and featuring sliding cockpit hatches, retractable landing gear, and all the other postwar "dream airplane" features. His crew also produced the PA-6 Piper *Skysedan*, seating four and powered by a 165 hp Continental engine. Gleaming all-metal in design, here was the postwar "family airplane," with electrically-operated retractable landing gear, retractable flaps, a cruising speed of 125 mph, and a top speed of 145 mph. And to round out his postwar line with a model for the wartime fighter pilot, he produced the PA-8 Piper *Skycycle* (MODEL AIRPLANE NEWS, November, 1945) single-seater powered by a 55 hp Lycoming engine, which gave it a top speed of 120 mph, and a cruising speed of 95 mph. Designed to sell for less than $1,000 and featuring an economy of 35 miles per gallon, the *Skycycle* rounded out Piper's postwar all-metal line. Here was a "love for the game" with a vengeance!

But Piper's old hard-headed business sense stepped into the picture in the nick of time and prevented the catastrophe that overtook dozens of other builders of all-metal postwar "dream" airplanes who took the full plunge into production and sales. Piper wisely said "No thanks!" and quietly shelved his beautiful all-metal collection and went back to producing the "washed-up, out-dated" *Cub* of prewar fame. And what happened? New sales records smashed, production records hung up month after month and a flood of *Cubs* across the nation's GI-Bill flight training airports.

The popular PA-11 *Cub Special* was followed by the terrifically successful PA-12 Piper *Super Cruiser*, which squeezed a second passenger into the rear seat to make it a three-place *Cub*. It was only a short step to an additional seat in front and the Piper PA-14 *Family Cruiser* four-placer entered the assembly lines. And still those good-old wing and fuselage jigs and dies, that had been turning out their metal ribs and welded steel-tubing fuselages for a decade, continued to produce frameworks on which fancy sales features were hung.

Finally, late in 1947, Piper's engineers took their first big step in redesigning the original *Cub* and produced the PA-15 Piper *Vagabond*, the first really new *Cub* since 1931. The *Vagabond* was designed primarily for economy, for the training of students and use of the private pilot. It featured a shortened and fattened fuselage, a clipped wing and the ultimate in simplicity. Powered by a 65 hp Lycoming, the trim little ship seated two side-by-side, cruised at 90 mph. The little *Vagabond* attained better than 20 miles to the gallon but, best of all, cost only $1,995 delivered at Lock Haven, Pa. Here was the hard-headed answer to the postwar "dream" airplane problem, not a gleaming thing of beauty but a complete, economical airplane selling for less than $2,000! Despite all the reams of debate and publicity on what the postwar personal aircraft should look like and do, Bill Piper gambled on his conviction that the postwar buyer, given the choice of an electrically-retractable landing gear or a price tag of $1,995, would take the latter: and he was right!

Cautiously, Piper added improvements to the *Vagabond*, producing the *Vagabond Trainer* and offering the *Vagabond*, with either the Lycoming or Continental 65 hp engines. With the rising market for four-place aircraft inexorably crowding the two-place market, Piper's equally hard-bitten Chief Engineer Walter Jamouneau skillfully added two seats to the successful *Vagabond*, installed a 115 hp Lycoming engine, added 500 lbs. of gross weight to the airplane, yet squeezed all this into the same *Vagabond* wing requirements. The result: the well-known Piper PA-16 *Clipper*, which cruises at 112 mph and lands at only 50 mph. And the price tag on this skillful blend of engineering and executive management: just $2,995! Here is a four-place airplane for less than $3,000, the kind his competitor's glistening all-metal, retractable landing gear models make look like a free gift (some other four-placers sell for more than $10,000!).

For 1950 Piper has again spruced up the *Clipper* with added refinements and a selection of more powerful engines resulting in the Piper PA-20 *Pacer*, our Plane of the Month. The *Pacer 115* uses a Lycoming O-235-C1 engine of 108 hp at 2,600 rpm, driving a Sensenich fixed-pitch propeller 6′ 2″ in diameter. It features an additional 6 gallons of fuel over the *Clipper*, redesigned landing gear, a larger horizontal tail and a redesigned instrument panel with glove compartment on the left side. The *Pacer 115* weighs 825-920 lbs. empty (depending on equipment installed) and 1,650-1,750 lbs. fully loaded. It is equipped with hydraulic brakes, landing flaps, 1-1/2 gal. oil tank, and carries 36 gals. of 80 octane fuel. It has a top speed of 125 mph at sea level and cruises at 112 mph. And this trim four-place craft sells for only $3,295!

The new *Pacer 125* features a step up to a 125 hp Lycoming O-290-D engine, the extra power increasing the top speed to 135 mph and cruise to 125 mph. It has a gross weight of 1.800 lbs., giving an extra 50 to 150 lbs. over the model 115. The model 125 uses the same Sensenich fixed-pitch propeller with the result that the heavier weight stretches the take-off substantially, but the addition of wing flaps to this model holds the landing run over a 50′ obstacle to the same 600′ as the model 115. The *Pacer 125* features sound-proofing as an added feature. The bigger engine and the many extras price the *Pacer 125* at $3,795.

The *Pacer 135* is the deluxe model with all of the above features, including the 125 hp Lycoming engine, plus an Aeromatic controllable-pitch propeller, which gives substantial improvement in the take-off run, the rate-of-climb, ceiling and other performance factors. With this propeller the *Pacer 135* cruises at 135 mph at 75% power at 5,000′, real altitude performance compared with 135 mph top speed for the other *Pacers*.

But cagey Bill Piper hasn't tossed all his eggs in these fancy new baskets, attractive as they are. The trusty Piper *Cub* is still available, although its now the 1950 *Super Cub* with a lot of improved features and stepped-up performance. But underneath all the fancy trimmings, we'll bet you'll still find Piper's trusty basic wing and fuselage tooling that has cut his costs and brought flying closer to the average man-on-the-street than all the fancy "dream" airplanes put together in the last decade!

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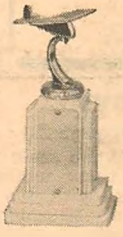

LFFP
[LARGE FREE FLIGHT PLANE]
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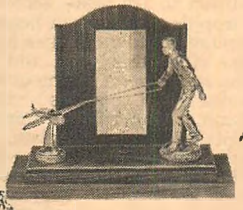
[illustrated]
12¾" - 11.25
14¼" - 12.75

LFFHL
[LARGE FREE FLIGHT HAND LAUNCH]
Available in 3 sizes
15½" high - $20.00
[illustrated]
17½" - 21.25
19½" - 22.50

ROG
[RISE OFF GROUND]
9" high - $26.00

LMP
[LARGE MODELER AND PLANE]
Available in 2 sizes
22" high - $28.25
[illustrated]
24" - 35.75

SFFHL
[SMALL FREE FLIGHT HAND LAUNCH]
Available in 3 sizes
16½" high - $11.75
[illustrated]
17½" - 12.75
19" - 13.75



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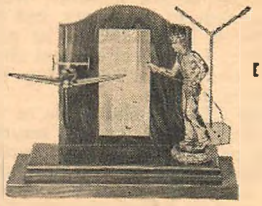

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Air Ways

(*Continued from page* 29)

by Ralph Snow, received top scale points, but did only 7.3 secs. time, while Walt Mooney made 57.6 secs. with his Piper *Super Cruiser*, but got only 30 scale points. Licher's time was 49.7 secs., to which was added 36 scale points. Models had to be built from commercial kits costing 50c or less; this requirement was added to obviate the need for deep research in the Aero Library for such planes as the tricky French tandem which won last year.

The same group will also hold their popular "two-bit contest" this year, so-called because the model must carry a 25c piece. perpendicular to the flight path and enclosed in the structure. (Sounds like a miniature PAA-Load event!) The winner takes all the quarters. Each model must be capable of disassembly to fit in a 5" x 6" x 13" shoe box, and all must R. O. G. No glue is allowed in assembly; scotch tape and aluminum tube joints are popular, while bodies are often made in two parts, and the quarters have even been carried in ping pong ball spinners! It's a real contest since their flying area has only a 25' ceiling, but high time is 2 mins. 18 secs.

SPEAKING OF CLUBS, Hal Roth, of the *Thermal Thumbers* (need we tell anyone they're located in Los Angeles?), writes that his group has agreed upon a new system for determining high-point winners of contests. They used to follow the standard practice of alloting 100 points for first place, 90 for second, and down to 10 points for tenth place. Then they hit upon the scheme of using the winning *time* as 100% with other times scaled downward in proportion to their percentage of winning time. This seems logical; if the fourth place man got a time of 9' and the winner had 10'; it seems No. 4 should get 90 points instead of only 70. as under the old system. It works both ways, of course. If the winner had 10', and the second place man only 5', No. 2 would receive only 50 points, instead of 90 as under the older method.

The plan has been found very satisfactory for every type of contest, except indoor glider. Here the winning times are usually so tightly grouped, that it has been found desirable to square the times, then calculate as above.

This point-scoring plan was worked out by Don James, and will be put in effect during the coming season.

THE FOURTH International Model Plane Contest, one of the biggest annual flying events in the country, will be held this year at Detroit, Mich., August 14 to 21. As is well known by now, the meet is sponsored annually by the Plymouth Motor Corporation in conjunction with the Aero Club of Michigan and as customary will be an invitational event, limited to 500 of the top model builders in the U. S. As usual, sectional Plymouth Elimination Meets will be held to pick the 500 fliers who will then be invited to compete in the meet at Detroit. For this year's contest there will be $7,000 in U. S. Savings Bonds for prize winners in 40 events. in addition to 120 first-, second-, and third-place trophies, and seven beautiful perpetual trophies. A few changes have been made in the rules this year, and an important addition is the team racing event. Since this particular event requires highly-trained crews. team racing will be limited to older contestants in the Senior class.

A change has also been made in the flying scale event to allow model builders to enter any type of scale plane they wish rather, than having to enter a standardized model. as has been the custom in the past.

The 1950 Plymouth meet will feature events for Indoor Rubber Powered jobs, Rubber and Gas Free Flight, Towline Glider, Gas and Jet propelled speed airplanes, Team Racing, and Flying Scale. Age groups will be *Freshman*—11 years or under; *Jr.*—12 to 15; *Sr.*—16 to 20. It will be noted that the age limit has been lowered, since Plymouth intends this meet to encourage the younger model fliers as much as possible.

That old favorite, the North American *Navion*, appears in our first photograph. This really beautiful scale model is the work of Robert B. Wolfe, Jr., (3629 Rogers Street, Charlotte, North Carolina) and as is apparent from the photo, the finish is extraordinary. It was applied by brush and is so smooth that the airplane looks as though it is made of solid plastic. The *Navion* is powered by a *Madewell 49* motor and about 1-1/2 years of spare time went into the job. It is fitted with navigation lights, sliding cockpit hatch and has a complete set of seats with a full instrument panel. The color scheme is light yellow, light blue trim, with black pin stripe.

Picture No. 2 shows the first version of the Howard *Ike*, built by B. Weisberg (2707 Creston Avenue. Bronx 58, New York). In this version an *Ohlsson 23* was fitted. However, on the very first flight, the control cords broke and the ship was a pretty complete wreck. Upon being patched up and tried out for a second flight, the motor failed to give full power and another crack-up was the result. For a third version, the landing gear was moved far forward to protect the motor and propeller, and the plane was fitted with an inverted *Bullet* engine. Since the completion of the third version, it has flown very nicely and has made up for its inauspicious beginning.

The unusual scale ship seen in illustration 3 is a Sopwith Triplane which was built to scale of 1"—1' by P. Cock (92 Paynes Road, Freemantle, Southampton, England). This model was a first-place winner in the Southampton Controline Scale Contests. It is powered by an *ERE* diesel of 2.48 cc. Mr. Cock says that the plane is fully acrobatic and flies at about 70 mph.

Interest in Wakefield models is growing constantly and a rather different design, worked out by Carl Hermes (3222 Storey Lane. Dallas 9, Texas), appears in No. 4. This ship is unusual, mainly from the fact that the wings are of 1/16" sheet balsa, fitted with a 1/4" sq. leading edge. There are no spars and the airfoil is a flat-bottomed NACA 6409, which has been found to give the model a very fast climb. Weighing

10 oz. as pictured, the ship averaged 3 mins. in dead air. After the picture was taken, a lighter fuselage with a retractable landing gear was built which resulted in a weight drop to 8.4 oz., complete with dethermalizer timer. Mr. Hermes has the model so arranged that the ship cannot be flown unless the dethermalizer is in operation. He states, "I have lost too many ships because I was too lazy to light the fuse. The fuse works fine, but I can't be depended upon."

The novel stunt job in our fifth illustration is called a *Twin Warrior*, and this photo was sen to us by Harry B. Fake, Jr., 1245 North Lancaster Street, Annville, Pennsylvania). The ship is a creation of his Uncle Paul, and Harry states that it was originally just a single engine job. But a twin was built and the two ship were stuck together. The model has a span of 6-1/2", weighs well over 4 lbs. and is powered by two *Torpedo Specials*. The model will do very nice wingovers and inverted flight. Each engine has its own tank and the *Twin Warrior* flies quite well on only one engine, either right or left.

Picture 6 shows a very attractive sailplane constructed by W. Morgan and named the *Igo*. The snapshot was sent in by Geoff Harrison (28 Sturdee Avenue, Gillingham, Kent, England), who writes that the model is finished in black and yellow, and has an adjustable tab on the fin. The plane was recently a prize winner at a model exhibition held by the *Gillingham Model Flying Club*.

Representing the speed boys this month is Jim Larkin, Jr.'s ship, powered by a *Hornet* engine, seen in No. 7. He gave us no other details (not even his address) aside from the fact that the ship is finished in red and white and, of course, uses a drop gear.

Oscar Eklof (Schantzgatan 2Anb., Orebro, Sweden) submitted our eighth illustration, showing his scale model of the Gloster *Gladiator*. The ship appears to be finished with insignia of the Swedish Air Force, but Mr. Eklof neglected to include any other data about the *Gladiator*.

The gentleman posing proudly beside his large radio control job in Photo 9 is Richard B. Spencer (Spencer Publishing Co., 212 East Main Street, Greenfield, Indiana). This is a Berkeley *Custom Cavalier* which appears to be fitted with a *Forster 99* engine. Mr. Spencer writes that the plane is equipped with the Rockwood 5-channel tone control system which was described in M. A. N. some months ago. The *Cavalier* has rudder and elevator control with provisions for aileron control to be added later, and also has a servo-operated two-speed timer. Although the airplane has not been test flown yet due to unfavorable Indiana spring weather, the radio control equipment has been found to work perfectly.

Another favorite of the scale model enthusiasts, the Supermarine *Spitfire*, is shown in No. 10. This one was made by Arthur C. Bassett (130 Toledo Street, Adrian, Michigan). It is a non-flying ship with a span of 20" and has been completely planked with medium grade 1/32" balsa sheet. The aluminum propeller, when wound, retracts the main landing gear through a small winch powered by a short rubber motor. Counteracting rubber bands lower the gear when the propeller is released. Other features are full swivel tail wheel, movable controls and detailed cockpit. Incidentally, Mr. Bassett is the secretary of the *Adrian Aero Club*.

More scale models appeal in picture 11, this time of the free flight variety. This picture was sent to us by Cedric E. Galloway (328 East Tujunga Avenue, Burbank, California), who is well known for his scale model work on the West Coast. He constructed the Fokker D7 on the right side of the picture and notes that the ship was built from a Cleveland M-15 rubber kit. The change-over from rubber to the *Baby Spitfire* was very simple: a 1/16" plywood bulkhead was added in such a position that it allowed the propeller to clear the cowl. The tail surfaces were made from sheet balsa to add the necessary weight to balance the engine. This conversion was found very satisfactory and lots of fun to fly. Mr. Galloway tells us that the S. E. 5 in the foreground was built by Kenneth Aymar (333 East Tujunga Avenue) from a Scale Master kit and this model is also powered by a *Baby Spitfire*. The S. E. 5 has a very good glide for this type of model, and on several occasions has picked up a thermal for some really fine flying.

We close this months' models with another Wakefield design, showing the plane built by Celso Piamonte (Jaro, Iloilo City, Philippines), who states that he is a constant reader of our regular monthly feature *"Design Forum"* and that this Wakefield ship was designed strictly according to the theories of Charles H. Grant. It will be noted that the C. L. A. of this airplane is on a horizontal line with the C. G. The model has been flying very successfully and turned in a record of 3 mins. 7 secs. in dead air during the National Boy Scout Contest, winning first place. The prop is 18" in diameter, single blade, and the airplane is powered by 40 strands of 1/8" flat *T-56 Brown Contest* rubber; it weighs exactly 8 oz.

The photograph of the model B-29, built in Japan, which appeared in our February '50 *"Air Ways"* caused quite a bit of interest and we have received several letters giving more details of the plane. We learn that it was built by a group of Japanese modelers who were working for Mr. Mamiya, the camera manufacturer. The engines are M60's and are not copies of the *Ohlssons*, as we originally thought— although they do resemble the old *Brown D*. The engines are operated throttled-back which gives the impression that there is a lack of power, though this is certainly not the case. The craft weighs 15 lbs., and centrifugal force is such that the operator can barely stand up against it when flying. The model has been flown successfully on only two engines. Electrical power for operating the landing gear come from a series of wet batteries and the gear operates when the elevators are put momentarily in the full-up position. The owner, Mr. Mamiya, when asked what the purchase price might be, quoted $278." We are indebted to M/Sgt. W. Kelley, USAF, and Lt. Hugh C. Chapman, USAF, (20-20 AWS Det., APO 919 Misawa AB, c/o PM, San Francisco, California) for this information.

NEWS OF MODELERS

PEN-PAL SEEKERS: H. S. Rao, Loughborough College, Loughborough, Leicestershire, England, would like to correspond with anyone who is employed in an American aircraft factory . . . O. Griffiths, "Melrose," Poplar Road, Tredegar, Great Britain, is 15 years old and mainly enjoys power-driven model airplanes . . . Peter Bennett, 37 Banole Avenue, East Prahran, Melbourne, Victoria, Australia, also 15, is eager to write about free flight gas, controline, Wakefield, and sailplane models . . . Alan McGreevy, 109 Riselaw Road, Dunedin, S. W. 1, New Zealand, likes controline and sailplane flying . . . Henry Sharp, 308 Park Street, New Town, Hobart, Tasmania, Australia, age 14, has constructed ten model airplanes and prefers rubber models, gliders and scale controliners.

EXCHANGE MOTORS: R. F. Green, 189 French Street, Sunbury on-Thames, Middlesex, England, would like to have any American engine equivalent to his *Allbon* 2.8 cc. diesel . . . Charles Haffner, 64 East 17th Avenue, Columbus, Ohio, would like to trade model motors with a reader living in France or Italy . . . David Goodd, 2A Plantation Road, Gillingham, Kent, England, would like to exchange motors and motor parts.

SPECIAL REQUESTS: Attilio Brambilla, Via S'Ottavio 45, Torino, Italy, would like to exchange a design of his original model . . . John Bishop, 922 West 50th Place, Chicago 9, Illinois, is seeking plans for a *Baby Playboy* or equivalent kit . . . Louis Morgan, 29 Charles Street, Blenheim, New Zealand, is looking for three views, plans, pictures, etc., of any jets used by the Germans at the close of the second World War. The particular type he is interested in obtaining information about is the Heinkel 162 *Volksjaeger*. Any information, he writes, on Russian jet planes would also be welcome.

CLUB NEWS

California

Robert E. Moncrieff, president of the *Inglewood Flightmasters*, announces that on May 20 the club will sponsor a Model Aircraft Exhibit in the Inglewood Recreation Center, which is intended to acquaint the general public with all phases of the hobby. The secondary reason for sponsoring the show is to help create a fund for defraying expenses of the *Flightmasters'* team that will compete at the 1950 Nationals Meet. Further details will be sent to anyone who inquires; write Mr. Moncrieff, 1939 Pacific Coast Highway, Lomita, California.

Change of name: Members of the *Fresno Control Fliers* unanimously voted to call themselves the *Fresno Hell Divers*.

Bob Boomer, formerly associated with the *Detroit Balsa Bugs*, has started a 100% AMA club for all interested modelers in Brisbane. Meetings are held every Friday night, 7:30 p.m., at 458 Mendocino Street. Although several names for the new club were submitted, the one selected was *Brisbane Power Modelers*. Wesley Eaton was elected president; Del Sterling, vice president; Ira Romriell, secretary; Russ Wilson, treasurer, and Dennis Sullivan, Sgt. at Arms. Dues will be 25c a month. Patricia Boomer and June Dyer are among the twenty-four members.

Sad news. There will be no more flying from the *Fresno Gas Model Airplane Club's* field, which the members have been using for the past four years, because someone left a gate open at the south end of the field and the owner rightfully became angry and has refused to let the field be used any more. The new flying site is about three-quarters of a mile due north of the old site on Madera Avenue. Incidentally, this club is not to be confused with the *Fresno Control Fliers* who have recently changed their name. Our thanks to June and Jack Dyer for this information.

Here are the results of the Bakersfield monthly meet for March. Bud Patterson won *Class ½ A* with a time of 10:46.5; *Class A*—Herman Stubblefield, 20:21.6; *Class B*—Clinton Merrill, 20:38.3; and *Class C*—F. L. Swaney, 21:36.2.

Colorado

Dean Sadler, president; Norman Deitchman, secretary, and Bill Clark, treasurer, are diligently working to consolidate the newly-organized club in Denver, the *Sky Hooks*. We learn that membership has been closed for the time being. The *Hooks* are solely free flighters and are interested in scheduling a competitive meet with another club. Those interested should contact the secretary at his home address, 4310 West Forty-sixth Avenue, Denver, Colorado.

Connecticut

There are still many clubs associated with the *Connecticut Chapter of the AMA* who haven't paid their back dues, reports John Affeldt, secretary, of 74 Raymond Street, New London.

Word has been received that the membership of the *Prop Busters* is rapidly increasing.

The *Bristol Club* really intends to be a success now that the election of officers is over and done with—president, Fred Meyers; secretary, Bill Treadway; treasurer, Glenn Ballard, and contest board member, George Eddy.

By the way, Art Guertin is the new contest board member of the *Greater Hartford Model Airplane Club*. A controline meet is being planned to take place in that city some time in the very near future.

Plans for the proposed flying site are not completed yet, reports Martin Pelatowski, of the *Valley Aerial Cowboys*.

Indiana

The first annual indoor model airplane contest staged by the *Anderson Johnnies* was a big success. Results: *Sr. Hand-Launch Glider*—Norman Beyrlin; *Jr.*—Ronald Foster; *Sr. Rubber Endurance*—Gene Sample; *Jr.*—Luther Marr Hays. Our thanks to Mrs. Glenna Williamson, secretary and publicity director of the *Johnnies*, for sending us the list of winners. Her address is 2637 Meridian, Anderson, Indiana, if you wish to contact the club.

Illinois

The *Illinois-Iowa Aeronautical Association* is open to new clubs within a radius of approximately 100 miles of the Quad-City area (Rock Island, Moline, East Moline and Davenport). The entrance fee is ten dollars, which is the dues for the first year; thereafter the annual dues is only five dollars per club. Four contests each year are held for members only; these include a free flight, a controline, a beauty exhibition, and an indoor flying contest. The following officers were elected at the *IIAA's* second annual banquet. Lawrence Conover, president; Ray Johansen, vice president; Lee Daebelliehn, secretary; Bob Meeker, treasurer and publicity chairman. Bob's address is 605 East Locust Street, Bloomington, Illinois, and he will be glad to give you additional information.

Maine

Six of the eleven member clubs (*Augusta Flying Maniacs, Bangor Hedgehoppers, Gardiner Flying Tigers, Portland Propsnappers, Lewiston Sky Devils*, and *Waterville Flying Aces*) attended the first meet-

COMING CONTESTS

May 21, PA.—Bristol, Class A, *Aeromodeleers'* Annual Flying Circus. Only residents of Bucks, Philadelphia, Montgomery, and Delaware counties of Pa. may enter; CD—Clarence Wells, 1300 Dixon Ave., Croydon. U—Sp and St.

May 21, MINN.—St. Paul and Minneapolis, Class AAA, Talent Scout Model Airplane Meet, F, R, G, U—Sp and St; CD—Paul J. Ring, 4150 29th Ave. S., Minneapolis.

May 21, FLA.Miami, Class AAA, combined PAA and *Tropic Aeros'* Free Flight Meet; CD—Ralph Prey, 200 Albatross St., Miami Springs.

May 28, PA.—Pittsburgh, Class AA, *Pittsburgh Model Airplane Control-Liners'* Goodyear Meet; CD—L. J. Stoutenburg, Jr., 100 South 13th St., Pittsburgh.

June 4, S. D.—Sioux Falls, *Pylon Pirates Model Club's* U contest; CD—F. Rogers, 619 South Main, Sioux Falls.

June 4, IOWA—Dubuque, *Illinois-Iowa Aeronautical Association*, U—all types.

June 11, W. VA.—Beckley, Class A, 21st Contest, *Beckley Modeleers*, all classes of U—Sp; CD—R. Smiley, P. O. Box 749, Beckley.

June 11, N. Y.—Bethpage, Long Island, Class AAAA, New York Mirror Model Flying Fair, F, PAA, RC, U—Sp and St. CD—Thomas A. Herbert, 259 Mamaroneck Ave., White Plains, N. Y.

June 11, PA.—Pittsburgh, Class AA, *Pittsburgh Model Airplane Control-Liners'* contest, U—Sp, St, S; CD—same as May 28.

June 18, WISC.—Beloit, Class AA, 4th Annual *Thermal Dusters* Model Airplane contest, U—Sp, St, S, J. CD—M. F. Koebernick, 1337 Dewey Ave., Beloit.

June 18, CONN.—Bristol, Class AA, Bell City Invitation Meet, team racing, stunt and flying scale. CD—George Eddy, 73 Stearns St., Bristol.

June 23-24-25, MICH.—Detroit, Class AAA, (pending), Annual Michigan Exchange Club's Model Aircraft Meet, I—R, R, F, U—Sp, and PAA. CD—Frank Sposite, c/o H. J. Clemens, 423 Penobscot Building, Detroit.

June 24, CANADA—Toronto, Ontario, *Canadian Gas Model Club* T. Eaton Contest at the De-Havilland Airport.

June 25, Washington, D. C.—5th Annual Model Air Show at Andrews Air Force Base, sponsored by National Capital Model Air Show, Inc., CD—William Pennoyer; no entry fee; over 30 events, and PAA.

June 25, PA.—Pittsburgh, Class AA, *Pittsburgh Model Airplane Control-Liners'* Goodyear Meet; CD—same as May 28.

July 2, N. J.—Jamesburg, 3rd Annual Metropolitan Model Airplane Championship, *Richmond Model Flying Club*, Forsgate Airpark; F, G, Beauty. Info: 129 King St., Staten Island 8, N. Y.

July 9, PA.—Pittsburgh, Class AA, *Pittsburgh Model Airplane Control-Liners'* Contest, U—Sp, St. S. CD—same as May 28.

July 9, ILL.—Rock Island, *Illinois-Iowa Aeronautical Association's* 5th Annual Air Derby (25-mile endurance race for U models).

July 16, ILL.—Moline, *Illinois-Iowa Aeronautical Association*, closed U meet.

July 23, FINLAND—Wakefield Finals.

July 25 to 30, TEXAS—Dallas, Class AAAA, 19th Nationals; CD—John Clemens, 2114 Greenville Ave., Dallas.

U—Controline; F—Free Flight Gas; R—Free Flight rubber; G—Glider; RC—Radio Control; W—Water Events (ROW); S—Scale; I—Indoor; T—Towline; PAA—PAA-Load; Sp—Speed; St—Stunt; TR—Team Racing; J—Jet Speed; HL—Hand launched; Class—shows size of meet and signifies AMA sanction; AMA—Academy sanctioned.

ing of the *Maine Council of Model Airplane Clubs* for 1950. The officers elected for the next twelve months are: Howard E. Smith, president: Howard K. Lambert, vice president; Donald H. Maguire, secretary-treasurer; Richard S. Smith, recorder. The *Council* membership incorporated several changes in its constitution and by-laws. The principal change was the additional officer to the staff, called "the recorder." His responsibility will be to keep records of all the speed, stunt, and scale events in all the age classes, and maintain an accurate record of meet sanctions and records. The other important change was that all member clubs must apply for a sanction through the *Council* for contests to be held in Maine in 1950. For further facts, write Howard E. Smith. *Augusta Flying Maniacs*, 93 Bangor Street, Augusta, Maine.

Maryland

Wilbert E. Rolf, secretary of *The Dundalk Model Airplane Club*, writes that the club is nearing the completion of its airport. Construction of a model control tower, in which they plan to sell refreshments and supplement the treasury's funds this spring and summer, and leveling four flight circles has kept the twenty *Dundalk* members pretty busy. Among their many experiments is night flying, using pen lights attached to the landing gears of the models.

Michigan

The *Inter-City Model Club* trophy for the most flight points earned during the 1949 model airplane flying season has been awarded to Robert W. Fraser-Lee. Over half of his flight points were made with a 6' 9" free flighter, which was built in the winter of 1939-40. It was designed according to Mr. Charles H. Grant's theories and built largely of bass wood, both of which, Mr. Fraser-Lee says, account for the long life of his ship. During the war the plane was idle, but since then has been flown in every kind of weather. He wholeheartedly agrees with Mr. Ellila's remark in the April '50 issue of M. A. N. that success at the Wakefield Meet was due to Ellila "becoming fully acquainted" with his model.

New York

We are pleased to boost another brand-new orangization, *MeKay Aero Model Association*. Edward J. Charnuk (22-64 Forty-third Street, Long Island City 5, New York), the club secretary, will gladly give full particulars to anyone who lives in the vicinity of Astoria. At the present time there are 25 members. Most of the flying is done at the old World's Fair parking lot in Flushing Meadows. To facilitate matters, the *MAMA* have a blue and yellow trailer to transport members' model airplanes to the various fields. Meetings are held every Saturday evening from 7 to 9 p.m. at the Veterans of Foreign Wars Post, 28-17 Astoria Boulevard.

The Flying Bisons have extended the term of officers for 1950 to bring election night to the opening of the fall season instead of the early spring, which was their former arrangement. In this way the *Bisons* expect to have a good opening meeting after the summer contest period. They also contend that this system will put "fresh" officials in office and bring the club through an uninterrupted series of seasons. New officers are: president, Harry Keller; vice president, Ron Kirk; recording secretary, Bud Coomber; corresponding secretary, Norris Maltby, and treasurer, Don Hobel.

Washington

President James W. Amis, of the *West Seattle Model Airplane Club*, which recently celebrated its first birthday, would like anyone living in or outside of Seattle who is interested in attending the club's meets to write him (3049-46 S. W., Seattle 6, Washington) for the exact dates of contests to be held during the coming months. Jim says he will be only too glad to send the information promptly. However, we have not received any definite contest dates from this group as yet.

Canada

We note in HOBBY HIGHLIGHTS, monthly publication of the *Canadian Gas Model Club* of Toronto, the request for all news about active groups to be sent to 2453 Yonge Street, Apt. 4, Toronto 12, Ontario, Canada.

The Wolf

(*Continued from page* 11)

a half-wheel cemented to the fuselage. The tail-skid is built up from scraps of balsa and cemented to the place shown. Towing hooks are inserted through the sheet sides of the fuselage and cemented from both the inside and outside for added strength. Notice that they are mounted off-center so that the model may circle during the glide; yet it will climb in a straight line while on tow. The front hook is used for windy days, while the rear hook is used for days when there is not much air moving. Complete the construction by color doping all exposed wooden parts such as struts, skids, etc., and you are ready for test flying.

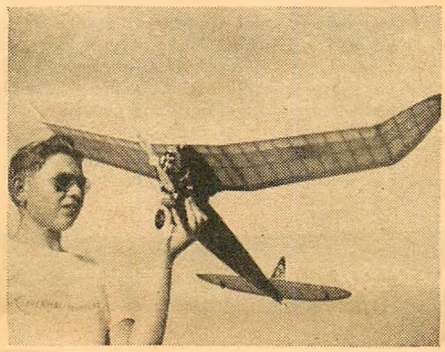
Since weight will probably have to be added to the nose for correct balance, it is advisable to take some modeling clay along to your flying field. It can be attached by merely reaching through the cockpit and pressing the clay against the rear of the nose block. Once the correct balance is determined, a more permanent weight such as a small piece of lead may be cemented inside the nose. For the first flights, try a few shoulder-high glides over a patch of deep grass until you have the model adjusted so that it glides smoothly without diving or stalling excessively. The next step is to try some tows with about 10 or 20' of towline, using the front hook. Then increase the length of the line till you are getting maximum altitude with your *Wolf*, and watch it take its place in the air with the best of them.

Report from the West

(*Continued from page 8*)

ing and adjusting their ships for the trials that will soon be upon us. That coveted Wakefield "mug" would be a sight for sore eyes if the United States could bring it back to rest over here. The fliers out West are out for just that purpose this year, and it looks like they may make it rough for all comers. Everett's *El Dobo* has excellent flight characteristics and some unusual features. The rear section of the ship is hinged for winding and dethermalizing. The single blade can be changed with the flick of the wrist. The prop just hooks on the hub. The gear retracts approximately 3 secs. after the ship is airborne. Sixteen strands of 1/4" *Dunlop* rubber, a Gottingen 602 section, and 8-1/4 oz. of weight give Dick's ship high performance. Just a short time back, he turned in a 14:43 time for his flights under Wakefield rules.

Glen Holsinger, one of the Plymouth representatives out here on the Coast, is making a tour of the schools and is showing the pictures of the Plymouth Internats. Dope and glue bottles have been rattling for many a day now as ships are being readied for that big event. The 4th Internationals. It looks like the final eliminations will be held at the Santa Ana Lighter-Than-Air Base again this year. The hangar adjacent to the flying sites is really an indoor modeler's dream. The ceiling is practically unlimited and the disturbing drafts and gusts are practically nil due to the excellent air tight doors. It looks from here like a few records may fall when the indoor "ghosts" start unwinding at the eliminations. It's rumored around that the "old timers," (contestants over 20!) may be invited to fly in the eliminations, but their flights will not count for the trip back to the "big meet" in Detroit. Their points will in no way interfere with the points of the younger contestants.



Thermal Thumber **Gene Wallick, holding his *Zeek* aloft, is one youngster that's pushing the big boys**

We hear that a few new team speed rules are coming into being. Seems the fuselage cross section will be 2-1/8" and from the bottom of the fuselage to the top of the pilot's head, a 3-3/4" minimum will be required. AMA will give us the latest dope on this. The Team Speed event at the Nats this year should really be something to watch.

Contest season is here and the Nationals and Internationals are getting closer each day, SO . . . work those ships out and watch the hardware come your way. See you here next month, when we'll include the results of the Bakersfield and San Diego *Aeroneers* meets to be held April 16th and 30th, respectively.

PHOTO CREDITS

Page		
11	*All*	A. L. Cleave
21	*All*	Gordon Vincent
25	*All*	D. A. Newell
32	*Upper*	L. F. Stockmeyer
	Lower	Kenwood Photo Shop

Rumpler C-5

(*Continued from page 17*)

ber job, and is one of the very important items in this phase of model building, we feel that more time and interest should be spent on this item. Well, nevertheless, here goes—select a relatively hard, quarter grained block of balsa of the correct size and draw the top view on the wood, following the dimensions given on the plans. Cut this out with a coping saw and repeat the procedure for the side view. Carving can now begin by starting on the rear face of the blade. About 3/16" under camber should be cut in and then the forward surface can be carved. Sandpaper well and round off the sharp corners to give the blades a pleasing shape. Do not remove too much from the blade area because every cubic millimeter counts, in view of the restricted diameter. Several coats of dope with intermittent sandings will provide an adequate finish. A *Jasco* ratchet-type free-wheeler can be used if you are satisfied with a moderate rate of climb of long duration; however, if you expect to pack in the rubber for a skyrocket climb, use a more substantial free-wheeling mechanism. Be sure the free-wheeler is foolproof as the propeller will tend to spin the plane in, unless it free-wheels properly.

Small face bushings should be fitted in both ends of the nose block as well as the propeller hub for the utmost efficiency. Slight down and right-thrust are the required adjustments. Bend the shaft from music wire and sheath the rubber hook with tubing to prevent it from cutting the rubber. A very fine rubber band stretched from the forward landing gear struts around the nose block will hold the block in place on the model.

The engine details can now be added using very soft scrap balsa; soft balsa is also used for the dummy radiator.

Make certain the model balances at the point shown on the plan, before test-gliding. If during these tests the model dives or stalls, weight can be added to remedy this condition. Our Rumpler was slightly tail heavy, but a few more coats of dope on the propeller and nose block brought the model to trim. A climb and glide to the right is preferred in order to keep away from that "old devil torque." Keep the rubber well lubricated and free from dirt. A drop of oil on the ball bearing washer helps matters. The model Rumpler C-5 is not an "all-weather flier," so don't take her out in a gale! In calm weather you will find your model a super performing biplane, if built with lightness and accuracy.

What About Professionalism?

(*Continued from page 16*)

Hilton, N. Y.—At another meet a motor manufacturer took two speed prizes with a "stock" motor. I happen to know he spent $300 to get it souped up. Hugh DeJonge.

Kirkwood, Mo.—I believe much of this cry against the professionals arose from a handful of over-eager men, such as ——— cleaning up in coastal meets. Parnell Shoenky.

Falls Church, Va.—Mr.———took first place in stunt at ——— last summer, competing in stunt against Junior, Senior and Open. It would be okay if he just competed against Open, but Juniors work hard to do a good job in stunt. This can be detrimental to the hobby. Mr. ——— claims to have won over 100 prizes in contests. How about giving someone else a chance? James Little.

* * *

And so it goes, for, and against. Both sides feel they have a lot of common sense in their favor. It is, as we knew, a very controversial subject. Next month we will sum up with the actual tally of pros and cons. It's a big scoop, for at last we will know just how the majority of individual model builders feel about the professional. Watch for the final installment—you will get some big surprises, we're sure.

Li'l Critter

(*Continued from page 31*)

Set the wing on the stick in about the position shown on the plan, and glide the model. Correct stall by moving the wing back, correct dive by moving it forward. When you get a flat glide, bend the boom for *left* circle. Put in some turns, and see what happens. Too great a bank is easily cured by warping up the leading edge of the inboard wing. If there is a tendency to power dive, warp the boom up, if a power stall, warp the boom down. When the flight attitude seems okay, put in about a thousand turns and see what she will do. Make adjustments as you increase the number of turns to 1,600; and if you still don't manage to hit the roof, make a new motor of a 15-inch loop, lubricate, and put in 2,400 turns. You can now go out for a coke as the ship ambles about, among the rafters.

Flash

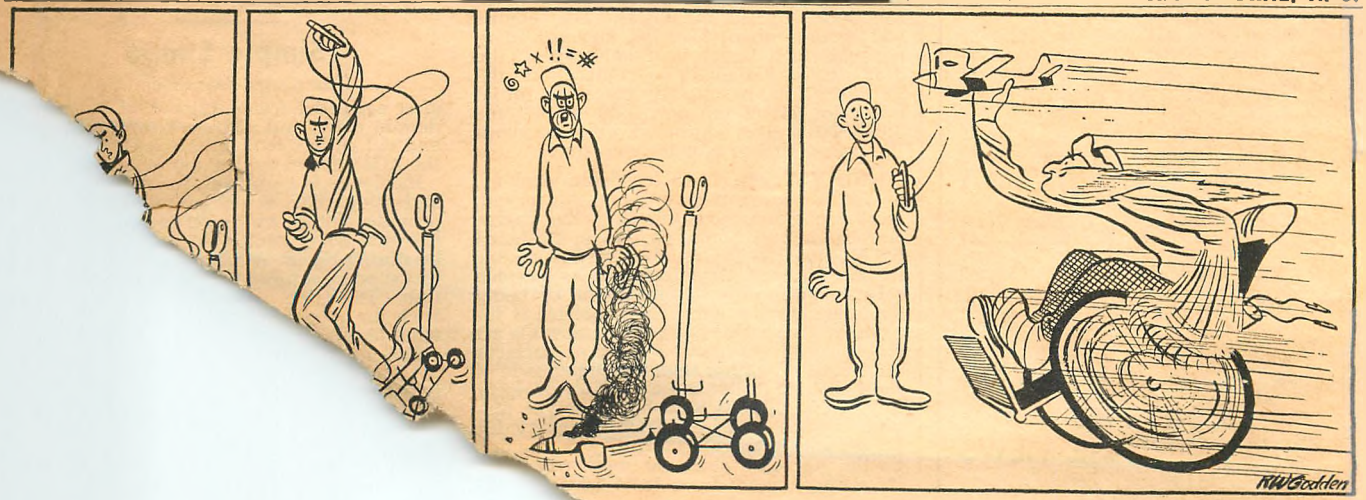
(*Continued from page 7*)

features a longer fuselage, additional seats, and a new wing design over the 2-0-2, which suffered bad publicity when one of the type lost a wing in service. The joint-purchase agreement calls for 65 airplanes at a cost of $35,000,000. While TWA is awaiting delivery on its 4-0-4's, it is leasing twelve 2-0-2 airplanes, which were undelivered, from the Martin company.

FIRST PRODUCTION MODEL of the plane the Navy readily admits it is putting its "blue chips" on, the Vought F7U *Cutlass*, has been flown at the Chance Vought plant near Dallas, Texas. The swept-wing fighter features afterburners on its two Westinghouse turbo-jet engines which brings its speed well into the sonic range. Navy has placed an initial production order for 19 of the type, plus a more recent order for 30 to 50 planes. Reason for the inaccuracy of the latter order is that exact price determination has not yet been set, which means that Vought would like to deliver 30, but the Navy wants 50 for the price of $21,877,800 specified in the contract.

IT'S AN OLD, old story to those who fly, but the Civil Aeronautics Board has just completed a year-long study of private flying accidents that shows about 90% of the deaths reported due to pilot error. The largest single cause (41%) was due to plain, old-fashioned "reckless operation," such as the show-off and the "buzz boy." Next greatest cause was failure to maintain flying speed, and the third greatest cause of fatal accidents was "continued VFR into instrument weather," which is another way of saying: "Aw, I can make it through those clouds!"

THE BRITISH have used a unique method of testing the pressurized fuselage of the Airspeed *Ambassador*, one just the reverse of that used in this country. Whereas U.S. engineers simply pump air into the test fuselage and then note the leakage, the British went to all the trouble and expense



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JUNE, 1950
MODEL AIRPLANE NEWS

of lowering an *Ambassador* fuselage into a deep sea dock and noting the amount of water entering the cabin! The advantage claimed for their method is that the exact point of failure can be determined, whereas the U.S. method of pumping the fuselage up until it explodes doesn't provide an accurate indication of the exact point of failure.

THE FAMILIAR OLD Fairchild *Packet* is still going strong and even branching out into the Navy and the Marine Corps. An initial group of 40 Fairchild C-119B transports has been delivered to the Air Force, two model R4Q-1 transports have gone to the Navy and the Marine Corps has received one R4Q-1. The C-119 and R4Q-1 are bigger, faster versions of the more familiar C-82 *Packet* and feature two Pratt & Whitney R-4360 *Wasp Major* engines or 3,250 hp each, plus more interior room and relocation of the pilot into the nose instead of high atop the fuselage. A total of 196 *Packets* is on order.

FOLLOWING A LONG period of development, the Navy has announced plans for actual flight tests of its special "escape capsule" for supersonic combat aircraft. This device contains the pilot and all instruments and flight controls, plus a parachute, survival gear, and a rescue radio. In actual use, the pod comprises the nose of the airplane and is blown off by a small powder charge. The parachute is released and the entire pod with the pilot inside floats down to a safe jumping altitude for the pilot if he so desires. However, the pod floats in water and may be used as a boat, so that the pilot may elect to stay with it over water. Tail fins, which extend automatically, are used to steady the pod after separation from the airplane. Necessity for the device is due to the impossibility of a pilot bailing out at supersonic speed, even with an ejection seat. No details have been released on the method of flight test to be employed at the Navy test center Inyokern, Calif., but it is believed that the pod will be carried aloft in the belly of a bomber and dropped from a high altitude. Certainly no supersonic aircraft are going to be deliberately destroyed as a mere flight test for an ejection capsule!

FIRST CONVAIR T-29 trainer, an Air Force development of the familiar Convair *Liner*, has been delivered. It was flown to Wright-Patterson Air Force Base for familiarization and test program. The twin-engine trainer has accommodations for 14 student navigators and 4 instructors. A total of 48 T-29's is on order.

PRATT & WHITNEY Aircraft Division of United Aircraft Corporation reveals that its new J-48 turbo-jet engine has already been test flown in a Grumman F9F-5 *Panther* Navy jet fighter and a North American F-93A Air Force jet fighter. The engine is an Americanized development of the British Rolls-Royce *Tay* and produces 6,250 lbs. of thrust, the largest of any production engine in the world. An exclusive P & W feature of the new engine, however, is a huge afterburner installation which increases output to more than 8,000 lbs. thrust for short bursts of power. The engine weighs only about 2,000 lbs. and is a mere one-half inch larger in diameter than the J-42 it is designed to replace in the *Panther*. Navy has already placed an initial order for 264 of the new J-48 engines for $10,000,000 and an additional order for about the same number is being negotiated.

AND YET ANOTHER roadable airplane, or flying automobile, or what have you, has been announced, this time the Taylor *Aerocar* out at Longview, Wash. Designed by Moulton B. Taylor, the craft is similar to the Fulton *Airphibian* in its surface form but differs in its flight form by being a pusher installation. The propeller is located at the extreme tail of a removable aft fuselage, which features vertical surfaces on the lower, rather than the upper, side of the fuselage. Unlike most roadable projects, Taylor has already sold his prototype airplane to the B. F. Goodrich Company for $10,000 and is planning quantity production on the *Aerocar*, which he hopes will [illegible] its selling priced down to $4-5,000.

vantage of the Taylor design is the fact that the wings are folded back against the fuselage which, upon being detached, becomes a trailer towed by the car. Other designs leave their wings at the airport, resulting in restrictions on the "fly or drive" choice that is the goal of such designs.

RYAN IS OFFERING three versions of the famed *Navion* for 1950, each designed not only for special purposes but to fit different pocketbooks. The *Utility Navion* is a rock-bottom model selling for $9,485 and powered by the standard 205 hp Continental engine. The *Deluxe Navion* sells for $10,985 and features such "extras" as controllable cowl flaps, radio antenna, refined cabin interior, etc. A new development is the *Super Navion* powered by a 270 hp Lycoming engine, giving it a cruising speed of 170 mph, but the new powerful *Super Navion* is tagged at $13,985!

IF YOU THINK THE "lowly DC-3" is a dead duck in this age of jet air liners, you will be interested to know that according to the latest count, U.S. scheduled air lines are flying exactly 452 Douglas DC-3 transports, twice as many as the next nearest type! Here's a brief rundown: 233 Douglas DC-4, 113 Convair *Liner*, 110 Douglas DC-6, 80 Lockheed *Constellation*, 41 Boeing *Stratocruiser*, 24 Martin 2-0-2, 11 Lockheed *Lodestar*, 6 Lockheed *Electra*, 5 Boeing *Stratoliners*, and 21 miscellaneous other types, a grand total of 1,906 scheduled transport airlines. Looks like the gas turbine air line is more than just around the corner!

YOU MAY HAVE wondered what ever happened to the *Hoppicopter*, that one-man helicopter that you sit in like an amusement-park flier. Well, the latest news is that inventor H. T. Pentecost, has designed a ram-jet version, known appropriately as the *Firefly*, with small ram-jet engines located at the tips of the single rotor. The rotor is 18' in diameter and the whole machine weighs about 175 lbs.

Improved R.C. Receiver

(*Continued from page 33*)

4. Change R_2 to a larger value, if the relay does not open with signal. However, if a meter is placed in the plate battery lead, and a current change of 2 ma. is observed, do not change R_2; but instead, adjust the relay both in gap and spring tension until it operates with this change.

The R.F. choke used may be any good high frequency choke, or a winding consisting of about 35 turns of No. 30 cotton covered wire scramble wound on a small 10 meg. resistor, the ends of the winding connected to the ends of the resistor.

For the quench coil, the unit from a *Beacon Electronics* receiver works very well. Also, it is possible to use two 5 mh. single-pie chokes with the windings set very close together. For those who have the necessary measuring equipment, it was found that a .127 mh. coil for the secondary and .038 mh. for the primary are about optimum. Manufactured quench coils, available from most amateur radio supply houses, should also do the job nicely.

Simple Simon

(*Continued from page 25*)

after each coat. Cement the sheet bals[illegible] ders in place, and add the 1/16" dow[illegible] and tail rubber band anchors. Drill the 3/16" dowel rubber motor anch[illegible]

Incidence is "built-in" for bo[illegible] and wing. This combination provides for downthrust. It this that when gliding the m[illegible] be nosing-down. A sligh[illegible] thrust was required t[illegible] right. The glide w[illegible] ance the model wing becaus[illegible]

Test gli[illegible] not att[illegible] is flat [illegible] fifty [illegible]