AIR TRAILS Pictorial

NOVEMBER 1948

25 CENTS

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CHOICE OF U-CONTROL OR FREE FLIGHT

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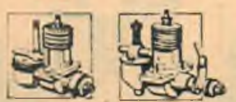

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THOR OHLSSON

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1) Your own choice of 6 well-known engines, all guaranteed by the manufacturer and America's Hobby Center.
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35) Membership in Modelcrafters of America.
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Ohlsson Rotary Valve engine included in $12.50 unit for $1.00 extra.

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OR

FREE-FLIGHT BANSHEE

It isn't often that you get a chance to buy, at less than half price, your choice of either a U-Control or a Free-Flight Outfit with your own choice of six well-known engines. Everything carries the famous America's Hobby Center guarantee.

Even if you are a beginner, you won't have trouble building and flying any of these flying outfits. Full-size plans of easy-to-build planes, every accessory you will need, complete instructions, etc., etc. If you are an old-timer at building and flying model planes we don't have to tell you what this bargain outfit is really worth.

Thousands of these units have already been sold. They have met with enthusiastic reception because they represent a value unheard of before in the modeling field. The price is so low that we cannot sell to dealers. You really save from $10 to $12 by buying the complete packaged unit—everything is engineered by experts for a perfect flying combination.

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COMPLETE CO2 FLYING OUTFITS

HERE IS WHAT YOU GET:
1. CO2 Engine, ready to run.
2. CO2 Capsule holder.
3. 2 CO2 Capsules.
4. Correct propeller.
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6. Complete suitable airplane.
7. Landing gear.
8. Wheels.
9. Complete plane plans.
10. Cement (if needed).
11. Flight log.
12. Insignia.
13. Identification tags.
14. Packing.
15. Postage.
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17. Membership in Modelcrafters of America.
18. 24 pg. Giant model catalog.
19. Full A.H.C. Guarantee.

NOTHING ELSE TO BUY!!

$5.95

BUZZ CO2 ENGINE (includes refillable tank, capsule charging unit). Costs only 2c per flight to run. Choice of Cavacraft Stinson or Ercoupe kits with all parts Cava-Cut (kits are completely prefabricated, ready to assemble)

$6.95

O.K. CO2 ENGINE (largest CO2 engine made) with choice of Megow CO2 Special (completely ready to fly—no gluing) or the contest CO2 Powerhouse kit.

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CAMPUS A-100 (CO2) ENGINE (smallest CO2 engine made, includes refillable tank). Costs only 1c per flight to run. Choice of Cavacraft Aeronca kit with Cava-Cut parts, completely prefabricated, ready to assemble or Carter Craft SE-5 kit.

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There's nothing to learn and plenty of fun!

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CLASS A, B or C ENGINES NOW ONLY $4.95

4 CHAMPIONS IN ALL 4 CLASSES

Ideal for both ignition and Glo-plug operation

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CL"A" $4.95

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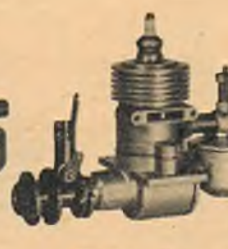
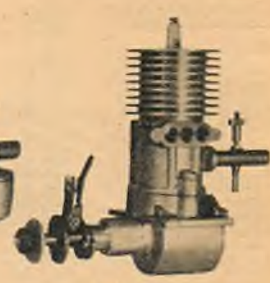
CL"B" $4.95



BUZZ 35
CL"C" $4.95



BUZZ 60
CL"D" $7.95

BIGGEST NEWS IN YEARS!!

We are the largest model motor headquarters in the world. We have sold over 200,000 model engines (made by 117 different manufacturers) in the last 15 years. We *know* engines. When we were approached by one of America's largest companies in this field and offered the exclusive agency for the sale of the BUZZ, we knew we had the biggest bargain ever offered to the American Modeler.

WHO MAKES THESE ENGINES?

The BUZZ Engines are manufactured by a company that for years has been the world's largest maker of automobile replacement pistons and other precision gasoline engine parts. Thousands of gas engines and parts were made during the war by this company for the War Dept. for use in walkie-talkies, field generating sets, etc., etc. Since the war, thousands of gas engines have been made for scooter, lawn mower and other industrial uses. When we say unconditionally that the BUZZ engine is well engineered and well constructed, will give you plenty of good service, this is no idle boast, but a fact!

NOT A CLEARANCE SALE!

As the owner of a BUZZ Engine, you are sure that you will always have available full service for your engine, as well as replacement parts. You will never have an "orphan" engine on your hands. We guarantee service and parts for your engine for at least five years.

PRECISION ENGINEERED!

Despite its low price, the BUZZ Engines have been engineered to the last decimal point. Pistons and cylinders have been carefully burnished by a special patented process within .0002 of an inch. All bearing surfaces are made of selected materials and finished with the most costly care and equipment. Even a Champion Spark Plug is included. Every BUZZ Engine is indeed a jewel of precision engineering.

FULLY GUARANTEED!

With each and every engine is included a full 30-day written guarantee against defective parts and workmanship. You take no chances with BUZZ Engines. In addition, service and replacement parts are guaranteed for at least five years.

FULLY GUARANTEED

Factory assembled—
ready to run—
including Champion Spark Plug

BUZZ A, B or C $4.95
BUZZ 60 (Cl. D) $7.95

THE BEST BUY IN ENGINES EVER

YOUR CHOICE OF BUZZ A, B or C $4.95 EACH
CLASS D $7.95

SERVICE & PARTS SUPPLY Guaranteed FOR 5 YEARS!

1948 MODEL ENGINES AT LOWEST PRICES EVER!

NOT A CLEARANCE SALE
1,000,000 Engines a year available.

NO SALES TO DEALERS
Due to low price, none sold to dealers. All the savings are passed on to you.

Engine prices are introductory only. Effective Jan. 1, prices will be increased 100%.

HIGHEST QUALITY AT LOWEST PRICES!

Do not judge the BUZZ Engines by their low prices. It is true we make very little money on each engine sold. But because many, many thousands of these engines have been produced by the latest modern processes, the cost has been reduced so that they can sell at the lowest prices ever seen.

PRECISION ENGINEERING OFFERS:

* Construction and materials that permit use of engines in boats and cars as well as airplanes.
* Complete Instructions.
* Streamlined for cooler operation and longer life.
* Easier to start.
* Steady, consistent running.
* Lightest weight engines ever made in relation to power produced.
* All wearing surfaces especially finished for longer wear.
* Requires shorter break-in period than any other engine.
* All metal tank that takes any fuel.
* Invertible and runs in either direction.
* Replacement parts available and interchangeable.
* Runs on easy-to-get oil mixed with ordinary gasoline. No hard-to-get and dangerous chemicals needed.
* Smooth, velvety power that never lets you down.
* Last but not least, we maintain an inspection and testing department where your engine gets the last word in care not only before it is shipped, but where it can receive expert attention if anything goes wrong after you own it.

NOW YOU CAN AFFORD THE BEST!

SPECIFICATIONS

	A	B	C	D
Displacement	.199	.299	.350	.610
Bore	.66	.812	.880	1.00
Stroke	.562	.562	.562	.777
Horsepower	1/7	1/6	1/5	1/4
RPM	7,500	8,000	8,500	9,000
Propeller	8"	10"	11"	12"
Weight (ozs.)	4	4½	4½	9

COMPLETE ACCESSORY UNIT

Sold only with each BUZZ Engine

Coil-Condenser-prop-switch high tension wire-ignition wire-coil holder-battery box-wrench-presto engine starter, No. 70 oil.

ONLY $2.49

NEW! BUZZ CO^2 $4.95

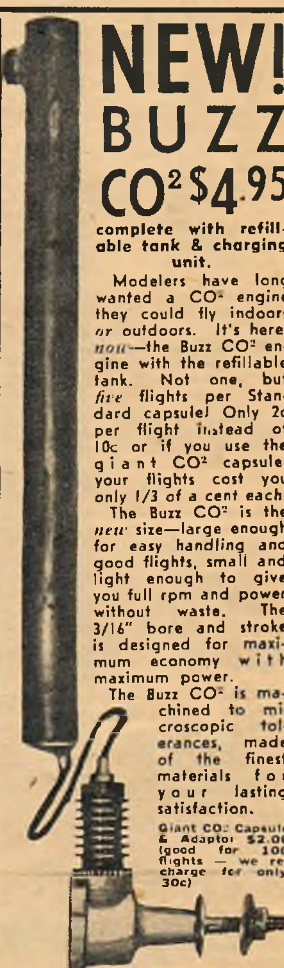
complete with refillable tank & charging unit.

Modelers have long wanted a CO^2 engine they could fly indoors *or* outdoors. It's here, *now*—the Buzz CO^2 engine with the refillable tank. Not one, but *five* flights per Standard capsule! Only 2c per flight instead of 10c or if you use the giant CO^2 capsule, your flights cost you only 1/3 of a cent each!

The Buzz CO^2 is the *new* size—large enough for easy handling and good flights, small and light enough to give you full rpm and power without waste. The 3/16" bore and stroke is designed for maximum economy with maximum power.

The Buzz CO^2 is machined to microscopic tolerances, made of the finest materials for your lasting satisfaction.

Giant CO_2 Capsule & Adaptor $2.00 (good for 100 flights — we recharge for only 30c)



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* POWERFUL
* ECONOMICAL
* PRECISION BUILT
* FREE FLIGHT OR U-CONTROL
* 3/16" bore & stroke; .0052 cu. in. displ.; speed range 2,000 to 6,000 rpm.
* FLIES 18" to 24" models and up.
* Weight only ⅝ oz. ready to fly.

WHY OUR LOW PRICES?

THE ANSWER TO THE $64 QUESTION!!
Buzz prices are the lowest ever. Why? Because we pass the jobber's and dealer's profit on to *you*. If you buy an engine from a dealer, he buys it from a jobber! The jobber, in turn, buys it from the manufacturer. WE SELL IT DIRECTLY TO YOU—*YOU* PAY THE WHOLESALE PRICE!!

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COME IN AND SEE US DEMONSTRATE THE BUZZ. SEE OUR DISPLAY OF THOUSANDS OF MODELS, KITS AND ACCESSORIES.

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Watching Those Warps

Sirs:

These new editions of *Air Trails* are really the stuff. I have been subscribing to airplane magazines since '38 and *Air Trails* gives the most for the pennies. Being a builder of free-flight and U-control I get my money's worth out of your book-type magazine.

I have a gripe, though, after reading C. O. Wright's article on warps. He thinks you should build cases for your tail assemblies to prevent them from warping when sand bags will do the job more efficiently. The article also states that just a couple of coats of dope should be put on flying surfaces. This is an excellent method of producing nice warps—and who wants an oil-soaked, dirty, weak airplane? A covering job treated in his manner used on a damp day will loosen up causing a warp and when it is dry and hot the warp will disappear and possibly another will be formed.

This is the procedure I use: I put on eight coats of dope in cross grained manner, one coat brushed along the span, the next along the chord. After each coat is put on, the surface should be pinned down and allowed to dry in the sun. If any warp is formed it will be slight and adjustments can be made to compensate for it. Once a wing or tail is treated in this way, it will not become oil-soaked or weak. Furthermore, dew or the hot sun won't affect them.

LEE LOGAN

Los Angeles, Calif.

Full Size Plans

Sirs:

Along with my son I have been a continuous follower of *Air Trails* . . . Your (full size) plans were so good in my son's eyes that I can't even borrow his so please find enclosed 35¢ for another set.

ARTHUR G. GREEN

Galt, Ontario, Canada

Sirs:

Reading your magazine as I do every month I ran across the swell news about being able to buy full size plans of planes featured in this issue. This will save me a lot of work enlarging plans.

KENNETH TRESTER

San Luis Obispo, Calif.

● *Air Trails'* full size plan service will continue as long as there is a demand for such drawings. The complete listing of available plans is detailed in the announcement in this issue. *Air Trails* does not have plans available in any other form of any other ships than those listed.

Tower Talk

Sirs:

I have just completed reading your article, "How to go Mad in Eight Minutes." It certainly brings out in a comical way some of the things we control tower operators go through when the airport traffic gets in full swing!

We sweat enough during the heavy traffic as it is without some "dumb" pilot getting in the traffic pattern and fouling it up! Practically all of us operators have sweated out these conditions you mentioned in your article.

Several accidents—and near accidents—have happened because a pilot disregarded the instructions the tower operator gave him, or else he did not completely understand the instructions he received. Some pilots "roger" for instructions they receive, yet they are in a complete fog (figuratively) and seek to find their own way in the traffic movement.

If our instructions are not clear and understandable, we are glad to repeat and clarify them at the pilot's request. The pilot will feel safer, and we will worry and sweat less, if we know our instructions are understood completely—and correctly!

LEWIS CARRIFEE

Fairfield AFB, Calif.

Model Matters

Sirs:

You have one of the swellest magazines on the market. I'm especially interested in aviation, and your little job does the trick. I am just finishing a CO_2 model and will soon give it the test for flyability.

Have been kicking around the lakes up here in a Stinson 105 with floats, so have been keeping my time up to date. Between all this and my work, I'm busy keeping our sleek DC-4's and DC-6's going.

I repeat, your magazine is a real deal, but you could have a little more room for comments in The Readers Write.

DANIEL W. SHAW, Asst. Station Mgr.
Transocean Air Lines

Gander, Newfoundland

Sirs:

I read *Air Trails* every month and have written postcards in pretty often about models I would like to see plans of.

I am a master mechanic of T.W.A. and have been there quite a while. I am a model fan from 'way back. When I was in the Army I started using your mag's plans for building my solid models.

I have been trying to get *Air Trails* to publish plans of all the up-to-the-minute airline planes—Connie, DC-3, 5 & 6, Convair, Martin 202, and the like. I think H. A. Thomas does one of the best plan jobs I ever saw. I do wish he would do the airplanes of the airlines.

ARTHUR F. LEFFEL

Bayside, N. Y.

● Thanks for the suggestion, Mr. L. Did you finish your model of the 202 yet?

The Plymouth Motor Corporation congratulates all of the 500 contestants whose skill, imagination and sportsmanship made the Second International Model Plane Contest such a success. The official winners are listed on these two pages.

Meet the 2ND INTERNATIONAL

JUNIOR WINNERS

INDOOR STICK

Place		Flight Time
1.	Raymond Wykes, Medford, Mass	862.6 Sec.
2.	Martin K. Bainbridge, Watertown, Mass.	594.0 "
3.	Alex G. Chizmadia, Detroit, Mich.	525.0 "

INDOOR CABIN

1.	Martin K. Bainbridge, Watertown, Mass.	397.8 Sec.
2.	Raymond Wykes, Medford, Mass.	292.0 "
3.	Haig Parchanian, Cambridge, Mass.	260.0 "

OUTDOOR STICK

1.	Haig Parchanian, Cambridge, Mass.	830.4 Sec.
2.	Edgar C. Broom, Minneapolis, Minn.	669.2 "
3.	Fred N. Blount, New Orleans, La.	591.6 "

OUTDOOR CABIN

1.	John Korta, Hamilton, Ont., Canada	827.2 Sec.
2.	Fred N. Blount, New Orleans, La.	686.6 "
3.	Raymond Wykes, Medford, Mass.	660.4 "

FREE FLIGHT—CLASS A

1.	Thomas M. Moffitt, San Diego, Calif.	805.0 Sec.
2.	Leonard H. Anderson, Rockford, Ill.	600.0 "
3.	Bernard J. Stock, Omaha, Neb.	406.8 "

FREE FLIGHT—CLASS B

1.	Fred W. Morgan, Fresno, Calif.	924.8 Sec.
2.	Rollin R. Levon, Chicago, Ill.	843.0 "
3.	John C. Humphreys, Lakewood, Ohio	794.5 "

FREE FLIGHT—CLASS C

1.	Jack Hudspeth, Portland, Ore.	766.0 Sec.
2.	Roger Barron, Springfield, Va.	713.4 "
3.	Daniel Dougherty, Tulsa, Okla.	630.0 "

FREE FLIGHT—CLASS D

Place		Flight Time
1.	Thomas G. Diel, Fresno, Calif.	734.0 Sec.
2.	Thomas M. Moffitt, San Diego, Calif.	422.2 "
3.	Maurice G. Pollock, St. Joseph, Mo.	397.6 "

CONTROL LINE—CLASS A

		Speed
1.	James Singleton, Oak Ridge, Tenn.	93.23 M.P.H.
2.	Steven A. Jordan, Kenmore, N. Y.	87.77 "
3.	Crosley J. Fitton, Jr., West Hartford, Conn.	85.35 "

CONTROL LINE—CLASS B

1.	Robert W. Rawe, Kenmore, N. Y.	110.25 M.P.H.
2.	Eddie J. Schwarz, Little Rock, Ark.	109.58 "
3.	Robert R. Fraza, Hammond, Ind.	108.65 "

CONTROL LINE—CLASS C

1.	Eddie J. Schwarz, Little Rock, Ark.	121.08 M.P.H.
2.	Kenneth R. Kimmel, Fort Wayne, Ind.	114.60 "
3.	Roger K. Welden, Rockford, Ill.	113.23 "

CONTROL LINE—CLASS D

1.	Kenneth R. Kimmel, Fort Wayne, Ind.	131.05 M.P.H.
2.	Eddie J. Schwarz, Little Rock, Ark.	127.97 "
3.	Leonard Boesken, Lakewood, Ohio	124.95 "

CONTROL LINE—JET PROPELLED

1.	Edward Sweet, Beloit, Wis.	122.90 M.P.H.

CONTROL LINE—STUNT

		Points
1.	Clifford Scaible, Roselle Park, N. J.	114.0
2.	Lawrence Goodall, San Diego, Calif.	85.5
3.	Robert A. McClary, Scotch Plains, N. J.	76.5

CONTROL LINE—FLYING SCALE

1.	Ronald Thorenson, Portland, Ore. (Jack Hudspeth flew proxy)	98
2.	Jack Hudspeth, Portland, Ore.	96
3.	Jack L. Butler, Inglewood, Calif.	43

SENIOR WINNERS

INDOOR STICK

Place		Flight Time
1.	Carl M. Brewer, Detroit, Mich.	1008.8 Sec.
2.	Erwin E. Rodemsky, Detroit, Mich.	1006.0 "
3.	Robert C. Wykes, Medford, Mass.	912.1 "

INDOOR CABIN

1.	George Xenakis, Detroit, Mich.	857.5 Sec.
2.	Robert C. Wykes, Medford, Mass.	737.3 "
3.	Carl M. Brewer, Detroit, Mich.	722.7 "

OUTDOOR STICK

1.	Robert Perkins, Clarksburg, W. Va.	996.2 Sec.
2.	Donald J. Robbers, Oakland, Calif.	865.4 "
3.	Robert C. Wykes, Medford, Mass.	856.6 "

OUTDOOR CABIN

1.	Carl Redlin, Detroit, Mich.	1296.2 Sec.
2.	Herbert Kothe, Omaha, Neb.	1045.2 "
3.	Joseph D. Kubina, Detroit, Mich.	756.6 "

FREE FLIGHT—CLASS A

1.	Donald G. Hobel, Buffalo, N. Y.	1282.0 Sec.
2.	Jason Hayward, Tucson, Ariz.	887.9 "
3.	Roy Boone, Tucson, Ariz.	792.1 "

FREE FLIGHT—CLASS B

1.	Carl R. Wheeley, Washington, D. C.	1278.0 Sec.
2.	John Kavulich, Binghamton, N. Y.	1204.0 "
3.	Robert A. Gardner, Massillon, Ohio	878.1 "

FREE FLIGHT—CLASS C

1.	Edward J. Lays, Rochester, N. Y.	1314.1 Sec.
2.	Donald G. Hobel, Buffalo, N. Y.	770.0 "
3.	Edmund Morosky, Detroit, Mich.	728.4 "

Contest Champions

Jack Hudspeth, Portland, Oregon, receives Junior High Point Trophy from K. T. Keller, President of Chrysler Corporation

Donald G. Hobel, Buffalo, N. Y., receives Senior High Point Trophy and congratulations from Brigadier-General R. C. Candee.

Frank L. Cummings, Los Angeles, Calif., winner of Open High Point Trophy, with J. B. Wagstaff, Vice President, De Soto Div. Chrysler Corp.

Robert O. Rada, Berwyn, Ill., gets Stinson Control Line Flying Scale Trophy from J. P. Shaw, Sales Mgr., Stinson Div. of Consolidated Vultee.

Sponsored by **PLYMOUTH MOTOR CORPORATION**

Winners!

MODEL PLANE CONTEST

DETROIT, MICHIGAN • • • AUGUST, 1948

FREE FLIGHT—CLASS D

Place	Flight Time
1. Carl J. Randall, Fresno, Calif.	990.0 Sec.
2. Joseph Kubina, Detroit, Mich.	862.2 "
3. James H. Ripken, Baltimore, Md.	663.2 "

CONTROL LINE—CLASS A

	Speed
1. Maurice Stanglin, Dallas, Texas	102.12 M.P.H.
2. Thomas Baker, Kings Mountain, N. C.	101.08 "
3. Richard Rigney, Long Beach, Calif.	94.00 "

CONTROL LINE—CLASS B

1. Stanley Grish, St. John, Ind.	116.16 M.P.H.
2. Charles E. Hallum, Oakland, Calif.	111.90 "
3. James Richmond, Terre Haute, Ind.	107.04 "

CONTROL LINE—CLASS C

1. Maurice J. Stanglin, Dallas, Texas	127.61 M.P.H.
2. Richard N. Rigney, Long Beach, Calif.	123.24 "
3. James D. Whitlatch, Fresno, Calif.	122.82 "

CONTROL LINE—CLASS D

1. Richard Malinski, Chicago, Ill.	126.89 M.P.H.
2. James D. Whitlatch, Fresno, Calif.	126.09 "
3. John Hammel, Sioux City, Iowa	125.82 "

CONTROL LINE—JET PROPELLED

1. Donald Block, Minneapolis, Minn.	137.98 M.P.H.
2 Thomas Baker, Kings Mountain, N. C.	132.98 "
3. Donald M. Sektnan, St. Paul, Minn.	126.80 "

CONTROL LINE—STUNT

	Points
1. Jack W. Gilroy, North Hollywood, Calif.	96.5
2. Russell Snyder, Laredo, Texas	86.5
3. Albert Grimm, Jacksonville, Fla.	85.5

CONTROL LINE—FLYING SCALE

1. Robert O. Rada, Berwyn, Ill.	124
2. William Boyd, Salina, Kan.	110
3. Donald E. Yearout, Albuquerque, N. M.	92

OPEN WINNERS

INDOOR STICK

Place	Flight Time
1. Bill E. Atwood, Glendale, Calif.	1275.0 Sec.
2. Frank L. Cummings, Los Angeles, Calif.	1128.0 "
3. Merrick S. Andrews, Forest Hills, L. I., N. Y.	1106.0 "

INDOOR CABIN

1. Frank L. Cummings, Los Angeles, Calif.	1065.8 Sec.
2. Donald T. Donahue, La Crescenta, Calif.	1062.6 "
3. Merrick S. Andrews, Forest Hills, L. I., N. Y.	919.5 "

OUTDOOR STICK

1. Edward Naudzius, Jr., Highland Park, Mich.	1368.8 Sec.
2. Dick Korda, Euclid, Ohio	1074.2 "
3. Otto E. Curth, Chicago, Ill.	984.9 "

OUTDOOR CABIN

1. Harold L. Stofer, Indianapolis, Ind.	1450.2 Sec.
2. Clarence F. Mather, Naperville, Ill.	1076.6 "
3. Harry E. Wiegel, New Orleans, La.	851.0 "

FREE FLIGHT—CLASS A

1. T. A. Burris, Lew H. Mahieu, Long Beach, Calif. (Team)	1331.5 Sec.
2. Keith Bousfield, Hamilton, Ont., Canada	1200.0 "
3. Jerry L. Stoloff, Brooklyn, N. Y.	975.6 "

FREE FLIGHT—CLASS B

1. Al Blatter, Detroit, Mich.	1357.0 Sec.
2. Jerome J. Schroeder, Detroit, Mich.	954.0 "
3. Ernest Maynard, Nashua, N. H.	927.6 "

FREE FLIGHT—CLASS C

1. Dennis Davis, San Diego, Calif.	1310.4 Sec.
2. Merwyn D. Seaman, Minneapolis, Minn.	1228.1 "
3. Robert L. Holland, Sunland, Calif.	947.7 "

FREE FLIGHT—CLASS D

Place	Flight Time
1. Gareth E. Treuter, Detroit, Mich.	1432.0 Sec.
2. Stuart P. Weckerly, Toledo, Ohio	1381.6 "
3. George E. Ritter, Bloomsburg, Pa.	1311.2 "

CONTROL LINE—CLASS A

	Speed
1. Leonard A. Wagner, Niagara Falls, N. Y.	102.00 M.P.H.
2. Ronald S. Kirk, Kenmore, N. Y.	100.63 "
3. Lew H. Mahieu, T. A. Burris, Long Beach, Calif. (Team)	100.52 "

CONTROL LINE—CLASS B

1. Anthony J. Grish, St. John, Ind.	119.24 M.P.H.
2. Edward K. Waters, Chicago, Ill.	113.52 "
3. Walter H. Wincek, Massillon, Ohio	113.16 "

CONTROL LINE—CLASS C

1. Anthony J. Grish, St. John, Ind.	133.58 M.P.H.
2. Babe Dunning, Santa Ana, Calif.	131.62 "
3. James McElroy, Phoenix, Ariz.	126.27 "

CONTROL LINE—CLASS D

1. Keith H. Storey, Laguna Beach, Calif.	144.87 M.P.H.
2. Robert H. Thomas, Anaheim, Calif.	143.71 "
3. Speed Ambler, Cleveland, Ohio	137.77 "

CONTROL LINE—JET PROPELLED

1. Robert M. Thor, H. H. Lundquist, Minneapolis, Minn. (Team)	141.34 M.P.H.
2. George W. Sweet, Beloit, Wis.	130.19 "
3. Arthur Aegerter, Mansfield, Ohio	128.80 "

CONTROL LINE—STUNT

	Points
1. Lewis J. Andrews, Newton, Mass.	116.0
2. James G. Saftig, San Diego, Calif.	106.5
3. Carl Malmsten, Boulder, Colo.	99.0

CONTROL LINE—FLYING SCALE

1. George Earl, Detroit, Mich.	118
2. Chesley C. Common, Detroit, Mich.	116
3. Richard L. Maguire, Portland, Maine	110

Plymouth President D. S. Eddins presents Control Line Jet Event Trophy to Robert M. Thor, Minneapolis, who teamed with H. H. Lundquist.

Air Trails Editor A. L. Lewis congratulates Lewis J. Andrews, Newton, Mass., High Point winner in Gas Powered Control Line Stunt Events.

Sandra Pinckney, Elmhurst, Ill., receives Girls High Point Trophy from C. E. Bleicher, President of De Soto Division of Chrysler Corp.

Seven-year-old Billy Peden, Vallejo, Calif., gets Youngest Contestant Trophy from H. B. Heberling, Assistant General Sales Manager of Plymouth.

SUBSIDIARY OF CHRYSLER CORPORATION

Showcase

It's a Cinch →

Catching on not only in the East but throughout the country is Consolidated Model Engineering (3087 3rd Ave., New York 56, N. Y.) Co's new Super Cinch control-line stunt job for large Class B and C engines. For ignition type or glow plug motors. Kit has everything but wheels and liquids, costs $2.95. Designed with beginning modeler in mind. Consolidated also makes Baby Cinch for Class A and B.

← Car of the Future

Featuring body of futuristic design, new Atomic Jet Jr. car by The Megow Corp. (Philadelphia, Pa.) sells for 50¢ ready to run. Molded of durable plastic, car has metal axles for minimum bearing traction and wire running lugs with brass bushings. Powered by standard CO_2 capsule, car gives great promise of high speeds. Design is said to give minimum drag. Races along guide wire. Catalog 15¢.

Take Your Pitch →

A boon to CO_2 engine admirers is the adjustable pitch prop available from Hillcrest Mfg. Co. (1695 Cordova St., Los Angeles 7, Calif.). Blades are of flexible, molded plastic which give in rough landings so they're difficult to break and protect motor shaft. Pitch is quickly adjustable to plane's requirements. Machined dural hub locks blades at desired setting. For OK motors; 7" dia., complete, 45¢.

← Try Tri-Chem

Here's a handy, helpful item for all you Air-Pix fans. Eastman Kodak Co. comes up with the Tri-Chem Pack which gives enough developer, short stop and fixer to process two rolls of #620 film or make 50 2¼" x 3¼" prints. Powders are put up in separate envelopes and the whole thing comes in a cardboard box for only 20¢. Meets needs of amateurs who develop and print films at irregular intervals.

No Gassing Here →

Now in its eighth printing, "Model Gas Engine Handbook," by Bernard B. Winston, has been increased to a 200-page affair devoted to the theory and practice of model gas engine operation. Has 100 pictures, cuts and diagrams, features instruction sheets for nearly all postwar engines. $1 at your dealer's. Distributed by America's Hobby Center, 156 W. 22nd St., New York City. 45,000 sold to date.

Showcase Shopping

For items presented here try your nearest hobby or photo shop. Write to the maker for address of a retailer handling the product if you can't locate it. Prices and specifications are subject to change.

Hold That Tiger →

Out of the box, ready to fly (just slip the main components in place) comes the Lucky Tiger model made by ReCor Mfg. Co. (3326½ S. Main St., Los Angeles, Calif.). Red and blue all-balsa flyer has 18" wing span, 15" fuselage. Nose which carries landing gear is made of drawn aluminum. Assembly instructions clearly shown on generous size box in which model is packed. $1.25 at your dealer's.

← Skyrocketing Ship

The familiar name of Comet is back in the model circles again. Now called Comet Model Hobbycraft, Inc., firm is headed by Sam Goldenberg and is located at original address, 129 W. 29th St., Chicago 16, Ill. Among new offerings is Comet's L10 kit, the "Skyrocket," which has 30-inch wing span and can be powered by rubber or CO_2 motor. High-wing design of contest configuration. Has sub-rudder.

Drilling Performance →

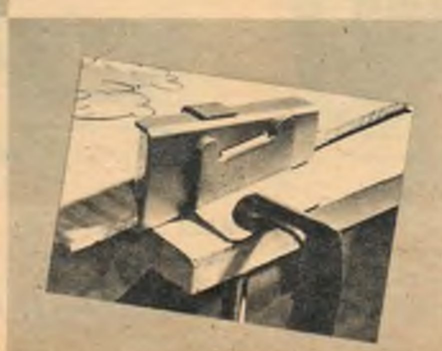
Small size drills of special interest to model builders are being made by J. M. Ragle Industries (4029 Indiana Ave., Kansas City, Mo.). About same size as automatic pencil, drill has pocket clip. Tempered-steel, double-end chuck takes drill sizes from #45 to #80. Handle holds 24. Twelve assorted drills in even number sizes #52 to #74 with holder, for $3.50. At welders or from manufacturer.

← Prevents Arguments

You can eliminate the guesswork from control-line speed flying with a set of Killy's Speed Tables (Box 1191 Dallas, Tex.) which are set up for both race cars and model planes. Original booklet has been condensed into pocket-size affair printed on light cardboard stock for durability. Revised for new AMA rules, the tables cover all four classes of racing models and give times directly in mph. 50¢.

What's Your Vise? →

A small vise to do the many jobs required by model builders is a product of the Palmer Mfg. Co. (Box 439, 147 Broadway, Des Moines, Ia.). Three parts of 14-gage polished aluminum hold everything from ½" down to paper thickness. Longest part measures 4". Comes with clamp; entire unit weighs only 4 oz. Serves as handy hand clamp, too. Prepaid, the Midget Vise sells for only $1.50.

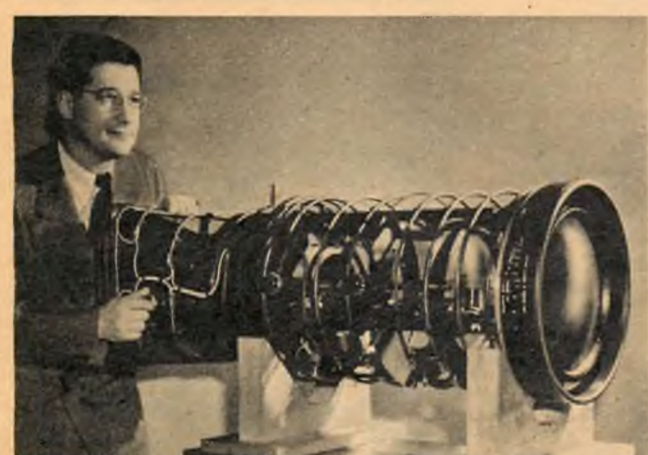


DEVELOPMENT HIGHLIGHTS

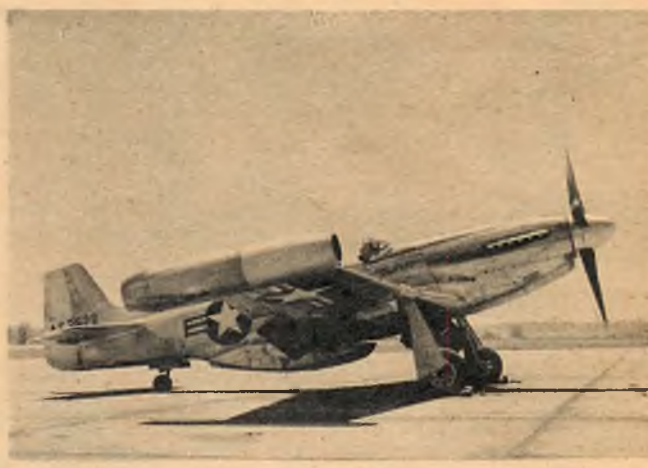
● Artist's drawing of North American T-28 trainer, 268 of which will be built for the AF. Will be used for basic and advanced training and transition to jets. First of this type to feature tricycle landing gear. Engine 800 hp, speed 292 mph.

● British Boulton Paul Balliol powered by an Armstrong Siddeley Mamba turbo-prop engine. Plane is to serve as advanced trainer and give valuable experience in operation of gas-turbine power plants. Will be a stepping stone to jet airplanes.

● Artist's drawing of a Russian jet plane, presumably copy of German DFS-346. Features swept wings and straight-through air flow engine installation. DFS-346 was supersonic design, with two liquid fuel rockets capable of Mach 2.5 at 100,000 feet.



● Giant 60-inch tele-photo lens designed and manufactured by Eastman Kodak for the Air Force, to be used in the K-34 aerial camera with 9x18 film. Can take photographs at altitudes up to ten miles. Lens has five elements, and heating device in mount.



● Not a wing tip bank but a Marquardt XRJ-30-AM ram jet engine, two of which are fitted to wings of a North American F-51D. Purpose: to investigate performance of this type of plant. Test-flown by Air Materiel Command, Wright Field.

► *In a huddle on their design for the rudder of a student project aircraft these Northrop students study their assembly drawings, thus duplicating a scene that will occur often in their careers.*

► *Northrop students get practical experience in modern engineering test methods. Here stress distribution is being studied by passing polarized light through a transparent plastic specimen.*

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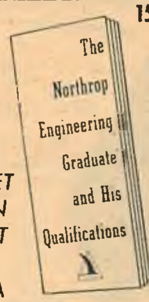

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Air Notes

AVIATION TODAY AND TOMORROW

By John Forney Rudy

WAR BY WEATHER: The military is no longer able to keep the lid on 'meteorological warfare.'

While little is known outside of a very select group of scientists, it is believed that the control and use of weather as a military weapon will rank with atomic power.

Aviation will play an important part in the new development; just how is still a secret. Some indications have leaked that American scientists already know how to control weather and to direct its effect on areas of considerable size, but not yet large enough to create severe drought over an entire country thus destroying the food supply of a nation.

CAA WILL HAVE ITS SAY: During the last few years many of the recommendations advanced by CAA's Non-Scheduled Advisory Committee have later become rules, regulations, and new developments. As a portent of what may be forthcoming, here are the latest recommendations:

That spin tests be eliminated from private pilot exams; that the new cross-country course be approved and promoted; that as many single strip landing fields as possible be encouraged and that cross-wind landing gear success be reflected in airport planning; that weather forecasts be increased; that location of weather stations at airports be encouraged, and that private pilot physicals every two years be maintained.

JOBS FOR ALL: The greatest search since wartime for aviation engineers of all types will begin shortly after the first of the year. The drive will center around college engineering seniors. At least 250 colleges and universities will be contacted for personal interviews of engineering students for aviation manufacturing jobs.

NORTH POLE PATROL: The accent is on more Arctic aviation research. Although military secrets are whizzing around Congressional and governmental corridors in Washington, it is becoming increasingly evident that the U. S. is building a sizable Arctic air force.

Latest evidence is the USAF's First Arctic Aeromedical Laboratory in Fairbanks, Alaska. Electrically heated clothing, long-term and short-term acclimatization, effects of cold on blood coagulation, sight, hearing and heart activity, are only a few of the items being intensively researched in order to perfect Arctic aviation.

FROST FIGHTERS: There's never a month that we don't find some brand new use for lightplanes. The newest is chasing frost from budding wheat. Recently a squadron of seven low-flying personal planes in an early morning flight in Idaho saved more than 3,000 acres of budding wheat from ruin by frost. Flying 10 to 70 feet above the fields the planes created a downwash that stirred up ground air which raised air temperatures and dissipated the killing frost.

COMPLICATED COCKPIT: Jet test pilots are complaining about too many encumbrances in the cockpits of hot planes. Many pilots are urging a jettisonable cabin so equipped that the pilot will be limited to a 'G' suit, small mike and writing pad. Among the items they must contend with now are oxygen mask, pressure vest, crash helmet, life preserver, radio receiver headset, goggles, gloves, and more.

SIT DOWN! Have an idea how many passengers sit in and get up from an airliner seat before it wears out? The estimate is 100,000 times. To provide more passenger comfort, ease of maintenance and long life of plane seats, Consolidated-Vultee is using some Rube Goldberg sounding devices on different types of plane seats.

One of the devices is a 'dynamic cycler' in which plaster shapes fitted with standardized human forms are loaded with lead weights, and then pressed thousands of times against the seat cushions.

CHANNEL WING: A report of the Custer Channel Wing development in Air Trails started a wave of enthusiasm and interest clear around the world. Willard R. Custer, inventor of the plane, reports greatest interest from American modelers who are swamping him for requests of engineering data to build models.

Missionaries in China, cattle ranchers in South America, prospectors in Alaska and crop dusters in Europe have inquired about the plane, all visualizing its utilization in their operations which seem unsuited for conventional planes.

One large aircraft maker is now building a number of models of the channel wing for research purposes, may later launch full scale production of a channel wing personal plane.

Tests have been made recently with two counter-rotating engines in order to overcome torque at slow speeds. Actual flying is just about to begin and Custer promises to 'uncork sensational flight characteristics that will rock the aviation world.'

TURBOPROP PROGRESS: A sizable turboprop engine program is now underway to produce about six engine designs, one of which is expected to be in use in early 1949. Somewhere between 60 and 100 millions will be spent in the turboprop program which should give the U. S. world turboprop engine leadership.

Probably the first of the half-dozen engines, developing now by Allison, will be used in a giant flying boat in the spring. While the first turboprops will be in the 5,500-hp range, ultimately the concentrated research and development program is expected to produce an engine of nearly 12,000 hp.

HEARD IN WASHINGTON: Convair expects to build a giant turboprop flying boat for the Navy while Boeing may build a super long range turboprop bomber, bigger than the XB-47 . . . Jato units are being tested on small liaison planes, perhaps presaging use of jato in the personal plane field . . . More mergers of scheduled airlines are in the wind with several important consolidations actually in planning stage.

A total of 5,000 new pilots will be trained in next 12 months, 3,000 in Air Force and 2,000 in Navy . . . National Aeronautic Ass'n will increase promotion of modeling, gliding and soaring and private flying . . . Details of the XR-17 flying crane 'copter powered by two jets and able to carry 12½-ton payloads 50-75 miles should be available soon. . . . Pan Am is experimenting in some of its cargo planes with a radar nose enabling the pilot to 'see' the terrain below and about 40 miles ahead of the plane . . . The multi-bladed prop and muffler development perfected by NACA to reduce noise in private planes may soon be applied to commercial planes . . . Miami isn't letting the claim of the world's finest airport go to Idlewild; it will soon announce its plans for Miami International Airport.

LOVE THOSE LIGHTPLANES: The experts may still differ in the fine details about the improvements needed to project the lightplane into the mass market, but in general terms they are becoming more agreeable. Here's the latest characteristics, and the design features, for tomorrow's lightplanes:

Safe landing or take-offs in 500 ft.; control of air flow over wings by some form of boundary layer control; far less than present noise in propeller, exhaust and engine clatter; cross-wind landing gear; roadability; elimination of ice hazard, and convertaplanes which would combine the advantages of both fixed wing craft and 'copters, or something similar to the Custer Channel wing plane.

ROCKET RESEARCH: What's ahead for rockets? The Guggenheim Foundation after an exhaustive survey looks ahead confidently to a tremendous expansion in both development and use of rockets. Before that occurs, however, it has found need for more research, a greater supply of adequately trained specialists than exists at present, better propellants, new combustion processes and improved design and controls.

Survey found 80% of the companies working on rocket development were directing part of their work toward the rocket's peacetime applications; in aircraft engines, braking for plane landings, 'copter propulsion, and in jet assisted take-off gear.

The survey listed three projects which should be started. One—development of a plane capable of 2,500 mph or better for commercial use; two—an analysis of non-military applications of satellite and space ships; three—sponsorship of an interplanetary flight project.

TINY TELEMETERING: The Navy's finally perfected it, a miniature telemetering system for rockets weighing only a few pounds which will transmit continually 24 different kinds of scientific information ranging from flight characteristics to cosmic ray intensity while the rocket soars to higher than 70 miles at 3,000-mph speeds.

MORE MAGNESIUM: There is a growing trend toward greater utilization of magnesium in military aircraft. While the accent will be to use it in high speed fighter types, the first concrete results have come from its use in the long range B-36.

Consolidated-Vultee has designed nearly two tons of magnesium alloy into the B-36. It is estimated this will save about 2,000 lbs. in the plane's empty weight and may probably extend the plane's range by nearly 200 miles.

AIR AGE EDUCATION: The day when school students will board planes and fly off for on-the-scene learning may not be as far in the future as you'd think. The flying classroom idea is already being used by school principals and supervisors. It may not be long before school buses will be augmented by school planes.

One plane already being given consideration, would utilize inactive military transports to take thousands of leading Americans abroad and bring leading foreign citizens back to the U. S. in an exchange that would lead to better world understanding.

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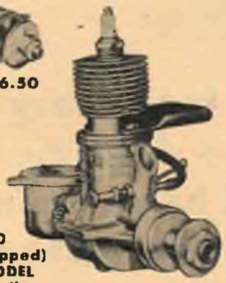

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(ball bearing equipped)
SPARK PLUG MODEL
$16.50—less coil
GLOW PLUG MODEL
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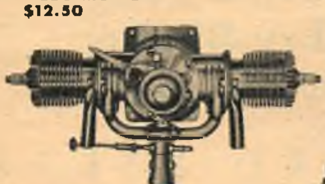

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SPECIFICATIONS

Model	Class	Displacement	Bore	Stroke
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Super 29	B	.299	.760	.660
Super 60*	D	.604	.900	.950
Twin	Exp.	1.208	.900	.950
Hot-Head	B	.299	.760	.660
CO_2	Compressed Gas	.0178	.275	.300

*Super 60 also available in Raceway-Marine model equipped with flywheel

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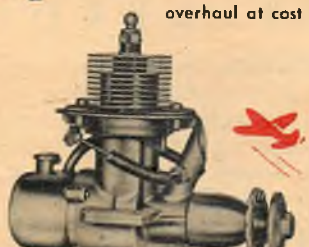
OK COIL
$1.75 with lead
(In coil pack with lead and matched condenser—$1.95)



OK HOT-HEAD—$12.50
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OK HOT-HEAD fuel, for faster starts and higher speeds, (for Glow-Plug operation).

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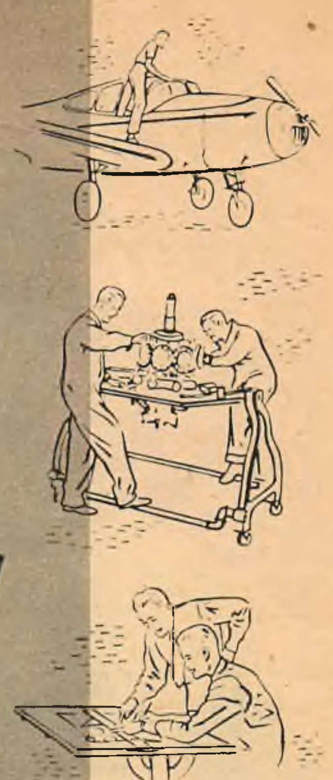

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TRAIN IN MIAMI -- AIR CAPITAL OF THE WORLD

AIR TRAILS
NOVEMBER 1948

Beyond the "Barrier"

NEXT to the atomic bomb, there has been more misinformation thrown around on the general subject of high-speed flight than on anything else this season. To qualify as an expert, all you need know are a few catch phrases—"sonic barrier," "compressibility," "guided missiles." These, coupled with almost anything said hurriedly in between, will make you an authority. If your wife has recently had one of the new "supersonic" permanents, that should help too.

The whole country has broken out in a rash of high speed lately. It started at the time the Skystreak broke the world's speed record and then repeated the performance by bettering its own record. More recently, there has been an asinine exchange of "we done it first" releases between the British and our NACA on the subject of achieving supersonic speeds. While we are considering these claims, without much regard for how such speeds were achieved, let's not overlook the kid next door with a basement rifle range. He has been getting supersonic velocities every time he pulled the trigger of his .22, and with very little effort and no special equipment. As a matter of fact, probably the first supersonic velocities in this country were reached by rifle bullets shortly after the Civil War. To ballistics experts, the word "supersonic" is no stranger.

But there are many questions about high-speed flight that have to be answered in a simple form if the average person is to acquire some sort of knowledge about the subject. For instance, what is this business about the sonic barrier, anyway? Why do we have to pierce it? Of what value are the missile experiments and the speed runs at Muroc? How did the speed of sound get tied up with the whole thing? What is Mach number and what good is it? Taking first things first, maybe we can work some sense out of these questions in a logical order.

Perhaps the best way to start is with a simplified approach to an understanding of compressibility. This involves mentioning how the speed of sound got tied up in the whole thing, and why we speak of critical Mach numbers. So, if you are willing to accept the concept of air molecules as little elastic particles that bounce around madly when agitated, we may go on from there.

One of the unique things about a fluid such as air is that if a sudden change in pressure occurs somewhere, the disturbance moves along a spherical wave-front. (You can see a two-dimensional picture of this when next you heave a rock into a still pond.) Sound, it has been found from basic studies, travels as a wave-form sort of energy, expanding in space in spherical waves from the source. It doesn't take much to see that sound will very likely travel with the same velocity as the pressure disturbance we mentioned, because sound is a series of controlled pressure disturbances in the air—alternate compressions and rarefactions, if you

IF YOU HAVE FIRED A GUN, YOU HAVE DABBLED IN SUPERSONICS. BUT HOW MUCH DO YOU KNOW? IS THERE A SONIC BARRIER? WHAT IS COMPRESSIBILITY? HERE IS A CLEAR ACCOUNT OF WHAT HAPPENS TO AIR AND PLANE AT HIGH SPEED

BY DAVID A. ANDERTON

Beyond the Barrier (CONTINUED)

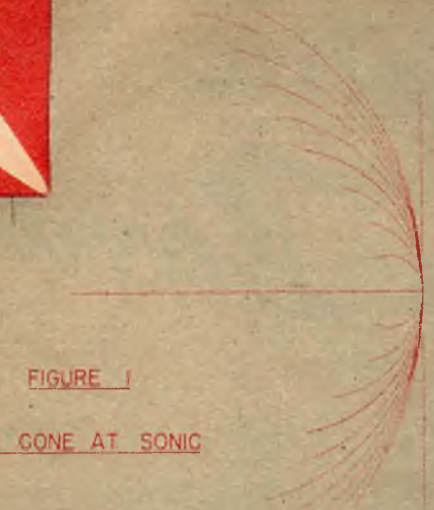


FIGURE 1

MACH CONE AT SONIC

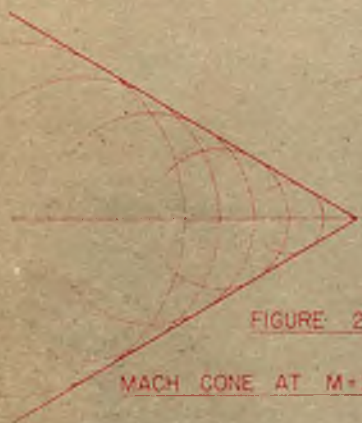


FIGURE 2

MACH CONE AT M=2.0

AIR FLOW

FIGURE 3

SWEEPBACK KIDS THE AIR

FIGURE 4 SUPERSONIC SWEEPBACK

will. Well, that *is* what happens—the sound wave-front travels with the same speed as the pressure disturbance. Furthermore, the wave-front, or little compression wave, weakens in intensity as it gets farther away from the source. Remember these two things.

Now we are ready to talk about airflow. We want to consider three speed ranges: subsonic, trans-sonic and supersonic. You'll note that all of these contain the syllables "sonic"; that's because they are all compared to the speed of sound. Why? Actually, for convenience in speech; more correctly, they should be compared to the propagation speed of a pressure disturbance in air. Those last nine words are merely saying, as we learned above, the velocity (propagation speed) of sound (a pressure disturbance in air).

The speed ranges are generally defined by giving limiting Mach numbers. (Is it still necessary to say that Mach number is the ratio of the speed of the airplane or missile to the speed of sound?) Subsonic, for instance, goes from a Mach number of 0 to one of 0.85; trans-sonic, from 0.85 to 1.2; supersonic, from 1.2 on up. These boundaries, by the way, are drawn with a wide brush, mostly for convenience.

At subsonic speeds, flow conditions are simple. Suppose we think about any airfoil shape, and see what happens. The air, blowing at the wing, divides and goes above and below the surface. The reason it divides is because each air molecule was told what was coming. And the reason it was told is that a little area of high pressure, creating a disturbance, builds up on the nose of the airfoil. The air particles flow from areas of high pressure to low pressure; they can be repelled, in a sense, from high pressure areas. So the oncoming airstream divides and flows around the wing. And just so long as the speed of that oncoming air is low compared with the propagation speed of a pressure disturbance in air (velocity of sound), the warning reaches out upstream, and the air molecules are told in time.

Suppose now we increase the speed of the plane, or of the air over the wing. We know that the air passing over the upper surface of a wing is traveling faster than an equivalent particle passing outside the wing along a chord line. (A straight line is the shortest distance between two points.) Slowly the airplane approaches sonic speed, and if we could see it, here's what would happen.

The air on the upper surface of the wing (or for that matter, a cowling, canopy, fuselage nose or duct inlet) gets very close to, and finally reaches sonic speed while the rest of the airplane is traveling somewhat slower. And at sonic speed, a shock wave forms—and those eight words are going to take a lot of explaining. Chapters have been written on the mechanics of shock waves, but most of them are too technical. Too many make the mistake of assuming that a shock exists, and then proving, thermodynamically, that it can. If we think about the propagation of compression waves some more, we can probably get a good picture of what happens in sonic flow. In fact, we can draw some pictures that will show exactly.

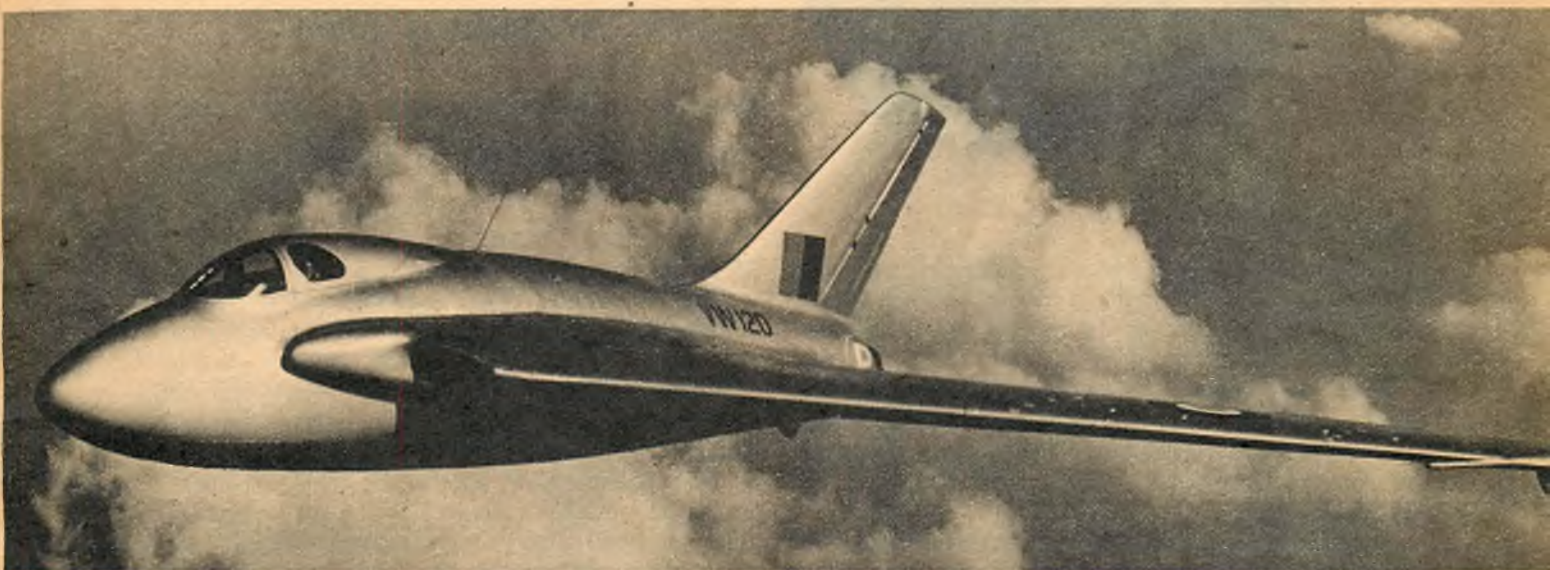
For this, we need a compass and a scale. Let some convenient unit represent the speed of sound, and other speeds be expressed by multiples or fractions of that unit. Suppose the air is traveling at sonic speed; we can draw a number of points, all one unit apart, which represent positions of a wing leading edge, for example, on successive seconds. In Figure 1, ten points were used. At time = 10 seconds, the sound wave has just begun to propagate. At the distance corresponding to nine seconds, it is one second old. It can be represented on paper by a circle of one-unit radius. This goes right on down the line to the zero point, at which point the pressure sphere is ten seconds old.

See what's happening? All these spheres of disturbance are tangent, and they show an envelope of common boundaries. If you do this for enough points, a straight line envelope results, perpendicular to the air stream. This envelope represents the sum of many little pressure disturbances, adding and reinforcing each

A normal shock wave, and by normal we mean perpendicular to the airflow, has supersonic velocity upstream of it, and subsonic downstream! Picture an aircraft flying at just under sonic speed, and with a normal shock standing out from the upper surface of the wing. Ahead of the shock, the air flows faster than the plane is traveling; behind the shock, the air flows slower than the airplane's velocity. Confusing, isn't it?

Actually, however, everything is all right. There are compensating pressure and density changes so that the equations of continuity are satisfied. But worrying about this, or trying to calculate the process through the sonic speed range, has annoyed aerodynamicists.

It has been determined, from wind tunnel tests, that the normal shock wave on a wing moves aft as the airplane speed approaches sonic. Just a fraction of a mile per hour below sonic, the shock wave is at the trailing edge of the wing, and a bow shock is beginning



● The British De Havilland 108 used for high speed research. Sweptback all-wing configuration greatly retards compressibility.

other until they are very strong. This envelope is a shock wave. Simple?

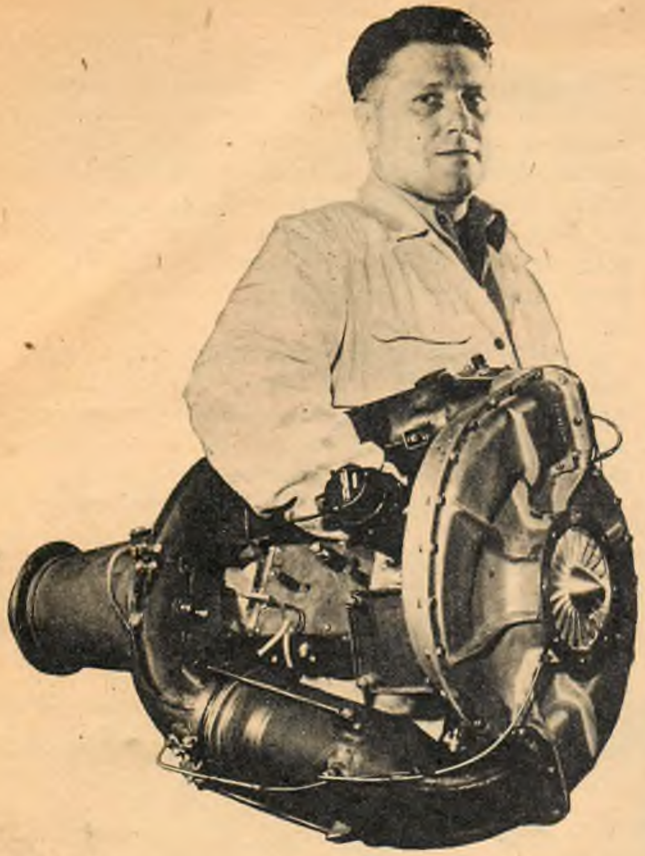
If you draw the same sort of a diagram for a supersonic speed, say twice that of sound, you get the conical shape shown in Figure 2. These shock wave envelopes are sometimes called Mach cones, or if observed or drawn on a plane surface, called Mach waves.

Here, then, are physical pictures of what happens to the air over a wide range of speeds. There are, however, lots of other things to consider. The way these shock waves were so easily drawn can't begin to hint at the trouble they may cause. Some of these troubles have been named "compressibility effects," and have been ascribed to the so-called "sonic barrier." We've seen how and why these shock waves form at near-sonic speeds, but what effect do they have? Let's talk about this for high subsonic Mach numbers.

One of the seeming paradoxes of supersonic flight apparently violates the laws of continuity at first glance.

to form at the leading edge. At sonic speed, the shock attaches at the trailing edge, and the bow shock builds up strongly. What this does to the airflow over a wing is the real danger in the "sonic barrier." Under conditions of such a shock system, the flow over the wing is first subsonic, then part supersonic and part subsonic, then almost all supersonic, then all supersonic. Since airflow speed alters the pressure distribution over a wing, the air loads on the wing change terrifically during this procedure. These changes may, in fact, become severe enough to rip the wings off completely. And the control surfaces in the wake of all this flow shift are affected, too. The changes in flow-angle off the wing trailing edge (usually called "downwash") cause large variations in the tail loads, resulting in violent pitching motions and loss of control.

Fortunately, there are means of keeping an aircraft relatively free of compressibility troubles. For instance, wind tunnel tests have shown that a *(Turn to page 101)*



Here Come the MIDGET JETS

BY ANDREW R. BOONE

CAN YOU IMAGINE CRUISING IN YOUR CUB AT 300 MPH? A NEW ERA IN ENGINES BEGINS NOW

A NEW era in small aircraft propulsion may have begun with the development of two new lightweight gas turbine engines by Boeing as part of a long-range power plant research program.

These new midget jets have been designated Models 500 and 502. The 500 is a turbojet, with single-stage compressor, and dual combustion chambers. The compression ratio is 3:1, and the air mass flow 3.25 lb./sec./36,000 rpm!

The axial flow gas turbine carries a fabricated steel diaphragm, with 27 inserted nozzle guide vanes. The rotor disc, of special steel alloy, has 64 welded solid blades, of 7.28 inches diameter. Gas temperature is 1500 degrees F., at 36,000 rpm before the turbine, and 1250 degrees after the turbine. Starting is effected with compressed air—two igniter plugs and two ignition coils being provided for firing.

Model 500 weighs only 85 pounds, light enough for a man to carry under his arm. Fuel consumption at cruising has been found to be 1.30 pounds per pound of thrust, per hour. The engine is 22 inches in diameter, 29 inches long, and has a frontal area of 2.2 sq. ft.

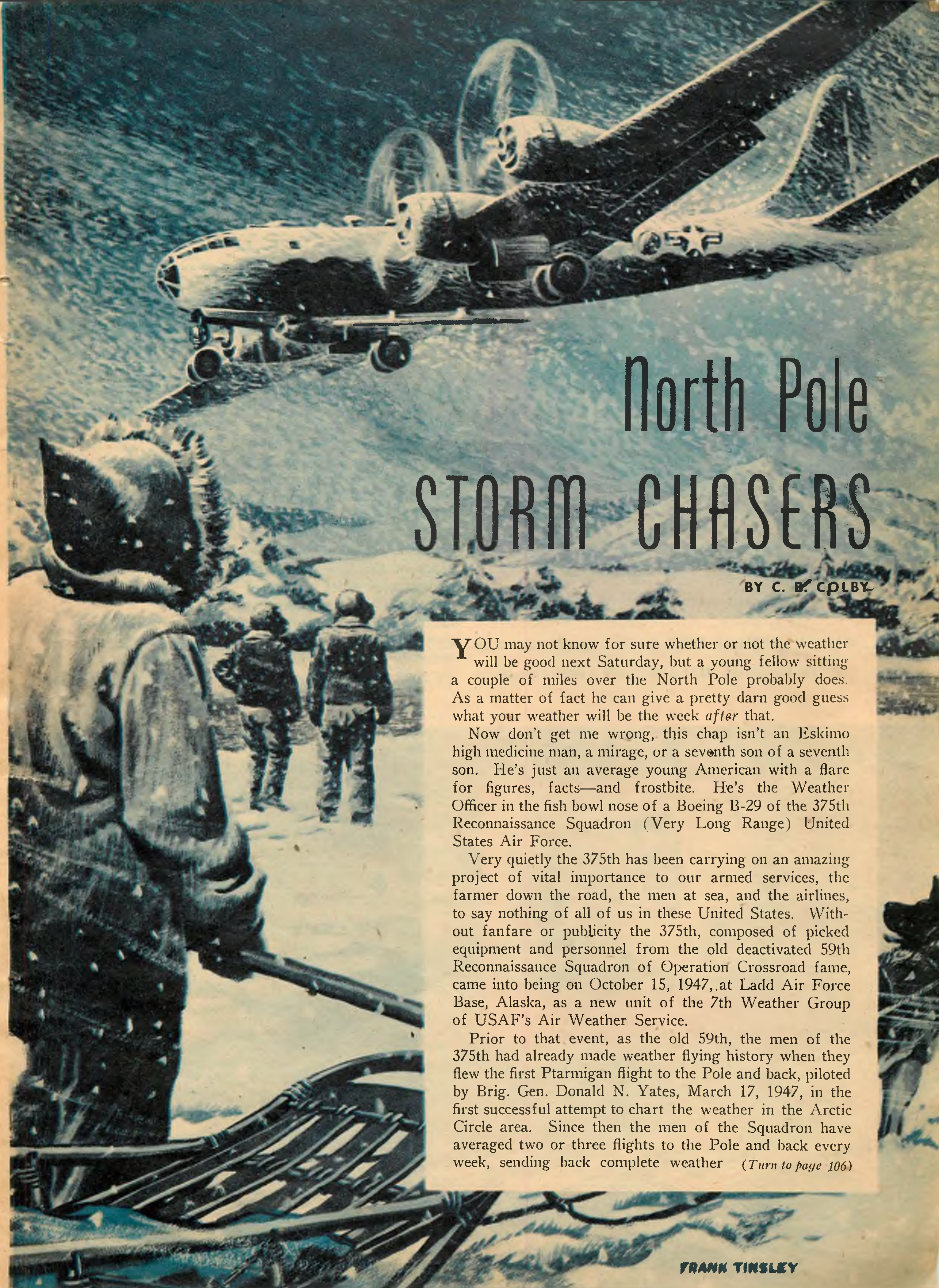
Model 502, unlike its smaller predecessor, is turboprop in type, and may prove valuable as a power plant for small planes whose requirements do not pass 200 shaft horsepower. This engine embodies a single-stage compressor, dual combustion chambers, single-stage turbine and geared propeller drive. Compression ratio is 3:1, and the air mass flow 3.50 lb./sec./36,000 rpm, slightly higher than in Model 500. Combustion chambers duplicate those in Model 500, while the turbine is of the two-stage axial flow gas type. Diameter duplicates Model 500, 22 inches. This engine, however, is 42 inches long, has a frontal area of 2.2 sq. ft., and weighs 140 pounds. Fuel consumption for cruising is declared to be 0.5 lb./hr. Take-off rating (static) is fixed at 200 shp/50 lb. t./2750 shaft rpm/sea level.

What are the possible uses for these power plants? Either would prove suitable as a starter engine for larger jet units or turbines; as a thrust source for guided missiles, glide bombs or small airplanes; as auxiliaries on large aircraft; as the main driving engines for small boats; as stationary engines.

Obviously, the day of the small gas turbine—the midget jet, employed either to develop thrust or horsepower applied to a propeller—has dawned. But development lies ahead. Several companies in this country are known to be working on such units, some of them for the military services. Details cannot yet be revealed. As for their uses, only some are known. The Navy is reported to be considering powering fast, small boats with such units. Their adaptability to small aircraft, both military and civilian, is a distinct possibility.

None has yet reached commercial production. Up to now, all are "custom made," by hand, and at the moment serve research purposes only. Of greater importance than their direct application as stationary engines, and to power boats and small aircraft, is the knowledge now being gleaned by research engineers in fundamentals of power so produced, metallurgy, and other factors necessary in creating turbojets and turboprops of much higher horsepower, for application on large aircraft.

Should these small engines find their way into small aircraft, perhaps private pilots will find themselves suddenly accelerating to much higher (*Turn to page 72*)



North Pole STORM CHASERS

BY C. B. COLBY

YOU may not know for sure whether or not the weather will be good next Saturday, but a young fellow sitting a couple of miles over the North Pole probably does. As a matter of fact he can give a pretty darn good guess what your weather will be the week *after* that.

Now don't get me wrong, this chap isn't an Eskimo high medicine man, a mirage, or a seventh son of a seventh son. He's just an average young American with a flare for figures, facts—and frostbite. He's the Weather Officer in the fish bowl nose of a Boeing B-29 of the 375th Reconnaissance Squadron (Very Long Range) United States Air Force.

Very quietly the 375th has been carrying on an amazing project of vital importance to our armed services, the farmer down the road, the men at sea, and the airlines, to say nothing of all of us in these United States. Without fanfare or publicity the 375th, composed of picked equipment and personnel from the old deactivated 59th Reconnaissance Squadron of Operation Crossroad fame, came into being on October 15, 1947, at Ladd Air Force Base, Alaska, as a new unit of the 7th Weather Group of USAF's Air Weather Service.

Prior to that event, as the old 59th, the men of the 375th had already made weather flying history when they flew the first Ptarmigan flight to the Pole and back, piloted by Brig. Gen. Donald N. Yates, March 17, 1947, in the first successful attempt to chart the weather in the Arctic Circle area. Since then the men of the Squadron have averaged two or three flights to the Pole and back every week, sending back complete weather (*Turn to page 106*)

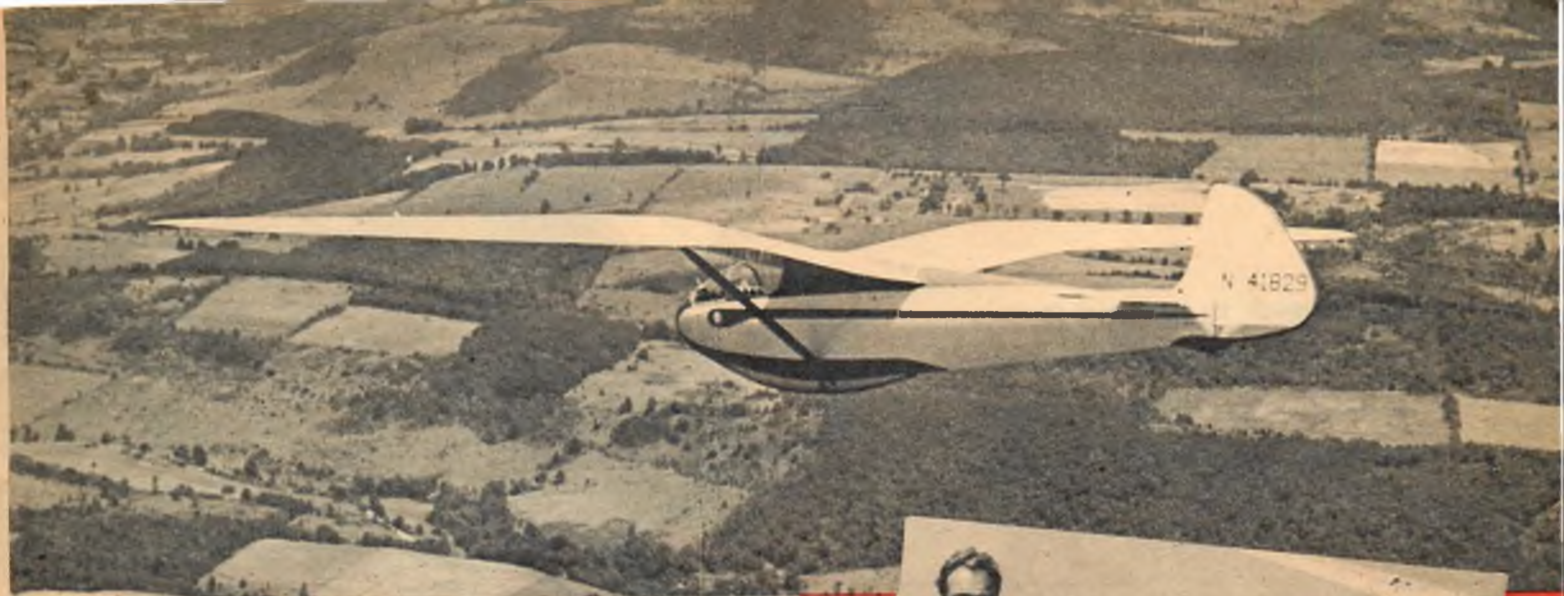
15th National Soaring Contest

ELMIRA'S THERMALS SMILE ON THE CONTESTANTS OF THE 15th NATIONAL MEET AND ELECT A NEW CHAMPION

BACK to its home town of Elmira, N. Y., came the 15th National Soaring Contest, having splurged last summer with Texas thermals at Wichita Falls.

Soaring pilots flew a total of 10,320 miles, made 629 take-offs and enjoyed the hospitality extended to them and their crews by the citizens of the town during the competition. Although meteorological conditions were not as good as those encountered last year in Texas, only two of the twelve days were unsuitable for soaring. Nevertheless, the meet proved to be highly successful. Much of this was due to the revised and improved contest rules which eliminated both duration and altitude from the point award system leaving the contestants to compete for distance alone. Points were given for flights only beyond 25 miles and the point award fund, totaling $3,700, was divided according to the point value of a contestant's five best flights. In

● Father and son team. Champion Paul MacCready, Jr., and Dr. MacCready who was his crew chief.



order to qualify, the final score of the pilot could not be less than 25% of the average of the three highest contestant scores. Another innovation was the fund of $1,000 set aside by the Elmira Area Soaring Corporation, sponsors of the meet, as travel pay for pilots coming from points located beyond a 300-mile airline distance from Elmira.

The contest always attracts pilots who enter less for the serious competition than for the fun of flying and the personal satisfaction of having participated in the most important soaring event of the year. Two classifications were established which graded entrants as "Contestants" or "Participants." While Contestants had more privileges and were eligible for point award money, Participants were given prizes for special activities such as altitude, spot landing, duration, speed dashes and aerobatics. For the most (*Turn to page 87*)

● Above: The graceful Kirby Gull flown by Emil Lehecka of New York starts out on a cross-country flight. This is a fine example of superior home-built craftsmanship.

● Top right: Judged the best team of the meet, John Robinson and crew chief John Olley. A good crew chief is as important as a good sailplane. Olley is considered the best.

● Right: E. J. Reeves, Dallas, Texas, second time president of Soaring Society, watches intently progress of a sailplane.

PIPER'S ANSWER TO THE LONG SOUGHT PROBLEM OF A LIGHTPLANE FOR AVERAGE MAN'S POCKET WITHOUT SACRIFICE IN PERFORMANCE, COMFORT OR LOOKS

We Fly THE VAGABOND

BY WILLIAM WINTER

PIPER'S saucy side-by-side Vagabond is a friendly little airplane which we predict will make many friends among the flying fraternity. Piper says it is ideal for the businessman, the partnership or club ownership. But we have a hunch that Piper has produced something that is more the true air flivver than anything they have made to date. Just as the Cub always was a "trainer," this long-overdue, inexpensive *side-by-side* has the earmarks of a lucky strike combination that is logically suited for private ownership.

The Vagabond wraps up in varying degrees many of the desirable attributes of the true lightplane. As Bill Piper will tell you, "If there is any such animal as a private ownership market, we will soon find out."

There are two possible reactions to the Vagabond. An operator friend of ours voiced the unimaginative (to us) view that this is just another steel-tube and fabric Piper, a typically old-fashioned conservative job. We dispute this view.

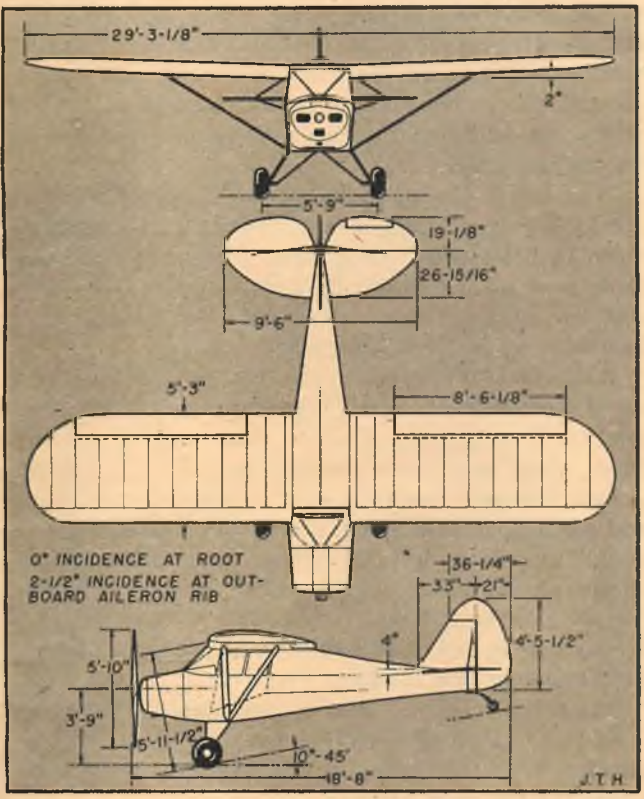
There is a certain cuteness about this small job—the Vagabond spans six feet less than the Cub—that gets you. Of course one doesn't buy airplanes just because they are cute but we average guys do love "schmaltz" in our ships! This cuteness extends to the interior accommodations, which are on the roomy side. The lankiest passenger can cross his legs with room to spare.

For anyone who has soloed, the Vagabond is a cinch to fly. Its excellent visibility adds to the feeling of rightness, as does that 3¾ gallons of gas per hour (26 miles to the gallon) burned by the 65-hp Lycoming.

Here is one of the first airplanes ever designed specifically around the 65-hp Lycoming, an engine which has finally come into its own. The combination should be a happy one.

When we walked into Safair, Piper's distributor at Teterboro, New Jersey, the operator simply asked us if we had flown side-by-side before, then said, "Go ahead and fly it!" Inasmuch as we still had not seen the Vagabond except in pictures, this was a surprising and auspicious beginning. He did add that the Vagabond had controls on one side only (one of the features that held down the cost), but that if *(Turn to page 75)*

● Simplicity is the keynote of the Vagabond. Well balanced design gives plane attractive lines. Note large entrance door.



● Landing gear of the Vagabond. Shock absorbers have been eliminated, large air wheels considerably subdue landing shock.

VAGABOND LOVER

BY GEORGE R. REISS

BILL PIPER, known as the Henry Ford of aviation, is the fellow who brought inexpensive aviation within reach of everyone, just as Henry Ford was credited with bringing the low-priced auto to the masses.

Piper's latest bid to stay at the top of the heap by staying at the bottom of the price range is the Piper Aircraft Corporation's PA-15, alias the Vagabond.

Like Ford with his Model T, Piper has spared no effort in paring down the expense in building his Vagabond. He kicked out all the frills, knocked off the money-taking extras, stripped out the non-essentials.

Now, priced at $1,990, FAF, Lock Haven, Pa., boasting a length of 18 feet, 8 inches, and a wing span of 29 feet, 3 inches, the Vagabond is easily one of the most compact, smallest, most inexpensive airplanes—considering today's devaluated dollars—ever to hit the commercial plane market.

Sure, Piper a dozen years ago built and sold a cheaper plane, the stripped-down 40-hp J-2, priced at $995. That was in the day of dollars worth 100 cents each, 50 cents an hour wage rates.

It isn't an unconventional plane. But it does represent a new trend. Piper always has clung tenaciously to the idea that folks rave about the unconventional type, but when they're ready to buy, they buy the conventional types. Especially the lowest priced conventional types. That's why Piper has made a fetish of keeping down prices, has stuck to the proven designs. (*Turn to page 74*)

"Oh, excuse me—I didn't see your cigar."

"You're new here, ain't you, Mac?"

AIR TRAILS Solo Club

LAST month was an important milestone in the history of the Solo Club. With nearly 8,000 active members on the roster and with more joining every day, the Solo Club had reached the point of being able to help effectively private flying. Through the interchange of useful information of all kinds based on personal experiences we can assist each other to fly more cheaply and safely and to get more satisfaction and utility out of flying through a more practical use of the airplane itself.

"I'm for it one thousand percent," writes member Joe McKenny, of Long Island, "but how about getting down to brass tacks. For years I have been hearing about how planes should have more utility, how they cost too much to fly—as they do. But nothing ever happens. Its just yak, yak, yak!"

Well, Joe—as the politicians say—we are glad you asked that question. Let's hope, however, that the answers will be suitably specific. Last month, you will recall, these aims were summed up as ". . . any pet system that gets results, a useful experience, opinions and methods of safe flying, how to get a break for our dough, anything and everything that makes flying cheaper, safer, and more enjoyable." Now perhaps this sounds like the old malarkey. Our problem, as McKenny puts it, is to make these objectives more than a high-sounding but toothless platform. To get down to cases, how can one member help another?

Si Lund, a professionally active lightplaner and an educator from the University of Oklahoma, at Norman, suggests a six-point program.

"What can you do with an airplane, besides fly around the pattern?" he asks. "That is the first thing I would suggest for the Solo Club. Month by month, send in examples of the practical utility of personal flying.

"A second item is that of exploring ways to overcome the present serious handicap to personal flying, that of high cost. Encourage pilots to send in descriptions of flying club plans, or rental plans which lower the cost for the private pilot to keep his hand in and, what is more important, to get some returns from his flight instruction investment.

"Third," continues Lund, "we will never reach the time when safety hints won't be needed. All of us learn new angles of safety. Many *(Turn to page 112)*

HOW TO BECOME A SOLO CLUB MEMBER

This club is open to those who have actually soloed a heavier-than-air craft, either powered or motorless. It does not matter where or when the flight was made. Applicants must furnish the membership committee with a satisfactory proof of their qualification for acceptance. There are no dues, membership is for life.

To obtain sterling silver Solo Club wings and life membership card, send coupon, with 50¢, to Solo Club Membership Committee, Air Trails Pictorial, 122 E. 42nd St., New York 17, N. Y.

Proof of qualifications as a Solo Club Member:

1. CAA Airman Certificate, number and rating ....

2. F.A.I. license and number ....

3. Evidence of: Service in Army or Navy air forces, either as a rated pilot or having received flight training including solo time (attach).

Applicant .... Age ....

Street ....

City or Town .... State ....

Mystery AIR FORCE

ATTACK PLANES, BOMBERS, AND TRAINERS ARE SUBJECT OF REVIEW IN THE SECOND PART OF MYSTERY AIR FORCE

IN this month's issue *Air Trails* presents the second part of the Mystery Air Force in which little known attack planes and trainers are shown. There are some pretty interesting numbers such as the Stearman XA-21 which unfortunately crashed during demonstration; the Brewster XA-32 built by the manufacturers of the famous "Flying Pickle Barrel," the Buffalo; the Beechcraft XA-38 Destroyer designed around a 75-mm cannon and similar in shape to the well known twin-engine Beech; the North American XA-27 which is a dead ringer for the widely used Air Force trainer the AT-6, the ancestor of which it actually is. In the bombers we have the B-19A which just before the war was the largest craft in its class in the world.

● Stearman XA-21. Built in '40, was one of entries in design competition for multi-engine attack plane. Span 65', 2 Pratt & Whitney Hornets, 1400 hp each. Top speed 250 mph.

● Brewster A-32A. Single-place attack bomber with four 20-mm cannon. Only one produced. Wing span 45' 1", weight 19,800 lbs., engine 2000-hp Pratt & Whitney, speed 310 mph.

● Martin XA-22. Of same vintage as XA-21, later became the Maryland, used by French and British at beginning of war. Span 61' 4", 1200-hp Pratt & Whitney engines, speed 270 mph.

● Beechcraft XA-38 Destroyer. One 75-mm and two .50-cal. machine guns in nose, two .50-cal. machine guns in belly turret. Powered by 2 Pratt & Whitneys, 2300 hp each, speed 375 mph.

● North American A-27. Light attack bomber built in '38. Powered by Wright Cyclone 775-hp engine, span 42' 8", speed 250 mph. Features of plane were later incorporated in AT-6.

● Consolidated-Vultee XA-41. Single-place attack bomber, designed to serve also as torpedo bomber. Wing span 54'. Powered by Pratt & Whitney engine of 3000 hp. Speed 360 mph.

● Douglas XB-19A. The famous XB-19 built in 1941, powered by four 24-cyl. liquid-cooled Allisons of 2600 hp instead of 2200-hp Wright radials. Wing span 212′, speed 250 mph.

● Consolidated-Vultee B-32 Dominator. Supposed to have been teammate of B-29. Few saw service in Pacific. Wing span 135′, engines four 2200-hp Wrights, top speed over 300 mph.

● North American XB-21 Dragon. A 1938 entry in bomber design competition at Wright Field. Only one built. Span 95′, crew of six, engines 1200-hp Pratt & Whitneys.

● Vega XB-38. A Boeing B-17E converted by Vega Aircraft by fitting plane with four 12-cyl. Allison liquid-cooled engines, 1425 hp each. Plane weighed 4000 lbs. more than B-17E.

● Douglas B-23. 38 were built, of which a dozen were converted to transport use and designated C-67. Very fast plane with top speed of 280 mph. Powered by two 1600-hp Wrights.

● North American XB-28. Experimental medium bomber with pressurized cabin, remote control gun turrets. Wing span 72′ 7″, engines two 2000-hp Pratt & Whitneys, speed 370 mph.

● XB-39. YB-29 fitted with four 24-cyl. liquid-cooled Allisons, 2600 hp each. Modification made by General Motors. Was first B-29 off Boeing production line. Used only for tests.

● YB-40. One XB-40 and 13 YB-40's were modified from Boeing B-17's to serve as escorts for bomber formations on long range missions. Had 14 cal. .50 machine guns in twin mounts.

● Douglas XB-42 Mixmaster. Formerly designated as XA-42, powered by two Allison engines, 1725 hp each, driving two contra-rotating propellers. Speed 410 mph, range 5000 miles.

● Fairchild XAT-13. Four-place bomber crew trainer of all-wood Duramold construction. Went through many modifications ending as AT-21 with Ranger engines. 600-hp P&W's.

● Douglas XB-43. Generally similar to the XB-42 except that power is supplied by two General Electric J-35 turbo-jet engines. Span 71' 2", maximum speed over 500 mph.

● Boeing XAT-15. All-wood bombardier trainer, only two built, carried crew of four. Wing span 59' 10", weight 12,100 lbs., two Pratt & Whitney R-1340 engines of 600 hp, speed 200 mph.

● Fleetwing XBT-12. Two-place basic training monoplane. 25 BT-12's were supposedly delivered out of the order for 200. Had stainless steel landing gear. Span 40', engine 450 hp P&W.

● Noorduyn AT-16. A North American AT-6 with small variations built by Noorduyn in Canada for Royal Canadian Air Force. 1500 delivered, powered by 600-hp P&W engine.

● Boeing XBT-17. All-metal trainer, only one built, weighed 500 lbs. less than standard Army trainer BT-13, powered by same 450-hp P&W engine. Wing span 35' 9", speed 190 mph.

● Federal AT-20. Avro-Anson II, all-wood advanced trainer powered by two U.S. Jacobs engines, 330 hp each. Wing span 56' 6", carried crew of five, top speed 150 mph. 50 built.

EMBRY-RIDDLE

AN AIR TRAILS AIR CAREER REVIEW

A FLORIDA ESTABLISHMENT IS THIS MONTH'S SUBJECT IN SERIES ON AMERICA'S VITAL AVIATION SCHOOLS

● John G. McKay, president and owner of Embry-Riddle.

THE benefits of specialized training at such aviation institutions as the Embry-Riddle School of Aviation are best indicated by the fact that hundreds of pilots now flying for America's major airlines are Embry-Riddle graduates, and hundreds of technicians in important posts in the industry are Embry-Riddle trained.

Dominating the vast Opa-locka airport, a few miles north of Miami, Florida, the Embry-Riddle School looks forward with confidence to the part it will play in the future of aviation. Its past history has been marked by outstanding achievement.

The rapid expansion of Embry-Riddle with its giant training program before and during the war brought it high-caliber personnel, equipment and properties that spread from Florida to Tennessee.

The school still maintains many of these facilities—the Aviation Building and eleven acres in Miami, the famous Coliseum and a group of apartment houses in Coral Gables. The Embry-Riddle physics laboratory, shops, machinery, tools, engine-test stands, paint and dope shops and other facilities are geared to today's and tomorrow's aviation training.

● Dormitory for unmarried students is this former Navy BOQ building situated in the pleasant tropical atmosphere of Miami.

The Embry-Riddle School of Aviation is approved by the CAA and the Florida State Board of Education. It is authorized by the Veterans Administration for training under the GI Bill of Rights.

Embry-Riddle is a member of the National Council of Technical Schools, a recognized accrediting association for schools giving training above the trade school level. This group includes many famous institutes of a scientific nature.

It also is a member of the Aeronautical Training Society. E-R's owner and operator, John G. McKay, is one of the directors of ATS. Mr. McKay is a Miami attorney and has been associated with the company for many years. He purchased the interests of the founder, John Paul Riddle, in 1944. John G. McKay, Jr., an Embry-Riddle trained flyer, now a pilot for Pan American Airways, is vice-president and legal adviser.

Another son, Hobert B. McKay, is assistant vice-president. Mrs. Isabel S. McKay, wife of the president, is treasurer, and supervises the student dormitory.

Ernest J. Smith, vice-president and general manager, has an aviation background that covers many phases over a period of years. During the war he was engineering officer at Riddle-McKay Aero College (No. 5 British Flying Training School at Clewiston, Fla.).

The school's technical adviser is Lee Malmsten, one of Embry-Riddle's first directors. He was granted leave of absence during the war to serve the CAA as a civilian pilot specialist.

L. David Carlton, dean of the school, has been with the company since 1940. In his capacity as dean and registrar he is in contact with students from the time they enroll until the completion of their training.

Embry-Riddle flight and technical schools function side by side. Surrounded by miles of concrete runways and occupying a huge Navy-constructed hangar, part of an adjacent hangar and large utility buildings, the school is ideally located for air and ground instruction.

Mechanic and technical training is conducted in airline-size hangars where complete airplanes are handled as practical work projects. The actual overhaul of licensed aircraft that return to flying service is an interesting and important phase during the latter months of A & E training.

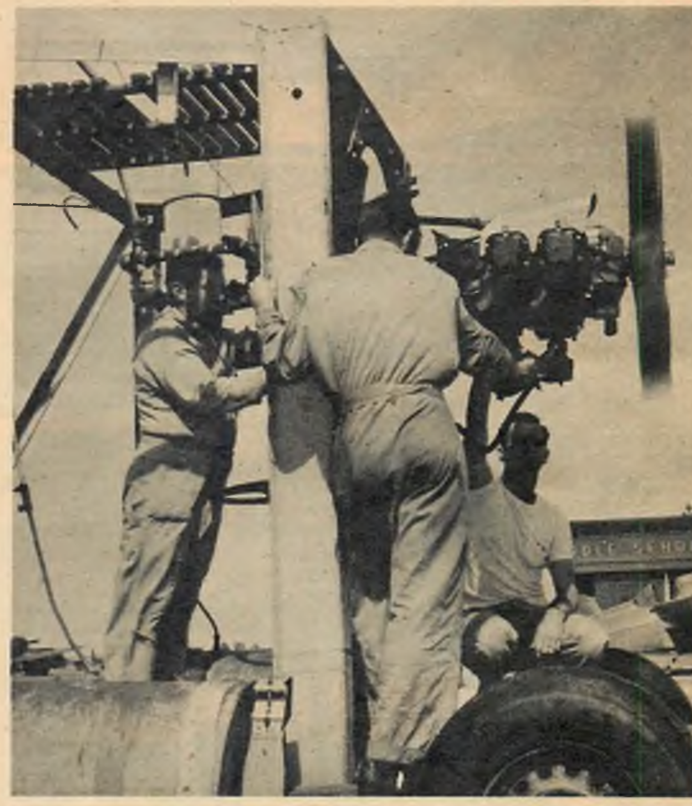
Latest equipment in classrooms, laboratories and shops assures up-to-date instruction in Combined Aircraft and Engine Mechanics, Aircraft Mechanics and Engine Mechanics. The school also offers courses in Aircraft Design Engineering and Maintenance, Aeronautical Drafting and Design, Flying Mechanic, Airplane Operation and Maintenance, Special Commercial Pilot and Flying School Operator.

This division is under the direction of Hugh Copeland, who has been an operator of technical schools for 21 years. He has been active in aviation for over 31 years and holds an enviable array of ratings. The assistant director, or chief technical instructor, is Frederic J. Dahne who has been associated with aviation for the past 12 years.

The flight division, with its backlog of more than two million hours of civil and military flying training, operates from the vast airport built to comply with U. S. Navy safety regulations. Its broad runways and well regulated traffic are consistent with the standards set by Embry-Riddle in its training of almost 30,000 pilots.

The school enjoys a very high safety record. Correct flying habits and a sound foundation on the ground to sharpen efficiency in the air is a "must" for the beginner or the commercial pilot seeking additional ratings.

The Embry-Riddle training fleet is comprised of Piper Cubs, Cessna 140's, Stearmans, BT-13's, Navions, and a Douglas that take the student from primary to airline transport training. Private pilot, commercial pilot, instrument, instructor and multi-engine students mount up hours—now well over the two million mark—in the ideal Florida flying weather. (*Turn to page 98*)



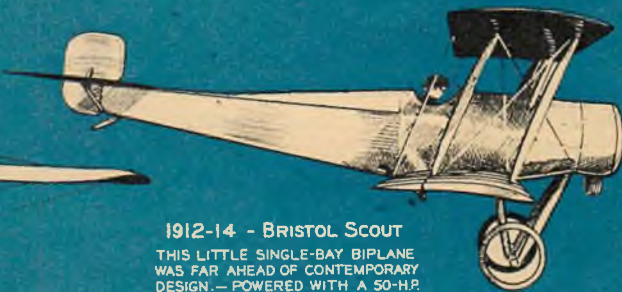
● Top right: Students in Engine Mechanics courses are running up an engine on a mobile test stand.

● Below: Converted Douglas B-18A used as trainer for students taking their Air Transport rating.

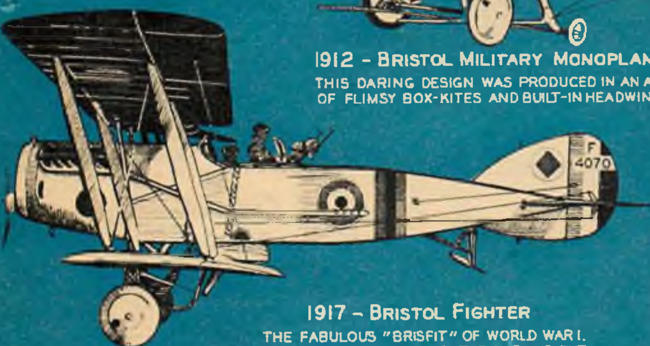
Air Progress

1911 - BRISTOL-PRIER
FIRST ORIGINAL BRISTOL DESIGN

1912 - BRISTOL MILITARY MONOPLANE
THIS DARING DESIGN WAS PRODUCED IN AN AGE OF FLIMSY BOX-KITES AND BUILT-IN HEADWINDS!



1912-14 - BRISTOL SCOUT
THIS LITTLE SINGLE-BAY BIPLANE WAS FAR AHEAD OF CONTEMPORARY DESIGN.— POWERED WITH A 50-H.P. GNOME ROTARY ENGINE IT HAD A SPEED RANGE OF FROM 40 TO 90 M.P.H.



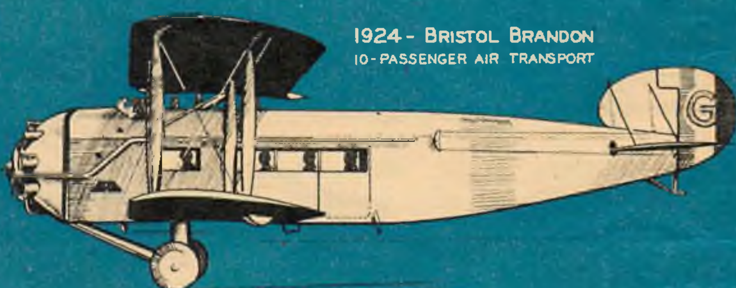
1917 - BRISTOL FIGHTER
THE FABULOUS "BRISFIT" OF WORLD WAR I. FAME COULD OUT-FLY, OUT-FIGHT AND OUT-MANEUVER THE BEST PURSUITS OF THIS ERA.

Organized in 1910 as the Bristol and Colonial Aircraft Company this is easily one of the oldest existing aircraft firms. Its founder, the late Sir George White, foresaw the future of the airplane and insisted on developing something better than the glorified box kites of early years.

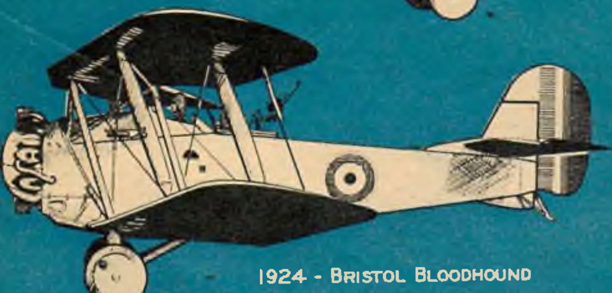
First Bristol design (not illustrated here) was a modification of the Farman box kite, but the company soon forged ahead with completely original designs. The Bristol Scout, produced between 1912 and 1913, may rightly be considered the ancestor of the modern propeller-driven pursuit. The Bristol Fighter, probably the greatest military design of World War I, could fly rings around most of the

1922 - BRISTOL EXPERIMENTAL MONOPLANE
PRODUCED MORE THAN A QUARTER OF A CENTURY AGO THIS RADIAL-POWERED MID-WING MONOPLANE AFFORDS STRIKING PROOF OF BRISTOL'S ENGINEERING VISION.

1924 - BRISTOL BROWNIE
2-PLACE ULTRA-LIGHT LIGHTPLANE



1924 - BRISTOL BRANDON
10-PASSENGER AIR TRANSPORT

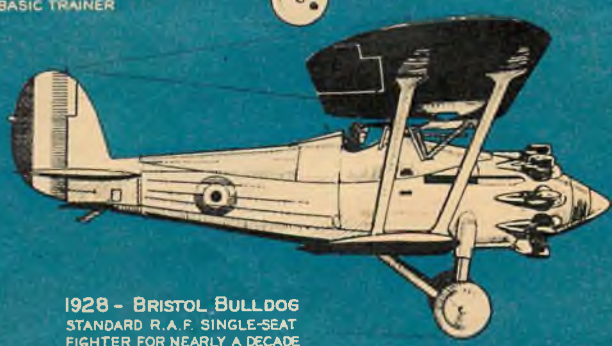


1924 - BRISTOL BLOODHOUND

1924 - BRISTOL LUCIFER
BASIC TRAINER

DOUGLAS ROLFE

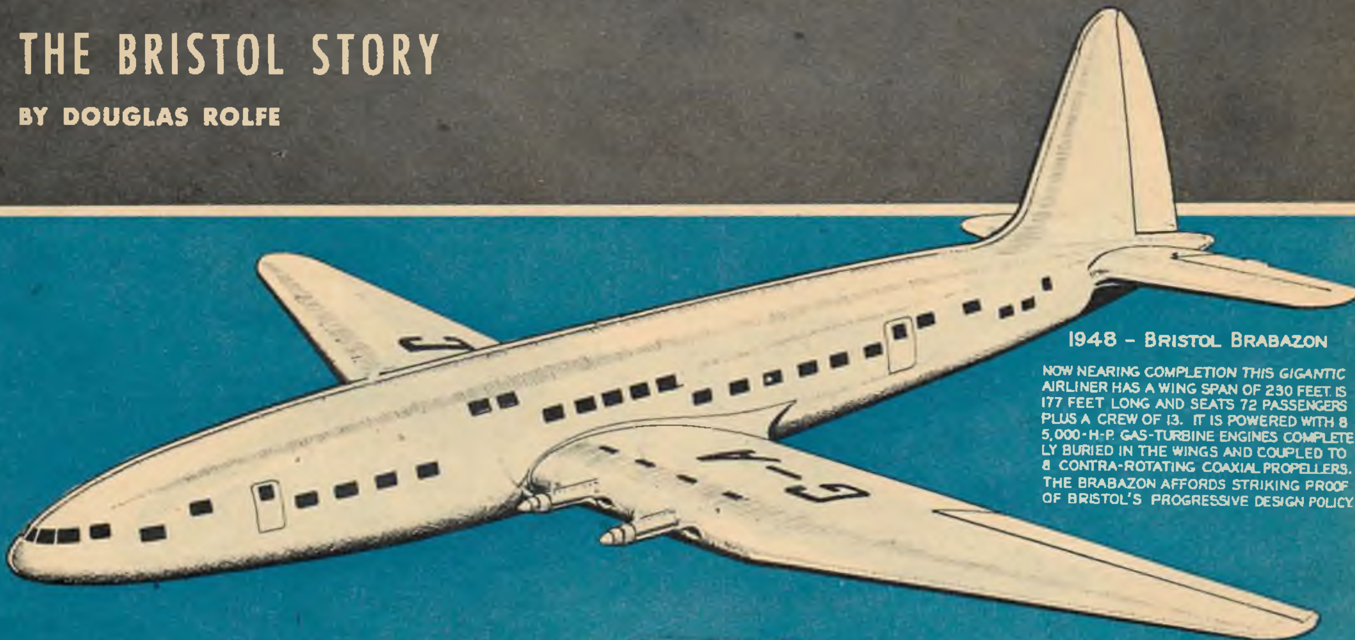
1926 - BRISTOL BADMINGTON



1928 - BRISTOL BULLDOG
STANDARD R.A.F. SINGLE-SEAT FIGHTER FOR NEARLY A DECADE

THE BRISTOL STORY

BY DOUGLAS ROLFE

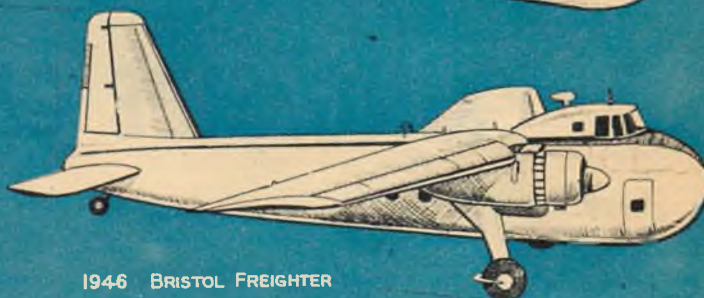


1948 - BRISTOL BRABAZON

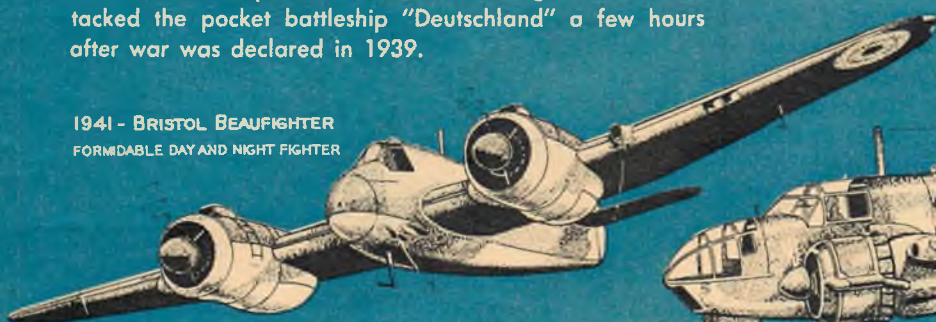
NOW NEARING COMPLETION THIS GIGANTIC AIRLINER HAS A WING SPAN OF 230 FEET. IS 177 FEET LONG AND SEATS 72 PASSENGERS PLUS A CREW OF 13. IT IS POWERED WITH 8 5,000-H-P. GAS-TURBINE ENGINES COMPLETELY BURIED IN THE WINGS AND COUPLED TO 8 CONTRA-ROTATING COAXIAL PROPELLERS. THE BRABAZON AFFORDS STRIKING PROOF OF BRISTOL'S PROGRESSIVE DESIGN POLICY.

pursuits of that era. With the pilot using the forward fixed gun or guns and the rear gunner manning twin guns on a ring mount, it did much to establish Allied air superiority.

The extraordinary Bristol experimental monoplane of 1922 was not an unqualified success (a glance at the drawing shows that the tail surfaces were inadequate, for one thing), but it reveals remarkable engineering vision and clearly anticipated the mid-wing pursuits of World War II. During the late conflict Bristol designs were spearheads of the attack. A squadron of Blenheims sought out and attacked the pocket battleship "Deutschland" a few hours after war was declared in 1939.



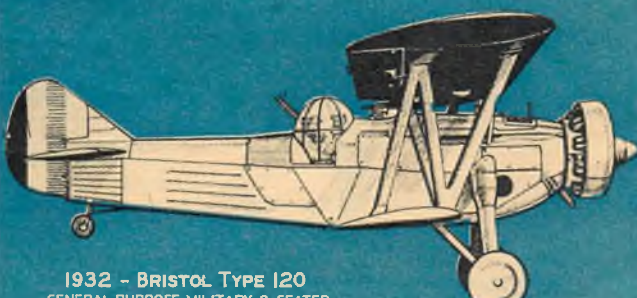
1946 BRISTOL FREIGHTER



1941 - BRISTOL BEAUFIGHTER
FORMIDABLE DAY AND NIGHT FIGHTER

1940 - BRISTOL BEAUFORT
COASTAL COMMAND TORPEDO-BOMBER

THREE STAGES IN THE EVOLUTION OF THE UBIQUITOUS "BLENHEIM" FAMED R.A.F. MEDIUM RANGE, ALL-PURPOSE WORKHORSE OF WORLD WAR II.



1932 - BRISTOL TYPE 120
GENERAL PURPOSE MILITARY 2-SEATER. NOTE EARLY MODEL GUNNERS CUPOLA WHICH PRECEDED THE POWER TURRET

1941 - BRISTOL BLENHEIM VD
(TYPE 160-D)

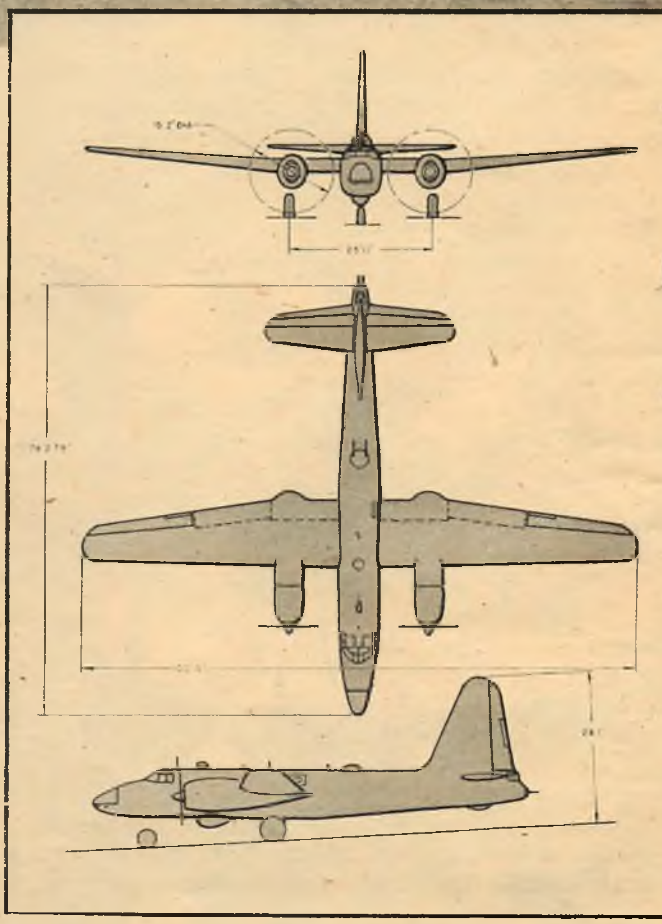
1936 - BRISTOL BLENHEIM I.
(TYPE 142-M)

1930 - BRISTOL BULL-PUP
HIGH-ALTITUDE INTERCEPTER-FIGHTER

1935 - BRISTOL TYPE 142

KING SIZE CARRIER CRAFT

ON April 27th off the Virginia Capes, the U. S. Navy demonstrated the feasibility of launching a large patrol and search-mission aircraft from a carrier. Piloted by Commander Tom Davis, a Lockheed P2V Neptune took off from the flight deck of the carrier Coral Sea. It was in another P2V that Davis in 1946 established a world non-stop distance record of 11,235 miles from Perth, Australia, to Columbus, Ohio.



● P2V three-view. Two 2,500-hp engines, 5,000-mi. range

● Top left: Showing its ability to fly on one engine, this P2V has just recovered from a slow roll with one propeller feathered.

● Bottom left: Start of a historic flight. The Truculent Turtle, using Jato, leaving Perth, Australia, on 11,235-mi. flight.

IN DAYS OF YORE

BY ELLIOTT S. HERTZMARK

INGENIOUS WERE THE EARLY ATTEMPTS TO MEASURE SPEED AND ALTITUDE OF PLANES

In days of yore, when pilots were bold,
Flying was so dangerous, it made men old.

AND no wonder! How would you like to learn flying without knowing just what your air speed was, or whether your engine was developing sufficient power for a take-off? How did they do it in 1910? Well, to make sure the engine was developing enough thrust to get the ship off the ground and over the tree tops, a spring balance was borrowed from the grocer. Securely fastening one end to a fence post, and the other to the tail skid, the throttle was opened wide. If a weak 15-pound pull was registered, it was best to take a walk! Assuming, however, that there was enough power to pull the craft up into the wide blue, the next step was to dangle a handkerchief out at arms length to make sure the wind was not great enough to cause frustration and graying hair.

Once in the air, there were still things to worry about. Forced landings, stalls, slips, and skids continually plagued the pilot. The chief cause of forced landings was running out of gasoline or oil, since there were no gages. But after engineers provided a fairly satisfactory fuel and oil gage to warn of impending engine failure, the pilot probably forgot to look at either, in his efforts to keep the airplane in its proper medium—the air!

Since the sport of "aeroplaning" kept the flyers more often on the ground repairing their rather flimsy engines, than in the air, their hours of flying were comparatively few. Without instruments, or considerable experience, it was not an easy matter to fly straight and level for any great distance without skidding or stalling. But even in 1909 the Wrights had that problem licked with what was probably the cheapest combination ball-bank indicator and stallometer ever invented. It consisted of an ordinary piece of cloth hung from a strut on the elevator out in front! If the cloth was tightly stretched to the rear, the craft was at flying speed. When off to one side, it was slipping or skidding. When it tugged upward, watch out for a stall! If the flight was without mishap, the pilot came back to earth within a very short time, and would not think of taking off again until he had carefully examined the engine—even overhauling it!

Starting with Orville Wright's garden rake, the altimeter involved many strange devices in the course of its evolution. For instance, at the air meet held at Belmont Park, Long Island, in 1910, Wright could estimate the height of his planes, and those of his competitors from France and England, by sighting up the handle through the teeth of the rake, encompassing the wing span within so many teeth. The higher the plane, the fewer the teeth its wing would embrace.

Soon after this meet, however, the scale of a barometer was changed to read in feet instead of inches of mercury, and thus the first aircraft aneroid altimeter was born, the type still in use today. But with a shivering indicator needle, lag and hysteresis errors, it was a case of "my guess is as good as yours!"

Another system proposed to measure altitude, in the early 1900's was to time the fall of a bomb which ignited after it fell. In the case of fogs, someone suggested dropping a miniature radio transmitter which would emit a signal after it hit the ground. One shudders at the thought of the expense involved in stumbling around in a fog dropping radio transmitters across the terrain!

In 1931, a young Austrian engineer, Hans von Braun, came up with a gadget called the "Braun Relative Altitude Meter," more properly referred to as a "whirligig." Here's how it worked. A cross pendulum was driven at 1,200 rpm by an electric motor. The pendulum arms carried at their ends weights which were acted upon by gravity and centrifugal force. A spiral spring was connected to the pendulum arms in such a way that when the arms closed up or spread out, the spring was contracted or expanded. The further the aircraft rose from the earth, the less the attraction on the weights, and the more the arms could swing out in response to the centrifugal force. Highly geared to the swinging arms was the pointer of the indicator dial. The experimental model was found to be very sensitive, giving readings even when passing thru bumps, though this might have been due to acceleration and deceleration of the airplane rather than the sudden change in distance from the earth's surface. It was an ingenious idea, except that temperature changes, and loss of elasticity in the springs would serve to introduce too many errors.

Compasses were used as early as 1911. The first ones, of bowl construction with horizontal dials, were merely adaptations from ocean liners and naval vessels. They were mounted on the floor of the aircraft, a fine location except that their out-of-the-way position made them difficult to use. So Charles H. Colvin, founder of the Pioneer Instrument Company, developed a compass that could be read through the side. *(Turn to page 100)*

THE OLAT

91st Year—Official County Paper OLATHE, JOHNSON COUNTY,

NATIONAL MODEL

● Two Navy boys amend the warning sign slightly to indicate that model planes have taken over runways at Naval Air Station.

THE most perfect National meet in the history of American aeromodeling, the 17th National Championship Model Airplane Contest, was held on August 4, 5, 6, 7 and 8, under the sponsorship of the Olathe, Kan., Chamber of Commerce and the Olathe Earl Collier Post 153, American Legion.

Actively cooperating was the U.S. Naval Air Station at Olathe, where all the outdoor flying events were held. Indoor events were held in the Municipal Auditorium at Kansas City, Mo.

The contest was highlighted with a visit by Rear Admiral Richard F. Whitehead, Chief of Naval Air Reserve Training. Capt. Campbell Keene, Commanding Officer of the Olathe Naval Air Station, gave his full support to the meet as did all the men based at the huge Navy field.

National Championship honors went to handsome Bob Holland, 33, of Sunland, Calif. Ace-flyer Holland

● Fred Megow Champion Club trophy (l. ctr.) won by Oakland Cloud Dusters.

● Air Trails Trophy speed winners: Parker Hubert, senior D; Wallick & Thomas, open D.

● Rear Adm. R. F. Whitehead, left, inspects Steve Jordan's record Cl. B ship.

● Harry Rice, Irv Ohlsson, Jack Norris, Bill Fox & Norval Hale—O&R winners.

● Navy helps: Olathe sailor holds H. deBolt's (himself an ex-gob) 1st place Speedwagon.

● The Army wuz there, too: Msgt H. G. Ponder of Keesler Field Mod. Plane Club.

HE MIRROR

, KANSAS, THURSDAY, AUGUST 5, 1948 Ten Pages No. 32

MEET UNDER WAY

racked up an impressive number of wins: 2nd in indoor stick, open; a place on the 1948 American Wakefield team; 3rd in rubber-powered flying scale; 1st in R.O.W. models, plus other lesser places.

Top place in the club competition was taken by the Oakland, Calif., Cloud Dusters whose 7-"man" team consisted of Pete and Mike Demos, Joe Bilgri, Dick Schumacher, Manuel Andrade and "Pop" and "Mom" (H.S.) Robbers.

The age-category champs were as follows: Bob Holland, first in open class; Charles Sotich, Chicago, Illinois, first in junior division; and Jack Norris, Lakewood, Ohio, first in senior competition.

Several new national records were set. A complete breakdown of winners, including the types of models they flew will appear in subsequent issues of *Air Trails*. An enlarged "Sketchbook at the Nationals" will be presented in December.

● Tom Poor, Olathe Chamber of Commerce, presents Exchange Club National Champ trophy to Bob Holland of Sunland, Calif.

● Jet job by Harold deBolt, Williamsville, N. Y., won 1st place with 133.3 mph.

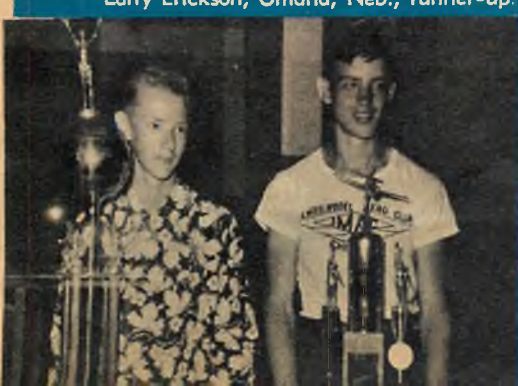
● Don Newberger (1st in Class C speed, open) and Lew Mahiew's Class C Invader speed ship.

● Herb Kothe, Omaha, Neb., took first ($500) in PAA's weight lifting contest.

● Charles Sotich, right, was Jr. champ; Larry Erickson, Omaha, Neb., runner-up.

● Jerry Brofman, Hicksville, N. Y., 1st in class D free-flight event with his Cosmic Rave.

● Jim Walker, 1st in r-c, given U-control "Stupidity Award" by Peggy Roddy.



● Paul Gilliam, Glendale, Calif., won rubber-powered flying scale event. This is his Stinson L-5 in flight.

FLYING SCALE MODELS ECLIPSE ALL OTHERS IN SPECTATOR INTEREST AT NATIONAL MEET

By far the most spectacular, crowd-pleasing event at the 17th annual National competition was that in which detailed scale models of full size aircraft competed in the rubber-powered and gas-engine-powered categories.

Unfortunately the free flying rubber-powered scale ships had to be flown at an open site which was away from the crowds. The gas jobs, tethered as they were by conventional U-control lines, were able to make all qualifying flights on the apron in front of the Navy's main hangar, attracting the largest crowd of the meet.

It was obvious to most experienced onlookers that the control-line flying scale models will soon be as popular as the well-established stunt and precision flying craft.

● Team of Yates and Palmer took gas-powered flying scale event with 380 points. Here, J. C. Yates starts PT-17 Stearman as Palmer watches. Model flew inverted, did consecutive loops.

● Larry Queisert, Kansas City, Mo., took first in Junior with this Piper Skysedan.

● Highly detailed, fine finished Douglas Observation by L. A. Morey, Sr., was high-stepping flyer.

● Third place, open, won by Murray Hamilton, Topeka, Kan., with Curtiss P6E.

● Marvelously detailed twin-engine Black Widow by Fred Sage. Motors gave trouble.

● With a Monogram Piper Cub Special, Dale Kirn, Soloman, Kan., took 1st in senior with 301 pts.

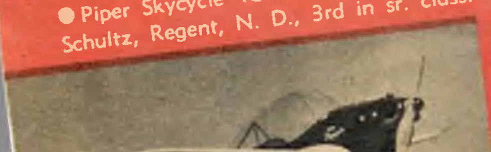
● One of several Pipers entered. T and Monocoupes were popular s

● Chet Lanzo's Moraine 677 with Arden power. Yates flew ship in qualifying run.

● Roy Mayes, Berkeley, Calif., made second highest score of 327 with highly maneuverable Buster.

● Mark Altman from Keesler F 2nd in senior with this No. Am

● Piper Skycycle (Comet kit) by Alfred Schultz, Regent, N. D., 3rd in sr. class.



● Built from a Capitol kit, this Beechcraft by Harold R. Ferguson was one of many striking entries.

● Tom Ryan entered this nicel Cessna 190. Balky engine ga

● Fudo Takagi of Chicago and single float R.O.W. rubber entry. Note floatavators.

● Chet Lanzo and his English-type Wakefield model. Lanzo flew well in r-c too.

● Dale Dorst, right, Olathe, Kan., was contest manager. Did outstanding job.

● F. R. Foxworthy, Indianapolis, Ind., placed 3rd in r-c event with twin-rudder controls.

● Oakland Cloud Duster Manuel Andrade's multiple tungsten braced indoor stick entry.

● Micro-Bilt provided this sound truck. Ray Arden, in white, surrounded by his admirers.

DOPE CAN

"MY ONLY GRIPE," SAID ONE ENTRANT, "IS THAT I HAVE NO GRIPE. THIS IS ONE CONTEST THAT IS REALLY WELL RUN." SUCH WAS THE GENERAL FEELING ABOUT THE FINEST OF ALL NATIONAL MEETS

CAN you imagine a town of 5,062 folks where 500 turn out to erect snow fencing for the National contest? That was Olathe, friends.

We have no way of knowing where or when the 18th National Model Airplane Meet will be held, but this year's outstanding meet will really give the '49 sponsors something to shoot at. After two post-war competitions that were not all that they might have been (in '46, of course, Wichita volunteered to take on the meet at the last moment after it had been cancelled out of Chicago, so all honor is due that city), it was a refreshing change to encounter a contest that was so very good from start to finish that the contestants themselves could hardly believe the whole thing was a reality.

Months ago *Air Trails* detailed some of the arrangements. The final setup was even better than the early releases would lead you to believe. For those who wished to stay close to the Naval Air Station on which the meet was held, there were facilities for sleeping 1,000 in a big Navy gym—adjoining the gym was the largest swimming pool in the midwest!

(Turn to page 84)

● Genial Johnny Clemens, Dallas, Tex., and one of his beautiful control-line stunters.

● Former Wakefield champ Jim Cahill. This airfoil-fuselage model put him on '48 team.

● Les McBrayer, Pasadena, Calif., and junior-type Goodyear U-control racer.

Rascal

BY CLAUDE McCULLOUGH

AN AMERICAN TYPE WAKEFIELD MODEL CAPABLE OF HIGH CLIMB, FAST GLIDE AND MEET WINNING TIME

WITH the grand old mug of modeldom, the Lord Wakefield trophy, back in competition again, and events for this class being held at many big regional meets, interest again turns to 200 sq. in. jobs after a rash of super big crates ranging up to 400 sq. in. Much more convenient to fly and carry, a 200 sq. incher gives little to big ships in the way of performance. In addition, you don't need Man Mountain Dean on the winder to get in those last few turns.

The Rascal is strictly in the American Wakefield tradition, a little on the boxy side, strong simple construction, no unnecessary frills or frippery and designed to pack a whopping rope of rubber for a quick climb to thermal country. The high angle of climb is aided by the use of thin low-drag wing section, a setup that gave such spectacular results for many of the experts at the Nationals. The original Rascal uses 28 strands of 3/16" T-56 brown rubber, and turns out a climb that would make a Zipper envious. If you are really looking for a jet-propelled take-off, a few more strands will give it, although at the cost of a few winds. Built-in downthrust (positive stabilizer) helps to control all of the power you can pack in. Altitude is what you are shooting for; ground huggers seldom bring home the money at a contest.

Tiring of having the covering punctured like an archery target after a few flights, we used silk on the entire ship. You needn't raise your eyebrows. We hasten to explain that the ship turned out only 3/4 ounce over the required weight of 8 oz. This small extra weight has more than paid off, for after literally hundreds of flights the ship is still in perfect shape after some thumping encounters with trees and fences. However, you'll end up with surfaces looking like pretzels if you just stick on the silk and slap on the dope. By not stretching it too enthusiastically while applying and then patiently doping a wing rib section at a time, carefully checking while drying, we got a super strong covering job free of warps.

But a framework is necessary before you have to decide whether to silk or not, so enlarge the plans to full size or send for the full size drawings.

The fuselage is a box, built from 1/8" sq. *hard* balsa strips. Formers U, V, W, X, Y and Z are installed on the nose section and stringers of 3/32" sq. are added. The dowel for rear rubber attachment is seated in two small aluminum squares drilled to fit the dowel and cemented to the inside face of the filled-in 1/8" sheet section. The 1/16" steel wire landing gear and tail skid are cemented securely in place. Wheels are 1 3/4" diameter, cut from 1/16" birch plywood and equipped with large face bushings to serve as bearings. Wakefield rules require unassisted take-off, so a straight free-running gear is an essential for competition.

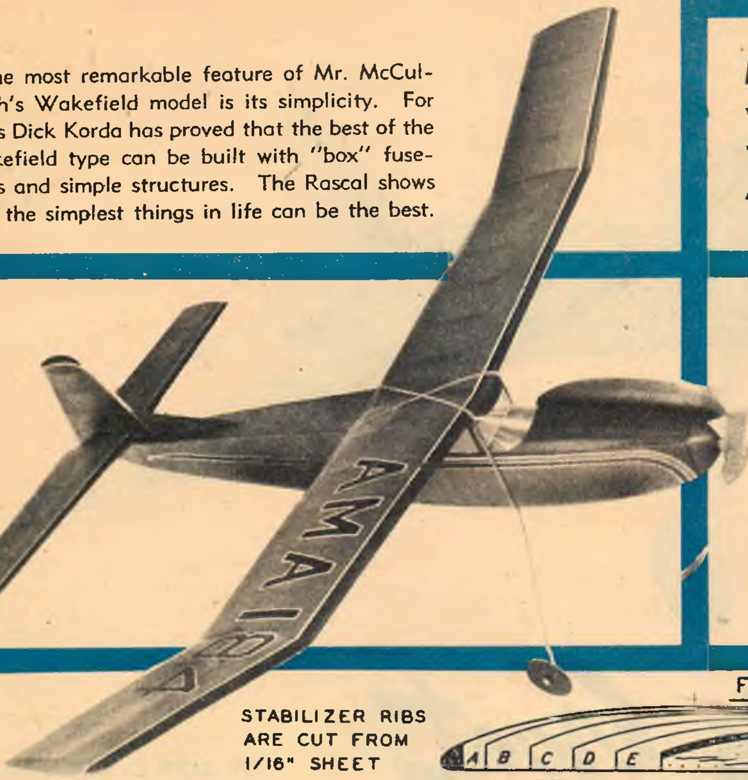
Details of the nose plug and prop hinge and rubber tensioner appear on the plan. Both Jasco and BBT produce complete sets of the hardware components for this part of the job and are of good design and handy as well, saving the time of producing your own. Carve the prop carefully from a medium balsa block and cover with silk and dope to strengthen the blade.

Full size wing and stabilizer ribs appear on the plan and are cut from 1/16" sheet balsa. The wing and elevator are of similar construction, with 1/8" sq. spars, 1/32" leading edge sheeting and soft scrap balsa block tips. The ribs are indented into the 1/8" sheet trailing edges. Block the wing up for the indicated amounts of dihedral and coat the joints with cement several times.

The rudder is built up with 1/8" x 1/16" capstrips curved over the 1/8" sq. spars to form a symmetrical section. Dorsal fin is made of 1/16" hard sheet balsa.

If you do not agree with my arguments for silk covering, use Silkspan or jap tissue. In any case add drops of castor oil to the dope until an (*Turn to page 118*)

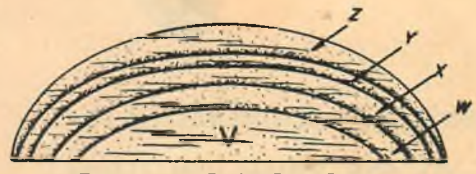
● The most remarkable feature of Mr. McCullough's Wakefield model is its simplicity. For years Dick Korda has proved that the best of the Wakefield type can be built with "box" fuselages and simple structures. The Rascal shows that the simplest things in life can be the best.



FULL SIZE PLANS

WORKING DRAWINGS OF THE RASCAL AS WELL AS OF OTHER MODELS ARE AVAILABLE FROM AIR TRAILS. **SEE PAGE 96.**

MAKE FOUR "S" SECTIONS FROM 1/8" SH.

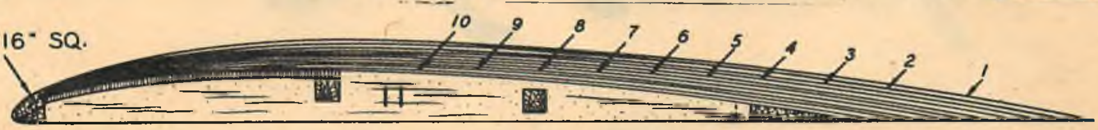


FULL SIZE FORMERS

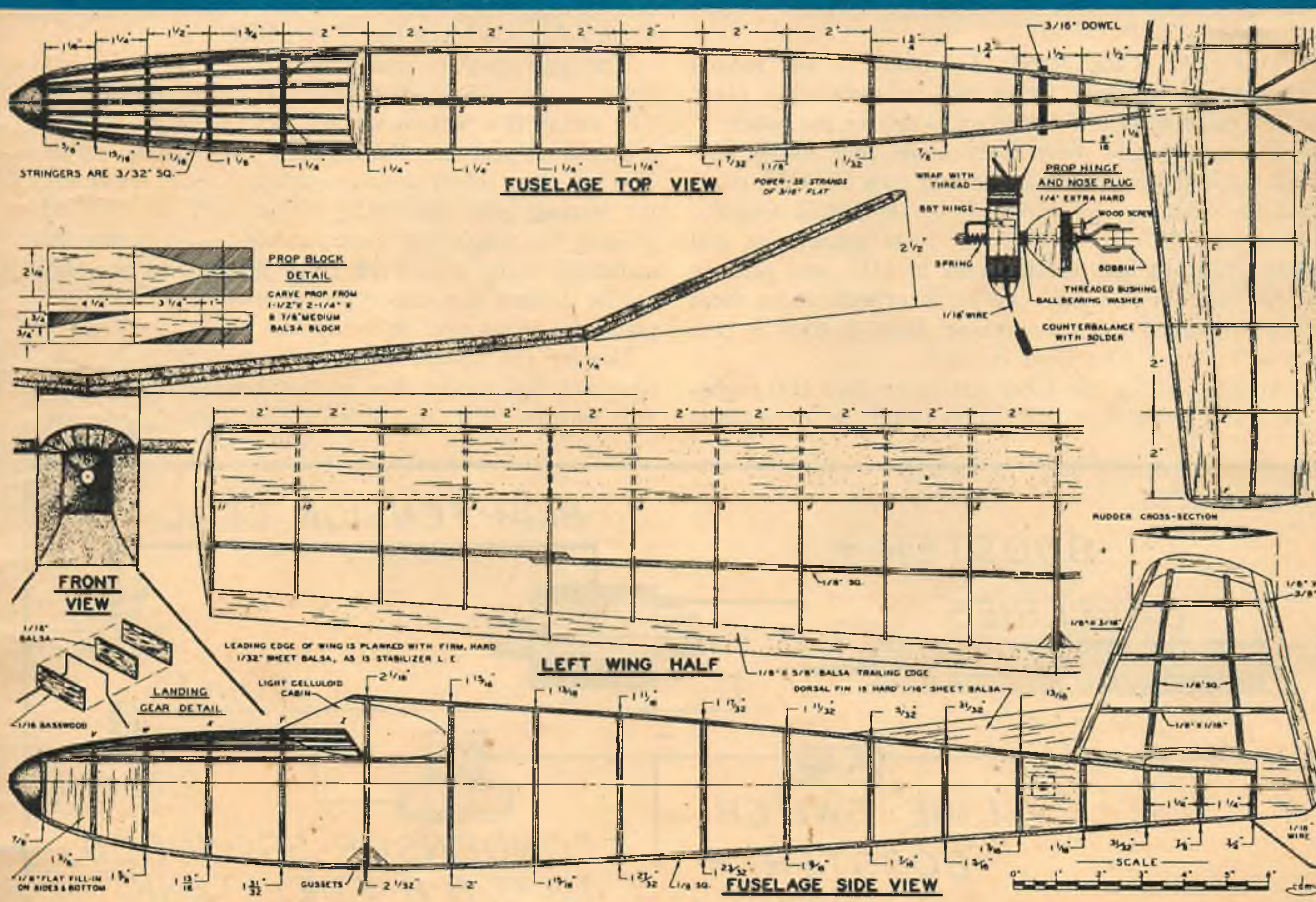
FULL SIZE STABILIZER RIBS

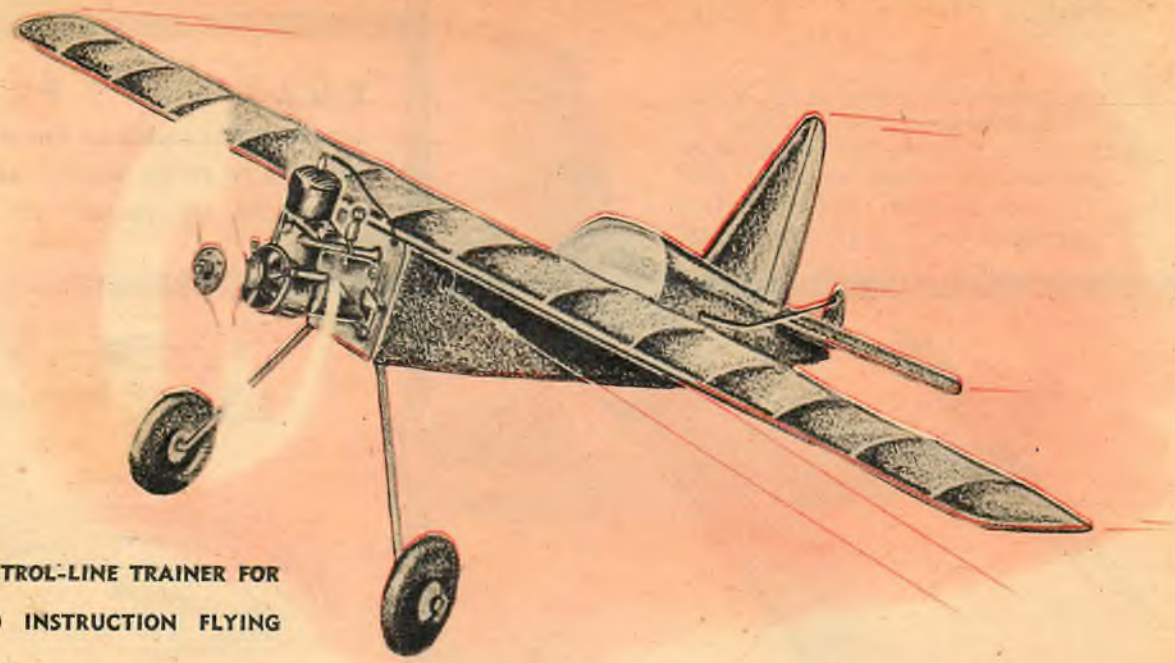
STABILIZER RIBS ARE CUT FROM 1/16" SHEET

3/16" SQ.



FULL SIZE WING RIBS





SIMPLE CONTROL-LINE TRAINER FOR CLUBS AND INSTRUCTION FLYING

Beginner's Goat

BY ROY L. CLOUGH, JR.

THIS control-line trainer, together with the operating instructions which go with it, has been worked out carefully to guarantee absolutely good results to the newcomer.

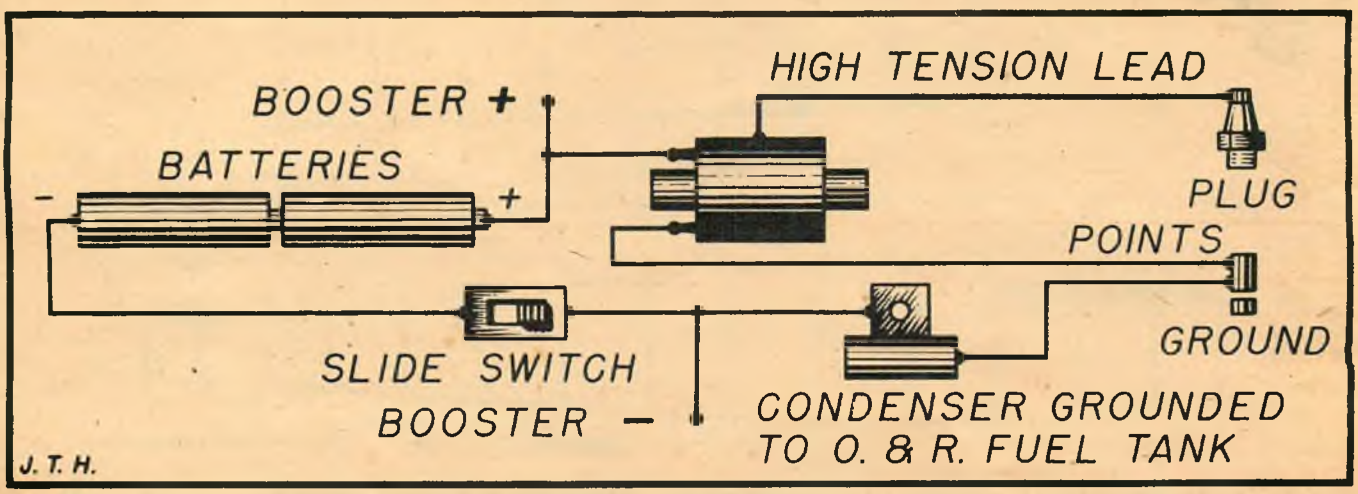
This Goat is the result of a study of the factors involved in building, flying and maintaining a plane which can always be counted on to deliver the goods.

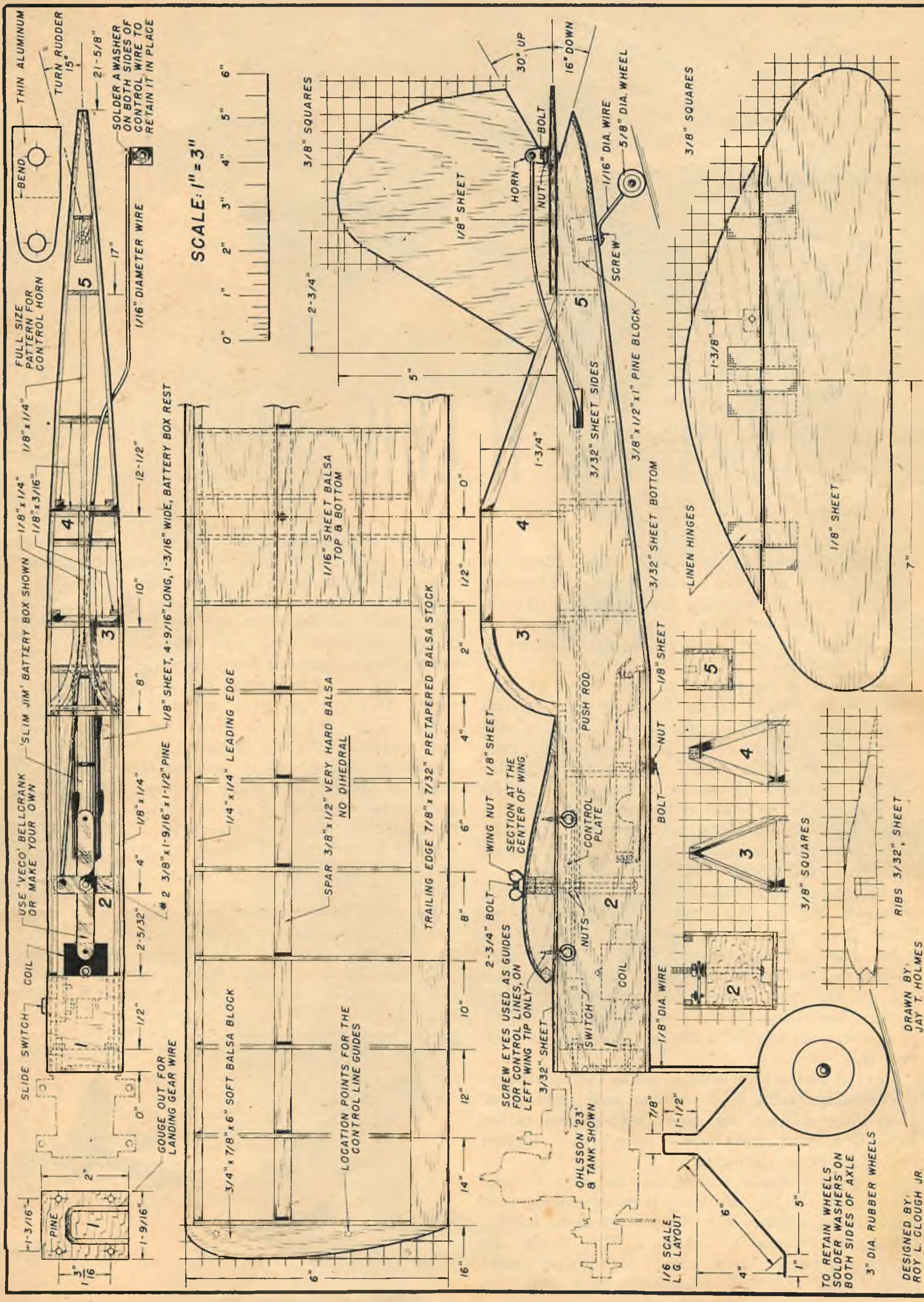
No assumptions have been made that the builder will fly it from smooth fields and only on calm days. On the contrary, we expect it to be treated roughly, flown in relatively high winds from gravel pits and deep grass, in hot weather and in cold, and perhaps in the rain. If a model can perform well under these conditions, and incur no major damage, then it is a "good" plane. The Goat is good.

At this writing the Goat has more than 600 flights averaging better than five minutes each, or a conservative estimate of more than 50 hours in the air. Non-flyers have learned to fly it in about a dozen laps apiece and nearly every member of the Bell City, Bristol, Conn., Aeromodelers has flown it.

The high spots of this design are the wing section, tail configuration, landing gear and engine installation. The airfoil is a section worked out by the writer over a period of years by the effective cut-and-try system. The tail plane offers positive control without trickiness, the landing gear can "take it" and get the ship off ground too rough for most models. The engine installation, being sealed off from the rest of the ship can be dunked in a can of kerosene for cleaning if the plane has nosed over in sandy soil.

Despite the square lines and generally boxy construction this model flies in the neighborhood of 50 mph with an O&R .19. With a trick (*Turn to page 78*)




SCALE: 1" = 3"
THIN ALUMINUM
TURN RUDDER 15°
BEND
FULL SIZE PATTERN FOR CONTROL HORN
SOLDER A WASHER ON BOTH SIDES OF CONTROL WIRE TO RETAIN IT IN PLACE
1/16" DIAMETER WIRE
1/8" x 1/4"
1/8" x 3/16"
'SLIM JIM' BATTERY BOX SHOWN
USE 'VECO' BELLCRANK OR MAKE YOUR OWN
COIL
SLIDE SWITCH
PINE
GOUGE OUT FOR LANDING GEAR WIRE
1/8" SHEET, 4-9/16" LONG, 1-3/16" WIDE, BATTERY BOX REST
2 3/8" x 1-9/16" x 1-1/2" PINE
1/16" SHEET BALSA TOP & BOTTOM
1/4" x 1/4" LEADING EDGE
SPAR 3/8" x 1/2" VERY HARD BALSA
NO DIHEDRAL
TRAILING EDGE 7/8" x 7/32" PRETAPERED BALSA STOCK
3/4" x 7/8" x 6" SOFT BALSA BLOCK
LOCATION POINTS FOR THE CONTROL LINE GUIDES
3/8" SQUARES
1/8" SHEET
30° UP
16° DOWN
BOLT
HORN
NUT
1/16" DIA WIRE
5/8" DIA. WHEEL
SCREW
3/8" x 1/2" x 1" PINE BLOCK
3/32" SHEET SIDES
3/32" SHEET BOTTOM
PUSH ROD
1/8" SHEET
WING NUT
SECTION AT THE CENTER OF WING
CONTROL PLATE
2-3/4" BOLT
NUTS
SCREW EYES USED AS GUIDES FOR CONTROL LINES, ON LEFT WING TIP ONLY
3/32" SHEET
SWITCH
1/8" DIA WIRE
OHLSSON '23' & TANK SHOWN
LINEN HINGES
RIBS 3/32" SHEET
1/6 SCALE L.G. LAYOUT
TO RETAIN WHEELS SOLDER WASHERS ON BOTH SIDES OF AXLE
3" DIA. RUBBER WHEELS
DRAWN BY: JAY T. HOLMES
DESIGNED BY: ROY L. CLOUGH JR.

YOU COULDN'T ASK FOR A MORE SIMPLIFIED TOWLINE GLIDER

DROP ME A LINE

BY JERRY BROFMAN

DEAR JOE:

Knowing that you're the type of model builder who enjoys building and flying towline gliders, and knowing that you appreciate anything new in the way of technique, structure, and design in model aviation, I am sure you will be very much pleased with this set of towline glider plans.

This glider is the product of many years of practical experimentation. It combines lightness, extreme strength, and exceptional performance. It is a challenge to the builders of the large, high aspect ratio type of towline glider, and I am sure that with this ship you will have no trouble in competition against the very best in the model gliding and soaring field.

You will find the plans very complete. However, here is some information to help explain the interesting structure of this model.

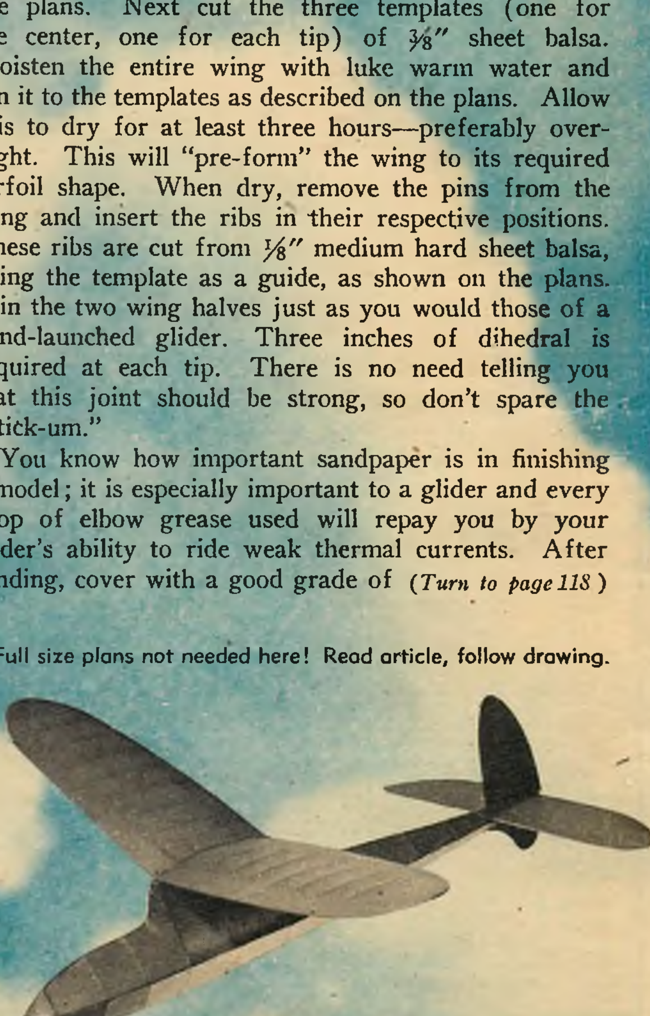
The fuselage is constructed by first cutting the main horizontal keel of 1/16" medium hard sheet balsa. Then cut the upper and lower keels of the same material. Cement the upper and lower keels to the center on each side of the main horizontal keel. When this is dry add the cross braces which are of 1/8" square medium hard balsa, to the positions shown. I don't think you could ask for a fuselage more easy to build than this.

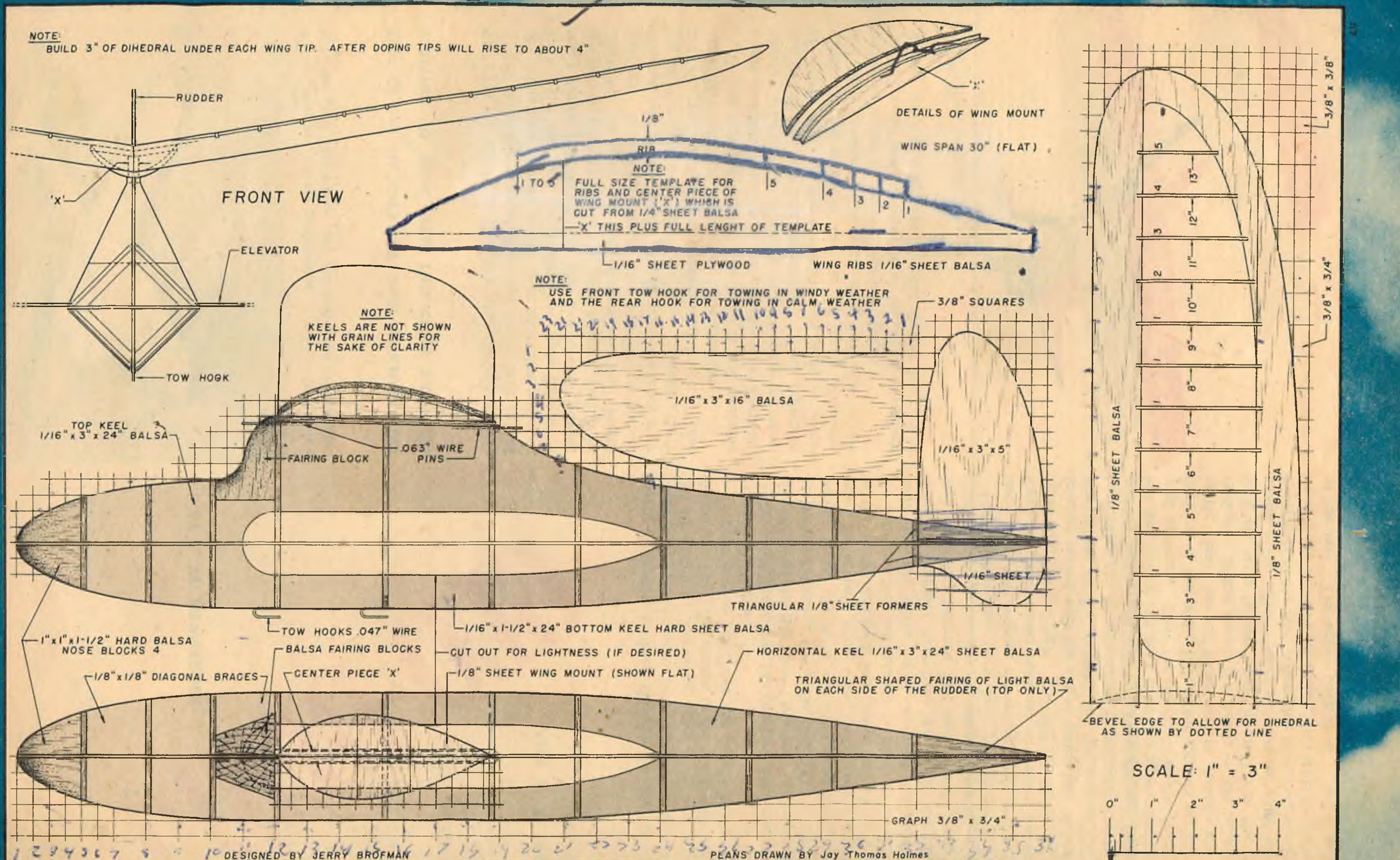
The tail surfaces are constructed by cutting them to outline shape from 1/16" medium hard sheet balsa. Sand them as usual and cover with colored rubber model type tissue, using dope as an adhesive. Cement the rudder to the stabilizer.

You have probably noticed that the wing is quite unusual. Well, Joe, this wing is really nothing new, but isn't too well known to the average model builder. Among the experts, it is called a "Ritz" wing. Its outstanding features are extremely high lift per square inch of area and high strength-to-weight ratio. Its structure is quite simple as you will see. Begin by cutting the outline shape from 1/8" medium hard sheet balsa. Glue these sheet sections together as shown by the plans. Next cut the three templates (one for the center, one for each tip) of 3/8" sheet balsa. Moisten the entire wing with luke warm water and pin it to the templates as described on the plans. Allow this to dry for at least three hours—preferably overnight. This will "pre-form" the wing to its required airfoil shape. When dry, remove the pins from the wing and insert the ribs in their respective positions. These ribs are cut from 1/8" medium hard sheet balsa, using the template as a guide, as shown on the plans. Join the two wing halves just as you would those of a hand-launched glider. Three inches of dihedral is required at each tip. There is no need telling you that this joint should be strong, so don't spare the "stick-um."

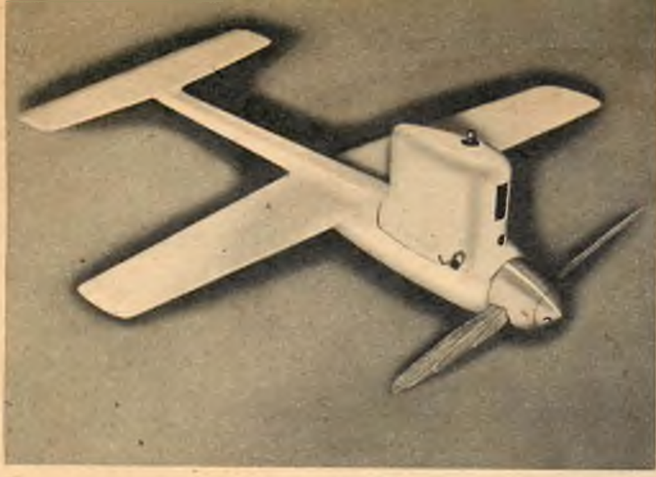
You know how important sandpaper is in finishing a model; it is especially important to a glider and every drop of elbow grease used will repay you by your glider's ability to ride weak thermal currents. After sanding, cover with a good grade of *(Turn to page 118)*

● Full size plans not needed here! Read article, follow drawing.





NOTE: BUILD 3" OF DIHEDRAL UNDER EACH WING TIP. AFTER DOPING TIPS WILL RISE TO ABOUT 4"
RUDDER
'X'
FRONT VIEW
ELEVATOR
TOW HOOK
1/8"
RIB
NOTE: FULL SIZE TEMPLATE FOR RIBS AND CENTER PIECE OF WING MOUNT ('X') WHICH IS CUT FROM 1/4" SHEET BALSA
1 TO 5
'X' THIS PLUS FULL LENGHT OF TEMPLATE
1/16" SHEET PLYWOOD
WING RIBS 1/16" SHEET BALSA
DETAILS OF WING MOUNT
WING SPAN 30" (FLAT)
NOTE: USE FRONT TOW HOOK FOR TOWING IN WINDY WEATHER AND THE REAR HOOK FOR TOWING IN CALM WEATHER
3/8" SQUARES
NOTE: KEELS ARE NOT SHOWN WITH GRAIN LINES FOR THE SAKE OF CLARITY
1/16" x 3" x 16" BALSA
1/16" x 3" x 5"
1/16" SHEET
TOP KEEL 1/16" x 3" x 24" BALSA
FAIRING BLOCK
.063" WIRE PINS
TRIANGULAR 1/8" SHEET FORMERS
1" x 1" x 1-1/2" HARD BALSA NOSE BLOCKS 4
TOW HOOKS .047" WIRE
1/16" x 1-1/2" x 24" BOTTOM KEEL HARD SHEET BALSA
BALSA FAIRING BLOCKS
CUT OUT FOR LIGHTNESS (IF DESIRED)
HORIZONTAL KEEL 1/16" x 3" x 24" SHEET BALSA
1/8" x 1/8" DIAGONAL BRACES
CENTER PIECE 'X'
1/8" SHEET WING MOUNT (SHOWN FLAT)
TRIANGULAR SHAPED FAIRING OF LIGHT BALSA ON EACH SIDE OF THE RUDDER (TOP ONLY)
GRAPH 3/8" x 3/4"
DESIGNED BY JERRY BROFMAN
PLANS DRAWN BY Jay Thomas Holmes
3/8" x 3/8"
3/8" x 3/4"
1/8" SHEET BALSA
1/8" SHEET BALSA
BEVEL EDGE TO ALLOW FOR DIHEDRAL AS SHOWN BY DOTTED LINE
SCALE: 1" = 3"
0" 1" 2" 3" 4"



● Clean lines and speedy performance of the Glo-Debbil stem from the glow plug engine and pod-and-boom arrangement.

GLO-DEBBIL

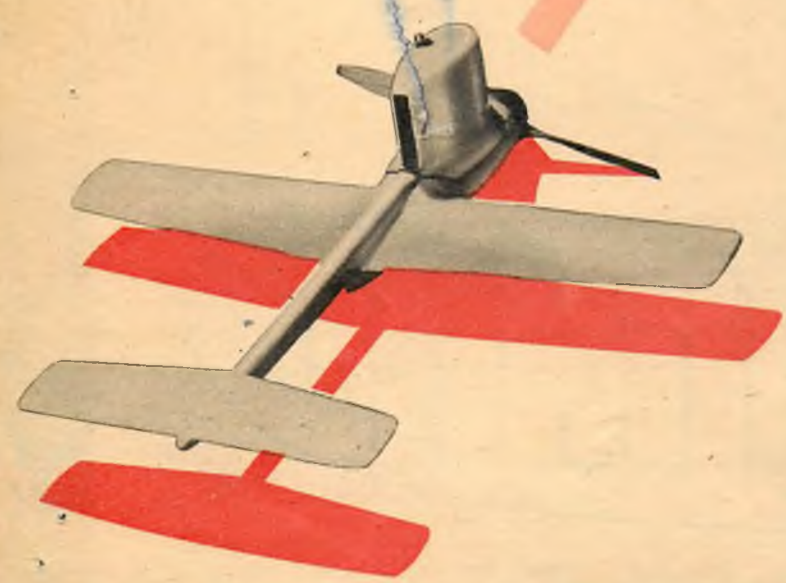
BY D. W. NEWBERGER AND W. T. TURNER

TWO OF THE NATION'S TOP SPEED MERCHANTS GET TOGETHER TO BRING YOU THIS CLASS B-C RACER

WITH the advent of the glow plug the opportunity of designing a speed ship that was a little out of the ordinary presented itself. The idea of a pod-and-boom type fuselage speed ship has been considered many times, but because of the difficulty in placing ignition accessories in such a small space it had to be discarded in favor of the conventional full length fuselage. Most of us know that this design feature does not add greatly to the aerodynamic efficiency over the more conventional type fuselage. However, there are certain advantages over conventional design. These are light weight and simplicity of construction.

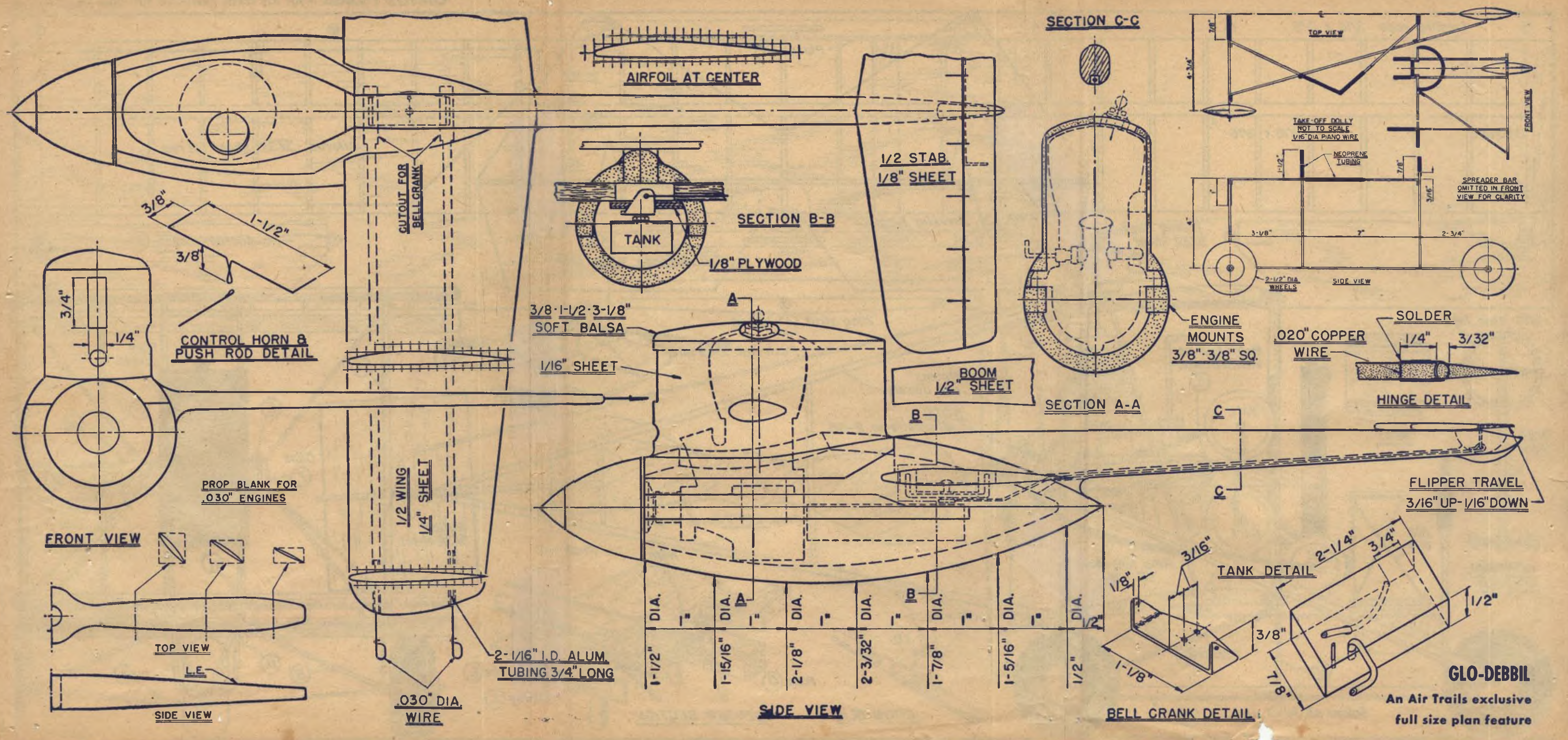
As you first look at the Glo-Debil it will probably strike you that the ship is too small for a 30-cu.-in. engine. The initial advantage of glow plug operation can be seen in this first impression. With reduction of weight (due to the elimination of ignition accessories) lifting surfaces can be cut to a minimum, and with a reduction in area, drag will also be decreased, thereby increasing ultimate speeds.

The second and probably most important advantage is that with a reduction in total weight less actual power is needed to keep the ship in the air. This extra power can be used for driving the ship through the air faster by increasing prop pitch and reducing diameter. The prop shown in the plans together with a Torpedo engine has flown the Glo-Debbil at speeds exceeding 130 mph.



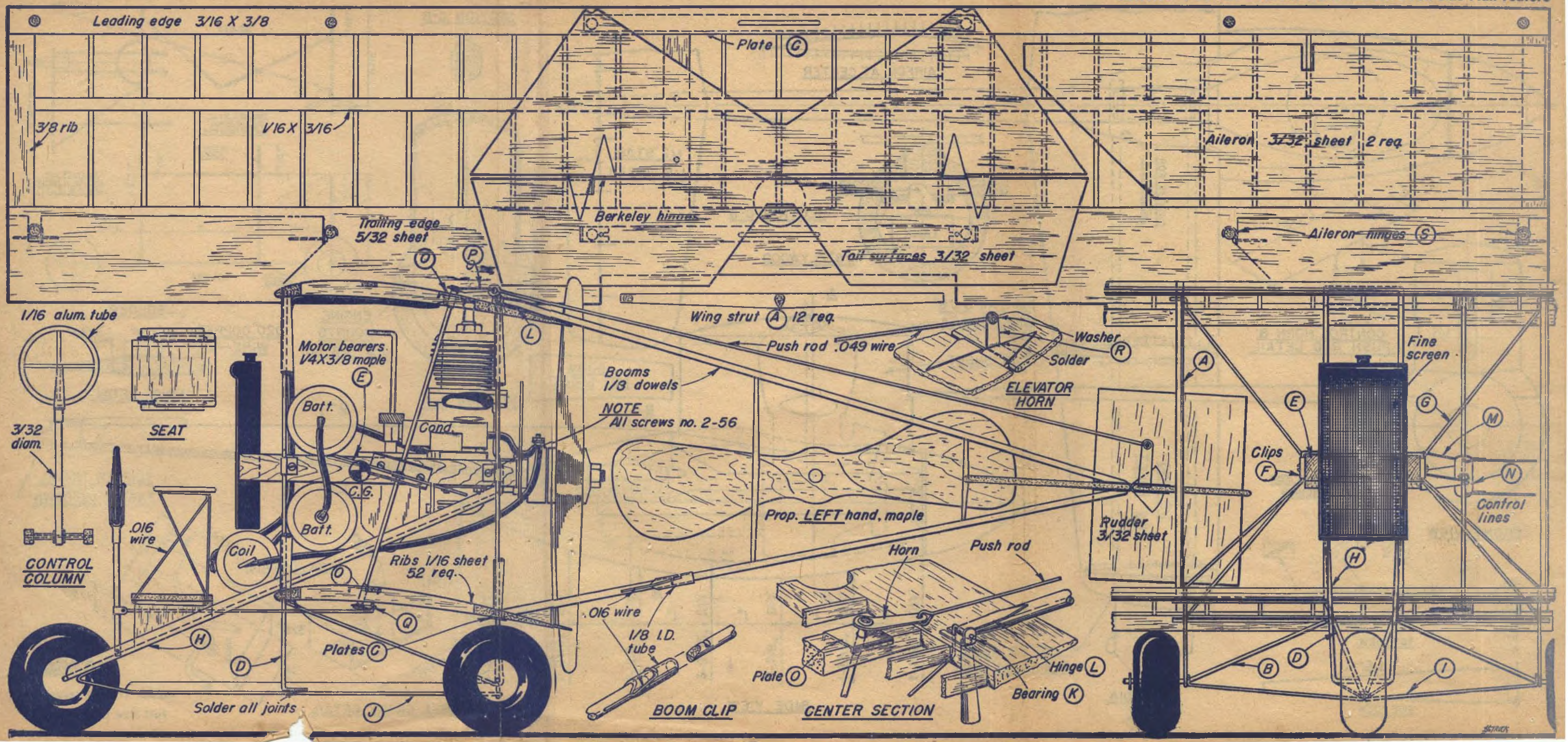
The only change that has occurred since the original conception of the Glo-Debbil has been in the placement of the wire leaders from the bellcrank to the flying wires. Originally these wires came out from the pod below the inboard wing. The inclosure of these wires in the wing increased top speeds by ½ to 2 mph. To some this may not seem to be much of an improvement for the extra work involved. Nevertheless, numerous contests have been won with less than ½ mph difference between first and second place; so a little extra work can pay off where it counts.

Construction has been held to the most simple methods known without detracting from performance. Read the instructions carefully to insure top speeds. Start with the fuselage. The pod can be turned on a lathe or carved with the aid of templates. White pine was chosen as the material for the original pod, but hard balsa can be substituted if necessary. After the pod has been turned, split lengthwise through the center line and hollow out both halves to approximately ¼" shell thickness. Slots for the maple motor mounts are then cut in the pod. Before the mounts are installed in the plane, line up motor on the mounts and drill through. Motor mount bolt heads should be soldered to a tin strip before being inserted into the motor mount holes. The mounts can now be glued into the lower half of the pod. After glue is thoroughly dry the mounts are rounded off to conform with the curvature of the pod. The upper portion of (*Turn to page 110*)



GLO-DEBBIL

An Air Trails exclusive full size plan feature


Leading edge 3/16 X 3/8
Plate C
3/8 rib
1/16 X 3/16
Aileron 3/32 sheet 2 req.
Berkeley hinges
Trailing edge 5/32 sheet
Aileron hinges S
Tail surfaces 3/32 sheet
O
P
Wing strut A 12 req.
1/16 alum. tube
SEAT
3/32 diam.
CONTROL COLUMN
L
Motor bearers 1/4X3/8 maple
E
Batt.
Cond.
C.G.
Batt.
Coil
Push rod .049 wire
Booms 1/8 dowels
NOTE
All screws no. 2-56
Washer R
Solder
ELEVATOR HORN
A
Fine screen
E
G
M
Clips
F
N
Control lines
Prop. LEFT hand, maple
Rudder 3/32 sheet
H
.016 wire
Ribs 1/16 sheet 52 req.
O
Q
H
D
Plates C
Solder all joints
J
.016 wire
1/8 I.D. tube
BOOM CLIP
Horn
Push rod
Plate O
Hinge L
Bearing K
CENTER SECTION
B
D
I

CURTISS PUSHER

BY HENRY STRUCK

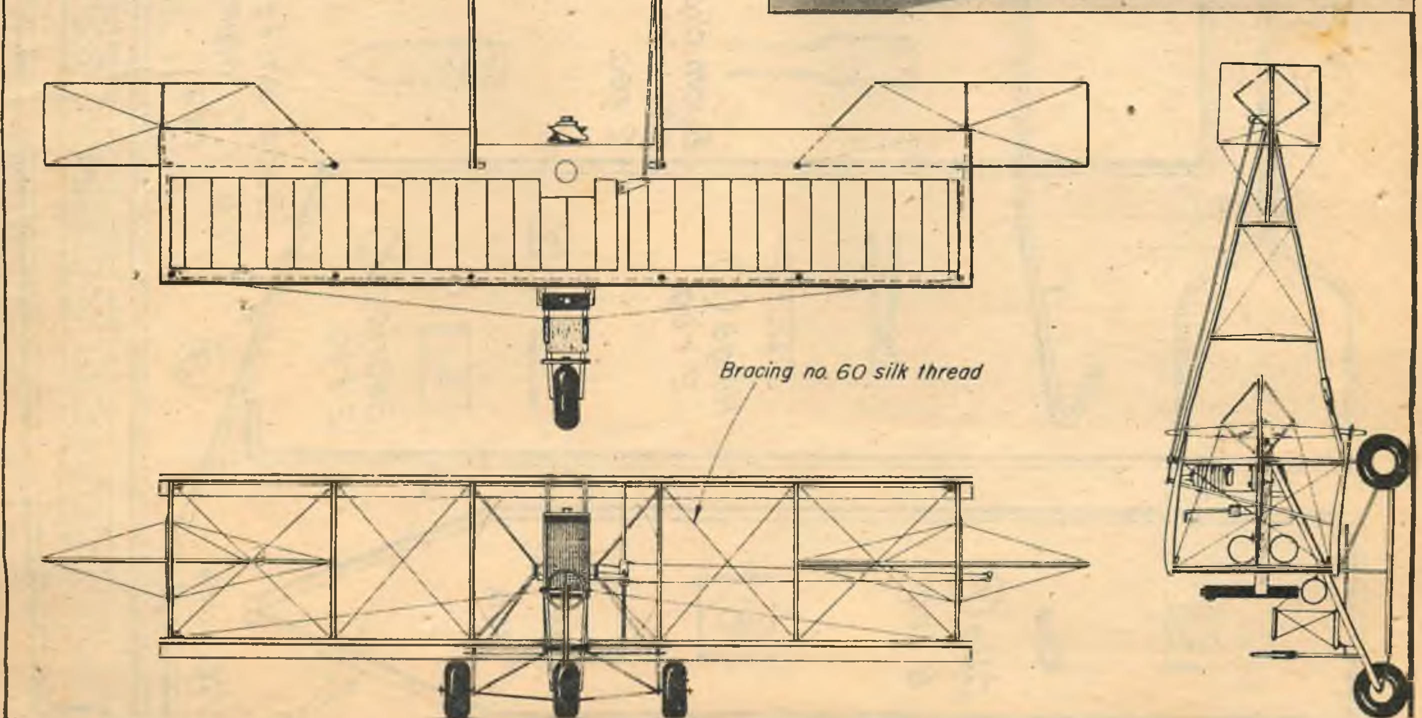
BACK in the days when airplanes were "flying machines" and jets were gas-light burners, Lincoln Beachey amazed America with his incomparable precision flying and stunting. He was the first to power dive and zoom, whip stall and spiral, as well as the first American to fly inverted and loop. To demonstrate the ease and precision with which he could control his Curtiss "Tripod" pusher, Beachey flew for miles up and down Chicago boulevards, skimming the tops of autos and trees.

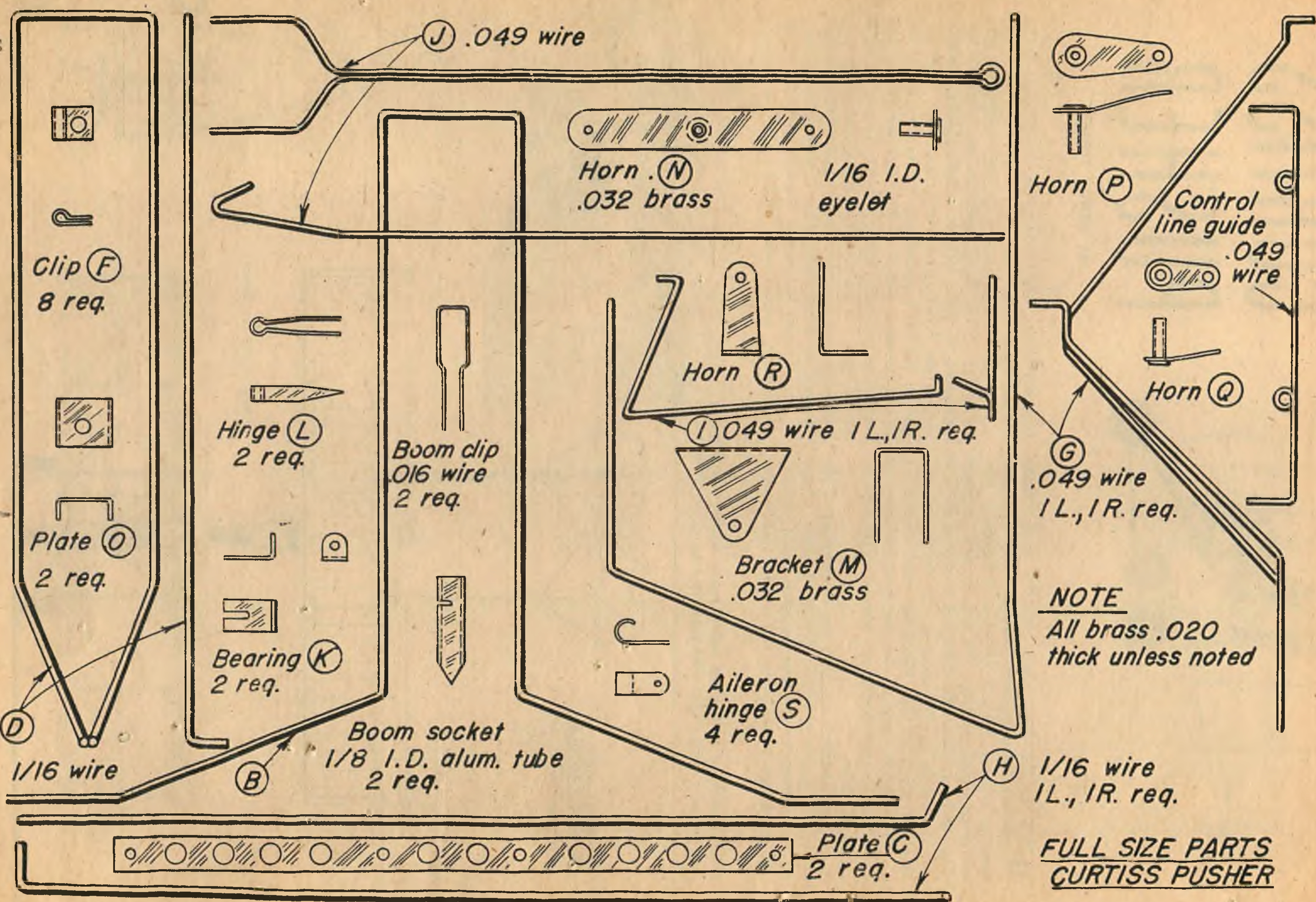
Lincoln Beachey's machine was the product of the pioneering genius of Glenn Curtiss, founder of the aircraft enterprises that bear his name today. Curtiss with his talent for mechanics and zest for speed moved naturally from racing bicycles to motorcycles, to flying, dominating each field in turn.

Overshadowed perhaps by the more spectacular performances of his flying machines was Curtiss's development of light weight, reliable power plants—notably the liquid-cooled Vee arrangement. The engine in Beachey's pusher was the predecessor of the almost universal OX-5 of the '20's, and today has reached its peak of refinement in the Allison and Rolls Royce types. This contribution of practical power, enabling others to materialize their theories of design, hastened the development of the airplane immeasurably.

After Curtiss had taught himself to fly, becoming the holder of international Air Pilot *(Turn to page 94)*

● The problem of starting the pusher engine without interference from the boom members has been solved by hinging the aft section.





FULL SIZE PARTS CURTISS PUSHER

PLENTY OF FUN FOR YOU WITH THIS

CO_2 POWERED U-CONTROL SPEEDSTER

EXCESS TOO

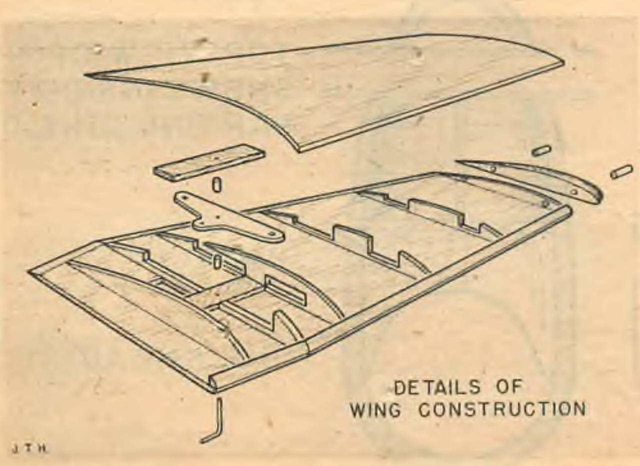
BY ED LIDGARD

THIS little model was built to explore the possibilities of the Herkimer compressed gas engines for U-control use. Not only has the engine proved itself adaptable for U-control but is excellent for indoor work and for flying in restricted spaces. It has been flown in exhibitions with marked success. Those who have flown it have enjoyed the experience as much as the spectators.

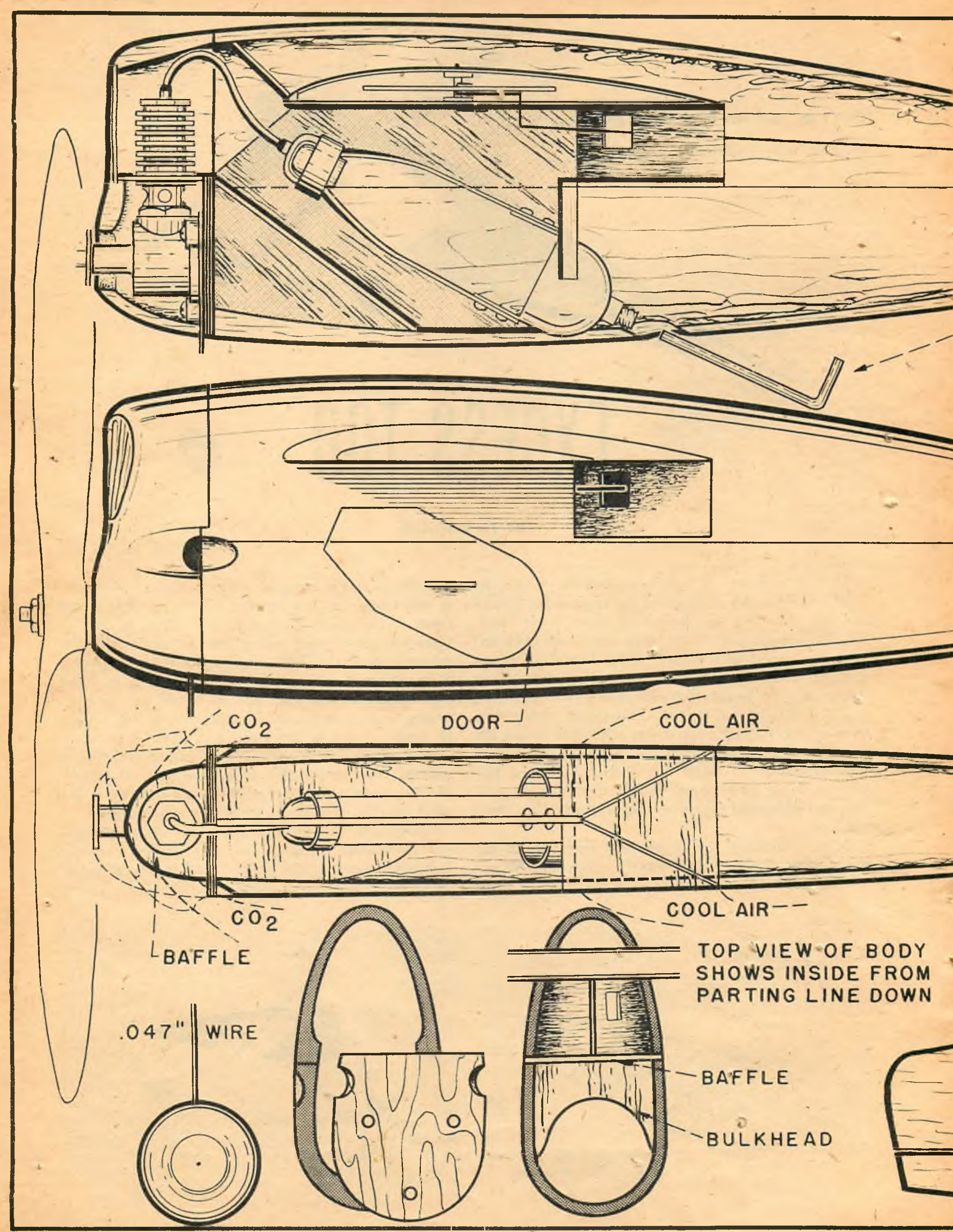
When designed, speed was considered rather than stunt or sport flying since it was our intent to use the model as an instrument of research into propeller sizes for this engine. To date the model has clocked 34.7 miles an hour, which could be increased with drop-off gear and additional experimenting with propeller types and sizes.

Before installing the engine and cartridge in the model some tests were performed to determine the advisability of soldering a series of washers on the pressure line from the cartridge holder to the cylinder head. It was found that without the washers the line would frost. After about 75 washers were added to the line there was no frosting of the line, indicating that the washers were absorbing heat from the atmosphere. Since no exact calculations were made for thrust and engine run comparisons it is hard to say for sure that adding washers increases the efficiency of this engine. However, it can be supposed that there is some increased efficiency. Whether the increase in efficiency is sufficient to warrant this added weight is debatable. For this reason the plan shows a short straight line connection between cartridge holder and engine.

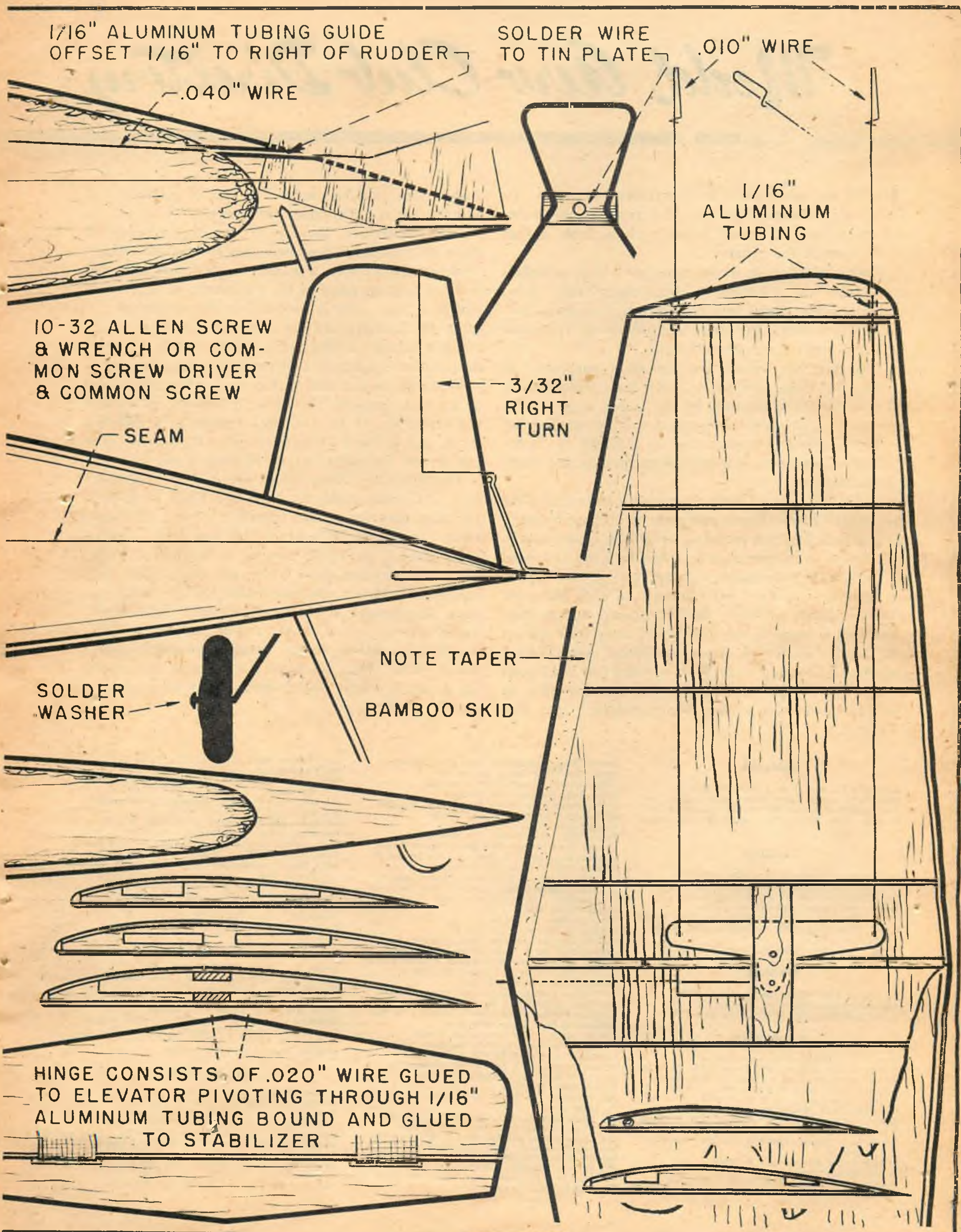
Incorporated in the cowling of this model are several innovations already proven in previous models. You will notice that the exhaust CO_2 is vented out of the cowling so as not to pollute the *(Turn to page 83)*



DETAILS OF
WING CONSTRUCTION



CO_2
DOOR
COOL AIR
CO_2
COOL AIR
BAFFLE
TOP VIEW OF BODY SHOWS INSIDE FROM PARTING LINE DOWN
.047" WIRE
BAFFLE
BULKHEAD


1/16" ALUMINUM TUBING GUIDE
OFFSET 1/16" TO RIGHT OF RUDDER
SOLDER WIRE
TO TIN PLATE
.010" WIRE
.040" WIRE
1/16"
ALUMINUM
TUBING
10-32 ALLEN SCREW
& WRENCH OR COMMON SCREW DRIVER
& COMMON SCREW
3/32"
RIGHT
TURN
SEAM
NOTE TAPER
SOLDER
WASHER
BAMBOO SKID
HINGE CONSISTS OF .020" WIRE GLUED
TO ELEVATOR PIVOTING THROUGH 1/16"
ALUMINUM TUBING BOUND AND GLUED
TO STABILIZER

Model Aero Club Directory

JUST one year ago, in its November 1947 issue, *Air Trails* presented for the first time an up-to-the-minute listing of model aviation clubs from almost every state in the country.

Since that time, in these pages have been published corrections and additions to that original list. Now, continuing the model aero club directory as an annual service to readers, the latest compilation of American aeromodeling organizations follows.

This directory serves two important purposes. It enables free lance modelers to locate their nearest clubs, so club memberships may be increased; it gives club secretaries and contest directors a valuable mailing list so that interested groups may be advised of forthcoming model meets, aeronautical gatherings, and council conferences.

The listing is as up to date as possible and as complete as the staff of *Air Trails* can make it. Those formally established clubs not included, or groups whose data is incomplete or incorrect in this directory are requested to provide the publication with the missing information or corrected addresses and names. In such instances, club secretaries or senior advisors should turn to page 109 of this issue of *Air Trails* and completely fill out the form, "Roster of American Model Aero Clubs," which will be found there. Keep in mind that in all cases —either new clubs reporting in for the first time, or already listed clubs sending along corrected data—this roster form must be used. The task of collating club information is too complex otherwise.

In the directory, because of the large number of clubs included, it has been necessary to brief the listings. Punctuation has been left out. Under each state you will find first the name of the community in which each club is active. This is followed by the club name and after the dash appears the name and address (where one is available) of the individual to contact for more information concerning that particular organization.

When the contact man resides in the same community as the club operates, the name of the city or town is not repeated. If he (or she) resides in a different locale, that is listed. Where Av, Pl, Ct, Rt or Rd does not appear, the word "street" is understood.

The following abbreviations are used in this directory: AC, aero club; Av, avenue; Blvd, boulevard; Bx, post office box; CLC, control-line club; Ct, court; Dept, department; E, east; GMA, gas model association; GMAA, gas model airplane association; GMAC, gas model airplane club; GMC, gas model club; HC, hobby club; MA, model association; MAA, model airplane association; MAC, model airplane club; MAE, model aero engineers; MAL, model aero league; MC, model club; MFA, model flying association; MPC, model plane club; N, north; Pl, place; Rd, road; Rt, route; S, south; SME, society of model engineers; and W, west.

ALABAMA

Mobile Gas Flyers—J T Ford 1806 Old Shell Rd
Mobile Hobbylanders—Leroy Weitzel 1051 Virginia
Montgomery Prop Busters—R Tiermann 113 Gaston Av
Mt Olive Midget Modelers—C L Eargle Jr 1408 Sutherland Rd

ARIZONA

Casa Grande Gremlins—W Staats Bx 1321
Kingman Flying Bulldogs—Ben Logas Bx 1174
Mesa Flying Dutchmen—R T Preston 57 W 2nd Av
Phoenix MAC—G H Webster 417 W Adams
Prescott Flymasters—Mrs Ernest Baker 334 N Mt Vernon
Tucson Cholla Choppers—F C Townsend 2751 N Campbell Av
Tucson Thermaleers—Walter Eisiminger Rt 5 Bx 12

ARKANSAS

Hot Springs Flight Club—Emerson Benson KWFC
Murfreesboro Cloud Busters—C E Dillard Jr
Rudert Aeronautics—Shirley McCutcheon Dept 13A

CALIFORNIA

Alameda Aero Modelers—542 Bainbridge Av
Alameda Jr Aero Modelers—J C Harkness 613 Taylor Av
Albany Control Flyers—W S Biscay 513 Pomona Av
Alhambra Hedgehoppers—Q T Oesterreich 14 S 3rd
Anaheim Balsa Butchers—900 Blk S Palm
Bakersfield GMAA—Francis Stewart 900 21st
Banning Air Bronchos—J W Vanderhoof 3108 W Nicolet
Bellflower Balsa Butchers—Bob Courtney 348 Ryon
Bell Gardens Thermal Thumbers—William Sweet 6901 Eastern Av
Berkeley Control Flyers—1204 Delaware
Berkeley Tether Terrors—291 Purdue Av
Berkeley Vapor Trailers—C W Doane 1433 Oxford
Burbank Sun Valeers—Art Swift 3407 W Magnolia Blvd
Burbank Wing Twisters—Don Gylfe 1512 N Evergreen
Chula Vista Flying Goats—604 3rd Av
Colton Aeronuts—Virgil Hamilton 640 4th
Colusa Balsa Butchers—Gary Kaveney
Delano Thunderbirds—Robert Behryes 2145 Princeton
Dinuba MC—Clarence Mason 215 1st Av
Fresno Control Flyers—Bill Price
Fresno GMAC—Orle Randall 716 Waterman Av
Glendale Cloud Rowdies—Dick Guard 1214 N Everett
Hamilton Field AC—J E McDonald 588A Crescent Dr
Hayward Hedge Hoppers—383 Medford Av
L A Aero Modelers—R E Acord 5111 Lemon Grove Av
L A Buzz Bombers—Chuck Kimbrough 5478 Templeton
L A Gremlins—John Weaver 8324 Grape
Modesto Flying Aeros
Napa Gremlins—507 Jefferson
Oakland Air Foilers—2723 12th Av
Oakland East Bay Aeroneers—6036 Telegraph Av
Oakland East Bay U-Control Flyers—3803 Midvale Av
Oakland Cloud Dusters—H S Robbers Sr 5610 E 17th
Oakland Prop Busters—G E Dake 1420 46th Av
Oceanside Prop Spinners—307 3rd
Pacific Grove Tethered Terrors—Jack Grimsley Bx 251
Palo Alto U-Liners—Rt 1 Bx 112E
S Pasadena Flying Tigers—Charlie Roehm 11-38 Pine
Petaluma Do-Little Flyers—405 B St
Pomona Airfoilers—D C Johnson 456 E 10th
Richmond Aero Modelers—3803 MacDonald Blvd
Riverside Winders—H R Ellis 3695 Housh Av
Sacramento MAC—K E Sullivan 964 Fremont Way
Sacramento MAA—Julia Perisich 1833 48th
Salinas MAC—324 Main
San Bernardino Sky Devils—E C Heywood 2763 Stoddard Av
San Diego Aeroneers—H C Clines 4381 Campo Dr
San Diego Airliners—L M Webb 2043 Albatros
San Carlos MAC—J G Ridgely Rt 2 Bx 699 Campbell
San Francisco Presidio Golden Gate Modelairs—Bx 33
San Francisco Golden Gate Modeleers—129 Kana Rd
San Francisco Mustangs—3247 24th
San Francisco Pterodactyls—Bert Walker 600 Ocean Av
San Francisco MAC—4212 25th
San Francisco South City MC—240½ Grand Av
San Francisco Vultures—600 Ocean Av
San Gabriel Valley MC—C O Wright 1225 E Foothill Blvd Azusa
San Luis Obispo Modeleers—Gordon Porter 751 Marsh
San Mateo Prop Twisters—316 B St
San Pedro Aero Modelers—H Loomis 1731 S Pacific Av
San Rafael Marin Power Modelers—1550 Lincoln Av
Santa Barbara Silver Falcons—F G Low Jr 601 E Sola
Santa Monica Bay Cities Modellers—J G Berry 1034 6th
Santa Monica Aeromodelers—W C Luther 529 Santa Monica Blvd
Santa Paula Gremlins—R G Johnson 204 S 4th
Santa Rosa Sky Bugs—813 Spencer
Sonoma Air Bears—299 E Napa
Vallejo Sky Jockeys—Ralph Stillings 84 B St
Watsonville P V Aerobats—George McKenzie Bx 696

COLORADO

Arvada MAC—William Thoes Rt 1 Bx 20
Boulder Wind Jammers—L C Foiles 1832 Broadway
Colorado Springs 6K-MSL MC—H C Strang 1339 N Nevada
Denver MAC—C H Schuller 1726 Champa
Englewood Flying Circus—Donald Clinton 3360 S Bdwy
Ft Collins Modeleers—J W Tipton 118 Fishback
Greeley Cloud Mites—D R Schumacher 1110 11th
Longmont Model Fliers—J E Peckham

CONNECTICUT

Ansonia Aerial Cowboys—482 Main
Branford Sky Wolves—R E Comer 258 Main
Bridgeport Aeronuts—Earl Gay Jr 629 Boston Av
Danbury Hat City GMC—Carl Faust Jr 95 Osborne
Danielson MAC—Richard Patterson 122 Main
Glastonbury Wright Club—H H Sargent 28 Orchard La
Hartford Hedge Hoppers—H F Brooks Sr 39 Gold
Hartford MAL—Brown Thomson Dept Store
W Hartford MAE—David Hunt 598 S Quaker La
Manchester Sky Liners—E L Oates 176 Wadsworth

CONNECTICUT (Cont'd)

Milford Indians—F A Weimann 197 E Broadway
Mystic Prop Busters—Charles Hollek Dennison Av
New Haven Gas Bugs—Wm Paulson 529 Quinnipiac Av
New London Prop Busters—97 Post Rd
Norwich Gremlin Chasers—Richard Danilowicz 26 Page
Rockville MAC—Ted Staudt 6 Kingsbury Av
Rockville Royal Sky Masters—J H North 19 Davis Av
Salisbury School MAC—W W Miller Jr
Waterbury SME—E D Anderson 45 Prospect
West Haven Gas Hawks—Harold Finer 25 Wood

DELAWARE

Claymont Sky Blazers—Joe Di Pinto 301 Commonwealth Av
Wilmington Modeleers—Richard Macadam 407 Shipley

DISTRICT OF COLUMBIA

Balsa Bugs—E W Causey Jr 35th AAF BU-Bolling Field
Capitol Model Aeroneers—W A Pennoyer 813 7th NE
Dead Dodos—Donald Dyers 4627 Verplanck Pl NW
Helicopter Forum—William Foshag 2 Westwood Dr

FLORIDA

Daytona Beach MPC—W T Thomas 105 N Halifax
DeLand MAC—A V Hays 439 N Clara Av
Hialeah Tri-City HC—E S Brunk 51 Okeechobbee Rd
Jacksonville MAC—C H Thornton Recreation Dept
Lakeland MAC—Bx 1581
Lake Worth Flying Gators—M H Caldwell Bx 855
Lake Worth MC—F T Kerr Jr 609 Lake Av
Miami Tropic Aeros—L J Scoville 1030 SW 28th Av
W Palm Beach MAC—N K Bennett Bx 1748
Pensacola Prop Twisters—Jim Green 1407 N Palafox
Tampa Helldivers—Joe Friscia 1201 Estelle
St Petersburg Night Hawks—Bob Bender 3610 19th Av S

GEORGIA

Albany MAC—R M Evans 619 3rd Av
Atlanta Aero Engineers—W H Arnold 666 Parkway Dr
Atlanta Controlliners—J K Coppage 630 Cleburne Ter NE
Atlanta Southern Aerolists—Jack Roberts 634 Berne SE
Decatur MC—Douglas Scott 3177 Glenwood Rd
Douglasville MC—Steve Strickland
Griffin MC—Richard Gaston 356 E College
Marietta Kitty Hawks—J W Hoskins 205 George Hamilton Ct
Savannah GMAC—I C Henderson 121 W Hall
Savannah MFA—A C Rountree 16 E Taylor
Thomaston Prop Spinners—Capt C H Orrick PMS & TRE Lee Institute Bx 712
Warner Robins MC—P H Coons 220 Southview Av

IDAHO

Boise Balsa Butchers—206 N 9th
Boise MC—Norman Taylor 1118 Michigan Av
Caldwell Model Manglers—Al McClusky 511 Arthur
Kimberly Aero-nuts—Kenneth Emerson
Nampa MC—Dale Lawrence 320 13th Av N
Pocatello Spark Plugs—K F Graveline 427 W Center
Rexburg Strato Katz—R P Cook 246 S 1st W

ILLINOIS

Alton Balsa Butchers—Donald Belanger 2222 Brown
Alton MAC—B R Carter 3702 Western Av
Aurora Aeronuts—H G Bette 7 Fox Prom
Berwyn High Liners—R Smutny 2107 S Clinton Av
Bloomington Normal Modeleers—L M Grubel 906 W MacArthur Av
Carmi Dope Daubers—Wallace Brown Rt 4
CHICAGO:
- Aerocrafters—Andrew Wiktorin 2303 S Whipple Av
- Aero Grasshoppers—G C Kripner Jr 1615 S Kedvale Av
- Air Cadets of America—Maurice Roddy Chicago Times 211 W Wacker Dr
- Aeronuts—Carl Goldberg 2645 S Wabash
- Balsa Wasps—J E Chronister 2146 W 110th
- Buzz Bombers—Paul Leserman 736 Buena Av
- Flying Gremlins—Geo Chirigos Jr 1425 W Carmen Av
- Gremlins—Earl Wagenseller 1635 W Farragut Av
- Model Nuts—J J Baron 5025 N Pulaski Rd
- Piston Pushers—Bob Swenson, 6125 N Fairfield Av
- Prop Busters—Kenneth Brown 7806 W Victoria
- Screamliners—William Patience 1331 N Bosworth
- Sky Scrapers—Henry Duminie 311 E 61st
- Spinners—R C Brown 2818 E 79th
- Tethered Terrors—Herb Brokhof 4424 N Sawyer Av
- Thermal Thumbers—Tom Schoenau 9934 S Union Av
- Washburne GMC—A J Heinmiller Washburne Trade School 1225 Sedgwick

Cicero U-Liners—George Kos 2712 S 61st Ct
Danville Sod Scoopers—Charles Reck 1509 N Gilbert
De Kalb Cloud Dusters—D Hess 137½ E Lincoln Hwy
Decatur RPM MC—D R Johnson 1168 W Marietta
E St Louis Cloud Hounds—D E Williams Parks Air College
Elgin Thunderbirds—Lyle Pflederer 424 Park
Elmhurst Crack Props—John Panitin 216 Berkley Av
Evanston Eager Beavers—C A Keller Jr 507 Davis
Evanston CLC—D J Sauser 2537 Prairie Av
Freeport Pretzel GMC—J C Rund 1016 S Walnut Av
Galesburg MAC—Ken Freese 422 Monroe
Harvard Aero Bats—Robert Marcks 200 Church

ILLINOIS (Cont'd)

Kankakee GMA—Lee Herscher 1205 S 5th Av
La Grange Gas Lions—H C Twinting 112 S Waiola Av
La Salle Modelaires—Joe Locasta 7th & Gooding
Morris Cloud Dusters—S C Orr 847 Armstrong
Naperville Air Villains—Clarence Mather Rt 1
Ohawa Moose Athletic Assn—1131 Post
Peoria Prop Twisters—W E Roach CMR 105 Oakwood Av
Rock Island Hill Toppers—H Daebelliehn 4101 14th Av
Rockford Gas Bugs—Arthur Hudson 609 Kilburn Av
St Charles Prop Busters—Donald Schmidt 1403 S 2nd
Springfield Prop Busters—A W Edwards 307 W Allen
Urbana Torque Jockeys—Art Beachler 702 S. Goodwin Av
Waukegan Stratohawks—C W Clark 624 Keith Av

INDIANA

Anderson Johnnies—Olenna Williamson 2637 Meridian
Angola Tri State MAC—C H Harry 206 S Darling
Brazil Winged Modelers—L R Weaver 1205 N Meridian
Clinton MAC—W L Marietta 759 Elm
Columbus Prop Busters—James Poulton 1704 Central
Crown Point MC—W C Rothermel 482 S Court
Elkhart Balsa Termites—Carl Rich 3412 Polo Av
Elwood Prop Busters—Robert Bennett 2408 S B St
Evansville Thermal Thumbers—F Scott 1717 Hollywood
Ft Wayne Mad Modelers—P C Kruse 1029 Sinclair
Gary Balsa Butchers—W McDermott 626 E 7th Av
Indianapolis Capitoliners—B Stellhorn 710 S New Jersey
Indianapolis GMA—L V Brown 5506 N Illinois
Indianapolis RPM MAC—A L Caldwell Jr 949 E 86th Rt 14 Bx 271
Indianapolis Strato Streaks—Robert Hudson 66 N Ritter
Lafayette Aeromodellers—F M Crosby School of Aeronautics Purdue Univ
La Porte Thermal Chasers—O L Payne 212 John
Muncie Gas Hawks—C E Kirk 117 E Main
Noblesville Model Maniacs—Bob Goodwin 1306 Monument
New Albany MAC—L I Mayfield 1620 E Main
Richmond Prop Nuts—H N Willoughby 123 S 10th
South Bend Michiana MAC—C B Keller 930 26th

IOWA

Ames Hot Rock-I-Tears—C E Quade 1403 Kellogg Av
Ames Two Cyclers—J E Brunk Bx 670 Friley Hall Iowa State College
Cedar Rapids Aeroneers—M Camizzi 1312 Burch Av NW
Davenport Prop Busters—J H Whitaker 2415 Bridge Av
Decorah Skymasters—Dick Kulaas 409 Eriksson Dr
Dubuque GMA—Ted Jellison 665½ Central Av
Ft Dodge HC—Laurence Walterick Bx 79
Iowa City Gas Hawks—R R Palik 628 N Lucas
Le Mars MC—F S Jenkins
Marshalltown Aeromodelers—Wally Blake 529 N 3rd
Marshalltown Flying Tigers—J C Walker 114½ E Main
Ottumwa Rockteers—Dick Blomgren 731 N Green
Ottumwa Hornets—Claude McCullough Rt 5
Red Oak Cloud Chasers—B E Graham 1201 8th
Sioux City Helldivers—Bob Hoffman 4434 Polk
Waterloo Prop Twisters—E H Fletcher Bx 2456

KANSAS

Emporia Prop Spinners—601½ Commercial
Garden City Prairie Eagles—L R Downing 126 Grant Av
Great Bend Flying Maniacs—J H Louthan 800 Holland
Kansas City Piston Pushers—Bob Aiduk 3122 Stewart Av
Lawrence Sundusters—M Mitchell 1008 New Hampshire
Manhattan Circle Burners—Ralph Moll Bx 681
Salina MAC—Mrs A Goedde 408 W South
Topeka MC—Val Sherrard 1021 W 6th
Wichita Planesmen—835 Porter Av
Wichita Hy Flyers—A J Hummel 4007 E Kellogg

KENTUCKY

Louisville ABC MC—Courier Journal
Louisville MC—J A Strobl 1808 Norris Pl

LOUISIANA

Baton Rouge MA—C G Leonard 151 Bedford Dr
Lafayette MAC—James Starr 1021 Lafayette
New Orleans AC—W J Norman 840 Union
Shreveport MAC—William Baulch 2105 Market
Shreveport Modeleers—T O Philyaw Bx 3292 QB Sta

MAINE

Augusta Flying Maniacs—R F Vigue Jr 143 Northern Av
Rockland Model Hawks—William Pease 224 Limerock
Portland Propsnappers—M G Kennedy 457½ Congress

MARYLAND

Bainbridge MAC—P R Pendleton HA VC Med Dept NTS
Baltimore Air O Ites—H R Jex 3508 Rosedale Rd
Baltimore Aero Craftsmen—R Stevens 1210 Northview Rd
Baltimore Martin Modelers—H W Cassidy 45 Blister
Baltimore Sky Jockeys—T Williams 3521 Meadowside Rd
Hagerstown MBA—J K Baker 516 Reynolds Av
Middle River Spiral Divers—Ford Hannigan 16 Blister Aero Acres
Silver Springs Aeronuts—Ronald McDevitt 1320 Dale Dr
Westminster MC—Morris Koontz Hollow Rock Av

MASSACHUSETTS

Adams Blackhawks—E J Saviski 18 Reeves
Allston Balsa Bees—George McGuiness 61A Franklin

MASSACHUSETTS (Cont'd)

Lawrence GMC—J W Ramsden Jr 65 Beverly N Andover
Beverly Aero Modelers—John Hamor 3 Gardner
Boston AC—James Schivek Peabody House 357 Charles
Boston JAL—Jordan Marsh Co
Braintree MFA—A F Muldoon 23 Miller
Brockton Cloud Chasers—John Ross 70 High
Brookline AC—Arthur Rigor-da-Eva 1236 Beacon
Charlestown MAC—W D Headle 4 N Mead St Ct
Cheshire Black Hawks—Harry Schwarzer
Dorchester Speed Demons—Robert Clark 66 Clarkson
Fall River MAE—Julian Deschene 800 Charles
Gardner MAC—Paul Safstrom 29 Crawford
Lawrence GC—John O'Rourke Bay State Bldg
Leominster Prop Blasters—Alfred Bergeron Bx 364
Lowell GMC—C E Watt Jr YWCA Bldg
Lynn Speed Lions—J A Jodoin 4 Baker
Malden Rubber Demons—Bud Rosenberg 184 Belmont
Medford Gashoppers—J L Guarino 34 Washington
N Quincy Cloud Busters—W S Sterling 19 Belmont
Norwood SME—Edward Heyn 709 Washington
Royalston Gasoleers—John Wells Bx 49
Holyoke GMC—B R Smith 632 Westfield W Springfield
Springfield Snafoo C—E B Cleveland 170 Parkerview
Taunton Mod-Aeros—A P Correia 38 Purchase
Uxbridge Blackstone Valley GM—D J Wesgan 17 Oak
Westfield Aeronauts—T W Gilligan 6 Lozier Av
Worcester Jinx Inc—A S Clemence 30A Holden
Worcester MAA—F R Mosiello Jr 359 Shrewsbury
Worcester MPC—H J Chicoine 61 Cutler
Worcester Piston Pushers—H D Weiss 64 Deerfield

MICHIGAN

Ann Arbor Airfoilers—H C Varnum 607 Hill
Battle Creek Gasoleers—K A Vincent 25 Haskell Av
Bay City MC—J A Pedit 611 N Dean
Boyne City Modeleers—Jack Carman 707 Earl
Breedsville Balsa Bugs—Frank Hartman
Fordson GMC—H S Lewis 411 N Rosevere Dearborn
Detroit Balsa Bugs—Recreation Dept 9800 E Jefferson
Detroit Propnuts—Al Laugenbacher 19131 Hickory
Detroit Sky Guys—William Bristow 2141 *Antoinette*
Detroit N Woodward GMC—J C Schuch 12658 Cheyenne
Detroit Strathmoor MC—H P Foucher 14515 Grand River
E Detroit Prop Busters—Albert Kerner 21855 Gratiot Av
Dowagiac Modeleers—L L MacKenzie 404 Walnut
Flint HC—D I Lambert 2544 Bagley
Gladstone Strato Flyers—Rex Coulter Rialto Camera Mart
Grand Rapids MC—L F Richason 2226 Jefferson Dr SE
Hamtramck Crowley's MAL—C J Singer 9344 McDougall
Jackson MAC—C E Greene 502 McNeal
Kalamazoo Aero Nuts—Allan Rowe 341 Lovell
E Lansing Buzzards—W J Werback 900 Wildwood Dr
Menominee Gremlins—Robert Chernosky 808 Dunlap Av
Muskegon MAC—W J Gagnon 143 Western Av
Pontiac Aerobats—Bill Godschalk 6957 Lakeside Dr Rt 7
Pontiac Torque Twisters—J W Sandberg 7 Prall
Romulus MAC—R W Reimschussel 27630 Goddard Rd
Saginaw MC—M F Schmidt 1726 Monroe
Shepherd Goofy Gremlins—A M Stellwagen Bx 55
Wyandotte Gremlins—Charles Pyrone 849 6th

MINNESOTA

Duluth Arrowhead Flyers—Gene Jameson 213 W 3rd
Detroit Lake Slip Streamers—Robert Hustad Bx 772
Hibbing MAC—Bill Reeve 1835 8th Av E
Le Sueur Flying Eagles MC—Eugene Modert Rt 4
Mankato Modeleers—J A Bowen 118 Parsons
Minneapolis Dope Fiends—G A Johnson 4112 24th Av S
Minneapolis MAC—R M Thor 2633 Garfield Av S
St Cloud MAC—J G Williams 28 5th Av S
St Paul Piston Pushers—R C Sorensen 1379 Osceola Av
St Paul Modeleers—Lytton Calrow 572 N Snelling
Shakopee Prop Snappers—Robert Sweeney 506 Holmes
Winona Win Aero MC—Wesley Kittle 79 W 3rd

MISSISSIPPI

Columbus MAC—Lt Frank Winner 504 3rd Av N
Hattiesburg MC—R J Spencer 105 E Pine
Jackson MAC—Charles Hudspeth Rt 7
Laurel MAC—Henry Lansford 1015 2nd Av

MISSOURI

Aurora Boy Scouts MC—Lewis McNutt Bx 211
Houston Model Aeronauts—Max Burkhead Bx 267
Independence Spark Sharks—Bill Meadon 631 S Fuller
Joplin MC—Carl Lowerance 1627 Main
KANSAS CITY:
- Cloud Chasers—Kenny Haysler 105 Wornell Rd
- Model Manglers—Bob Costigan 5632 Garfield
- MRA—C W Mumaw 107 W Pocahontas La
- Ski Hi MC—L L Cook 4825 Independence Av
- Sky Kings—Fred New 3685 Summit
- TWA MAC—W G Smallfield 2429 Quincy Av
- Winged Motors C—H M Schrieber 3507 Prospect

Kirkwood Thermaleers—Parnell Schoenky 125 E Maple Av
Maplewood Sky Hawks—Mickey Raldoff 3146 Cherry Av
Neosho Flying Fools—Vivian Mikoliza 311 E Main
Pine Lawn Thunderbirds—L Matustik 3924 Council Gr
Princeton Prop Smashers—John Buren College Av
Rolla Hammer Throwers—Fred Nevin 704b E 12th
St Joseph Hell Cats—A F Pierce 3012 Penn
St Joseph Vultures—Paul Stewart 1013 Frederick Av
St Louis Air Scouts—G E Tabor 6636A Garher Av

(Turn to page 90)

AIR TRAILS

Air Pix

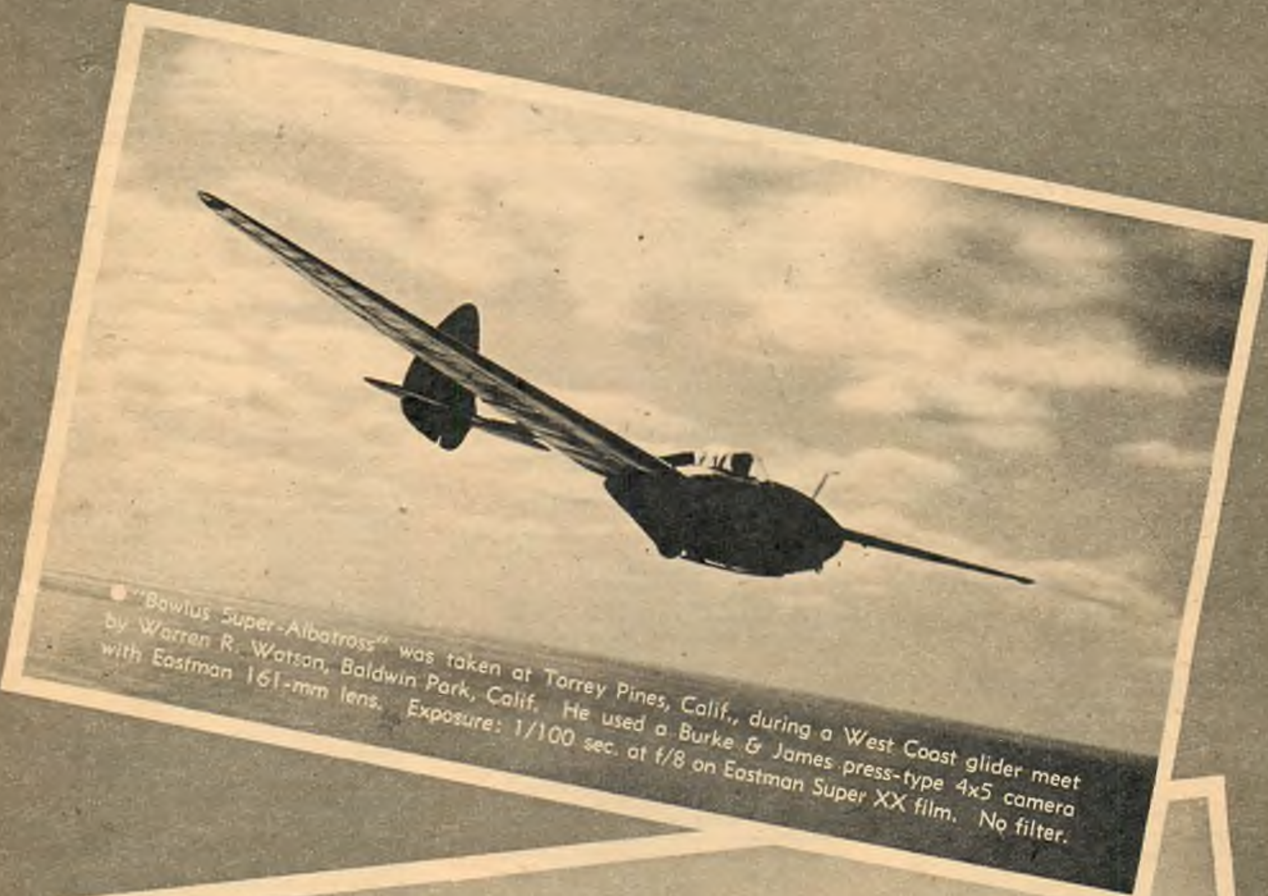
PHOTO COMPETITION

CONTEST RULES

This competition is open to all photographers—amateur or professional. No distinction is made between either class of entrant. Payment of ten dollars will be made on or before publication to those whose photographs are selected to appear in the Air Pix competition.

Entries may be concerned with any phase of aviation or aeromodeling. These should be glossy prints not less than 5 by 7 inches in size. Prints should be well wrapped and protected in the mails by stiff cardboard. Entries must be accompanied by the name and address of photographer and sufficient stamps to cover return postage.

Include full data on the subject, camera and film used, exposure, lens setting, and conditions under which the picture was made. Give details concerning equipment for enlargement, printing paper, and all other pertinent information. Air Trails does not assume responsibility for entries. The editors regret they cannot enter into correspondence concerning contributions.



● "Bowlus Super-Albatross" was taken at Torrey Pines, Calif., during a West Coast glider meet by Warren R. Watson, Baldwin Park, Calif. He used a Burke & James press-type 4x5 camera with Eastman 161-mm lens. Exposure: 1/100 sec. at f/8 on Eastman Super XX film. No filter.

● Fifteen-year-old Victor Lewis, Long Beach, Calif., made this shot of a North American B-45 jet bomber. Camera was an Ansco B2 Speedex. Film was Verichrome with K-2 filter. Exposure was 1/250 sec. at f/4.5 at infinity. Printed on Kodabromide F-3 paper with a Federal 219 enlarger.

"Strike or spare... it's a snap!"

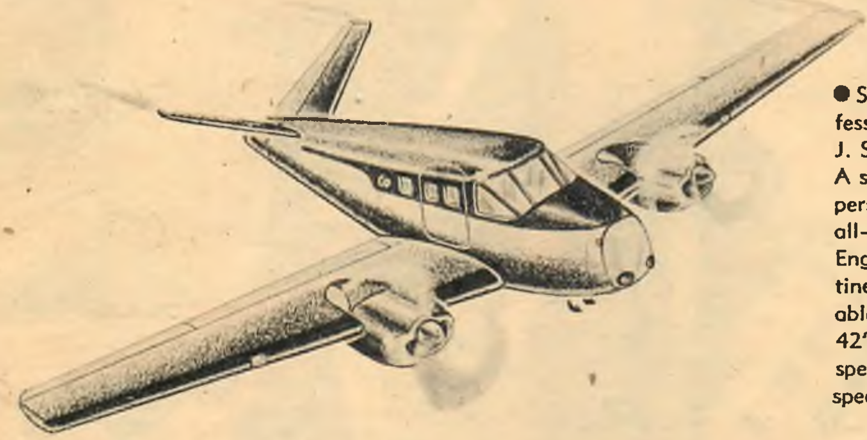
Snaps are right down everybody's alley! They're so much fun to see... to save! And so much fun to take... with Kodak Verichrome Film! For it makes picture-taking easy as pie. You press the button... it does the rest. Eastman Kodak Company, Rochester 4. N.Y.

Kodak Film

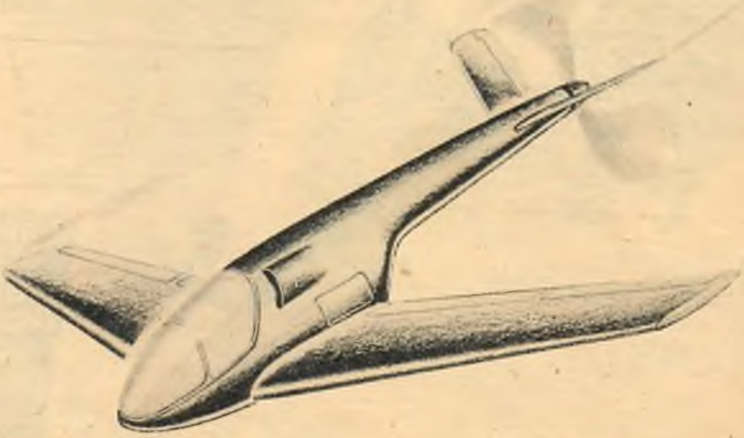
...the film in the familiar yellow box

Airmen of Vision
DESIGN COMPETITION

● First prize (amateur entry) a high performance sailplane by Wally Wiberg of Dallas, Texas. Wiberg, an expert soaring pilot, has some definite ideas on what a soaring plane should be like. Wing span is 44', wing area 108 sq. ft., aspect ratio 18, glide angle 30:1, cruising speed 65 mph., weight 450 lbs., maximum diving speed, 150 mph.



● Second prize winner (professional entry) by Walter J. Stannus of Bluffton, Ohio. A seven-place executive and personal transport featuring all-metal geodetic structure. Engines are two 90-hp Continentals equipped with variable pitch propellers. Span 42' 5", length 29' 3", top speed 166 mph, stalling speed approximately 56 mph.



● A very interesting all-metal personal plane design by Carlton A. Spalding of Safford, Ariz., featuring a rear driven propeller. Though the idea is not new, this type of aircraft presents good possibilities in efficient airplanes. Spalding's fuselage configuration presents small drag coefficient. Estimated speed with 90 hp, 155 mph.

[See Rules on Page 84]

Model of the Month

PIPER CUB

PREFABRICATION APPLIED TO CONTROL-LINE SCALE IS A FEATURE OF THIS MONOGRAM "SPECIAL" KIT

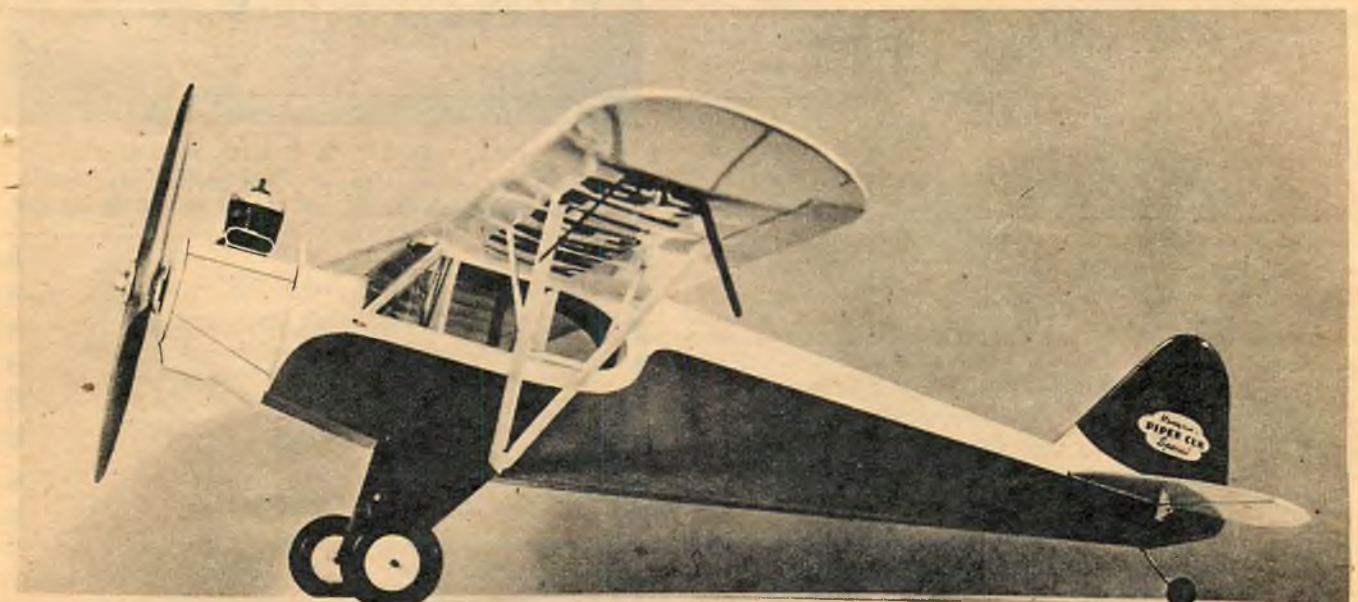
ONE of the brighter aspects of post-war kit manufacturing is the continual refinement and development of control-line kits brought about by a combination of keen competition among the manufacturers and a consumer demand for quality at reasonable prices. Whereas free-flight national records show that many old established kits like Sailplanes, Pacers, and Buzzard Bombshells remain as popular as ever, many new control-line kit designs are making their mark in the model world, and among them is the Monogram Piper Cub Special, a prefabricated scale stunt job selling at $4.95. With a wing span of 35¼ inches, this kit was designed around engines of .19 to .49 cubic inch displacement.

When you open many of these new control-line kits for the first time you find yourself wondering how much further the manufacturers can go in ingenuity both in kit design and packaging. One has a feeling of guilt in spoiling such a kit by putting it together.

"In this business," president Jack Besser of Monogram explains in answer to a question about their selection of the Piper Cub as a kit, "new models rather frequently are more than a thought or a desire—they are a necessity. Timing also is most important. Last September we were already considering new items for May or June appearance. Our personal surveys, as well as market trends, indicated to us early as January of 1947 that control-line flying would be highlighted by stunt, precision, and sport flying. Contests and general flying activity throughout the spring and summer season showed a great increase in stunt and precision flying."

How hep the manufacturers must be to trends is evident, for it wasn't until the Nationals late in the summer of 1947 that people generally tumbled to the trend in stunt, precision, and sport. It wasn't until early in 1948 that this trend became visible in the far corners of the country. Besser and associates also had noticed a phenomenon that has had observers scratching their heads: whenever a scale model was flown interest was more than just ordinary—it was tremendous! Even contestants, reluctant to try scale themselves, flocked around whenever a more (*Turn to page 71*)

● A good looking, light and rugged, easily built model is the product of Monogram's new prefabricated Piper Cub Special kit.



ALL NEW!

And A Winner Too—

The BALL BEARING

DRONE DIESEL

Again and again the Drone Diesel Engine has won contest after contest, — competing against engines of all prices, sizes, classes and displacement!

Now the new Ball Bearing Drone Diesel has proven itself to be even more superior than its predecessor by walking off with top honors in the World's greatest contests winning these places . . .

INTERNATIONALS

1st — Junior Stunt Event	(Combined Engine Classes)
2nd — Junior Stunt Event	" " "
5th — Open Stunt Event	" " "
5th — Senior Stunt Event	" " "
6th — Open Stunt Event	" " "

NATIONALS

2nd — Open Class B	Precision Event
2nd — Junior Class B	Precision
2nd — Novelty Event	(Combined Engine Classes)
3rd — Novelty Event	" " "
5th — Radio Control	" " "

What's the secret of the Drone Diesel's Success?

Its ruggedness, easy starting, and reliability can easily be seen, but performance in the air requires constant power. A good driver doesn't climb up a steep hill in 3rd gear, real planes climb in low pitch, but a model has no variable power to gearing which can be used under such conditions.

Here is where the Drone Diesel really performs, — Drone Diesel, the modern power plant supplies this tremendous unvarying power constantly, under all load conditions incurred during violent flight maneuvers, — making it **tops** in stunt and sport flying.

Only **$14.95**

At Dealers Everywhere

JR. INTERNATIONAL STUNT CHAMP!

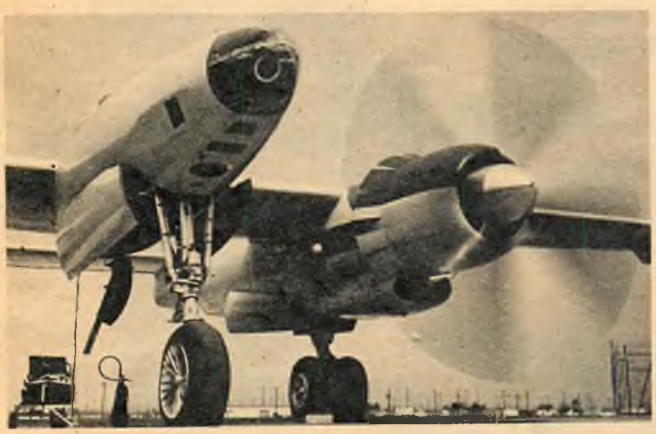
Clifford Schaible, 15 years old, of Roselle Park, New Jersey won the highly contested event, flying a Secret Weapon Kit, using Drone Diesel Fuel, and the Drone Prop.

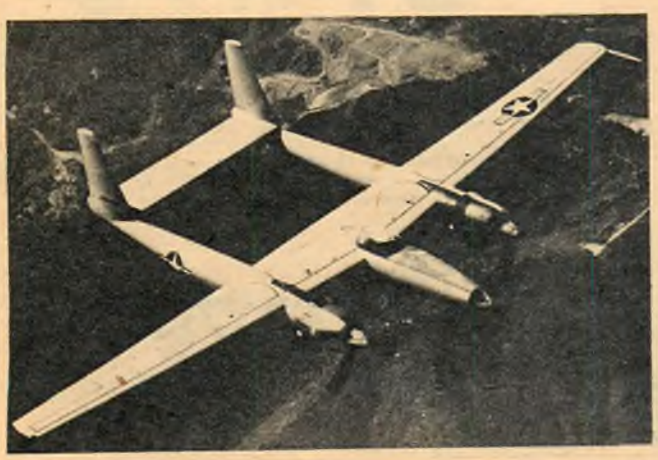
Here's proof that Drone Diesel Engines, Fuel, Kits, and Propellers have the winning punch necessary when competition is keenest!

Don't moan, buy a Drone!

DRONE ENGINEERING, INC.
851 ANNA STREET, ELIZABETH, N. J.

THIS sleek, twin-engine, twin-boom airplane, especially designed for photo-reconnaissance work, is a product of Hughes Aircraft Corp., Culver City, Calif., and was pretty much of a hush-hush project for a while. It burst into the limelight when its prototype, equipped with eight-bladed contra-rotating propellers, crashed during one of the trial flights with Howard Hughes acting as test pilot. The accident was due to a sudden reversal of pitch of the rear right propeller unit which imposed such a severe yaw on the airplane that it became uncontrollable. Hughes miraculously escaped death but was laid up in hospital for several months. As a consequence, the second prototype, illustrated here, now undergoing test flights at Wright Field, has conventional, four-bladed, Curtiss electric reversible-pitch propellers. The plane is of all-metal construction with a wing span of 101 ft. 4 in., and a length of 65 ft. 5 in. Weight empty is 37,200 lbs., gross weight 47,500 lbs. It is powered by two Pratt & Whitney R-4360-37, 28-cylinder engines developing in excess of 3000 hp at take-off. Maximum speed is in the neighborhood of 425 mph, service ceiling is 44,000 feet, and range is 5000 miles. An interesting feature of the XF-11 are the spoiler ailerons like the ones used on the Northrop P-61. This permits use of full span flaps on the wing with the result that the plane stalls at only 80 mph. The XF-11 carries a crew of two, seated side-by-side in a pressurized cockpit, second member acting as co-pilot, camera operator, and navigator. The slim fuselage nacelle houses up to eight aerial cameras which can be operated either from the plexiglas nose or the cockpit.





PIPER CUB SPECIAL

(*Continued from page 68*)

ambitious modeler brought out one of these realistic airplanes.

"Scale models have appeal," Besser tells you. "We asked ourselves why more weren't flown." To this question there are as many answers as there are experts. But in Monogram's book there are only two that hold water. First, such models were generally too difficult to build and, secondly, were usually fragile—not able to take the beating which is part and parcel of control-line flying. The solution, reasoned Monogram's ace designer, Bob Reder, was a prefabricated kit based on a design that would be rugged, sturdy, easy to handle in the air and accurately patterned after some extremely popular lightplane. Monogram decided that the Piper Cub was, perhaps, the best known lightplane and that the latest in the series, the Special, was most readily adaptable because of the completely cowled-in nose. Piper was contacted for accurate data for the development of an authentic model.

It is easy enough to term a kit "prefabricated," but to really prefabricate a scale stunt job—particularly because of its large wing—is a tall order. Many builders' difficulties in making a fuselage or a wing have been apparent as long as model airplanes have been a hobby. These problems had to be licked. In the case of the fuselage the answer was completely finished balsa sides, finished formers, and finally—to locate these formers and make building easy—the use of accurately cut slots in the inner face of the slab sides. This feature has been turned into an excellent sales point by packaging the fuselage with two formers and the sides temporarily in place, held together by rubber bands.

The wing was a much greater problem. Because it had to be light in weight for good performance it seemed that a built-up wing with spars, leading and trailing edges, ribs, and tissue covering was the only way out. But such a wing is difficult to build for some and takes too much time in a prefabricated kit.

After burning much midnight oil in trial and error experimentation, Reder and assistant Syl Wisniewski came up with what Monogram considers a revolutionary idea in wing construction. This consists of an accurately machined, hollow, light-weight balsa wing with spars, edges, and top planking built in as a unit. Each half of the wing, left and right panel, is a milled chord-wide slab of balsa with wood being left to form spars and edges. The lower surface is formed by gluing on fourteen "ribs" as supports for tissue covering, which is then water sprayed and doped. While it is true that some built-up construction is employed in the wing the production design is so

skillful that one doubts if this wing would take longer to build than the usual precut and formed wing panels found in speed and sport kits of good quality.

With this one small, grudging compromise with built-up construction in a kit where one would expect an almost entirely built-up design, Monogram was able to make the remaining parts completely finished. Tail pieces are accurately cut out, cowling parts already shaped, struts streamlined, and all metal parts and fittings bent to shape. Screws, nuts, washers, and the like are furnished. Celluloid windows and windshield are die-cut to proper shape. Drawn by Wisniewski, the plans are remarkable for their clear construction steps. An interesting sidelight is that the high degree of prefabrication makes a plan that is nearly all assembly illustrations with nothing of the conventional being necessary except a full-size side view.

Although this is a high-wing job, smart designing resulted in control-line leads that run through the wing. This was accomplished by the use of a pre-formed metal control horn which attaches well out on the wing. This horn pivots like the conventional bellcrank, and is connected to the bellcrank by a push rod inside the wing. The control horn on the wing looks like an inverted U, with the ends of the U extending down from the wing to take the lines. The usual bellcrank is mounted inside the fuselage at the top. In print this may sound complicated but actually it is simple. The arrangement prevents external wires and guide from becoming an eyesore.

Behind the design and development of the Monogram Cub is the team of Reder, vice-president and treasurer, and Wisniewski, the chief designer for the firm. Bob Reder spent twelve years with one of the largest model concerns in various capacities, winding up as chief of design and research with a sizable staff under him. Jack Besser himself spent eight years with the same company, finally as their sales manager. Wisniewski had worked under Reder. When Besser came out of the Army he and Reder decided to go into business in the field they knew best. Wisniewski joined the firm when he got out of service in June, 1946.

Besser and Reder were firm believers in the mass market based on a policy of models that are easy to build and fly so that more people could enjoy the sport. Prefabrication was the answer and by now the young firm has piled up an excellent reputation for its prefabricated products.

The Senior Whirlwind control kit was one of the first to be prefabricated. The Junior Whirlwind won laurels in the lower priced market as a finished kit. Monogram's Hot-Shot was an outstanding CO_2 jet racer, and the prefabricated Terra-Jet, Midjet, and Mono-Jet made their marks. Both the Prowler and Pirate contest rubber-powered models feature completely shaped fuselage sides with other parts finished or cut out. The Junior Whirlwind, Prowler, and Pirate have held a number of records.

As we go to press, the Monogram boys are sufficiently pleased with the debut of their Cub to uncross their fingers.

HERE COME THE MIDGET JETS

(Continued from page 24)

speeds than those in vogue today. Such a step-up would entail new designs for aircraft. Why more speed? Because these engines will not prove efficient at, say, 150-mph air speed. Here's why. Although the small turbine may prove exceedingly efficient, at 150 mph the jet type produces only about 60 hp. At 375 mph, 150 hp would be produced (150 pounds thrust). I do not suggest small planes soon will be screaming along the airways at 375 mph. This does suggest, however, a possible trend. Before Joe Doaks pushes a swifter counterpart of a Cub around at 300-plus, it's more than likely he will be reading of such engines powering missiles and glide bombs.

The Model 502 will likely find application in aircraft ahead of its smaller turbojet predecessor, for the reason that the propeller version is definitely superior in efficiency, especially at lower speeds. Too, this adaptation is easier and less costly to build, and better suited to mass production.

For reliability, it is proposed that two 502's be provided for such large planes as the Stratocruiser, each with sufficient capacity to satisfy the entire aircraft's normal and emergency electrical load, the entire cabin fresh air requirement, one-half the entire plane's maximum heating and cooling load, and one-half the maximum heat available for thermal surface icing. Each unit would be located in the outboard lower nacelle fairing, behind the firewall, and accessible through a large hinged door. Employed either as a prime mover or an accessory power unit, the combustion turbine burns the same fuel as the plane's main power plants, and therefore requires no added tank installations.

Light weight of these installations argues potently for their widespread use, cost and reliability permitting. When you remember they weigh less than one pound per horsepower produced, you know the engineers are approaching the ultimate in weight efficiency. That's a dream long held by such daring designers as Bill Stout.

In designing the 500 and the 502 Boeing undertook not only critical research into designs of various components, but basic studies of metals and methods of fabrication as well.

The two gas turbine projects are not ends in themselves. They have been wholly financed and developed to satisfy the need felt by Boeing engineers for more complete data on future power plants. Reasoning behind the turbine project was the fact that the aircraft business progressively gets more and more complex each year. An airplane such as the B-29 took almost five years to develop. If a wrong decision had been made anywhere along this period of development, the Superfortress could not have been the great airplane it is. Doubtless future airplanes will be even more expensive to develop and will need more time to prove. Here again, a wrong choice dictated by lack of sufficient knowledge on power plants or design of airframe or manufacturing technique may erase years of development.

Much research and practical testing remain to be done in the turbine field. Boeing, through its extensive propulsion facilities is embarking on further studies into all types of propulsion. This will enable its design staffs to have on hand the best and most complete knowledge possible before starting preliminary studies on future aircraft.

One dare not predict with certainty a glowing future for the minijets. It is sufficient to say, they promise great things. The proof of the pudding will lie in their performance, reliability-wise, performance-wise and economy-wise.

VAGABOND LOVER

(Continued from page 29)

Piper has sold more airplanes—perhaps 30,000 in all—than any other commercial producer. That proves his point.

You recognize the new Vagabond instantly as a branch of the Cub family; however, it resembles the rest of the tribe as a new-born albino goat resembles the rest of the litter of normal goats. It has the same general lines. But, with its clipped wing, stubby fuselage, unbraced wide and flattened struts, it is quite radical.

For the last two decades, the notion that a two-place high-wing monoplane, especially the low-powered type, must have a 35- or a 36-foot wing span has persisted. At least 90 to 95 percent of all high-wing light monoplanes built in 18 or 20 years have had a 35- or 36-foot span, regardless of horsepower. The PA-15 is definitely a new plane, with a definite aim, explains Piper's domestic sales manager.

"It is aimed at the market that has not been too well taken care of in the past—the personal plane market, the partnership and club market, the airport rental market," he said. "It's the ideal plane for the flying salesman who wants most for his money, economical transportation, with lowest first cost."

And it's definitely not the trainer; in fact, it comes only with one set of controls.

Piper Aircraft currently is producing about 10 Vagabonds daily, has a backlog of orders good for 30 days.

And Piper is beating the bushes for more Vagabond orders. The company feels there's plenty of demand for such a plane. And innumerable jobs that it can do economically. Just a few—pipeline or electric transmission line patrol, business or sales travel, timber cruising, animal census, and others. And a little imagination will bring forth more.

At first you get the idea Piper merely revived his old Cub Coupe. Untrue. There's no similarity—except that both carry two people side-by-side, both are high-wing jobs, both are spacious for passengers with good baggage room.

The Vagabond is much faster, insists Piper, much more economical, its rate of climb is much higher, and it doesn't even have interchangeable parts. However, the Vagabond does have interchangeable parts with J-3 or PA-11 trainers—tail surfaces, ribs, ailerons, for example.

SPECIFICATIONS AND PERFORMANCE

Wing span....................29′ 3⅛″
Length..........................18′ 8″
Height ....71½″
Weight, empty.................623 lbs.
Weight, max. gross...........1,120 lbs.

Top speed....................102 mph
Cruise, 75% of power..........90 mph
Landing speed..................45 mph
Climb ....510 fpm

Engine...Lycoming 65 hp, model 0145B2

Gas capacity...................12 gals.
Gas consumption........3 gals. per hour
Range...........,270 miles with reserve

Baggage........................40 lbs.

Price.....$1,990, FAF, Lock Haven, Pa.

Terms........down $677.20, plus $100.27 monthly for 18 months.

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Page 48—James H. McGovern

WE FLY THE VAGABOND

(*Continued from page 28*)

we wished, one of his pilots would ride around the field to let us see the attitude of the ship during take-off, level flight, the approach, and landing.

Less than six feet high, the Vagabond measures less than 20 feet from its downswept cowled-in nose to the tip of its tail. Not only does the Vagabond break away from the classic Cub lines, it has a short-coupled appearance.

A solid Cub yellow outside, the interior of the roomy cabin is an attractive dark blue. No one could have trouble climbing through that auto-type door. Fine visibility makes the Vagabond easy to taxi and fly and land.

Piper has put real he-man toe brakes on the Vagabond and good brakes they are, too. Due to the extended low position of the legs, you make a conscious effort to depress the toes to actuate the brakes, which virtually eliminates accidental touches so common to brakes when the force is applied from above the pedal, or when the position of the foot is such that the pedal can be moved without braking only with caution. The Vagabond is a pleasure to taxi, and swings around easily when barely moving in response to a touch of the brake.

Instead of the throttle lever by your left hand on the side of the cabin, there is a nice push-pull throttle sticking out from the panel, just in front but slightly off to the left, where it is easily reached with the left hand. Trim is a long handle pivoted close to the floor by your left hand, the end of the handle swinging from a position about hip-high for nose up, all the way down and forward to the floor for nose down. Markings show nose up, down, and nose down, a somewhat confusing wording. Later we found that we needed full down for proper cruising trim, the lever having only slight effect at any more moderate setting.

The tach, airspeed, altimeter, and oil pressure and temperature, are lined up across the panel. To the left of the throttle is the cabin heat button and, to the right of the throttle, the carburetor heat button. Toward the right is the prime. The 12-gallon gas tank is mounted under and behind the panel so that, looking down, you can see the familiar Cub-type gas gage on the front of the tank. A most unusual money-saving feature is the lack of shock cords on the landing gear but our landings, if anything, were smoother than our usual Cub landings. In fact, we would not have suspected the missing shock cord had not the operator mentioned it to us.

By using the standard Cub wheels and tires—which are oversize on the Vagabond—Piper has put a sort of "hidden"

shock absorbing system in those tires. If these tires are inflated to the familiar pressure on the Cubs, the Vagabond is going to ride hard on the ground. Tires should be deflated some. Rather than mention actual pressures, we suggest that anyone interested should write the Piper Sales Department.

The light weight of this ship and the use of oversized tires means that Vagabonds can fly when other ships are grounded due to thaws or muddy fields after rains. During the annual flood at Lock Haven dozens were flown out to a nearby field which was in a sad shape. Vagabonds rolled over the mud with ease. There is a story around Lock Haven about some chap who put double wheels on a Vagabond. The idea is as good as it is startling, for operators can get more flying days out of their airplanes.

With two big men and a full load of gas aboard, the first hop was made in a moderate cross wind by holding the nose down with the wheels firmly on the runway (to prevent a premature take-off which might have been followed by settling in a landing-gear-straining drift). Then the stick was brought back rather quickly to lift the ship off the runway. Already the Vagabond had revealed some of its excellent characteristics.

Although the tail was brought up rather quickly and early during the take-off, there was no feeling of swing due to torque. The tail came up easily in contrast to some types which require well developed biceps for this operation. We know you should not rush getting up the tail, but we feel better when it is up in a wind. The Vagabond does not give you that quick-breaking jump-off feeling you get with the PA-11 on a similar take-off.

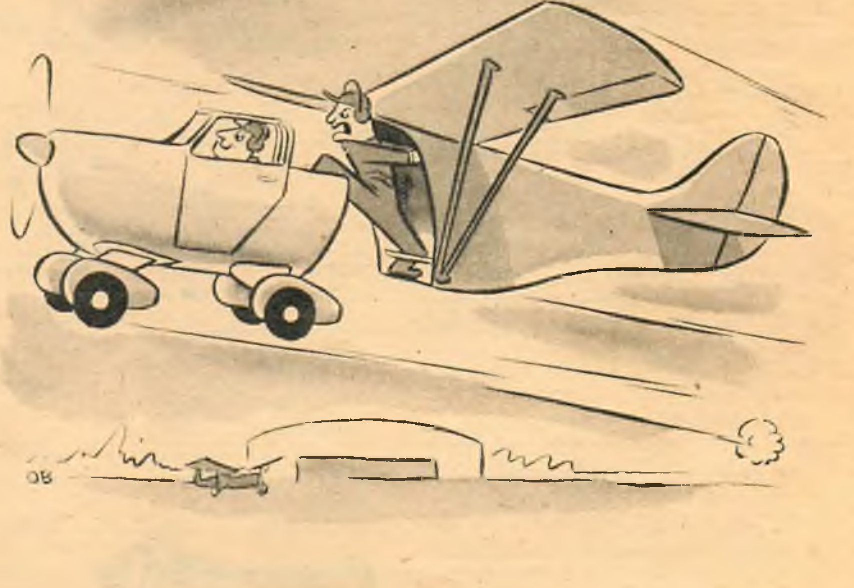
Climbing at the usual 60 mph, the ship seemed a bit on the sluggish side but then, this particular Vagabond was well loaded. Climb is stated to be 550 feet per minute, cruising speed 90 mph, top speed 102 mph, and landing speed 45 mph.

Over the practice area we began to feel out the little ship. Coordination exercises brought out the fact that the Vagabond turns on a dime and can be flown with stick alone—within reason, of course. You can bank the Vagabond fairly steeply with aileron alone, then roll out and into a similar turn in the other direction, still without touching rudder, even when the stick is firmly applied.

The short-coupled look may tempt some people to fool around, pushing it into spins. One operator told us that a Vagabond had spun out the bottom when he attempted a climbing turn with crossed controls. This incident led to a trip to Lock Haven where the ship was further investigated with a company test pilot.

A climbing turn was started at full throttle. Then, as the little ship hung there nose high, the stick was brought over all the way to the opposite side. The nose dropped slightly for the stall but the stick was kept all the way back and over without corrective movement of any kind. The nose came up again, stalled again, dropped, and so on through several cycles. Eventually, we were roller coasting into quick dives, followed by recoveries that almost stood the ship on end. It was finally agreed that the Vagabond could be forced to break loose with crossed controls. We believe the Vagabond is as stable as any other lightplane.

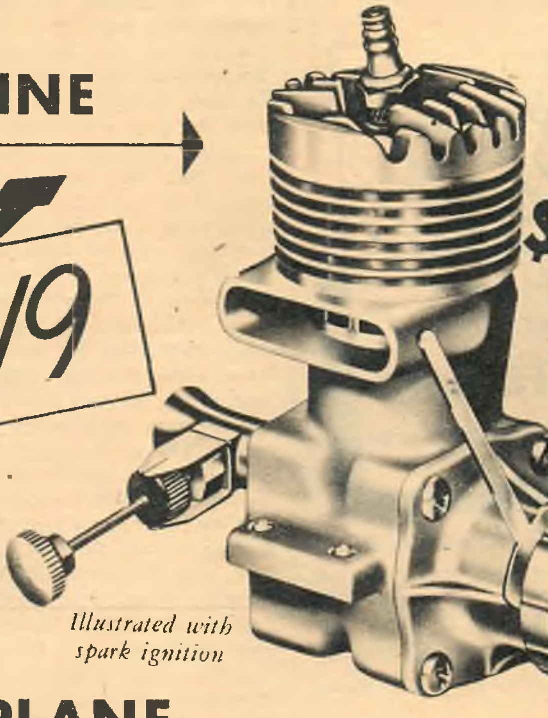
Perhaps it would be well to mention that those mysterious stall spin accidents which account for more than half the fatalities in private flying—which we blame on pilot error—result from those slow, perhaps nose-high turns, both gliding and with power, coupled with bottom rudder to force the ship around, while opposite aileron is being held. The close view of the ground from low altitude gives a false impression that the ship is taking excessively long to come around, hence the abnormal stick and rudder



"Take it easy! I haven't got it hooked yet!"

BEGINNERS

THIS IS YOUR ENGINE



McCOY 19

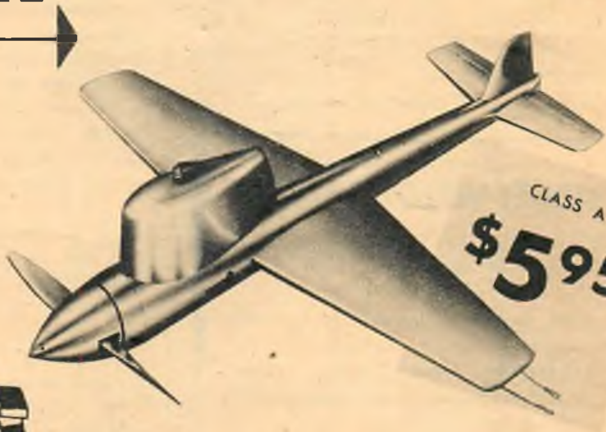
CLASS A $9.95 with "Hot-Point" ignition

$10.95 with spark ignition

It is easy to start and easy to run. It is made with the same care and precision as other McCoy engines. The "19" has aluminum fins, disc rotary valve, ball bearing and chrome plated crankshaft. This engine will handle ships in its class with power to spare. *Every* engine must pass a test run at the factory before being shipped. Buy it with confidence.

Illustrated with spark ignition

THIS IS YOUR AIRPLANE



Invader **ALL-METAL PRE-FAB KIT**

CLASS A $5.95

This Invader airplane is almost ready to fly when you get it. There are just 8 pre-fabricated parts. In a few hours you can assemble and have it in the air. It goes together with 10 screws. No riveting, bending or cutting. Install the "19," put in your fuel tank and propeller . . . and let her fly!

DURO-MATIC PRODUCTS COMPANY
HOLLYWOOD 38, CALIFORNIA

Checkered Flag Line *See them at your hobby store*

MAC AND JIMMY SAY "WRAP UP TWO"

work. In normal flying none of these lightplanes will bite you.

The stalling characteristics of the Vagabond are entirely different from those of any other Piper. With either power off or on, you can get the stick all the way back, and the nose will not drop, but oscillates very slightly up and down. You feel a mild warning buffeting but the stall does not break fully, dropping the nose through the horizon, or even down to the horizon. Seeing that the stall would not develop into a complete stall, we continued holding full back stick until the nose was traveling upward on its fourth oscillation, at which point loss of altitude forced a recovery.

Power stalls at 2,000 rpm were even more interesting. Not only did we sit with stick all the way back, feeling the same mild buffeting without the complete stall developing, but there was a complete absence of any tendencies for the ship to fall off on a wing. Consequently, there was a minimum of "flying" to be done. The solid feeling of the ship approaching the stall suggested some experiments. First we did a power stall without touching aileron during the approach or near the stall. Then we tried one without aileron or holding against torque. We definitely recall doing these stalls on a southerly heading and recovering each time on the same general heading. This ship is so stable that no corrective movements of the controls were needed, even at the stall.

Even in stalls out of the turn with power, the Vagabond did not whip over toward a spin over the top, but merely rolled out of the turn until the wings were level. This sort of thing went on for at least 30 minutes and never once did we effect a complete stall, power on or off, from any flight attitude.

If it seems surprising that a new and different airplane should have such nice initial characteristics, the explanation lies in the fact that the younger Pipers have been playing around for years with clipped-wing Cubs. The boys know plenty about directional stability and other requirements for such airplanes, and this experience was worth its weight in gold in designing the Vagabond.

Except for a slight nose-up tendency in cruising flight, there is remarkably little need for trim control. As gas is consumed, more nose-down trim is required. But trim is about the same as on the Cub, although there is no special force on the stick when you approach a three-point landing.

The approach and landing is a delightful experience in the Vagabond. Visibility over the nose is tops in the what-can-you-see department. This works wonders in making landings easier.

The Vagabond is a fairly clean airplane. We were surprised by having to raise the nose during the early part of the approach to kill off a little speed. Wanting the ship to glide at 60 mph, the Vagabond sailed merrily along at closer to 70. It is a wise idea to trim for glide at the desired speed. Breaking the glide rather close to the runway, the ship was held just off the ground until speed obviously was being lost, then the stick was brought back gradually, and the Vagabond landed itself beautifully. We felt like getting out and patting it on the back.

The Vagabond's flying characteristics remind us a little of an NACA report on experiments conducted with a standard Cub to render it nearly stall-proof (it had to stall for landings) and completely spin-proof. The stall qualities were controlled by the incorporation of downthrust, washout of the wing tips, and less incidence in the wing mounting. It was impossible to stall that modified Cub out of a turn. By limiting the rudder travel, the Cub was made spin-proof, regardless of how badly the pilot manhandled the machine. A characteristic of that plane was a similarity in feel of the stick on both power-on and gliding stalls. While the Vagabond is not stall-proof, it behaves so well that we judge it an airplane that can "forgive" many pilot errors.

It would be a mistake to judge the Vagabond according to the equipment it does not have, or the things it will not do. This airplane is in a class by itself and it will be a sad commentary on private flying if this is not appreciated. There is a market for *the cheapest possible* plane that will enable the average Joe to get into the air for the sport of it. The Vagabond could be the beginning of a trend.

BEGINNER'S GOAT

(*Continued from page 46*)

prop and hot fuel it has hit over 60 mph.

To begin construction, select two pieces of 3/32" sheet balsa, two inches wide, for the fuselage sides. Cut one piece to size and use it as a pattern for the other. The heavy nose block and wing mount block are cut from thick plywood, or soft pine, and are 1¾" wide. Cement the two sides to these pieces after installing the carriage bolt wing stud in the smaller block.

When dry, pinch the tail ends together and tack-cement. Another 3/32" sheet of balsa is laid on for the bottom fuselage covering, then trimmed to shape. Use short bits of scrap cross-wise to cover the sharply curved section near the tail. Install the tail wheel, using a small block of pine to hold the wood screw behind the balsa covering.

The cabin is a light structure, "dummied up" of 1/8" sheet bulkheads and covered with thin cardboard. "Glasswork" is painted on in a light contrasting color. This is durable and easy to assemble.

REMINDER

(Courtesy Mother Nature)

The turn of summer into fall is Nature's most poignant reminder of another year gone by.

It's a reminder that should make you think, seriously, that you yourself are a year closer to the autumn of your own particular life.

What steps have you taken . . . what plan do you have . . . for comfort and security in those later years?

You *can* have a very definite plan—one that's automatic and *sure*.

If you're on a payroll, sign up to buy U. S. Savings Bonds on the Payroll Plan, through regular deductions from your wages or salary.

If you're not on a payroll but have a bank account, get in on the Bond-A-Month Plan for buying Bonds through regular charges to your checking account.

Do this . . . stick to it . . . and every fall will find you richer by even more than you've set aside. For your safe, sure investment in U. S. Savings will pay you back—in ten years—$100 for every $75 you've put in.

AUTOMATIC SAVING IS SURE SAVING—

U.S. SAVINGS BONDS

Contributed by this magazine in co-operation with the Magazine Publishers of America as a public service.

Lay out the tail surfaces on 1/8" sheet balsa; cut out the stabilizer, rudder and elevator. For hinges use cloth strips, or the more durable metal hinges sold especially for this purpose. The rudder has a permanent setting as seen by the plan. Use plenty of cement in attaching it.

Make up a cardboard template of the wing ribs, then cut out 16 pieces of 3/32" sheet, 1" x 5"; stack and pin them together with the pattern and cut to shape. Saw out the spar notches before unstacking to insure good alignment.

Building the wing is very easy. Select a good hard spar, cut it to 32" length and mark it every two inches, allowing a four-inch gap in the center. Working on a flat board cement each rib to the spar, centered on a mark. Next, before the cement has completely "set" true up the ribs by eye, or with a small square. Put on the trailing edge, allow the cement to dry, then install the leading edge. The center section where the bolt hole is to be drilled is beefed up with extra pieces of spar stock. This section of the wing is flush-covered with sheet balsa. Soft blocks of balsa cap the wing tips and are sanded to a smoothly rounded shape.

Do not round off the leading edge spar or cover the front section with balsa sheet. Cover with light Silkspan, the grain running spanwise. The covering should be water-shrunk and clear doped before pigmenting. Pinning the wing to a board during the water-shrinking process will keep warps from developing. No wash-in or wash-out is used.

Along the front edge of the wing, about a quarter inch from the leading edge the front spar will be visible through the covering. This, we claim, is exactly as it should be, and will produce more lift at low speed than the regular sheet covered leading edge.

Because this article was written to help the beginner, we are going to name names and tell you just which products to use for this particular ship. We have found that those we recommend, in the combination specified, give the best results for this ship.

The plane was designed around the Ohlsson & Rice .19 engine. Use it, or the .23 of the same make. A rotary valve unit is not needed, since the standard side-port engine has plenty of pep. You must use the special O&R tank-mount.

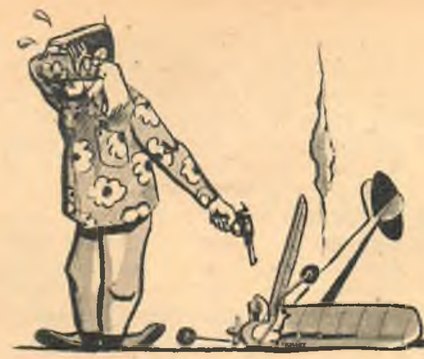
Obtain a 14"-diameter Flo-Torque (low pitch) prop and attach it to the engine in the most convenient cranking position. Hook up the wiring according to the diagram, using red for positive and black wire for negative leads. We recommend the use of the Aerospark Quality coil, together with matched condenser and hi-tension lock lead. Don't fool around with unknown or unmarked coil or paper condensers as these items are subject to failure without warning and are responsible for most of small engine difficulties.

To run in your engine remove the spark plug, turn on the switch and rotate the propeller making certain that a spark

jumps with each revolution. Set the timer as far retarded as it will go without shutting off, then replace the plug. Shut off the switch, put about a half a medicine dropper of fuel in the exhaust port and crank the engine over a dozen times. Now you know it is lubricated. Do not put any gas in the tank. Turn on the switch and flip prop until the engine fires and runs out the prime. Do this a half dozen times until you know just how much head prime is required to start. This is the quickest and best way to start any engine, despite the fact that many people will tell you otherwise. The reason is that a head prime loosens up any thick oil which may be in the engine, and gets fuel into the cylinder with a minimum of flipping. This is particularly true of cold weather operation.

Fill up the tank, open the needle valve four turns, prime and start the engine. It will run slowly and with a great deal of smoke. Turn down the needle valve slowly until the engine runs steadily. Do not run it so rich that it "hammers" and vibrates excessively, but don't try to find out how lean it will run—yet. Do not advance the spark

While the engine is running drop a little castor oil in the intake tube from time to time. Run the engine for a good hour this way, then remove the big prop and install a Mercury 8"D 6"P prop. Start in the regular way. Note that now the engine has a tendency to load up with fuel because the small prop lets it run faster. Turn down the needle valve again



until it runs steadily. After a couple of hours running you can advance the spark a bit. For the fourth hour of the break-in period experiment with the phenomenon called "leaning out." Start the engine up, set the needle valve where it will run steadily, then pull the spark up until you reach a point where advancing it further will result in no increase in speed. Now turn down the needle valve a little at a time. Suddenly the engine will seem to burst into life with a brand new sound and the increased power and speed will be very noticeable. This is the way the engine must sound in the air, but do not run it this way on the ground or block for any length of time.

After four hours the stiffness should be out of your engine and it is ready to mount in the plane. Also, during this time you will have learned how to operate it—and that is just as important as having a plane to put it in.

Take the timer apart and polish the points bright. Follow O&R instructions as to point clearance, but make the clearance too small, rather than too large if you can't hit it right on the nose. The timer of this engine is as good as any on the market, but if it is to operate satisfactorily it requires occasional intelligent attention—the same as any other mechanical device. Stone up the points every four or five hours whether they need it or not and you will never have any starting troubles from this source.

Possibly all this seems like a tedious and involved procedure, but it is not. A careful breaking-in of your engine insures a long and powerful life, and what you will learn while sweating out a break-in is more valuable than a stack of books on the subject.

Wipe up the engine after taking it from the block, spot the mounting holes on the nose of the ship and drill them out. The landing gear is held in place between the tank and firewall, so gouge a Vee to accommodate the heavy wire snugly—don't try to force the gear into the wood by drawing down on the tank bolts. After trying several brands of wheels we found the Phillips Air-Lite 3" dia. wheel fitted the bill. It will take a beating, never needs inflation, yet has great shock-absorbing powers. After a good deal of flying, oil seeps between the hub and tire and a rough landing may knock it off. This can be successfully forestalled by cementing the tires to the

hubs with gasket shellac before they get oily.

Two small screw-eyes under the left wing tip serve as control wire guides. The bend in the control rod puts it outside the ship where it can be checked. The control horn is bent of sheet aluminum and fastened to the elevator with a bolt and nut. The bellcrank is a Veco. Use the short radius for the control rod and hold it in place with a nut soldered on the wing mount stud.

The coil goes in the section between the wing mount and engine block. Solder the wiring to it before installing, then put the coil in place and pack around it with paper dampened with dope. This will hold it firmly and is wonderful crash-insurance. There is ample room to install a good toggle switch and booster terminals on the right hand side of the ship. The battery is of the "Slimjim" type and is secured to the floor with two small bolts and nuts.

The top section of the fuselage is covered in ahead of the wing, the timer and spark plug wire go through this covering an inch apart. Mount the condenser to one of the tank lugs.

Make a trial assembly of the wing to fuselage, and make sure the control system does not bind. If desired, strips of stock can be cemented to the underside of the wing to lock it in place in the fuselage opening. A wing nut holds the whole works together for flying and is much more convenient and neater than the usual greasy rubber bands.

Since this is a class A ship use an AMA specified line length of 42 feet. Shorter lines are not any easier to learn on and limit space in which to correct mistakes. Use any good stranded cable, preferably cadium plated, since it solders fairly well. Wrap all joints. Do not bother with swivels at this point.

If directions have been followed you need not worry about the balance point of the ship, which we have found by actual test may be a half inch on either side of the wing stud without affecting flying qualities. If possible, you will find it of great psychological benefit to have an experienced flyer test-hop your plane in your presence.

Now, fly it yourself.

Start up the engine, but advance the timer only about half way, or to where the engine is running at half speed. With a competent person holding the plane, walk out and pick up the control handle, check to see that "up" is in the right place and signal for release. When the ship starts forward give it most of the "down" control. Note how the lines begin to exert a pull as soon as the tail comes up. Run the ship around on the ground three or four times making no attempt to take off before you get the feel of turning in a circle. Since the motor is not turning up there is little chance of an inadvertant take-off. Next try to make the ship take off in short easy hops of twenty or thirty feet at a time. This should take about all the "up" control there is. In this way you learn to make a take-off without the usual beginner's mistake of flying the ship up to the end of the lines and piling it in.

After a couple of these "bounce-around" flights, advance the timer a trifle to keep the plane in the air better with less "up" control. Do not allow the plane to rise higher than twenty feet until after you have made a half-dozen flights or so. Concentrate upon watching the plane instead of the plane and ground together. This minimizes the chance of becoming dizzy.

When you are quite sure of the control reactions try zooming and diving, then wing-overs and wheel-rolling, this last being excellent for developing a good sense for putting the model where you want it. The Goat is not a stunt ship so don't try to loop or fly inverted.

EXCESS TOO

(*Continued from page 59*)

air which flows around the cylinder head. This has been done to keep the cylinder head temperature as high as possible. If the engine is to be cowled without a separate venting system the exhaust CO_2, being very low in temperature, would then cool the cylinder head. When vented separately, air at atmospheric temperature entering the cowl is not cooled by anything other than the cylinder head.

For maximum streamlining the cartridge holder is completely enclosed within the fuselage. It is also placed so that air going past the cylinder head must flow around the cartridge holder and bottle before being drawn out of the vents under the wing. It has been found that it is definitely better to mount the cartridge holder rigid inside the fuselage than to allow it to flop around supported only by the copper pressure line.

The model itself is very easy to construct, the fuselage being carved from two blocks of approximately 6-lb. per cubic foot balsa wood glued together lightly at the parting line. The outside contours are carved first and then the blocks are separated at the parting line and the inside carved to the thickness shown on the plans. After the two shells are completely carved and sanded inside they are carefully glued together, with the cartridge holder, baffles and formers cemented in place. The wing and tail are simple structures. It is considered that the plans are self-explanatory.

The landing gear is long and spindly due to the size of the propeller in comparison with the size of the airplane. A drop-off gear or dolly should work very well since the model has a tendency to take off and accelerate very rapidly.

Propellers varying from 7″ diameter and 4″ pitch to propellers 8″ in diameter with 8″ pitch have been used. A propeller of 7″ diameter and 8″ pitch seems to give the best all-around performance. It is advisable to use stock gas model propellers of good quality and sand them down to a thin section with a slight amount of under-camber. Much weight can be eliminated and the efficiency increased tremendously. It has also been found that a stock gas model propeller is far too strong and any minor mishap will tend to damage the ship a great deal, whereas a lighter propeller will absorb shock and break, saving the ship.

The model has been flown on lines 15 and 20 feet in length. For maximum speed .003 Tungsten wire is excellent. However, for general sport flying try fine silk thread, preferably white, since it is more visible, durable, and easy to keep in condition. For safety it is advisable to use new lines for each flying session.

For stunting, this model can be easily converted into a biplane by adding a lower wing and increasing the movable elevator area.

AIRMEN OF VISION DESIGN COMPETITION

(*See page 66*)

In response to many requests *Air Trails* has opened its columns to model builders and full scale airplane designers who are interested in presenting simplified plans for aircraft of the future.

There will be no formal rules or regulations governing the competition other than the following:

1. Three-view sketches of the proposed aircraft will be required. These sketches may be of any size convenient for handling except that they must not be less than 8½ by 11 inches for the entire three views.

2. Sketches may be submitted in pencil or as inked drawings. If possible sketches of the complete airplane preferably in three-quarter front and/or rear position should be included.

3. If any entrant wishes he may submit photos of a completed model of his proposed design.

4. Each entry must be accompanied by information concerning the type of power plant(s) utilized, together with estimated performance, dimensions and explanations of any unusual features.

5. Entries will not be returned and for that reason those participating in the competition should make certain that they retain copies of all material sent to this publication.

6. Because of the large number of entries anticipated, the editors cannot enter into correspondence concerning designs submitted.

Designs may be of any type within the realm of reason: commercial aircraft, military planes—both small pursuit craft and large bombers and troop transports, planes for the private flyer and single-place sporting craft.

Entries will be designated as either professional or amateur. A professional entrant is one who earns his or her living or works part time in any of the many places of the full size aircraft business. Amateurs are all others including model builders, private pilots and the individual generally interested in aviation. Each entrant must classify himself. Additional data as to age, occupation or schooling, and aspirations will be welcomed.

The best entry each month will be prepared for publication by recognized aviation illustrators. An award of $25.00 will be presented to the individual whose entry is judged by the editors as the most practical or of the greatest significance. Awards of $5.00 will go to runners-up.

An annual trophy award will be made for the outstanding design of the year.

DOPE CAN

(*Continued from page 43*)

Linen cost for those using the big "bunk room" was a big 35¢! Three Navy meals (the chow was excellent) cost only $1 per day. In all respects the contestants were well treated, well fed, and well supplied with ample timers—all in Navy uniform and all assigned to work at the meet all week long.

The hospitality of Olathe (pronounced Olath-ah) was overwhelming. Even the mayor, H. K. Robinson, was out on the fence-erecting detail, and he proclaimed officially the period of the meet as National Model Airplane Week. Tom Poor, president of the Olathe Chamber of Com-

merce personally placed model meet signs and welcoming banners on all the lamp posts in the friendly little community. Perhaps one reason for the town's knowing how to play such an excellent host is that it is located on the old Sante Fe trail and has been accustomed to welcoming strangers for hundreds of years.

The first big batch of contestants flew in. Ohlsson & Rice's silvery DC-3 landed more than a dozen of the west coast's best builders and more than 100 of their planes the night before registration started.

The flying area was so vast the contest was run off as a series of simultaneous events—each under the direction of an outstanding contest director with a full crew of processors and recorders (AMA leaders members) and with a team of Navy enlisted and commissioned personnel as timers. The timers had been pretrained and knew well one end of a stop watch from another as well as a contestant's tale of woe from the truth.

L. L. ("Cookie") Cooke of Kansas City, Mo., was in charge of all control-line flying—stunt, speed, precision and scale. Tom Wardlaw, also of Kansas City, originally scheduled to handle the free-flight events, had to withdraw after TWA had assigned him to its Constellation school (Tom is a TWA "captain" pilot). His shoes were ably filled by "Red" Hillegas of Cleveland, Ohio, who was drafted into service just a few days before the meet.

Boeing engineer Jim McClelland of Wichita, Kan., contest director for the '46 Nats, handled the indoor events, and "June" Pierce of St. Joseph, Mo., directed the radio-control flying with the able assistance of M. J. "Mike" Thomas of Pittsburgh. Lt. Harry Vogler, USAF, put in an appearance at the meet after many years' absence in the air force, and was promptly assigned the job of handling the rubber-powered flying scale event. Harry worked so hard on this he worked himself right into the Navy hospital, but recovered in time to preside at the presentation of scale awards in the big recreation hall on August 8.

Frank Nekimken of American Legion headquarters in Indianapolis, Ind., acted as contest supervisor. He was ably assisted by Fred Wallace, Kansas Dept. Commander of the Legion, and Edward C. Marshall, commander of the Olathe American Legion Post #153. Val Sherrard, president of the Mid-States Model Aeronautical Association, handled recording and did a magnificent job.

One of the few models in the Pan American Airways payload contest especially designed for that event was the 1st place job built and flown by Herb Kothe of Omaha, Neb. Many of the "PAA-load" event entrants discovered that two "passengers" weighing a total of 1 pound were considerably more than they bargained for. It is our guess that this event will catch on quickly throughout the country if PAA keeps sponsoring a payload event—not only nationally, but on a local, state and regional basis, too.

Has anybody any new ideas on how the myriad events at the Nationals can be combined or simplified? It's impossible for any contestant to get three official, well-planned flights in even half the events. Why doesn't the AMA contest board figure out a system whereby Class A free-flight can compete against Class D—and so on down through the various categories?

As a suggestion, how about a power loading of 80 oz. per cubic inch displacement for A, 95 for B, 110 for C, and 125 for D, permitting all classes to be flown against one another?

Bob Holland, '48 National champ, wonders if Class A (0-.10), B (.10-.20) and C (.20-.30) couldn't be used for free-flight only; classes D (.30-.50) and E (.50-.65) for control-line. As the free-flight jobs get bigger and bigger, transportation and storage becomes a problem. In the speed events, he points out, the bigger ships get the greatest play and seem to be the most popular.

Frank Cummings, '47 National champ, couldn't make the Olathe meet. As we go to press we receive word of a run of bad luck he had at the Plymouth meet in Detroit which culminated in his stepping into a gopher hole while chasing a model thus wrenching a leg badly.

The Model Industry Association held several meetings in Kansas City, but so much was going on at Olathe that only a handful of MIA members were able to

attend. Most of the industry boys were able to get out to the competition; quite a few competed, including Harold deBolt, Anthony Grish, Carl Goldberg, Wally Simmers, Jerry Brofman, Bill Atwood, and Johnny Clemens.

Mr. Atwood continues to display his skilled hand in the indoor field. It is heartening to see a well known engine manufacturer giving a comparatively little known category such a boost by his active support and participation.

Bob Holland who took first in the rise-off-water flying, received considerable attention—or, rather, his models did—from other entrants. Bob's ships were all beautifully constructed and the covering was dyed a brilliant red which enabled timers to keep his ships in sight for a longer period than models not so vividly colored.

One of the most remarkable turnouts in the meet was for the towline glider event. Evidently plenty of modelers are continuing their interest in this event which achieved considerable attention during the war when rubber and motors were hard to get. If the event draws in the future as it did this year it may soon become one of the biggest events in the National picture.

Along the same lines, indoor flying saw some very fine performances in the hand-launched glider categories. Flights of more than a minute were turned in consistently by the top place flyers in an arena which one would expect not suitable for that type of competition.

There were the usual registration, processing and waiting-for-timer lines at the National meet, but these moved along speedily much to the contestants' joy. Flights could be taken quite early in the day if one desired, and more than one contestant was astonished to see Dick Korda completing his third official Powerhouse flight in one gas event before most of them had even requested a first official for the day. Dick is evidently one of those early-to-fly-means-early-to-bed boys.

The Navy painted white the top wings of a TBM dive bomber and lettered an announcement of the meet on each one. The wings were then left in folded position. Each day this plane was towed to the main intersection leading to the field and served as an excellent road sign. Inasmuch as the plane probably cost something close to $115,000, it was obviously the most expensive model meet sign in the history of aeromodeling.

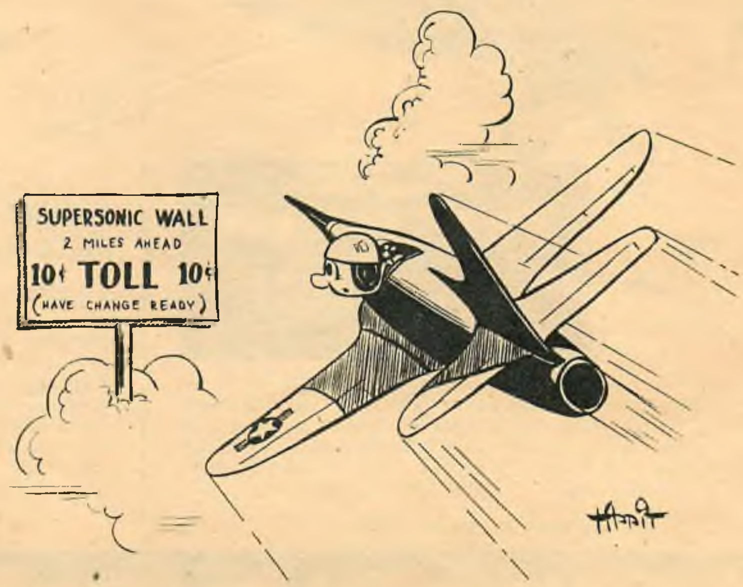
A great deal of the credit for the splendid meet is due the personnel of the U.S. Naval Air Station—without the facilities of the field and the all-out cooperation of the men stationed there, the meet could not have been the success it was.

Probably no National contest has ever boasted the indoor flying facilities that were available at the Municipal auditorium in Kansas City, Mo. Plush lined seats awaited those who tired of heaving indoor gliders around or those who wearied themselves cranking the mammouth indoor motors (one loop of 1/16" T-56 rubber 16" long)!

Jack rabbits abounded on the free-flight field the first day of the outdoor event, but after taking a good, long look at the average bleary-eyed contestant and his "new look" monstrosity in the gas category, the rabbits wisely went underground for the remainder of the contest.

You might well claim that the meet was "out of this world." Take the hydro events, for instance. They were held on a pond right on the air station. Gently sloping banks formed a natural amphitheatre where the spectator could loll at his ease while watching the R.O.W. boys founder around shaking water out of engines and disclaiming responsibility for float designs.

In subsequent issues *Air Trails* will present a complete break-down of the winning models—not only who flew them, but what types of ships won. And during the next 10 months many of the outstanding winners will be presented in plan form. Keep your eyes on *Air Trails* for the parade of winners—the ships that set the model world agog at beautiful Olathe.



15TH NATIONAL SOARING CONTEST

(*Continued from page 27*)

part these events centered around Harris Hill and afforded the spectators a fine view of sailplanes in action.

Another event offered for the first time was the Aerobatic Championship for which $500 in prize money was donated by the local Henry B. Bentley Post, American Legion. The winner was Kim Scribner, master pilot for Pan American Airways. He executed rolls and flew inverted while still in tow and was the only pilot to do the difficult outside loop after releasing from the tow plane.

Total prize fund in money and merchandise distributed to contestants and participants was $12,500—the largest yet—and practically every pilot took home some sort of reward.

The 70 contesting pilots who brought 50 sailplanes to Harris Hill were whisked into the air every day as soon as contest meteorologist Barney Wiggins compiled the daily weather information. His unerring judgment as to where best thermals were to be found and what direction to take in order to obtain best performance, was largely responsible for many of the very good flights made by the contestants.

Although from standpoint of soaring, the weather was far from sensational, thermal conditions were sufficiently good to carry sailplanes with fairly heavy wing loadings to distances of more than 150 miles. The best flight of the meet was made by Paul MacCready, Jr., of New Haven, Conn. Piloting his Polish built, red and white Orlik sailplane, MacCready landed at Middlefield, Ohio—222 miles from Harris Hill. This was the first long distance flight into the West made from Elmira. Earlier, MacCready made a "goal" flight of 167 miles to Trenton, N. J., to win the prize of $250 offered by Michael Stroukoff, President of Chase Aircraft Corp.

MacCready, through his clever flying, then advanced from second to first place, which was held in the beginning by the veteran soaring pilot John Robinson, three times National soaring champion. MacCready cinched the championship with his flight to Ohio, piling up all his points on the first five flights, not one of them being under 140 miles. Next best flight in distance was made by Robinson who soared 178 miles to New Midway, Md., in the famous Air-100 sailplane (Feb. 1948, *Air Trails*) lent to him by the French Embassy. Don Pollard of Roanoke, Va., reached Altoona, Pa., 142 miles from Elmira, taking third place on his points. Other notable flights were made by Eastern Airlines captain Fritz Compton of Miami—163 miles; Ray Parker of Twenty Nine Palms, Calif.—146 miles; Bill Coverdale of Chat-

tanooga, Tenn.—143 miles; and Steve Bennis of Sanford, Fla.—128 miles.

Despite the fact that Harris Hill is a one-way field, with a runway less than 2,000 feet in length, five tow planes relegated to the task of launching sailplanes did a fast and efficient job of towing. On one occasion, 39 gliders were sent on their way in one hour. The smooth operation drew high praise from the Swiss, French, British, Hindu and other foreign observers who viewed the contest.

Considerable interest was shown by the spectators as well as pilots in the daily Air Force show during which a CG-15 cargo glider was snatched from the ground by a C-47 transport. Upon release, the heavy glider went through a series of aerobatics, which drew gasps from the crowd and officials, ending with a spot landing back on Harris Hill. Another daily spectator event which attracted wide attention was a parachute jump by Dick Ward from a two place Pratt-Read glider flown by Richard McGrath of Elmira. Air-to-ground radio broadcasts through loud speaker system, from both Air Force glider and the Pratt-Read furnished additional interest.

Majority of participating sailplanes were the familiar surplus machines, so popular since the war: Laister-Kauffmanns, Schweizer TG-2s and TG-3s, and Pratt-Reads, some of them dolled up for better performance. The non-military types included two Minimoas, one owned by William Coverdale and the other by Lyle Maxey and Charles Kohls of Detroit. Others included John Robinson's Ross-Stephens Zanonia, MacCready's Orlik, a Kirby Kite flown by Steve Bennis, the Kirby Gull piloted by Emil Lehecka of New York City, Richard Comey's Schweizer 1-21, the Screamin' Weiner entered and flown by Wally Weiberg of Dallas, Texas, Bill Bowmar's Rigid Midget flown by Ray Parker (in which he won fourth place) and the two newcomers, an all-metal Schweizer SGS-1-23 owned and flown by William Frutchy of Elmira, and the Tiny Mite flown by Dick Johnson of California.

The SGS-1-23 at first glance is reminiscent of the 1-21. However, this newer ship was designed and built especially to take advantage of weak thermals. It has a considerably lighter wing loading than the 1-21 and a stalling speed of only 31 mph, 10 miles below that of the 1-21. The sailplane is all-metal, even to the control surfaces and is practically immune to deterioration due to weather. The wing has a straight planform to about 50% of the span and is tapered from there to the tips. Schweizer took three weeks to build it and the organization feels that it can market the sailplane at a reasonable figure. On the other hand, Tiny Mite, lives up to its monicker. It's a very small all-wood sailplane having only 84 sq. ft. wing area. It was designed for fast cross-country flights under strong thermal conditions. Inasmuch as the ship weighs fully loaded 630 lbs. and has a wing loading of 7.4 lbs. sq. ft. (considered very high for sailplanes), Fowler

flaps had to be incorporated in order to enable the sailplane to make small diameter turns. Unfortunately Elmira thermals were too weak for the Tiny Mite, and this interesting design had little chance to show its worth. Another interesting sailplane was a Laister-Kauffmann flown by Eugene Miller of Miami, Fla., and Kempes Trager of Detroit, Mich. Miller went to the extreme in streamlining and lightening the ship by cutting off the turtle deck, sealing the glider entirely against air leaks and equipping the cockpit with a bubble canopy similar to P-80s. The revamped LK stalled 12 mph below its stock sister and had a considerably better glide angle and greatly reduced sinking speed.

Evenings at Harris Hill were devoted mostly to the favorite sport of all pilots—hangar flying. Suppers were served by various Elmira civic and social organizations. By far the most important meeting was that of the Institute of the Aeronautical Sciences attended by such luminaries as T. P. Wright, former Administrator of the Civil Aeronautics Administration, S. Paul Johnson, Director of the Institute, and Roland Rohlfs of first Region CAA, in charge of Personal Flying. Papers were presented by Dr. August Raspet, Director of Research, Soaring Society of America, Dr. Alexander Lippisch, famous German aerodynamicist, Robert Kidder of Cornell University Research Laboratories and others.

On Saturday, the day before the closing of the meet, a special speed event was held. Prizes were donated by Beech Aircraft Corporation for the fastest flight from Harris Hill to Norwich, N. Y. First place in this dash was won by Lyle Maxey flying a Minimoa sailplane; Paul MacCready took second and Fritz Sebek of Homestead, Fla., flying his special LK-10A, placed third.

The final day was devoted to ground activities on the hill. No contest flights were scheduled in order that statisticians and judges could add up scores and determine the winners of the different events in preparation for the awards banquet held that night.

Principal speakers at the banquet, traditionally held at Elmira's Mark Twain hotel, were Maj. Gen. Robert Webster, Commanding General of the First Air Force; Maj. Gen. William D. Old, Commanding General, Ninth Air Force; Admiral A. M. Pride, Chief, Naval Bureau of Aeronautics; Capt. Ralph S. Barnaby, USN Retired; E. J. Reeves, who was elected a second time as president of the Soaring Society of America (the sanctioning organization for the meet); as well as dignitaries of the City of Elmira.

For amassing the greatest number of points during the contest, Paul MacCready, Jr., was crowned National Soaring Champion and awarded the Richard C. duPont Memorial Trophy. MacCready collected in the neighborhood of $1,500 of which $410 was point award money and the rest cash prizes for different outstanding flights—for example, $500 donated by Bendix for longest distance flight and $200 for second fastest flight to Norwich.

Francis B. Compton was awarded the Warren E. Eaton Memorial Trophy for his outstanding work in simplifying and arranging the contest rules. The Lewin B. Barringer Memorial Trophy for the best distance flight of the year made from automobile tow was won by Don Pollard who in September 1947 flew from Elmira to Asbury Park, N. J. The Douglas Aircraft Company Trophy for the championship soaring club was presented to the Philadelphia, Pa., Glider Council.

The Northrop Aircraft Co. Youth Award of $100, awarded for the top altitude performance by a pilot under 21, was captured by 17-year-old Richard McPherson of Elmira, N. Y.

One of the two prizes donated by *Air Trails*, each consisting of a 350-ft. nylon air tow rope, was awarded to the best team. This team consisted of Richard J. Comey, former National Soaring Champion and Frank Hurtt, who between them shared Comey's Schweizer 1-21 sailplane. The other *Air Trails* award went to John Robinson for making the most flights.

The Sperry Gyroscope prize, an Altitude Indicator, valued at $577, went to Fritz Sebek for the best altitude reached during the meet. A number of additional prizes were given out during the banquet.

MODEL AERO CLUB DIRECTORY

(*Continued from page 63*)

MISSOURI (Cont'd)

St Louis Buzz Bombers—Hugh Pickering 5563 Hebert
St Louis MA—G A Winn 8027 Wynnwood
St Louis FSOTC—W L Kincheloe 7439 Wayne Av
Springfield Hot Rods—Jim Stewart 1725 Kimbrough
Springfield MAC—R W Voss 829 S Weller
University City-Airs—W L Kincheloe 7439 Wayne Av

MONTANA

Anaconda MA—R S Carroll Bx 1000
Billings Balsa Butchers—Vic Bedinger 610 N 24th
Bozeman GMC—R L Bradford 135 W Mendenhall

NEBRASKA

Bassett Aero-Loops—Bob McCullough Bx 403
Boys Town Hell Cats—E Henkel
Omaha Model Pilots Assoc—Fred Keep 111½ N 40th
Omaha Model Gremlins—Edward Corbin 6120 Grant
Omaha Thermal Chasers—Jack Fleuhr 6223 Pierce
Scottsbluff Torque C—1322 8th Av
Sidney NEFU C—John Foster 1124 5th Av
Springview Earliott Modelers—Meade Hallock Bx 84

NEVADA

Las Vegas Aveites—M R McNee 628 S 5th
Reno Sagehoppers—R A Singleton U of N Sta

NEW YORK CITY

Astoria LI Queens Aero Assn—J Kiernan 37-18 31st Av
Bellaire LI Thermal Thumbers—Nicholas Haschak 93-59 Francis Louis Blvd
Bronx Balsa Hackers—M Potosky 1841 Marmion Av
Bronx AC—August Thode 2702 Bailey Av
Bronx Aeroneers—H O James 967 Trinity Av
Bronx Metcalf—Tully Adler 1435 Edw L Grant Hwy
Bronx Model Knights—A Hasselback 3087 3rd Av
Brooklyn Airfoilers—Steve Carner 585 E 16th
Brooklyn Avions—L Blumenkranz 2332 E 22nd
Brooklyn Bay Ridge AC—J R Maieli 260 91st
Brooklyn MA—Arthur Aronstein 1924 Homecrest Av
Brooklyn Playboys—R Bartholomew 33 Norwood Av
Brooklyn Record Wreckers—William Templin 680 E 49th
Brooklyn Sky Lancers—Edward Luca 199 Bay 17th
Brooklyn Skyscrapers—Tobias Feuer 915 43rd
Brooklyn Cloudbreakers—Bernard Asher 2052 62nd
Brooklyn Aero Bats—Alex Ostapshuk 92 Boerum
Brooklyn Highland Pk Unit CAP—H H Rice 2975 Fulton
Brooklyn Mercury Mites—A C Cacaro 1592 Lincoln Pl
Brooklyn TAMBE—Charles Lynn 87 Ft Greene Pl
Brooklyn Thermaleers—M Josephson 220 Highland Blvd
Brooklyn Model Craftsmen—S November 593 Lenox Rd
Corona Vanguard AC—Paul Katerges 99-20 41st Av
Elmhurst Prop Spinners—W H Fletcher 8708 Grand Av
Flushing Cloud Hoppers—45-77 160th
Flushing Cloudhoppers MAC—W C Kimbell 36-14 165th
Glendale LI Gashoppers—J J Eden 65-23 80th Av
Jackson Hts Cloud Chasers—R Laderman 80-38 Baxter Av
Jamaica Idlewild GMAC—H B Nelson 144-30 159th
Jamaica Air Birds—Joe Powers 109-27 130th
Jamaica Thermalites—Don Edmonds 172-10 111th Av
Long Island City Air Screws—D Mass 2512 Steinway
Long Island Bonac Buzzards—J R Riley East Hampton
N Y Aeroneers—H O James 967 Trinity Av Bx 56
N Y Gas Birds—George Kern 210 E 85th
N Y Haze Hackers—J Sirabella 3939 White Plains Rd
N Y Piston Pushers—Emilio Pesante 633 W 171st
N Y Aeronuts—B B Schoenfeld 11 Cornelia
N Y Queens GMC—T R Pulliam 8718 110th
N Y City Star Chasers—W C Burlingame 1006 Columbus Av
N Y Modeleers—M E Libby 122-03 142nd Pl South Ozone Pk
S Ozone Pk LI Mallards—G W Meserole 132-45 142nd
Queens Village Thermal Thumbers—G F Harkins 88-21 208th
Richmond Hill Z-Z MC—Tex Foster 105-14 Jamaica Av
Rockaway Beach Model Mashers—B H Waag 430 Beach 130th
Far Rockaway Modelairs—F Babbit 143 Beach 32nd
Staten Island Eaglets—W R Anderson 106 Merserean Av
Staten Island Victory Controliners—Wally Wright 237 Richmond Av
Whitestone Cloud Haunters—Mary Lutz 146-37 22nd Av

NEW YORK STATE

Albany Flying Squadron—Anthony Chiboucas 40 High
Albany Modelairs—E F Hyde 11 Central Av
Belleville Model Craftsmen—P M Chewey 178 Malone Av
Bemus Point Model Aeronauts—Clayton Thomas Rt 1
Binghamton Aeros—Herb Menish 1 Kendall Av
Binghamton Balsa Bugs—C L Boughter 1 Asbury Court
Buffalo Miniature AE—Norris Maltby 95 Marlmont Av
Buffalo Prop Twisters—D A Goodwin 150 Jewett Pky
Corning Aero C—H M Nixon 42 Ontario
Dunkirk Center Flyers—33 Wright
E Hampton Bonac Buzzards—Charles Smith Sherill Rd
Freeport Sky Chiefs—B K Bull 41 Church
Garden City LIPGC—Harry Moore 134 Newmarket Rd
Gloversville Control Bats—R E Hathaway 47 Pearl
Great Neck Buzz Bums—Fred Vander Schmidt 79 Berkshire Rd
Hempstead Sky Lancers—D Yulke Mildred & Stanton
Hempstead LI Screamin Demons—T R Tourt 14 Frazier
Hudson Blue Anchor MC—C L Wollsloyer 521 State
Islip Flying Kiwies—J A Wilson 33 Maddox Av
Johnson City Aeroneers—F E Rowe 21 Main
Kenmore Flying Bisons—Michael Jordan 21 Grosvenor Rd
Lockport MAC—N E Hare 34 Park Pl
Long Beach MAC—A B Landau 42 Pennsylvania Av
Mineola Sky Kings—Harvey Knopf 120 Washington Av
Mt Vernon Aeronuts—A A Tiso 123 4th Av
New Lebanon Aeronauts—J W M Clark Darrow School
Niagara Falls Prop Spinners—H B Morgan 9017 S Military Rd
Olean MAC—B K Koeppel Bx 216
Olean Prop Busters—Wilson & Diffenderfer 412 S 3rd
Oriskany Hell Razors—Charles Nelson 123 Oklahoma
Oswego Thermal Snoopers—Bill O'Brian 208 E 9th
Patchogue Air-O-Neers—S J Bloch 156 W Main
Peekskill Prop Spinners—Sanford Hohauser Peekskill Military Acad
Poughkeepsie Eagles—R L Kaplan 138 S Hamilton
Poughkeepsie GMA—D F Johnson 11 Mildred Av
Poughkeepsie MC—Henry Sautter Violet Av Rt 33
Rockville Center Prop Nuts—Frank Leung 19 S Village Av
Rosendale Gas Monkeys—Danny Logue 241-20 145th
Saratoga Springs Pyloneers—John Morrissey 81 Nelson Av
Schenectady Aeroneers—Raymond Voigt 202 Jackson Av
Sea Cliff Prop Splitters—H A McLaughlin 208 Littleworth La
Syracuse Controliners—John O'Dwyer 118 Gordon Av
Syracuse MAC—Jim Matthews 227 Norwood Av
N Tarrytown Gas M—John Flanagan 161 Beekman Av
Watertown AM—J D Morrow 418 Holcomb
Wayne County Red Creek C—L W Caster
Co A-1 West Point MAC—Don Kavanagh
White Plains MA—T A Herbert 259 Mamaroneck Av
Williamsville MAE—Harold deBolt 52 Hirschfield Dr

NEW HAMPSHIRE

Nashua Cloud Chasers—P A Mercier 2 Fowell Av
Portsmouth M Maniacs—D M Knickle 149 Deer

NEW JERSEY

Atlantic City Sky Blazers—Joe Bligh 134 N Missouri Av
Atlantic City Cloud Chasers—J Siegfried 220 N Maine Av
Avon Stratosphere Roamers—R Stier 141 Summit Av
Bloomfield HC—A A Marden 72 Washington
Bloomfield MC—C A Fink 17 Pierson
Bordentown MC—J E Forbes Rt 1
Burlington Falcon MAC—Ray Balon 427 Wood
Butler Cloud Clippers—Charles Whritenaur George St
Cape May Prop Busters—112 Perry Rudy Von Collin
Garfield Jersey MC—J V Denuto 245 Lincoln Pl
Guttenberg Hudson Hellcats—D G Schmedes 113 70th
Hillside Aero Nuts—R I Mullican 209 Hillside Av
Irvington Flying Gremlins—524 Stuyvesant Av
Irvington Prop Busters—H A Schumacher 36 Elm Pl
Jersey City Air Wheels—95 Franklin
Linden MAC—R E Tucker Recreation Comm
Maywood N Jersey ME—Robert Cartwright 742 Oak Av
Millstone Somerville MAC—G W Dickenson Amwell Rd
Newark Flying Cardinals—W J Stanton 141 Vermont Av
Newark Controliners—G C Gebhard 105 N Mumm Av
Newark MAC—W A Van Buren 437 S 10th
Ocean City Exhaust Fumes—B L Adams 1102 Wesley Av
E Orange Prop Nuts—R J Buragas 311 Elmwood Av
Newark Sky Bugs—I J Schneider 497 Jelliff Av
Passaic Aeronauts—John Dyr 204 4th
Passaic Prop Busters—S R Kuhta 208 Hope Av
Perth Amboy Aero Fiends—Lawrence Golden 184 Water

"That's a funny looking flower, Johnny."

NEW JERSEY (Cont'd)

N Plainfield Queen City Flyers—H Bueschel 168 Grove
Princeton MAC—R E Hamer 118 Jefferson Rd
Ridgewood MAA—Anthony Maciag 196 E Ridgewood Av
Ridgewood MC—R B Evans 848 Hillcrest Rd
Roselle MAC—Samuel Plafskey 913 St George Av
S Orange Gremlins—R W Mahoney 481 Irvington Av
Summit Sky Rovers—L V Badgley 446 Springfield Av
Sewaren MAC—Charles Jacobsen gen del
Union City Prop Busters—Anthony Fellini 508 11th
Vineland Aeronauts—Andrew Canino 116 Quince
W Orange Spanduals—Edw Rozewski 6 Tremont Av
Westmont S Jersey GMAA—Ray Chatlein 213 Toledo Av

NEW MEXICO

Hobbs MC—Bob Bishop 414 W Park

NORTH CAROLINA

Burlington Aeronauts—R G Bennett 708 Rainey
Charlotte AC—N A Lewis 1834 Lombardy Circle
Charlotte MAC—J E Pierce 1221 Clay Av
Cherry Point MAA—Pfc W H Schmitt AES 41 Eng Div
Concord Modelaires—D T Howell 88 E Depot
Concord MAC—Dr H P Sapp DDS
Gastonia MAC—James Hollinger
Greensboro Prop Twisters—W H Bunting 334 S Elm
Kernersville Model Masters—Howard Payne Rt 1
Leaksville MAC—Wilford Redmon Bx 266 Blvd Branch
Raleigh U-Liners—H P Cherry 3 S Person
Salisbury MAC—R N Corelle Bx 49
Thomasville MAC—R T Swaim
Wilmington MAC—D E McElveen 161 Lake Forest Pky
Winston-Salem Sky Writers—J G Stratton 1230 W 1st

NORTH DAKOTA

Grand Forks Modelairs—A R Brasted 121½ S 3rd
Minot Aeromodelers—M E Schnase 822 6th Av NW
McClusky Ceiling Unlimited—Dewey Wahl
Valley City Aero Mites—Francis Dahl 104 Elmwood Av

OHIO

Akron Aeronauts—E W Conrad 2141 17 St SW
Cambridge MC—R W McKee 1904 Stewart Av
Canton MAC—R R Schlemmer 1131 11th St NW
Canton Thermalairs—Jack Dech 3614 Fairmont NE
N Canton MA—R E Wensel
Chillicothe MC—Gene Osborne Bx 113
CINCINNATI:
Jr Albatross Birdmen—Jack Strecklin Bx 437 Dry Ridge Rd
Albatross Birdmen—M L Specter 1830 Avonlea Av
ME—R W Bassett 1269 Rutledge Av
CLEVELAND:
Aerleers—R L Schalamon Flight Res Bldg Hangar Cleveland Airport
American Airlines GMC—H D McCall 9609 Lorain Av
Controliners—E L Davis 4130 Hyde Pk
Balsa Butchers—J W Hillegas 1960 E 105th
Columbus MAA—Denver Devore 20 E Lincoln
Dayton Model Aces—H E Beard TSVMP Wright Field
Dayton MA—Patricia Boomer 341 W 2nd
Delaware Model Maulers—T H Marten 66 W Fountain Av
Euclid E Cleveland MC—E O Tierney 1441 E 252 St
Findlay MAC—W R Reissig 409 Howard
Gallipolis MA—F A Shane 513 1st Av
Garfield Hts Controliners—M E Lutz 10407 Granger Rd
Hamilton MAC—Vincent Stanley 314 S 2nd
Hamilton Mitchellite C—Dick McGaughy 969 Main
Lakewood Gas Guzzlers—James Mondak 1452 Olivewood
Lakewood Prop Twisters—Hal Roth 1562 Wyandotte Av
Lancaster Thermal Teasers—A R Feigley 405 E Mulberry
Lewisburg Thermal Chasers—N E Hammel Rt 1
Oxford Flying "5"—James Peterson 420 W Vine
Marietta Balsa Busters—E S Miller 108 Front
Marion Prop Busters—R D Blank Rt 6
Piqua Flying Indians—Lloyd Hubbard Echo Lake Dr
Portsmouth Thermaliers—R W Carson 2915 Brant Av
Shelby Balsa Buzzards—H L Robinson 16 W Madison Av
Springfield Petrol Airs—C Greetham 358 E Madison Av
Steubenville Sky Hawks—Frank Barilla 1212 Plum
Springfield Strato Hawks—A Stickney 1123 S Limestone
Toledo Model Manglers—R C Rhein 608 Nevada
Warren MA—W Hill 635 Porter NE
Wauseon Cloud Chasers—Harold Lewis 205 N Fulton
Wooster MC—M J Long 515 Saybollt Av
Xenia Aero Modelers—Richard Bruce 226 W 3rd
Youngstown Mahoning MC—H L Kirchner 2700 Market

OKLAHOMA

Bartlesville Balsa Birds—Marvin Humphrey 715 Seneca
Chickasha MAC—1021 S 16th
Chickasha Flyers—J B Wood 210 S 10th
Duncan Balsa Bugs—Tom Kiester 1105 Beech Av
Norma Flying Sooners—P I Brown Irving House Bx 2158 Blvd Sta
Norman MAC—D W Lucas 763 DeBarr
Oklahoma City MAC—P T Lower 115 W Main
Ponca City Prop Spinners—Thad Barhydt 107 W Grand
Tulsa Glue Dobbers—W H Kehr 1408 S Cinna
Tulsa MAC—J L Litchenburg 1136 S 76th Av E
Tulsa Modelairs—T H Monteith 725 N Wheeling

OREGON

Bend Prop Busters—Herbert Schwab 1445 Jacksonville
Coos Bay Modeleers—875 S 12th
Coquille Cowl Crackers—Donald McLarrin McKinley Rt

OREGON (Cont'd)

Klamath Falls GMAC—Gordon Reed 5530 Summers La
Medford Prop Nuts—E H Sims 23 N Fir
Portland Fireballs—R D Smith 5204 SE Foster Rd
Portland Gashoppers—B Fletcher 4142 NE Taddington Ct
Portland GMC—C P Van Court 206 SW Washington
Redmond Rompers—Jimmy Dale Bx 26
Salem Cloud Chasers—T D Pomeroy 217 S High
Salem MAC—E J Roth 21st & Market

PENNSYLVANIA

Ardmore Eagles—William Kershaw 2815 St Marys Rd
Bangor MAC—W D Eisenberg 323 Broadway
Belle Vernon MC—Carmen Natalini 507 Broad Av
Bernville Model Aircrafters—Charles Klopp Bx 132
Bethlehem Aero Aces—G E Faulstick 65 E Broad
Brackenridge Allegheny Kiski MC—1508 Union Av
Bradford AMC—C F Barber 50 Bedford
Brookville Aero Club—William Preston 72 Mabon
Bryn Mawr Wings Aero Modeleers—850 Lancaster Av
Butler Flying Dutchmen—Tom Young 124 Patterson Av
Carlisle Prop Spinners—Jerry Russell 412 S Pitt
Chambersburg Model-Airs—W E Thomas 126 Lincoln Way E
Charleroi Mon Valley Modeleers—616 Fallowfield Av
Dalton SMAA—W H Hallstead 111 Beechcroft
Freeland MAC—John Novak Jr 532 Walnut
Gibsonia Dopy Dopers—F A Smith Rt 1 Bx 118A
Glenolden Modelairs—J M Mansley 47 N Chester Pike
Glenside Air Scouts—W R Norman 344 N Easton Rd
Harrisburg Cloud Chasers—G W Thompson Jr 1405 Regina
Hatboro Air Scouts—Fred Olsen 11 Potter St Lacey Park
Hazleton Gremlins—Calvin Pardee III Council Crest
Jenkintown Air Scouts—S S Graham 309 Old York Rd
Johnsville Air Scouts—C E Kirkbride Naval Aircraft Mod
Knox Shangri La C—John Talbot Jr Bx 213
Lancaster Caudron C—J R Landis Jr 50 Fairview Av
Lansdale Airfoilers—V E Underkoffler 220 W 8th
Laureldale Skyliners—R C Oyler 3312 Earl
Lemoyne AC—S W Baker 111 Hummell Av
Mahoney City CLC—C H Liachowitz 29 W Center
Milton MAC—N L Barber 385 Vine
New Castle Small Flies—K G Walter 114 W Lensure Av
Oxford Privateers—Hugh Lesley Rt 2
Philadelphia GMA—Jesse Bieberman 21 Dartmouth Rd Cynwyd
Philadelphia Hi Flyers—E J Bonelli 4318 Oakmont
Philadelphia Mt Airy MC—C F Modjeski 103 E Mt Airy Av
Philadelphia MAA—1427 Spruce
Philadelphia Barnstormers—J P Noto 6038 Cedar Av
Philadelphia (W) GMC—Thomas Rothera 6039 Delancey
Pittsburgh CHS AC—Jack Dougherty 53 N Emily
Pittsburgh N Boroughs MC—J Murray 234 Ridgewood Av
Pittsburgh Aero Nuts—Peter Krasofsky 1925 Carson
Pittsburgh IGMA—J Eberle 1170 New Hampshire Dr
Pottstown GMC—John Herb 35 Scott St Penn Village
Quarryville Hi Flyers—F S Jackson
Reading Berks MAC—S L Moyer Recreation Dept
Ridley Park Piston Pushers—D E Roetman 312 Shaw Rd
Scranton MAA—Anthony Kavaleski 315 Adams Av
Sharon Hill Air Scouts—D M Carroll 215 Sharon Av
Shenandoah Controlliners—J C Michalsky 15 S Carbon
South Perkasie Flying Hornets—Robert Bacorn
Sunbury Model Airs—Frank Peebles 308 N 9th
Swissvale Pacemakers—W G Carrell 7816 Sailor Pl
Warren MC—A G Stafford 230 Penna Av W
West Chester M&HC—H J Aldworth 102 W Market
Wilkes-Barre Aero Modelers—G J Kozich
Wilkes-Barre MAC—Edward Sikorski 229 Sambourne
Williamsport GMC—F D Page Jr 437 E Church
Woodlyn Airfoilers—Fred Dinkelmann 117 Fairview Rd Bx 203
York AC—Henry Lenz Court House

RHODE ISLAND

Cranston Aeromodelers—G Henthorne Jr 89 Auburn
Davisville Model Maniacs—Norman Olson, School St
Wickford Model Maniacs—Raymond Shaw 6 Champlin

SOUTH CAROLINA

Charleston Prop Busters—J J Francese 23 Saratoga Rd Waylyn Naval Base
Florence Airoheads—G C Avent 415 Franklin Av
Greenville Torque Flyers—204 N Laurens

SOUTH DAKOTA

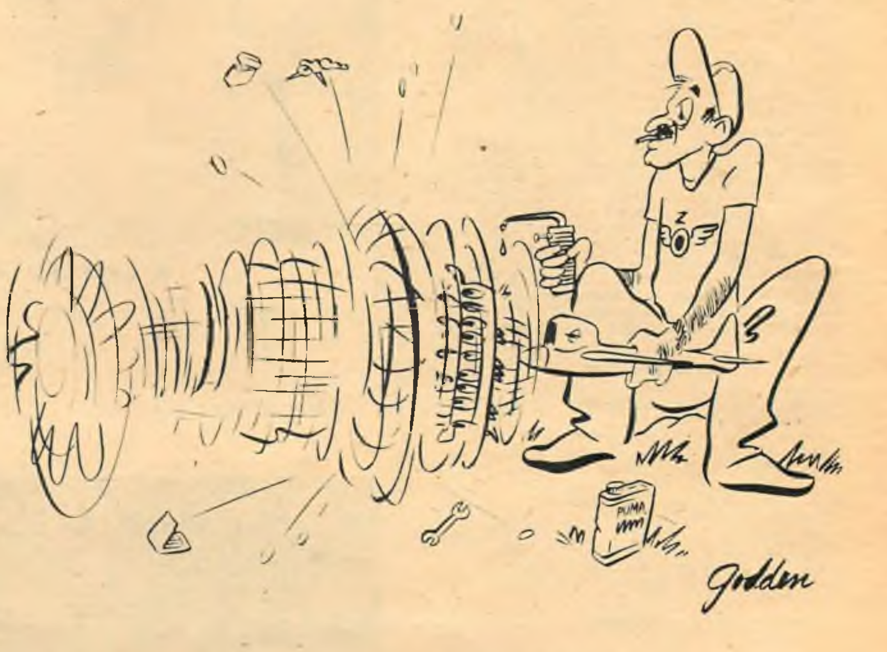
Aberdeen AMC—Carroll Gibson 1095 Jay
Rapid City Cactus Patch—D F Clarke Bx 62
Sioux Falls GMC—R F Fetzer 507 S Menlo Av
Spearfish Prop Busters—B A Fassbinder
Vermillion Thermites—Carl Harris

TENNESSEE

Chattanooga Barnstormers—Leland Browne 301 Bass Rd
Chattanooga Valley MAC—F W Childers 404 Market
Crossville MAC—John Dooley Air Scout Sqdn 7002
Jackson Cloud Busters—J T Wyatt 413 Greenwood
Johnson City Hillhoppers—J D Snook 200 W Pine
Knoxville MAC—H D Powers, Briarcliff Rd Fountain City
Knoxville Prop Busters—J M Sobolewski 916 McGhee
Madison MAC—J T Buck 202 Neeley's Bend Rd
Marville AC—Charles Barton 6 Main Eagleton Village
Memphis Modelers—H W Walpole 985 Galloway
Memphis S Air Services MC—John Evans Rt 6 Bx 434
Nashville AC—R E Martin 176 8th Av N

TEXAS

Austin Aerocrats—L O Watson 1100 Castle Hill
Beaumont Gas Gremlins—2293 Calder
Brownsville Southwest Hobby Club—T A Bryson Bx 227
College Station Aeromodelers—R L Barton Bx 722
Corpus Christi Modeleers—M Herbert 2849 S Staples
Dallas Cliff MC—Paul Schwedler 416 W Jefferson
Dallas GMA—Syd Smart 4212 Oak Lawn Av
El Paso CAPMAC—Charles Clark 3401 Louisville
El Paso Miniature Motor C—James Brock 3606 Douglas
Ft Worth GMA—R D Smith 2200A Park Pl
Ft Worth Sahibs—Helmer Johnson 1913 Tremont
Houston MC—H R Millingar 2717 Morrison
Kilgore MAC—J T Jeter
Longview E Texas MA—Thomas Elwood Bx 2307 Le Tourneau Inst
Lubbock Dope Dabblers—L C Totom 618 Av O
Lubbock Thermal Snatchers—H English 2118 Broadway
Nacogdoches Balsa Bugs—Billy Nations Bx 47
Plainview Skydusters—J B Oberthier 709 Oakland
San Antonio Glue Birds—Jack McDonald 112 Peach
San Antonio GMAA—E J Schramm 527 W Cypress
Woodsboro MAC—L C Riley



"Don't advance the spark so quick, Jim."

UTAH

Layton Star Twisters MC—Donald Loe Bx 2
Murray Modelaires—Robert Poole 4772 S State
Salt Lake City MA Research—Frank Clarke Bx 444
Salt Lake City Ute Aeromodelers—Mary Samuelson 740 Browing
Vernal Model Builders C—Herold Delehoy, gen. del.

VIRGINIA

Fredericksburg Model Crafters—R Knowlton 806 Caroline
Ft Myer Flying Yardbirds—Pvt Leland Norcross So Post
Hampton Brain Busters—M Gough 2923 Chesapeake Av
Hampton Gas Bugs—T W Schindler 427 Hampton Rds Av
Norfolk Jr Brainbusters—Jessy Shepard 109 Oak Grove Rd
Norfolk MA—F W Gregory Jr 143 Louisiana Dr
Portsmouth AC—J W Whitehurst 744 Park Av
Portsmouth Aero Nuts—James Walker 335 Broad
Portsmouth Slide Rule & T-Square C—Marianne Geoghegan 16 N Fairview Circle
Richmond MA—B L Frostick 2402 Wedgewood Av
Roanoke Gas Modelers—F C Funnell Jr 119 Franklin Rd SW Bx 318
Suffolk Prop Twisters—T B Cutchin Jr Bx 738

VERMONT

Burlington Green Mt Modeleers—T A Dietrich Bx 505

WASHINGTON

Bryn Mawr Renton MC—S M Muri Bx 345
Bremerton Modelers—G F Henry Bx 3002 Sheridan Rd
Bremerton MAA—A B Cullins 3086 Cherry Sheridan Pk
Everett Cloud Dusters—A Thostenson 1818 Hewitt Av
Hoquiam Sky Kings—C W Martin 2739 Pacific Av
Olympia Macs—A Johnson Glenwood Park
Port Angeles Cloud Chasers—Edgar Burns 125 W 1st
Seattle Aerochumps—Robert Smith 5545 Campbell Pl
Seattle Aeronuts—J F Bauchtal 10012 32nd SW
Seattle Guideliners—W S Willemin 311 W Smith
Sedro-Woolley Flying Brats—Dick Glad 609 Central Av
Spokane Island Empire MA—D J Longly N 4507 Maple
Tacoma Aeromudlers—C A Sims 1614 N Union
Vancouver Skyliners—A L Frazier 107 E 12th
Walla Walla Gas Bugs—Ed Mitchell 434 N 5th
Wenatchee Cloud Chasers—G Straley Mission & Ornodo
E Wenatchee Modeleers—Johnny Gruenewald
Yakima GMC—L J Varco 708 Pleasant Av

WEST VIRGINIA

Beckley Modeleers—Bill James 104 Wickham Av
Beckley Raleigh Co MAC—L P Keatley 217 Prince
Bluefield Balsa Bats—J D Wingfield Jr 217 4th
Bluefield VFW HC—R W Butt
Clarksburg VFW MAC—C A Hopkins Bx 1985
Fairmont MAC—E L Carpenter 604½ Potomac Av
Fairmont Sky Sharks—Frank LeDonna 614 State
Huntington Prop Busters—J A Summerfield 802 6th
Martinsburg Aero Modelers—P M Mauck 205 N Maple Av
Short Creek Aeromodelers—T T Husuar Bx 713
Wevaco Young Cadets—Charles Crouder
Wheeling Skyblazers—R H Kennedy 1063 Main

WISCONSIN

Beloit Hangar 13 MC—R L Bont 122 Hackett
Beloit Thermal Dusters—T E Garry 1318½ W Grand
Fond du Lac Flying Badgers—C J Hein 396 S Hickory
Green Bay Model Fliers—P J Kassner 714 S. Maple Av
Janesville Record Wreckers—Mrs Virginia Camposi 34 Racine
La Crosse MA—Wally Struttmater 1010 S 16th
La Crosse Thermal Riders—Ralph Matusa 424 S 23rd
Madison GMC—J W Gambrill 739 Farwell Dr
MILWAUKEE:
Cream City Gulls—E H Haupt 2719 S Shore Dr
Flying Tigers—Mrs Paul Grossman 4638 N 49th
U-Control A—R C Abresch 3066 N Humboldt Blvd
New London MAC—F R Nelson 212 W Cook
Oshkosh Aero Nuts—B A Zuehlke 47 Mill
Shawano Prop Busters—Kurt Stubenvall Bx 145

WYOMING

Casper Sagebrush Soarers—G L Briggs Jr 122 N Kimball
Cheyenne MPC—C L Bristol Bx 818
Lander Prop Spinners—O T Howe Bx 771

ALASKA

Anchorage Alaskan Chapter AMA—Alfred Person Bx 1200

HAWAII

Honolulu MA—E V Schoenberg 3265 Huelani Dr

PUERTO RICO

Santurce Prop Nuts—L A Rodriguez 2090 Eduardo Conde Av

CANADA

Ajax (Ont) Aces MC—Doug Dinniwell 14 Nelson Av
Calgary (Alberta) GMC—Greg West 320 S 2nd W
Ottawa (Ont) MAC—K J Wood 190 Bronson Av
Toronto (Ont) Gas Hoppers—Will Kelley 31 Dingwell Av
Toronto (Ont) NVS C—C B Mist 35 Bedford Park Av
Victoria (BC) MA League—Don Bradley 70 Fort
Windsor (Ont) MAC—YMCA

CURTISS PUSHER

(Continued from page 57)

Certificate No. 1, he realized the necessity for training others, and established the Curtiss Flying Schools. Most of the early pilots, including Beachey, and many World War I flyers received their early training under this system.

With its premier position in aviation history the Curtiss "Tripod" Pusher is a most interesting and challenging model project. The numerous flying wires, struts and open air controls afford the opportunity for much detail.

To support the weight of the Bantam engine successfully the landing gear and center section braces are an integral structure of piano wire, on which the wings merely rest. A difficulty common to all pusher models—flipping the prop for starting—required a radical solution. The entire tail was hinged at the upper surface and clipped into sockets at the lower wing, permitting the assembly to be swung up and out of the way without disconnecting any controls.

In the absence of a regular fuselage, the wings must be built first to provide a structure from which the remaining elements of the model may be located. Cut out 52 ribs of 1/16" sheet, and 6 of 3/8" sheet. This can be greatly speeded up by snipping a wing rib section from thin sheet metal and cutting around the template with a razor blade. Shape the trailing edges to a wedge section, 1/32" thick at the rear edge. Pin the leading edge, shaped of 3/16" x 3/8" hard balsa, to the plan at an angle to match the nose of the ribs. Cement the tip and center ribs to the leading edge and pin the trailing edge against them. Fit shims under the junction of the ribs and trailing edges to maintain the contour of the wing section. Insert the remaining ribs, and fit the spars of 1/16" x 3/16" hard balsa. Remove the wing from the plan when dry and re-cement all joints. Sandpaper the framework carefully to remove any bumps that may spoil the finish. Cover the wings with light weight Silkspan, sticking the paper to the bottom of each rib to preserve the camber of the section.

Shape the wing struts A, of 1/8" x 3/16" hard balsa to a streamline section at the center and to 1/8" diam. at the ends. Drill 1/8" holes through the wings and cement the struts in place, beginning at the tips and working toward the center.

Form the upper portion of the rear motor support B, and the front support D, of 1/16" piano wire. Cut two plates C, of .020 brass strip. Drill a number of large holes in them to permit the cement to anchor them securely to the wing surface. Slide the motor supports through the plates and complete the bends. Push the wire supports through the slots provided at the center of the wings and cement into the upper wing.

Attach the motor mounts E, of ¼" x ⅜" maple to the supports with clips F, of .020 brass strip. Form the motor braces G, of .049 piano wire and work them carefully into position through the bottom wing. Enlarge the holes through the wing if necessary to simplify installation. Clamp the braces to the outside of the motor mounts with clips F. Bend the front wheel support H, of 1/16" piano wire. Clamp the rear end to the inside of the motor mounts with a brass clip, and bind to the front motor support with fine wire. Form a pair of rear axle trusses I, of .049 piano wire. Clip the inner ends into the rear plate C, and bind the outer ends to the motor braces G, with fine wire. Link the trusses I, to the front wheel support H, with a fork J, of .049 wire. Check the alignment of the wing assembly carefully—bind all overlapping joints with fine wire, and solder. Solder the clips F, to the struts, and solder the nuts of the 2-56 machine screws to the clips to simplify assembly. Solder the struts to the plates C wherever they pass through. Be sure all parts are clean and bright. Use acid core solder, a well tinned iron, and the job can be done quickly without danger of charring the wings. Fair the struts H and J with strips of ⅛" x 3/16" hard balsa recessed to fit the wire.

Make two bearing plates O, of .020 brass to support the control shaft. Drill ⅛" holes through the ⅜" thick ribs. Assemble the horn N, of .030 brass and a 1/16" I.D. eyelet, on the shaft in the mounting bracket M. Solder the horn assembly to the shaft and slip the unit into the wings. Bolt the bracket to the motor bearers and cement the bearing plates O in position. Slip the upper horn P, and the lower horn Q on the shaft and solder quickly in place to prevent charring the wood. With the horn N parallel to the motor bearers, the upper horn P should be pointed toward the boom hinge point, at an angle of about 60°. The lower horn Q points toward the center, parallel to the wing span.

Fit the engine in place and mark the bolt positions. Remove the bearers and drill. Attach the motor and work the unit back in place.

Assemble the tail booms directly on the plans of ⅛" dowels, joined by 3/32" x ⅛" hard balsa streamlined struts. Use several coats of cement at the joints. Lash the hinges L, to the booms with thread and coat with cement. Slip the booms onto the spur of brace G protruding above the upper wing. Fit bearing K in place and solder to the wires where they intersect, using a minimum of solder to prevent seizing up the hinge.

Cut the stabilizer of 3/32" soft sheet balsa, sandpaper carefully and cover with Silkspan. Set the stabilizer in place and align it with the wings while locating the lower ends of the booms. Reinforce the boom with a wedge of ⅛" balsa. Cut the lower booms apart and cement sockets of ⅛" I.D. aluminum tube in place on the stubs. Push the booms in place and file the notches in the dowel stock. Raise the tail and bevel off the

PLAN #104

AIR TRAILS Official Full Size Plan Service

To make your model building more fun, Air Trails has established an *official full size plan service*. Each month the editors select popular planes which are made available to you in a gigantic size model plan measuring 35 by 45 inches! The regular cost of each of the big size plans is 50¢. Anyone is eligible to order one or more at that standard price. But if you possess your own copy of Air Trails and order on the coupon at the bottom of this page you save a big 15¢ *per plan* ($1.80 per year!) bringing down the cost to 35¢ each.

RASCAL

McCULLOUGH'S FINE WAKEFIELD — SEE ARTICLE PAGE 44

KNIGHT TWISTER

FINE SCALE CONTROL LINER FOR CL. B AND C MOTORS

BEGINNERS GOAT

JUST THE JOB FOR THE NOVICE — SEE ARTICLE PAGE 46

PLAN #101

CURTISS PUSHER

FAMOUS "OLD TIMER" FOR CO. ENGINE

BOJO

SPORT-STUNT CONTROL LINE BIPLANE

WACO

SCALE BIPE FOR CLASS D ENGINES

CLIMAX

CHARLIE FOLK'S RECORD B FREE FLIGHT

PLAN #102

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upper part of the dowel in front of the notch, to permit it to snap into place. Drop the .016 piano wire clip in the notch and lash to the boom with thread and coat with cement.

Hang the elevator on the stabilizer and solder the horn R, to the left hinge. Form a 1/8" I.D. eye in a 12" length of .049 piano wire and hook it into horn P. Set the elevator in neutral, and with horn N parallel to the motor bearers, bend the end of the push rod into the elevator horn. Solder a small washer to the end of the wire to retain it in the horn.

Cut the ailerons of 3/32" soft sheet balsa. On the original model they were hung on the rear struts with hinges S, of .020 brass. Threads passed over 1/4" diam. eyelets, cemented in the corners of the front struts, connected the ailerons to the shoulder yoke at the seat. Diamond shaped horns of .020 wire were cemented to the surfaces. The upper line was rigged from the left aileron to the right, over the upper fairleads. Each lower line was rigged to the corresponding side of the shoulder yoke, over the lower fairleads. For flight the yoke was locked in place. If desired the ailerons may be merely cemented to the struts, or omitted entirely for flying.

Mount the control column of 3/32" diam. dowel between the seat supports with a short shaft of .020 wire. Link the column to the U-control system with a push rod of .049 wire. Cement the control-line guide of .049 wire to the left outboard struts, just below the ailerons. Attach a pair of .016 lines to horn N, and pass them through the guides.

Install the ignition system using medium size batteries and a midget coil. Solder all connections and lash the batteries and coil in place with a couple of turns of rubber. Lead the negative side of the battery to the ground and provide a booster attachment on the positive side of the coil.

A heavy, wide bladed propeller is necessary to absorb the torque in the small diameter required. Carve a left hand prop of maple, using a spokeshave and cabinet rasp for speedy roughing down.

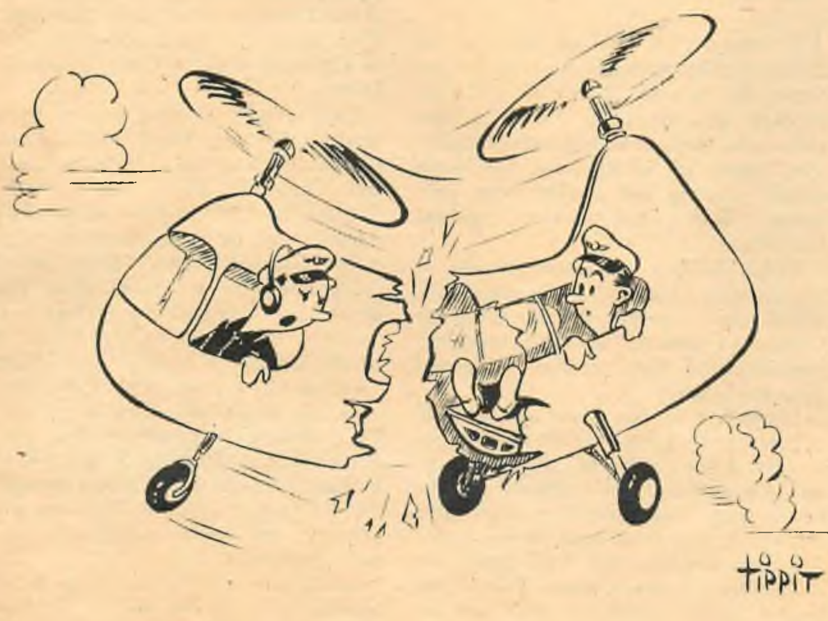
Build up a dummy radiator of 3/8" soft balsa and cover the front with fine wire screen. When cemented between the motor bearers the batteries are considerably camouflaged by it.

Apply several coats of shellac to all bare wood parts. Spray the wings with water to shrink the tissue and apply two coats of dope, and one of thinned shellac when dry. Finish all wire struts and horns with flat black paint.

When flying, clip booster leads to the ground and coil. Be sure they are not crossed. Release the tail booms from the sockets and lay the tail over the top wing. The prop can then be easily flipped over in the conventional manner. A length of rubber tubing slipped over the intake pipe, projecting between the batteries and radiator, may be pinched shut to simplify choking and eliminate priming. No trouble was encountered in operating the engine with the propeller specified. Closing the booms while the engine is running proved even simpler than expected, due to the smooth functioning of the clips. For the most stable flights the C.G. should be well forward. Add weight to the front wheel support H, under the seat, if required.

Due to the tricycle landing gear the model may be run easily along the ground, lifted off when desired and brought down without danger of nosing over while feeling out the controls.

Wherever exhibited the Curtiss Pusher will always provoke discussion of the pioneer days, of the men like Lincoln Beachey who flew with such skill and daring, and of others like Glenn Curtiss who created the machines through vision and infinite patience.



"Well, O. K. then, you go your way!"

EMBRY-RIDDLE

(*Continued from page 35*)

Of immeasurable importance is the school's own maintenance department, under the supervision of George Gibbons. Directing the highly intricate system of flight training is Robert M. Johnston, a Quiet Birdman and a pilot of many years.

Johnston was Embry-Riddle's first employe when the company started seaplane operations in Miami. General manager of that base, he later acted in the same capacity when landplane operations commenced under the Civilian Pilot Training Program. He subsequently was transferred to the Riddle-McKay Aero College as squadron commander. He remained there until the British flying training school was inactivated at the end of the war, when he returned to the Miami divisions as director of flying.

The chief pilot is Lewis M. Smith, a perfect example of working one's way up in aviation. He enrolled at Embry-Riddle in 1942, and in due time he had earned his commercial certificate and ratings through multi-engine and was recommended as a member of the instructor staff. He continued to make rapid advancement on the line and when GI flight training was inaugurated in 1946 he was made chief pilot. He also is a CAA Examiner for private and commercial pilots and instrument ratings and is an Examiner for the FCC.

The chief pilot works directly with and for the flight students. With the application of a little psychology he endeavors to assign a newcomer to an instructor he believes best suited to that individual's temperament. One instructor has infinite patience with the not-too-sharp, another has the ability to handle the "hot pilot," one specializes in the training of feminine students, and still another works with the boys from foreign countries.

The majority of students entering the Embry-Riddle School of Aviation are between the ages of 18 and 35, with the average age about 25. With a few exceptions, they are all high school graduates, many of whom have had some college training and a very large percentage having had previous aviation experience.

Embry-Riddle's placement record is exceptionally high. Last summer the school could have placed many times the number of students available upon the completion of their various flight and technical courses.

Ninety-five percent of the student body is comprised of out-of-state aviation aspirants—from California, Maine, Minnesota, the southeast, the southwest and the middle west. International in scope, there are young men from most of the Latin-American countries, the West Indies, the Dutch West Indies, Canada, Poland, the United States Territories and even far off China.

Young women also seek instruction in most of the flight courses and in many of the technical phases of aviation. Hundreds of the gentler sex have been trained by Embry-Riddle and gone on to good positions in the industry.

The school's dormitory is located directly on the airport and only a short distance from the training center. Navy-built bachelor officers' quarters house unmarried students. Private rooms, apartments and houses are used by those who wish to live off the airport or are married and have families. The school maintains its own cafeteria adjacent to the dormitory.

Organized sport is under the direction of the student council, which sponsors basketball, softball, tennis and other competitive games. Swimming at Miami Beach, Crandon Park and the public beaches on Biscayne Bay, and fishing in the various waters around Miami are available to all.

Like any other school with young men and women from every walk of life and from the four corners of the globe, Embry-Riddle encourages a strong student council. The president of this council, with his advisers, assists with problems that arise in the hangar, on the flight line and in the dormitory. He is the liason officer between the faculty and his companions.

The story of Embry-Riddle dates back to the early 1920's when John Paul Riddle and T. Higbee Embry went into partnership in Cincinnati offering flight instruction and carrying air mail, passengers and cargo. In 1929 they sold out to what is now American Airlines, Riddle remaining with American for three years and Embry moving to California and out of the Embry-Riddle picture.

In 1938 Riddle reorganized the company in Miami and commenced seaplane operations on the County (now MacArthur) Causeway. With the Civilian Pilot Training Program getting under way, he leased a hangar at the Municipal airport and started training students in conjunction with the University of Miami. When the Navy took over that field in 1942, landplane operations were moved to Chapman Field, a few miles south of Miami.

Civilian pilot training proved so successful that in March 1941 Embry-Riddle was awarded a military contract and Carlstrom Field was opened in Arcadia, Florida. Known as the Riddle Aeronautical Institute, Army Air Force cadets received primary flying training there and later at nearby Dorr Field, which was activated the following December. In Union City, Tenn., the Riddle-McKay Company (an affiliate) operated still another AAF flying school

In July 1941 Riddle Field at Clewiston, Fla., became headquarters for No. 5 British Flying Training School (Riddle-McKay Aero College), where nearly 2,000 Royal Air Force cadets were given primary and advanced flying training until September 1945.

In addition to CPT at Chapman Field, navy aviation cadets learned elementary flight there under the War Training Service, while seaplane operations were

devoted almost entirely to private flying.

Concurrently with flight training, the technical school in Miami trained thousands of army mechanics, civilians and Latin-American students. In March 1942 the greater part of what is now known as the Aviation Building came under the AAF Technical Training Command for the instruction of enlisted men in aviation mechanics.

This program soon overflowed into the Coliseum and several other buildings in Coral Gables. Apartments, hotels and restaurants were taken over to house and feed the detachment.

At the same time Latin-American students, under the supervision of the State Department, came from Honduras, El Salvador, Paraguay, Bolivia, Ecuador, Chile, Venezuela, Cuba, Brazil, Uruguay, Nicaragua and Argentina.

Embry-Riddle, in addition to its training work, operated one of the most complete overhaul stations in the south. Aircraft, engine, instrument and accessory overhaul divisions were set up throughout Greater Miami and in six big hangars at Carlstrom Field.

1943 saw the retrenchment of Army technical training and the inception of technical training for the Brazilian Air Ministry in São Paulo, Brazil.

Shortly thereafter the returning service man and woman came to Embry-Riddle, following a contract with the Veterans Administration. Technical training, and later flight training, under the GI Bill of Rights became a major enterprise.

In July 1944 Mr. McKay, vice-president of Embry-Riddle and co-owner of the two Riddle-McKay units, took over the interest of Riddle, who retained management only of the Brazilian division.

Curtailment of Army Air Force flying training folded the wings of Carlstrom, Dorr, Embry-Riddle and Riddle Fields in the latter part of 1944 and fall of 1945. Outstanding among these great wartime bases was Carlstrom which ceased operations after four years of record breaking achievement. This detachment alone flew over 550,000 hours, 45,000,000 miles, training over 7,500 cadets with only one fatality.

Post-war activities found Embry-Riddle flying operations, overhaul and maintenance at Chapman Field and the Seaplane Base. Technical students were at the Coliseum and the Aviation Building.

French was added to the bi-lingual school early in 1946 when the school, under contract to the government of France, undertook advanced flying training of French naval aviation officers. This project was carried on at the Homestead Army Air Base, south of Miami, and was completed in November of that year.

This era of another expansion continued with Embry-Riddle moving in the fall of 1947 to the former Navy airport at Opa-locka. The centralization of the flight and technical schools, maintenance and overhaul departments, and the general, executive and administrative offices was then achieved.

IN DAYS OF YORE

(*Continued from page 39*)

In this way, it was possible to mount the instrument on the instrument panel directly in front of the pilot where it could be read at a glance. This type is still in general use today.

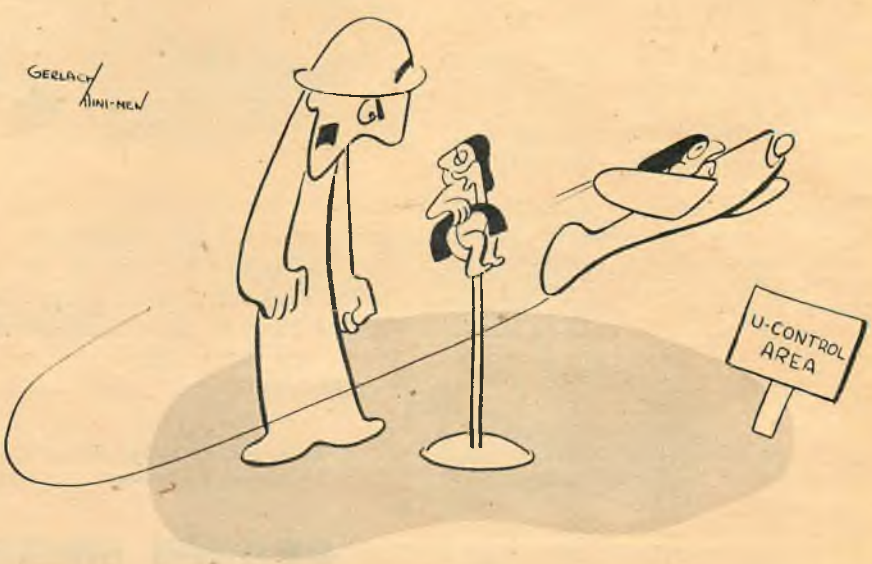
As long as aviation remained in the hands of sportsmen pilots, such things as bad weather and fog presented no problem. But by 1917, aviation was becoming an important military endeavor, and later of great commercial importance. Fog and night landings thus became a prime consideration. One of the first recommendations for a solution to the problem, was to utilize lighted captive ballons along the air routes. Floating above the fog, they would serve as guideposts or route signs to the airman. Also, according to one reporter of the day, the idea of ". . . using the radio compass and wireless signals" were "seriously considered." In fact so "seriously" were they considered, that millions of dollars have since been spent in erecting radio range stations all over the globe!

A proposed solution to the problem of night landings was introduced to the aviation family in 1923, with the presentation of the "Jenkin's Optical Night Landing Altitude Indicator." It consisted of three projectors all of which were attached to one side of the plane in tandem. Two were stationary and parallel, and the third was rotatable. A tube projected the altitude figures on the terrain below. These altitude figures could be changed by rotating the tube parallel to the longitudinal axis of the plane. As the ship came closer to the ground, it would have to be rotated in order to keep the altitude figures between the arrowheads. The maximum indication was 500 feet, and the smallest reading was 50 feet, lower altitudes being estimated by use of the bar cast by projector.

One can only visualize two very busy pilots attempting to land a multi-engined airliner with such an instrument. They would have to be a couple of double-jointed acrobats to juggle engine controls, flaps, landing gear, radio signals and play the game of "chase the arrowheads" all at the same time! In 1923, however, the instrument must have been considered capable of further development since the Bureau of Standards spent considerable time exploring its possibilities. It was also used in Great Britain, and the Germans turned up with a similar idea.

In 1920, the unique notion of making a blind landing by spiraling down inside the radio cone of silence was proposed. (The "cone of silence" is the area directly over the transmitter on a radio range where no signals can be heard. The area is in the shape of an inverted cone.) The first thing to do was to circle the cone to find its diameter. From this, it was supposed, the altitude could be "easily" determined, and a blind landing "safely" negotiated. Though the cones were 110° wide, I'd stake a cookie that assuming the maneuver was at all possible, it wasn't safe!

We have poked fun at many of the devices that turned up in the course of instrument evolution. But it must be remembered that they represent great sacrifices of time and money on the part of the individuals who worked them out in an effort to make flying a more practical affair. Though these instruments fell far short of the purpose they sought to achieve, they serve to point up the numerous trials and errors of pioneers in "days of yore."



"And I say you gotta have lines on that handle!"

BEYOND THE "BARRIER"

(*Continued from page 23*)

thin airfoil section is capable of delaying compressibility effects to a higher subsonic Mach number than a thick section. An example of this can be quoted. For the NACA 16-500 series, the critical Mach number of a 20% thick section is about 0.68. By thinning the same section to 5%, the critical Mach number is raised to 0.76. At sea level, this means an increase in speed of 61 miles per hour, from 519 mph to 580 mph. Not bad, not bad!

Following this lead, aircraft designers began to consider thinner wing sections for fighters and high-speed bombers. But right away, they ran into another problem: a thin wing has less physical dimension for structure than a thicker one. Structure is what one needs most as aircraft speeds go higher and higher, because the loads get greater and greater. However, it was possible to build a thin, strong wing, once the designers could be weaned away from conventional practice. (The Bell XS-1 has a very thin wing, on the order of 8%, and uses an ingenious and different type of construction.)

A great contribution was made by the Germans during the last months of World War II. Our technical missions to Germany reported that all of their new aircraft designs featured wings with large amounts of sweepback in order to delay compressibility effects. (A good discussion of sweepback was presented in the February 1948 *Air Trails.*) However, the war ended before the Germans were able to get many practical flight tests on such wings. Their capabilities were indicated by the fact that most of the calculated performance data showed top speeds around 0.9 Mach number, much faster than any fighters we were playing with at the time, or would have had in time. As a matter of fact, we still don't have such fighters.

There are two things to remember about sweepback. First, all it does is to kid the air into thinking that it is flowing over a thinner section than the wing actually has. Figure 3 shows what is meant. If the wing is a 10% thick section, then the thickness is 10% of line AB, following usual nomenclature. But the air flows along AC, which is longer. Consequently, section AC is an airfoil of less than 10% thickness, and as was stated above, we gain a fraction of a Mach number that way. If the angle of sweepback is 45°, that section at AC is only about 7.1% thick.

The second thing to remember about sweepback is that the reasons for sweeping a wing are completely different for subsonic speeds than they are for supersonic speeds. Subsonic reasons have been covered above. At supersonic speeds, the

wing leading edge is swept to keep it completely inside the Mach cone so that the flow over the wing will be uniform (Figure 4a). It is difficult to calculate what happens if the Mach wave crosses the wing surface some place (Figure 4b).

The only way of avoiding compressibility effects on control is to locate the controls out of the wake of the wing. That is why the XS-1 and Skystreak have elevator and stabilizer perched high on the vertical tail. Going a step further, there's a good reason for tailless aircraft. If there's no tail, there are no compressibility troubles with the tail. (It's not as easy as that, but that's another story.)

So, by doing these things—thinning the wing, sweeping it back, getting the tail out of the way—an airplane can be kept relatively trouble-free up to a pretty high subsonic Mach number. And remember, the present world's speed record (Skystreak, 650.6 mph) represents only about 0.82 Mach number. We have a long way to go to reach sonic.

Why do we have to reach sonic speeds, or beyond? First, let's not fool ourselves by assuming that transports or lightplanes are going to fly at supersonic or even near-sonic speeds in the conceivable future. The faster you go, the more it costs—above certain limits. A rocket-propelled transport is very unlikely for domestic service. The answer to this question lies in its military implications. We want military aircraft, or missiles, that can go fast and be safe for a pilot, or free from the danger of breaking up in flight if we carry no pilot.

But we don't *know* what happens through sonic speed. There has not been enough experience with trans-sonic flight to draw any general conclusions. Only test work can provide the experience and data so urgently needed. We do know, from hundreds and thousands of wind tunnel tests and flight tests, what generally happens below Mach numbers of 0.85. Occasionally even here, something eludes us and causes trouble, in spite of 45 years of aeronautical development.

At supersonic speeds, one can judge fairly well what happens to wingless missiles or bullets, because of the long background of ballistic studies here and abroad. The never-never land of the trans-sonic range still has to be explored and mapped.

That's why we make missile experiments. That's why the NACA drops special models from aircraft to reach sonic speeds, and why the Skystreak and Skyrocket were developed. We know nothing about the trans-sonic range except what we guess, or extrapolate.

Wind tunnels? Not at trans-sonic speeds—the tunnel will "choke" with a shock wave, probably at the model, because of the reduction in test section area. Only recently did Lockheed announce its ingenious "hump" technique for obtaining trans-sonic speeds in a high-speed tunnel. If you've seen their releases, you know that in the tunnel test section, the air is locally accelerated by a hump on the floor. A drawback here is that a small model must be used, to avoid blocking off too much area. Further, it must be a half-model, complete only to the centerline of the aircraft, in order to avoid unsymmetrical effects due to the presence of the floor.

That leaves only flight tests of many sorts. Piloted aircraft are approaching sonic speeds from the low side, accelerating towards a Mach number of one. Dropping specially prepared models has been done too, because they reach supersonic speeds on the way down. Fastening a small model half-wing to a fighter's wing gives an open-air tunnel using the "hump" technique, à la Lockheed. Or rockets can be fired, and data taken as they decelerate through sonic speed.

All this is for education. We must probe, not pierce, the sonic range; map it, not ride through it; respect it, not fear it. We must know more, we must do research work, we must be capable of intelligent design of extremely fast aircraft. The value of the XS-1, the Skystreak, the Skyrocket and other aircraft to follow, lies in their ability to fly, under control, closer and closer to the speed of sound.

As with other developments, new and technical, a great deal of misinformation has been circulated on the subject of high-speed flight. Some of these have been collected for refutation here.

Fallacy 1: If a rocket or ramjet engine cuts at supersonic speeds, the resultant deceleration will kill the pilot.

Acceleration or deceleration, which are the same except for choice of direction, are caused by a difference between thrust and drag. A little simple algebra and one of Sir Isaac Newton's handy laws show this neatly.

We know that force equals mass times acceleration:

$$F = ma$$

Further, in power-on, level flight, force is thrust minus drag, mass is weight divided by g (for gravity) and acceleration is just that. So we rewrite the equation:

$$T - D = \frac{Wa}{g}$$

Now, the ratio of a, the acceleration produced, to g, the acceleration of gravity, is spoken of as the number of g's of acceleration. If $a = 64$ feet/second/sec-

ond, we call it a $2g$ acceleration. So we can again rewrite the equation to get the ratio of a to g on one side:

$$\frac{a}{g}=\frac{T-D}{W}$$

What this last equation says is that the number of g experienced by the pilot will be the difference between thrust and drag, divided by the weight. Incidentally, for the special case of vertical rocket flight where drag is small, the right hand numerator is thrust minus weight, not drag.

In general, the thrust of any supersonic airplane is not going to be much more than three or four times its weight, if that much. The V-2, for example, has a thrust roughly twice its weight. The XS-1 has somewhat less thrust than weight at launching, somewhat more at empty weight. For the equilibrium conditions of level flight, thrust and drag are equal; otherwise the airplane speeds up or slows down. Therefore, if the engine is cut at maximum speed, this equilibrium is upset, and the only force acting is drag. But we saw that drag equaled thrust at top speed, and that thrust was maybe only three times the weight. Put those numbers in the equation, and what kind of a terrific deceleration do you get? $3g$! My maiden aunt could take that with her corset off, and not come apart.

It would be possible, it seems, to get a little more than $3g$. For instance, if the plane were still accelerating to its maximum speed, and then the engine cut, the change from acceleration to deceleration could be a little more than $3g$, but certainly nowhere near the $100g$ body-ripper of the misinformed.

Well, somebody says, how about the way the drag builds up through the sonic range? If the plane is slightly supersonic and begins to slow down, the drag will build up faster, which will slow down the aircraft even more, and so on. That's correct. But the airplane, in order to get through the sonic speed range, had to have more thrust than drag at sonic speed. If we consider what happens coming back from the supersonic speed, we can see that the deceleration increases from the reduction in speed, and that the maximum deceleration will occur where the drag, in pounds, is highest. We know that happens at, or very close to, sonic speed, and we also know that that drag will not be more than two or three multiples of the aircraft weight. It's still only about $3g$ or so.

Fallacy 2: Mach waves are opaque, and the pilot of any supersonic plane will therefore be flying blind.

No! That fallacy has appeared twice in magazines of national circulation. It is not true.

If a shock wave were opaque, you could see an opaque cone in the air marking the location of a bullet you just fired. Have you ever seen such a phenomenon, even on a well-lit indoor target range?

There are two sources from which this fallacy may have sprung. First, there are condensation shocks. These are analogous to a shock wave, except that they

can occur at very low speeds. For instance, these can be observed during a flight through clouds or fog. Little wisps of denser fog come off the prop and the wing. Also, in landing in a moist atmosphere, a plane may suddenly shed a long sheet of condensed water vapor, which looks opaque. High altitude vapor trails are another example of condensation shocks. But all these only occur under special conditions of atmospheric pressure, temperature and humidity. Generally, supersonic planes will be flying at very high altitudes where the water content of the atmosphere is very low indeed. We would not expect to get condensation shocks very often under such conditions.

Second, there are pictures of bullets, for example, taken in flight, showing the Mach waves as heavy, dark lines. Don't be fooled—these are taken by special optical means. There are three of these means: schlieren, shadowgraph, and interferometer. Without going into the details, suffice it to say that all three of these methods make use of the density changes through a shock wave. These density changes bend the light rays much as a lens does, and vary the illumination intensity on a photographic plate. What the plate "sees" then, are gradations in density. And the more rapid the gradation, the sharper the line or area on the plate. Consequently, a Mach wave, which has a large density change across it, shows as a dark line of strong intensity. Remember, a shock wave is no more opaque to the unaided eye than any other hunk of compressed air.

Fallacy 3: There is a sonic barrier, a stone wall of compressibility.

The only sonic barrier is the headwind built into an airplane by the designer, or by military or other requirements. There is no reason that any airplane cannot exceed the speed of sound, or any reasonable multiple thereof, if the power is available, and the design is clean.

But to make the design clean, aye, there's the rub. Cockpits protrude, wings and inlet ducts have rounded leading edges, access doors and landing gear fairings make for slight unevenness in contour. So, only if the designer sets out to build a purely research aircraft, can he use the external lines he must to avoid the built-in headwinds. It is axiomatic that the cleaner the airplane, the lesser the drag, the faster it will go.

Statement of the Ownership, Management, etc., required by the Acts of Congress of August 24, 1912, and March 3, 1933, of Air Trails Pictorial, published monthly, at Elizabeth, N. J., for October 1, 1948.

State of New York, County of New York (*ss.*)

Before me, a Notary Public, in and for the State and county aforesaid, personally appeared H. W. Ralston, who, having been duly sworn according to law, deposes and says that he is Vice President of Street & Smith Publications, Inc., publishers of Air Trails Pictorial, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, embodied in section 537, Postal Laws and Regulations, to wit:

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(*Continued from page 25*)

pictures every half hour during the seventeen hour flights over 3,275 miles of the most terrible forced landing country on the globe.

The Ptarmigan flights, as they are designated, take off from the icy, drift-bordered runways of Ladd Air Force Base, Alaska, and point their frosty noses northeastward to a tiny weather observation station at Aklavik, 362 nautical miles away, located on the Mackenzie River in the northern part of the Yukon Territory. From this check point they continue their heading roughly northeast another 508 nautical miles to Cape Manning on the southern tip of Prince Patrick Island where the big ship banks up and around and heads due north up the 123rd longitudinal meridian for 846 more miles until the B-29 and its crew can look directly down on the geographical North Pole. Once there, where the only way you can go is south, the ship swings around and drones 1,121 nautical miles back "down hill" to Point Barrow, Alaska. At this "northern back door" of Alaska the pilot banks to the left again and they set their nose on the final leg of 438 miles back to Ladd Field and fresh coffee.

During these flights over the silent ice fields and the Polar Cap with the northern lights crackling and weaving above them, about twenty two complete weather "pictures" are radioed back to the base, giving the same effect as from a chain of complete but "absent" weather stations along the entire route—a route through the birthplace of storms that eventually reach Canada and the United States. A storm accurately reported here may in a week or longer be over southern Texas bringing frost to the fruit growers, or over the plains of the midwest bringing trouble to the farmers there. Thanks to the chaps in the B-29's flying the Ptarmigan merry-go-round, the storms are tracked down from the arctic polar cap and the farmers forewarned long before they get there.

This project of the Air Force is a serious and exacting one as well as a cold one. Five months of the year it is practically all darkness along the way and for five months it is practically all daylight in the polar regions. Those ten months are the "easy ones." It is the two "transition months" one in the fall and one in the spring that are the tough ones. These "twilight months" offer a serious challenge to the crews whose job is no picnic no matter what time of year, due to particularly dirty and treacherous patrol weather during these periods.

The aircraft carries three navigation specialists. Two well trained men can do the job but taking along an extra man is an added safety factor and it gives an opportunity for additional arctic experience for the third.

The Ptarmigan crew numbers up to twelve and consists of pilot and co-pilot, the three navigators, a weather observer, flight engineer, radio operator, radar operator, and two scanners.

The weather officer, or observer, sits in the nose of the B-29 just ahead of and slightly below the pilots, right where the bombardier usually parks his talents. He is the kingfish of the project. Each member of the crew personnel is the tops in his line. Safety prohibits anything less.

The navigators consist of a lead man referred to as the "dead reckoning navigator," who is furnished with data by other crew members to determine and plot the ship's heading and position on a route chart. The second navigator's chore is to spot the plane's position and maintain the "D.R." navigator's desired heading. He uses the astro compass to find the direction and the aircraft's gyros to hold the heading. This second navigator, labeled the "astro navigator," must constantly check the plane's heading by sights on a celestial body to determine any error in the gyros operation or procession rate.

The third member of the "get-'em-there-and-back" team is called the "sextant navigator," who earns his hot coffee and chocolate bars by forwarding every hour to the "D.R." navigator three lines of position obtained by sextant shots at three different stars, which together make up a "three star fix." This is an added check on the other position estimates. Their exact position is not only for safety's sake, but knowledge of it makes the weather reports that much more accurate.

The radar operator is an unexpectedly important member of the navigation part of the flight, for up here where there is nothing but ice surrounded by more ice, it is next to impossible to estimate drift and ground speed for lack of check points

"Looks like Slipsy finally finished his super-streamliner"

below. The radar operator, by constant scanning, using the cracks and shelves in the ice cap below as targets, can give an accurate drift and ground speed report of inestimable value to the navigation team. At night, particularly, the radar operator is a "must" member of the team for even on the brightest arctic night sights on the ice shelves and cracks are useless without the electronic eyes of radar. In addition to being the eyes of the ship for navigation data, the radar can track and determine active cold fronts as far as fifty miles away, important additional data for the weather officer to stir into his weather forecasting recipe.

The flight engineer, in conjunction with the two scanners, keeps every-second watch on the four engines, he at his myriad instrument dials and gages at his station just behind the co-pilot, and the two scanners one in each aft side bubble blister. These two crewmen have the monotonous but highly vital job of watching the engines for oil leaks or signs of fire.

The engineer and scanners must be on their toes along with the pilots to see that the aircraft performs perfectly every foot of the way to guarantee a successful mission. The fuel on these polar weather flights is obviously of utmost importance. Constant weighing of all such factors as fuel remaining in the tanks, ground speed, forecast winds, forecast icing conditions, estimated flight time remaining, and distance yet to go, must be done periodically and accurately. If a fuel shortage threatens, the pilot, flight engineer and navigators must consult at once to determine the correct action to be put into immediate effect.

The radio operator is the link with civilization during the circuit of the route. He directs a steady stream of coded weather reports back over the barren and icy wastes, the position of the plane every half hour and all other communications. In return he receives fresh weather reports of vital interest to his particular ship, terminal weather data and landing information in case of fuel shortage and a hurried shortcut to an emergency field or outpost. It would be impossible to give the nod to any "most important" member of such a crew, for all are a part of a team dependent upon the ability of all the members.

The flying of "synoptic" or "fixed track" circuits of the area instead of different routes is of much greater value to the base weather experts and meteorologists following and interpreting weather mass movements across the globe. The half hourly reports from ships of the 375th as they wing their way over the frozen polar cap come in from approximately the same areas each flight so that the step by step development of storms and their movement down from the "storm birthplace" can be traced and predicted. The "Ptarmigan" track is flown to obtain weather information at the 700 millibar (10,000 feet) and the 500 millibar (18,300 feet) levels with some additional data obtained at the surface, or for safety's sake, the 500 foot

level, over the ice and flow-filled water.

The operation of this flying weather station is a highly complex as well as technical chore. It is a two-part operation consisting of collecting the weather data and then transmitting the findings back to the base weather experts.

For the first part an astonishing array of techniques and instruments are required and used. Some of them are still so new they are secret. Improved and entirely new equipment is being devised all the time to make the projects more efficient, safer, and easier for the "frosty forecasters." For example, it has been the practice to make "soundings" as they are called to obtain weather data at various altitudes during a series of ascents and descents. The plane was put through a series of planned climbs and glides taking temperature and humidity values at every thousand feet. This was usually very accurate but at the same time expensive in time and fuel too darn far from home. Special radiosonde equipment has been devised to be dropped from the plane en route. The miniature radio sending sets are lowered by parachute to give a steady stream of the same vital data obtained from the old "sounding" maneuvers without the plane having to lose altitude and then laboriously regain it. The new system has the added advantage of giving the data right down to the surface of the ice pack.

Other equipment carried include pressure altimeters, air speed indicator, thermometers, psychrometer (to measure temperature and humidity) radio altimeter, aerograph (to give pressure indications) and, of course, the radar search set for drift readings.

All the data obtained is sent back to the base meteorologists via a complete radio transmitting setup including radio teletype and a facsimile transmitter. The weather officer of the crew takes the readings, measurements and observations and encodes them for transmission via radio, giving the base experts a picture of the weather as it unfolds a couple of thousand miles away to the north. From these reports he learns also of cloud formations, height, types and composition as well as their movements, plus all ocean and ice conditions and movements. Special messages give on-the-spot descriptions of unusual meteorological phenomena or incidents observed.

The data received at Ladd Field is relayed via normal weather teletype machines to all parts of the United States, Canada, Alaska and even Hawaii. In a matter of thirty minutes or less this information from the plane high over the polar ice cap is being read off the tape in the land of the flower lei, even while the plane is still in flight sending back later information from further along the great loop to the Pole.

'Twas The Night Before The Contest

BY IDA NOVEMBER

(with apologies to Clement Moore)

'TWAS the night before the contest, and all through the house
Not a creature was sleeping, not even a mouse.
The models were placed by the chimney with care,
In hopes that no one would step on them there.
The children were nestled, all snug in their beds,
While visions of trophies danced in their heads.
And I in my housecoat, and Pop in his jeans,
Were packing his lunch of meat and of beans.
When out on the lawn there arose such a clatter,
He sprang to the window to see what was the matter.
Tore away the curtain and blind like a flash,
Pulled at the window and almost fell out the sash.
For what to his wondering eyes should appear
But a rickety car and eight free-flight jobs dear
To the heart of the driver, so lively and quick—
We knew in a moment it must be our friend Nick!
More rapid than eagles his motor it came,
And he whistled and shouted and called us by name!
"I've got my Hornet, McCoy, Super-Cyke, and Phantom;
And Vivell, an' Atom, an' Arden and Bantam!"
We drew in our heads, and were turning around,
In the door Nicholas came with a bound.
He was dressed in coveralls from head to foot,
And his clothes were all tarnished with grease and with soot.
A bundle of lunch he had flung on his back,
And he looked like a peddler just opening his pack.
"Hey, are you ready, we've got to leave soon,
We can make good time by the light of the moon!"
Quickly the planes were stowed in the car,
And the sacks of lunch—the field was so far.
They sprang to the car, to the kids gave a whistle,
And away they all flew like the down of a thistle.
But they heard us exclaim, 'ere they drove out of sight,
"Good luck to you all, bring a trophy tonight!"

Secretaries of clubs not included in the directory beginning on page 62, or incorrectly listed therein, should complete the form below and mail it to *Air Trails*, P.O. Box 489, Elizabeth, N. J. Please do not send the information by letter.

ROSTER OF AMERICAN MODEL AERO CLUBS

(PRINT OR TYPEWRITE)

[MAIL TO AIR TRAILS PICTORIAL, BOX 489, ELIZABETH, N. J.]

CLUB NAME ______

MAJORITY OF MEMBERS RESIDE IN WHAT COMMUNITY? ______

MEETINGS HELD WHEN ______ WHERE ______

YEAR ESTABLISHED ______ NUMBER OF MEMBERS ______

AVERAGE AGE OF MEMBERS ______

SPONSOR (IF ANY) ______

SPONSOR'S ADDRESS ______

ACTIVITIES—(CHECK):
( ) INDOOR ENDURANCE
( ) SOLID SCALE
( ) FREE-FLIGHT GAS
( ) RADIO CONTROL
( ) GLIDERS
( ) OUTDOOR RUBBER
( ) FLYING SCALE
( ) CONTROL-LINE GAS

OTHER: ______

NAME(S) OF ANNUAL INVITATION CONTESTS AND USUAL DATES: ______

______

______

NAME, LOCATION AND APPROX. DATE(S) OF ANNUAL EXHIBITIONS: ______

______

NO. CLUB MEETS PER YEAR ______

SEEKING NEW MEMBERS: ( ) YES; ( ) NO

MODELS FLOWN WHERE INDOORS ______

MODELS FLOWN WHERE OUTDOORS ______

A.M.A. CHAPTER? ______ IF "YES," WHEN CHARTERED? ______

NAME OF CONTACT MAN ______

ADDRESS ______

CITY ______ ZONE ______ STATE ______

POSITION IN CLUB ______ TELEPHONE NO. ______

IS THIS (CHECK) ( ) ADDITION, OR ( ) CORRECTION TO PRESENT LISTING; OR ( ) NEW LISTING?

DATE ______ SIGNED ______

[ATTACH NAMES OF CLUB OFFICERS AND COPY OF CLUB EMBLEM IF ANY.]

DON'T MISS THE
Big December
AIR TRAILS
CHRISTMAS ISSUE

GLO-DEBBIL

(*Continued from page 50*)

the pod can now be slotted and cut to receive the mounts, the wing, and the motor.

With the engine mounted, scotch tape the upper half of the pod to the lower half and start on the cowl. Cowling is made of three parts: the sides of $\frac{1}{16}''$ sheet balsa, and the top of $\frac{3}{8}'' \times 1\frac{1}{2}'' \times 3\frac{1}{8}''$ soft balsa. Scotch tape the cowling top directly to the top of the engine. Complete by pinning the two sides to either side of the top, and glue the cowling to the upper half of the pod. After it has dried, a cowling slot and the ram air hole is cut in the front of the cowling. Do not glue pod halves yet.

The wing is cut from a sheet of $\frac{1}{4}''$ medium hard sheet balsa. Templates of the airfoil sections should be cut out of heavy cardboard. Carve wing to general airfoil shape and finish by sanding to the template sizes. Cut-outs for the bellcrank can now be made and bellcrank assembly glued to the underside of the wing. The bellcrank assembly consists of the bellcrank, one 4-40 bolt and nut, two washers, and a mounting block ($\frac{7}{8}'' \times \frac{7}{8}'' \times \frac{1}{8}''$ plywood). Assemble as shown, with one washer on either side of bellcrank. Slot underside of inboard wing $\frac{1}{16}''$ deep and $\frac{1}{16}''$ wide to receive lead wires. Aluminum tube guides are next inserted in the wing tips and glued heavily. Slots for the lead wires can now be covered with $\frac{1}{32}'' \times \frac{1}{8}''$ balsa capstrips. Care should be taken in applying capstrips so that they will not hinder movement of lead wires.

Next comes the boom, cut from hard $\frac{1}{2}''$ sheet balsa. After shaping to required size, boom is slotted in same manner as wing to receive push rod. Carve half round hole in rear of boom for control horn.

Stabilizer is cut from $\frac{1}{8}''$ medium hard sheet balsa and sanded to a symmetrical shaped airfoil section. Control horn should now be bent and inserted into flipper and glued generously.

Wing is glued in place on upper half of pod. Boom is next cemented to the upper portion of wing—care should be taken at this point to insure parallel alignment of boom and center line of pod. Push rod is bent to conform with that shown and put in place attaching to the bellcrank and control horn. The horizontal stabilizer is glued to the boom and hinges inserted, bent, and soldered as per plan detail. To complete the structure, glue the lower half of pod to the upper half.

After assembly has been completed engine cowl may be cut off the pod follow-

"I suspect he's planning to desert me first excuse he gets."

ing the same general cut shown. Method of holding cowl on the pod is optional. Scotch tape was used on the original model and proved very satisfactory, but inside clips or a hold down bolt may be substituted.

A wood filler should be used on the entire ship before painting. One of the best fillers we have found consists of talcum powder and dope mixed to a thick brushing consistency. Apply at least two coats of this mixture to the ship, sanding between each coat with #400 wet or dry sandpaper. The ship can now be color doped. Light sanding between each coat will give a lustrous finish. After completion of doping apply a light coat of spar varnish to the entire ship to protect the finish from hot fuels.

The tank shown on the plans has proved to have ample capacity for the Torpedo and smaller engines. The original tank was built of .004 brass shim stock; however, lightweight tin may be substituted. Proper placement of the pick-up tube in the tank is of utmost importance. The end of the tube should be placed 1/4" from the end of the tank and approximately 1/4" from the bottom. The filler and pick-up tubes are of 1/16" inside diameter brass, while the vent tube is of 1/32" inside diameter brass. During flight the filler tube should be plugged, and this is done easily by threading a small wood screw into the end of the filler tube.

A good menthonal base fuel, such as Supersonic 100 has proved to operate very satisfactorily. After much experimentation it was found that by moving the heating element up or down in the plug housing the engine would gain or lose speed. This proved conclusively that the heating element position was a prime factor in obtaining the maximum horsepower from any given engine. To find the right position is purely a cut-and-try proposition. If the plug is running too cool the engine will sound as if the spark is retarded on a regular ignition engine. The remedy for this is to pull the coil down out of the plug housing. Caution must be taken in this operation to prevent breaking of the element. If the engine has a cackling sound and runs hot you will know that the heating element projects too far out of the plug, and must be pushed in slightly. A movement of from five to ten thousandths of an inch is all that is necessary to give both extremes.

Take-off dolly construction is self-explanatory. Care should be taken to wrap and solder joints well. After completion, check to see that dolly tracks correctly, turning neither to the left or right. If when flying, the ship has a tendency to come out of the dolly before flying speed is reached increase the height of the wing stop wires.

The prop shown is designed expressly for 30-cu.-in. engines, but if a smaller engine is used it is advised that the builder follow the general outline and airfoil sections shown.

While all the highlights of speed flying could not possibly be packed into one article, the hints that have been given should insure satisfaction.

SOLO CLUB

(*Continued from page 30*)

times they are variants of older angles, but the new approach may mean more to pilots. Then, too, this is one item where repetition is necessary. . . . We have to keep hollering about it day in and day out. The more specific the presentation, the better.

"Fourth, why not set up a program so that every Solo Club member will locate others in his community, and encourage them to form local aviation clubs. The aim should be fellowship, and the promotion of flying in that locality. Our Oklahoma bunch is on the right track. Stimulated by Eldron Stout, our State Director of the Aviation Commission, and a few others, the . . . Oklahoma Aviation Association has been resurrected and rejuvenated. Where it used to charge $20 a year from operators it now charges $1 a year from everyone. Anybody interested in aviation is eligible for membership. Little by little they are succeeding in forming local aviation clubs, bringing the high school crowd into the picture, and results look very encouraging.

"Fifth, once a month you could feature a new, small community airport—the minimum sized outfit, the 1,800-foot single landing strip. Because if we need anything in private flying we need thousands of new landing strips. They are the minimum essential of a healthy personal flying industry. I am bullish about the close-in, single-strip, turf, landing field, with or without the other desirable features, such as fuel, hangar, and so on. Just a place to land and tie down. Thousands of communities can afford that start. I am also in favor of state systems of landing strips adjoining highways, close in to towns, intalled and maintained by state highway departments.

"Sixth," Si winds up, "sell the members on the basic idea that to be a pilot is also to share the responsibility of helping personal flying to grow into a safe and valuable member of the transportation family. Learning to fly opens up a whole new world. As pilots we slowly learn our way around in it. Can we teach others our new found knowledge? I don't know, but I believe we should try."

You will be surprised, Si, to learn that all but one of your points has been discussed at headquarters with a view toward getting action as quickly as possible. Your suggestion of reporting close-in air strips is a good deal and this, too, will be added to the agenda. Headquarters has been working on the possibilities of putting members in touch with other Solo Clubbers in their vicinity, but this may take time. Your other points would seem to be a clear cut guide to fellow members on the kind of information we hope to publish with their assistance from month to month.

Utility, the point which looms uppermost in Lund's estimation, is an odd thing. To the layman utility means simply that a plane should be as useful as an auto. Like the farsighted visionary he thinks in terms of detachable wings, folding wings, and combination auto-planes that could ferry bread and baloney from the corner delicatessen or cart the kids to Aunt Jenny's. Some day it may come to that. But utility, right now, is not a matter of radical designs. It is simply a question of getting more out of the planes we have today.

Like most eastern pilots who have had the good luck of a few cross-country trips into the open spaces, contact with western and southwestern pilots has been a definite shock. That the flying farmer, the cattleman, and others could use a plane like we use an auto may be explained by terrain and weather. But perhaps there is another important difference. Perhaps our viewpoint is different. In the opinion of some people who get the most out of their airplanes, the typical easterner is conservative, cautious, and overly serious about his flying.

One western pilot puts his finger on a sore spot. "I would like to say something about the so-called 'wild boys' of Texas, Oklahoma, and the vicinity," he begins. "It is undoubtedly true that most of the type that gives the impression of braggadocio and recklessness are found in 'these here parts,' but I think it is a mistaken impression. Last summer I wanted to fly at Minneapolis, but they had closed flying for the day. Why? There was a 15-20 mph wind, somewhat shifty, with turbulence near the ground. Even dual had shut down. In Wisconsin I found the same almost neurotic attitude toward flying when conditions were not ideal, a sort of attitude that the personal airplane should not be trundled out unless things were just right, because it is a sort of impractical gadget anyhow. In the east I have found the same thing, a kind of neurotic fear of the airplane and an almost worshipful attitude toward the person who flies.

"On the other hand," continues this westerner, "in our country the airplane is increasingly being accepted as a matter of fact. Being a pilot impresses no one.

The airplane is accepted as a practical gadget, and it had better get in there and pitch when we want it to. If the wind is blowing 25 per, what of it? We want to go to Amarillo, and if that gadget can't stand the wind, what good is it anyhow? We might have to wait two weeks for the wind to go down, so off we go. At training fields, particularly those using Cessnas, it isn't at all unusual to see an instructor send a student solo in one of our usual breezes because that is what the student has been learning to fly in. Our flying farmers fly in and out of fields which are so small and obstructed that in other parts of the country even the experienced commercial pilot would be impressed. The airplane is just another machine and it had better do what it is supposed to do."

Touchy stuff to us easterners, this idea that we fail to get the maximum utility from our flying because we baby the airplane. "But aren't you people foolhardy?" we retorted.

"Sure, we have our share of the show-offs but that is a horse of a different color," he came right back. "Even that can be understood in the terms of the ways and traditions of our people. That has been the prairie for the past 75-100 years, not long ago with the horse and then the auto, and now with the airplane. Some of the crazy flying stunts one sees at the air shows almost give one gray hair. I have no patience with that kind of stuff but realize it is part of the pattern of living in these wide open spaces. The midwesterner, particularly the southwesterner, has a sardonic sense of humor about his airplane, while the pilots in other parts of the country are so dreadfully serious about it. Which will add to the air age the fastest, I am not sure. When it comes to exploring the uses of the airplane our people are tops. There isn't anything they won't try.

"Our problem," concludes the man from the open spaces, "is to encourage exploration and experimentation, and the acceptance of the airplane as just another commonplace tool of living, but always to build an attitude of maintaining at least a slim margin of safety. I wish for the east that it would lose its seriousness concerning the airplane. I have talked with pilot-owners of float planes in downtown New York and they are amazed at their prowess in commuting up and down the river." Thanks, sir, we'll accept that contribution on utility in the spirit with which it was given. Any comment, easterners?

Still another aspect of the utility question is personal aircraft rental. Many people feel that most private pilots have no business owning an airplane, unless it can be used in connection with a business or profession, or unless they have that kind of money. But there must be some way of setting up rental so that private pilots can afford to fly, and so be encouraged in making use of their skill. With about 3½ to 3¾ gallons an hour, and practically nothing complicated to cost maintenance, an operator should be able to rent a ship like the Piper Vagabond

for $6, and maybe as little as $5, an hour, and still make money provided he is able to keep the thing busy. For two people this would work out to something like 2½ cents a seat-mile.

Various schemes are being tried in the midwest and southwest. One reader reports renting a Bonanza at nine cents an air mile, plus 40 cents an hour for time away from base. Cessna 120's and 140's may be rented at six cents a highway mile, averaging out slightly more than $8 an hour for the operator. One operator is renting Cubs at $10 a day and you-buy-the-gas, but our correspondent thinks that a trifle high. How that stacks up against the eastern scale is indicated by a large metropolitan operator who gets $25 a day and you-buy-the-gas for a Piper Super-cruiser.

Si Lund, whose comments preface this month's column, mentions his interest in the Mooney, a little job that has set more that one pilot to raving (June, 1948, *Air Trails*). It is reported to make better than 100 mph and on two gallons of gas an hour. Landing speed is said to be 32 mph. Lund, who travels widely, and as much as possible by private plane, states that a ship like the Mooney would be useful in 90% of his trips. If such a job could be rented at $5 an hour, or perhaps $5 plus a small hourly charge to cover insurance and overhead, there should be plenty of takers. The trouble is that when a ship like, say, the Vagabond comes along we immediately want more speed, more climb, more power, and naturally get a higher rate of fuel consumption. And then we beef about the cost!

Bulletin Board: Reputedly the busiest airport in the United States, Teterboro Airport has been sold to the New York Port Authority for $3,115,000. Until the developing regional air terminal program requires the expansion of Teterboro as one of the chain of fields by 1956 or sooner, the present type operations will be continued.

Speaking of airports, T. T. Hannah, director of airports, Riverside, Calif., informs us that Riverside has become the sponsoring agent for a system of highly developed ex-military airports. The second largest county in the United States, Riverside has airports widely scattered, including some in the desert which would make excellent emergency facilities to fit into the national airport plan. County-wide airport dedication ceremonies were to be held October 23 and 24. A supper flight to Ryan Field, at Hemet, was to be held on the 23rd. Though not intended for any particular branch of flying alone, the Riverside County fields are available to private flying.

Lindberg Instrument Co., of Berkeley, Calif., has announced a carburetor ice detector which will warn a pilot when to turn on carburetor heat. Any improvement in this field of carburetor ice trouble is welcome.

With CAB almost hopelessly behind on safety cases, some 24 states have their own special investigating agents. The vast increase in certificated pilots and planes apparently is going to force the trend toward state, and not federal, policing. CAA-CAB alarmists should not overlook the splendid safety program prosecuted in Pennsylvania when show-off flyers had entire sections of the state up in arms about private flying. Under William L. Anderson, state director of aeronautics, and with the co-operation of the State Police, the Keystone State has done a job that is a credit to the nation.

HOW I QUALIFIED FOR MEMBERSHIP IN THE SOLO CLUB

By L. E. "Smoky" Lippoldt

I guess it all started back about 1927 when I took my first ride in an old Ryan high-wing job. It was one of those that us five passengers sat in the cabin while the pilot sat in an open cockpit above and forward of us and above and back of the engine.

Incidentally the pilot and passengers all got killed in it a few days later.

Ever since that day back in 1927 I have been very much interested in aviation. From then to about '42 or '43 I bought every aviation magazine I could lay my hands on. Since '42 or '43 I am gradually cooling off towards airplanes.

Back in "those" days magazines ran plans on how to build your own airplane, such as the Driggs Dart, the Ramsey Flying Bathtub, the Open Corben Baby Ace, the Cabin Corben Baby Ace, and a two-place side-by-side Corben, the Pietenpol Aircamper, the Pietenpol Sky Scout, the Harlequin Longster, the Church Midwing, the Heath Parasol, the Heath Midwing, the Heath Low-wing, the Crawford Powered Glider and so on. Then there was a biplane powered with a Chevrolet 4 motor and several other biplanes and monoplanes including one powered with an out-board motor boat engine. I was dreaming of the day when I could build and fly my own.

I took many rides in an OX-5 powered PT Swallow, a Butler biplane and many others including a free ride in a Ford Tri-Motor.

I built a glider from plans. It was a Duede glider. It had warping wing controls. I traded it off before I got it covered.

I had an open Corben Baby Ace that I traded off before I ever got to fly it.

I had the wings and tail surfaces from a 42-ft.-span secondary Cessna glider and built a two-place tandem open-cockpit type fuselage with a two-wheel landing gear similar to a Heath, but a wind storm tore it up before I got it covered.

I also built a one-wheel ground trainer that I powered with a 1912 Excelsior single motorcycle engine.

Well! Finally, in August 1935 I went to Wichita to visit an uncle of mine. He claimed the personnel manager at the old Stearman Aircraft Co. was a personal friend of his and that he would "get me in" at Stearman's. So we went out to Stearmans and the manager acted

like he didn't even know my uncle. Anyway he asked me if I had ever built any models and I had to say "no." I told him about my other exploits in aviation but he said "no." But he did tell me that if I'd learn to fly he'd give me a job just as soon as I soloed. . . . First thing I had to go get was my student permit from Doc Palmer. In the physical exam I qualified for the highest possible rating at that time (September 5, 1935): Transport Rating.

The morning of September 6th I was out to one of the flying services bright and early and anxious and with my 60 bucks. There was one mechanic on duty and I told him what I was there for and he told me that the boss wouldn't be there today but he'd take me up. I found that the operator was a sort of flying salesman test pilot and that at the time he was in Mexico City trying to sell the Mexican Government some planes. And he did sell them some.

Well! The mechanic and I rolled the old 2,000 model up. Of course in those days we didn't have wheel brakes nor even a steerable tail wheel. Just wheels and a tail skid and an OX-5. The mechanic gave me a few preliminary instructions as to what his hand motions meant and then I crawled into the rear cockpit and him in the front. I "cobbed" the engine and wham my goggles went over the back of my head but I hadn't noticed it yet.

From in front of the hangar I headed north and was in the air in no time at all for those days. About this time I discovered my goggles weren't on my face. I put them on and then flew on a few miles north till I reached 2000 feet then made a slow right hand turn with the correct amount of bank (no turn and bank) and headed south until I was even with our hangar and then made a slow banking 90° turn to the right and headed south a few miles and then made another 90° turn to the right heading west till nearly in line with the field landing strip that we used then making another 90° turn north into the wind. All this accomplished from watching the mechanic's hand movements in the front cockpit.

Then when we got about a mile from the field and right in line with the green grass strip he waved both of his arms back so I pulled the throttle back and took my feet off the rudders and my hand off the stick. Down and down we glided and we just went over the phone wires and we were still heading down. I knew that he should start pulling the stick back but it was still in neutral. At the last second I grabbed the stick and yanked it clear back in my lap, and the wheels went thud, thud, thud, and we rolled to a stop, then he motioned for me to taxi on up in front of the hangar. He crawled out first and then I crawled out. He said "What did you say you came out here for?" I said, "I came out here to learn to fly." He said, "You ain't kidding *me*, you know how to fly as well as I do." I said, "I don't either, this is my first time at the controls." Boy! He about passed out right there. He said, "The ---- you don't know how to fly, you made too good a landing to make me believe that."

I said, "I didn't make the landing, I wasn't even on the controls." He said, "What? I wasn't either."

He wouldn't take me up any more so I had to wait till the operator got back and then I bounced the ship all over the field.

I also took time in a 3000 model OX-5T Travelair that was built for a Wright J-5. Overpowered, ha! It took four or five months to get four or five hours.

Then I switched over to another flying service and soloed in a Velie Monocoupe in a total of 6½ hours, in March, 1936.

I logged 32 hrs. and 23 min. and then went to Chanute, Kansas and bought me an OX-5 GXE Waco for $400.00. A friend of mine that had a Private, flew it to Wichita for me and when he landed at Cessna field he taxied into an automobile and tore up one wing and broke the prop.

I had Cessna fix the wing and my friend Smitty paid for half of a new prop. Then a few days later he went up for a test-hop and lost the magneto drive gear at 2000 feet over Wichita. This time he glided it two miles to the edge of town and landed in a barbed wire fence.

Then the next day we took the missing part out of another OX-5 and put it in mine and another friend of mine, one of the Rodin Brothers, that now build hatches for Fairchilds and Stearmans, flew it out of the field and back over to Cessna's with the fabric on the undersides of the lower wings and bottom of fuselage all ripped up and 3 ribs and the trailing edge ripped out by a fence post. Their ship with the OX-5 was homemade and looked much like a Curtiss-Robin but faster.

Again Cessna fixed up OX-5 GXE Waco NC777K.

Then I wanted to fly it home but Bill Vacin wouldn't let me fly it. I was still determined to fly it home so I got busy and ground the valves and then the Dept. of Comm. Bureau of Aeronautics (now CAA) grounded it because I didn't have a mechanic's license.

That was when I was about fed up with aviation circles so I rolled the Waco out of the hangar and warmed it up one Sunday morning in August 1936 and took off with my brother Jim in the front cockpit as passenger.

I guess I'm a little ahead of my story. When it was grounded I gave a Cessna mechanic $25.00 to paint out the NC's and check the ship all over. And I put my student-permit and my AB-16 in an envelope and mailed them to Washington. That made me unlicensed and the ship unlicensed.

Then I took my brother up and we lost two spark plugs at 300 feet on the take-off and had to make a forced landing to get spark plugs. Then we headed 140 miles cross-country for home. Got 15 or 20 miles off course, but made it anyway. Went up to 4200 feet hunting for smooth air and finally found it at tree top level where we flew most of the way home. I landed in a plowed field and almost nosed it over. Two weeks later I flew it again and cracked it up. I ground looped it over on one wing and broke both wing spars and then it spun around and on the other wing and broke both spars and blew a tire and rolled down a wheel. I traded it off and that was almost my last flying.

Well then I took the fatal dive, I got married. My wife doesn't object to me flying but I can't afford it.

To top it all off—my wife not knowing what a log-book was for was using the backs of the pages for her grocery list from week to week and when I found it I only had the last page left. Hence no log book to prove anything.

But my friend Smitty now lives in California and has a commercial and he said he would verify 70 hours for me in a new log book.

Do I get the pin or don't I.?

Carbon Dioxide

Sirs:

It was with great pleasure that I found exactly the "crate" for my OK CO_2 in the September issue. I must compliment you on your selection of such an outstanding CO_2 model. I refer to Caldwell Johnson's "Phizz Bird." A super-duper for us "phizz-kids."

Air Trails becomes more and more a better magazine—sorta mellows with the years. But I'm going on record as one who is 100% in favor of much, much more CO_2 hints and kinks.

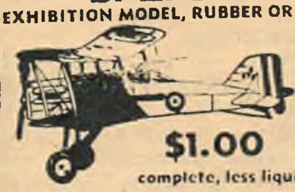
BILL CHRISTIANSEN, JR.
Dover, Dela.

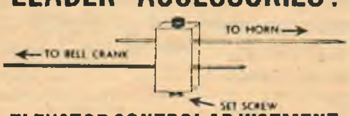
Sirs:

I have always bought *Air Trails* since 2 years ago and I have always liked your full size plans since you started putting them in the book. But—I wish you would quit putting in so many CO_2 models and have some good Class B and C control-line gas models in instead of A's, since most gas modelers have more B and C engines that A's.

DONALD RYAN
Annapolis, Md.

● "You can please some of the people . . ." We're interested in all sides of every question. Keep those letters coming this way. —THE EDITOR





The Readers Write

Arentz Booster

Sirs:

Let's have more articles by that lad Bob Arentz. His is one of the few intelligent approaches to lightplane flying I have had the pleasure of reading. If more lightplane pilots approached flying in the same manner he does the obituary columns would be substantially reduced.

Paul J. DuPree, Chief Pilot
Northern Airlines, Inc.
Seattle, Wash.

Try And Stop Us!

Sirs:

I like *Air Trails* very much and I hope you keep putting it out every month.

Kenneth Craig
Lakeland, Fla.

Sorry, Jerome!

Sirs:

Since when does 3,000 divided by 60 add up to 50.6? Where I come from it's just plain 50.

Otherwise, your magazine is very good and interesting, and also informative, but don't make any more mistakes as atrocious as the aforementioned as I am only 12 and I detected your mistake immediately.

Jerome K. André
Ancon, Canal Zone

Plan Fan

Sirs:

I have been reading *Air Trails* for a number of years. I think that your magazine is one of the best in the aviation field. This is just one of the reasons why I am sending for the full size model plan #102.

James F. Connollen, Jr.
Elizabeth, N. J.

"So Much For So Little"

Sirs:

I am 12 years old and have been reading *Air Trails* for 3 years and enjoyed every issue. In the August issue I liked the control-line Bojo and the Taylorcraft.

How about some oldies like the PT and Waco for CO_2 power?

In the April issue I liked the Waco and the Co-Ette. They both turned out very nicely.

I like *Air Trails* very much. You get so much for so little. Keep up the good work.

Darrell Brown
Sebastopol, Calif.

AIR TRAILS

ADVERTISERS' INDEX

November 1948

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 November, 1948, index.

RASCAL

(*Continued from page 44*)

application doesn't curl up a piece of tissue. This reduces warping tendencies and gives a gloss to the finish. Be careful not to use too much castor oil or the finish will be tacky. Decorations were marked on in India ink, painted with black dope and pin-striped with aluminum paint used in a draftsman's ruling pen.

Glide-test the ship until an even glide is obtained, shifting the wing to obtain balance. Go easy on the winder on the first flights. Recommended adjustment is right turn in the power and glide. This will probably require a little right thrust. A small aluminum tab cemented to the trailing edge of the rudder serves as an adjustment for the glide. Shoot for a tight circle for better thermal riding characteristics.

When you get your version of the Rascal performing nicely, get out the old Kodak and take a few snaps, keeping in mind the tips that have been passed out on model photography in *Air Trails'* series on the subject. Send along several to the Dope Can.

With the Rascal on tap you can be assured of being in the money at contests and have a ship that will provide many hours of sport flying as well.

DROP ME A LINE

(*Continued from page 48*)

colored rubber model tissue. Choose a bright color such as red or orange for the sake of visibility. The fuselage and tail surfaces should be given three to four coats of clear dope; the wing, about six. You will notice that each successive coat of clear dope applied to the wing will increase its dihedral slightly. The final dihedral should approximate four inches at each tip and should assume a semi-elliptical curve.

Incidentals such as tow-hooks and wing retainers may now be securely cemented in place.

Before flying your model be sure to place your name and address in some conspicuous place, because this baby really likes to wander. The model may be flown in any type of weather but we all like those calm, sunny days. For calm weather use the rear hook. The forward hook should be used only in windy weather. You will find that this glider will tow practically straight with no compensating adjustments. You may adjust the glide for either right or left circle by warping the rudder or either trailing edge of the wing.

I am sure you will be amazed by the fine soaring ability of this model.