AIR TRAILS

JANUARY 1951

25 CENTS

Midget Air Racing Roundup

Read Bill Brennand's "How I Won The Goodyear"

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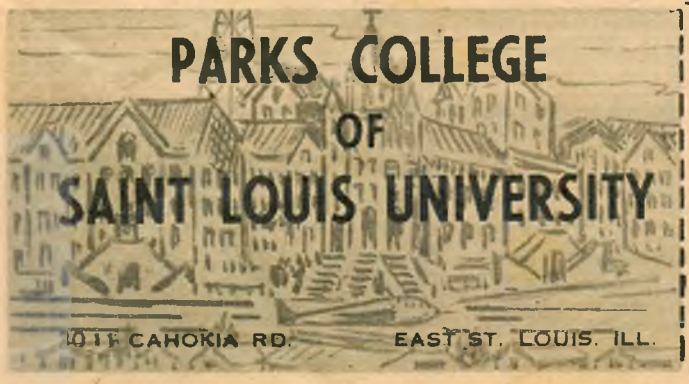

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AIR TRAILS

JAN., 1951 ● VOL. XXXV, No. 4

All communications to the Air Trails editorial offices should be addressed to Air Trails, 122 East 42nd St., New York 17, N. Y.

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THE READERS WRITE:

Hawker Super-Fury vs. Bayle's Gee Bee . . . I was very pleased with a recent issue except for one thing. You had a picture of the Hawker Super-Fury stating that it was the fastest plane of its time with a top speed of 252 mph.

The fastest plane of this era was Bayle's Gee Bee Special. In the Thompson Trophy Race at Cleveland in 1931 it averaged a speed of 267.342 mph in four dashes over the field. In one of these dashes it had an official American speed record of 280 mph.

So you can see this tops the Super-Fury by quite a margin!

Jim Belknap, Syracuse, N. Y.

● The Gee Bees were specialized aircraft built entirely for racing. What we meant in our Hawker caption was that the Fury was the fastest service type fighter of its day.

Pilots Who Wear Glasses . . . I would like the following information to settle an argument. Can one who wears glasses get a pilot's license? Also give me some information on the small Cub J-3.

A. McLaughlin, Industrial Farm, Burwash, Ont., Can.

● A pilot may wear glasses provided his visual acuity in either or both eyes is not less than 20/50 and that corrective lenses bring it up to 20/20.

The J-3 Cub is a two-place lightplane manufactured by Piper Aircraft Corp. of Lockhaven, Pa. It is powered by a 65 hp four-cylinder air-cooled engine. Span is 35 ft. 4 in., top speed 90 mph.

Such Name Calling! . . . Now and then we see pictures and articles describing interesting little rotary wing aircraft whose airfoils are powered by ram-jets attached to their extremities.

Seems to me Uncle Sam might be able to find a good job for them if they could attract enough of his attention, and I thought interest might be stimulated by providing them with a suitable name.

It is not an ornithopter but a little helicopter with which someone has combined the athoyd; it's a mighty slick creation but it lacks a designation, so why don't we call the thing the HELIDYD?

Glenn R. Stephens, Glendale, Calif.

Depends on Us . . . I like your magazine very much. The "Dopester" must be quite a card! I depend on your tests regarding Motor and Model of the Month before buying anything. I also like the section on "Your Job in Aviation" as I intend to be an aeronautical engineer and I am entering University next year to study for same.

Thomas Wallace, Granum, Alberta, Can.

Citation for Stunt . . . Been reading Air Trails since 1946 and find it a very interesting magazine. I fly just one nice stunt ship and that's the Triumphant. I'm hoping you'll get out more stunt ships like it. Yes, I know scale jobs are beautiful but I still like stunt. Right now I'm in Korea and haven't got much time to build planes, but am still reading AT. Nothing will stop me from that. Can't you get out more stunt ships?

Cpl. S. Aya, HQ Battery, 64th F.A. Bn., APO 25, c/o PM, San Francisco, Calif.

● See this issue, Cpl.!

Pitts Special . . . In studying the plans of the Pitts Special fairly carefully in your magazine, and three-views of the same ship in other mags, I noticed a difference in the shape of the elevators between the two plans. Also, the upper wing on your ship seems to be set slightly higher. Is this an error on your designer's part or were there more than two different designs of the real ship?

Robert Neulin, Hellertown, Pa.

● Our 3-views of the Pitts were scaled directly from the plane and we consider them entirely accurate.

Who's Claude's Stand-in? . . . It's a fine shot and a fine plane which you attributed to me in the caption under one of the pictures in the recent photo feature on the '50 Nationals—but that's not me! Proof positive lies in the fact that the job does not bear man Triple-Bar brand, podner. And last but not least, I just love ROG since you get a 5-second bonus and ROG'ed all my officials at the Nats.

Will wear a propeller beanie next year for positive spotting through AT's camera viewfinder.

Look for me at radio-control, for free flight is getting too hectic for an old man like me.

Claude McCullough, Ottumwa, Iowa

Photo of "Claude" in Nov. 1950 Issue

Delanne Questionnaire . . . I enjoy your magazine so much I can hardly wait to get the next issue. In a recent one containing the article on "Delanne and His Duo-Monoplanes" I was wondering if the plane would fly as well or better with the wings just opposite. The top wing would be on bottom and the tail set would be on bottom. If it wouldn't work I would like to have explained why.

Richard Bannon, Plain Dealing, La.

● We would say no—since the slot effect, created by the present method, would disappear.

. . . I've wanted to build a small plane for some time, but don't want to wind up with a "home-built Cub." To me the Duo-Monoplane offers possibilities. So can you help me in obtaining more technical aerodynamic information? I would specifically like to buy a publication of Delanne's design if it is available.

W. M. Burkitt, Bakersfield, Calif.

● All patents on the Delanne configuration are owned by the Pardel Development Corp. of New York City, and information regarding its aerodynamics and other details are not available to individuals.

. . . I noticed that Delanne's plane has a resemblance to Mignet's Flying Flea. Mignet is also French.

Pfc. Salvatore Fiorentino, Fort Bragg, N. C.

● Yes, superficially Mignet's Flying Flea does somewhat resemble the Delanne Duo-Monoplane. The difference, however, is in the aerodynamics, which not only greatly increase the lift of the Delanne wings but also greatly reduce the drag of the aircraft.

Wee Bee Model . . . We certainly want to express our thanks to you for the explicit presentation of the article by Lloyd V. Hunt on our airplane the Wee Bee. Mr. Hunt did an excellent job of reproducing our airplane as a free flight and U-control model.

K. S. Coward, Ken S. Coward & Associates, San Diego, Calif.

(Continued on page 9)

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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.

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For Ignition	Pts	Qts
Ohlsson #1	.75	1.40
Power Mist #6	.65	—
Reg. Pink	—	1.25
For Glo		
Ohlsson #2, #4	.75	1.40
Ohlsson AA	.75	—
Ohlsson #2 or #4 Econ.	.59	—
Powermist Glo	.90	—
Powermist Spitfire	—	1.35
Ranger Glo	.80	—
Red Devil	.60	1.10
Testors 29	.75	—
Dynagle	.75	—
Ranger AA	.80	—
Spitfire AA	.80	—
Blue Blazer #1	.65	—
Blue Blazer #2	.75	—
OK Cub	.75	—
For Diesel		
Deisel	—	1.50
Ranger (Fixed Head)	1.00	—
Ranger (variable head)	.85	—

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

PROPELLERS

Rite Pitch Stunt 8, 9, 10, 11, 12, 13, 14 in., 6 and 8 pitch .35
Rite Pitch 8, 9, 10, 11, 12, 13, 14 in., 6, 8, 10 or 12 pitch .38
Scamper Plastic 3½" Sp. .25; 9" Sp. .45; 10" Dp. 11" Sp. .65
Super Spl. 8", 9", 10", 11" in 4 & 8" p. .22

FLIGHT TIMERS

Austin metal 1.50
D-E Shut Off Valve 1.00
Elmic (ign. or glo) 1.95
Hillcrest plastic 1.25
Stutter-off Valve .75

A.A ACCESSORIES

Shut-off Valve (state engine) .65
E-Z Minimount .25
.004 or .006 x 2—36 .50
.006 x 2—36 .50
Spinners (state engine) .40
Presto Starter (state engine) .25
Props (state engine) .25
Tanks (state engine) .35, .60, .75
Neoprene (ft) .15
Fuel Meter .50

MISCELLANEOUS

Batt. Box Pos. and Medium .40
reg. .50
Brass Tubing 1/16", 3/32", 1/8" .15
Coil Holder .15
Copper Tubing ¼" OD, per ft. .20
Finger Guard .49
Fuel Line Filter .35
Fuel Pump .85 & .89
Metal Motor Mounts, 5m—30f; 1g .50
Metal Prop Cut .75¢ & 1.50
Needle Valve Exten. flexible .25
Neoprene Tubing, per foot .30
Transparent (reg. or AA) ft. .15
No. 70 oil, 3 oz.—25¢; pint .80
Plastic Fuselage 12" set of 2 .50
Plug Wrench, 3-way—15¢; 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) .20
heavy 24x36" (white) .10
Red, Blue, Yellow 24"x20" .10
Sachet Plug Wrench, 4-way .50
Soldering Set 2.25
Spinner Starter 3.00
Tissue (most colors) 20"x24" .05
Universal Needle Valve .50
Flexible .75
Vibratac 2.50

SOUVENIR ITEM

America's Hobby Center does not buy or sell used engines. However, over the last few years we have acquired the assets of several motor manufacturers. Included in these assets were hundreds of assembled engines which were defective and returned by customers.

We do not guarantee these engines. They may have cracked castings, broken plugs, defective tanks or timers, etc. They are not sold for use, but only as an interesting display in your den or on your desk. As they come — no choices.

No. J2 —75¢ each

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Buy your model engines, planes and supplies and pay for them over a 12 months period. Send 25¢ for complete details and application blank.

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Stinson Sta. Wagon 45" B-C-D 6.50
Streamliner 22" B-C-D 4.00
Streeo 22" AA 1.50
Stunt Bird 16" AA 1.00
Stuntmaster 40" B-C 5.95
Stuntwagon 30 44" B-C 3.50
Stuntwagon 29" D 7.95
Super Bipe 22" B-C-D 4.95
Super Clinch 36" B-C 2.98
Super Sky Boy Stunt 42" C-D 4.95
Super Smarky 40" C-D 2.95
Super Solution 18" A 2.29
Super Squirt 21" (Jet) 4.95
Super Stunt Bird 20" A 1.95
Sweet Chariot 16" AA-A 2.50
T-28 N.A. Trainer 20" B-C 4.95
Taylorcraft 28" A.B.C. 1.95
Topper II 16" A-B 2.25
Trail Blazer 24" B-C-D 1.98
Vega 6" 2p. 4p. 7" 4p. 5p. 8" 5p. 6p. 9" 6p. 7p (6"—2¢; 7" & 8"—30¢; 9" & 10"—35¢)

Also Oldtime, Flo-Torque, Garday.

RUBBER & TEST BLOCKS

E-Z Running Stand 1.25
Universal Running Blocks 1.25
Wright Test Block (Jpn.) 4.95
Wright Test Block (Glo) 2.50

METAL GAS TANKS

Dale Stunt Tanks—All sizes .65

#1—1½x1½x¾		#4—3½x1½x¾	
#2—2½x1½x¾		#6—4½x1½x1	
#3—2½x1½x1		#12—3½x1⅝x	
#18—2½x1½x2¾			

Proons: 1½x1½ or 2 hor. or ver. .75
1½x1½x2 Sq. .80
1½x1½x2¾ Wedge .80
1½x1½x2¾ ½-Rnd Stunt .80

FLYWHEELS

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

IGNITION COILS

Arco Featherweight 2.50
Aero Dual 3.00 Regular 1.50
Arden 2.50 Rogers 2.00
O.K. 1.50 Wilbo 1.95
O.K. Twin 3.50 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 .80
Infant Glo-plug (spl) .95
McCoy Hot Point .95
Ohlsson Glo (V, V2 or AA) .65
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—.25 Turn .50
Ohlsson Snap-Pack .25
Arden Battery Cord Kit .25

PROP SPINNERS

Adapter Nuts (state eng.) .20
¼"—20; 1¼" .65
1½"-.65; 1¼"-.90; 2"-.95; 2½"-1.00
3" Needle Nose 1¼" dia. 1.15
2" 1.00
Plastic 1½" .50
Scamper Plastic 1½", 1¾", 2", 2½" .65

WHEELS

Semi Pneumatic (pr) 2" .95
2½" 1.10 3" 1.50
Sparky Tail Wheel Assembly .25
Sponge Rubber, Dural hub (pr) ⅝"—25¢, 1, 1⅛"-25¢; 1¼", 1⅜"-30¢, 2¼" .65
Sponge Rubber, Wood Hub (pr) 2"—.60; 2½"—.65; 3" .80
Tail Wheels ⅝"; 1½" .15
Trexler Pneu. (pr) 1½" or 1¾" 1¼", 2"—.50; 2¼", 2½"—.60; 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
Elmic (ign. or glo) 1.95
Hillcrest plastic 1.25
Stutter-off Valve .75

A.A ACCESSORIES

Shut-off Valve (state engine) .65
E-Z Minimount .25
.004 or .006 x 2—36 .50
.006 x 2—36 .50
Spinners (state engine) .40
Presto Starter (state engine) .25
Props (state engine) .25
Tanks (state engine) .35, .60, .75
Neoprene (ft) .15
Fuel Meter .50

MISCELLANEOUS

Batt. Box Pos. and Medium .40
reg. .50
Brass Tubing 1/16", 3/32", 1/8" .15
Coil Holder .15
Copper Tubing ¼" OD, per ft. .20
Finger Guard .49
Fuel Line Filter .35
Fuel Pump .85 & .89
Metal Motor Mounts, 5m—30f; 1g .50
Metal Prop Cut .75¢ & 1.50
Needle Valve Exten. flexible .25
Neoprene Tubing, per foot .30
Transparent (reg. or AA) ft. .15
No. 70 oil, 3 oz.—25¢; pint .80
Plastic Fuselage 12" set of 2 .50
Plug Wrench, 3-way—15¢; 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) .20
heavy 24x36" (white) .10
Red, Blue, Yellow 24"x20" .10
Sachet Plug Wrench, 4-way .50
Soldering Set 2.25
Spinner Starter 3.00
Tissue (most colors) 20"x24" .05
Universal Needle Valve .50
Flexible .75
Vibratac 2.50

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, .010, .012; 2-55	.50
.008, .010, .012, .014 2-70	.65
.016; 2-45¢	1.00
Stranded .015, .021, .25¢ .75; 70' 1.00; 300'	2.75
Berkeley Metal Flight Reel	1.25
Berkeley Metal Handle	1.00
Elevator control horn .10; Vee	.25
Elevator hinges 4 for	.10
E-Z Plastic Control Handle	.35
Instant-Use Handle, 5 or 6"	.50
Lanen Clips A, B, C or D Pr	.10
FYLON control lines .006, .008, .010, .012, .014, .016 dia. 2-35' lines	.50
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FlexRite 2-52' 1.50; 2-70'	1.95
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Reel Pal Reel	1.00
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Stunt Bellcrank & Elev. Horn	.25
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$7.95

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Bore	.460	.612	.680	1.000	Prop.	5"	10"	11"	12"
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50c: Doug Daunt, Sup. Spitfire 1X, Grum. A'ger TBF-1, Corsair F4U-1, Vultee Ven. A-35, Piper Cub, Ercoupe, Dipper, Skyrocket, Stratos, Sparky

$1.00: N.A. Mustang 24", Doug A-26 30", Thunderbolt 24", Wildcat F6F 24", Lightning P-38 34", Clipper, Jr. 36", Pepper 32", Taylorcraft 54", Aeronca 54". Piper Cub 40", Gull 42"

ENTERPRISE 18" 50c: Piper Cub Special, Taylorcraft, Aeronca Champion, Monocoupe

AIRLAND 25c: Cessna 170, Stinson Voyager, Taylorcraft, Piper Cub, Beechcraft Bonanza, Aeronca

JASCO

Jasco Special 1.50, Jasco R.O.G. 35c, Jasco Kid 50c, Jasco Jr. 85c, Jasco Sr. 1.25, Thermalier 1.50, Thermal Cruiser 1.50

SCIENTIFIC (27"-30") 50c: Atlantic Ace, Skipper, Yellowbird, R.O.G. Bullet

25" at 35c: Royal, Major, Bantam, Ranger

ALSO: 50" Miss World's Fair 1.50, 42" Spartan 1.00, 30" Circle King 1.00, 42" Zephyr 1.00, 42" Olympic 1.00, 45" All American 1.00, 36" Flea 1.85, 36" Firefly 1.00, 36" Miss America 1.95

MONOGRAM 25c: Speedybuilts: Cessna Seaplane, P51 Mustang, Spad Pursuit, Republic Thunderbolt, Ryan Navion, Hellcat 6F6, Piper Cub, Aeronca, Monocoupe, Ercoupe, Boeing Kaydet, Midget Mustang

ALSO: 28" Prowler or 31" Pirate 1.25

DISPLAY - BOATS

$1.00: (16") Battleship Missouri, USS Carrier "Shangri-La," USS Destroyer "Hobby"

Gypsy Sloop 15" 1.00; Gypsy Sloop Jr. 11" 50c

MODEL SHIPWAYS: Grand Banks Fisherman 16" 8.00, Baltimore Clipper Schooner 24" 18.00, Diesel Tub 13" 12.00, Fishing Schooner 21" 12.50, U. S. Frigate 20" 11.00, Steam Paddle Cutter 19" 14.00, Virginia Pilot Boat 20" 8.50, Brigantine 22" 14.00, Revenue Cutter 19" 11.50, Merchant Brig 21", 15.00, Extreme Clipper Ship 21" 9.50

DISPLAY - OLD TIMERS

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1905 White Steamer 2.95, 1905 EMF Racer 2.50, 1908 Baker Electric 2.50, 1909 EMF 2.95, 1909 Hup 2.50, 1904 Cadillac 1.95, 1905 Reo 2.50

MOD-AC

Brougham 1.95, Victoria 2.35, Hanson Cab 1.50, Horse and Harness 1.50, Surrey 1.75, Horseless Carriage 1.50.

HUDSON

1903 Rambler 2.50, 1911 Maxwell 2.50, 1904 Olds 1.95, 1910 Int'l Harvester 2.95, 1911 Buick 2.50, 1903 Cadillac 2.50, 1914 Stutz Bearcat 3.95, 1903 A Ford 2.50, 1909 Stanley 2.95, 1910 T Ford 2.50, 1900 Packard 2.50

ALSO: Station Wagon 9" 1.25, Wessel 11" 2.95, Buckboard 1.25, Stage Coach 1.75, Covered Wagon 1.75, Army Truck 1.00, Wright Biplane 1.00, Chris-Craft Cruiser 1.95.

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GLIDERS: Sindbad Jr. 50c, Sindbad Sailor 50" 1.50, Super Sindbad 2.50, Imperial 72" 1.00, Condor 60" 1.25, Baby Condor 36" 50c, Thermic C 80c, Thermic 70 3.50, Thermic 50 1.00, Thermic Trio 35c, Thermic 72 2.50, Thermic 50X 1.00, Thermic 30 50c, Trooper 65c, Pirater 2.50, Sailwing 50 1.00, Thermic 20 35c, Thermic 18 20c, Thermic 100 7.50, Thermic B 50c

DISPLAY - AIRPLANE

COMET (8"-9") 25c: Aeronca Sedan, Cessna 170, Piper Cub, Taylorcraft, Luscombe Sky Pal, Stinson Voyager

CAVACRAFT 50c: Mustang, SE5, Piper Cub, Ercoupe, Taylorcraft, Navion, Cessna

QUIN PLASTIC (¼" scale): Shooting Star 1.00, Piper Cub 50c, Stinson 60c, Seebee 1.00, Beechcraft Bonanza 75c, Jet Sabre 1.00, Ercoupe 50c, Ryan Navion 75c

STROMBECKER 89c: Piper Cub Super Cruise, Piper Cub Super Sea Scout, Swift Land, Swift Sea

69c: P80, Shooting Star, Beechcraft Bonanza, Douglas Skyrocket, Douglas DC3 Flagship

79c: Convair Flagship

1.19: Northrop P61, Douglas DC6 Flagship

1.89: Liberator

3.00: Super Fortress B29

DYNA-MODEL: F6F, P61, F8F, F4U. P40, F.W. 2.75, P38 3.50, P47 2.95

HAWK PLASTIC: F84 Constellation, S6B 1.00, Gee Bee, Curtis, Ire. Laird 50c

Gruman Panther 1.50, Mr. Mulligan 1.00

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The Readers Write

(Continued from page 4)

How to Hold a Map . . . Many beginners can profit by a recent Solo Club article—if they will. However, I differ on one small point: holding the map with the course pointed toward the destination.

I encourage students to read their maps with North at the top (or forward). The advantages are: 1. The map looks the same as it did when they were drawing their course before the flight. 2. All the printed matter on the map is designed to read in this position.

No. 2 is the most important. The mind can easily re-orient pictorial or diagrammatic material, but it is harder to learn to read printed matter upside-down—let alone the infinite variety of angles resulting from holding the map-course parallel to the ground-course. This results in changing the position of the map when the pilot wants to read the description of the landmark or "area of magnetic disturbance." The beginner may simply neglect to read such remarks.

I always teach the proper use of both methods, explain my preference, and let the student take his choice. Naturally, most of them choose the one I recommend, but a few decide that the one you mention looks easier. However, all those I have been able to follow (as I could on a controlled cross-country course) eventually came back to holding North at the top because of some experience caused by not reading the cock-eyed printing on the map, or holding the map in the wrong position because their destination was not where they thought it was.

Having spent some time in print shops and reading charts over the student's shoulder, I have little difficulty reading the map in any position, but I still prefer it right-side-up.

Al Knouff, Tucson, Ariz.

Foreign Stamps . . . As one of the Vets over here at Halloran Hospital, I want to thank you for myself and the rest of us fellows for the stamps you sent us. You are more than kind to us and true Americans. Thanks a million and may God bless you.

Willie S. Vaughn, Halloran Vet. Hosp., Staten Island, N. Y.

● All foreign stamps received on letters addressed to Air Trails are sent to the VA hospital on Staten Island.

Flying Lessons . . . I am thirteen years old and would like to know how old you have to be to take flying lessons and approximately how much they would actually cost me per hour.

Jim Borys, Chicago, Ill.

● You have to be at least 17 years old before you can take flying lessons. Your parents' consent is required. The average cost for flight training in lightplanes is $11 an hour for dual and $8 for solo.

Figures on the Stitts Jr. . . . I would like to obtain some information about the Stitts baby plane pictured in a back issue of Air Trails.

It looked like an interesting job.

Thomas Rose, East Hampton, Conn.

● The Stitts Jr. was built by Raymond Stitts of Battle Creek, Mich. It has wingspan of 9 ft. 5 in., fuselage length of 11 ft. 4 in., weighs empty 400 lbs. Wing area is about 75 sq. ft. Cruising speed is 125 mph, top speed 155 mph, fuel capacity 4 gals. It climbs 800 ft. per minute at 85 mph. Stalling speed: 62 mph indicated.

The Zero and Zboyan . . . I have just received my monthly copy of AT from you people and I couldn't believe it. The cover was really terrific. Simple, yet so eye-appealing. I really think that Mr. Zboyan has excelled himself on the November cover.

Also enjoyed the "Zero" story by Mr. Horikoshi. I have a private pilot's license and think I'd like to fly the Zero. In 1946 I was in Korea and visited a buddy at Kimpo airport, and if I remember right I saw a couple of Zeros there.

F. J. Medaylia, Everett, Mass.

How Many Coats? . . . Another boy and I would like to know how many coats of dope they put on a lightplane at the factory. He says about 10 coats of clear and about 5 of color dope. I say about 5 coats of clear, about 5 coats of silver and about 10 of color and a couple more coats of clear for protection. Which one of us is more nearly right?

Jackie "Speedy" Ford, Nashville, Tenn.

● Different manufacturers have different ideas on how many coats of dope are needed for finishing their planes. It may be a total of anywhere from 8 to 15.

World War I Photos . . . I wonder if you could send me some names and addresses of people that still sell pictures of First World War photos.

R. C. Feeney, 6043 E. 12th St. Terrace, Kansas City, Mo.

● Can anybody help RCF? Air Trails knows of no such service.

Long Midget l.g. . . . I am having a great deal of trouble forming a landing gear for a Long Midget model. I have tried bending it cold, and also bent it after heating with a blow torch and then tempered it, but it broke under the slightest pressure. Please inform me on forming the gear, or a better material I can use. The 3/32" diameter music wire that I have been trying to make the gear with just doesn't seem to work. The thing has me pretty well baffled.

Frederick Muesegaes, Bloomingdale, Ohio

● Evidently you acquired some really tough steel music wire, probably the material known as piano wire. This can be bent but you must bear down considerably. Use a vise and clamp it tightly where you want the bend, then bend it as far as possible by hand. Complete the bend by hammering until the radius is as small as desired. You may find that hammering while you bend will also help.

Heating this wire will not help matters because the temper will be removed. Retempering is rather difficult unless you have a good knowledge of heat treating processes, and we advise against this particular measure.

air notes | AVIATION TODAY AND TOMORROW

Along the Flight Path. North American Aviation Inc. has taken over the operation of the former Curtiss-Wright plant in Columbus, Ohio . . . Eleven Douglas DC-6A Loadmasters have been ordered by the U. S. Navy. The aircraft's military designation will be R6D-1. . . . American manufacturing rights for the British Armstrong-Siddeley Sapphire jet engine, said to be the most powerful in the world, developing 7200 lbs. thrust, were acquired by Curtiss-Wright Corp.; engine will probably power some U. S. jet fighters.

Dusters to the Rescue. Faced with a complete destruction of their crops by an unusual hatching of great numbers of leaf worms, farmers of Southeast Missouri sent out an SOS for dusters and sprayers. Nearly 150 planes responded, some coming from points 1,000 miles distant. With operators dusting as much as 1400 acres a day, it was not long before the scourge was brought under control and the flying worm fighters returned home.

Russia's Plane Production. Production of the 600 mph YAK-17 jet fighter is said to be between 9,000 to 10,000 a year.

700 mph. According to the Annual Report recently issued by the McDonnell Aircraft Corp., the company's XF-88 Voodoo twin jet fighter is listed in the 700 mph class. This is the first time figures on the plane's speed have been released.

Missile Center Named. The name of Patrick Air Force Base has been given to the former Air Force Long Range Proving Grounds at Cocoa, Fla., in honor of Major General Mason M. Patrick, first chief of Army Air Services.

Record Tornados. Four North American B-45 Tornado bombers established new Air Force records with flights across the Pacific and the continental United States. The B-45s flew what is believed to be the first group jet bomber flight across the Pacific to Hawaii. Another B-45 streaked nonstop from March Field, Calif., to Langley, Va., AFB in four hours and six minutes, with an average speed of 569 mph.

Turbo-Prop DC-3. Two Douglas Dakotas, as the British call the DC-3s, have been fitted with Rolls-Royce Dart turbo-prop engines by British-European Airways. The two planes will go into service the early part of this year as freighters. The Dart develops 1200 hp and is the type that powers the Vickers Viscount airliner ordered by BEA. Experience on the Dakotas will furnish data as to actual service performance and maintenance problems of the engine prior to its use on scheduled airlines.

New Planes for Eastern. Eastern Airlines has placed a $40,000,000 order for new flying equipment consisting of 35 new model Martin 404 twin-engine transports and 14 Lockheed Model 1049's, the 92-passenger Super-Constellation.

Boeing Washington. The Boeing B-29 Superfortress, a number of which were turned over to Great Britain under the Military Aid Program, has been given the name of Washington by the RAF.

Turbo-Prop Liners. Twenty-eight Vickers Viscount turbo-prop airliners have been ordered by British-European Airways. Delivery of the four-engined 40-passenger transports will begin in 1952. In the meantime the BEA is operating experimental test flights between London and Paris with a jet-powered Viking. So much interest was evidenced by American airline operators in the British jet and turbo-prop transports that the U. S. authorities have finally agreed, after a five-year discussion, to honor the British Certificate of Airworthiness over here, thus opening the door for the import of British airplanes into the United States.

Miles by the Millions. Scheduled airlines of the world flew a total of 870 million miles, an equivalent of 35,000 trips around the Equator, and carried 27,000,000 passengers in 1949.

Status of U. S. Military Aircraft. If you have been wondering what military planes are in production and which are not, here's a list of their standing (as of 60 days ago):

Aircraft in Production and Being Delivered. *USAF*—Fighters: Republic F-84, North American F-86, Northrop F-89, Lockheed F-94. Bombers: Convair B-36, North American B-45, Boeing B-47, Boeing B-50. Transports: Boeing C-97, Fairchild C-119, Douglas C-124, Northrop C-125. Liaison: Cessna L-19A. Helicopters: Bell H-12, Bell H-13, Sikorsky H-18, Sikorsky H-19. Air Rescue: Grumman SA-16A. Trainers: North-American T-28, Convair T-29, Lockheed T-33. . . . *U. S. Navy*—Fighters: Douglas F3D, Grumman F9F, McDonnell F2H, Vought F4U, Vought F7U. Attack: Douglas AD, Grumman AF, North-American AJ. Patrol Bombers: Lockheed P2V, Martin P4M, Martin P5M. Tranports: Fairchild R4Q, Douglas R6D. Helicopters: Sikorsky HO4-S, Piasecki HRP, Piasecki HUP, Bell HTL. Trainers: Lockheed TO2. Utility: Grumman UF. Anti-Submarine Search: Lockheed POW-1, Lockheed PO2W.

Aircraft No Longer Being Delivered. *USAF*—Fighters: Republic F-47, North American F-51, North American F-82, Lockheed F-80. Bombers: Douglas B-26, Boeing B-29. Transports: Beechcraft C-45, Douglas C-47, Douglas C-54, Curtiss C-46, Douglas C-74, Fairchild C-82, Lockheed C-121. Liaison: Piper L-4, Stinson L-5, Convair L-13, Ryan L-17. Helicopters: Sikorsky H-5, Bell H-13. Trainers: North American T-6, North American TB-295. . . . *U. S. Navy*—Fighters: Grumman F6F, Grumman F8F, McDonnell H1, North American FJ-1, Vought F6U. Attack: Martin AM, General Motors TBM. Patrol Bombers: Convair PB4Y-2, Martin PBM-5, Convair PBY-5. Transports: Beechcraft JRB, Douglas R4D, Douglas R5D, Lockheed R-60, Martin JRM, Curtiss R5C. Helicopters: Sikorsky HO3S. Trainers: North-American SNJ.

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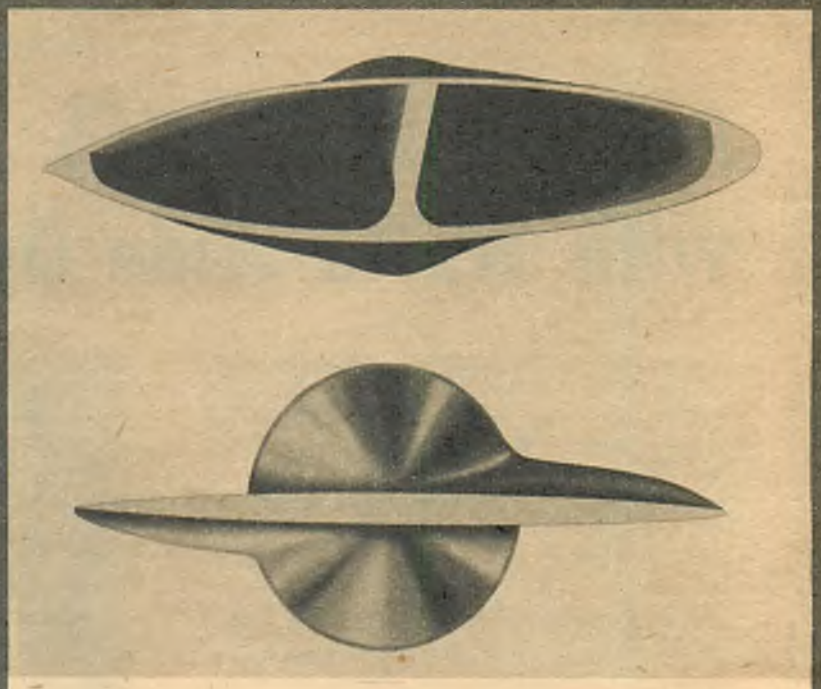
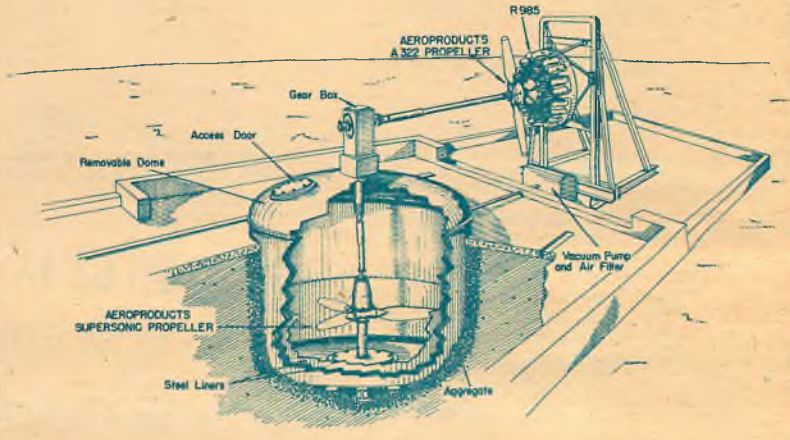


A chord section of a supersonic propeller (lower figure) at a station 20 in. from butt end, compared with similar section of the conventional propeller.

Supersonic Props

■ Practicability of using propellers in connection with supersonic flight is a problem under study now by the Aeroproducts company, a Division of General Motors. Both the Air Force and the Navy are vitally interested in the project, having granted to Aeroproducts a development contract. Although it has been often said that a jet aircraft will put the prop out of business when it comes to supersonic speed, propeller engineers have now sufficient data to prove its practicability in this speed range, when driven by turbine powerplants. Blades of such propellers will be of a very thin section, tapered in plan form.

To test such a propeller, Aeroproducts is erecting a "Spin Pit" consisting of a cylinder 12 ft. 10 in. in diameter and 7 ft. 10 in. high, sunk below ground level, and secured with an airtight seal to a concrete base. A removable steel dome facilitates installation and removal of the supersonic propeller. This chamber will have 99% of its air pumped out. The reduced atmosphere thus permits the use of a low horsepower (450 hp) engine to rotate the prop at high speed.



Aeroproducts Supersonic propeller "Spin Pit". Prop on engine used for cooling.

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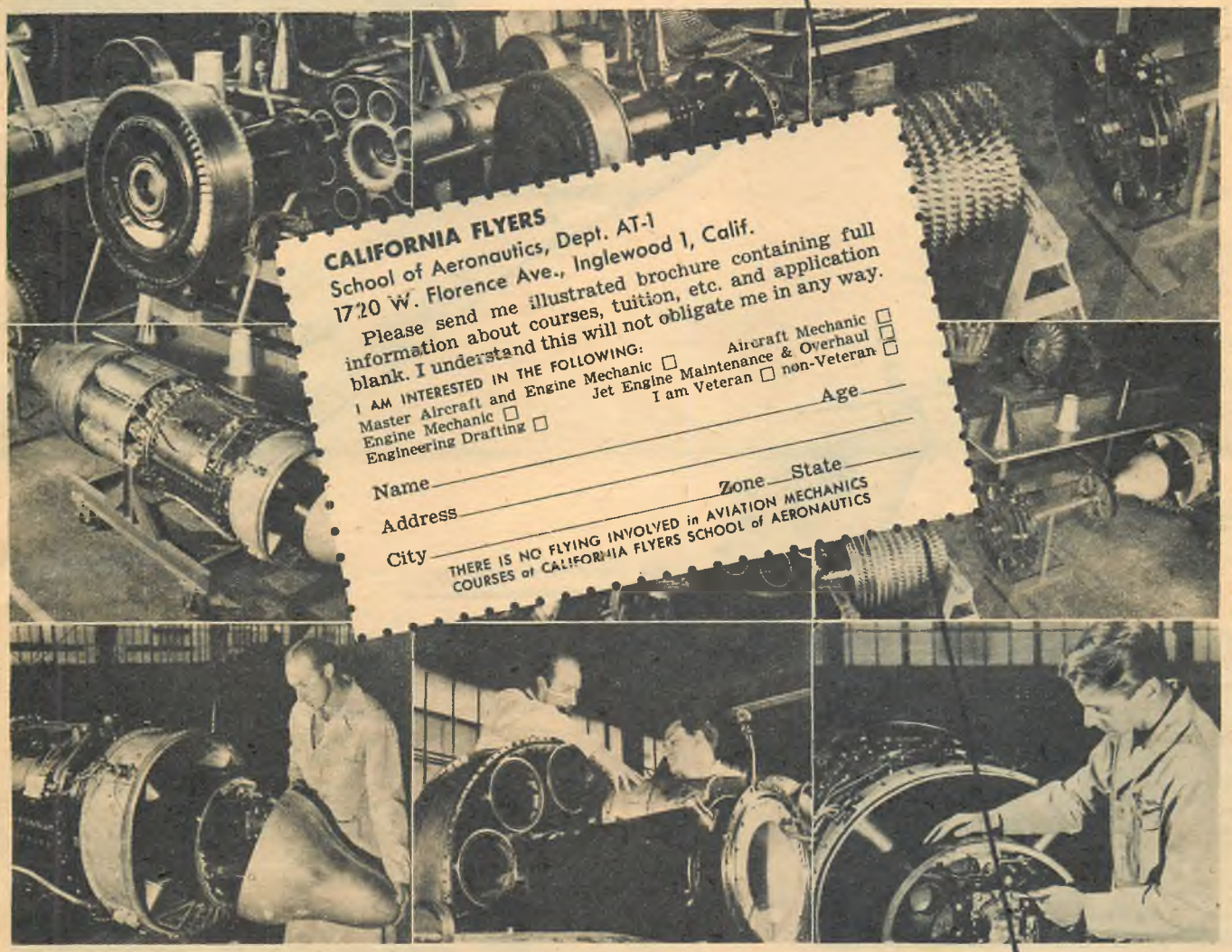

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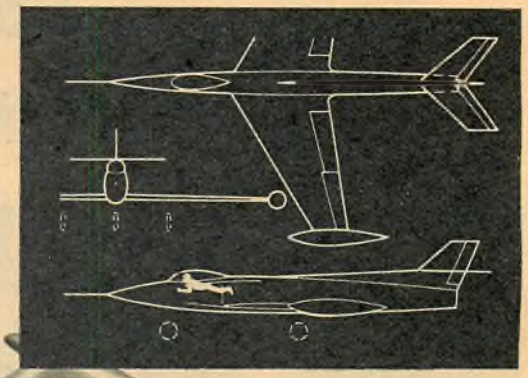
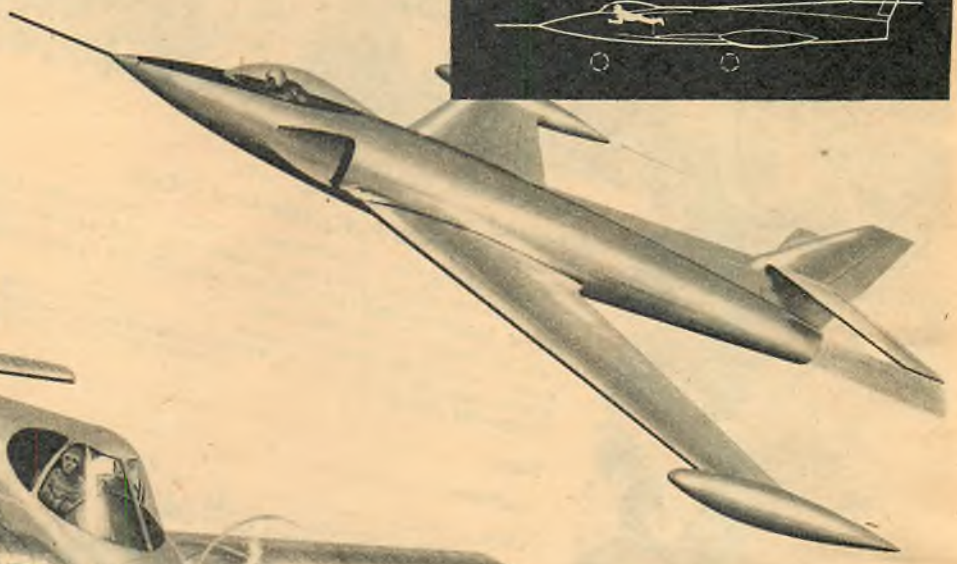
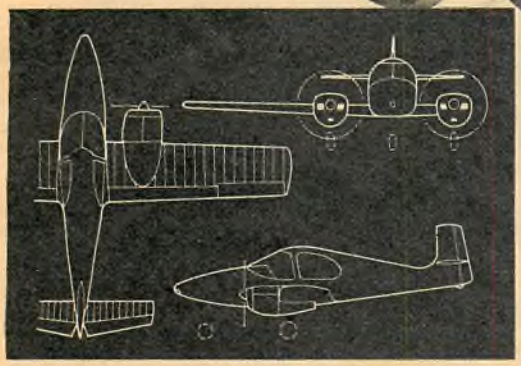
DESIGN COMPETITION



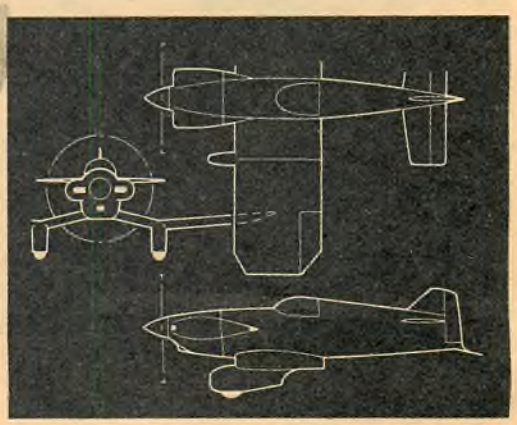
A supersonic interceptor featuring prone pilot cockpit to reduce G loads wins first prize for Alex Swidar of Bridgeport, Conn. This cockpit layout permits a slim fuselage line, so important to high-speed aircraft. The plane is powered by a turbo-jet engine of 6,500 lbs. of thrust and has a 750 mph speed. Six .50-cal. m.g.'s and two 20 mm cannon.





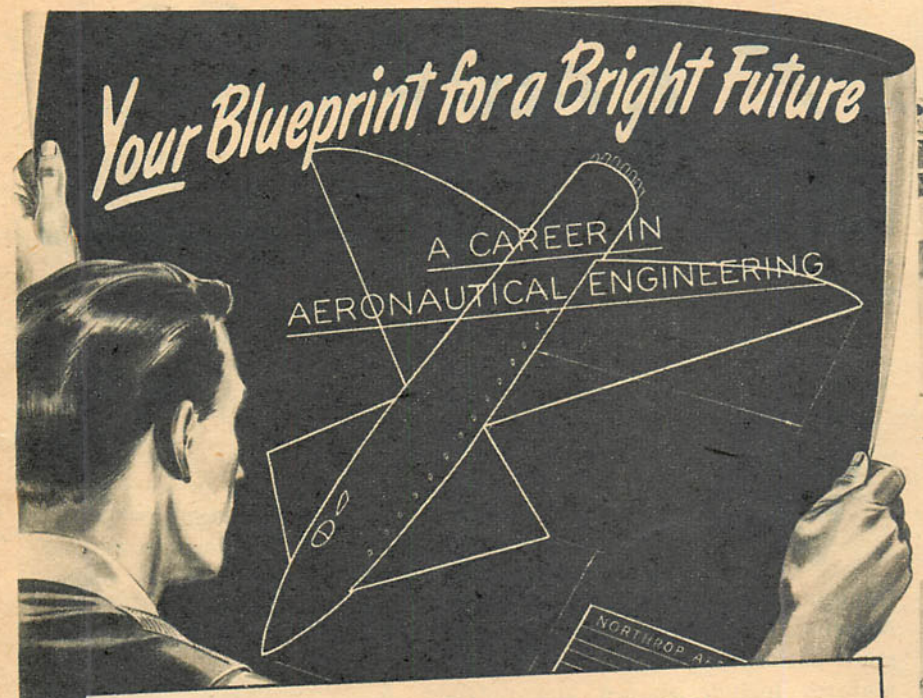
Second prize goes to Julio C. Ecker of Newark, N. J., for his two-place, twin 65-hp personal plane. Mr. Ecker is a private pilot and has very definite ideas as to his preference in private planes. This one, designed to do 135 mph, is eminently suitable for instrument flying. Plane is all metal, with wing structure similar to that of a Republic Seabee, consisting of three spars with corrugated skin riveted to them. The span is 32 ft.

A midget racing plane brings third prize to Earl S. Mathis of Granite City, Ill. The little speedster features an inverted gull wing. This wing shape permits good juncture at fuselage with minimum of fairing as well as smaller and cleaner landing gear which actually consists of wheel pants, eliminating drag-producing legs. Span is 16 ft., length 15½ ft. Speed 200 mph. Engine of 85 hp and 190 cu. in. displacement provides power.



Air Trails has opened its columns to those who are interested in presenting plans for "aircraft of the future." Rules governing the competition are as follows: Three-view sketches of the proposed aircraft will be required. These should be not less than 8½ x 11 inches for the entire three-views. Give sketches of the complete airplane in three-quarter front and rear positions. Photos of a model of proposed design may be included. Information on power plant(s), estimated performance, dimensions, and explanations of any unusual features are required. Data as to age, occupation or schooling of the entrant will be welcomed by the editors and judges. The designs may be of any type: commercial aircraft, military planes (fighters, bombers, troop transports), planes for the private flyer and single-engine sporting or racing craft. The entry each month judged the most practical or of the greatest significance will receive an award of $25. Payments of $5 will go to the runners-up. Entries will not be returned and for that reason those participating should keep copies of all material submitted. Mail entries to Airmen of Vision, c/o Air Trails, 122 E. 42nd, New York. The editors regret that because of large number of entries they cannot enter into correspondence on Airmen of Vision.

Your Blueprint for a Bright Future



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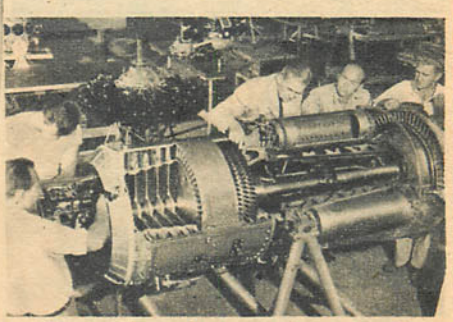

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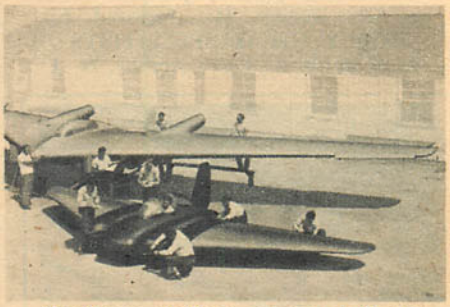

Northrop student engineers learn the principles of advanced all-wing aircraft design, as they study the design and aerodynamic characteristics of a Northrop-built experimental "buzz bomb" (front), and one of the N-9M 60-foot scale model Flying Wings (rear).

In a huddle on their design for the rudder on a student project aircraft, these Northrop students study their assembly drawings, a scene they will repeat many times in their careers.

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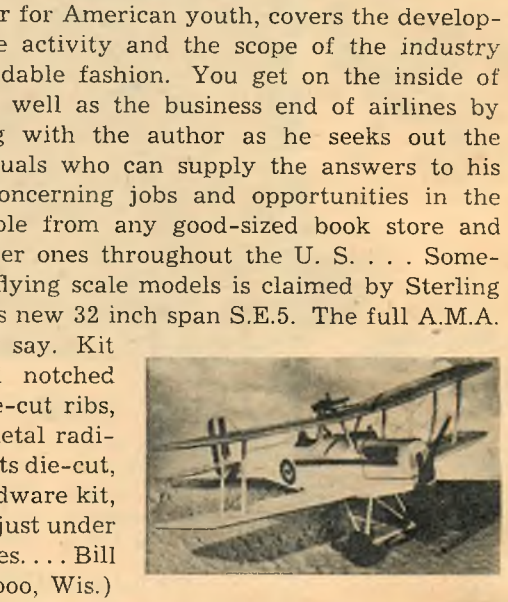
Showcase

Contact your hobby shop for items shown here. Both the price and the specifications are subject to change.

"Aviation from the Ground Up" is a fine new book by John J. Floherty published by J. P. Lippincott Co. The author, who has been called the star reporter for American youth, covers the development of the activity and the scope of the industry in very readable fashion. You get on the inside of factories as well as the business end of airlines by going along with the author as he seeks out the key individuals who can supply the answers to his questions concerning jobs and opportunities in the air. Available from any good-sized book store and many smaller ones throughout the U. S. . . . Something unusual in control line flying scale models is claimed by Sterling Models of Philadelphia with its new 32 inch span S.E.5. The full A.M.A. stunt pattern is possible, they say. Kit features include shaped and notched leading and trailing edges, die-cut ribs, bulkheads and tail surfaces, metal radiator nose plate, all plywood parts die-cut, formed l.g., decal insignia, hardware kit, plus others. Fuselage length is just under 26 inches; for B, C and D engines. . . . Bill Halbert of Flo-Torque (Baraboo, Wis.) says his concern is again manufacturing the original Flo-Torque design prop. Available will be following sizes and pitches: 6/3; 6/5; 7/3; 7/6; 8/4; 8/6; 9/4; 9/6; 10/4; and 10/6. Flo-Torque props are sanded and finished with a smooth tumbled lacquer and are ready to use. Retail price is 15¢ each . . . . Pylon Brand tube-packed music wire in three-ft. lengths for model builders is the newest item offered by Sullivan Products (Philadelphia), manufacturers of wire and accessories for the hobby field. The new tube packaging keeps the wire clean and makes it easy to handle; no oil or grease coatings are necessary. Wire is protected from all moisture.



One of the many fine features of an Academy of Model Aeronautics' model flyer's license is the public liability coverage ($50,000 and $100,000 personal injuries; $10,000 property damage). By subscribing to the safety rules of the AMA, you can obtain the license and liability coverage. All licenses are on a calendar year basis, so the sooner you sign up the more you get for your money.

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On July 1, '50, I was ..... years old (license classification is based on your age on July 1). Please issue license checked:

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Showcase

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Scientific (Newark, NJ) has turned out a race car that retails for $2.95. Called the "Half-Pint," it's been clocked at 40 mph and can be operated on any smooth surface, in a backyard or even in a cellar. Half-Pint features a brightly painted one-piece body moulded of sturdy "Science-Wood." Designed for the popular small bore engines from .02 to .074 cu. in., the racer utilizes direct drive with the rear left wheel attached directly to the engine. Kit is prefabbed. It includes moulded one-piece painted body, four rubber wheels with metal hubs, gas tank material and fuel line, front axle, die-cut plywood, decals and complete hardware. . . . An old outfit with new ideas is Cleveland Model & Supply Co. (Cleveland, Ohio). Witness the firm's latest offerings: flying saucers! C-D has an interplanetary saucer kit for 39¢ that contains two different ships which assemble in 2 minutes. Cleveland says these fly on the disk flying (patented ogee curve) principle and do not spin like a pie plate when tossed into the air. In the patent search the mfgers could find no record of an ogee curve wing design having previously been tried as an aerodynamic supporting surface. . . . Forster Brothers engine concern has marketed a socket spark plug wrench which has two openings: 5/16 inch hexagon and ⅜ inch hexagon to fit all plugs on A and B class engines. These wrenches are turned from solid bar steel stock (not stamped out) and fit the depressed plugs found on many of the new engines; 40¢ each. The brothers Forster also have a short prop drive washer for their new G-29 and G-31 glow engines. For stunt flying some flyers claim they want a prop close to the center line of the motor; you can get the drive washer, a prop washer and crankshaft nut as unit for 35¢.

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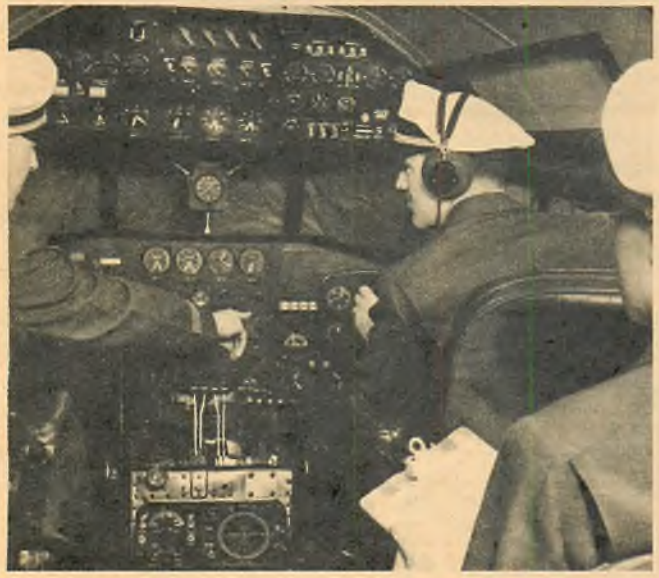

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Sailplane Parade

Highlights and news of motorless flight activities among soaring clubs in this country and overseas

World Soaring Contest, held at Oerebro, Sweden July 3 to 16, was won by the Swedish sailplane pilot Billy Nilsson. Second was our own Paul McCready, Jr., trailing Nilsson by only twenty points. Both pilots flew the Weihe type sailplane, considered one of the best soaring craft in the world. McCready's magnificent flying technique, over a very rugged and unfamiliar land and in a sailplane he was not too familiar with, gained him great respect and admiration from all participants, officials and spectators. It has also opened the eyes of European soaring pilots and technicians as to the caliber of our motorless enthusiasts, not only as sailplane pilots but as genuine students of meteorology and sailplane aerodynamics.

Paul's Weihe was aerodynamically cleaner than any other of its type. This was accomplished by the elimination of such protrusions as the pitot tube and the use of orifices drilled into the fuselage nose and sides for pressure and static sources for the air speed indicator; the aileron gaps were covered with aluminum strips and all openings such as at wing-fuselage and cockpit enclosure sealed off with Scotch Tape. This greatly reduced turbulent air flow over the ship, and improved his glide angle from 29 to over 31.

One of Paul's greatest contributions to the technique of soaring is his cruise control in order to obtain optimum cruising speed on cross-country flights. By this method, he selects the best speed to fly between thermals, depending on their strength. If the lift is strong he will dive the ship and fly fast to the next area; if weak, his speed is slower and in conformance with the best glide ratio of his ship, to let him reach the next thermal with as much height as possible and spend minimum time in regaining the altitude. For this he has a ring airspeed selector, graduated in miles per hour, attached to a dial variometer (sensitive rate of climb indicator). The ring can be rotated to the appropriate rate of climb, thus obtaining best cruising speed for a given condition.

The only other U. S. entry participating at the Swedish International was the Swiss pilot Rene Conpte, who has spent some time in the U. S. and who flew as a member of the American team. Conpte piloted a Moswey IV sailplane of Swiss design which was built for him just prior to the contest. He placed twelfth.

One of the most interesting designs in Sweden was the Yugoslavian entry Orao II sailplane with a very slim semi-pod-boom fuselage and a thin 61-ft.-span, gulled wing. It was flown by the well-known Yugoslavian pilot Milan Borisek, who took third place. It was credited with a glide angle of 32 to 1 at 47 mph and a sinking speed of 2 ft./sec. at 40 mph.

Dr. August Raspet, chief of the sailplane project, Mississippi State College, who also attended the Swedish meet, said that one of the greatest scientific contributions by the U. S. A. was the Scotch Tape used by McCready as fairing for his Weihe. As a matter of fact, the American team ran out of its supply by lending the stickum paper to other participants. While in Sweden Dr. Raspet was appointed Chairman of the Scientific Committee of the International Scientific and Technical Organization for Soaring Flight (OSTIV), which held its 3rd Congress at Oerebro.

Wave Soaring. In late September members (*Continued on page 84*)

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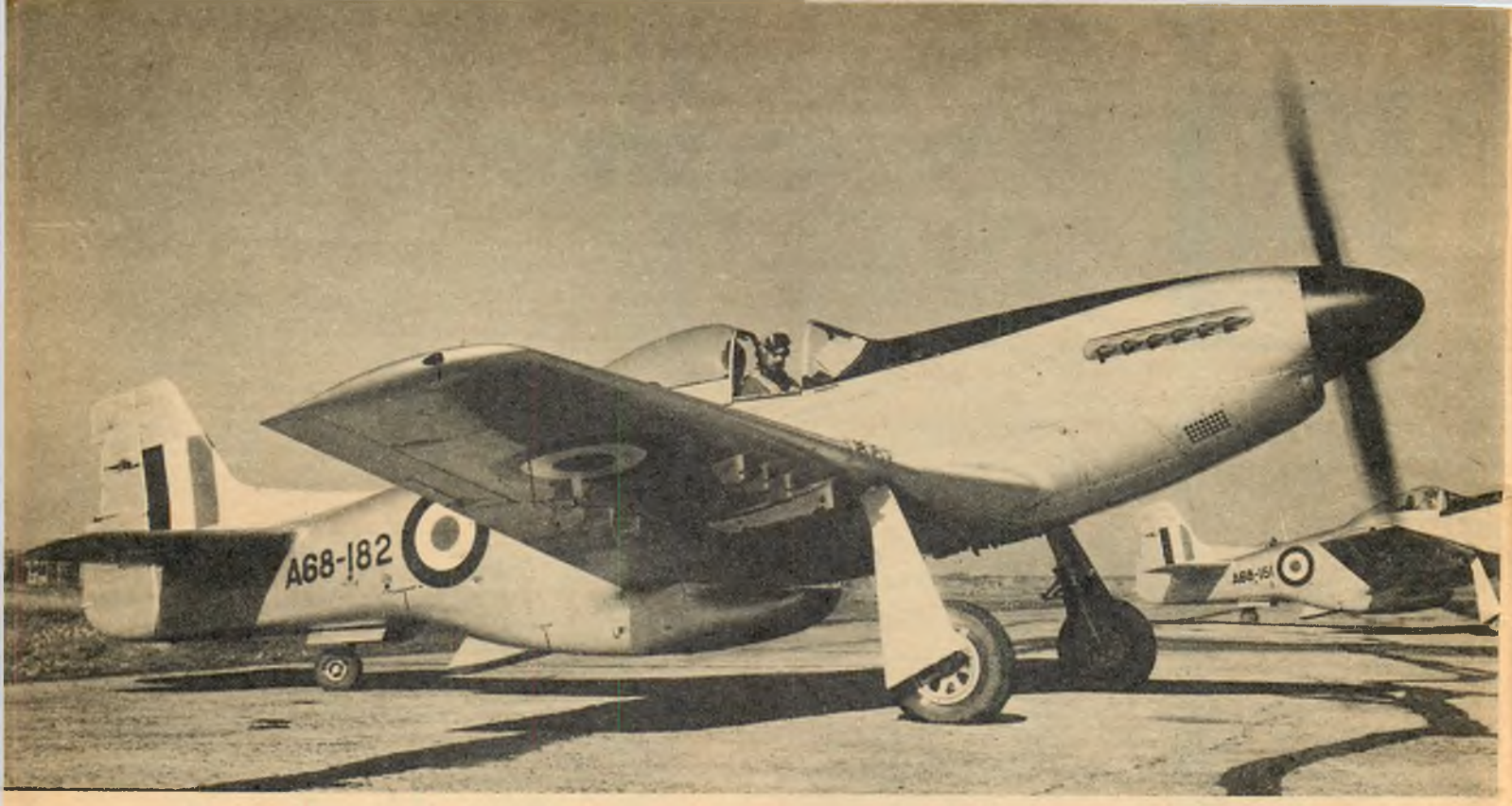
AIR TRAILS

JAN., 1951

HIGH, WIDE AND MIGHTY CLOSE:

An Air-Pix of the Grumman Panther by air-photog Harold Martin



Australian Mustang. Standard operational fighter with the Royal Australian Air Force is the familiar North American F-51. A number of them were delivered to Australia under Lend-Lease, but after the war, Commonwealth Aircraft Corp. built around 250 under license.

These aircraft can form the beginning of an aerial armada vast and powerful enough to guard world peace

United Nations AIR FORCE

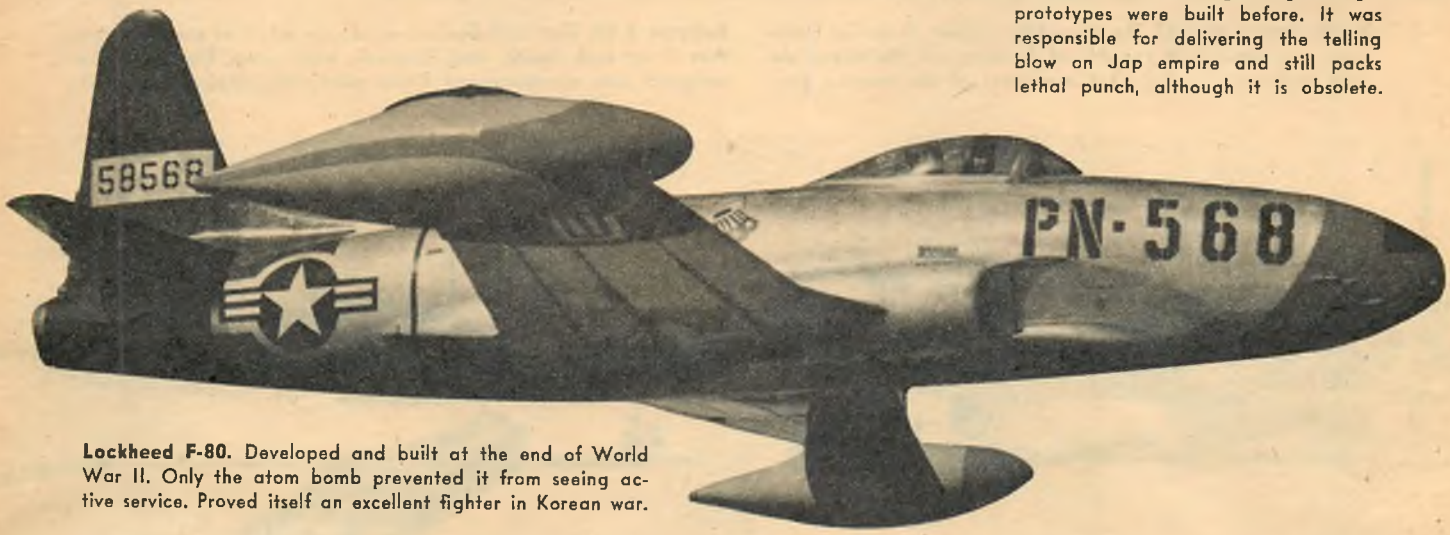
If there was one thing proven in the Korean war it was that peace loving nations will band together and give battle to an aggressor attacking a weak nation. It has also proven that a world police force has become a necessity if another major conflict is to be averted. This police force would be impotent without an air arm. On these pages are shown the aircraft which served as the United Nations Air Force. Luckily, in Korea, the enemy was weak in the air and it was not necessary to commit the most advanced types and disclose their capabilities. Although the U.S. supplied most of the planes, Great Britain contributed fighting craft from its Naval Air Service operating from carriers, and Australia sent RAAF fighters. By not using our most modern aircraft, an ace remains up the U.N. sleeve, to the general consternation of North Korea's silent partner.

Douglas AD-2. Carrier-borne attack bomber capable of tremendous fire power equivalent to that of a light cruiser. In addition to 20 mm cannon, carries torpedoes as well as a variety of rockets and bombs under wings.

Seafire 47. Naval version of Spitfire 24, specially adapted for operation from carriers. Mounting a powerful 2375 hp RR engine and two contra-rotating propellers, it is capable for 452 mph. A total of 21,767 Spits were built, the last in 1947.

Fairchild C-82. The flying boxcar has a variety of uses which include transportation of cargo, medical supplies, guns, light tanks, trucks, para-packs, airborne infantry and spare parts including entire wing panels. For dropping of heavy equipment entire rear fuselage cone is removed.

Boeing B-29. First of super-bombers to see action although larger single prototypes were built before. It was responsible for delivering the telling blow on Jap empire and still packs lethal punch, although it is obsolete.



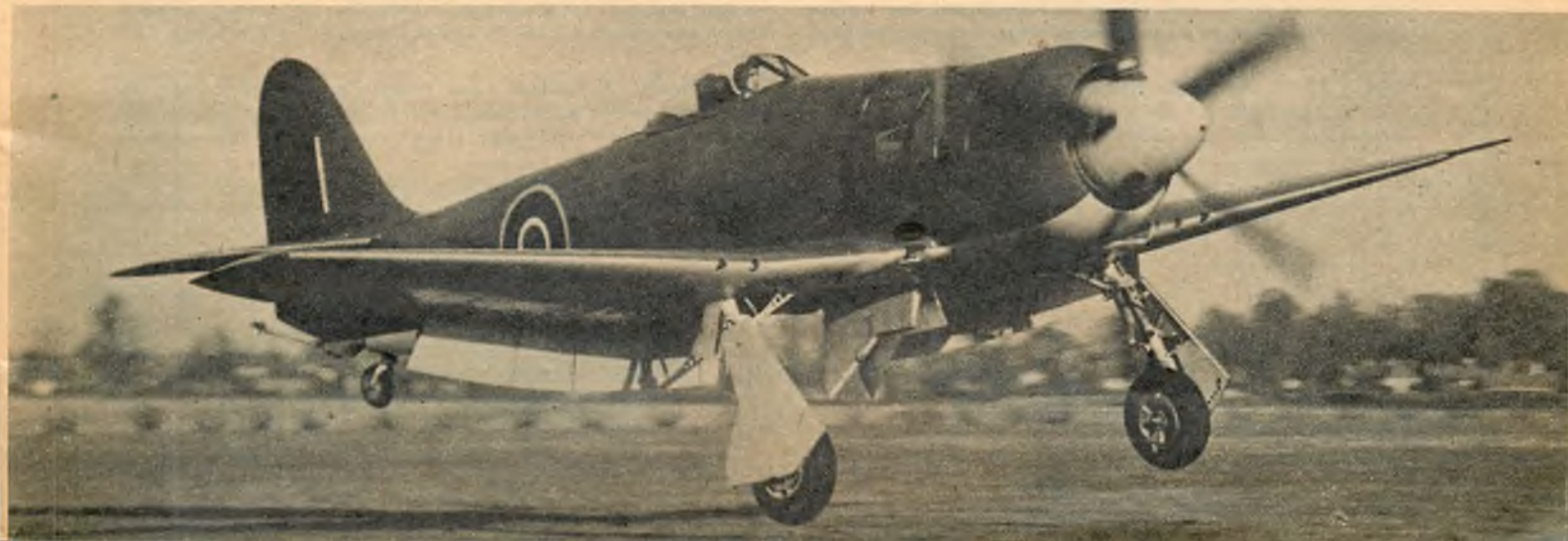
Lockheed F-80. Developed and built at the end of World War II. Only the atom bomb prevented it from seeing active service. Proved itself an excellent fighter in Korean war.

Grumman SA-16A. Latest addition to Air Rescue Service is this powerful amphibian capable of landing in high seas to effect rescue. Auxiliary wing tanks give it considerable range. Radar equipped, but unarmed.

Chance Vought F4U-5. The famous Corsair won many combat laurels in the hands of U. S. Marine pilots. Considerably improved and with a more powerful engine, it is one of fastest propeller-driven fighters.

Sikorsky H-5. Because of its ability to take off and land in highly restricted areas, the helicopter is ideal for rescue work in places where all other means fail. Its importance militarily is increasing daily.

Hawker Sea Fury. British Naval fighter which comes from a long line of distinguished Hawker aircraft such as the Hurricane and the Tempest. Light for a fighter, weighing slightly over 12,000 lbs. and powered by 2,500 hp engine, it is fast and maneuverable.



UNITED NATIONS AIR FORCE

North American F-82. An all-weather fighter, it carries elaborate radar equipment capable of ferreting out the enemy despite darkness and fog. Has armament of six machine guns.

Douglas B-26. Fast light bomber which saw action at close of World War II on both Pacific and European fronts. Was first of its kind equipped with remote-control firing mechanism, laminar flow wing.

Boeing SB-29. Equipped with a para-boat, the B-29 is also attached to Air Rescue Service. Was conceived during last war, serving in Pacific, and affectionately dubbed Super-Dumbo.

L-17A. The popular Navion personal plane in war dress. Serves as liaison plane, staff "car" and also on constabulary and dispatch courier duty. Used in occupied Germany, Japan as well as on Korean front.

Grumman F9F. Navy's jet carrier fighter capable of speeds in neighborhood of 600 mph. Has quick take-off and slow landing characteristics due to hinged leading edge and effective flaps.

North American F-51H. Vastly improved over the original Mustang designed and built for the British in 1940. The "H" is the sixth modification powered by a 2,200 hp engine instead of 1,325 hp of the "A".

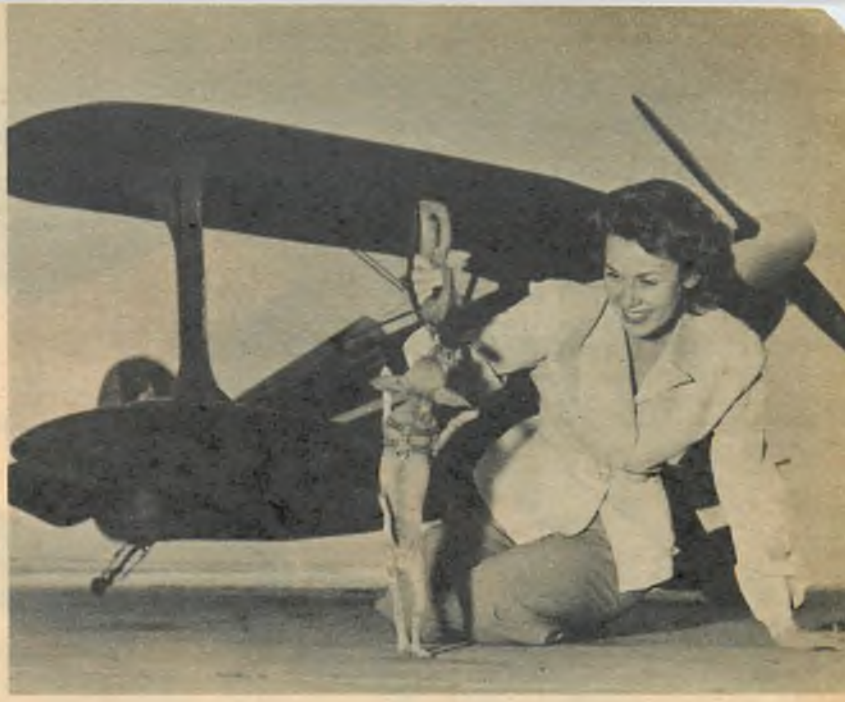
Boeing SB-17. Air Rescue Flying Fortresses were the first craft to be equipped with the air-borne boats. Because they operate in combat areas, both the SB-29s and the SB-17s are fully armed.

Fairey Firefly. A two-seat naval reconnaissance fighter which saw considerable service during World War II aboard British aircraft carriers. There is also a night fighter version. Plane has four 20 mm cannon.

Girl vs. Airplane

And consider the plight of this comely miss . . . imagine playing second fiddle to a plane

By BETTY SKELTON



Betty and her pup Tinker for once steal the spotlight from Lil' Stinker.

■ I was the luckiest girl in the world! (So I thought.) Almost every career gal has secret ambitions of travel, adventure, and romance, and after two years of admiring a certain little airplane that I was sure could make these dreams come true, I suddenly came down off "Cloud 13" to find the little airplane finally *belonged* to me. The adventure, thrills and travel came plenty fast after that —but romance? Well, just how flattering do you think it is to find you are playing second fiddle to an airplane!

This plane, my midget Pitts Special built by Curtis Pitts, is definitely a "she"—'cause anytime she's parked on an airport line it doesn't take ten minutes for every man within a ten-mile radius to gather round and admire her lines. Invariably they ask all her measurements from head to toe, and I usually politely reply: "Sixteen feet nine inch wingspan, fourteen feet eight inch length, 90 hp Continental engine, McCauley propeller, 568 pounds empty," all the time thinking to myself, *"Probably the only way I'd get such attention would be if I weighed 568 pounds!"*

Little did my mechanics, Eddie Gomis and Jamie Serra of Airco Aviation Corp. know how appropriately they named "Little Stinker" when they dubbed her this at Tampa, Florida, in 1947. While working on the ship in my presence, if something went wrong, instead of cursing they'd simply mutter "You stinker!" So Stinker it became, and a coy Walt Disney skunk was painted on the fulselage beside the name.

Very often I have to control a quick quip when Lil' Stinker and I land at a strange airport and somebody inquires: "Who's the Stinker, you or the airplane?" To keep from being one, I simply don't reply. If I didn't know better I'd almost think Stinker fully realizes the competitive situation and sort of gloats over it, for she is forever giving me a bad time. Fan letters pour in from model builders about the airplane, never about *me,* and she sits pertly on the line while I struggle to answer all of them. May as well admit it, flying a midget airplane with such a small cockpit means I have to drool at the banana splits while other people eat them, but Stinker gulps down all the gasoline she wants and never gives weight a thought. But just let *me* gain a couple of pounds too much—she pouts and refuses to perform properly.

Perhaps I'm just plain hopeless—never have been able to talk anyone into putting me on the front cover of their magazine. But Stinker? Gee, they even wire her asking permission. She's a three-time cover girl now, each time in color. Believe me, the competition is stiff, but what can I do about it? I work like mad flying a 15-minute aerobatic exhibition to entertain thousands of people, only to land all hot and sweaty with stringy wind-blown hair and no make-up. Everyone wonders who that "hag" is climbing out of the cockpit. But Stinker just sits there in all her glory looking prettier to them than before she took off.

Just before landing for gas on cross country flights, I always carefully turn over my map board which has a mirror on the back and make difficult attempts—while Stinker bounces all over the sky—to comb my hair as well as apply powder and lipstick. After a landing in Chicago recently, as I stepped out of the airplane, a nice deep masculine voice exclaimed half aloud, "Gee, what a nice paint job." My first thought was that for once I got the lipstick on straight, but even as I turned around I knew he hadn't even seen me—he was admiring Stinker's gay sun-burst design!

While in England last year giving exhibitions for the RAF and Royal Aero Club, I sent home several front-page clippings with pictures of Stinker and headlines reading: "LITTLE STINKER THRILLS HUNDRED THOUSAND" . . . "LITTLE STINKER CUTS RIBBON" . . . "LITTLE STINKER SMALLEST PLANE TO EVER CROSS IRISH SEA." Mom and Pop finally cabled to me, "Aren't *you* doing anything at all over there?" (*Cont'd on page* 60)

How I Won The Goodyear

The Kid from Oshkosh tells why his second major race victory was the most exciting of his career

By BILL BRENNAND

Two-time winner of the Goodyear race, Brennand also captured Continental Motors trophy (above)

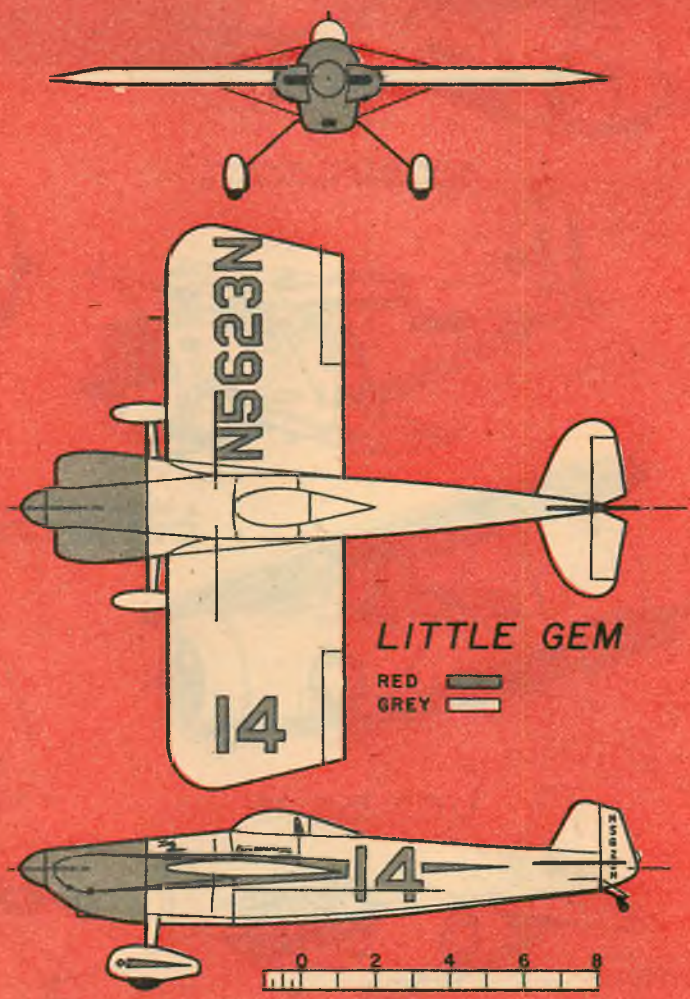
■ It is a nice warm summer day in August. Two midget planes from the small town of Oshkosh, Wis., take off and disappear into the Southwest. Their pilots: Steve Wittman in one and myself in the other. Our destination: the National Air Races; our objective: the Goodyear Trophy. It isn't an easy objective as we both very well know, although I did make a successful try at it in my first race, back in 1947.

As my tiny craft slips serenely along over the scattered cottonlike clouds I settle comfortably down in the snug cockpit. I glance over at the sleek lines of the bright yellow Bonzo flying alongside. My thoughts wander off to the adventure we are swiftly approaching. I think of the other pilots I know, Tony LeVere, Herman Salmon (Herman won the year before), and Pitts from Florida. I wonder what the newcomers will come up with this year.

It's funny how you feel about your chances of winning. Sometimes I'd think, "We don't have a chance" and sometimes I'd think, "We can't be beaten." Right now

More competition, Bill: one new, one revamped midget

Loving Special. Designed by Neal Loving of Detroit, Mich. Span 20 ft., length 17 ft. 6¼ in. Was completed in 1950. The inverted gull wing permits use of lower landing gear, gives better fairing.



Miller Special. Has participated in a number of races, but was recently modified. Complete new wing and tail group, cleaner fuselage and a bubble canopy. Span is 15 ft. and length 17 ft.

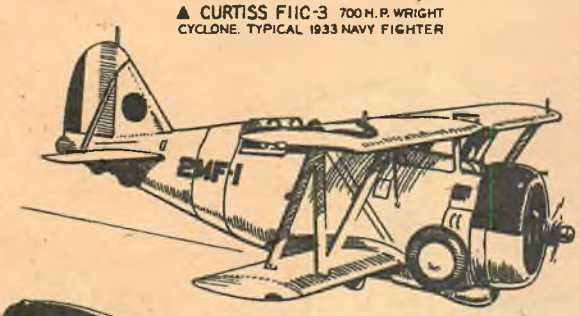
I'm feeling pretty good. Looking over at Bonzo gives me a hopeful feeling. We worked hard on the little yellow monster most of the summer, and we really have it moving, too. Buster, my poor little red plane, has received practically no attention because of the concentrated work on Bonzo. Buster is due for a remodeling after this race. However, I would be more than content with second this time—if we may be so fortunately blessed, but anything can happen in an air race. . . .

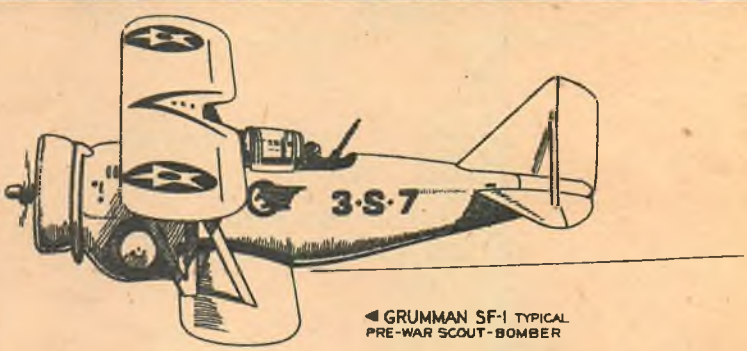
The weather is nice all the way and we soon find ourselves over the huge Cleveland municipal airport, the setting for the great event. As we circle the field I move in, even closer to Bonzo. Nothing like making it look good to those on the ground. A short traffic pattern, a green light from the tower and the two ships settle softly down on the long runway, never varying from their tight formation. We roll quickly toward the Air Force hangar, anxious to see our old racing buddies, many of whom we encounter only once or twice a year, at these events. As we coast up to the busy hangar a large number of people come from various planes. We open the canopies and greet them—Bill Robinson, Bob Downey and Keith Sorenson from the West Coast, and there's Earl Ortman. He's going to need crutches pretty soon, but he still flies. We chat freely for a while exchanging news and rumors and airing the ever-present gripes that accumulate.

Almost unnoticed, our crew has (*Continued on page* 64)

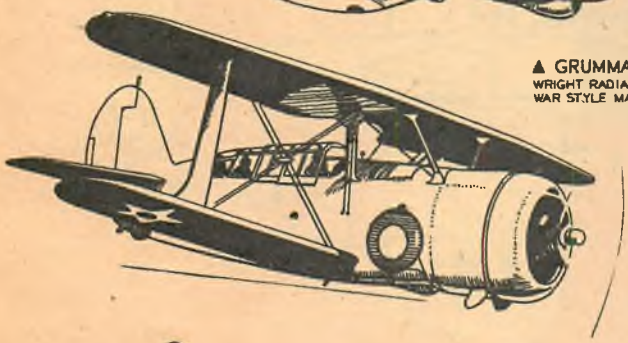
Air Progress

▲ CURTISS F11C-3 700 H.P. WRIGHT CYCLONE. TYPICAL 1933 NAVY FIGHTER

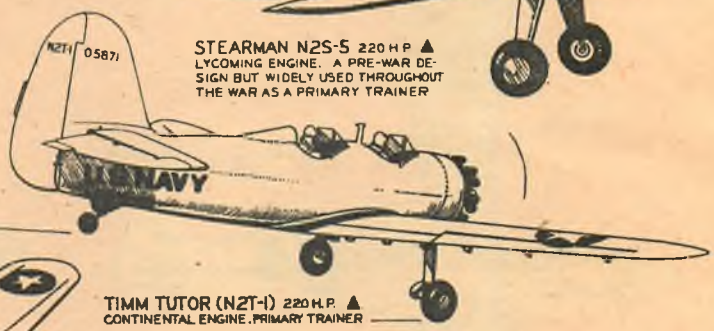




◀ GRUMMAN SF-1 TYPICAL PRE-WAR SCOUT-BOMBER

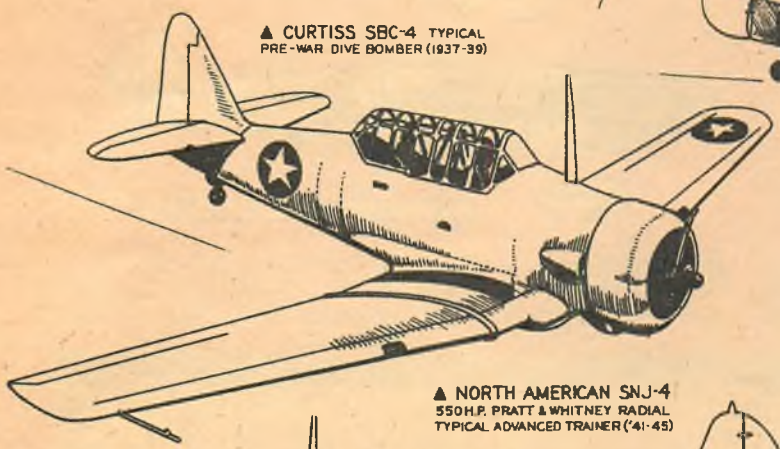


▲ GRUMMAN F3F-3 1,000 H.P. WRIGHT RADIAL ENGINE. TYPICAL PRE-WAR STYLE MARINE CORPS FIGHTER

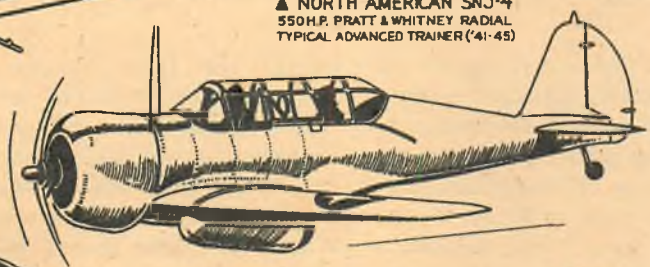


STEARMAN N2S-5 220 H.P. ▲ LYCOMING ENGINE. A PRE-WAR DESIGN BUT WIDELY USED THROUGHOUT THE WAR AS A PRIMARY TRAINER

TIMM TUTOR (N2T-1) 220 H.P. ▲ CONTINENTAL ENGINE. PRIMARY TRAINER

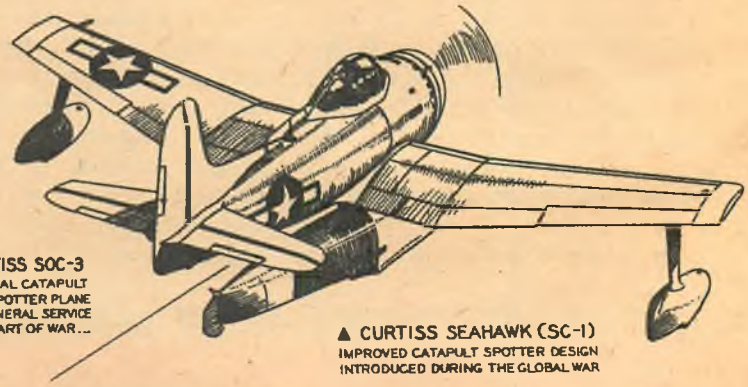


▲ CURTISS SBC-4 TYPICAL PRE-WAR DIVE BOMBER (1937-39)



▲ NORTH AMERICAN SNJ-4 550 H.P. PRATT & WHITNEY RADIAL TYPICAL ADVANCED TRAINER ('41-45)

▲ CURTISS SNC-1 420 H.P. WRIGHT WHIRLWIND ENGINE — ADVANCED TRAINER



CURTISS SOC-3 TYPICAL CATAPULT ◀ SPOTTER PLANE IN GENERAL SERVICE AT START OF WAR...

▲ CURTISS SEAHAWK (SC-1) IMPROVED CATAPULT SPOTTER DESIGN INTRODUCED DURING THE GLOBAL WAR

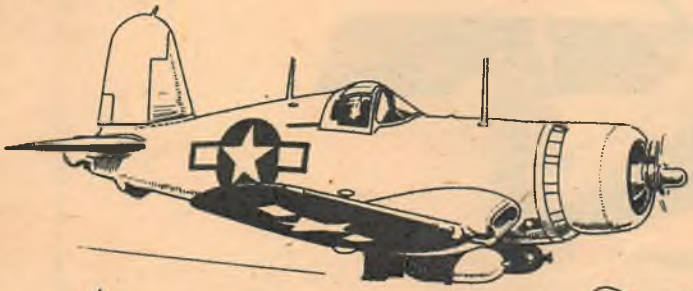
The U. S. Navy air arm, already strong before 1941, was rapidly strengthened when the global nature of World War II became apparent. Naval aircraft, originally intended to serve as an extension of eyesight for ship gunners, actually became in this war an extension of the guns themselves. In the battles of Midway and the Coral Sea no capital ships were engaged, and the major portion of the fight was borne by aircraft either land-based or operating from carriers. Furthermore, the naval air arm took care of sea rescue work all through the years of World War II.

Types illustrated here cover merely a few of the numerous aircraft procured by the Navy Air Service during

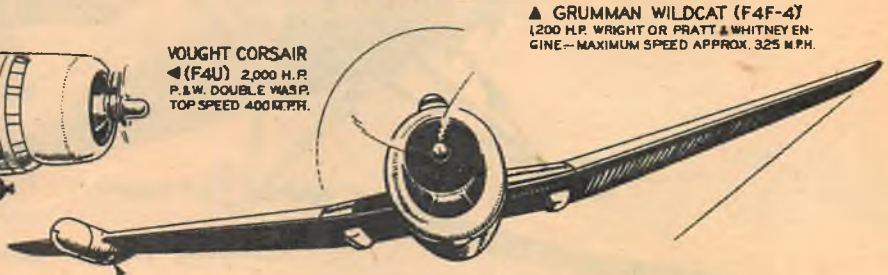
Naval Air Service Story

PART 2—By DOUGLAS ROLFE

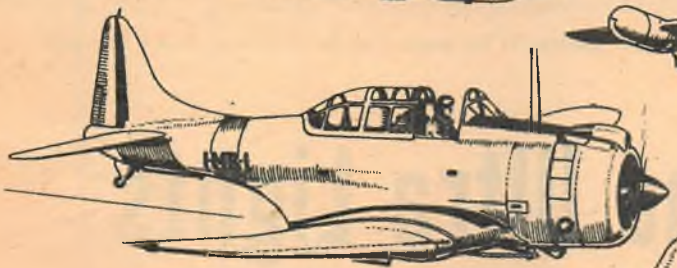
▲ GRUMMAN WILDCAT (F4F-4) 1,200 H.P. WRIGHT OR PRATT & WHITNEY ENGINE.—MAXIMUM SPEED APPROX. 325 M.P.H.



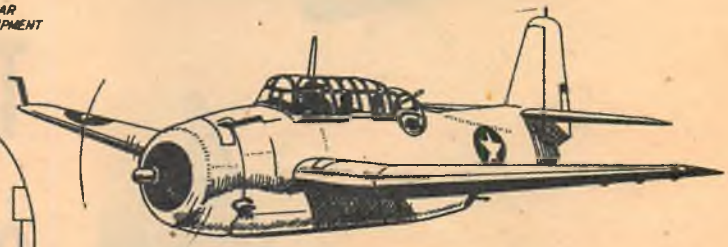
VOUGHT CORSAIR ◀ (F4U) 2,000 H.P. P.&W. DOUBLE WASP. TOP SPEED 400 M.P.H.



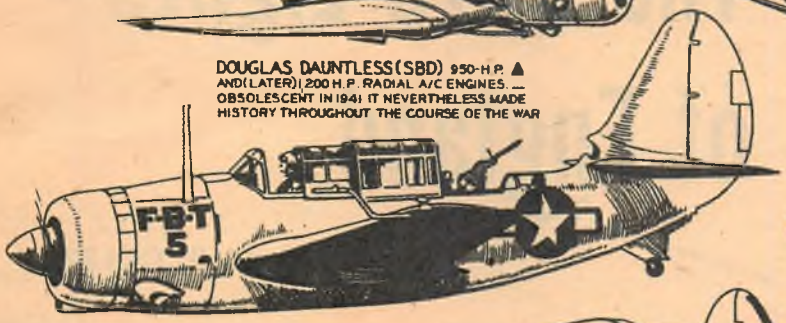
▲ GRUMMAN HELLCAT (F6F) 2,000 H.P. PRATT & WHITNEY DOUBLE WASP ENGINE. TOP SPEED 400 M.P.H.+



RADAR EQUIPMENT



DOUGLAS DAUNTLESS (SBD) 950-H.P. ▲ AND (LATER) 1,200 H.P. RADIAL A/C ENGINES.— OBSOLESCENT IN 1941 IT NEVERTHELESS MADE HISTORY THROUGHOUT THE COURSE OF THE WAR

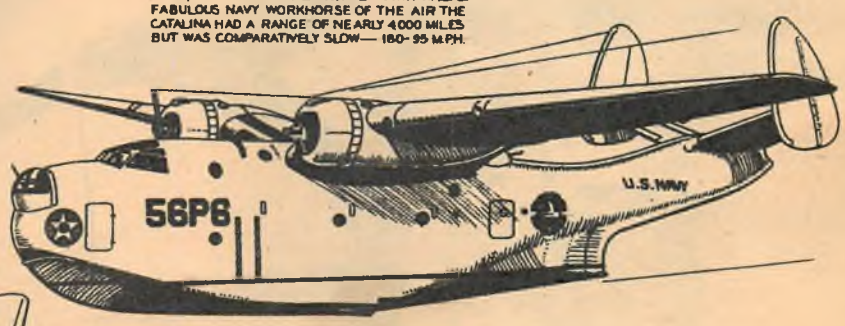


DOUGLAS ROLFE

▲ GRUMMAN AVENGER (TBF) 1,700 H.P. WRIGHT CYCLONE ENGINE.—THIS TOUGH SHIPBOARD STRIKE BOMBER CARRIED A REGULATION FULL-SIZE NAVY TORPEDO

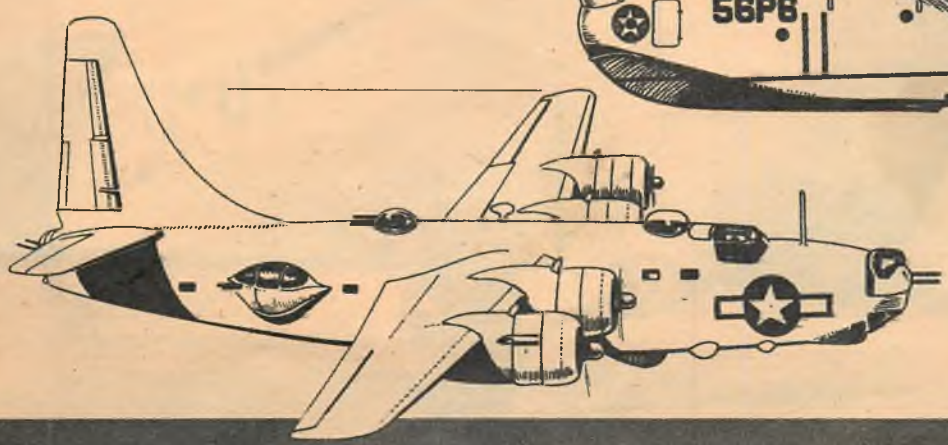
CURTISS HELLDIVER (SB2C-1 TO 4) ▲ 1,700 H.P. WRIGHT CYCLONE RADIAL ENGINE

▲ CONSOLIDATED CATALINA (PBY-5A) TWO 1,200 H.P. PRATT & WHITNEY TWIN WASPS. FABULOUS NAVY WORKHORSE OF THE AIR THE CATALINA HAD A RANGE OF NEARLY 4000 MILES BUT WAS COMPARATIVELY SLOW— 180-95 M.P.H.



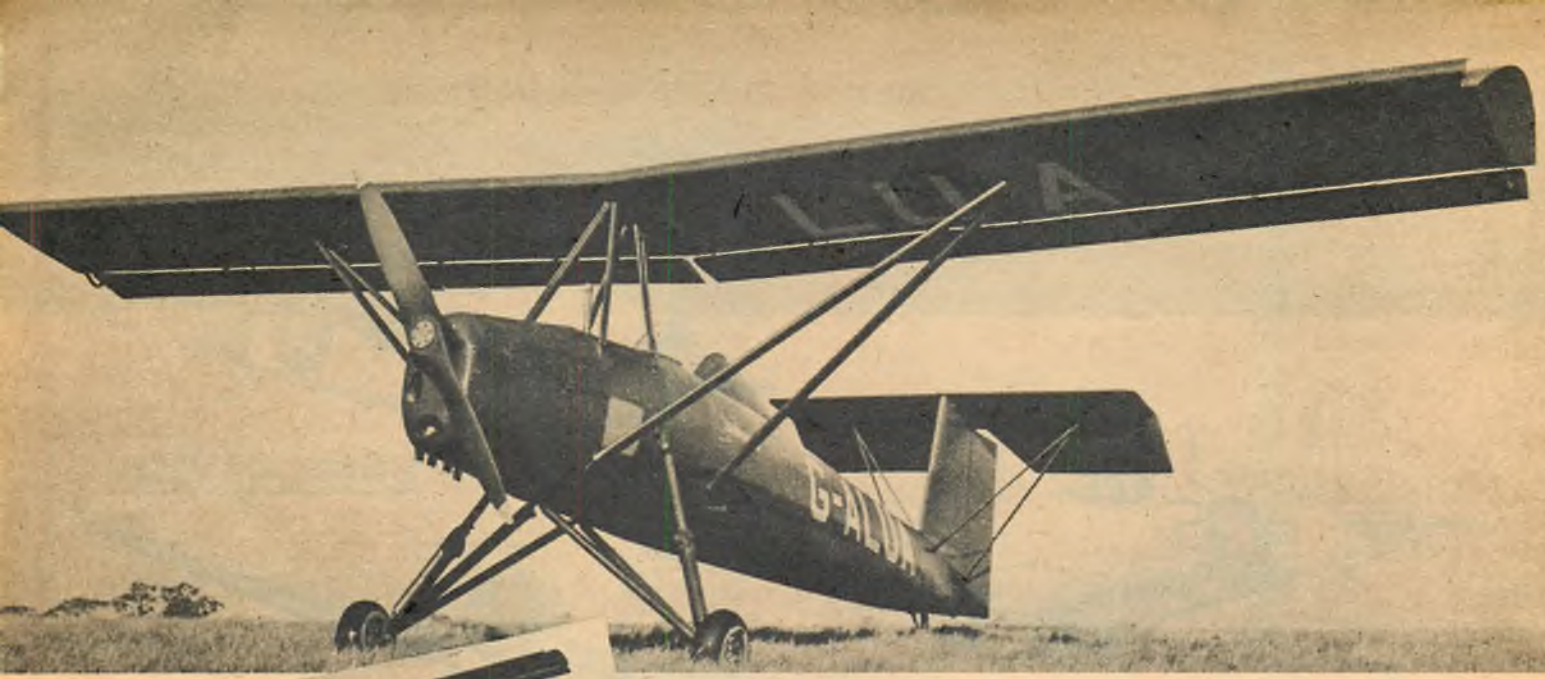
the war. The left-hand page shows a few prewar models, typical trainers and a couple of fleet spotters. On the right-hand page are displayed typical shipboard fighters, dive and torpedo bombers and heavy patrol bombers. Many of these ships, notably the Douglas Dauntless and the Consolidated Catalina, were of prewar design. The Dauntless, regarded as obsolescent at the time of Pearl Harbor, hung up an impressive battle record. More than 5,000 of these supposedly second-line airplanes were delivered to the Navy during the war.

(No attempt has been made to cover lighter-than-air aircraft or aircraft carriers which of course played an important role in the Navy's war effort.)



▲ MARTIN MARINER (PBM-3) TWO 1,600 H.P. WRIGHT RADIAL ENGINES — LIKE THE CATALINA THIS LARGE PATROL BOMBER WAS A PRE-WAR DESIGN

◀ CONSOLIDATED PRIVATEER (PB4Y-2) LAND-BASED HEAVY PATROL BOMBER.— FAMILY RESEMBLANCE TO THE ARMY LIBERATOR IS STRIKING BUT ACTUALLY, APART FROM THE HIGH-LIFT DAVIS WING, THIS WAS A COMPLETELY DIFFERENT DESIGN



Zaunkoenig (Wren). A German 51 hp plane. Can fly at 35 mph. ULAA now owns.

The Ultra Lights of England

By C. B. COLBY

Sport flying at low cost is a field that has been sadly neglected. Here's how one country gives a boost to the "little" boys

BAC Drone is actually a powered glider introduced originally by Robert Kronfeld, Austrian glider pilot. Engine is 30 hp 4-cyl. Carden.

■ Roughly twenty years ago a young officer of the British Merchant Navy saw an airplane. It was the tiny Heath parasol monoplane and the officer was R. W. Clegg. In the Heath he also saw a solution to the question of how to fly for fun and eat regularly at the same time.

For years private aviation had been out-smarting itself by the simple trick of adding more and more horsepower to lightplanes intended for sport flying . . . until the planes were no longer "light" and their flying no longer an inexpensive "sport."

In England and a few other European countries something had been done about it even though in a haphazard way. With aviation fuel limited, designers had turned their hands to the problem of obtaining greater performance from low horsepower engines by the process of cleaning up the fuselage rather than adding bigger powerplants. Many of the resulting ultra-light aircraft were sensational.

To name a few, there were such planes as the Parnell Pixie powered with a 6 hp engine; the Wren that took off and flew on 2½ hp; the German Udet Colibri monoplane that performed well on 7 hp; and the Bristol Brownie two-place powered with a 16 hp engine. These small engines were rated on the basis of one horsepower for every (*Continued on page* 69)

Luton Minor. Also one of the prewar oldies in ultra-lights. Span is 25 ft. Weight empty 380 lbs.; 34 hp Anzani. Top speed 75 mph.

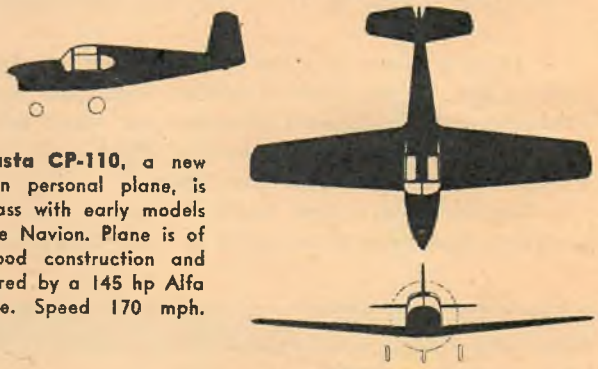
Fairey Junior. Postwar addition to the popular Tipsy, a Belgian design. Seats one, has 36 hp Aeronca JAP engine. Speed 90 mph.

Heath Parasol. An American design quite popular here in late '20's. This British version is powered by a 36 hp JAP. Span is 31 ft.

A 62 hp Walter Mikron II 4-cyl. engine powers this model of the Fairey Jr. Plane is designed for home building by amateurs.

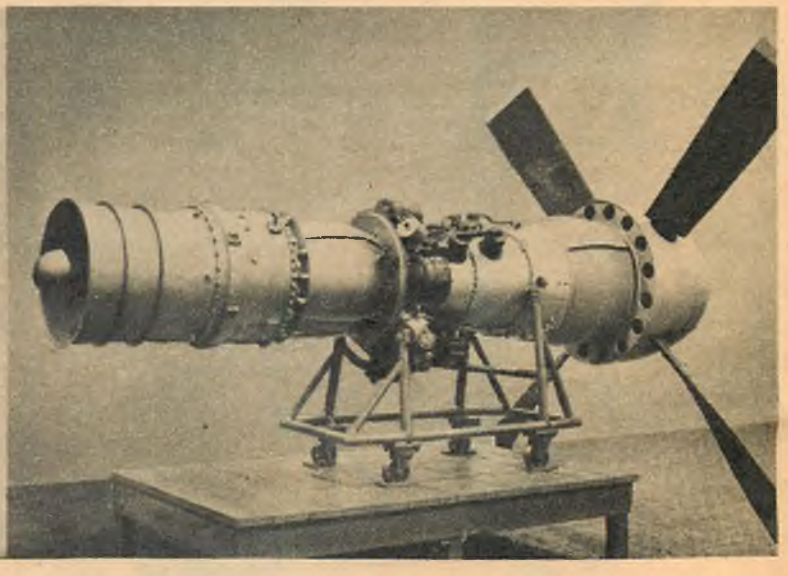
Development Highlights

RB36D Reconnaissance Bomber. Its mission will be to seek and bring back facts on enemy targets. Equipped with power cameras.



Augusta CP-110, a new Italian personal plane, is in class with early models of the Navion. Plane is of all-wood construction and powered by a 145 hp Alfa engine. Speed 170 mph.

Seibel S-4 helicopter. Cargo and passenger compartment and fuel tanks located at center of lift for better balance under different load conditions. Craft's engine is a 125 hp Lycoming.

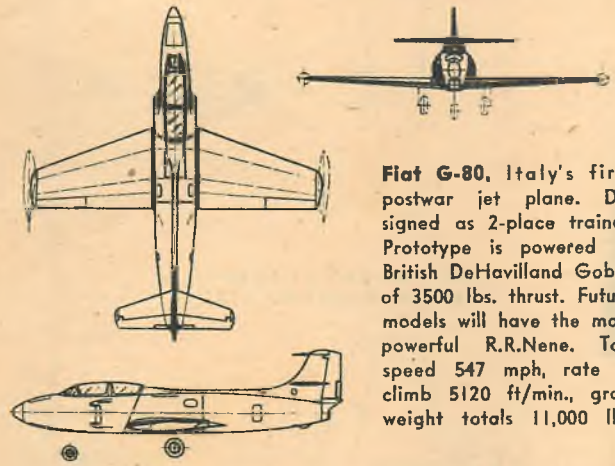


Turbo-Wasp T-34. Designed and built by Pratt & Whitney Aircraft, this turbo-prop engine is said to be the most powerful in the world. Basic weight is 2500 lbs. Develops more than 5000 hp.

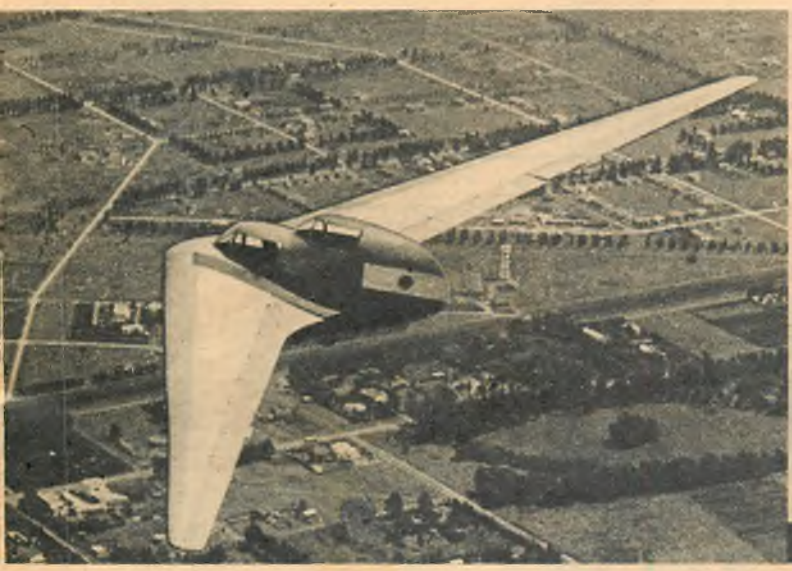
More reach is given to the North American B-45 Tornado bomber with these wing tanks whose normal range is around 800 miles. Note stabilizing fins on tanks. The pay load is over 10 tons.

Canadian Sabre. The first of 100 Canadian-built F-86s, manufactured by Canadair Ltd. of Montreal. This model is powered by the U. S. made General Electric J-47 jet engine; subsequent aircraft will have the Canadian Avro Orenda of 7200 lbs. thrust.

Brazilian single-place lightplane, the Bichinho I.P.T.O. designed by Institute of Technical Research to test qualities of national materials. It has a top speed of 130 mph.



Fiat G-80. Italy's first postwar jet plane. Designed as 2-place trainer. Prototype is powered by British DeHavilland Goblin of 3500 lbs. thrust. Future models will have the more powerful R.R.Nene. Top speed 547 mph, rate of climb 5120 ft/min., gross weight totals 11,000 lbs.

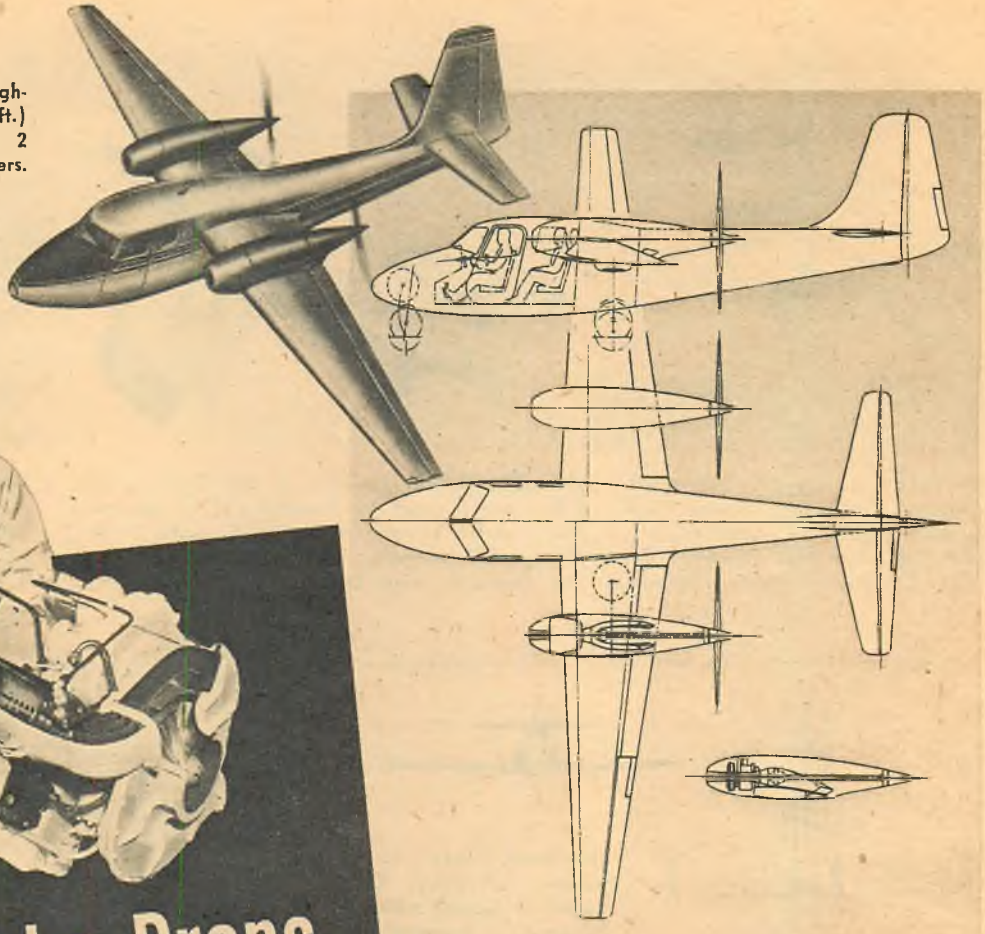


Clen Antu (Sun Ray), an unusual-looking flying wing sailplane developed by the Aeronautical Institute of Argentina, designed by one of Germany's famous Horton brothers. Span is 59.04 feet.

YH-23. Military version of the very pouplar Hiller 360 helicopter recently purchased by the Air Force for use by the Army Ground Forces. Craft also carries ambulance installation.

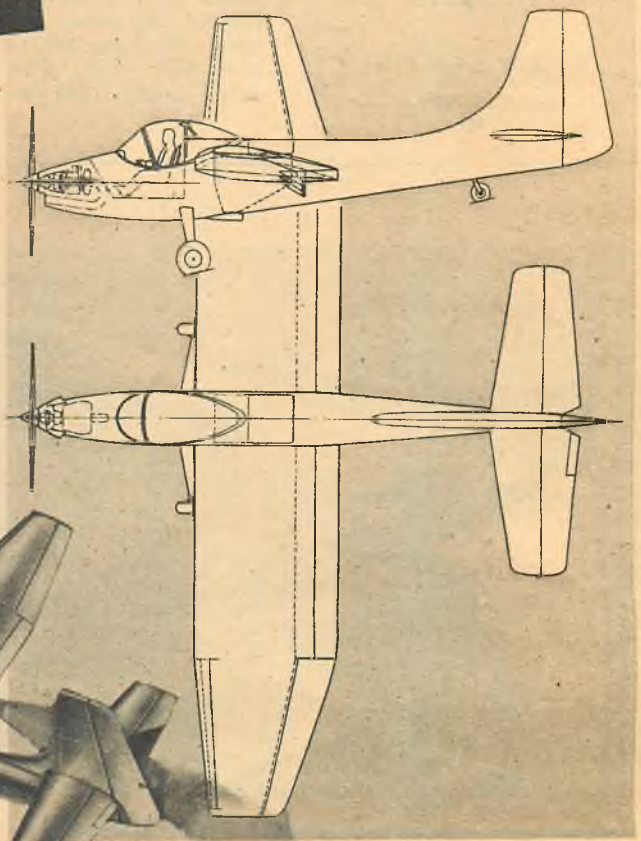
High-speed (220-260 mph), high-altitude (service ceiling, 30,000 ft.) pressurized executive plane with 2 Boeing turbines hooked up as pushers.

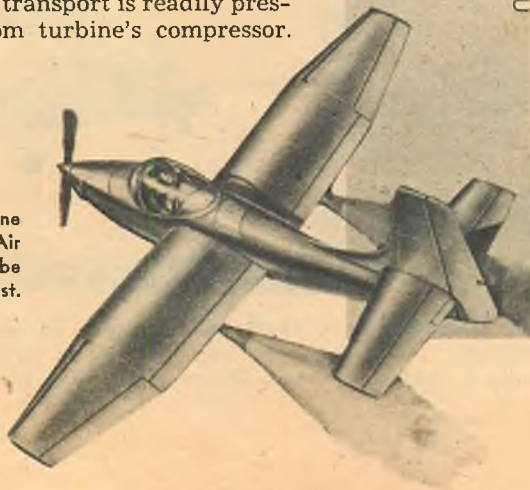
Tiny Turbo-Props



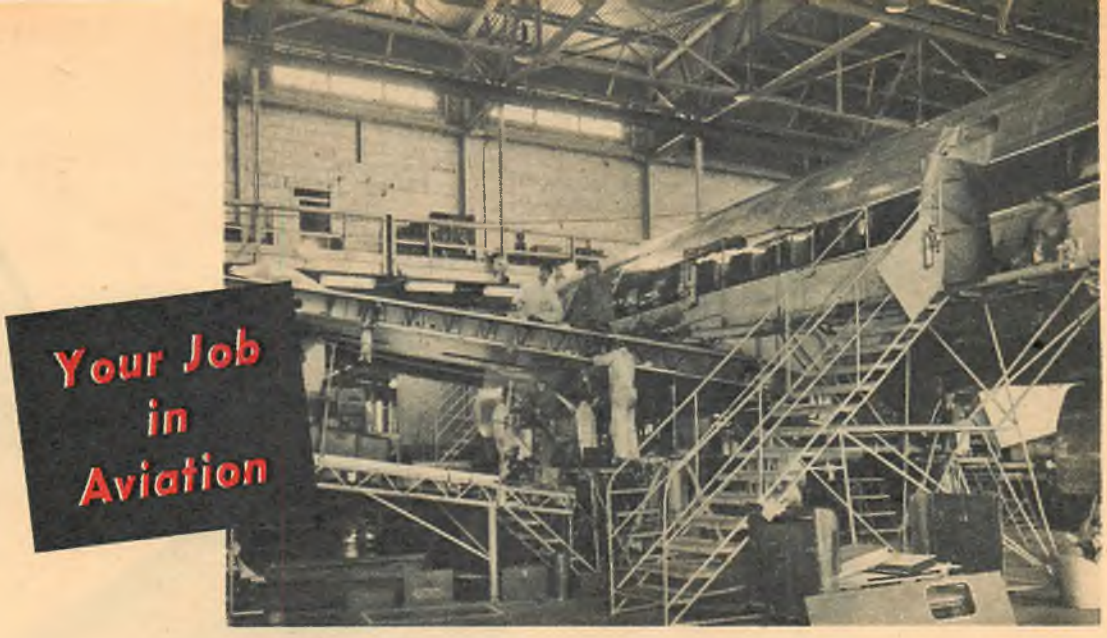
ILLUSTRATIONS BY BOEING PRELIMINARY DESIGN DEPT.

The gas turbine may be expected to change the whole concept of small-airplane design and operation within the next decade. Boeing Airplane Co.'s small gas turbine (above) designated Model 502 has only 20% of the parts that comprise its piston-engine sister. Studies show that by 1952 it could have a take-off rating of 254 hp. Its maximum continuous horsepower at an altitude of 20,000 feet would be 140. In production quantities it should be cheaper to build than current reciprocating engines. The two design studies presented here show the possibilities of small airplanes flown on turbine power. The executive transport is readily pressurized by bleed line from turbine's compressor.





Design study of crop-dusting plane powered by "502" gas turbine. Air bleed from compressor could be easily used to pump spray or dust.



Maintenance Man

He is diagnostician and doctor to the airplane

■ Suppose the entire front end of an airliner had been caved in by a nose-over. Or Number 1 engine starts backfiring during final let-down.

Very likely you'd consider either of these a serious mishap. If you were an airline superintendent of maintenance, you'd want experts to tackle the repair job. That's exactly what you would get. Scattered around the nation at scores of depots are doctors-of-all trades. Their skills are many. They are the maintenance men, capable of performing many near-miracles to keep the airliners flying, with a minimum of delay. You might call them airline mechanics. Actually, these wizards of wrench and pliers combine the diagnostic abilities of a doctor with the analytical skill of an engineer. They not only find causes of airplane troubles; they turn out precision workmanship of which any bridge builder or watchmaker would be proud.

Cliff Reed is one of these experts. For 10 years he has heeded hurry-up calls every working day. One morning in Cleveland, Cliff got his first glimpse of a caved-in nose. It belonged to a DC-3, which smacked its schnozzle into the earth on a landing. Flattened clear back to the first passenger seat, it looked like a washout to visitors at the field. But they did not reckon with the maintenance boys. Cliff shortly got an order: "Make it ferryable to Cheyenne."

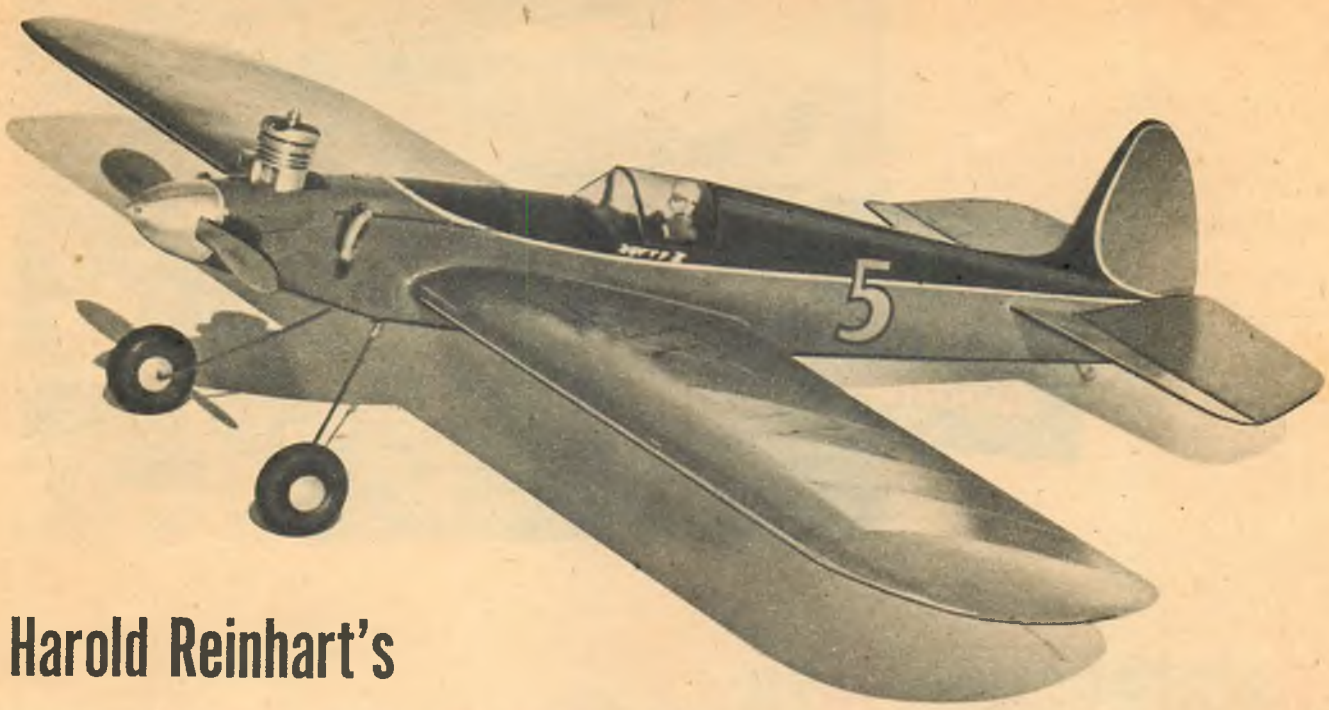
Cliff inspected the damage carefully. He consulted his black-covered manual, a valuable little volume akin to an engineer's handbook. He talked over the repairs with his lead man. The crew chief offered some suggestions. Then Cliff set to work. For 18 days, with others of his kind, he labored on that DC-3. Bulb angle (stringers) were formed to fit the nose. New skin was cut. Rivets were pounded home. Soon the old workhorse skimmed away from Cleveland. Out at the overhaul base in Wyoming, where necessary tooling was available to effect permanent repairs, Cliff's work was ripped out, and the plane put in shape for passenger-carrying once more.

Cliff never knows what troubles the next shift will bring. Yet he must be ready to diagnose their causes and come up with a remedy and repairs. The airliner must be returned speedily to service, for delays cost large sums. One engine on a DC-6 had been backfiring during the final leg of a transcontinental flight. Not too alarming, when three engines remained to pour out their power. Yet a backfiring cylinder, like a pain in the side, had to be corrected before the airliner could be permitted to take off again. You might look over Cliff's shoulder as he worked. A glance at his log would be more revealing:

"Number 4 engine backfired six times during last five minutes of final approach. BMEP (brake mean effective pressure) dropped 10 psi. All other instruments normal. Tried to check mags on ground. Engine began backfiring immediately. PN (plane) to hangar, oil system chkd for metal. Found ok. Comp. chkd. all cyl and found No. 16 cyl with 80 per cent compression loss. Plane removed from service. Eng. run up and normal. Plane returned to service."

Cliff sometimes wishes he were a physician who could take a stethoscope to an ailing patient, and ask questions whose answers would give him considerable help in spotting trouble sources. Not all human ailments with the same outer manifestations produce the same diagnoses. Nor do all backfiring cylinders backfire for the same reason. That's where the maintenance man's diagnostic abilities, his engineering acumen, come into play.

Number 1 engine on another DC-6 began backfiring on a take-off, just as it was pulling 50 inches of manifold pressure. Ground speed: 70 miles an hour. The flight was abandoned immediately, and Cliff got a hurry-up call that sent his nimble fingers exploring. He completely checked all cylinders and the oil system, and found them functioning satisfactorily. He megged the ignition system leads, discovered bad ignition insulation on No. 12 rear lead. Having replaced the lead, he checked the mag points—okay—and replaced all (*Continued on page* 76)



Harold Reinhart's International Stunt Winner

Top original design in 1950 stunt circles, this plane captured the big Air Trails-Plymouth Trophy

■ This ship was not designed to be just a "hot" airplane; it was built to fly the A. M. A. flight pattern, and do smooth, not necessarily tight, maneuvers. The construction is started with a ten-rib pattern. Cut out the ribs and stack them together. Pin them and sand well; notch out the leading edge for the ¼" square. Draw lines across the ribs 1" and 3" from the leading edge, as in Fig. 1. Pull out the pins and stack the ribs evenly as shown in Fig. 2, so that the 1" mark on outside ribs lines up with the 3" mark on the center ribs. Pin together and cut at dotted line as shown in Fig. 2 with a very fine blade on a coping saw.

Cut the spar from medium balsa. It is 1" x 36". Mark off the center and all rib locations. Cut spar halfway through and break to shallow "V" shape. Add the front halves of the center ribs and the outside ribs, then add the ¼" square leading edge. Add the rest of the ribs, as shown in Fig. 3. Add the trailing edge ribs and the bottom half of the trailing edge. Put in the trailing edge fill-ins, sand, and add the top half of the trailing edge (Figs. 4 and 5). Cut and install the ¼" x ½" center-reinforcements.

Make up the control system and slide it into place. Cut away the bottom brace to clear the bellcrank bolt and nut. Cut away the ribs so the bellcrank can swing freely. Cut away the ribs and add the extra layer of sheeting in the center. Sand the entire wing, then add the leading edge of sheeting and center sheeting. At this point, check the wing for warps, then add the cap strips and sand the wing smooth.

Next cut the tail surfaces from medium sheet. Sand well, then add hinges and control horn. Cover area around horn with silk.

Cut out the motor mount sides and bottom plate, and cut the mount to shape as shown. Glue and screw the mounts to the plywood pieces. Line them up on the wing and glue them in place; before the glue sets, glue and screw the bottom plate in position. Be sure the motor mount assembly is straight, for this lines up the entire fuselage. Make up the tank mount and glue into place ("x" on Fig. 6).

Now make the tank as shown. The swivel joint should not wobble but move easily. Add the tank lugs, and match the tank into the motor mount. Drill a 3/16" hole in the plywood side where the vent goes through. Make sure the tank mounting is secure, then drill holes for engine. Make the tin plates and screw them to the bottom of mounts.

Remove the tank and engine and drill holes for landing gear. Bend gear to shape and bolt in place. Be sure that the bolts are flush with top of mounts. Add the wheels, then cut out the fuselage sides from medium sheet, slide them over the wing and glue to plywood.

Add former #4, then glue sides securely to the

wing. Bend the end of the pushrod and slip on four pieces of 1/16" plywood (pushrod guides). Glue one against former #4, then slip pushrod through control horn and solder on a washer. Drop tail assembly into fuselage (do not glue yet). Add formers #5, 6 and 7. Slide a plywood guide onto each former as it is glued in place. Join the back ends of the sides, then securely glue the tail horizontal surfaces. Add the rest of fuselage formers. Make and glue in the tail-skid, and glue in the bottom sheeting. Add the bottom block in the front. After it has dried, sand to shape.

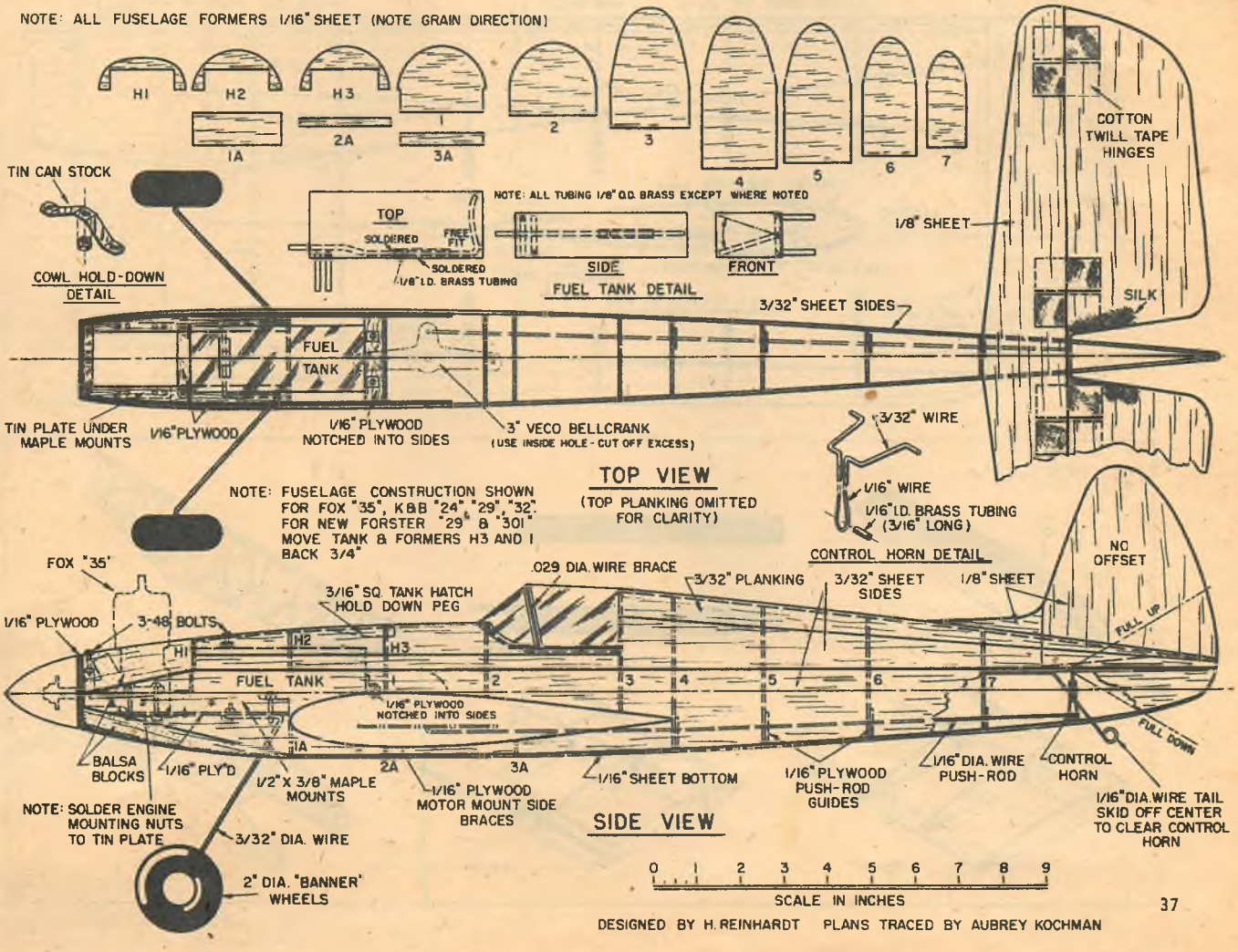
Glue on the front plywood ring (in one piece). Add the top sides and the planking (¼" x 3/32"). Spot-glue the engine cowl in place. When all is dry, sand the entire fuselage. Sand and glue in place the rudder and fairing. Cut away the planking around the cockpit, and glue in the cockpit floor. Cut away the hatch and engine cowl. Carve out inside of cowl and cut away to fit engine. Make and install the cowl hold-down. Install tank and make certain hatch fits over it. Add hold-down peg, then make the hatch hold-down and solder onto tank. Carve and add the wing tips. The inside tip is cut in half and hollowed, then

A couple of cuties. Janet Higgins shows you that the trend is away from the "barndoor" stunt jobs and towards smaller, sleeker entries.

cemented in place. Add the brass tubing, and bend lead-outs. Outside tip is left solid.

The ship is now ready for covering. Its entirety is covered with Silkspan. Brush on about four coats of clear dope, sanding between each coat; paint inside of cockpit, install pilot, then add the celluloid canopy. Trim to your liking, and brush on two coats of fuel-proofer. The tank was made removable in case of a leak or dirt getting in.

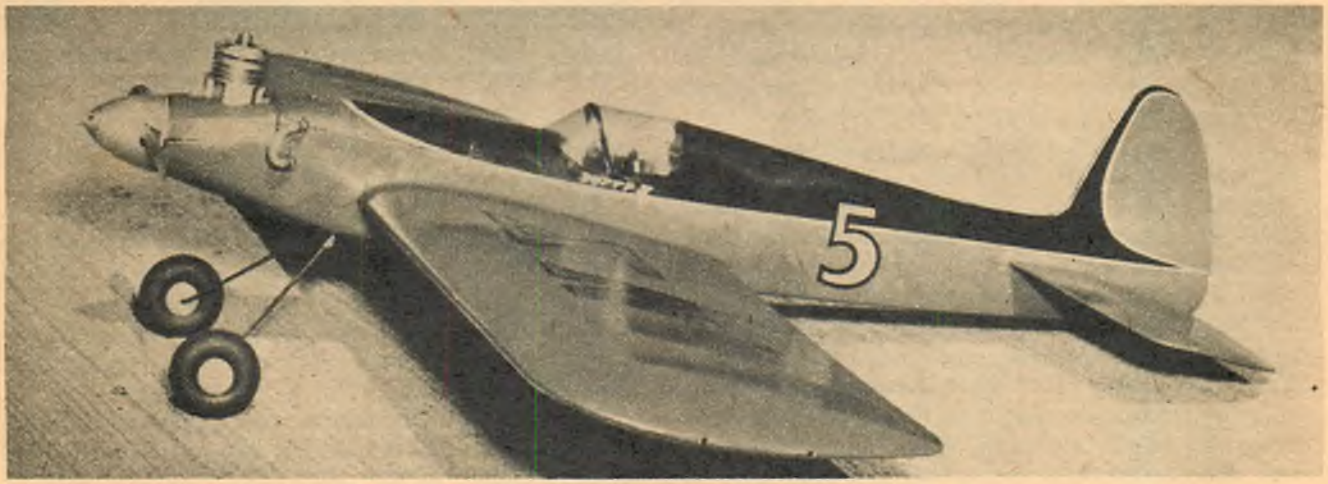
The wing construction may seem a bit radical, but the strength is in the center, where needed. There is little weight at the tips to add leverage to break

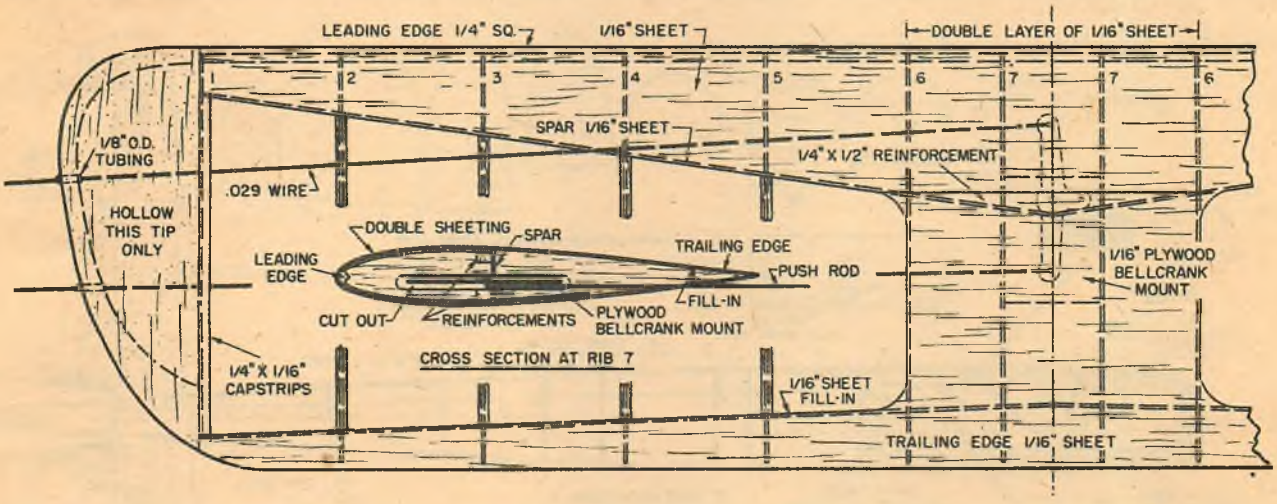


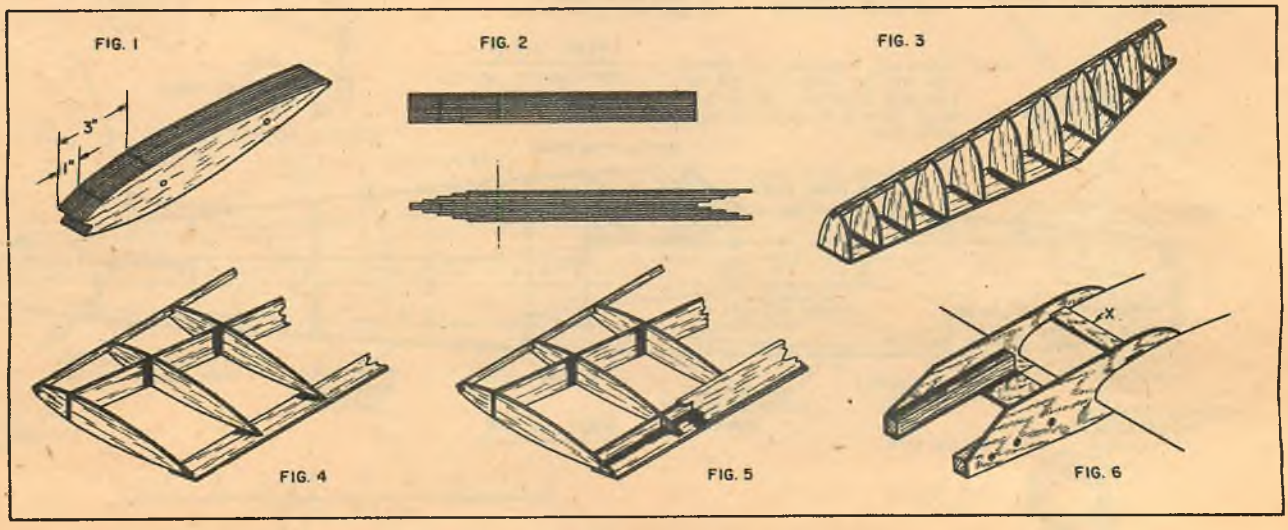
DESIGNED BY H. REINHARDT PLANS TRACED BY AUBREY KOCHMAN

the wing in case of a crack-up. This idea was developed by Walt Hughes of Carteret, N. J., and has been widely copied by Eastern modelers. We think if you once try a stunt wing of this type, you'll find it hard to go back to any other type of construction.

Once again check the wing for warps. The original ship was flown on about 65-foot .010 lines. You, yourself, must determine the best fuel and propeller to suit your particular engine. A Fox "35" was used on the plane which took top honors in the big Plymouth International meet last August in Detroit. Any similar sized engine such as the O&R 33, the Forster and the Veco 31 should work out well. You may have to "fudge" the fuselage to make a good installation.







Model Matters

News, Views, Comments and Photos from Model Clubs and Enthusiasts in America and Overseas

Sandy McCracken (l.), Bruce Bell, both 5, performed at Centennial Celebration of Raleigh County, W. Va.

DOPE CAN

BY "DOPESTER"

■ We did it and we're glad!

Two issues back Dopester summarized some of the thinking of activity leaders concerning the great number of competition events and problems of running off a good meet in the face of confusing rules. A few of the topics under discussion throughout the country were listed. We didn't come out for any specific

Whitman D 12 racer by Bud Jameson, Los Angeles. Model is to scale with sheet wing, power is by K&B. Bud's been building for 18 years.

proposal (we're as confused as you), but we did attempt to show what the A.M.A. contest board members are considering.

Response was overwhelming. Looks like every club and contest flyer turned their big guns on us and let 'em blast away. Bloody and bowed over the typewriter, we select a handful of replies. The people shall be heard!

But, first, here's a prediction: Our guess right now is that Pan American World Airways will restrict its National Meet sponsorship of the PAA-Load event to Half-A entries! Cash awards will probably continue in the National contest for PAA-Loaders, but regional contests will hand out special PAA trophies. The Half-A "occupant" will probably weigh 2 ounces; his dimensions: 3 inches overall height, 1½ inches wide, ¾ inch thick. His "head" will measure ¾ inch square.

George Gardner of Pan-Am reports, "At some contests where we sponsored PAA-Load last year, cash prizes were not acceptable to the contest management, so we provided trophies. Division of opinion among contestants seems to be about even. My own conclusion is that the cash prizes are appropriate for the Nationals, since contestants make long trips to get there and are put to expense, so the cash prizes are helpful. I have just about decided to offer trophies at all other contests, and already have a special trophy designed. It's right handsome and will be something unusual in a collection of hardware."

On the subject of rules and events we turn the floor over to Joe Bilgri, noted contest flyer from San Jose, Calif.: "Maybe you can explain something which is a little confusing to me. You list Leslie Bartlett as National Champion with 31 points and Jim Lempke as runner-up with 27 points. Where was Joe Foster of the Open Class who totaled 31 and also had a sixth place in outdoor h.l. glider which was supposed to be used in case of ties? He had 1st place in free flight B,

Swiss team which won All-Europe trophy in Belgium. Vallet (lt.) did 141 in D; Peclet, 123 in B; Meuwly, D speed 144 with American Hornet.

PAA-Load B, second places in outdoor cabin, indoor cabin, indoor stick and indoor hand-launched glider, third place in ROW gas, fourth place in outdoor stick. According to the "reverse 5" system this totals 31 points; with the 6th place counting ½ points he had 31½ points, but didn't even rate a runner-up award.

"We (the Oakland, Calif., Cloud

Free flight S.E. 5 to 1/7th scale by P. E. Norman of England. The Fokker D.R.1 is same scale, also free flights. Weight of German Fighter is 2½ lbs.

Dusters) were so stunned at the announcement of the Champion at the Nats we never thought to find out how many points it was won with."

Joe, and all you good contest flyers, listen closely. We contend that one of the most mixed-up deals in aeromodeling is the selection each year of the National Champion. As we said recently, no discredit to our past Champs, they've all been fine fellows and good contenders. But what we need is a new, logical and 100% workable method of picking a National Champ—a system that is known and publicized in advance and one that is *released at the close of each day's flying* at the National Meet so a fellow knows where he stands during the contest. This business of everything being in the dark until the presentation of awards is tough on everybody, including the contest director.

Now, and this will make a lot of people real mad, we want to give you (again) our suggestions on picking a contest champion. It is to award each (*Continued on page 82*)

● Payment of $3 to $5 is made for glossy photos (at least 4 x 5 in.) sent exclusively to AT and used. Don't send negatives.

Little Twister

By FRANK EHLING

Prediction for 1951: This model will capture many first places, set numerous A/2 records

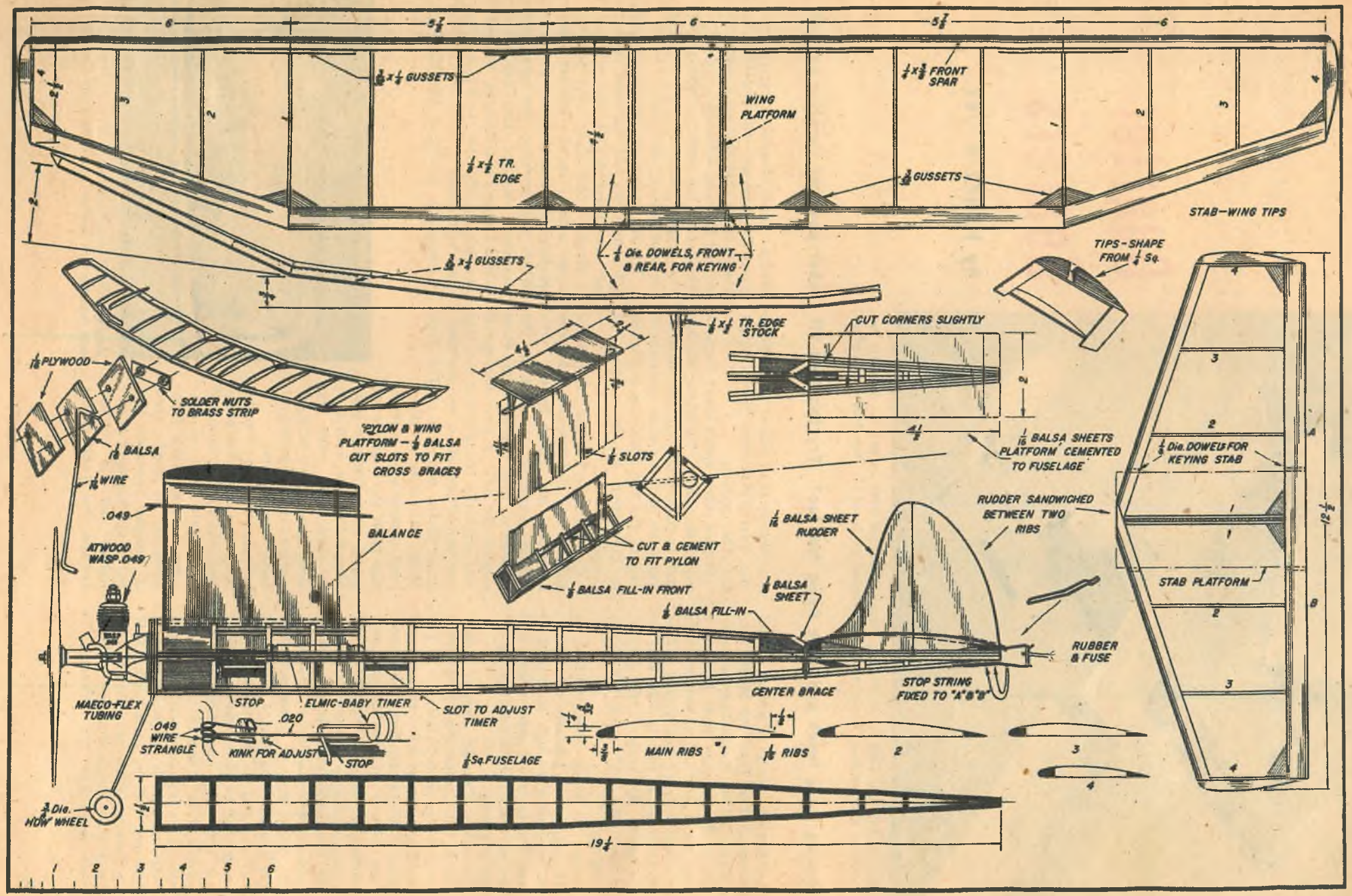
■ Most of the flight adjustments are built into the Twister to make flying easy. A model with the wing and tail out of line that flies well is nothing unusual these days. It's a lot easier to make a model turn in the glide and under power by tilting the stab than by other adjustments. The proper amount of tail tilting must be determined for each model since a wing may have been warped a little to help or retard the turn. This shows up in the glide. A model that has a stalling turn will rarely spin under power. Instead it will climb well and then stall in the glide. This can be taken out with "turn." You can get the most out of your Twister with true surfaces, a tight turn in the glide and a little offset in the thrust (if the model doesn't climb in a definite pattern).

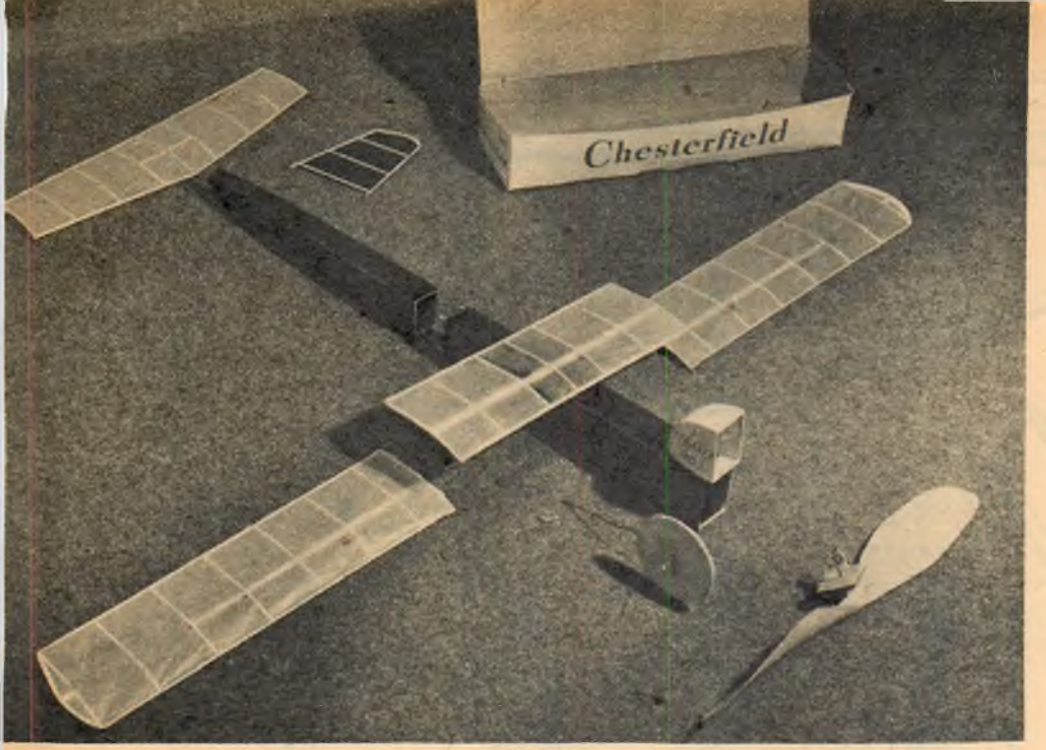
Start by building two fuselage sides. Cut out pylon, cement on wing platform. Add cross-pieces to sides, omitting those at top, right front. Cement pylon in place. Add remainder of cross-pieces and fill-in sheet. Add firewalls with landing gear in place. Fuel-proof this thoroughly. Cement stab platform in place with the wire parts; re-cement when dry.

Cut the wing ribs from "C" stock balsa to keep them from warping. Shape leading edges and cut to length along with trailing edges. Lay these down first, cementing gussets, then the ribs in position. Use light balsa for the tips. Sand wing parts, then re-cement joints again to prevent warping.

The stab is made the same as the wing. Cut the rudder to shape; sand leading and trailing edges. Cement the rudder in straight, as it does not turn the model but gives it directional stability.

Sand smooth and re-cement all fuselage and tail joints, then cover with lightweight Sky Sail. Cut out sections of paper for each part, leaving an (*Continued on page* 70)


6
5 7/8
6
5 7/8
6
3/8 x 1/4 GUSSETS
1/4 x 3/8 FRONT SPAR
WING PLATFORM
1/8 x 1/2 TR. EDGE
3/8 GUSSETS
STAB—WING TIPS
3/8 x 1/4 GUSSETS
1/8 Dia. DOWELS, FRONT & REAR, FOR KEYING
TIPS—SHAPE FROM 1/4 Sq.
1/8 x 1/4 TR. EDGE STOCK
CUT CORNERS SLIGHTLY
1/16 PLYWOOD
SOLDER NUTS TO BRASS STRIP
1/8 BALSA
1/16 WIRE
PYLON & WING PLATFORM — 1/8 BALSA CUT SLOTS TO FIT CROSS BRACES
1/8 SLOTS
1/16 BALSA SHEETS PLATFORM CEMENTED TO FUSELAGE
1/8 Dia. DOWELS FOR KEYING STAB
.049
BALANCE
ATWOOD WASP .049
CUT & CEMENT TO FIT PYLON
1/16 BALSA SHEET RUDDER
RUDDER SANDWICHED BETWEEN TWO RIBS
1/8 BALSA FILL-IN FRONT
1/8 BALSA FILL-IN
1/8 BALSA SHEET
STAB PLATFORM
RUBBER & FUSE
MAECO-FLEX TUBING
STOP
ELMIC-BABY TIMER
SLOT TO ADJUST TIMER
CENTER BRACE
STOP STRING FIXED TO "A" & "B"
.049 WIRE STRANGLE
.020
KINK FOR ADJUST
STOP
1/8 Sq. FUSELAGE
MAIN RIBS "1"
1/16 RIBS
2
3
4
3/4 Dia. HOW WHEEL
19 1/2
1
2
3
4
5
6



You can take our word for it, this big indoor rubber job folds up into the cigarette box. Durations of more than 1 min. have been racked up by M.I.T. Tech Model Aircrafters.

Quarter Soarers

By HENRY R. JEX

Looking for a laugh and some flying fun, too? Try this Two-Bit rubber-powered duration contest

■ *Given:* A group of ardent model builders called The Tech Model Aircrafters at the Massachusetts Institute of Technology near Boston; a need for a stimulating indoor event to provide flying fun during windy weather; only twenty-five feet of ceiling to fly under; and finally, limited time and space for model building.

Find: An event which will fit all said conditions, promote originality, be interesting enough to repeat at frequent intervals, and which will provide awards without draining the club treasury.

Solution: Two-Bit Trophy Event. Rules: (1) Contest shall be for rubber powered model aircraft. (2) The model shall carry a recognizable and removable twenty-five cent piece (two bits—a quarter dollar) perpendicular to the line of flight, and totally enclosed in some structure. (3) The model must fit into a standard size box (see below, Rule (4)). The model may be disassembled to put it in the box, but if so no glue may be used to reassemble it. (4) There shall be two classes: (a) Shoe box class—the maximum size box permitted is 5"x6"x13". (b) Cigarette class—any standard size cigarette carton is permissible. (5) Take-off shall be unassisted R.O.G. Droppable dollies are allowed. (6) The highest single duration of flight shall determine the winner. (7) The winner shall collect as his prize the twenty-five-cent pieces from the other models.

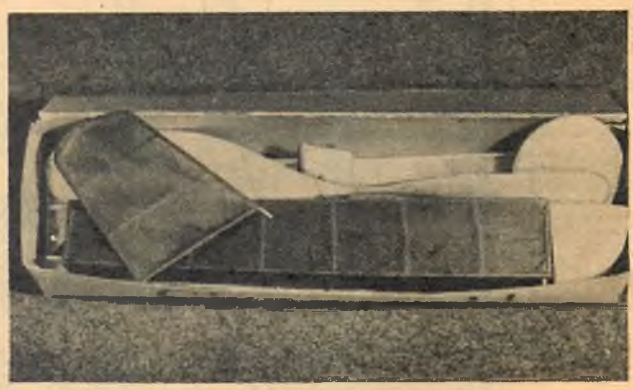
Simple rules, aren't they? Futhermore, the boxes facilitate storage and transportation of the models. The rules permit a wide variation in design, and the winner is rewarded in porportion to the number of competitors.

Credit for the Two-Bit Event Rules goes to two club members, Eugene Larrabee and Dick Baxter, who jointly presented the idea in the summer of 1948. The shoe box class existed for only a year because it was originally thought that this size box would provide a serious challenge to the members of The Tech Model Aircrafters. However, models soon grew in size from the single wing panel, stick fuselage prototype to those with two, or three, and even six, wing panels; two or three section fuselages; and even jointed propellers!

Enclosing the two-bit piece was always a problem. At first streamlined pods were used in conjunction with stick fuselages, but as models grew it became apparent that built-up fuselages were lighter and did not increase the drag excessively. Some members preferred to place the payload (the two-bits) in the nose so that the wing could be moved forward, while others put the quarter at the center of gravity of the empty model to permit flying with or without the load.

By the winter of 1948, nearly all club members had mastered the art of "unassisted" R.O.G. take-off with a single wheel dolly, and turning large models in the limited space available became the chief problem. When this problem was overcome durations reached two minutes—Lloyd Licher's two minutes, fourteen seconds is still the record for the shoe box class.

Ironically, Larrabee himself was

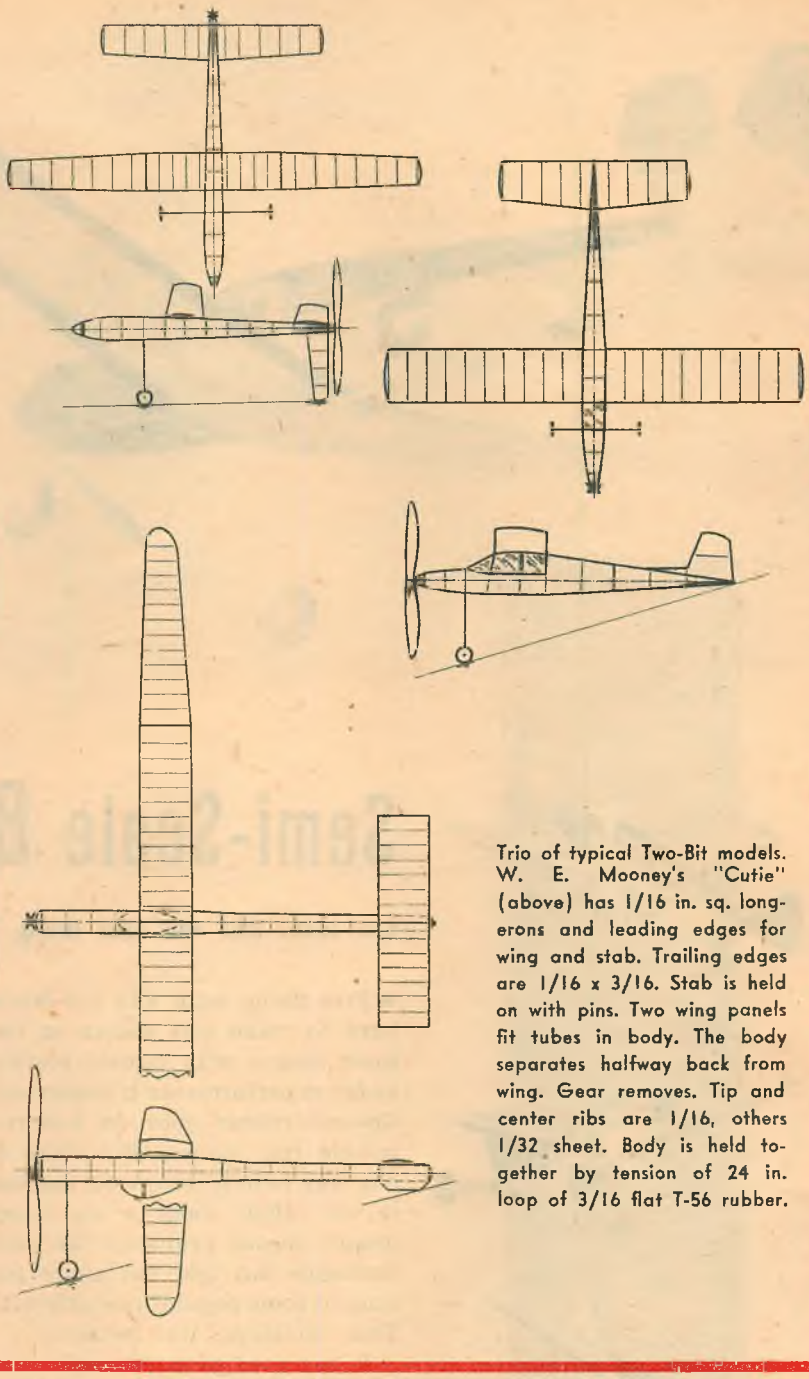


Simple, isn't it? Everything comes apart. Parts may be held together with Scotch Tape, braces, clips; no glue.

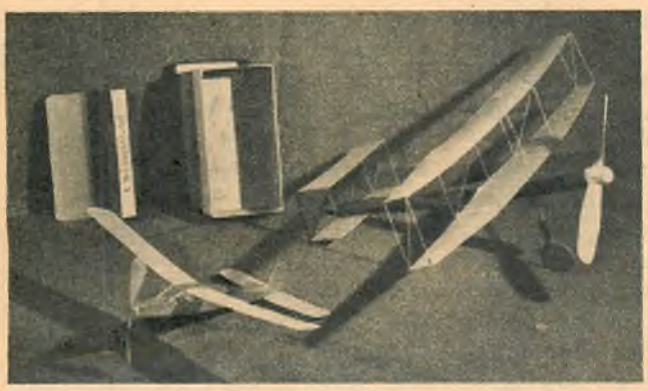
responsible in part for loss of interest in the shoe box models when he turned up at one of the weekly contests with a monster, the biplane shown in the photograph. It had *six* 5" x 13" wing panels (three per wing), a two-panel biplane tail, a two-piece 18" diameter propeller, and a half ping-pong ball spinner which enclosed the quarter. So complicated was the arrangement of joints, hooks, braces, and plugs that it took nearly half an hour to assemble the model. The original intent—production of a simple, compact model—seemed lost, so in 1949 the shoe box was replaced by the cigarette carton.

Despite the fact that the volume of the cigarette carton is only about one quarter of the volume of the shoe box, some recent models have been nearly as large as their forerunners, and durations have been only a little less, frequently exceeding one minute. It must, however, be admitted that the larger models in the cigarette class are somewhat flimsy.

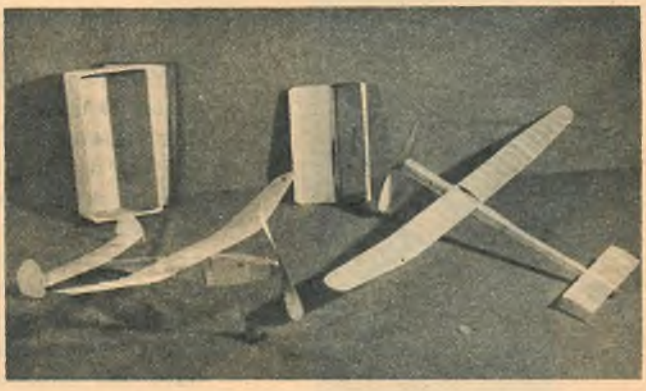
Some of the more prevalent features of the Two-Bit airplanes have been single surface wings of two, three, and even four panels (single surface wings are easily stacked), tube and pin or plug-in joints secured with Scotch Tape, two-section fuselages tapered so that the sections telescope, and eleven-inch one-piece propellers, or larger two-piece propellers. The propeller pitch-to-diameter ratio is usually from 1.5 to 2. Rubber motors naturally vary from plane to plane but, in general, long small motors are used. One loop of one-eighth T-56, one and a half times as long as the motor base is fairly (*Continued on page* 81)



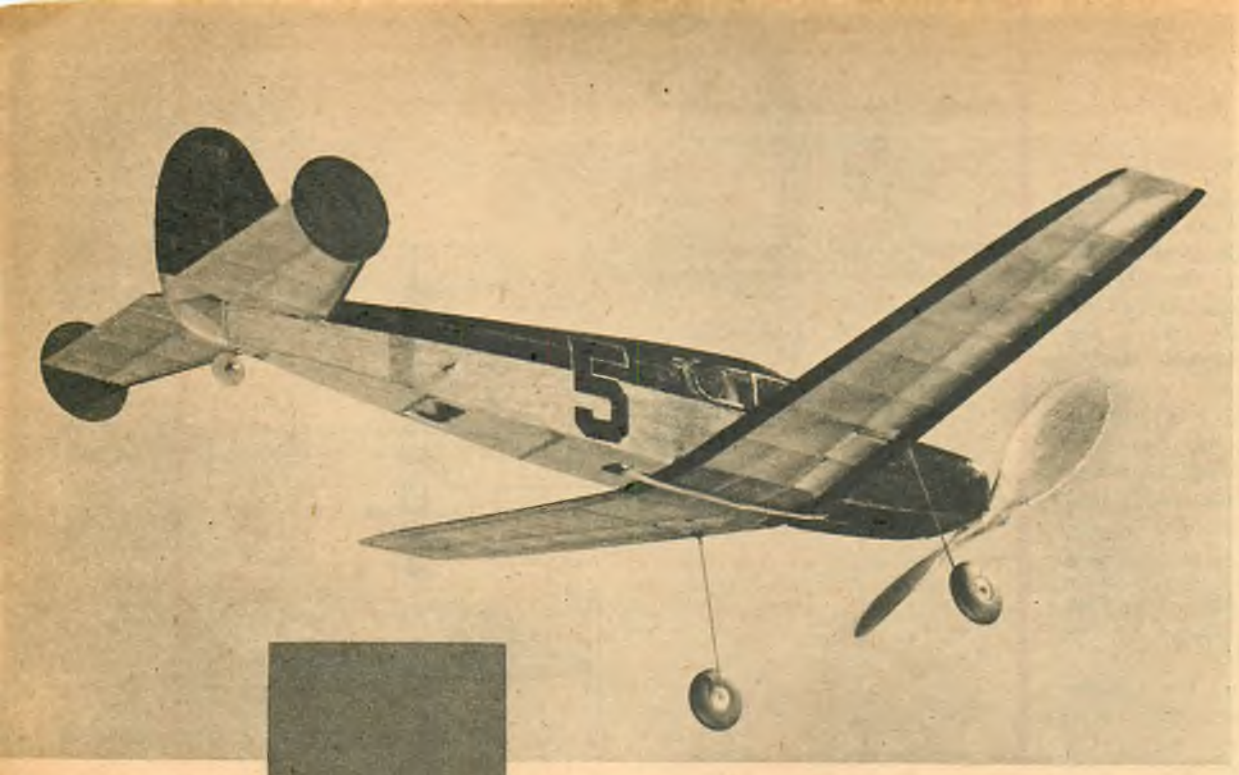
Trio of typical Two-Bit models. W. E. Mooney's "Cutie" (above) has 1/16 in. sq. longerons and leading edges for wing and stab. Trailing edges are 1/16 x 3/16. Stab is held on with pins. Two wing panels fit tubes in body. The body separates halfway back from wing. Gear removes. Tip and center ribs are 1/16, others 1/32 sheet. Body is held together by tension of 24 in. loop of 3/16 flat T-56 rubber.



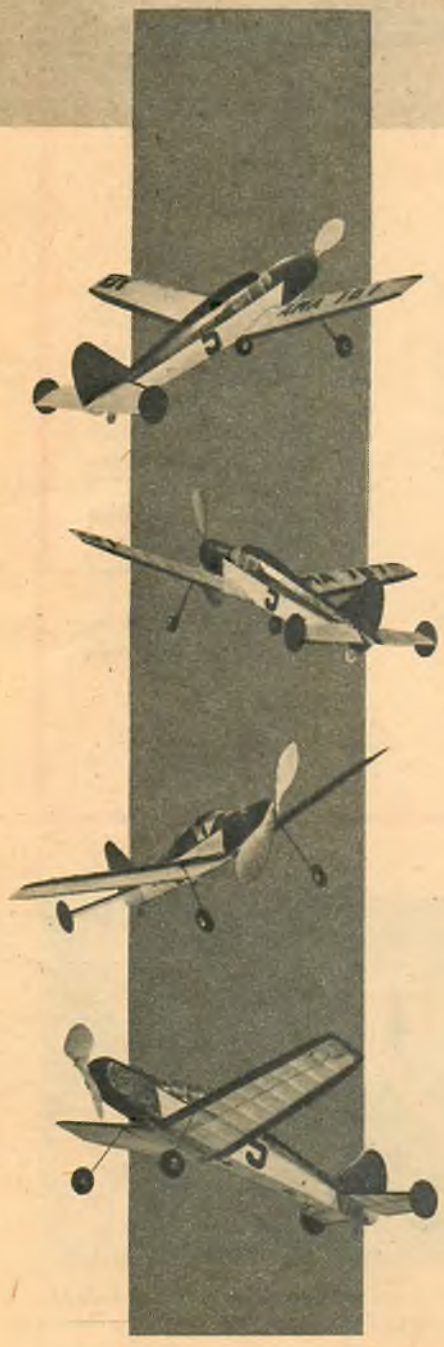
Nothing fazes the flying technicians of M.I.T. Biggest of the "shoe box brigade" was this biplane sporting 6 wing panels, 25c in spinner.



That high aspect ratio entry has a wingspan of 30 inches. Tech Aircrafters are typical of college flyers whose time is greatly limited.



By
CRISTO
RUSSO



Semi-Scale BELLANCA

She looks like the real thing, yet has contest type performance

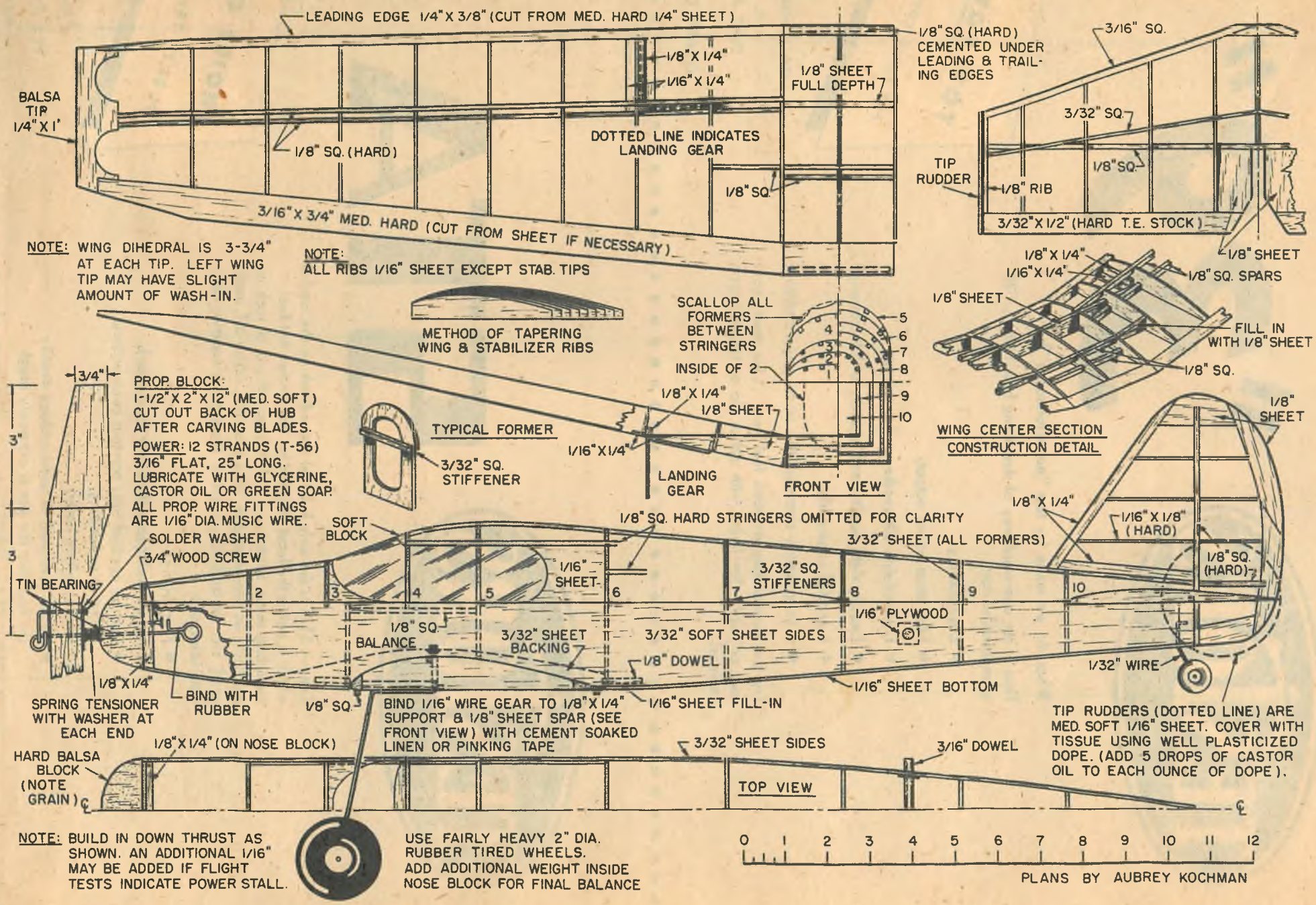
■ Free flying scale jobs are fairly hard to make and seldom in the same league with contest models as far as performance is concerned. Contest rubber jobs do not resemble real planes. But there is one way to have your cake and eat it too. How about a big sport design, meant primarily for performance but laid out along the lines of some popular real aircraft? This "Bellanca," for instance.

It has good proportions for flying, slimmed out as it is, with big prop and stilt-like landing gear. While there is nothing scale about it, every line—the wing tips, the stabilizer tip rudders, the cabin—shouts Bellanca. In the air it looks a lot like the real ship.

Since the fuselage sides are parallel back to the trailing edge of the wing, the forward bulkheads are cemented in first; the sides are then drawn together at the rear and the remaining formers put in place. The stringers are fairly hard and eliminate all bowing of the contours due to paper pull. The nose is extra strong with cross-pieces on all four sides. The heavy leading edge of the stab prevents easy breakage and gives a nicely rounded edge. Ribs are fairly soft.

To assemble, lay down the edges, then the bottom spar of hard ⅛" square; put the ribs in place, being careful not to make force fits (which may cause warps), and finish with the top anti-warp spar.

Cut all wing ribs identical to the center section rib, then trim to fit the taper as shown in the detail. The wing tip can be cut ready to go from 1" wide triangle stock, otherwise shaped from ¼ x 1" wood. First lay down the edges, next the bottom spar of ⅛" square hard balsa. Trim the ribs to fit and slide into place without forcing. Add the top spar. Be sure to note that the two panels are made separately, then joined in the middle when dihedral is incorporated. In other words, the center section is added last. The center section consists of filling in the connecting leading and trailing edge pieces, a full depth piece of ⅛" sheet (at the spar (*Continued on page* 79)


LEADING EDGE 1/4"X 3/8" (CUT FROM MED. HARD 1/4" SHEET)
1/8" SQ. (HARD) CEMENTED UNDER LEADING & TRAILING EDGES
BALSA TIP 1/4"X 1"
1/8"X 1/4"
1/16"X 1/4"
1/8" SHEET FULL DEPTH
1/8" SQ. (HARD)
DOTTED LINE INDICATES LANDING GEAR
1/8" SQ.
3/16"X 3/4" MED. HARD (CUT FROM SHEET IF NECESSARY)
3/16" SQ.
3/32" SQ.
TIP RUDDER
1/8" RIB
1/8" SQ.
3/32"X 1/2" (HARD T.E. STOCK)
1/8" SHEET
NOTE: WING DIHEDRAL IS 3-3/4" AT EACH TIP. LEFT WING TIP MAY HAVE SLIGHT AMOUNT OF WASH-IN.
NOTE: ALL RIBS 1/16" SHEET EXCEPT STAB. TIPS
METHOD OF TAPERING WING & STABILIZER RIBS
SCALLOP ALL FORMERS BETWEEN STRINGERS
INSIDE OF 2
1/8"X 1/4"
1/8" SHEET
1/16"X1/4"
LANDING GEAR
FRONT VIEW
1/8"X 1/4"
1/16"X 1/4"
1/8" SQ. SPARS
1/8" SHEET
FILL IN WITH 1/8" SHEET
1/8" SQ.
WING CENTER SECTION CONSTRUCTION DETAIL
3/4"
3"
PROP. BLOCK: 1-1/2"X 2"X 12" (MED. SOFT) CUT OUT BACK OF HUB AFTER CARVING BLADES.
POWER: 12 STRANDS (T-56) 3/16" FLAT, 25" LONG. LUBRICATE WITH GLYCERINE, CASTOR OIL OR GREEN SOAP. ALL PROP. WIRE FITTINGS ARE 1/16" DIA. MUSIC WIRE.
TYPICAL FORMER
3/32" SQ. STIFFENER
1/8" SQ. HARD STRINGERS OMITTED FOR CLARITY
3/32" SHEET (ALL FORMERS)
SOFT BLOCK
SOLDER WASHER
3/4" WOOD SCREW
TIN BEARING
1/16" SHEET
3/32" SQ. STIFFENERS
1/16" PLYWOOD
1/8" SQ. BALANCE
3/32" SHEET BACKING
3/32" SOFT SHEET SIDES
1/8" DOWEL
1/16" SHEET BOTTOM
1/32" WIRE
1/8"X 1/4"
SPRING TENSIONER WITH WASHER AT EACH END
BIND WITH RUBBER
1/8" SQ.
BIND 1/16" WIRE GEAR TO 1/8"X 1/4" SUPPORT & 1/8" SHEET SPAR (SEE FRONT VIEW) WITH CEMENT SOAKED LINEN OR PINKING TAPE
1/16" SHEET FILL-IN
1/16"X 1/8" (HARD)
1/8" SQ. (HARD)
1/8" SHEET
TIP RUDDERS (DOTTED LINE) ARE MED. SOFT 1/16" SHEET. COVER WITH TISSUE USING WELL PLASTICIZED DOPE. (ADD 5 DROPS OF CASTOR OIL TO EACH OUNCE OF DOPE).
1/8"X 1/4" (ON NOSE BLOCK)
HARD BALSA BLOCK (NOTE GRAIN)
3/32" SHEET SIDES
3/16" DOWEL
TOP VIEW
NOTE: BUILD IN DOWN THRUST AS SHOWN. AN ADDITIONAL 1/16" MAY BE ADDED IF FLIGHT TESTS INDICATE POWER STALL.
USE FAIRLY HEAVY 2" DIA. RUBBER TIRED WHEELS. ADD ADDITIONAL WEIGHT INSIDE NOSE BLOCK FOR FINAL BALANCE
0 1 2 3 4 5 6 7 8 9 10 11 12
PLANS BY AUBREY KOCHMAN

TESTORS "39"

What do we mean by top "*powerformance*"?

That is our one-word way of describing how Testor's "39" is unequalled for:

- Easy starting;
- Maximum power output;
- Dependable all-weather performance;
- Exactly right quality and quantity of lubrication;
- Extended engine life;
- Non-gumming characteristics under any condition.

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HALF-PINT 39c
•
PINT 75c
•
QUART $1.40

TESTORS STA

Testor's STA is the *only* hot fuel proof finish on the market which is not in the least affected by any known hot fuel . . . including those containing high concentrations of such ingredients as nitro-methane, nitro-propane, castor oil, methanol, etc. In addition, consider these other superior characteristics, too:

- Fast drying;
- Covers well (actually better than dope);
- Can be applied over previous coats without dragging or lumping;
- Has excellent luster;
- Lends itself well to hand-rubbing despite the fact that the film is extremely tough.

You'll find STA available—in a complete range of colors and in both the 15c and 50c size bottles—at your favorite hobby shop. Ask for it . . . *by name!*

***Plus**
STA Sealer
and
STA Thinner

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UST-FOR-FUN FLYING

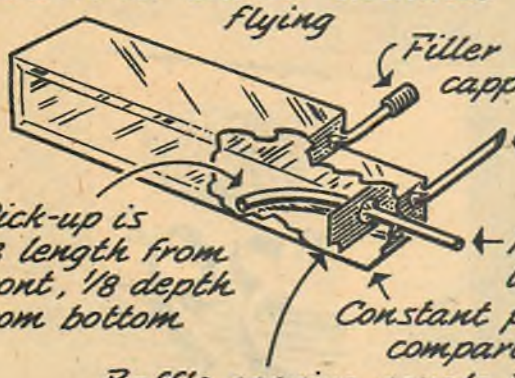
COLORS*

Oc SIZE BOTTLES

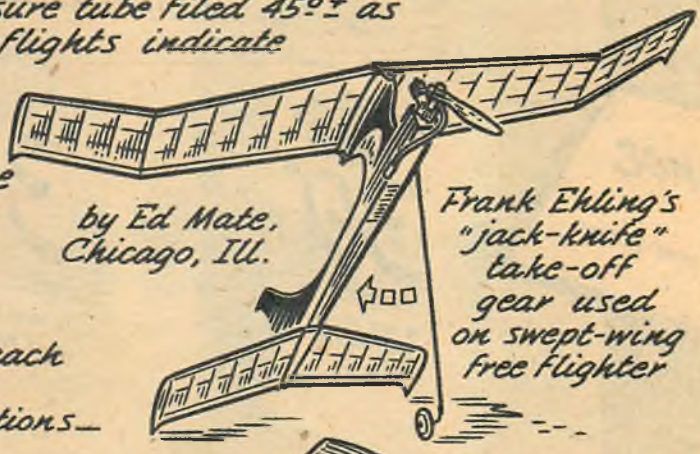
TESTOR CHEMICAL COMPANY • ROCKFORD, ILLINOIS

Sketchbook

"Constant Pressure" tank used by Tony Grish (137 m.p.h., cl. B) ... shown for counter-clockwise flying



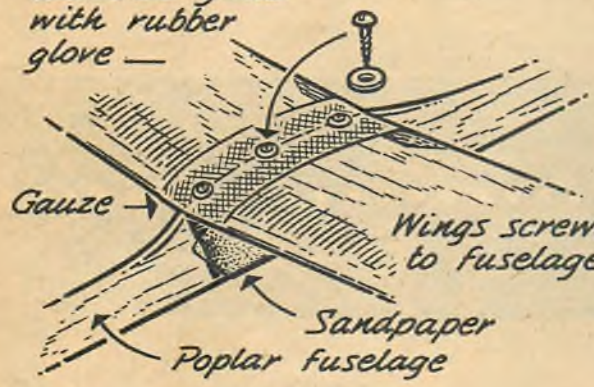
Note: Varying air pressure in vent due to plus-minus wind velocity in each circuit causes uneven engine run. Pressure compartment dampens variations—

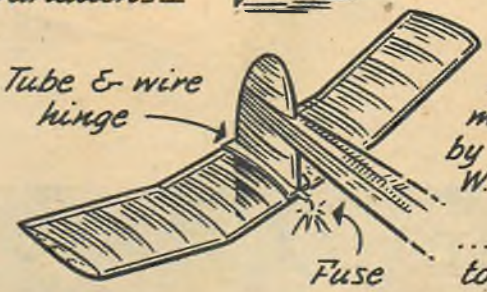


by Ed Mate, Chicago, Ill.

Frank Ehling's "jack-knife" take-off gear used on swept-wing free flighter

V. C. Hahn, Ft. Worth, Texas, launches glider with rubber glove —

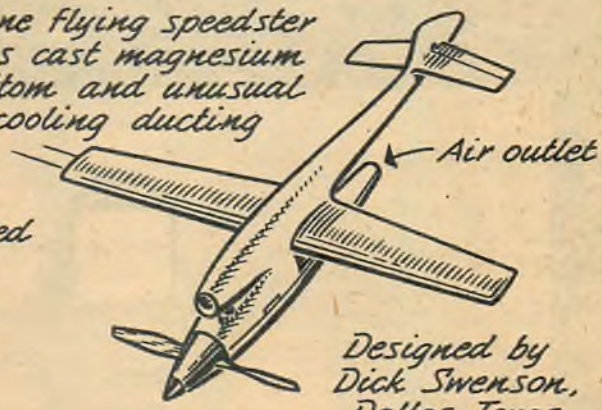




Low-swung stabilizers on models designed by Jack McNulty, W. Palm Beach, Fla.

... Pops down to dethermalize

Fine flying speedster has cast magnesium bottom and unusual cooling ducting

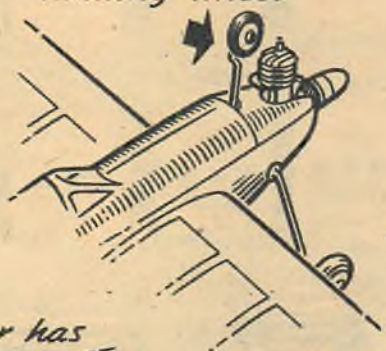


Designed by Dick Swenson, Dallas, Texas

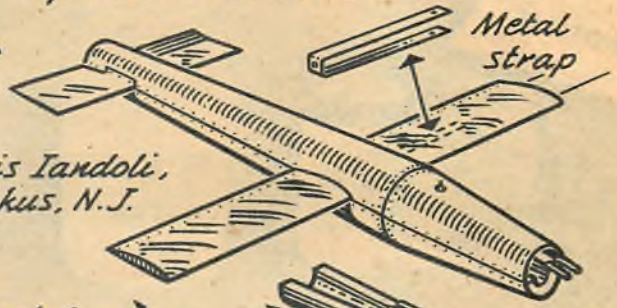
Metal, threaded

Glo-plug holder keeps coils clean— by Jimmy Price, Little Rock, Ark.

Stunt model seen with emergency inverted landing wheel

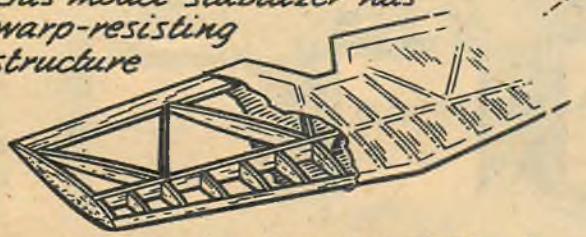


Enclosed-engine jet has done 150 mph ...placed 3rd. at Nationals —



Lewis Iandoli, Hohokus, N.J.

Gas model stabilizer has warp-resisting structure

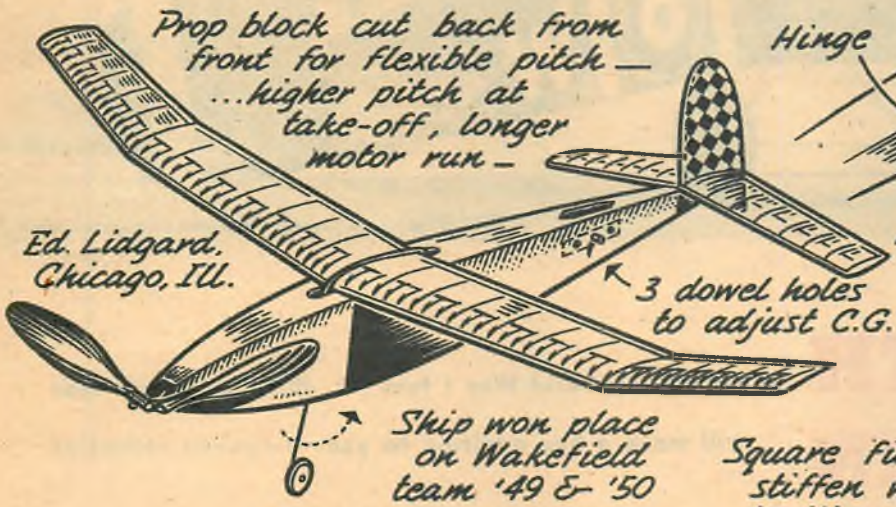


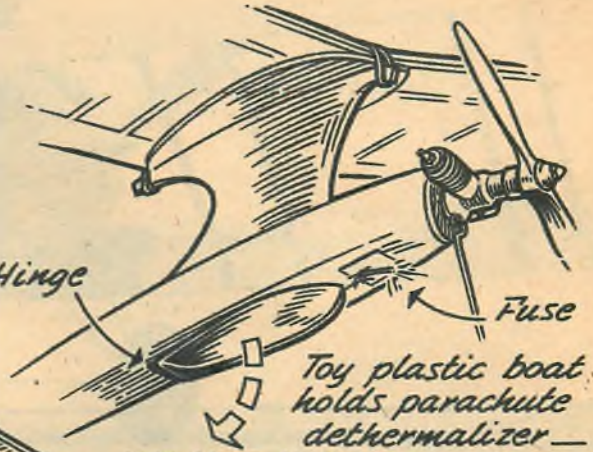
by Douglas Taffinder, Brooklyn, N.Y.

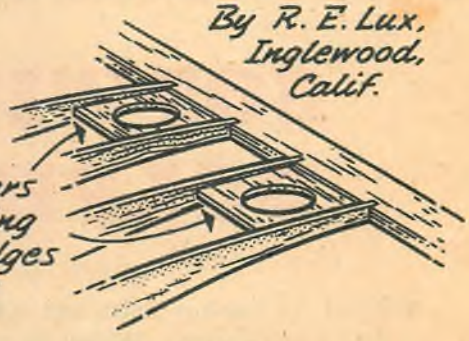
All metal

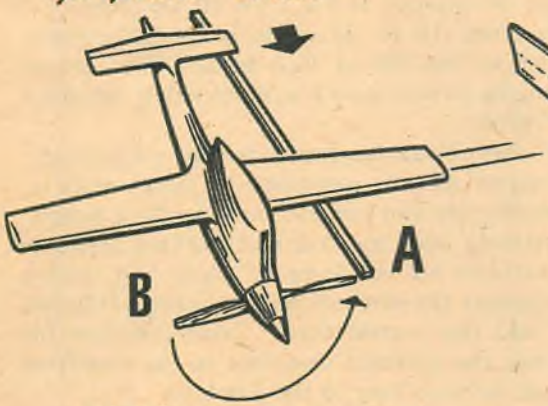
"U"-section tank

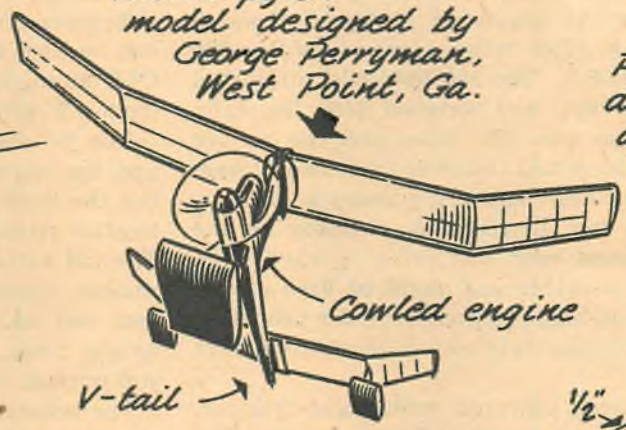
at the NATIONALS

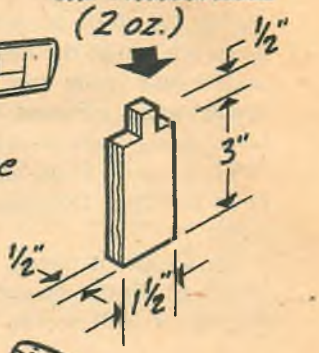


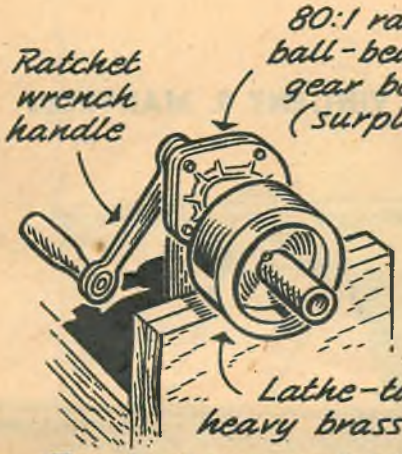


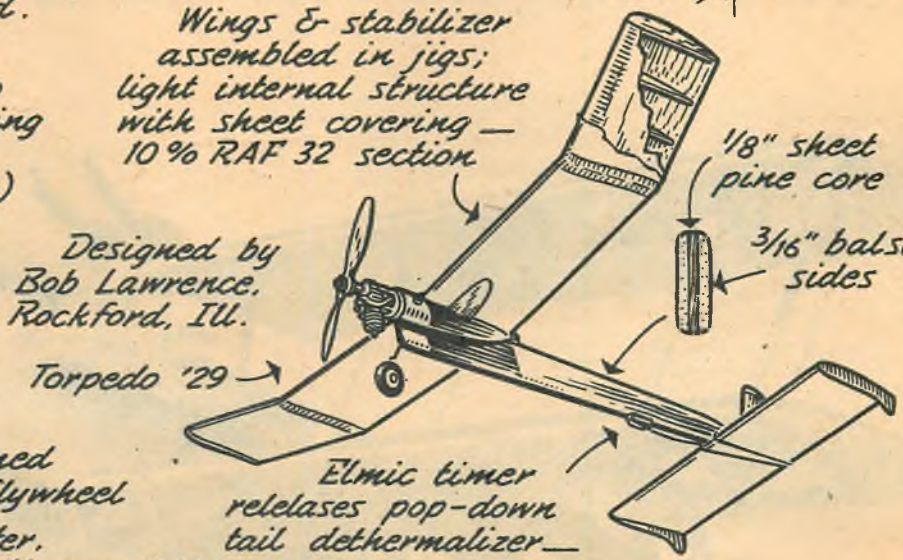


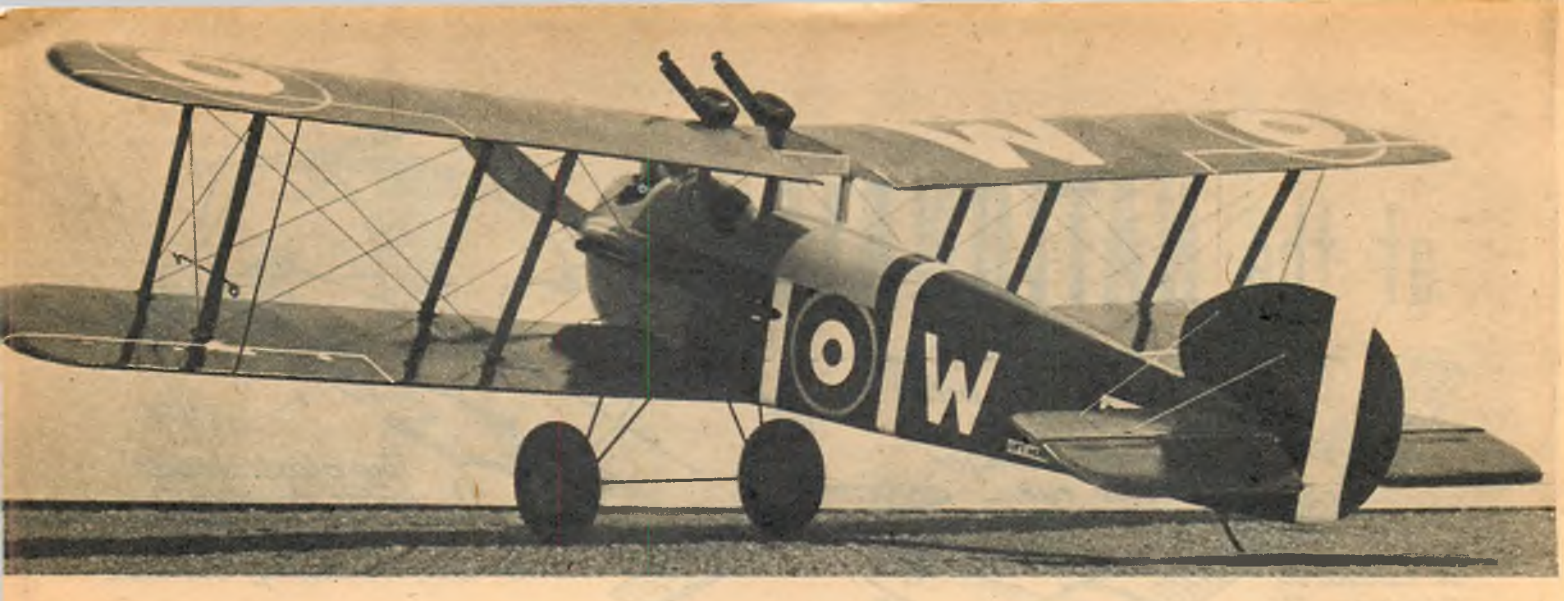












SOPWITH DOLPHIN

Paging all World War I fans . . . this easily built bipe will make a fine addition to your U-control collection

By VINCENT R. MANFREDI

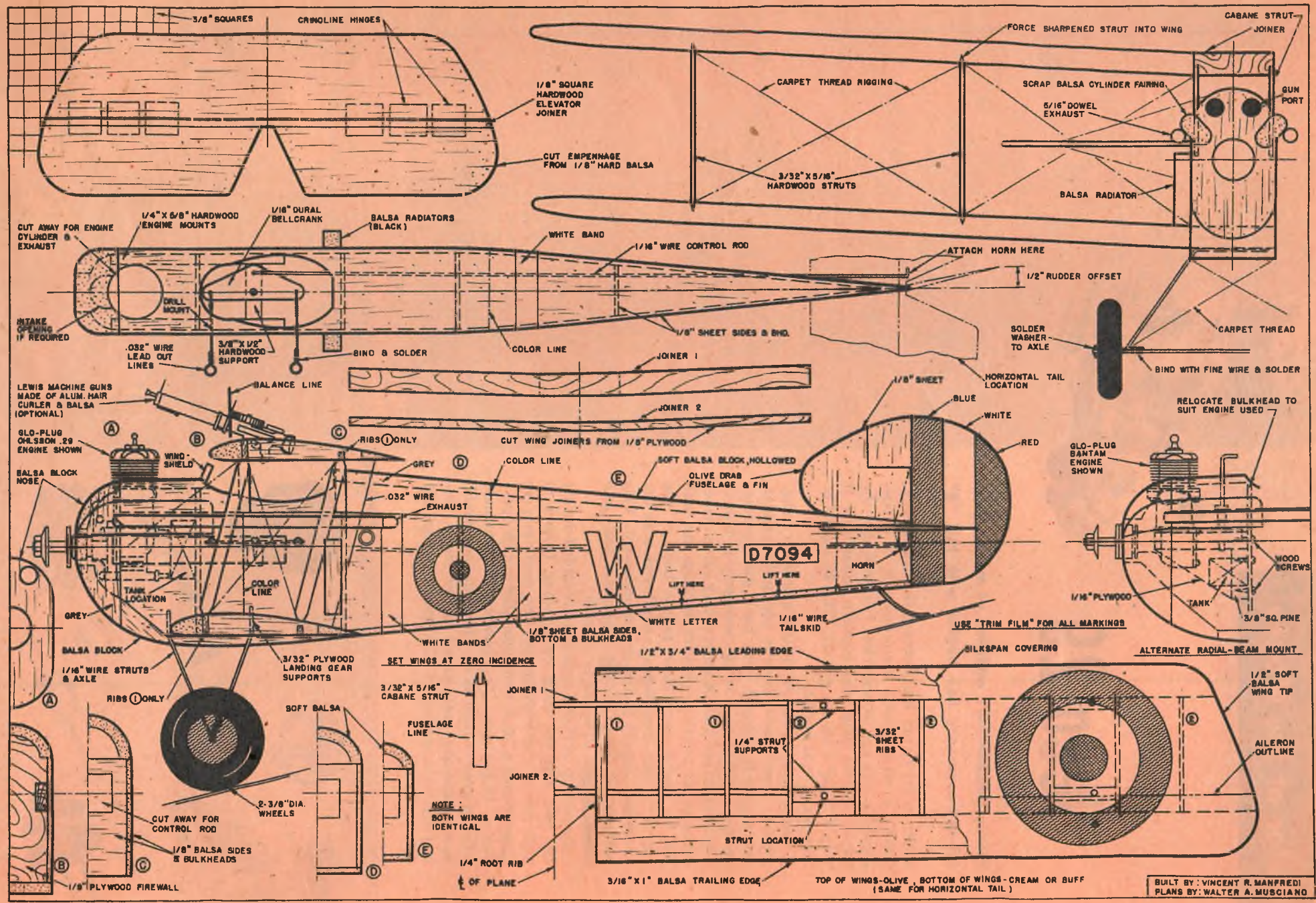
■ When the famous Spad and S.E.5 fighters began to find it increasingly difficult to maintain aerial superiority against the newer German machines, they were replaced by the negatively staggered Sopwith "Dolphin." This English design came in 200 hp, 220 hp and 300 hp models. The 200 hp model attained a top speed of 131 mph and weighed 1880 lbs. fully loaded. The range was 230 miles and the service ceiling 21,000 ft. Standard armament was two Vickers guns buried in the cowl and firing through the propeller disk, plus two Lewis guns mounted on the upper wing forward spar and firing upward. The latter guns were movable and could be fired almost directly up or at an angle just clearing the propeller. Four hundred Dolphins saw action; over 1,000 were built.

All Dolphins were powered with eight-cylinder, Vee type, liquid-cooled Hispano-Suiza engines. The French as well as the English used the 300 hp Dolphin. Our model sports the markings of the Eighty-Seventh Fighter Squadron of the Royal Flying Corps. The design designation is 5 F.1 for all Dolphins.

Engines from .19 to .33 cubic inch displacement can be used in this 265 sq. inch model. We used an O&R .23 engine swinging an 8½/6 propeller, cut down from a 9″ prop.

The ⅛″ sheet balsa fuselage sides are cut to shape and the engine mounts cemented to them securely. Cut the bulkheads and cement them in their proper location starting from the rear and working forward. The tail surfaces are cut from ⅛″ sheet and sanded smooth. Cement the elevator halves to the hardwood spar and add the control horn. Using crinoline for hinges, hinge the elevator assembly to the stabilizer and cement the stabilizer to the fuselage.

The bellcrank is mounted to the hardwood foundation and the lead-out lines are added. Cement this assembly securely to the (*Continued on page* 80)


3/8" SQUARES
CRINOLINE HINGES
1/8" SQUARE HARDWOOD ELEVATOR JOINER
CUT EMPENNAGE FROM 1/8" HARD BALSA
FORCE SHARPENED STRUT INTO WING
CABANE STRUT
JOINER
CARPET THREAD RIGGING
SCRAP BALSA CYLINDER FAIRING
GUN PORT
5/16" DOWEL EXHAUST
3/32" X 5/16" HARDWOOD STRUTS
BALSA RADIATOR
CUT AWAY FOR ENGINE CYLINDER & EXHAUST
1/4" X 5/8" HARDWOOD ENGINE MOUNTS
1/16" DURAL BELLCRANK
BALSA RADIATORS (BLACK)
WHITE BAND
1/16" WIRE CONTROL ROD
ATTACH HORN HERE
1/2" RUDDER OFFSET
DRILL MOUNT
INTAKE OPENING IF REQUIRED
.032" WIRE LEAD OUT LINES
3/8" X 1/2" HARDWOOD SUPPORT
BIND & SOLDER
COLOR LINE
1/8" SHEET SIDES & BHD.
SOLDER WASHER TO AXLE
CARPET THREAD
BIND WITH FINE WIRE & SOLDER
HORIZONTAL TAIL LOCATION
JOINER 1
JOINER 2
CUT WING JOINERS FROM 1/8" PLYWOOD
LEWIS MACHINE GUNS MADE OF ALUM. HAIR CURLER & BALSA (OPTIONAL)
BALANCE LINE
1/8" SHEET
BLUE
WHITE
RED
RELOCATE BULKHEAD TO SUIT ENGINE USED
GLO-PLUG OMLSON .29 ENGINE SHOWN
WIND-SHIELD
RIBS (1) ONLY
GREY
COLOR LINE
SOFT BALSA BLOCK, HOLLOWED
OLIVE DRAB FUSELAGE & FIN
BALSA BLOCK NOSE
.032" WIRE EXHAUST
GLO-PLUG BANTAM ENGINE SHOWN
D7094
HORN
LIFT HERE
LIFT HERE
TANK LOCATION
COLOR LINE
GREY
WHITE LETTER
1/16" WIRE TAILSKID
USE "TRIM FILM" FOR ALL MARKINGS
WOOD SCREWS
1/16" PLYWOOD
TANK
3/8" SQ. PINE
ALTERNATE RADIAL-BEAM MOUNT
BALSA BLOCK
1/16" WIRE STRUTS & AXLE
WHITE BANDS
1/8" SHEET BALSA SIDES, BOTTOM & BULKHEADS
3/32" PLYWOOD LANDING GEAR SUPPORTS
SET WINGS AT ZERO INCIDENCE
1/2" X 3/4" BALSA LEADING EDGE
SILKSPAN COVERING
1/2" SOFT BALSA WING TIP
RIBS (1) ONLY
SOFT BALSA
3/32" X 5/16" CABANE STRUT
JOINER 1
FUSELAGE LINE
1/4" STRUT SUPPORTS
3/32" SHEET RIBS
AILERON OUTLINE
JOINER 2
2-3/8" DIA. WHEELS
CUT AWAY FOR CONTROL RODS
1/8" BALSA SIDES & BULKHEADS
NOTE: BOTH WINGS ARE IDENTICAL
STRUT LOCATION
1/4" ROOT RIB
℄ OF PLANE
1/8" PLYWOOD FIREWALL
3/16" X 1" BALSA TRAILING EDGE
TOP OF WINGS-OLIVE, BOTTOM OF WINGS-CREAM OR BUFF (SAME FOR HORIZONTAL TAIL)
BUILT BY: VINCENT R. MANFREDI
PLANS BY: WALTER A. MUSCIANO

Motor of the Month

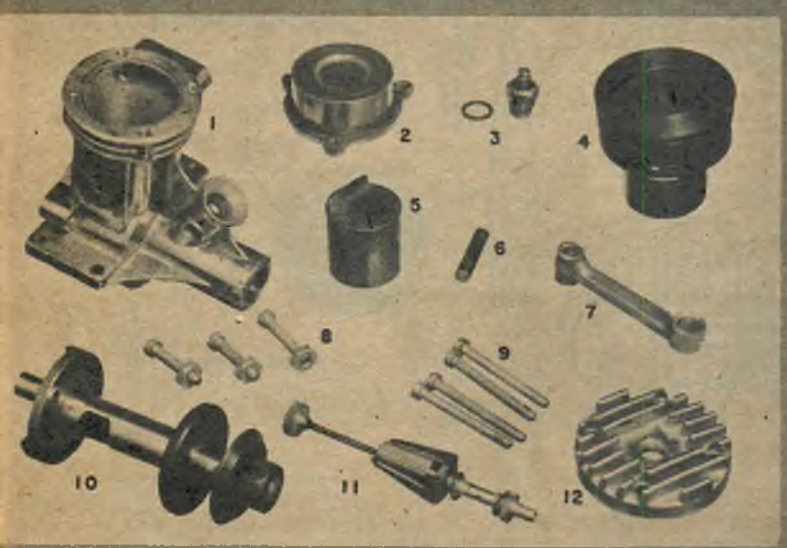
Veco 29

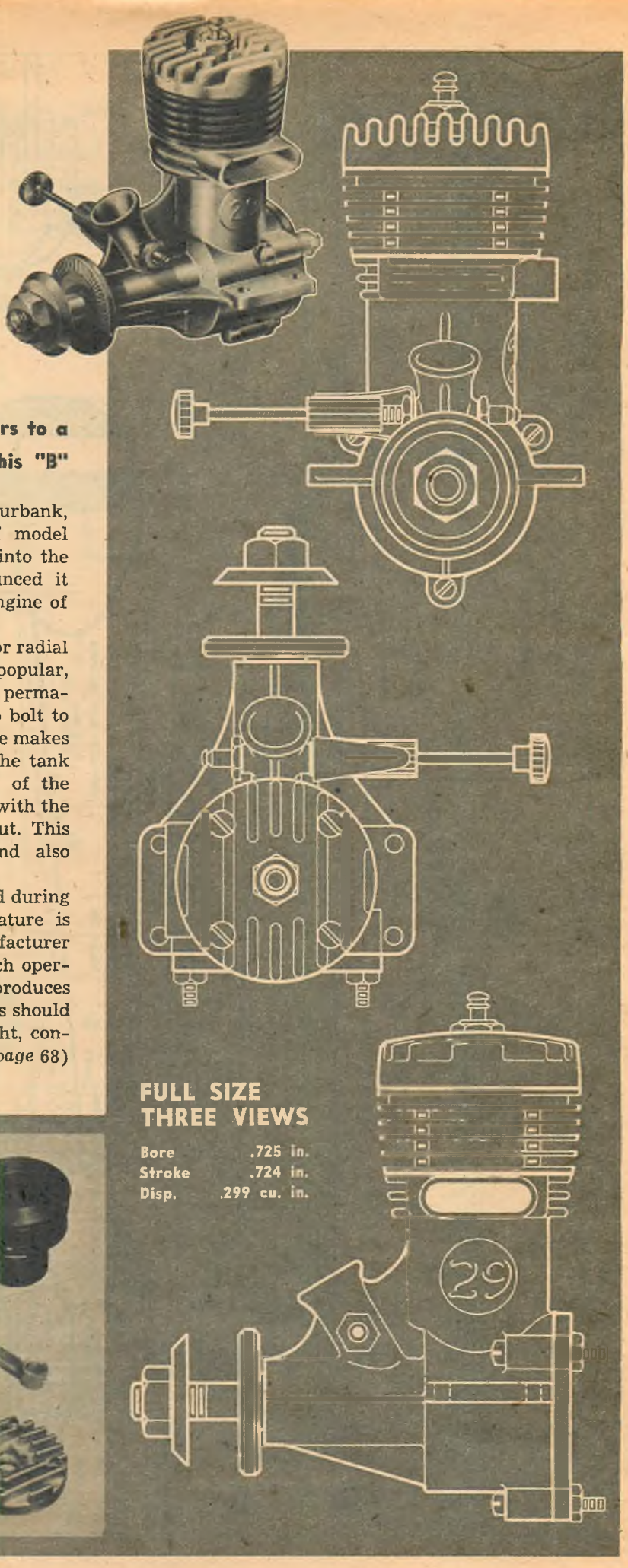
Henry Engineering's addition of motors to a kit-and-accessory line begins with this "B"

■ When the Henry Engineering Co. of Burbank, Calif., a well-known manufacturer of model airplane kits and accessories, ventured into the model engine field, the concern announced it would make a 19, 29, and 31. The 29 engine of this series was tested.

Construction features include a beam or radial mount. Since beam mounts are quite popular, the engine is shipped with back plate permanently attached so it is not necessary to bolt to a firewall to operate. A shaft rotary valve makes compact installations possible because the tank can be placed very close to the back of the engine. A cast-iron piston is employed, with the lower half slightly under-size or under-cut. This reduces oil drag during operation and also allows engine to break in quickly.

Speeds up to 15,000 rpm were recorded during the test, but the most outstanding feature is high torque and high thrust. The manufacturer recommends a 10/6 Veco propeller which operates at 10,300 rpm. This combination produces a thrust greater than 48 oz. These engines should be exceptionally well suited to free flight, control line stunt, and sport (*Continued on page* 68)





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Bore	.725 in.
Stroke	.724 in.
Disp.	.299 cu. in.

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Flying Fun!

Jim Walker FUEL REGULATOR

Supplies fuel under pressure in any flight position until tank is dry! Complete with Pressure Fuel Tank.

$2.50

U-REELY CONTROL

Keeps your flying lines off the ground ready for instant use. Take-off unassisted, reel in to land.

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With cable flying lines, **$8.50**

A-J FIREBALL

Original U-Control plane. High maneuverability. Kit includes control handle, flying lines, wheels.

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Ready-to-Fly

A-J INTERCEPTOR

Wings fold for launching, automatically spread to soar. 16½-inch cambered wing.

50¢

A-J HORNET

Will R.O.G. and fly 500 feet! Unbreakable prop, 18-inch cambered wing.

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CEILING WALKER

Flies straight up, indoors or outdoors. Does acrobatics on way down.

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Jim Walker FIREBABY

Solo on Your First Flight...

Do verticals on the second, loops on the third. Flying the Firebaby is that easy!

Buy it ready to fly...complete with flying lines and full instructions for flying and stunting.

Wing span of the Firebaby is 19". Weight with motor 3 oz. All parts are finished, painted, fuel-proofed. Just slip them together, bolt on wing and motor, "gas up" and you're ready to take off!

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less motor

Over with a swish! Jim Walker, inventor of U-Control flying, "wrings out" the Firebaby.

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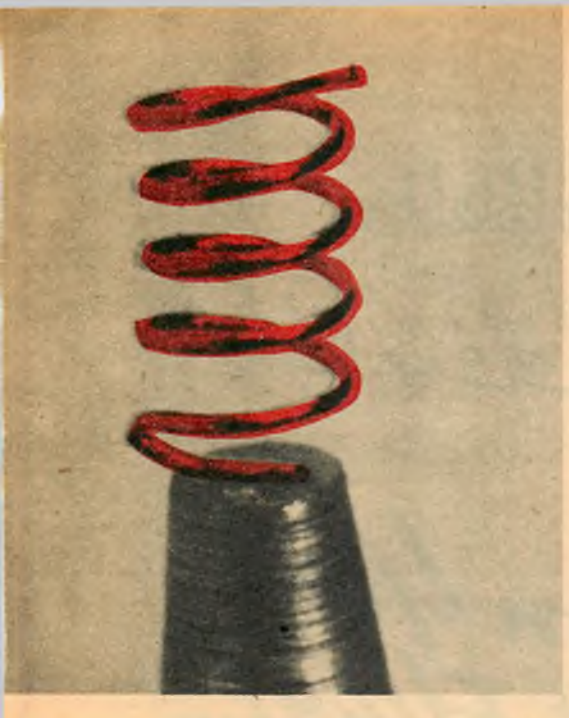


some glow HOT AND some glow COLD

By WALTON HUGHES

You'll get a lot more out of your engine if you match it up with the correct glow plug to fit your particular type of operation

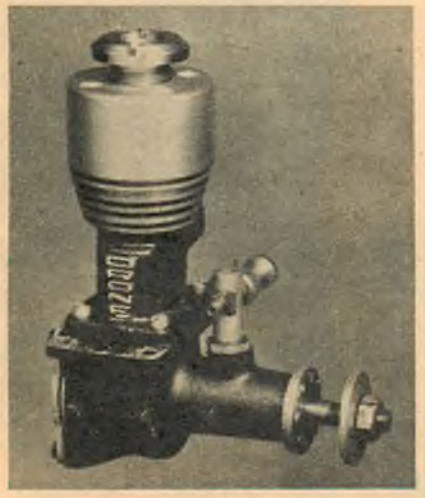
■ If there's a single point all modelers can agree on it is that the glow plug in your engine gets mighty hot when operating. But do you know that some of these clever little plugs which give a motor such nice hot-foots are frequently called "cold"? Let's look inside your engine while it's running and study the glow plug.

A small wire coil shown at left greatly enlarged does all the useful work. An electric current passing through the wire heats it to a red temperature (in the nighborhood of 1200°F.) to assist in starting the engine. This requires a housing with electrically insulated parts, and the whole assembly must withstand considerable heat.

Fuel must be heated to its "ignition temperature" before it will start to burn. Inside the engine cylinder fuel near the glow plug coil is heated, but not enough to ignite at atmospheric pressure. The piston traveling upward traps the fuel mixture and squeezes it together, reducing its ignition temperature. When compression pressure is high enough and the fuel ignition temperature has dropped down to match the glow plug temperature, the fuel mixture ignites and explodes.

Glow plugs can be built so they will ignite fuel at low pressure and are then called "hot plugs." Cold plugs require higher compression to start the explosion. Fuel mixtures also have a large effect on ignition. Plain alcohol and castor oil require a hot plug and high compression. Adding nitrates will reduce the ignition temperature of the fuel and result in explosions at lower compression. The time at which ignition starts is controlled by fuel mixture, engine compression, and glow plug heat. This has a great effect on engine performance.

An engine running at low speed will perform well if the fuel is ignited when the piston is at the top of its stroke. As rpm is increased a condition develops where the fuel is only partly burned when the piston is halfway down on its power stroke and power is lost. To allow time for the fuel to burn it must be ignited before the piston reaches "top dead center." This is called spark advance on the old spark ignition engines. There is one certain ignition timing where an engine develops its best power, and this must be controlled in glow plug operation as well as in spark ignition. A glow plug engine has no spark advance handle but the operator (*Continued on page* 62)



An old Drone Diesel (left) was converted to a variable compression glow plug engine in the initial studies which led to the data contained in this article. High-low fuel level tests were found to give good comparison results and are the type the average modeler can readily duplicate. The photo (above) illustrates a few of the new and old g.p.'s around. Which fits engines best? Cold plugs operate best with 10:1 or higher compression ratio.

OUTSTANDING-

IN EVERY WAY!

Enterprise's "KNOCKOUT"

"½A" SUPER - LIGHT SUPER - STUNT CONTROLINE MODEL

GENUINE "FLITEX" HINGE MATERIAL!

★ 18" WINGSPAN

FOR .030 TO .099 ENGINES

"EXCLUSIVELY ENTERPRISE" HOLLOW-STRUCTED "WONDER-WING"

COMPLETELY SHAPED, CARVED AND HOLLOWED INSIDE AND OUT!

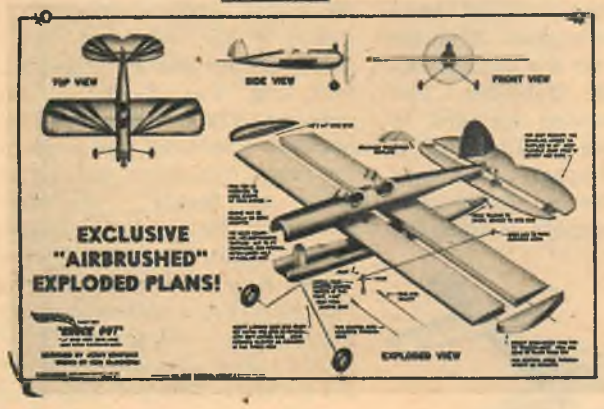
THE "KNOCKOUT" HAS RECEIVED MORE CONGRATULATIONS AND COMMENT, THAN ANY OTHER MODEL ENTERPRISE HAS EVER INTRODUCED. IT HAS BEEN ACCLAIMED FOR ITS COMPLETENESS, EASE OF ASSEMBLY AND WONDERFUL FLYING ABILITY, THANKS TO THE SUPER-LIGHT ALL-HOLLOW EXCLUSIVELY ENTERPRISE "WONDER-WING".

FORMED GEAR! BELLCRANK - RUBBER WHEELS!

DIE-CUT FIREWALL AND TAIL SURFACES!

COLORED DECAL!

ULTRA-MODERN FUSELAGE DESIGN! COMPLETELY SHAPED, CARVED AND HOLLOWED!



- ***SUPER-LIGHT***—selected AAA balsa throughout! it's the only "½A" model with a prefabricated hollow high-lift symmetrical airfoiled wing assuring greater stunting ability!
- ***A REAL BEAUTY***—ultra-modern in design. Special costly equipment enables ENTERPRISE to present a model with new trim lines, combining round and hexagonal sections in the completely finished carved-shaped fuselage!
- ***SUPER-FLYING***—aerodynamic design, coupled with ENTERPRISE workmanship assures you of a stunt model, outflying, outperforming every model in its class! Complete flying instructions, tips and diagrams are included on plans!
- ***"COMPLETELY COMPLETE"***—this amazing-value ENTERPRISE kit includes in its beautiful three-color box such extras as rubber wheels, formed gear, die-cut firewall, balsa parts, colored decals, "airbrushed" exploded plans, bellcrank, hardware and "Flitex" hinge material!

EASY TO BUILD - A PLEASURE TO FLY!

We at Enterprise have worked almost a whole year developing the great new "KNOCKOUT". We predict the "KNOCKOUT" will smash all sales records in 1951, outselling every other gas job in the country.

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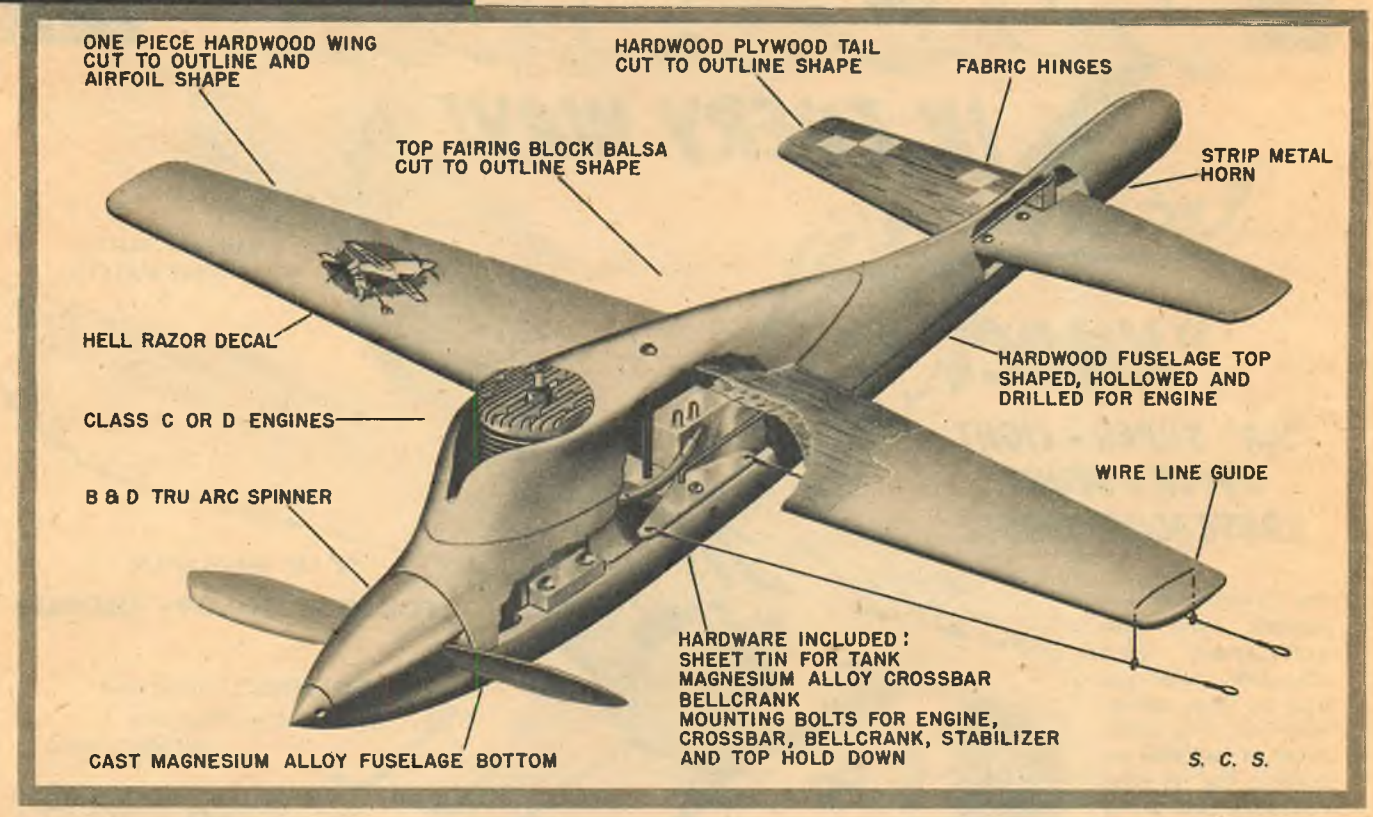


Hell Razor

Aptly named is Consolidated's contribution to speed competition

■ When George Fong made the "fastest time in '49," with the prototype metal-bottomed Hell Razor, the impact of the 159.23 record flight on the speed boys was slightly terrific. It wasn't that the East immediately thought they might take the West in another one of those East-West matches—as well they might. Or that a little-known New York lad pilfered the limelight. The significance lay in Consolidated's intention to kit the metal-bottom wonder plane, taking speed out of the machine-shop class and giving it back to the boys.

Like the times Hell Razors are making all over the country, the kit itself is a fast mover. Depending on the class, these kits are priced from $5.95 to $6.95. That includes a magnesium alloy cast bottom, a carved pine fuselage top, shaped pine wing, shaped balsa fairing block, fuel tank material, die-cut ply tail, B & D Tru-Arc spinner, hardware, and decals. You furnish the pilot and engine. The bottoms cost $2.75 when bought separately for Classes A and B, $2.95 in D. The spinner is an 85c item.

Designwise, the Hell Razor is a unique airplane, as speed jobs go, distinguished by the unusually high wing location with external leads underneath, and the peculiar open-top cooling of the engine. A single flipper is hinged on the outside-of-circle half of the stabilizer. The inside wing is canted forward ⅛ inch to compensate for line pull at high speed, and imparts an inward tendency to its normal flying attitude. General assembly is straight-

forward, the only detailed work being the drilling and tapping of the required holes. Span is 18 inches, slightly less in the smaller classes, the fuselage 17¼ inches long, and weight is 31 ounces. That it is an easy airplane to fly was proved when Freddy Sage, Jr., the six-year-old whiz kid, took firsts with a Hell Razor in both Classes A and B at the Plymouth Internationals.

In the beginning, that key feature, the metal bottom, was not even a gleam in the designer's eye. The first machine had a sugar-pine bottom and was flown at average speeds of 128 to 135 mph. The pine bottoms would not last long enough for tests, vibration starting cracks after 20 flights. Hammered-out aluminum bottoms were considered. At this point, Fong and a few other Model Knights entered early model Hell Razors in a contest at the Flushing Parking Field, the old New York World's Fair Grounds, and George got going at 139 mph. Higher speeds would result, 'twas thought, if the vibration problem could be licked for the new engines coming on the market.

That led to ⅛ inch thick magnesium crutches. These cracked under the motor lugs. Really desperate, the boys tried cast aluminum bottoms. Despite discouragingly high weight, these bottoms got their service testing but developed cracks from hard landings and engine vibration. After some three-shift thinking it (*Continued on page* 67).

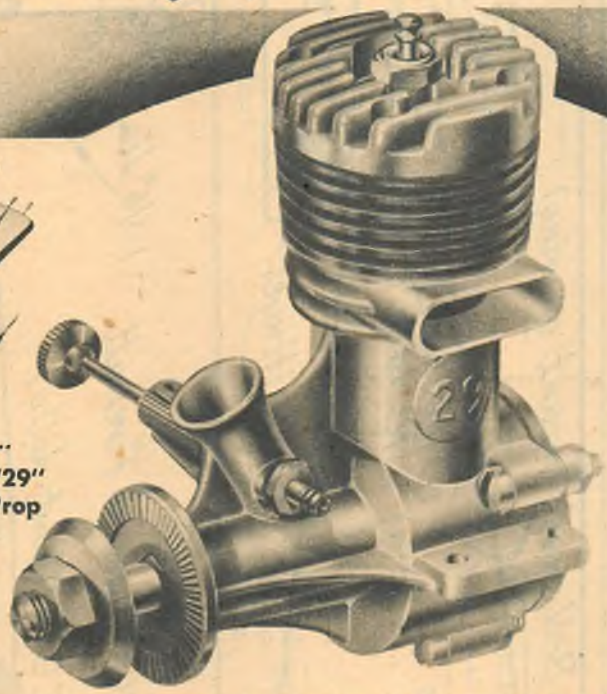
VECO SWEEPS 1950 STUNT CONTESTS

VECO planes win more places than all others combined—including the International Championship

NOW VECO PRESENTS THE RIGHT COMBINATION

of Engine, Plane and Propeller for real stunt flying

Fly VECO Equipment and be a Winner!



For Class B

The "Warrior" with the VECO "29" and VECO 9-7 Prop

For Class B

The "Squaw" with the VECO "29" and VECO 9-7 Prop

VECO "29"—AIR TRAILS' Engine-of-the-Month

For Class C

The "Chief" with the VECO "31" and VECO 9-7 Prop

All VECO stunt planes provided with full span flaps. Patents Applied For.

The Champions Boast from Coast to Coast ®

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HENRY ENGINEERING CO.
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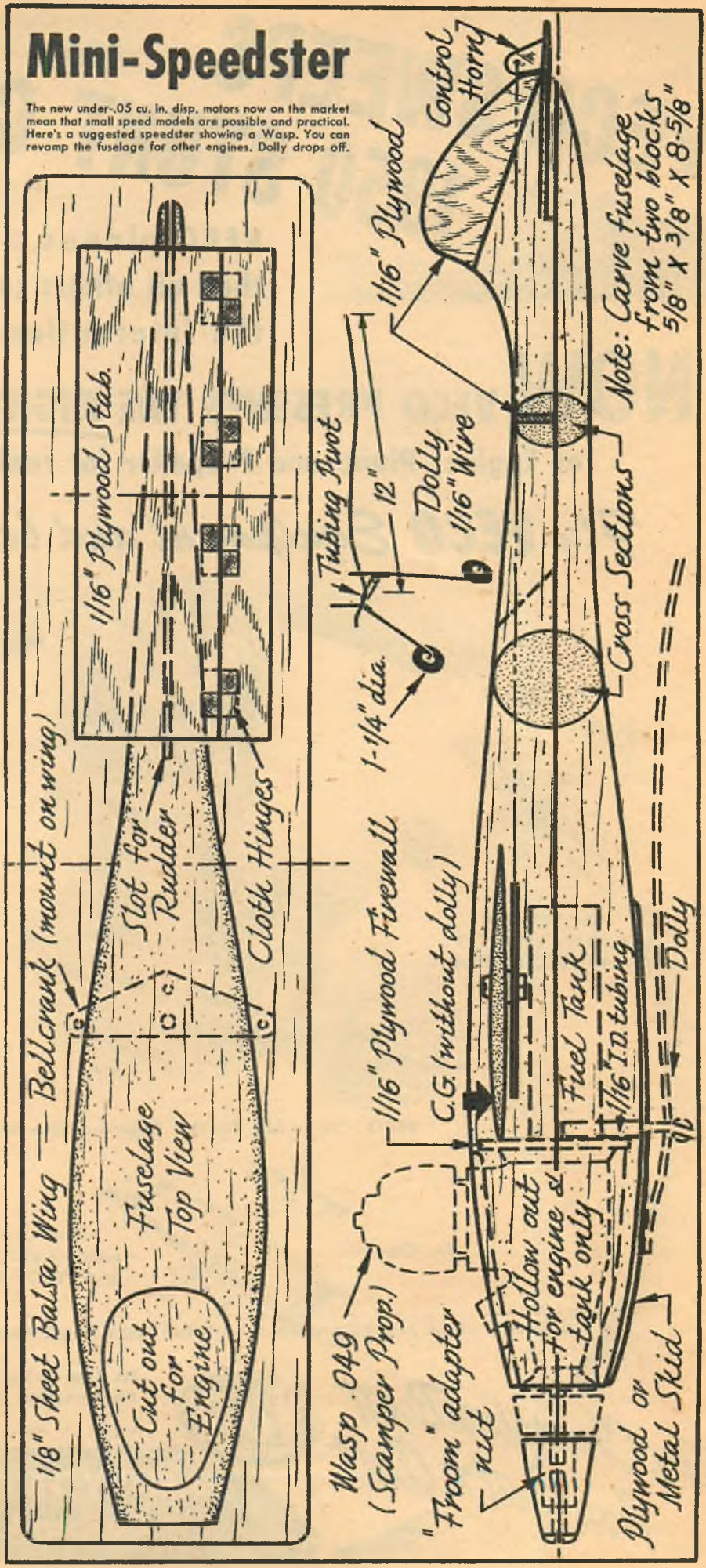
Mini-Speedster

The new under-.05 cu. in. disp. motors now on the market mean that small speed models are possible and practical. Here's a suggested speedster showing a Wasp. You can revamp the fuselage for other engines. Dolly drops off.



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$1.50 ea.

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AIRACOBRA KIT RETURNS!

SHARK-NOSED "WARHAWKS"

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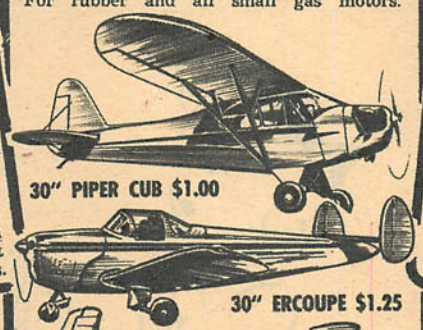
BIG, RUGGED GAS MODELS

Each the best of it's kind — the Playboy's long standing fame grows anew with each altitude grabbing flight. Extremely easy to build. For B&C motors. The Stinson Flying Station Wagon is one of the finest control line kits made. For A B&C motors.

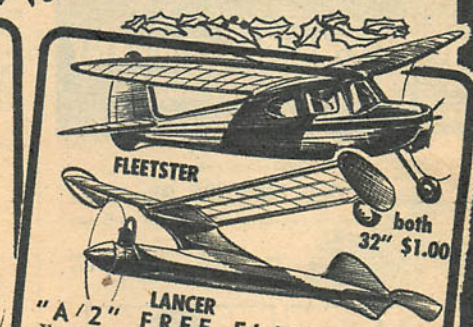
30" MODELS BELOW ARE WORLD'S MOST POPULAR

Modelers love them for their clear plans, simple construction, good materials, realism, and ability to fly higher and longer. For rubber and all small gas motors.



30" PIPER CUB $1.00

30" ERCOUPE $1.25



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"A/2" FREE FLITE KITS

Every line of these contest and sport models has been tailored for maximum flight efficiency. The Fleetster stresses realism, while the Lancer has been simplfied so well it allows beginners to make long flights right away! For gas and CO_2.

"MASTER" KITS—THE BEST!

Two prime examples of the perfect realism achieved when building from "M" (Master) kits. So real that photos of them have fooled experts. Known far and wide as "tops" in authenticity. Can be flown too, and are just right for half-A control.

30" BONANZA $1.25

OTHER 30" MODELS

- STINSON VOYAGER $1.25
- AERONCA CHIEF $1.00
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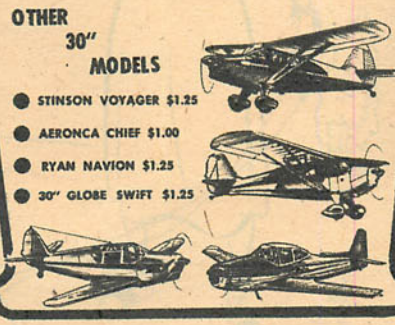

F-38 LIGHTNING $2.25

A/2 CONTROL BEAUTIES!

Each of these twin-motored warplane models have 36" wingspan, and can conveniently take half-A thru B motors for control line flying. Very easy to build. They're the "something different" you want, and they're very reliable. For rubber motors, too.

HOW TO ORDER: See your local hobby dealer first. If he does not have these kits, do not accept substitutes but order direct. Include 25c for pack.-post. (35c West of Rockies, APO's and U. S. Possess.) Min. order $1.00 plus postage. No C.O.D.'s accepted. Special Delivery in U.S.A. only, 35c extra. Foreign countries add 20% for special handling, etc., in addition to 25c pack.-post. charge. (Ohio residents: add 3% sales tax.) **SEND 10c FOR NEW ILLUSTRATED CATALOG**

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Cleveland 2., Ohio U. S. A.

Girl vs. Airplane

(*Continued from page 25*)

I shipped the plane back to the United States on the liner Queen Mary. Just my luck to be sea-sick all the way, but Stinker took the trip extremely well. The words "Little Stinker" appeared on the side of the shipping crate, and from the attention it received you would have thought it was a shipment of gold. When I arrived in New York, I discovered that the company hired at Newark Airport to reassemble the plane misunderstood and thought they were supposed to test-fly it too. In only twenty-four hours over 100 pilots had signed the list wanting to make the test flights. One Air Force colonel spent an entire day trying to talk me into letting him fly it, and finally offered me $100 just to let him fly "Little Stinker" around the pattern one time. But you might know, when lunch time came, he never thought about taking *me* out for a hamburger.

I keep asking myself, "What's that Little Stinker got that I haven't got?" I resort to perfume, fancy hair-dos, the latest in nail polish and clothes styles, but seem to get absolutely no place. And then all Little Stinker has to do is just swish around and spray gas and oil all over people. And they love it!

The crowning blow came during the 1948 National Air Races in Cleveland. Fred Nicole, French Aerobatic Champion from Paris, France, was star of the show. Guess we've all heard what great admirers of the fair sex the French are supposed to be, so my ego went sky high when Fred, who doesn't speak English, was waiting with a broad grin as I taxied in after my exhibition. He helped me out of the airplane making several excited exclamations in French. Then he went tearing around the wing and, to the amazement of everyone, planted a nice big kiss right on Little Stinker's prop spinner. It took great effort on my part to refrain from muttering, "Aw, nuts!" for, as I walked off toward flight operations carrying my own 20-pound chute, he was still fondly patting Stinker's propeller and nose cowling.

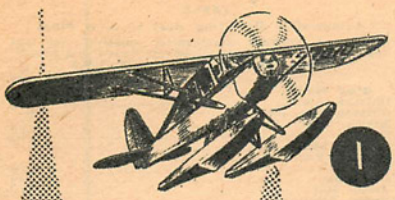
It's surprising how much confusion such a little airplane can cause. Was forced one time to land at Chatham Air Force Base in Savannah, Georgia, due to weather. Almost before the wheels touched down, every man on the base was out on the line. I wandered away from the crowd into the pilots' lounge just in time to hear the base commander storm into Flight Operations next door. "Where is everybody?" he gruffly asked one lone scared corporal who was standing on top of a file cabinet to look out the window at Stinker. "Did that dratted woman pilot cause all this trouble?" The corporal quickly answered, "Oh, no sir, we hadn't even thought about her—it's that cute little airplane everybody wanted to see."

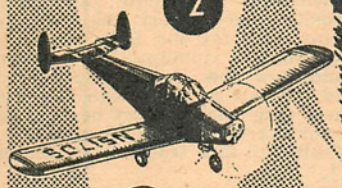
The only time Little Stinker has ever been a *real* stinker was in Oshkosh, Wisconsin, recently. I was practicing inverted passes across the airport from east to west attempting to cut a ribbon strung between two 20-foot poles held by race pilots Bill Brennand and Steve Wittman. On one pass, just as Stinker and I passed under the ribbon, the engine quit! Now this isn't a "there I was on my back" story, but engine failure while flying inverted in the vicinity of 20 feet isn't exactly habit forming. Can't print what I thought of the airplane at that moment, but the 30 seconds that followed brought my stock in Stinker way up again. She is so maneuverable we were able to quickly roll to right-side-up position, make a 90 degree turn, and plop down beside the south runway. Only when we rolled to a dead stop did I take back all the mean things I had said to Stinker and start giving her due praises for so quickly and nicely getting us out of such a mess. We have our little quarrels, but usually make up to be great friends.

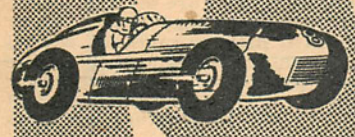
So, it appears I may as well swallow the pride, forget the vanity, and actually enjoy taking the back seat to an airplane. As a last resort, probably the only way I could outdo Stinker anyway would be to completely rebuild the fuselage, making it all plastic around the cockpit and fly in a French bathing suit—even have my doubts that this would work!

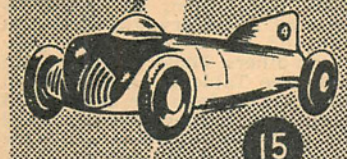
But perhaps Lil' Stinker has a side to

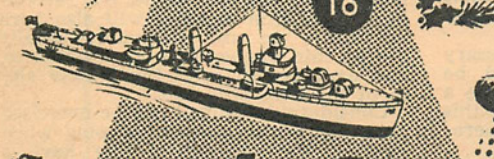
"Don't worry, it's all right—I've been wanting to meet you!"

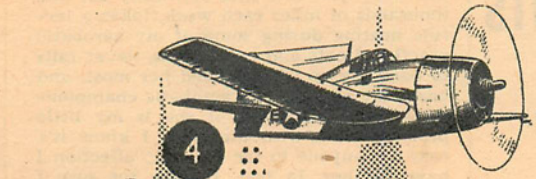


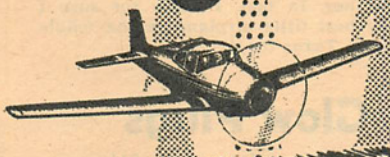


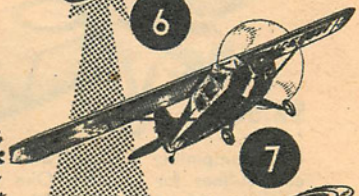


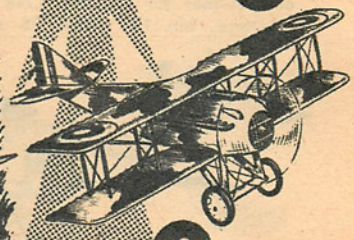


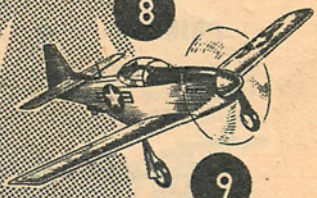


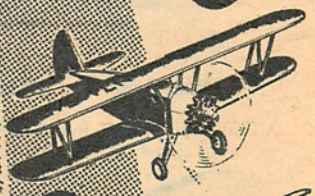


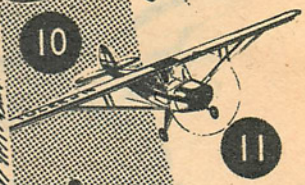


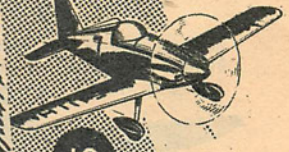


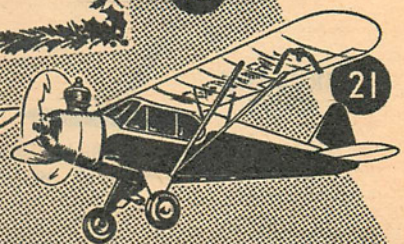


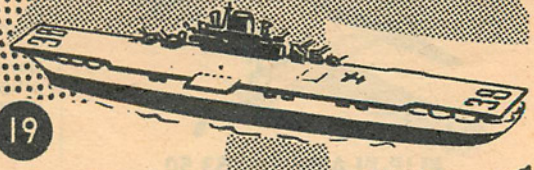












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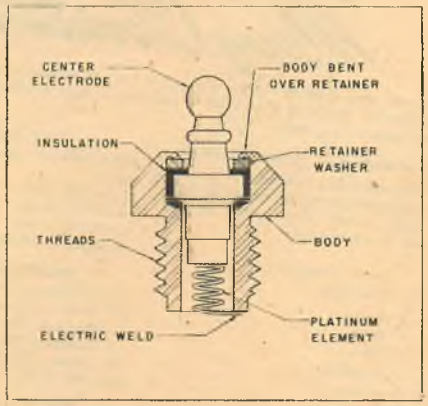
the story too. She flies faithfully for me thousands of miles each week, takes a terrific beating during some of my aerobatic practice flights and exhibitions, never fails to back me up when I need her most, and has made possible two aerobatic championships for us. So even if she is my little problem child with the boys, I know it's easy for anyone to see the deep affection I have for her. In fact, I know for sure I have the *best little airplane in the whole world (and Texas too)!*

Glow Plugs

(Continued from page 54)

can control ignition timing by proper selection of fuel and glow plug for his particular powerplant.

To arrive at a good engine adjustment, start out by selecting a propeller that will give the required engine speed. Higher rpm usually delivers more power but also causes more engine wear, so do not operate too fast unless you're after a world's record in speed. Now try a cold plug and cold fuel for a start. ("Cold" fuel has a low nitrate content, fires less violently on starting, and shows tendency to knock in high compression engines.) If engine sputters and runs unsteadily or not at all, go to a hotter plug. Continue testing hotter combinations till desired performance is obtained. If fuel and plug are too hot, engine will knock and buck, running very unsteadily. This puts unnecessary strain on the engine and should be avoided. If you should decide to use a different propeller, remember that this will change rpm and the plug temperature will also change.



A typical assembly is shown in the drawing. The element in this "sample" plug is electrically welded to the center electrode and then the asbestos insulating washers are slid into position. The complete assembly is next dropped into the plug body and squeezed together by machine. An electric weld at the lower end of the coil completes the plug. Several variations of this arrangement are used. Some plugs are assembled with threads instead of being clenched. Various insulating materials are used

Some more trials should be made to get the correct ignition timing again. Start with cold plugs and fuels and work up toward the hotter combinations. A small propeller, hot fuel, hot plug and a high compression engine usually result in chopped fingers and burnt-out glow plugs.

Engines equipped with a cold plug are sensitive to change in fuel mixture and hot plugs tend to be insensitive. Changes in fuel flow can be measured accurately by lifting the fuel tank up and down with the needle valve in a fixed position, so the test was made by measuring how far the tank could be raised without stopping the engine rich, and how low the tank could be dropped without stopping lean. A well-broken-in ring engine must be used so it will not overheat when running lean. The results of this test are shown in Table I.

TABLE I
Comparative Operating Heat of Glow Plugs
(Does not indicate comparative quality; list was designed to differentiate between "hot" and "cold" plugs. Hottest plugs are at top.)

Glow Plug	Fuel Level Test (in inches)
Ohlsson AA	14½
Ohlsson Economy	14
McCoy (early Duroglo)	13½
Spitfire	13½
Ohlsson Std.	13
Ohlsson Racing	12
O. K.	11½
Champion	11½
Arden Hot	9½
Arden Regular	9
Arden Cold	8
Ohlsson Std. Element pulled out	14
Element pushed in	11½

Comparing the test results with glow plug dimensions shows that no one factor alone determines how hot a plug will operate. Small-diameter wire tends to make a plug hotter. A large-diameter coil cavity in the body results in hotter operation because there is less tendency for surrounding metal to cool the element. Extension of the coil from the plug body also controls operating heat. A Champion plug has a heavy element and should operate cold, but this is offset by extending the elements out past the plug body to a wire bridge.

After all the facts are cooked down, it seems that measurements made under operating conditions are the only way to compare the heat range of glow plugs. In general it may be said that engines having a compression ratio of 10 or more will operate better on colder plugs. Medium (7 to 9) and low compression (4½ to 7) will operate on hot plugs and fuels.

So far our discussion has been limited to how a glow plug performs when the engine is running, but entirely different conditions exist when an engine is being started. A battery is used to heat the coil and some plugs will glow hotter than others. Those having a small wire size (see Table II) draw a small electrical current from the battery and will be dull red. Larger wire sizes (.008 to .010) pull more current and glow bright red. If strong batteries and short large-diameter wire leads are used, the thick element will glow brightest and fire more readily when starting. Weak batteries will reverse this condition because they cannot supply enough power for thick elements.

Plugs having a small diameter wire cause less battery drain and may seem better from the cost angle, but remember that a thin element will also burn out faster in use. Beginners usually prefer thin elements to save batteries, and experts stay with the thicker element for long plug life.

Considerable control can be exercised over the temperature of a plug when starting the engine. If you have a lapped piston engine with good compression seal, it is likely to kick back hard when starting. This may be cured by using long thin battery lead wires. Their resistance reduces current flow to the plug and reduces the temperature. Ring engines are usually leaky when starting and should start better with short heavy leads and a pair of

TABLE II
Glow Plug Specifications

Type	Insulation	Coil Turns	Coil O.D.	Coil Length	Dia. Hole in body	Wire Size	Current Drain Amps.
Arden Std.	Mica & fiber	5	.069	.160	.117	.008	2.6
Arden Hot Rep.	Mica & fiber	5	.072	.190	.110	.008	1.5
Arden Cold Rep.	Mica & fiber	5	.072	.210	.110	.010	3
Champion	Ceramic	5	.073	.140	.157	.010	3.2
McCoy	Asbestos	4	.059	.110	.125	.008	2.2
Ohlsson Std.	Mica	4½	.075	.100	.127	.007	2
Ohlsson Economy	Asbestos	4½	.075	.100	.125	.007	2
Ohlsson AA	Asbestos	4	.080	.090	.127	.0055	1.5
Ohlsson Racing	Asbestos	4½	.075	.100	.126	.007	2
O.K.	Asbestos	4	.068	.095	.110	.006	1.6
Spitfire	Asbestos	4	.061	.100	.118	.008	3

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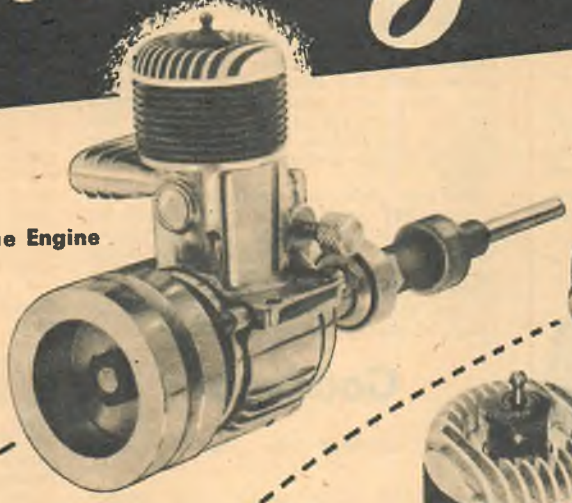

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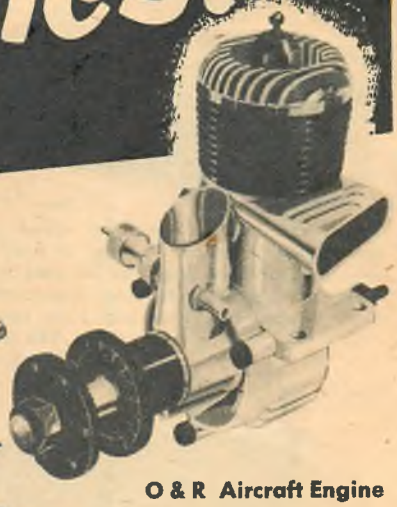

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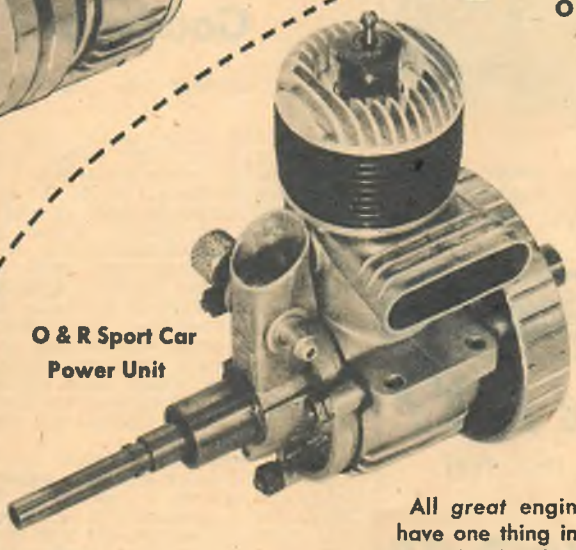

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strong batteries.

Starting troubles also develop when the plug is not properly installed in the engine. A short plug (VG-3) used in an engine designed for a long plug (VG-2) does not extend to the inner surface of the cylinder head. Oil or fuel will run into the mouth of the glow plug hole and stay there due to capillary action. This blanks off the action of the plug and prevents firing when the engine is slightly flooded.

If there is a question about what length plug to use, remove the cylinder head and see which one is flush at the inner surface. Some engines are designed so the plug projects slightly and fuel will run away from the plug rather than toward it. Trouble can also develop when using too long a plug. Placing a long plug in a small engine designed for the short variety may bring it too close to the piston. Oil and fuel on the surface of the piston will foul the plug easily.

For best glow plug performance select a propeller according to the needs of your particular engine and airplane. Start with cold plugs and fuel and work up the list till steady engine performance is obtained. Don't run the engine so hot that it bucks and knocks. Use plugs of correct thread length.

Goodyear

(*Continued from page 27*)

moved the ships inside and begun grooming them with wheelpants and racing props for the job ahead. I glance at a sign in the corner of the hangar, over the Operations desk. It reads, "It's later than you think." A look at my watch shows how true that is. I hurry over to the credentials desk to get myself and crew fixed up with badges and passes. Then I go down to the Technical Committee. They are like an umpire or game warden and, believe me, they have a tough job. Everybody thinks his particular little airplane is just right. It is the job of the Technical Committee to see that all the requirements are met.

Buster has been through this twice before so a quick check, a weight balance and it's set. I check with Operations for a clearance to qualify, grab my chute and helmet, and wait my turn. In a few short minutes I find myself and Buster cruising around the six-pylon, one-and-three-quarter-mile course. This is fun. I've waited months for this. A few trips around the circuit and I signal the timer I am set. I push the throttle to the stop, and for the two required laps go scooting along pylon high. Then the nose of Buster points up and I hurry in to check my speed.

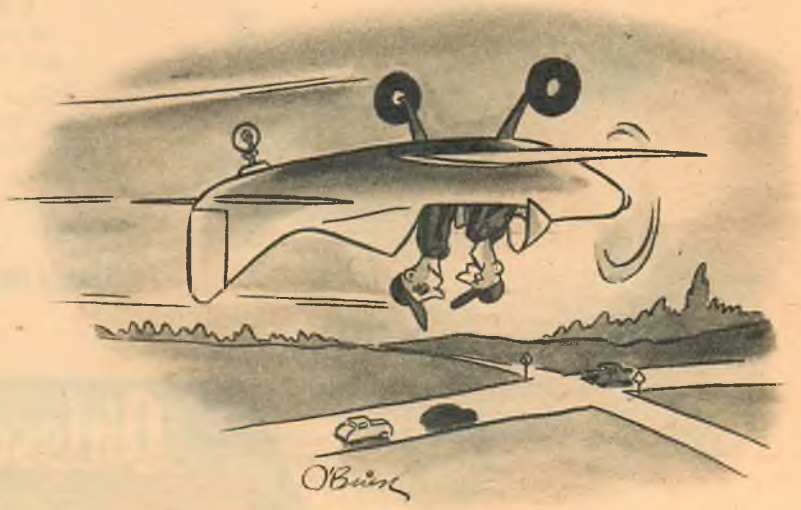
There it is, big and white on the blackboard—174 mph. *Hmmm*, that's not so good. Steve is out now in Bonzo and his time comes in, 176 mph. . . . It's disappointing. We should have done better. What's the matter? That night at the hotel Steve and I get together but come up with no reasonable answer.

The next day we come out prepared for the heat races. I check my opponents, eye up their ships, speed, and weights, and feel confident they will give me no trouble. I'm in the first heat of the day. We tow the ships out to the line. I get in and start up. The flags go down and we're off. For eight laps we go zooming around the course, studying each turn to find the best way of taking it. I slip quickly past the other ships and by the time I get the checkered flag I have lapped every ship but one and have left him far behind. I pull up, around, and land. A motorcycle comes out to escort me to the speaker's stand to say a word to all the good customers. I open the canopy in time to hear the speaker blare out my time of 177.6 mph, the fastest time ever run on a Goodyear course. I feel good now. Little Buster is doing better.

I stroll back to the hangar and see Steve getting set for his heat. We compare notes and I tell him how I feel about the course and what to watch for. I relax a little and then ride out to watch the take-off of Heat No. 2. Steve has the pole position and like me he feels confident of an easy victory. As the flags go down the ship darts ahead and in a few seconds they are on the course. We grab a jeep ride to the home pylon to watch the race. It seems good to see Steve's bright yellow midget far out ahead and rounding the course as if in a groove. The old master is in true form as always.

The pylon judges crouch low as the ships go shooting past. They have their lap pads in one hand and their insurance policy in the other. I step back a few paces myself and comment that the boys are coming mighty close. The pylon judge looks at me and says, "Look who's talking!" The checkered flag goes down and Steve pulls out far ahead of the field. We hurry over to check the speeds. Our eyes pop as the figures go up and the record really goes reeling—184.5 mph, the fastest time ever run on the Goodyear course to this moment! That's more like it. We have the boys talking to themselves now.

When the race results are all in we look them over carefully, and find Steve having pole position for the final event and myself in third position, Sorenson from L.A. between us. He is sort of an unknown quantity. His speed is a half mph faster than mine—but how is his take-off? That will decide it. Steve and I discuss our strategy back at the hotel that night, hoping, dream-



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ing, and wondering what tomorrow will bring. One thing we are pretty sure of is that with my getaway on the take-off anyone who wins will have to get past me.

We find ourselves out early the next morning checking our ships, equipment, and calculating our gas. At six pounds per gallon we don't want to carry any that we don't need. The show gets off on time. At one o'clock the loudspeaker sounds out: "All Goodyear participants get your crews on the ramps." That means there is only one hour before take-off time. We try to relax and take it easy, but that's pretty hard to do before a race. I grab a snack to eat and watch the parade assemble. We always parade past the grandstands, the midgets being towed by the jeeps and followed by the pylons which are mounted on trucks. That's soon over and the ships once more lined up on the big hard surface mat on the field. Mike Murphy, race referee, calls all the pilots together for last-minute details and pictures for the press. We are given wind direction and speed, a final warning about the hazards involved, a few remarks, and that's it.

Now we're beside our ships. The starter walks out front and extends both arms. That means "get ready." I slip on my chute and my shiny red crash helmet and have a few last words with my crew. Tension builds up all along the line. I climb in, buckle my shoulder straps and safety belt, and really pull it down tight. This may be a rough ride and one can't afford to be flying around the cockpit. As the red flag goes up signifying "five minutes to go," I close the canopy. The mechanic snaps the prop through and the 175-pound racing engine starts its steady bark.

I check the gas and magnetos. I keep the engine idling fast to warm up the oil. It's also getting warm inside. The hot engine air going by the side of the cockpit together with the sun beating into the windshield makes you feel like a baked potato. Three minutes to go. I take a quick look around all up and down the line. Everyone tense and anxiously waiting with his eyes glued on the flag man. The gum I am chewing is really taking a beating. The white flag goes up: one minute to go. The flagman starts his crouch. I check my watch and begin to increase the rpm, both on the motor and on my gum. My crew is hanging onto the tail fighting the slipstream. At thirty seconds the flagman starts rising. I swallow hard, still chewing frantically. At five seconds he's up on his toes. I increase the rpm some more and at the last second have full throttle. As the flag starts down the crew lets go.

Buster darts forward like a deer with JATO. Out of the corners of my eyes I check to see no one is crowding me. In about three seconds I am airborne and heading for the pylon. I glance left. I am well ahead of them, and then at the right I see Steve and Sorenson close but I'm still moving away from them. I watch the pylons ahead and count all three of them so as not to cut one. Around the turn and into the straightway, I take another quick glance around for other ships but see none. Then into the next twelve seconds of the straightway, my eyes are set on the next pylon calculating the drift. As I go around the west turn I shoot a look at the shadows on the ground. There's a ship immediately behind me—but who? Maybe it's Steve, maybe not. I work hard and am really busy taking six pylons, over one and three-quarter miles, for one lap all in thirty-four seconds. At just about pylon height or about twenty-feet.

I expected Steve to pass me and wonder why he hasn't. I try to count the laps. At about the fourth one I lose count. I look back and see maybe three ships. The rest are closer, too close to see. I keep down low so no one can get by under me, and take every advantage of my lead position. I know if I make an error of a couple of hundred feet in the whole twenty-one miles, I'll be in about fifth or sixth place. I'm so busy I don't even feel my tired back or the sweat rolling down my face. I've completely forgotten the 150,000 people watching. I'm just eyeing up those turns. Believe me, when it makes a difference of a few thousand dollars if you are a little too close or a little too far away, you really watch them. Errors are costly and sometimes in more than money, and twelve seconds on the straight way isn't very long when you are doing 200 mph just off the ground.

Round and round we go. I glance only occasionally inside the cockpit, and then only for a fraction of a second. Finally as I come out of the west turn I see the checkered flag. It dawns on me that no one has passed me, so I crowd even lower on the final few hundred feet so no one can dive past me. I see the finish line and checkered flag flick past out of the corner of my eye. I think of the turns of the past twelve laps. I know I didn't cut any.

I've won! A feeling of joy shoots through me. I point the nose of Buster toward the sky and then a snappy victory roll as I close the throttle. I laugh and pat Buster on the back and think it's the best airplane that ever flew.

As I come around to land I see the motorcycle coming out for the escort in. I wonder who was second and third and why Steve with the faster ship didn't get by me. I level off over the hard surface runway and concentrate on making a good landing. With our close-fitting wheelpants there's not much room for error. I set down and roll up to the stands. The little racing engine is pretty hot and doesn't want to stop. It's like an oven in that cockpit, too. I open the canopy and the photographers and newsmen take over for a while.

A couple of well-dressed men come up and congratulate me. I don't know who they are but they must be important or they wouldn't be out here. It seems like every photographer in the country is out there and of course there is always one who wants "just one more." Then the radio takes over. C.B.S. comes over and I talk with them for a while. Then I talk on the P.A. system. You have to be careful what you say because it's liable to be in every newspaper in the country tomorrow. How well I know! Finally, I go to Mr. P. W. Litchfield for the trophy presentation. He is an elderly gentleman with white hair. After a few words to the people, things quiet down a little. I talk to all the folks that come up to congratulate me. That is really tough. They all seem to know me and often seem to be long-lost buddies but usually I don't remember having seen them before. I don't know if it's some flunky hanging around or the governor of the state.

I have a big time the rest of the afternoon—talking, laughing, and kidding with everyone and why shouldn't I? This is the event of a lifetime and I might as well take advantage of it because when you aren't winning nobody pays much attention to you. By late afternoon the information sheets are out on the race. I look them over and it's about enough to scare 'most anyone. Steve was about one second behind me and he was third, with Sorenson between us. In fact, the first five places were within two miles an hour of each other. That's just a little over two seconds. With that in mind we will go home and work for the fractions of mph that will go into the winning of another major award.

Hell Razor

(*Continued from page 56*)

was decided to go into magnesium castings on a broad front. A dozen variations in alloys were cast from the same pattern and on the fourth try the Hell Razor looked like it was going to go places. Fong took the original magnesium bottom job to Rye Beach, N. Y., and was clocked at 148 mph, real hot time any place, anytime. The boys were loaded for bear, said bear being the 1949 Internationals.

Atmospheric conditions almost threw them for a loss but the 142 mph time was good enough for first. Then Fong switched to a new fuel formula (now Hell Razor Racing Glo-Fuel), took the ship to a Trenton, N. J., contest and knocked all records galley west. An interesting aspect of these developments was the use of fixed jets, thereby eliminating the well-known disease of *needlevalvitis*, scourge of so many modelers who lose out at contests. Another was the discovery that the Dooling runs best on small diameters and high pitches. Using Hell Razors, the Model Knights have gathered in some 50 trophies.

Remarkable as it is, the story of the Hell Razor pales when you talk about Consolidated and quiet Art Hasselbach. If you think the word Consolidated means a collection of many things, brother, you ain't wrong! It all began in the experimental department at Chance Vought, before that firm moved to the province of Texas. Art was bit by the bug, as they say, and went into the hobby shop business. That was 1938. Expansion-minded Art eyed possibilities of adding to his line of free flight kits, bought Burkard Model Engineering Co., manufacturers at that time of the only giant half-inch scale solids on the market. Having consolidated his position Artie went fishing for new free flight kits and found a couple of real old stand-bys, the always popular Pacer C, a national winner; and the reliable Bay Ridge Mike. So Art bought out the firm of Bay Ridge.

About this time the war was knocking things into a cocked hat. When the Navy took up almost the entire balsa supply for life rafts, Consolidated decided to transform their solids into hardwood but correctly estimated that the carving would have to be done by the manufacturer. Over in Jersey, the Bohsen Propeller Co., who made free flight props, owned a carving machine. So what happened? Art bought the works.

Art's new carving machine quickly became part of the defense industry, grinding out such assorted non-model items as meat-saw handles and bailing scoops for life rafts. Naval Intelligence ordered several types of identification models. No sooner did the war end than Art got back to his knitting. This time the name was Chamberlin. Ed, who had a fuel that ran without ignition. Seeing the implications of this, Art marketed Liquid Dynamite Glow Fuel, and demonstrated it with a Bantam engine in 1946 in Chicago at the Model & Hobby Industry Show. Several engine manufacturers said it would be impossible to promote such a product. Impractical. Will burn out engines, they said. But a certain well-known team of modelers turned the East into an uproar by walking off with $10,000 worth of prizes. Now it can be told! They did it with a regular spark plug and Liquid Dynamite.

There were no glow plugs. Art cooked up one and passed along the dope to engine manufacturers' representatives who speedily put the idea into mass production. With ignition out the window, models getting small and simpler, the profile era was at hand. Consolidated introduced their Super Cinch and Baby Cinch U-control jobs. Speed flying was coming into its own, speeds jumping from 115 mph to 140 mph, as the experts caught wise to the glow plug and glow fuels. Like a lot of other people, Hasselbach had a yen to make something to

(*Continued on page 77*)

Veco 29

(*Continued from page 52*)

flying. Before building a ship, test your engine on a block, or you may select a plane too small and wind up with an overpowered model.

The manufacturer makes the statement that the Veco engines have been designed for minimum fuel consumption. The Veco ran four minutes, while a reference engine, also a .29, ran only two and one-half minutes on the same amount of fuel. Another feature not mentioned by the manufacturer is the ability to produce full power on the cheaper grades of fuel containing less nitrates. Many engines now on the market have a compression ratio of between six and seven to one, and perform best on fuels costing approximately $1.50 per quart.

The Veco, with a compression ratio of eight and one-half to one, will drop only 200 rpm when switching from these high priced mixtures to a fuel costing $1.00 a quart. Most engines drop 1,000 rpm or more when a cheaper fuel mixture is used. Make certain any fuel you choose has sufficient lubrication, and the difference in price is due to smaller amounts of nitrated material.

High compression in both the head and base results in very constant power. The fuel level test shows eleven inches without great loss of power, and a maximum of thirteen inches without stopping the engine, the highest recorded during these engine tests. Stunt flyers should get exceptionally consistent power during stunt maneuvers according to these figures.

With high compression and a good piston seal the Veco 29 has a real "kick." A glove is recommended for the first one-half hour and you may have to pull the propeller past compression against the explosion to get it started. After three hours of running time the test engine became limber enough to start easily by hand. A light prime in the exhaust and a few drops in the intake will make the engine kick back. Three hours of running at 10,300 rpm made the test engine limber enough to run on a lean needle valve setting and the rpm tests were started. After running tests listed under "Performance Data," several speed props such as a 7/9 were put on the engine for test. High compression and a tight seal caused the engine to kick back enough to break these props before starting, so top speed was recorded on an 8/6 sport type propeller.

Performance. Bare weight: 7.05 oz. Propeller—Veco 10/6: 10300 rpm. Veco 9/7: 10900 rpm. 9/6 wood: 11800 rpm. 8/8 wood: 12400 rpm. 8/6 wood: 15000 rpm. Fuel: hot mixture not required for max. power. Fuel level test: 11" for good power—13" max.

Design Data. Displacement: .299 cu. in. Class: "B". Stroke: .724 in. Bore: .725 in. Stroke bore ratio: 1.0. Compression ratio head: 8.5. Compression ratio base: 1.47. Port area intake—.049 sq. in. Bypass: .032 sq. in. Exhaust: .104 sq. in. Ignition: short glow plug.

Construction Features. Bearings — crankshaft: bronze. Crank pin: aluminum. Wrist pin: aluminum. Head and cylinder held to base by same bolts.

Veco 29 Parts Illustrated

Part	Material	Size (in.)	Wt. (oz.)
1. Base	Alum. casting	.....	1.54
2. Back cover plate	Alum. casting	1.085 dia.	.24
3. Glow plug	Steel body	¼-32 thread	.11
4. Cylinder	Steel	.7529 Bore x 1 5/16 long	1.82
5. Piston	Cast iron	.7254 Dia. x .740 long	.35
6. Wrist Pin	Steel-alum. pad	.129 dia.	.04
7. Connecting Rod	Forged alum.	1⅜ long	.09
8. Bolts, back cover	Steel	4-40 x 5/8 long	.13
9. Head Bolts	Steel	4-40 x 1" long	.16
10. Crankshaft	Steel, ground Crankpin	.375 dia. .2178	1.18
Drive washer	Steel	1.0 dia	.32
Front washer	Steel	7/8 dia.	.18
Nut	Steel	¼-28 N.F.	.10
11. Needle valve ass'y	Brass & steel	8-40	.26
12. Cylinder head	Alum. casting	1⅜ dia.	.53
			7.05

Ultra-Lights

(*Continued from page 31*)

1000 c.c. of cylinder capacity as are automobile engines and hence appear lower than they actually are by the modern system of rating aircraft engines today (as developing so much brake horsepower at cruising speed). A modern English lightplane engine rated in the old manner at 18 hp is now rated at 37 hp. In like manner the Bristol Cherub engine used to power that early Parnell Pixie, rated at 16 hp. under the old system, is currently rated at 32 bhp. —still a tiny power-package to carry two people.

Bogged down by the war and the lack of new designs, this ultra-light plane flying has been revived with a bang by the man who saw that little Heath those twenty years ago. Mr. Clegg, convinced that you should be able to fly and still eat, and perhaps even raise a family, decided in 1946 that the time was ripe to start organizing airmen who believed in the really low horsepower plane for the average man. Soon the Ultra Light Aircraft Association came into being.

The purpose of the ULAA is not that of a flying club in the general sense of the word "club." It is more an organization to bring flying at a reasonable rate to the average man through active local groups dedicated to the design, construction and flying of really low-powered home-constructed aircraft.

The membership now stands close to one thousand and is growing by leaps and bounds with a potential membership of upwards of 30,000. There are two classifications: Individual Members, those interested in the future of "ultra-lights" while not being necessarily pilots or aircraft designers themselves; and Group Members, active participants in local group activities formed to operate ultra-light aircraft on a "joint ownership and nonprofit-making basis." Already eleven such active Groups are formed and operating and several more are about ready to start operations.

The ex-service pilots now flying the ultra-lights are among the most enthusiastic members and agree that they offer real sport flying in the true sense of the word even though it has been noticed that some of the ex-heavy-aircraft jockies are a bit "ham-handed" when they first begin to fly the ULAA type of Spitfires and Sunderlands. On the other hand, many glider pilots have experienced no trouble at all going solo in one ULAA type without any previous dual instruction on power planes at all.

The ULAA airplane must have an "all-up" weight not exceeding 1,200 lbs.; its engine must not be more than 75 brake horsepower and stalling speed must not exceed 40 mph. As quite a variety of aircraft could come under the above definition of an ultra-light aircraft, the ULAA found it necessary to divide the type into four classes.

Class 1. This includes rather high-performance types such as the Chilton monoplane. Class 1 aircraft have high aerodynamic efficiency, a wing loading as high as stall characteristics will allow (from 7 to 10 lbs. per square foot); low to moderate power loadings (12 to 15 lbs. per bhp) and are powered with engines about 40 to the maximum permitted 75 bhp, have excellent maneuverability and are easy to fly for the

"Those automatic pilots are wonderful things, aren't they?"

more experienced ULAA members.

Class 2. This group includes the general purpose ULAA type aircraft. The Luton Minor and the Tipsy Junior are in this category, made up of aircraft of orthodox layout, simple and "robust" in design. In Class 2 some of the aerodynamic efficiency of the design is sacrificed to permit cheaper and easier construction and maintenance. Safety is *not* endangered in this cheapening; it's merely that the finer points of design, construction and fittings which usually add a few dollars here and there have been "detoured" for the sake of the price tag. The wing loading is moderate (about 6 lbs. per square foot), power loading is also down (about 15 lbs. per bhp) and the powerplants in this class will run about 40-50 bhp. The cruising speeds of this group of aircraft will run about 70 to 90 mph, with a stalling speed of 35 mph. They will retain fair maneuverability, "viceless flying characteristics," are designed for good control at low speeds. This class is suitable for the average or novice pilot.

Class 3. This is the real motor-glider type. The design is as simple and yet rugged as possible. They have glider wing loadings (running around 5 lbs. per square foot) and will to some extent retain the general flight and glide characteristics of a secondary glider when the engine is shut off in flight. The Class 3 aircraft is really powered aircraft regardless of its "dead motor" glider characteristics. Power loading is higher than in Class 2, running from 20 to 25 lbs. per bhp, with the engines of from 20 to 30 bhp designated for Class 3. With these engines the cruising speed of course drops to the 55 to 65 mph range, with a stalling speed of 30 mph. They still have moderate maneuverability, good flight characteristics and good low speed control. A typical postwar Class 3 motor-glider is the Slingsby Motor-Tutor which has been developed from the Tutor secondary glider used by the British Air Training Corps.

The final ULAA classification, Class 4, seems to us the most interesting. This is really the auxiliary-powered sailplane type of aircraft. These are practically conventional high-performance sailplanes with some sort of small retractable powerplant installed. The engines will develop about 10 bhp and will normally be used for take-off and climb to soaring altitudes and for cruising in search of thermals for soaring, or for getting back home again after the soaring conditions die out. The cruising speed under full power will be about 40 mph—amply sufficient to take you to another soaring ridge. Performance with engine retracted will still be nearly equal to that of the best sailplanes. Wing loadings will be in the 3 to 3½ lbs. per square foot class.

British home-built aircraft have been handicapped by regulations stemming from several fatal crashes just before 1939. Some of those were the result of considerable freedom permitted the "basement-builders" of aircraft prior to the period of crashes. As a result, home-designed and built aircraft and their flying were stopped till August of 1947. At that time the ULAA persuaded the government to permit the flying once more of prewar ultra-light aircraft following inspection, and the designing and building of new ultra-light types provided they met and passed special design requirements and continual examinations during the actual construction, under a special category Certificate of Airworthiness to cover home-built ultra-light aircraft in the future.

This special Certificate insists that the designs be approved by the ULAA Design Team and that frequent inspections be made during the actual construction and assembly. Once the designs have been approved they will be made available to all members for their own Group undertakings. The inspection of the designs and construction is carried out by expert ULAA members who volunteer for the work and keep check on all craft being built in their areas.

The cutting down of the cost of flying the ULAA way is the main project aim of the "Clegg plan," and it is doing it. For example, the ultra-lights can be flown for as low as $4 an hour or less. With a Group working together to get the maximum utilization from a ship of the Tipsy "Junior" type, let us say, the cost per hour can be batted down to around a little over $2.50 an hour.

The Ultra Light Aircraft Association firmly believes that home construction, whether from raw materials or from semi-prefabricated kits, is the only way to provide cheap flying for the average airman—or at least until the ultra-light aircraft movement becomes so strong and popular that some manufacturer will find it good business to set up production lines of these cheap low-powered planes. The Fairey Junior and the Slingsby Motor-Tutor have been so designed, as has another Class 2 ship (the Britten-Norman BN-1F soon to be marketed in kit form, as soon as the prototype has passed its flight trials). Another well-known aircraft manufacturer is bringing out a kit for a Class 2 type that will sell for under $500, less engine. That "less engine" has been the problem!

The main bottleneck to the present time has been the lack of reliable low-horsepower engines but it looks now as though this has been remedied. The ULAA has recently secured a whole batch of new J.A.P. (for J. A. Prestwitch) engines as used in the Tipsy Junior, plus spare parts, together with the manufacturing rights. As a result they will be offered to the membership for about $200 each. This combination with low-priced kits will enable a group to produce a certified ultra-light for under $1,000, which will get a lot of member pilots into the air cheaply and safely. Another engine coming along is the 25 bhp Coventry-Victor.

Perhaps eventually our own CAA will set up a special certificate for home-constructed aircraft that meet and pass special requirements, or will encourage one of our many efficient "light" aircraft manufacturers to see the light and turn out some really *light* planes so that we can afford to fly for the fun of it.

Little Twister

(*Continued from page* 40)

inch border; moisten in water, then apply each section, smoothing it out as you go along. It will adhere to the framework; when all the wrinkles have been removed the excess covering is trimmed off. With thick dope go around the edges and tack them down. This is repeated until the model is completely covered. Now thinned-out dope is brushed on. Fuel-proof all surfaces where the fuel will hit. An eye dropper can be used as a fuel tank if you use a different engine than we did.

Before flying be sure the wings are not warped. Glide the model to be certain it glides to the left when viewed from the rear. It should be on the verge of a stall. With this turn and slight stall the model under power will speed up. The result will be a half-loop-and-circle climb and a stall in the glide. Now add a little more tilt to the stabilizer to eliminate the stall. Be sure that the nose is not below the horizontal as that produces a spiral dive. To keep the nose up it may be necessary to add weight to the tail. At this stage in the adjustment procedure the model will start to turn in one direction in the climb, then switch over to another. Add a little side thrust to get the ship to pull over opposite to the glide turn until a smooth circle is obtained. Then the model will be climbing at its best.

$HP = K(vel)^3$

or

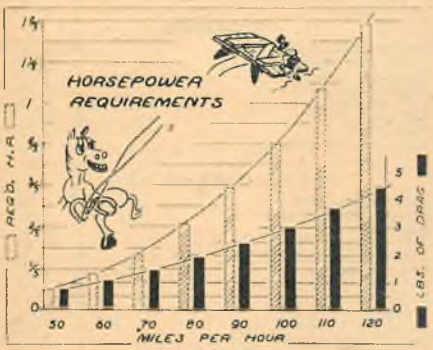
Who's draggin' his feet?

THEY say the first hundred years are the hardest, but when you're talking about mph, brother, they get even tougher over 100. Check the graph on our newest brainchild, the Super Snail, and you'll see what we mean. The Snail has only ¾ lb. of drag at 50 mph. But at 100, the resistance climbs to 3 lbs.—doubling the speed results in 4 times the drag.

If you think that's bad, look at the power requirement curve: it goes up faster than a contest director's blood pressure.

Back at 50 mph, 1/10 hp was required from our powerplant, the "Faltering 49." to overcome the ¾ lb. of drag. But at 100, the engine does 4 times as much anti-drag work every lap and does it in *half* the time. For this reason, stepping from 50 to 100 requires 8 times the power: a jump from 1/10 to 8/10 horsepower.

The picture looks just as black from any angle. Suppose our "49" churns out 8/10 hp and our Snail clocks 100.



Now suppose a hot new fuel boosts the power to a full 1 hp. A check of the chart shows that this fat 20% power bonus is burned up producing a slim 106 mph—20% more power and only 6% more speed.

Stated mathematically: Drag is proportional to the *square* of the speed and required horsepower is proportional to the *cube* of the speed.

Spelled backwards, the law is equally discouraging—cutting drag seems just as hopeless as hiking horsepower. Last year the Snail clocked a 70 mph top speed. This year we cleverly reduced the drag to ½ its former value by hacking away one wing, stab, and landing gear. "Half the airplane—half the drag—twice the speed," we said.

Actually, the 50% drop in resistance boosted the speed to only 88 mph instead of the expected 140. To hit 140, the Snail would have to be whittled down to ⅛ of its 70-mph drag!

But wipe away that tear, sonny boy. And someday your ole Uncle Paul will tell you the story of "How To Whip So Nobody Can Tell."

—Paul McIlrath

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Job: Maintenance

(*Continued from page* 35)

plugs. For good measure, he looked over the right main landing gear, where a trace of oil suggested a leak, and actually did find the retract strut leaking. He replaced the strut. As customary, next he ran up the engine. Normal. Plane returned to service with a delay of only 105 minutes.

Jog your memory back a few years, and likely you'll remember a commonly accepted fallacy that said, "Lightning never strikes an airplane in flight." Cliff knows how untrue that old belief is: he has had electricity-struck planes come home to roost more than once. He'd tell you especially of one that carried a trouble report reading: "HF transmitter and receiver out. Suspect antenna trouble."

He scratched his head, began to search his experience for a clue. What first to do? Start outside, by inspecting the antenna. Investigation showed lightning had struck on both the HF antenna and the rudder. The antenna was broken halfway between the mast and insulator. Lightning also had burned two small spots through the insulator. For good measure, the bolt had chewed a hole a half-inch across in the right side of the rudder and scorched the left side. To say nothing of a burn slightly forward of the trailing edge.

Cliff consulted his inevitable manual for repair instruction. The book gave him detailed instructions, including one sticker: "Not more than two ounces of material may be used." More weight, he realized, might unbalance the rudder, leading to dangerous vibration. He trotted to the stockroom, where he picked up the needed materials. Then, he repaired the rib by using very thin 24-ST aluminum doubler with flanges extending five inches each side of the damage. He attached the material with 3/32" rivets ⅜-inch on center. Very important, those specifications. Very important, too, the weight: 1¾ ounces.

Note to CAA: Cliff not only kept within limits, but he can prove the weight. Prior to making the attachment, he weighed it on nearby post office scales—with a witness. You'd find the weighing-in procedure attested in his report. He's not only a careful workman. He makes certain he can document the finished job, for the protection of both his airline and himself.

Once Cliff might have taken three hours to locate the cause of trouble when a prop refused to come out of reverse after landing. Now he thinks he's slow if he doesn't complete the job in 10 minutes. That's because formerly he would start tracing the trouble from the cockpit. Now he knows from experience it's likely one of three things: sticking relays, dirty commutator, or broken lugs on the end of electrical wiring.

No matter what job he tackles, he consults the book. "If the book says tighten a wrench with the left hand, I'd better use the left hand," he explains. "There's a good reason!" The rules are built up week by week to meet the changing requirements.

Many troubles arose when the DC-6 first arrived. Each required repair time. Hector Raymond, United Air Line's chief mechanic at Los Angeles International Airport, sought a way to eliminate the time-consuming trouble tracing. He thumbed through the reports. Shortly he glimpsed a solution. He briefed the 20 most common "gripes" on the plane's structure, 10 on the engine, three on the props. He also broke down the airplane by systems: engine, prop and governor; heating and supercharging; hydraulics; electrical and fuel system. Systematizing now makes this big plane a fairly simple structure.

Soon Cliff will be directing his talents toward inevitable repairs on the Boeing 377, an even bigger and more powerful liner. Right now he is mastering its complexities in the same manner, from system to specific assembly.

These engineer-mechanics might be considered unsung workers of the airlines. Yet their responsibilities bring them almost directly under the CAA's scrutinizing eye. Cliff's reports, covering even the most insignificant repair, move via several copies to the superintendent of line maintenance, the engineering base manager, the maintenance base manager, superintendent of service engineering and the station manager. If a new trouble has developed, engineering sets in motion a research program to eliminate same. Basing its decision upon Cliff's reports and others like it, CAA can ground every plane of that class on the line.

Being both well-trained in school and well-schooled under supervision, Cliff willingly tackles any job when a plane rolls up to his repair station at an intermediate port. At a major overhaul base,

BILL HUTCHISON

he may become a specialist. From the time the pilot cuts the engine, the plane belongs to ground operations—and that means Cliff and hundreds of other experts like him. He's not expected to be an average mechanic, working merely for the pay his grade calls for, either. In the locker room where he eats lunch, he sees every day a sign reading: "Take a good look at your job and see where it can be improved—then suggest your ideas." That way lies advancement.

When Cliff first asked for a job, he was led out to a DC-4. "Here's the landing gear, and here's a bolt," he was told. "How do you remove the bolt?" Simple request, and a simple job, yet in a few minutes Cliff showed whether he really understood how to extract that single threaded member. Not until then was he asked about his school experience, how much experience he had had on four-engine aircraft. Naturally he had presented his A & E certificate earlier.

Cliff has no way of knowing what sums he is saving his airline through the efficiency of his work, but they are considerable. Take engines, for example. Better engines account in part for the lengthening period between inspections and overhauls. More reliable work by the maintenance gangs is also part of the explanation. In six years, major overhaul period has increased from 600 to 1,300 hours. Cliff follows his book, and knows exactly what to do when an ailing engine comes in. An electrical tach magneto isn't working. Once he would shoot a stiff dose of Pyrene into the assembly to wash out excess oil. But mags began to fail more quickly. Now the book tells him to replace the mag with one furnished by the overhaul base.

It's guys like Cliff who recognize threatened disaster, and do something intelligent about it. He looked up one night at a few drops of moisture on the lower side of a main gas tank on a DC-4. Had gas been pouring down in a torrent two feet farther along, the plane could have been flown safely. But Cliff knew of two similar cases. Leaks in that particular location meant the possibility of a crack in the main spar. "Only one thing to do," he reported to his lead man. "Remove the gas, and ferry this job to major overhaul." No passenger rode that plane until the cracked spar had been repaired.

Cliff is something of a wizard at his job. He's come along fast for two reasons: he learned the basic mechanics of airplane and engine repair in school. He has seized every opportunity to learn in detail the airplanes on which he works. And he keeps one eye cocked on the next job. One of these days he will get the nod, and become a lead man. After that, it's strictly up to him.

Hell Razor

(*Continued from page 67*)

go 150 mph or better. This, of course, took a lot of doing, as witness the Hell Razor.

Innovations always meet with considerable sales resistance. But when the new is accepted, the consumer falls over himself trying to beat the line. At first, many modelers raised a snooty eyebrow over the magnesium bottom shells. Too heavy, was the learned opinion. Consolidated, meanwhile, had made some tests that indicated they could get good circular flight with a Class D model on .016 wires with a weight of 30 to 32 ounces.

Hasselbach credits George Fong with a very able assist in perfecting the Hell Razor. George, who was studying electrical engineering at C.C.N.Y., became fascinated with model airplanes. Quicker than the time it takes a Hell Razor to zip around the circle, Fong found himself studying aeronautical engineering at N.Y.U. His studies of chemistry and aerodynamics counted in the development of the airplane. It pays to do your homework.

GOOD ADVICE

From One Model Builder to Another

Whenever model airplane enthusiasts get together the conversation eventually gets around to such subjects as "Did you see the latest Air Trails? Frank Ehling claims that the best climb for a free flight job . . ." or "According to 'Red' Reinhardt you can win any stunt event these days with a smaller size ship. That model of his in Air Trails . . ." Those who have been building and flying model planes for any length of time know what we mean when we say that Air Trails is the leading air-modeling magazine. If you like to build from magazine plans, AT has the best. If you're a kit man, you'll find AT's "Model & Motor of the Month" and its "Showcase" department of special interest. There's lots of good reading ahead in the issues to come. We hope you won't miss a single copy. Join America's leading modelers—subscribe today.

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Bellanca

(*Continued from page 44*)

positions as shown), and a further ⅛" square about two-thirds chord point. This also is shown in detail. On the bottom surface, almost directly beneath this last piece, is a short piece of ⅛" square that does not extend beyond the root rib on either side.

The landing gear is really part of the wing, bent as shown. A piece of hard ⅛" x ¼" is inserted in the wing against the inner side of the appropriate wing rib (see top view wing); another short spar of ⅛" sheet (see front view wing) extends from the root rib out to this landing gear attachment rib; on the top view it may be seen between the top and botttom wing spars. The 1/16" x ¼" balsa pieces are placed to either side of the landing gear attachment rib as show on the top view.

The prop is a standard contest type. A freewheeler is used and five turns of a Jasco spring (or a light spring from your hardware dealer) is inserted between hub and nose block with a washer at either end. A ¾" wood screw is the stop. Divide the motor into three portions and braid. First, loop the end of the motor over a large nail. Draw out to three times its length each of the three portions and wind in about 20 winder turns. Slide a clothespin—the snap type won't slip—through the outer end of each stretched-out and partially wound portion. Proceed to braid and have a helper slide the braids along smoothly toward the opposite end of the motor, but not forcing them tight.

It is suggested that, before balancing the prop, the freewheeler or other metal parts be added first to the light blade. Usually, minor balancing remains after that. Cut the blades fairly heavy for strength. Use two coats of wood filler or sanding sealer followed by three coats of clear dope. Be sure wood holes are drilled oversize to permit easy freewheeling.

Covering is left to the builder. Some prefer rubber model tissue but good results and a durable machine result only from the use of Sky Sail. Wet cover if possible. First dope the structure to prevent warping of edges, and lay the wet tissue briefly between the folds of a towel to sop up excess moisture. Wet covering is faster, easier, and neater. Give the finished covering two coats of dope thinned half and half, then follow up with a third coat of the same mixture to which three drops of castor oil per ounce have been added. Run grain chordwise to avoid hooking down trailing edges.

While the Bellanca is not difficult to adjust it is imperative that it be lined up accurately and be without a warp. If you have a slight wash-in in the left wing tip, let it stand, but remove any other warp by softening the tissue with thinner, or by steaming, and then holding the surface at the proper angle until the tissue pulls tight again. If the warp is bad, twist the surface in the opposite direction in the hope the two will cancel out.

While the "Bellanca" will turn in spectacular flights it must be flown as described; the fact that low wings often behave badly is the result of trying to make them do what is impossible for them. In general, low wings should not be flown to the right. Trimmed one way, this one would not fly regardless of the method of adjustment. But trimmed another it flies quite reliably.

The big error in adjusting the low-wing semi-scale is to correct for tail heaviness by increasing the stabilizer angle, decreasing the wing angle, or by any means reducing

the decalage, which is the difference in angle between the two surfaces. It is necessary to purposely trim the ship tail heavy by the rigging of these surfaces, then to bring the C.G. into the proper position with lead ballast in the nose.

This method of adjusting insures that at high speeds the low wing will not dig under. In the beginning this ship would dive spirally into the left once the ship had stalled; if it didn't stall it would also come into the left but at a very shallow angle at high speed. When properly trimmed, the airplane climbs steadily and, if stalled, will recover from the left turn that results.

Be certain that there is at least 3/32" negative in the stabilizer. Use rubber-tired wheels to help bring the C.G. forward and down. No right thrust was used but we had purposely softened the tissue of the left wing tip with thinner and worked in slight wash-in, always good practice for the wing on the inside of the turn.

Make your usual hand glides. Don't worry about the gear, it is exceedingly whippy. The wing will come askew if you hit it. When satisfied that you have enough weight in the nose for a smooth glide, try about 50 power turns, over grass if possible. Add ten turns at a time. The ship should develop a slight stall tendency under power, so begin to add the remaining downthrust. Good flights should result. If the turn tends to tighten, add a trifle right thrust but not enough to make the ship go straight or to the right.

Dolphin

(*Continued from page* 50)

fuselage sides. Install the control rod now.

Construct the wings one panel at a time as follows: Cut the ribs from 3/32" sheet balsa and cut the space for the joiners on those ribs that require it. Pin the ribs of one panel directly over the plans and add the joiners, leading and trailing edges and tips, cementing all components well. When dry remove from the workbench and repeat the procedure for the opposite panel. Install the ¼" balsa strut foundations. Block up the wing panel which has already been cemented to the joiners in order not to disturb the panel under construction. Both wings are identical in construction. The framework should be well sanded and all joints recemented. They are then covered with light weight Silkspan, with a mixture of cement and dope used as the adhesive. The wings are watered and given three heavy coats of clear dope. Cement the lower wing to the fuselage.

Bill of Materials—Sopwith Dolphin

Fuselage. 1 ⅛" x 3" x 36" hard balsa, sides, bulkheads & bottom. 1 1" x 2" x 21" soft balsa, nose and top. 1 1/16" music wire, 24" long, landing gear & skid. 1 1/16" music wire, 18" long, control rod. 1 ⅛" x 2" x 5" plywood, firewall bulkhead & landing gear support. 2 ¼" x ⅝" x 4" hardwood, engine mounts. 1 ⅜" x ½" x 2" hardwood, bellcrank mount. 1 1/16" x 2½" x 1" dural, bellcrank.

Wings. 2 ½" x ¾" x 36" medium balsa, leading edge. 2 3/16" x 1" x 36" medium balsa, trailing edge. 1 ¼" x 2" x 6" medium balsa, root ribs & strut supports. 1 ⅛" x 1½" x 11" plywood, joiners. 1 3/32" x 2" x 36" medium balsa, ribs. 1 ½" x 2" x 8" soft balsa, tips. 1 3/32" x 5/16" x 45" hardwood, struts.

Empennage. 1 ⅛" x 2" x 36" balsa, tail surfaces. 1 ⅛" x ⅛" x 11" hardwood, joiner. 1 control horn (commercial).

Miscellaneous. 2 ⅜" Veco wheels, cement, clear dope, colored dope, fuel proofer, (Comet), Trim-Film, bolts, screws, fuel tank, Silkspan, (heavy) dowel, thread, celluloid, aluminum hair curlers, wood filler, brushes, sandpaper, rubbing compound, crinoline.

Bend the landing gear to shape and bind the joints with soft, fine wire. We use florist's wire, purchased at the dime store. Solder all joints securely. Bind the landing gear with strong button or carpet thread to the fuselage supports and apply several coats of cement.

At this time the cabane struts are firmly cemented to the fuselage sides. Notch the top of the struts to fit the wing joiners. The struts must be spaced the same distance as between the wing joiners.

Use soft balsa for fuselage fairing top and nose blocks. Cement lightly to fuselage. The ⅛" sheet bottom is securely cemented in place. When dry the fuselage is carved to shape following the fuselage sections shown. Sand smooth and cut off the blocks.

Hollow to the lines indicated and then recement to the fuselage. Sand the fuselage and add the fin and rudder; offset the rudder. Cut holes required for needle valve, propeller shaft and cylinder head.

Apply three coats of wood filler to all wood surfaces, sanding well between each coat. Apply the filler liberally. Our model was painted as follows: The entire lower surface of both wings and stabilizer and elevator plus the after portion of the fuselage are olive drab. All struts plus the nose and fuselage top up to aft of cockpit are medium gray. The fuselage bands and the letters on the top wing and fuselage are white. Serial number is black on a white background. Rudder and wing insignia are red, white and blue. Exhaust stack, propeller and radiators as well as machine guns are black. It is recommended that the lighter colors be applied first in view of the fact that they are easily covered by the darker shades. All insignia, fuselage stripes and markings were applied using Trim-Film.

The assembly is completed with the addition of the top wing. This must be rigidly secured. Attach the interplane struts to the top wing by pushing the sharpened ends into the strut supporters where the plans show. Apply cement liberally. When dry, the top wing can be added by pushing the struts into the structure provided. The cabane struts allow the plywood joiners to fit into the notch previously cut. Don't spare the cement. Bind and cement the control line guide to the struts closest to inside of the circle. A coat of Comet fuel proofer will protect the model from glow fuels. Add the carpet thread flying and landing wires and we are ready to take off.

The prototype model Dolphin was flown on .012 flying wires fifty feet long and behaved best when it balanced at the point indicated on the plans.

Soarers

(*Continued from page 43*)

typical, but smaller rubber is frequently used. The ideal is to have the power give out as the model lands.

Since the Tech Model Aircrafters are college students who are quite short of time, most of their activities are centered about events that do not require great expenditure of time. The Two Bit event is one of our solutions of the problem of fitting modeling into the college curriculum. Other solutions have been contests for indoor flying scale models built from kits costing less than fifty cents, hand-launched glider contests, precision contests which permit towline gliders, rubber models, and gas models to compete against one another (they certainly can't compete together), and paper-covered indoor stick contests.

When winter winds slack off to a mild gale T.M.A. goes outdoors to fly both U-control and free flight. One popular event for U-control of club invention is the twenty-mile race against time. Jet models have been quite profuse since last Christmas when some anonymous benefactor sent Jetex 50's to club members. Furthermore, some of the more ambitious members are doing active research on such phases of low speed aerodynamics as airfoils, stability, and control-line speed design.

PHOTO CREDIT LIST

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Page 24—F9F: Harold G. Martin; SB-29: Air Rescue Service; SB-17: Air Rescue Service; L-17A: Peter Bowers.

Page 26—Continental Trophy: Roy Pinney.

Page 30—Three Lions.

Page 31—Luton Minor: The Aeroplane; Fairey Mikron: U.L.A.A.; all others: Three Lions.

Page 33—Canadian Sabre: H. Levy; Bichinha: H. Levy; Fiat G-80: H. Levy; Tailless Glider: H. Levy.

Page 35—United Airlines.

Page 44—Robert E. Tucker.

Dope Can

(*Continued from page 39*)

flyer the inverse number of points of the position in which he places in every event. Thus, if you flew in Class B free flight and placed 3rd, and 200 contestants flew in that event, you'd receive 198 points. The winner would get 200 points, the last place man 1 point. Your points would not be determined by how many signed up for the event, but by how many went out to fly. Any attempt to fly would make a man a contestant even if his ship did not get off the ground and he recorded no official time.

If 15 fellows flew indoor stick, the winner would get 15 points, the runner-up 14 points. In this manner, the greater the competition, the more points for the winners.

Okay, so maybe you don't like that one. How about some better suggestions?

Sy VosGerau of Miami, Fla., 18-year-old v.p. of the Tropic Aeros club wondered if we'd print his letter. Guess he thought it was a little strong. Sure we will, Sy; step up to the mike.

"I think that there isn't a more perfect name to go by than the Dopester, with the Dope underlined. You start off with wanting to change the present rules. I guess that's nice for the contest officials, and if I were one of them I would like this very much. You also tell how this hobby of ours has progressed to 27 events; that is very true and also very progressive. Now, when it seems as though everyone is hard at work constructing these . . . models you want to change the rules all over again. Two years ago there were four classes of free flight—A,B,C,D. I purchased a motor of .51 cu. in. disp. so that I could have a C-D model; this meant that I didn't have to build two large free flight jobs. I could fly Class C and then change engines and fly Class D also. Then the rules were changed and I was holding the bag, out $20 for one engine.

"This time the rules read A/2, A,B,C. This made it much easier than last year because I used a .19-.23 and a .29-.32 combination which meant less cost to 'Joe Modeler.' Now you want to change the rules again to .099 and under and .10 and over. What happens? There is one heck of a lot of fellows stuck with engines they can't use. Sure they can fly for record, but most of the guys would rather fly for prizes, even if they are small.

"I attended the Nats and also the Internationals in 1950, both for the first time. There was one old-time leader asking fellows if they would want the Class C dropped and everyone he asked said no. Most flyers said they liked the rules as they were. I would venture to say that 99% of the modelers in Florida like the rules as is."

Sy goes on to refute the various proposals made in the column, but his remarks add up to the statement: "Don't change the rules."

As an aside, Sy, in twenty years of modeling, we've never seen the time when new rules weren't met with great resistance and by the time they were a year old most folks liked them and then didn't want changed what 12 months previously had been the *blank-blank* "new rules."

California Proposal. From Arcadia, Calif., Arlen Wetmore sends along the sentiments of modelers in his neighborhood. This is the contest event set-up as they visualize it: Free flight ROG, up to .09, .10 to .49, power loading 150 oz./cu. in. disp. Free flight ROW, one class to .49, same power loading. Control line speed, up to .29, .30 to .65. Control line stunt and scale combined, one class to .65. Models must be scale airplanes with scale surfaces. Judged on stuntability, workmanship and fidelity to scale. Indoor rubber ROG, no restrictions. Outdoor rubber ROG, maximum support surface, 250 sq. in. Wing loading is 4 oz./100 sq. in. Cross-section, $L^2/100$. Outdoor hand-launched glider, no restrictions. Outdoor towline glider, maximum supporting surface, 1,000 sq. in. Wing loading, 4 oz./100 sq. in. Towline length, 200 feet. Radio control.

Short, sweet (?) and mighty controversial.

Ohio Heard from. We can't continue forever on this rules discussion. But before we turn it off for this month, let's listen to John P. Maloney of Warren, Ohio. "First," says John, "let's consider the Nationals as a contest. In the early days of model building it was, of course, strictly a free flight contest. Indoors in those days was the big event. It was a tough event then and it hasn't changed much. Your time still depends entirely on your model, and when you see it up there at least you know it's there by virtue of your own skill, patience and ingenuity, for no motor or kit manufacturer helped.

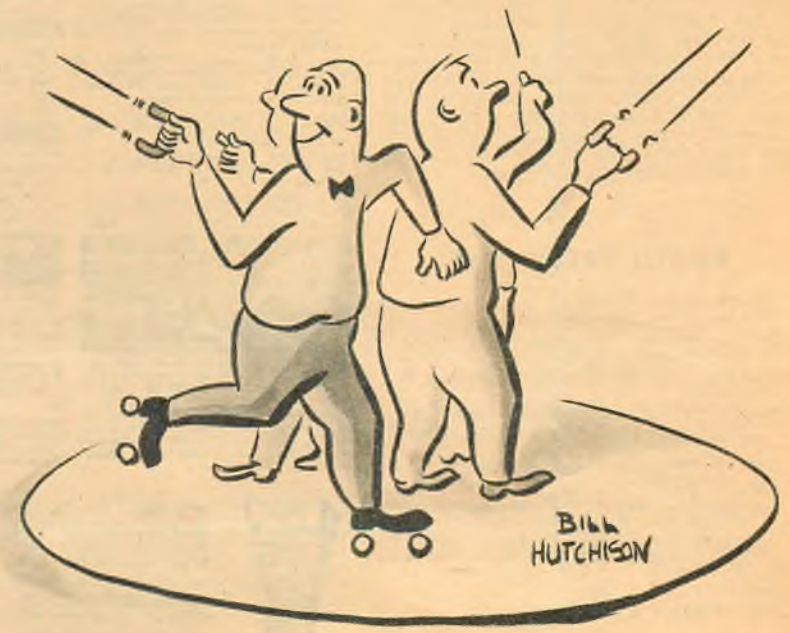
"The National contest has quite a history by now. That history is full of many traditions of which indoor competition plays an important part. If in redistributing the recognition given to these indoor events so that points won't count so highly for national honors, won't we be retarding the incentives that keep these indoor model builders going?

"Next, let's take the case of the outdoor hand-launched glider into consideration. Hand-launched glider events should be encouraged rather than be discouraged because there is no better training medium for the young model builder as far as elementary aerodynamics is concerned. What model must be designed to operate over such a large velocity range? Where are excellent finishes more important? One either learns to make a sound glue joint at the wing-fuselage joining on his hand-launch, or else (!). Also, it should be brought out that outdoor hand-launched gliders are as different from indoor gliders as outdoor cabin jobs are different from indoor cabin jobs.

"The outdoor glider must be a thermal hunter. Altitude must not be sacrificed for dead air endurance. Let's not suggest we abandon this event, particularly on the grounds of judging difficulties. If one were to use judging difficulties as the basis for event selection we would throw out U-control stunt and all of the scale events as these are judged on the basis of human opinion rather than with a stop watch.

"On the constructive side, if you have too many endurance events why not combine them? Certainly representative curves can be drawn from the data collected from previous Nats so that the performance of Class A free flight could be compared fairly with Class C free flight.

"If something must be combined, why not rubber stick and rubber cabin? Scale is fine, but why does it have to fly? Man-



carrying planes were designed to fly with pilots at the controls, not with the controls tied in one position as in the case of scale rubber free flight.

"Needed: higher power loadings—about 180 oz./cu. in. disp."

We said that would conclude the rules dissertation. In closing *that* subject, we recall something Frank "Phoenix" Ehling told us recently: "Let's try a 5 minute limit (free flight duration) with four flights permitted, 10 seconds hand-launched, 15 seconds ROG. Then we could spend more time on our models and expect them to last at least until the next set of rules come along. I lost five models during the past competition season, and that 5-minute top-time rule would have saved every one of them. We just don't have enough of the wide open spaces for the 10 minute rule."

Chairman Ed. "I have by means still quite confusing to me been made chairman of the A.M.A. Wakefield Committee. On my committee are William Fletcher, 8708 Grand Ave., Elmhurst, L. I., N. Y., and Russ Johnson, 344 Duane Ave., San Gabriel, Calif.," says Ed Lidgard of 814 Bryan, South Bend, Ind. Ed, you're too modest. You were selected as chairman since you demonstrated more enthusiasm about that fine event than anybody else A.M.A. headquarters had run into.

We imagine Ed would like to hear from everybody who has any constructive suggestions on the Wakefield. And if you have any ideas on prospective sponsors, write him quick!

Club Chatter. Up in North Bay, Ontario, Michael Overbury at the Dept. of Travel and Publicity, has decided to get a club started. Nearby modelers are invited to assist in the formation . . . The Sheboygan Pirate MC wants to build a trailer for transport of models. Would appreciate hearing from any club that may have plans for same. Contact the club c/o Lea's Hobby Center, 1106 N. 8th St.... Ralph A. Williams says his Chickasha, Okla., MC has been trying Jim Walker's "Pre-de" contest and members have run up scores of 1,047 to 1,393 points. Sounds mighty good to us, Ralph. Anybody done better? . . . New club in Brockton, Mass., is the Aero Liners. Prospective members can join by contacting Bruce Tibbetts, 15 Greenfield St. . . . Newly organized club in Huntington, W. Va., is asking for some outfit which can supply sweaters with club emblems. If you can help advise Robert John at the Hotel Frederick . . . Robert L. Venery, Bedford Gardens, Sackets Harbor, Rt. 1, N. Y., wants to join a model club. Any nearby? . . . Buffalo, N. Y., Flying Bisons are back on a full winter schedule meeting Friday nights at the Humboldt YMCA. If you live near there look 'em up and introduce yourself to Norris Maltby, corresponding secretary . . . Memo to all clubs: AT's club directory is scheduled for an early issue. If you haven't advised us that you're in business let us know immediately. For inclusion in the directory we must know where and when you meet, names of your club officers, when you organized, what kind of activities you run. Address data to Air Trails, Club Directory, 122 East 42nd Street, New York 17, N. Y.

Tangerine Meet. The Exchange Club of Orlando, Fla., is throwing a shindig, a whiz of a 2-day meet on Dec. 28 and 29. The official title is the "First Annual Mid-Winter International Model Airplane Meet." Trophies for 1st, 2nd and 3rd in control line speed, scale and stunt, jet, radio control and free flight. Barracks and hotel accommodations available; contest will be run off at the airport which has two 10,000 ft. runways. A victory banquet will conclude the two-day contest. All the dope from Thomas Mickler, Exchange president, 217 N. Main St., Orlando.

Control Models go to Jail. Members of the Inter City Modelers MAC of Michigan City, Ind., staged a two-hour stunt flying show for hundreds of inmates, officers and visitors behind the gray walls of the Indiana State Prison recently. This is the first time in penal history that such a show has ever been permitted behind prison walls anywhere.

Robert Drews, a newly employed prison guard and member of the Modelers club arranged with Warden A. F. Dowd to bring this event into the prison. The 15 members of the club were skeptical as to what the reaction of the inmates would be concerning such a show. Later they reported that they were overwhelmed by the appreciation displayed by the entire inmate population. Prisoners sat on bleachers spellbound for two hours watching the models go through their flight patterns.

Three large circles were laid out on the recreation field. Each member flew solo, then two and three flyers flew together in one circle. Among the models that performed was a 7 ft. Stinson. Tom Boothroyd, club president, is planning another show

Sailplanes

(*Continued from page 19*)

of the Metropolitan Soaring Corporation and the Airhoppers Gliding and Soaring Club had a chance to try their skill at soaring on a "standing wave" which visited Wurtsboro Airport, N. Y. Emil Lehecka, with Herman Kursawe as co-pilot, attained a height of 7,600 feet, while National Feminine Champion Ruth Petry soared to an altitude of 6,000 feet.

Winterization. Now that the soaring season has ended for most of us, clubs and individual owners should seriously think of overhauling their equipment to be ready for the 1951 season. If the sailplane needs recovering, this is the time to do it. Minor repairs, such as tears in fabric, should be patched with fabric tape, cracked plexiglas canopies, rust spots and inoperative instruments should be attended to, and controls and control cables checked. All this provides winter activity for the clubs and keeps the interest high during the dull winter months.

Contest Score Board. For those interested in the complete record, we add to our coverage last month of the 1950 National Soaring Contest held at Grand Prairie, Tex., by giving herewith the performances and points of the highest scoring pilots. The ship is listed along with the pilot; unless otherwise noted, the destinations are in Texas:

Richard Johnson, RJ-5. 8/3, 95 mi., Henrietta. 8/4, 90 mi., Orr. 8/7, 90 mi., Durant, Okla. 8/8, 105 mi., Caddo, Okla. 8/10, 157 mi., Abilene. 8/11, 220 mi., San Angelo. 8/12, 337 mi., Odessa. *Total points—1211.*

William Coverdale, Schweizer 1-23. 8/3, 80 mi., Bowie. 8/4, 42 mi., Denton. 8/7, 71 mi., Dennison. 8/8, 85 mi., Durant, Okla. 8/10, 116 mi., Wichita Falls. 8/11, 78 mi., Stephenville and return. 8/12, 228 mi., San Angelo. *Total points—851.*

William Ivans, Schweizer 1-23. 8/3, 25 mi., Argyle. 8/4, 57 mi., Valley View. 8/7, 53 mi., Howe. 8/8, 83 mi., Marietta, Okla. 8/10, 139 mi., Florence. 8/11, 225 mi., San Angelo. 8/12, 262 mi., Big Springs. *Total points—844.*

E. J. Reeves, Schweizer 1-23. 8/3, 99 mi., Henrietta. 8/4, 64 mi., near Henrietta. 8/7, 90 mi., Durant, Okla. 8/8, 76 mi., Dennison. 8/10, 60 mi., Mineral Wells. 8/11, 82 mi., Alba. 8/12, 223 mi., Colorado City. *Total points—837.*

Wally Wiberg, LK-10A. 8/3, 61 mi., Alvord. 8/4, 53 mi., Valley View. 8/7, 90 mi., Durant, Okla. 8/8, 95 mi., Durant, Okla. 8/10, 47 mi., Weatherford and return. 8/11, 109 mi., Breckenridge. 8/12, 160 mi., Abilene. *Total points—758.*

Paul Schweizer, Schweizer 1-23. 8/3, 59 mi., Alvord. 8/4, 57 mi., Valley View. 8/7, 85 mi., Cellers. 8/8, 64 mi., Gainesville. 8/10, 119 mi., Wichita Falls. 8/11, 122 mi., Witchita Falls. 8/12, 157 mi., Abilene. *Total points—694.*

Lyle Maxey, Prue 215. 8/3, 74 mi., Jackson. 8/4, 62 mi., Gainesville. 8/7, 66 mi., Sherman. 8/8, 96 mi., Durant, Okla. 8/10, 60 mi., Mineral Wells. 8/11, 220 mi., San Angelo. 8/12. 77½ mi., triangular speed course. *Total points—694.*

Ray Parker, Tiny Mite. 8/3, 59 mi., Alvord. 8/7, 70 mi., Sherman. 8/8, 85 mi., Colbert. 8/10, 107 mi., Corsicana and return. 8/11, 126 mi., Navarro and return. 8/12, 77½ mi., over triangular speed course. *Total points—680.*

Harry Perl and Les Arnold, Hummingbird. 8/4, 28 mi., near Denton. 8/7, 50 mi., Anna. 8/8, 58 mi., Van Alstyne. 8/10, 101 mi., Hillsboro and return. 8/11, 158 mi., Waco and return. 8/12, 77½ mi., triangular speed course. *Total points—641.*

Pat Mulloy, Schweizer 1-23. 8/3, 58 mi., Willow Point. 8/4, 52 mi., Valley View. 8/7, 66 mi., Sherman. 8/8, 83 mi., Marietta, Okla. 8/10, 65 mi., Sunset. 8/11, 105 mi., Henrietta. 8/12, 166 mi., Abilene. *Total points—612.*

Dope Can

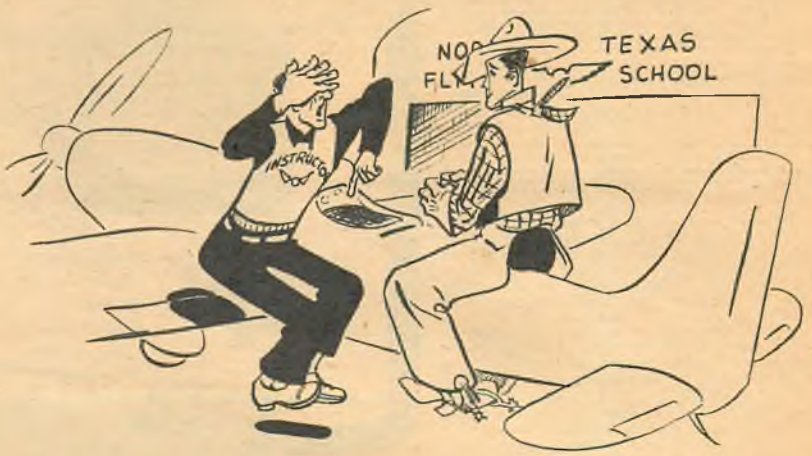
(*Continued from page 83*)

for the prison, this time a combat event and novelty flying affair.

Plymouth Records. Final check up of the Plymouth International meet showed 15 National marks were bettered. This is the most number of records set at any meet except in cases where records were automatically established by winners of new events. Richard A. Modler (a "model" Modler, you might say), 14, of Dayton, Ohio, did 24:20 in Junior free flight A and 141.78 mph in Class D speed. Both new highs. Other records were: Erwin Rodemsky, 20, Detroit, indoor cabin senior Class C, 16:52.5; James L. Lempke, 15, Detroit, outdoor stick rubber junior, 12:51.9; Thomas R. Jesme, 13, Minneapolis, outdoor cabin rubber junior, 10:00; Paul E. Simon, 17, Detroit, outdoor cabin rubber senior, 21:43.2; Donald Held, 6, Detroit, Half-A free flight junior, 11:37.4; Cornelius Morton, 18, Lake Villa, Ill., Class A free flight senior, 22:52.4; Jack Hudspeth, 15, Olympia, Wash., Class C free flight junior, 22:49; Carl R. Wheeley, 20, Washington, D. C., Class C free flight senior, 29:45.2; Ronald Marchese, 15, Class B speed junior, 123.83 mph; Alfred H. Stegens, 19, Cleveland, Class C speed senior, 134.67 mph; Henry LaVon, 13, Tacoma, Wash., jet speed junior, 133.28 mph; and Donald R. Zipoy, 20, Minneapolis, jet speed senior, 142.35 mph. Dick Modler set a third record, but no details were given.

Anti-Half-A'er Gives In. E. Dean Hall, Fairfield, Iowa, was mighty dubious of the small engine free flights, even though he had been building the bigger jobs for years. One day he went off to the Waterloo Prop-Twisters contest. A somewhat rugged wind almost wrote off his Forster 29 powered Zipper so he retired to the sidelines to do a quick repair job on the wing. While waiting for the glue to dry he had a chance to watch Claude McCullough sew up Half-A.

Hmm-m-m. Dean's big job couldn't take it, but the small one did. So home heads Mr. Hall—and turns out a Baby Phoenix in which he installs an O.K. Cub. Mind you, he still didn't give the tiny ships much—remember, he'd been building big-g-g-g free flights all during his modeling career.



"No! No! *Inside* the plane!"

"I went out one Sunday," writes Dean, "and made a couple of test flights using about 5 second engine runs. I decided one 15 second flight was in order. After starting the engine my old faithful cigarette lighter failed me, hence I launched the ship without lighting the dethermalizer fuse which was a big mistake.

"The ship climbed like a homesick angel and at the end of my 15 second engine run I was very pleased. She started down in a nice spiral and then that nasty old thermal came along. To make a long story short I chased it for several miles and it was still going up when I saw the last of it . . .

"I've learned the hard way—and I've kidded the Half-A's for the last time."

Karachi Reporting. From far off Pakistan, M. Usman Beg gives us the lowdown on what's in the air. He starts off by complaining that we don't have enough models in the magazine around .23 size. We have either scale or stunt models for the 1 cc. group or tiny free flight for the .5 cc. crowd. The D "monsters" (the word is his) can't be afforded over there because balsa is scarce, and the Half-A's can't stand the terrific winds of Karachi. For the Pakistan lads the small B jobs are just what's needed. Some modelers have glow plug engines, but the English diesels are considered the best buy because of fairly good performance, ease of acquirement and low cost (the English pound was devaluated, but not the Pakistan rupee).

Most control line is of the sport, or one-occasional-loop variety. Not much grass around. Order of the day apparently is a profile fuselage of 3/8" ply with engines mounted sideways, a strong undercarriage and biplane wings.

In free flight the famous Slicker from England (that resembles a Powerhouse crossed with a Zipper) is the contest standard; semi-scale cabin type jobs are more popular for the Sunday flyers. A silver (solid!) challenge cup has been established for this latter class, so that should start to perk. Gliders and sailplanes are in a rut, says Mr. Beg. Just aren't any thermals—well, mighty few, then. And the strong winds play havoc with the towline set. Really popular are all-balsa gliders of about 20 inch span that are catapult launched. Rubber models are surprisingly strong; four minutes is not exceptional with a Wakefield type. Rubber is available apparently in the proper sizes at no great cost. The Karachi modelers have learned to build really rugged rubber craft. Looks are usually sacrificed in favor of durability and performance.

Contributions Welcomed. Air Trails receives many fine designs for model airplanes during the course of a year. It's possible to run only a small portion of the material available, of course, but the editors give careful attention to everything submitted.

If you have a pet model you'd like to see in AT in plan and article form, here are a few suggestions to help you. First, don't fret if you haven't had anything published before. It's the quality of your contribution, the merit of the design, that counts. Send some clear photos of the model along with a description of it, a report on its performance and a little sketch on which you can note its special features. That'll give the editors enough to go on and they will advise you if they need more.

If your design should not be accepted, don't be discouraged. Perhaps it is a little too similar to something that has appeared before; maybe it's like another model "in the works"—one scheduled for presentation, but which you haven't seen yet in printed form.

If you're a cracker-jack draftsman, perhaps AT could use your services on a free-

lance basis. Send along various samples of your work; aviation artists are usually in demand; if you both draw and draft, good—show AT what you've done. If you can draw, but not draft, okay—let's see a picture or two!

Something New Under the Connecticut Sun. The Nutmeg State which has produced some fine trotting horses apparently has felt the effect of horse racing on model flying. Here is the 6-point "claiming" rule originated by Dick Matava and reworked by his club, the Hartford MAC.

Claiming Rule—at any AMA contest a motor may be claimed by another contestant. Rules are: to be eligible, a contestant must have a plane entered in the contest; a claiming form must be filled out by the claimant and presented to the contest director before the motor to be claimed has made its last official flight in the contest; the amount of money to be presented to the contest director along with the claim form shall be the current advertised list price of the engine; after an engine is claimed it shall be impounded by a contest official, plane included, until the owner wishes to make his official flights. At that time he shall be accompanied by an official to see that no engine change is made; at the end of the claimed engine's last official flight the engine shall be removed from the plane and given to the claimant.

After that the original owner shall be given his money. A claimant shall have the privilege of withdrawing his claim at any time; if there should be two or more claims, there shall be a drawing of lots, conducted by a leader member and the winner shall have the claim to the engine. The other claimants shall have their money refunded unless the winner withdraws, then the drawing shall be repeated.

Sounds like quite a deal, doesn't it?

Boy, Oh, Boy! Excavations are under way for the foundations of a new Junior Museum at Corona Heights, San Francisco, to be completed this year. Considerable space in this building has been earmarked for model airplane activities sponsored by the S. F. Recreation Dept.

Give a listen and don't drool on your Sky Sail! The model building room will be equipped with work benches, Celotex boards for lay-out work and locker space for storage. A glass partition will separate the builder from the visitor in such a way that the onlooker may have an unobstructed view of what is being made without interfering with the worker.

The new workshop will be equipped with a circular saw, band saw, jig saws, wood lathe and sanders, also the necessary hand tools, vises and clamps for all types of woodwork. In addition there will be available to the builder a metal shop (with metal lathe, drill press, punch press cut-off wheel, tin brake and hand tools plus solder bench and test bench for gas engines), a paint room (dust proof and equipped with a spray booth plus a tank for making microfilm), and a design room (with glass-top tracing tables, drawing boards and file cabinets for plans and blue prints).

Invited to participate will be any boy or girl under 21. Oldtimers, 21 and over, who have taken part in past model aircraft activities of the SF Rec Dep will be welcome when the youngsters are in school. This should include most of the adult builders in San Francisco since the Rec Dep has been conducting model airplane activities for the past 23 years.

Thought for the Month. If you've got a recreation department in your community with a speck of appreciation for aeromodeling, suggest an official write to the Junior Museum, 600 Ocean Ave., San Francisco 2, Calif., and get some ideas on getting up a similar program.

Mrs. Phyllis McCrorie, 42 Joseph St., Palmerston North, New Zealand, would like to correspond with other gals who are active model builders. . . . Lt. Ralph E. Burke on duty in Germany tells us that anyone desiring to correspond with a German model club is invited to write Ernst Anskinewitsch, (Sammelanschrift) Oberer Markt 26, Bad Mergentheim, Germany. Lt. Burke has visited with the club which has 30 members between the ages 11 and 30. He passes along his AT's to the group.

The Rubber City Aeronauts of Akron,

AIR TRAILS Hobby Shop Directory

Model Builders! Here's a listing of the nation's leading hobby shops. You'll want to file it away—and when you're in the neighborhood, drop in and browse around. They're expecting you.

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Ohio, have added an "Inc." to their name. All very official. Congratulations, fellows.

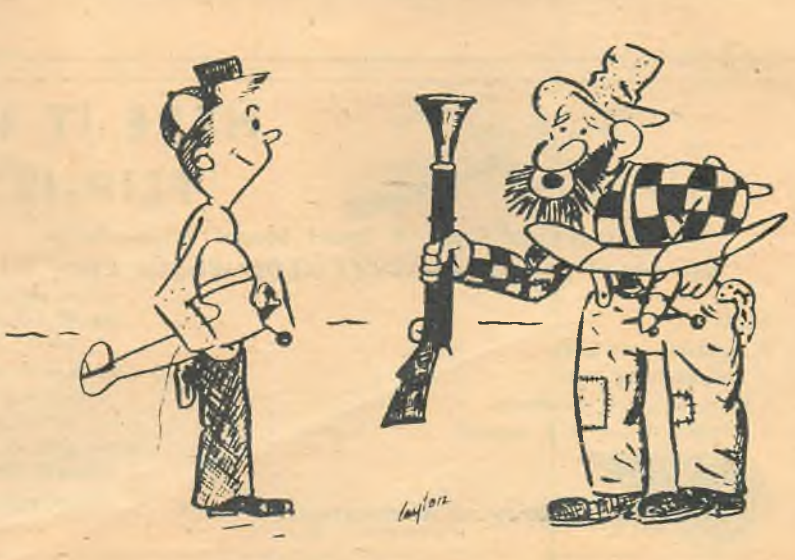
Club Chatter. George W. Kupec, secretary of the Schenectady, N. Y., Aeroneers brings us up to date on club doings. Present officers are George W. Fowler, pres.; John Schneider, treas.; and Dale Springster, "Prop Wash" editor. The club has 7 trophies which are awarded annually to the top modelers for best performances in rubber, sailplanes, free flight gas, R.O.W. gas, U-control, high point champ and merit prize.

At present there are 24 Aeroneers; anyone interested in modeling is welcome—the club gathers every Monday during the school year at Mount Pleasant High School in room 120 at 7:30 p.m. Besides competing for the club trophies and attending out-of-town meets, the group has had and hopes to have another inter-club "mail" contest with some English bods (the Aeroneers were beaten the first time and are looking for revenge).

Four Engine Fan . . . is Fred E. Koenig, 16-D Ridge Rd., Greenbelt, Md. He's asking Dope Can readers to let him know if they have any plans for a 4-engine U-control scale model, or know where he might secure same. FEK is an old hand at multi-engine flying. Sez he, "I have been building model planes for about 12 years. My present fleet consists of eight planes in flying condition, plus a couple minus engines and some under construction. I have 14 engines from an Infant all the way up to a Hornet. One of the first planes I flew was a model of the P-38 powered by two Pierce engines, later by two Drones. After three years it was destroyed when it lost an engine in flight. It was a fine flyer. The entire plane was covered with 1/16" sheet balsa and when it was ready to fly with the Pierce engines and regular electric ignition system, weighed but 48 ounces."

Kiwanis Aero Club Given Club House. William Lehman of Doylestown, Pa., admits that it's been a long time since he's contacted us regarding the progress of Kiwanis Aero Club of that city. He writes, "As you know we have a membership of 82 persons, we have a 50-passenger Mack bus which is used only by the Aero Club to travel to meets and the club owns power tools and equipment. Now we have acquired a parcel of land almost a full city block in size leased to us rent free with an option to buy in three years. I believe that our club will be able to raise the funds (to purchase it) by that time. On this land we are going to build a flight circle and a race car track.

"The latest addition to our club is a club room, work shop, and model railroad pike, all in one building—our own, which is a gift of the Kiwanis. We hope to pay the Kiwanis Club back for this gift some time in the future."



"No, son, I'm not a-feudin'—this here is my dethermalizer."

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While every precaution is taken to insure accuracy, we cannot guarantee against the possibility of an occasional change or omission in the preparation of this January, 1951 index.

Air Briefs

Stall Trainer. A CAA Piper Cub that's equipped with stall indicators and radar altimeter has been touring the country demonstrating to flight examiners, instructors and interested pilots the new stall recovery technique in which the plane's nose is not "dumped" but held on the "horizon line," thus preventing the usual considerable loss of altitude which resulted from the old recovery method.

CAA-CAB. Delos W. Rentzel, former Administrator of Civil Aeronautics Administration, has been appointed by President Truman to the Director's post of the Civil Aeronautics Board. His old post is now occupied by Donald W. Nyrop, who was Deputy Administrator.

Lightweight Record. Albert van Cotthem, Belgian pilot, established a new distance record for Class A planes (weight not exceeding 1000 lbs.) when he flew nonstop from Brussels, Belgium, to Biarritz, France, a distance of 587 miles. Van Cotthem, who holds No. 1 license in Belgium and is a captain of the SABENA line, piloted a Tipsy Belfair airplane powered by a 60 hp Walter Mikron engine.

Bigger and Better DC-6s. Pan American World Airways announced the purchase of 18 DC-6B airliners, larger and faster version of the standard DC-6. One version of the DC-6B will be a tourist-class airplane, and the other a luxury Sleeperette. Delivery for the airliners will begin in the fall of this year.

A Week in Hawaii. A week's tour to Hawaii for $316 was announced by Pan American World Airways. Price includes Clipper transportation from Los Angeles, San Francisco or Portland, hotel accommodations and guided sightseeing tour.

Korean Air Lift. At a recent convention of the National Defense Transportation Association in San Francisco, Brig. Gen. Henry C. Kristofferson, Commanding Officer of Military Air Transport Service, stated that 250 four-engined cargo and transport planes were in MATS operation at the peak of Korean Air Lift operation. Sixty-four of these were commercial planes under contract to MATS. The air lift delivered to Japan and Korea 34,000 passengers and more than 8,000 tons of vitally needed cargo such as the new type bazooka rockets. State-side-bound planes carried over 6,500 wounded.

Super-Connie. Lockheed Model 1049 Super-Constellation is said to be the first airliner capable of flying nonstop across the Atlantic. Present models will be powered by standard piston engine; however, the Super-Connie is engineered to take the VDT compound engine as well as the turbo-prop. Besides civilian airlines, the craft will also go to the Navy which ordered an electronic and early warning model designated as PO2W.

Ben Howard, well-known racing pilot of the early Thirties and designer of such famous racing planes as Ike, Mike, Pete and Mr. Mulligan, has been ap-

pointed General Manager of Fairchild Division, Hagerstown, Md.

Wire-Laying Drones. Radio-controlled target drones are used by the Army for laying half-mile-long sections of light telephone wire. The drone, with one end of wire attached, is launched from a catapult unreeling the wire from a canvas container, which stays on the ground. When all the wire has been unreeled the operator cuts the engine by radio signal, and the drone parachutes to the ground with wire still attached.

Model Mail

Beware Nitro-Benzene? . . . Mention of nitro-benzene as an ingredient in model engine fuels has often been made. I was, therefore, interested in seeing it listed in a certain consumers' bulletin as a highly toxic substance which may cause "illness or even death . . . on skin contact."

Although modelers sometimes slop the fuel about pretty freely I have noticed no ill effects. Is the presence of this ingredient in hot engine fuels a threat to health?

F. W. Stearns, Mason City, Iowa

• The bulletin probably refers to continuous exposure. Manufacturing plants, for example, have certain problems with people working with chemicals over a long period of time. In this connection carbon tetrachloride is considered very poisonous in industry, but it is sold as a spot remover and much used in cleaning establishments. Materials as common as kerosene bother some people and so could be "poisonous."

Model engine fuels contain a small amount of nitro-benzene and this is usually wiped off the hand if any quantity is spilled. We have heard of no ill effects from any of these materials. They might be dangerous in hands of young children if taken internally, and many manufacturers list an antidote for this on the fuel can.

Compression Adjustment . . . I have a Micro-diesel that starts right up with just a couple of flips every time and has been running very well. I have had it only a short while. But lately when I turn the compression turn-down level to the proper setting for maximum rpm after the engine starts, it just slides right back to minimum compression setting and results in faulty running or stops the engine altogether. Could you advise me on what may be the trouble and what I can do to remedy it?

Richard G. Kauffman, Carteret, N. J.

• This is a common ailment with a variable compression engine. The simplest cure is to lock a nut on the compression adjusting screw. Diesel engines will usually start with a pre-set compression adjustment once it has been set for the general weather conditions. Cold weather requires a higher compression.

If your engine will not start with fixed compression, a ratchet wheel similar to that used on a needle valve should solve your problem. Solder a notched washer to the compression adjusting screw and attach a spring clamp to the cylinder head. This attachment may have to be a band type clamp and would look very clumsy. A lock nut on the compression screw is much neater looking and very simple to install.

That Ole Glossy Finish . . . I am not able to get a smooth glossy finish on balsa display models, using three colors of dope, drab, blue and brown. Could you help me?

David Saaden, Woodstock, Vt.

• Achieving a smooth glossy finish on solid balsa requires a little care and extra trouble. The wood surface must be sanded until very smooth, then several coats of wood filler applied, with light sanding between each coat using fine grit finishing paper. We recommend Testor's finishing papers and sanding sealer for this job. You can make your own filler by mixing clear dope and ordinary talcum powder, three parts of dope to one of talcum.

Several coats of thinned dope are better than one or two coats of heavy dope, so add a bit of thinner till the consistency is more like that of milk than heavy cream.

Most olive-drab dope is made to give a dull finish. Used for camouflage, the dull finish is more desirable than a glossy one. It is possible you applied some of this type of dope that won't shine no matter how many coats are used. When buying dope, find out if it is the glossy or dull kind. A coat of fuel proofer over any of the dopes will really put a high gloss on your model.

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