

AIR TRAILS

OCTOBER 1949

25 CENTS

Pictorial



EGG BEATER PARADE:
Pictorial History of U. S.
Helicopters—see page 21

Pattern For Soaring . . . THERMAL

From hot flat surfaces—plowed fields, roofs, highways—warm currents of air rise to produce a pattern for soaring. *This is the thermal.* As the air rises it cools—its moisture condenses to form cumulus clouds—the cooled air descends to repeat the cycle. *Weather has been created.* A scientific knowledge of these atmospheric conditions can turn weather from an unpredictable threat into a valuable aid to air transportation.

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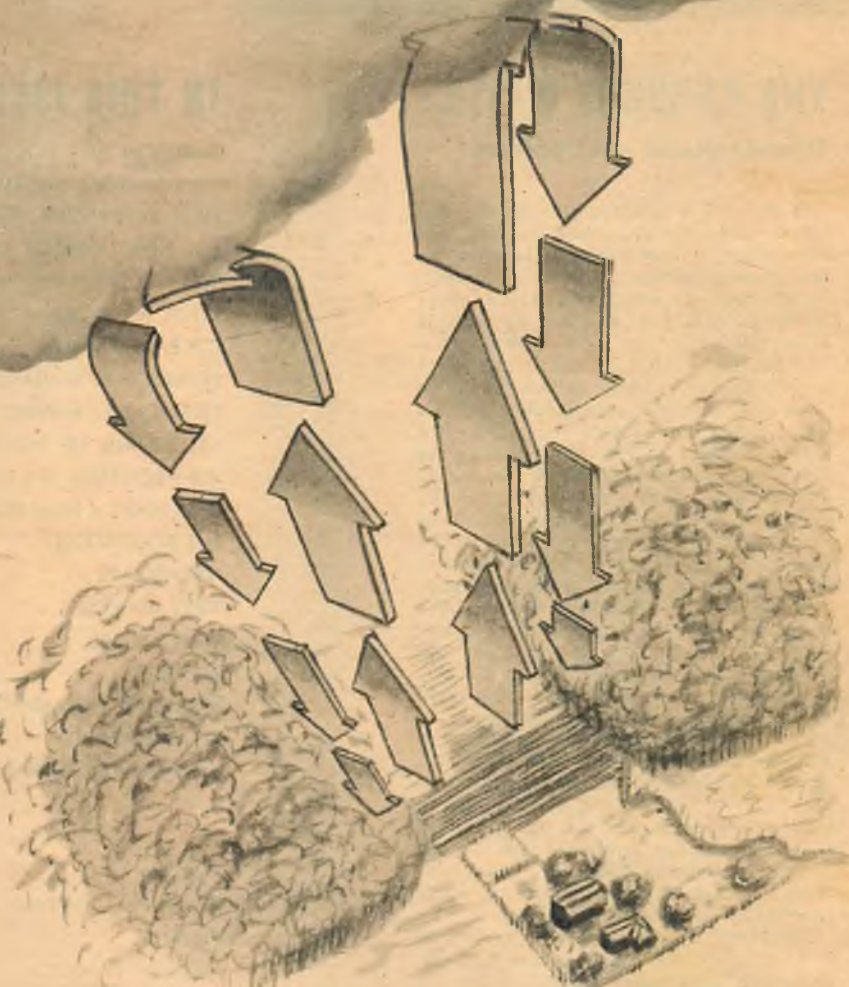
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AIR TRAILS

Pictorial

OCTOBER, 1949 • VOL. XXXIII, NO. 1

The four helicopters on this month's cover are typical of the progress that rotary wing aircraft has made since the time Igor Sikorsky lifted his skeleton-like VS-300 off the ground at Stratford, Conn. It is due to him and all other helicopter designers that the United States is leading the world in the design of this aircraft.



THE READERS WRITE:

Over-Emphasis on Contests?

Sirs:

It is with increasing uneasiness that I have noted the important position that the contest is beginning to take in the model aeronautical scheme of things. It has come to such a state that many modelers will just as soon fly outside of a contest as do eight hours' work without pay. This seems to me to be a very unhealthy state, as the basic idea of a hobby is to get pleasure out of doing something creative for its own sake, instead of for what prizes or glory one may get out of it. In model aeronautics, however, the creative aspects of designing, building, and flying for their own sake—the inherent satisfaction in a good piece of workmanship or a successful flight—have been submerged and subordinated to the all-important issue of making one's plane zoom higher or zip faster than the other fellow's, in order to get a large hunk of metal which will sit on a shelf gathering dust from that time on.

One of the arguments most often used to justify contests is that they contribute to the technical development of the hobby. However, I believe that a thorough examination of the situation will indicate the opposite. Out of the infinity of designs possible, a very few, chosen for their contest ability, have practically dominated the field...

However, the worst effect by far of the contest is the change it makes in the modeler's enjoyment of his hobby. In free-flight, the trend is to overpowered jobs which are a real strain to fly. In speed, the winner is the best engine mechanic, machinist, and hot-fuel chemist. In stunt the trophies go to the man who spends back-breaking hours practicing his routine. The overall result of all this is similar to what has happened in professional sports, where what was originally fun has now become a nerve-racking rat-race. Also, many people with limited ability or means will become discouraged competing with the

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Letters to the Editors

All communications to the Air Trails editorial offices should be sent to Air Trails, Box 489, Elizabeth, New Jersey.

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Displ.	.199	.299	.350	.610	—
Bore	.660	.812	.880	1.000	3/16
Stroke	.562	.562	.562	.777	3/16
Horsepower	1/7	1/6	1/5	1/4	—
RPM	7,500	8,000	8,500	9,000	variable
Prop.	8"	10"	11"	12"	5 1/2"
Weight	4	4 1/2	4 1/2	9	7 1/2

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 scooters, lawn mowers 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!

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BUZZ Engines recently passed their first Birthday. One year has passed of selling these famous engines to hobbyists all over the world. The letters and enthusiastic comments we have received make us proud of the fact that we can supply quality engines at this low price of only

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ONLY \$4.95



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Showcase

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

Patrol Emblem→

A neat rubber stamp for applying the Civil Air Patrol emblem to stationery, equipment, clothing and the like is available from Federal Supply Co. (135 Henry St., New York 2, N. Y.). It locks into blue ink pad and fits into vest pocket. Very useful item for CAP units and individual members. \$1.95. Outfit has price list covering many items for Patrol.



←It's a Daisy

Fall fun is in store for you with a Targeteer air pistol outfit made by Daisy and available from Trymo (81 Chambers St., New York City). Sells for \$2.95. Includes big, well balanced air pistol with 500 special calibre .118 shot, targets and steel spinning "birdie" targets. Sounds like fine anti-aircraft gun for use with catapult-launched balsa gliders.



Canadian Fuel→

Canadian readers will be interested to know Moro Craft (Box 4154, Edmonton, Alberta) now has available Supermite glow fuels. Comes in two formulas: racing and standard. The racing fuel has hot methanol base with special grade of castor oil lubricant for higher compression motors. \$1.25, 16 oz. Other is for lower compression engines, \$1.15, 16 oz.



←How much wood, would...

"Chop, chop," says Southwest Model Aircraft (915 South Main, Stillwater, Okla.) of its Woodchopper control-line kit. Wing span is 32 inches; wing area, 223 sq. in. For engines of .19 to .36 cubic inch displacement. Priced at \$2. Preshaped trailing edge, all parts sawed to shape. Will fly from a standstill in mid-air, so there's no landing gear.



It's a setup!→

Carry your work bench with you out to the contests! An aluminum folding table, the Foldaway, is distributed by B. Paul (6th & Market Sts., Philadelphia, Pa.). Opens with a snap of the finger to a working space of 2½ feet by 5 feet. Stands 19 inches off the ground, weighs 18 lbs., will hold 800 lbs. without sagging. Rustproof. Retail for \$18.95.



Showcase

Try your nearest hobby shop for items presented here. Write the manufacturer if you can't find it.

Carl's Cumulus→

Carl Goldberg's newest design is his free-flight Cumulus manufactured by American Hobby Specialties, Inc. (2635 S. Wabash Ave., Chicago 16, Ill.). Has 54" wing, 35" length, 3 sq. ft. of wing area; weighs 16 oz. without engine. Wing has straight taper with elliptical tip; fuselage is fully sheeted, has cooling duct for engine. Model has a new-type dethermalizer.

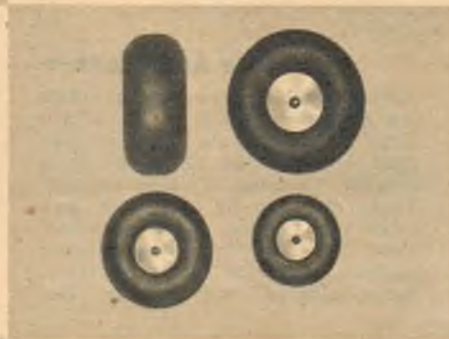


←Hey, See!

An entirely new spark plug for all model engines is the description that AC Spark Plug Division, General Motors Corp., gives to its latest "sparking" plug (as our English friends would say). Has patented seals and Coralox Insulator as on AC's full scale aircraft and automotive plugs. Stays gas-tight, clean. Available from your hobby dealer.

Big Wheel from Chi→

New sponge tires on precisioned machined aluminum hubs are offered by A & M Super Products (3352 W. Montrose Ave., Chicago, Ill.). Tires are of high quality, oil-resistant Neoprene. Wheels come in sizes of 7/8 inch diameter, 1 1/8 inch dia., and 1 3/8 inch dia. Priced at 10c and 15c, depending on size. Firm says wheels insure trouble-free landings.



←Bob's Rite

In addition to his line of "Rite-Pitch" gas tanks (horizontal, square, vertical and stunt) and his Formula 11 cement, Bob Roberts (32 W. 5th Ave., Gary, Ind.) offers Rite-Pitch props in 3 versions: Regular, Super Stunt and Special. The first two sell for 50c and 60c depending on size, the Specials for CO₂ motors retail at 35c each. Dimensions in his ads.



Now hear this→

A complete, two-way intercommunications system patterned after U. S. Army-Navy equipment is manufactured by Remco Industries (6602 Fresh Pond Rd., Brooklyn 27, N. Y.). Fool-proof construction, high volume level of operation. Electro-magnetically operated. Requires no batteries or external power. Ready-to-work Walkie-Talkie set is \$2.95.



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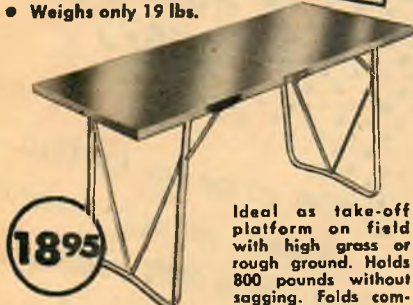
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Showcase

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

News from Newark→

Kingpin is new stunt control-line model put up in kit form by Scientific Model Airplane Co. (218 Market St., Newark, N. J.). Carved balsa fuselage, shaped and notched leading and trailing edges, formed landing gear, die-cut ribs and bulkheads, rubber wheels and fittings. \$3.95. 200 sq. in. wing; for engines from .099 to .29. Wing chord 8", span 28".

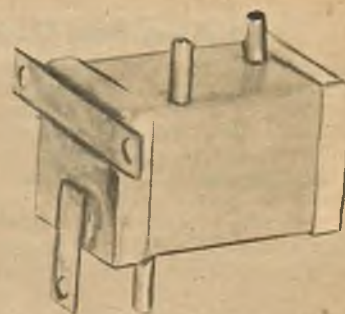


←Let's glow, Gus

Super Glo-Gas selling for 49c per pint is new Sportco formula of nitrated gasoline with petroleum lubrication. Will not affect dope finish on model, or cement joints. Put up by Sportco Products (4815 Frankford Ave., Philadelphia, Pa.). Firm also makes Super Glow, Super Atomic, Super Duper and Super Diesel fuels and special lubricators.

New Acme Tank→

Acme Model Engineering Co., (8120 7th Ave., Brooklyn 9, N. Y.) adds a Type "D" tank to its line. This goes good with the O&R 19, 23 and 29 as bracket fits back of these engines. Tanks also can be used with any other type engine. When mounted, Type "D" tank fits between engine mounts. All-brass construction, comes soldered, ready for use. 79c.



←New Tissue

A new model airplane covering tissue is Sky Sail made by the Whitfield Paper Works, Inc. (409 Pearl St., New York 7, N. Y.). Comes in colors and white. Insoluble in water, it is strong, yet soft, easy to apply. Modelers can acquire free get-acquainted book of samples from Whitfield or from their model dealer. Firm has made paper since 1869.

D.D. from D.D.C.→

A new stunt model designed and tested by a model club is the Di-Doe put up in kit form by the D.D.C. Model Mfg. (635 Porter Ave., Warren, O.). Has pre-cut parts. Wing span is 28 inches; overall length is 18½ inches. For large Class A and all Class B engines. \$3.95. Firm says Di-Doe is guaranteed to perform all A.M.A.-recognized stunt maneuvers.



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Development Highlights



● New nose for the Thunderjet. An experimental Republic F-84 featuring flush side inlet ducts instead of conventional front opening. This modification permits installation of radar gear.



● Lockheed XF-94. Latest Air Force jet fighter intended for 24-hour all-weather operations. Scheduled for early production, the fighter features after-burner, complete radar installation.



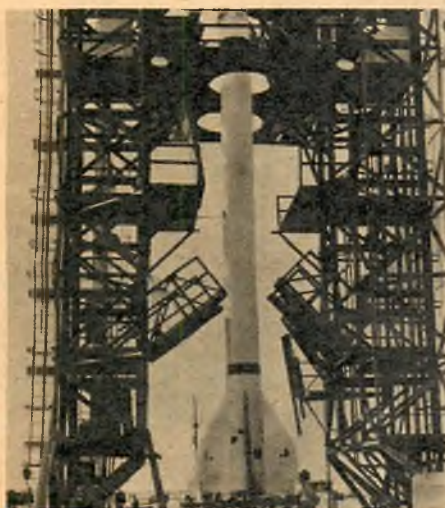
● Lockheed PO1-W. This Navy Constellation was built to test airborne electronic devices now in development. Note rows of spike-like antennae just ahead of topside radome. Range is 5,000 miles.



● The Heliplane, stall and spin proof, was designed by Prof. Otto Koppen of MIT and Lynn Bollinger of Harvard. Lands at 30 mph, takes off in less than 100 ft. Propeller has nine-foot diameter.



● Douglas Super DC-3. This modernized version of the famous twin-engined airliner has newly designed outer wing panels, longer fuselage, larger tail surfaces, and two higher powered engines.



● First American-designed high altitude research rocket, the Viking, built by Glenn L. Martin Co. for the Navy. Attained altitude

of 51½ miles during tests at White Sands, N.M. Missile is 45 ft. long. Speed, 2,250 mph. Is expected to reach altitude of 200 miles.

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



Wing-top classroom—an example of how engineering instruction at Northrop comes vividly to life in an actual aviation industry environment.



All-wing glider designed by Northrop engineering students—a typical training project for practical design and production experience.

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New Roles For The Wings

Northrop's B-35 Flying Wings, which flopped as piston-engined bombers and are being converted to jet power, now are being given several new research parts to play. One will serve as a flying test bed for a powerful new turboprop engine, the Turbodyne XT-37-1 developed by Turbodyne Corporation for the Air Force. The Wing, with designation of EB-35-B, will have the Turbodyne installed just left of center in pusher fashion. Wing will take off with its six Allison J-35 engines. When the desired altitude is reached, these will be cut back and the Turbodyne operated. The first evaluation flight is scheduled to take place late this year.

Six other B-35's being changed to jet power will be known as YB-35-B's and will be used for non-tactical purposes in advanced exploration of Flying Wing type airplanes. An eighth, the YRB-49-A will be equipped with full long-range reconnaissance devices.

One B-35 will be kept in original configuration. The other four of the original 13 are being cannibalized for spare parts. All the converted planes will have new Allison J-35 engines, with four submerged in the wing in dual bays and two suspended in individual pods.

Long Range Plan

Work is under way on the joint Army-Navy-Air Force long range rocket proving ground approved by Congress in the spring. It will extend from Cape Canaveral, Florida, over the Bahamas and out to impact areas in the clear Atlantic Ocean, with check and control points on islands en route.

Home base of the project will be the Banana River AFB, on which necessary rehabilitation is being started. Initial construction of the launching area on Cape Canaveral is also on the 1949-50 schedule. During 1950-51 there will be additional construction at the base and the Cape. A target base of July 1, 1951, has been fixed as the time the Joint Long Range Proving Ground should be ready for extensive guided missile tests, although limited tests may be made before then.

Museum Piece

A famous wartime B-29 which had been in storage at Tucson, Arizona, has left its cocoon and been formally presented to the Smithsonian Institution's National Air Museum. The ship is the "Enola Gay," which carried the world's first atomic bomb to Hiroshima four years ago. The plane was presented during the Air Force Association's big air fair in Chicago, then went back into storage. It will eventually end up with other famous planes in a proposed National Air Museum building to be erected in Washington, D. C.

Thunderjet Alterations

Republic Thunderjet seems to be USAF's fastest changing fighter. F-84D's of past few months are followed by F-84E's now in production, with still further changes being tested. E versions feature increased engine power, 180 maintenance excess doors in plane's fuselage, wings and tail; increased structural strength, longer fuselage, aerodynamic fins on wing-tip tanks, cabin pressurization and air conditioning.

Possible shape for future Thunderjets—flush side inlet ducts instead of the conventional nose air intake. Republic company, with cooperation of NACA, has produced one plane utilizing this development which has made successful experimental flights. One advantage would be room in the nose for radar equipment to aid in intercepting enemy planes.

F-80 In New Clothing

The Air Force's first jet fighter, the versatile Lockheed F-80, which has already been modified once into a two-seat jet trainer, is now making its appearance in a third guise as the F-94 night fighter. A prototype model is now flying, and production is scheduled to begin soon on an order for 110 planes of this type. Economies in both time and money are expected because wing, fuselage, and engine in new plane are the same as F-80's and will be built on parallel assembly lines.

The greatest difference is in F-94's extended nose section which houses radar equipment designed to search out and destroy enemy planes under completely blind flying conditions. Another added feature is an afterburner to give thrust for faster climb. F-94 will have the benefit of manufacturing experience gained in the production of more than 1,200 Shooting Stars.

Airman Career Program

As a further step toward making the Air Force an attractive career for aviation-minded young men, the USAF has begun a real Airman Career Program. It establishes a systematic plan of assignment and training and orderly advancement of enlisted personnel on consideration of ability, integrity, and initiative. Thirty-eight specific career fields are covered.

A similar program for officers is being developed. The programs for both officers and enlisted men are expected to be completed early in 1950.

Off Again, On Again

The Air Force has officially accepted Convair's delta wing research plane Model 7002, following a series of flight tests at Muroc, and has given it back the XF-92 designation which it started out with. Advanced research on the delta wing will be conducted by Convair under USAF auspices.

New Flying Classroom

The Air Force will soon put into service the first of its new T-29 navigational trainers which will have separate seats, desks, radio and radar equipment for 16 trainees. Thirty-six T-29's are on order, the first due to be completed in September. The trainer is a modification of the twin-engined Convair-Liner commercial transport. It has four astradomes atop a fuselage through which student navigators can take celestial sights. Unlike its commercial counterpart, the T-29 won't have cabin pressurization but will have an extensive oxygen system with individual outlets to give trainees experience with oxygen masks at high altitude.

Mission Accomplished

The first USAF tactical organization assigned to Alaska after the war to attempt sustained operations under polar conditions has come back to a U. S. base with its mission accomplished. The unit is the 72nd Strategic Reconnaissance Squadron which has completed three years of aerial photo-mapping of desolate areas of Alaska. Over 260,000 square miles were mapped by the squadron's RB-29 Superfortresses.

No strategic reconnaissance unit will be assigned to replace the 72nd, since virtually all remote areas of the territory have been photographed. Future mapping will be done by Strategic Air Command reconnaissance organizations on temporary Alaskan duty.

Connie With Humps

The Lockheed Constellation has joined the Navy in the role of a special test plane for airborne electronic devices. Navy is getting two of these specially modified Connies, designated PO1-W. The first has been flying since early summer. PO1-W is characterized by two large humps midway on the top and bottom of the fuselage. Fore and aft of these radomes spiny antennae run along the exterior of the plane. On experimental flights, full normal flight crews will be carried, in addition to technicians and electronic equipment operators.

Weather Ahoy!

The nations which cooperate in the maintenance of the North Atlantic ocean weather ship network have already made certain that there will be no break in this service when the present pact expires next June. They have signed a new three-year agreement to take effect at that time. The new pact calls for 10 stations to supply meteorological data, communications and rescue services. They will be manned by 25 ships of the United States, Canada, United Kingdom, France, Netherlands, and Norway, with cash contributions from Belgium, Denmark, Ireland, and Portugal.

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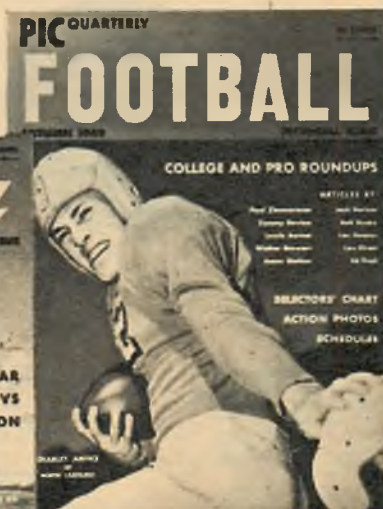
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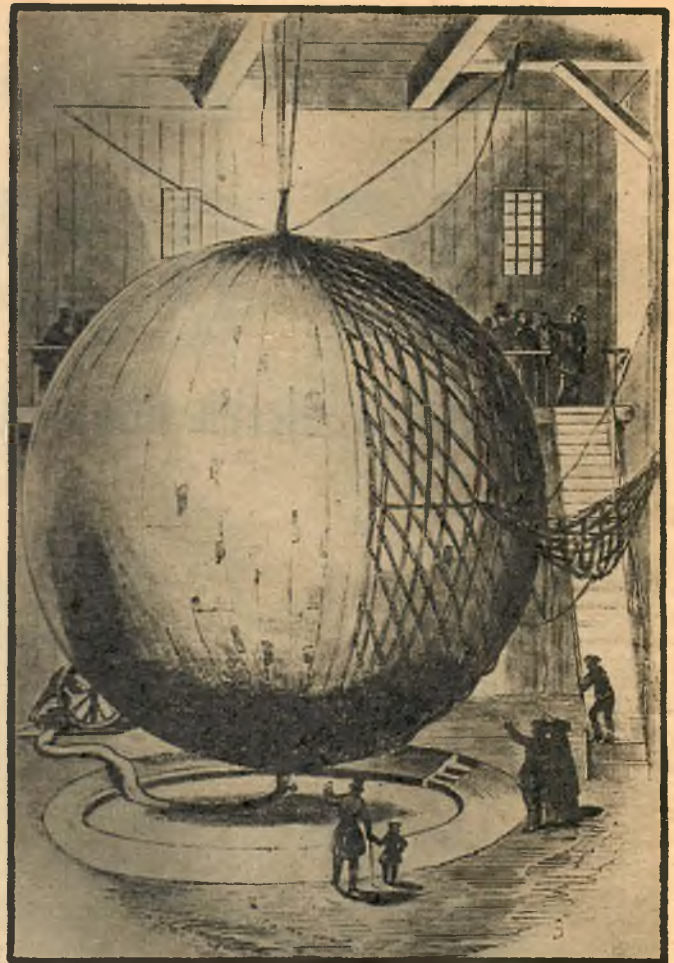
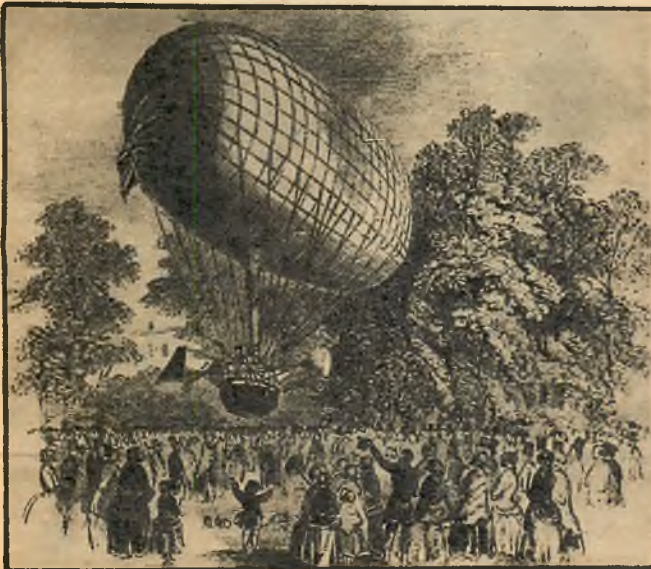
ON SALE AT ALL NEWSSTANDS 25c

Balloon Age Oddities



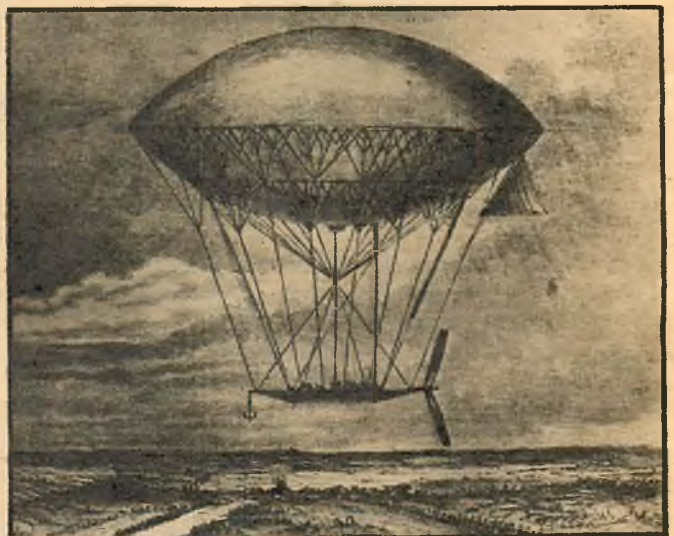
● This flying bale of hay is a foot power driven dirigible built by Prof. Ritchell of Connecticut. He sailed it for over an hour.

● Nell's Locomotive Balloon built in England in 1850 to test propeller efficiency. Though props turned, the balloon refused to move.



● All-copper balloon built in 1844 in Paris. Project was abandoned due to cost. The only benefit was to coppersmiths who worked on it.

About the middle of the 19th century men became bored with riding balloons blown about the skies by the will of the wind. Experiments were begun with improved aerostats having some sort of propulsive power—muscles being preferred since they were more abundant than internal combustion engines and lighter than steam. Here are some of their efforts.



● Anchors away! Hand-operated windlass was to drive this. It didn't.

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TRAIN IN MIAMI -- AIR CAPITAL OF THE WORLD

AIR TRAILS

OCTOBER, 1949

COPTERS AT WORK:



● Air-sea rescue.



● Search for oil.



● Power-line survey.



● Pipe laying.



● First Air Corps helicopter, designed by Prof. Geo. de Bothezat, made a 2-min. 45-sec. flight in '23.

THIS WINGED WORLD:

Egg Beater Parade

THE idea of rotary wing aircraft is probably as old as man's attempt at flight. Famous Italian scientist and poet Leonardo da Vinci made a number of designs for this type aircraft as far back as the 16th century. Ever since, a number of helicopters have been designed and built by engineers, mechanics and visionaries all over the world.

It was not until the early twenties that Prof. George de Bothezat in the U. S. A. and Louis Breguet of France came up with the first rotary wing aircraft which achieved actual flight. Difficulty of controlling these machines caused



● Crop dusting and pest control are some of the most important functions of the versatile 'copter.



● Sikorsky S51 four-place helicopter, powered by a 450-hp Pratt & Whitney. Speed, 103 mph.



● Hiller 360: Carries three side-by-side, blades controlled by servo tabs. Engine, 170-hp Franklin.



● McDonnell "Little Henry" features ramjets at its wing tips.

temporary abandonment of helicopter projects. In the meantime, in Spain Juan de la Cierva brought out his very successful autogiro design and a large number of these craft were built and flown both here and abroad.

The *autogiro* differs from the helicopter by virtue of having free-rotating blades which turn by the force of air exerted on them due to forward or vertical motion of the plane, the blades producing only lift, forward thrust being furnished by a conventional propeller. The *helicopter's* rotor blades are driven by an engine, and both lift and thrust are produced by the blades. Early autogiros were equipped with short stub wings featuring ailerons and conventional tail surfaces for controlling flight altitude, but they proved inefficient at low speeds and in the late thirties direct control autogiros made their appearance. These air-

craft had tiltable rotor heads controlled by a stick in the cockpit which eliminated the stub wings and elevators. This controllable rotor head gave impetus to further development of the helicopter in this country, and in 1940 the Platt-LePage Aircraft Co. was granted the first government contract to develop a military helicopter, the XR-1. At the same time Igor Sikorsky flew his first experimental machine the VS-300 which set the style for most helicopters with its anti-torque propeller located at rear of fuselage.

Military development contracts and orders during the last war were largely responsible for the fast growth and maturing of the direct lift aircraft.

Shown here are most of the important civilian models. Many have been abandoned, but during their development and testing stages they produced much significant data.



● Sikorsky VS-300: First prototype featured lifting tail rotors as well as anti-torque rotor.

● Sikorsky S-52-1: This machine recently set a helicopter world speed record of 129.6 mph.



● Bell Aircraft helicopter 47D-1: Bell is one of largest helicopter builders in the country.

● Another jet helicopter, this one by Marquardt Aircraft. Pulse-jet engines weigh only 20 lbs.



● A significant early model of Hiller's 'copter, no longer made.

● Clean, good looking Firestone helicopter introduced in 1946.





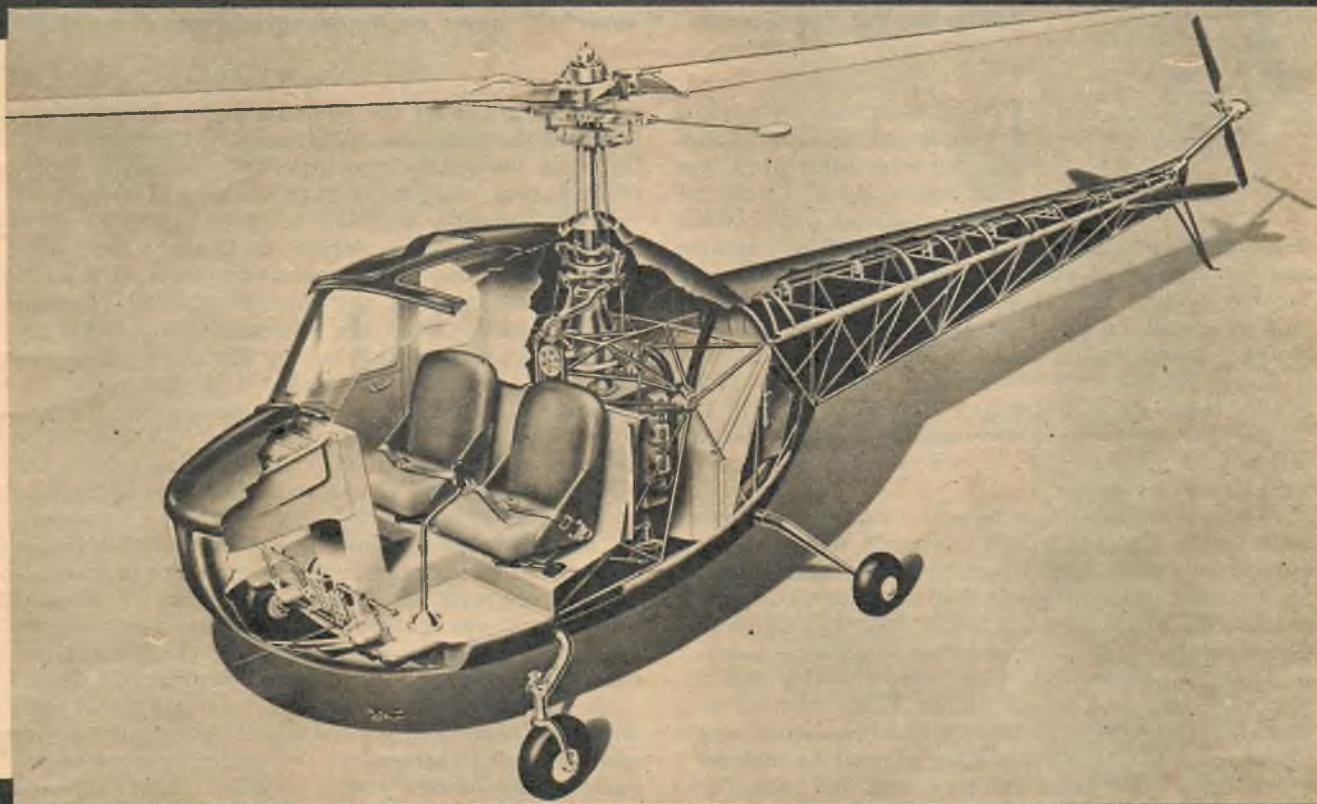
● Helicopter Eng'r'g Research Co.'s JOV-3. Tandem rotor setup.



● Sikorsky VS-300: This was second prototype ancestor of a long line of successful machines.



● Rotoron XM-1: Single-place coaxial helicopter powered by 5-cyl. 25-hp motor. Wt., 400 lbs.



● What a helicopter's "insides" look like. Cutaway of the Bell Model 47. Note up-ended engine located behind seats.



● Kaman K-190: Three-place utility has intermeshing rotor blades.

● Helicopters Inc. 4-place Model J originally designed by Bendix.



● Jet-propelled Helicospeeder designed by Antoine Gazda. Jet at rear is anti-torque device.

● Cutaway view of 7-passenger Daman Pelican shows engine located in nose. To carry 1,400 lbs.



● The Brantly helicopter, a two-place coaxial machine. It is still in the experimental stage.

● One of the best looking 'copters was Landgraf H-2. Has lateral overlapping rotor blades.





1st Supersonic Guided Missile

By R. G. NAUGLE

Unlike the V-2, the German "Wasserfall" could be maneuvered from the ground.

IT has been said by various people at various times that we were sometimes "too little and too late" during the war. Perhaps so, but once the tremendous productivity of our industrial machine and the energy of our manpower was unleashed, it became evident that it was the Germans who were "too little and too late"—and certainly so in the perfection of their much vaunted secret weapons.

Somewhat too late with their rockets, the Nazis nevertheless made important strides in design and substantial progress in developing practical rockets and guided missiles.

But they *were* late!

At any rate, it can now be seen that they first overestimated the ability of the Luftwaffe to end the war quickly so that in 1942 Germany found herself losing far too many aircraft over England—losses which, if continued, would all but wipe out the Luftwaffe. Consequently, first V-1's and then V-2's were ordered in huge quantities—but they were too few and too late in getting into action, as the Allies were by then flooding the skies with heavy bombers which were pulverizing the launching sites as well as making a shambles of German industry and her ability to wage war.

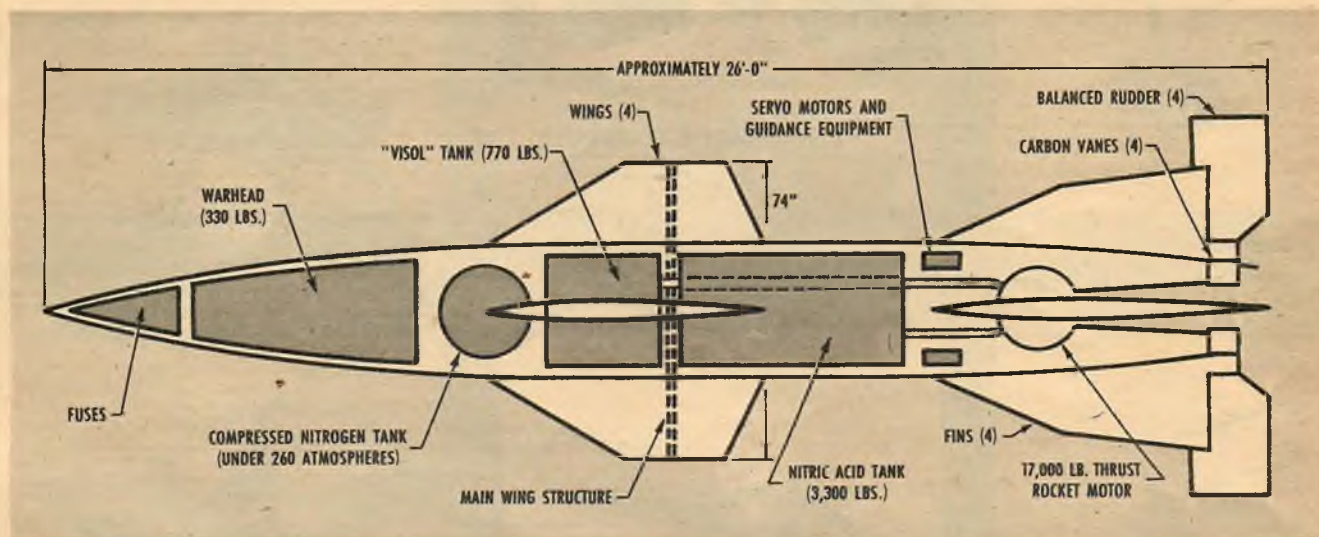
Instead of offensive weapons like the V-1 and V-2, Germany needed defensive weapons desperately—anti-aircraft rockets and rocket-propelled inter-

ceptors to ward off the bombers and to stave off defeat and the complete obliteration of Germany itself. But they were also "too little and too late" in perfecting these weapons to turn the tide of defeat.

Beginning early in 1943, the entire resources of the rocket experimental station at Peenemunde were committed to the development of their most promising ground-launched, anti-aircraft, rocket-propelled, guided-missile called the Wasserfall—or Waterfall. The project was carried out by the same group that had developed the V-2 rocket and was under the direction of Professor von Braun, designer of the V-2. It was developed directly from the V-2 but scaled down to a diameter of 880 mm, or 34½ inches, and a length of 26 feet. It had four short fins or "wings" added midway along its length. Weighing approximately 7,700 lbs. at launching, it carried 330 lbs. of warhead at a maximum speed at the point of fuel cut-off of 1,700 mph which carried it some 11 miles in the air. It was guided and maneuvered from the ground by radio and was designed to chase and intercept allied bombers and destroy them in mid-air.

As such, it was the first successful fin-stabilized and wing-supported guided missile to be maneuvered and controlled throughout the entire subsonic, transonic and supersonic ranges of speed. The 1,700 mph corresponds to a Mach number of 2.5, so for the first time the formidable transonic barrier was effectively breached without any loss of stability or control.

The V-2, of course, was (Continued on page 76)





The New Look of our Tactical Aircraft

How will any future war be fought? Our military planners have the answer. Control of the air is the key to victory.

By LUCIEN ZACHAROFF

SEVERAL full-fledged shooting wars are in progress at this writing. One of the world's oldest professions, warfare is giving the promise of remaining in fashion until human nature is refined and ennobled to a degree which would make combat obsolete.

Because war is such a primitive business, the principles of warfare don't seem to change appreciably. They and the strategies behind them ordinarily boil down to the assertion of power and freedom of action by one side, while denying these to the adversary.

Successful strategy is the product of sound public opinion combined with a sound national policy. With these, the military are enabled to develop and put into effect a strategy which in turn results in effective tactics. Tactics—which are simply actions in contact with the opposing forces—do show constant change and evolution. This fluidity is due to a large extent to the rapid change in weapons.

Nothing else in modern military history has exercised so much influence on tactics (and strategy) as the emergence of air warfare. The new look, postwar, of our tactical air power is worth our attention.

One unmistakable trend in the thinking of the national military establishment as a whole and of decision makers for its air arm particularly is: a strong offense is the best defense. This is an old idea but it was not until after World War II that it appeared as a component of national policy, the delay in its application owing to the fact that American public opinion is normally pacifist in peacetime. There are many indications at hand that irrespective of the present state of public opinion, offense initiative is a cornerstone of today's military viewpoint. Let's examine some of these indications, particularly those bearing on tactical aviation.

Last fall newspapers offered brief glimpses of the great war games in Florida and adjoining states. It

was the largest single display of tactical air operations. But the news accounts failed to convey to the more serious students the picture as it unfolded in the air and on the ground of the Eglin Air Force Base which occupies over 500,000 acres adjoining the Gulf of Mexico. Let us review Operation Combine III, as it was called, after devoting many months of study to the results.

The climax was a tactical air demonstration with airborne and ground operations. In the air phase of the remarkable performance some 500 aircraft and 8,500 men were thrown into action featured by the use of live ammunition against a mythical enemy. It further consisted of photo reconnaissance, rocket attacks, dive bombing, napalm bombing, strafing, glider snatch pick-up, aerial wire laying, paratroop drops, air resupply, high-level bombing, and escorting.

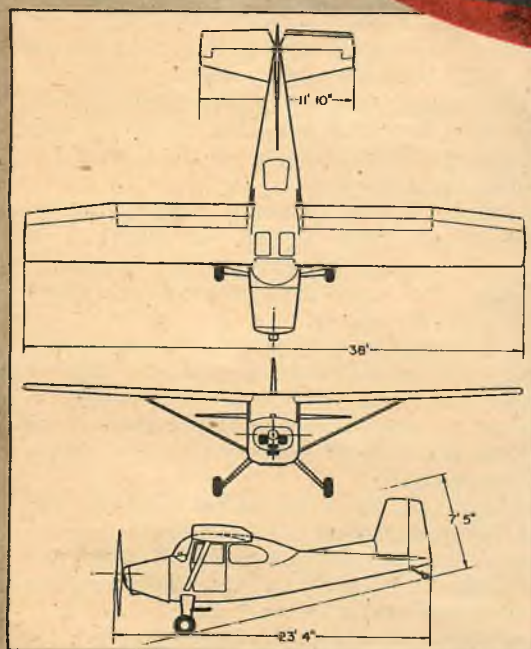
With all the military services participating, an outstanding aspect of the show was that air power was now enjoying a status of absolute equality with the surface combat organizations.

Another sharply defined principle is that modern strategy and tactics, both in time of war and of preparation for it, keep an eye on the economic, political, diplomatic, and psychological situations through which we are living.

This mutual dependence between strategy-tactics and economics-politics-diplomacy-psychology became especially clear at Eglin. Six skits were staged to show how plans are made up for an important tactical operation, from the highest government level down to the field commanders.

In the opening skit was a top secret meeting. The Secretary of National Defense of an imaginary country named Namora was briefing his chiefs of staff concerning the demands made by an imperialistic nation of Deluvia. Namora was a peace-loving nation with a governmental and military (*Continued on page 66*)

We Fly the Luscombe Sedan



By **WILLIAM WINTER**

No run-of-the-mill design, the Sedan offers auto-like riding comfort even in gusty flying weather

WHEN the average private pilot talks of his experiences on flying a strange aircraft, his comments vary from the comprehensive facts in the case of a 65-horsepower trainer to the colored impressions of the more complex machines. For the former is primarily an around-the-airport, fair-weather proposition, easily evaluated for its purpose, while the latter, varying widely in price, should be judged against the cross-country yardstick in terms of performance, ease of handling, comfort, safety, and cost. Judge the Luscombe Sedan by the latter criteria.

Oddly enough, the chief difficulties in flying differ-

ent lightplanes is not so much the varying characteristics of each machine—for those the company pilot always demonstrates before you take over—but the fact that the manufacturers' approaches to a problem will vary widely. Designed for the better class four-place market, a Cessna 170 is not a Bonanza, a Navion is not a Stinson, and so on, regardless of how you pair them. Sometimes impressions narrow down for a direct comparison with some other ship on many points. Everybody argues about Navions versus Bonanzas. Other times it is a case of comparing single characteristics with qualities of many other airplanes. Whenever you find yourself making these piecemeal comparisons you can be sure the ship in question has an individuality almost entirely its own. To point this up, suppose *you* fly the Sedan!

So you are going to fly the Luscombe Sedan, a ship you may have seen only in pictures. On the morning of the big day there is a howling wind, whistling around the corners of the house, rocking the bare limbs of the trees. Can't fly in this. Better check with their distributor. And what does he say? Forget the wind. This *should* be different!

At the airport the only activity is a frantic wind sock. Lighter planes are stacked safely away in hangars. Wind velocity is well over forty and at 8,000 feet where your visitor is traveling to avoid turbulence, the headwind is 75 mph. This is not a steady western wind, but a shifty, gusty, chopped-up sea of air that will ruin four out of five landings. But here he comes, boring in overhead, now circling wide and shallow out over the hills to make a long straight-in approach and a wheel landing. The Sedan runs tail high until it nears the taxi strip, then drops the tail, and taxis up to you. Meet pilot Nat Trager of Brockton (Mass.) Airways.

Afterwards, as is always the case, you can't recall where it all began but you get quickly to talking about the machine, noting its features, capabilities, construction, interior, as the pilot walks you around the Sedan.

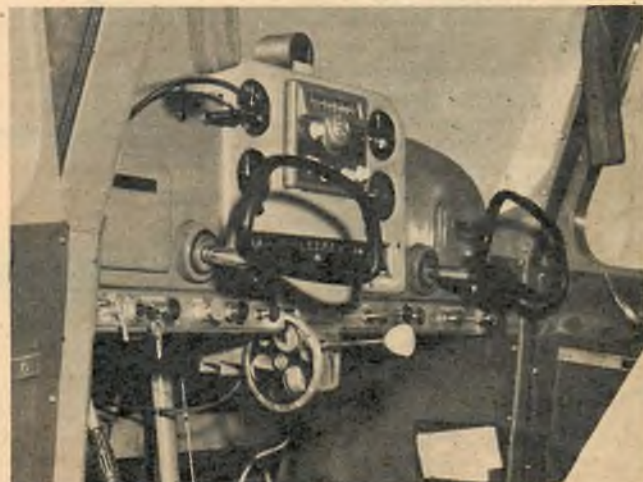
It certainly is an unusual looking job. Unique cabin lines and squarish tips add a fillip of the unorthodox to what is thoroughly a conservative, orthodox, and tonily worked out airplane. The difference, of course, is the cabin, ending as it does in a sweeping down curve behind the wing. Aft, the fuselage is quite shallow. In an aerodynamic sense the large dorsal fin probably makes up for the snipped off cabin area. One quickly gathers that this is the crux of the debate over whether or not the Sedan is a good looker. But the rear window made possible by this cabin contour should be a nice thing to have on a high wing airplane, generally totally blind to the rear. The eye, unfortunately, is used to the familiar straight lines between wing and tail and is reluctant to accept what is new, and probably better, just because it is different.

Not at first apparent is the fact that the Sedan's cabin is like a luxurious auto interior. Remove those wings in your mind's eye and the similarity between cabin and auto body cannot be missed. The name Sedan means something at Luscombe. Two large doors permit comparatively easy entry (for airplanes) into either the front or back seats, which are very wide with all kinds of leg room. Little touches like Cadillac ash receivers, leather hand-hold straps, sun visors, all-wool carpets, confirm the Luscombe motive. Upholstery is all-wool pin stripe with foam rubber cushions.

(Continued on page 73)



● Refreshingly different is the Sedan's fuselage which gives good rear visibility. Wheel landings are standard operating procedure.



● A place for all the essential "everythings" and all within easy, workable reach. Cabin is quiet, permitting normal conversation.



● Visibility from the front office is excellent. Absent are the generally accepted tubes, braces and what have you. Note gear tread.

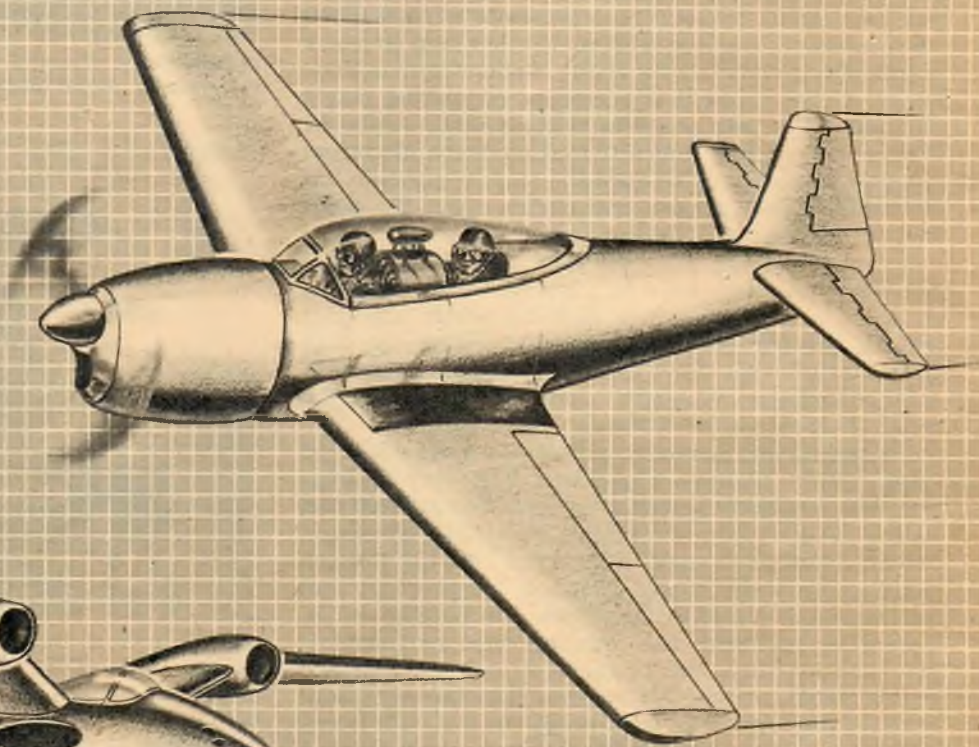
● Coming in for a landing at the Flushing, L. I., airport. Plane performs well in rough weather, as this pilot's report indicates.



Airmen of Vision

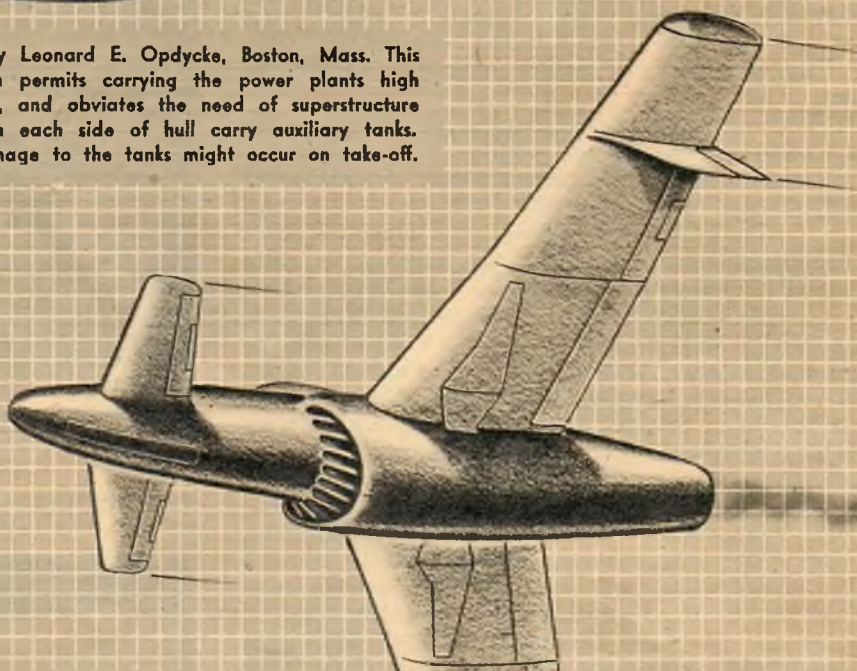
DESIGN COMPETITION

● **First Prize:** by James W. Kiel of Lancaster, Pa. A two-place training plane. A very clean, conventional low-wing aircraft with retractable landing gear and flaps. Suitable for military use both as primary and basic trainer. Performance similar to No. Am. T-6, but with better climb. Both Beechcraft and Temco have offered similar trainers to the military with idea that type is economical to operate.



● **Second prize:** a twin-jet amphibian by Leonard E. Opdycke, Boston, Mass. This interesting design has a gull-wing which permits carrying the power plants high above hull and well out of water spray, and obviates the need of superstructure for raising the wings. His hydrofoils on each side of hull carry auxiliary tanks. The wisdom of this is doubtful, since damage to the tanks might occur on take-off.

● **Third prize:** a canard-type jet-powered fighter bomber by Joseph M. Cartelli of Corona, N. Y.—15 years old and a technical student at Newtown High School. This is a very interesting design with good possibilities, though the air scoop could be reduced in size without impairing thrust. This would decrease drag considerably.



Air Trails has opened its columns to those who are interested in presenting plans for aircraft of the future.

Rules governing the competition are:

1. Three-view sketches of the proposed aircraft will be required. These should be not less than 8½ x 11 inches for the entire three views.
2. Give sketches of the complete airplane in three-quarter front and rear position.
3. Photos of a model of proposed design may be included.
4. Information on power plant (s), estimated performance, dimensions, and explanations of any unusual features are required. Data as to age, occupation or schooling

of the entrant will be welcomed by the editors and judges.

5. Entries will not be returned and for that reason those participating should retain copies of all material submitted.

6. The editors regret they cannot enter into correspondence concerning entries.

7. Designs may be of any type: commercial aircraft, military planes (fighters, bombers, troop transports), planes for the private flyer and single-place sporting craft.

8. Mail entries to Airmen of Vision, c/o Air Trails, P. O. Box 489, Elizabeth, N. J.

9. The entry each month judged by the editors as the most practical or of the greatest significance will receive an award of \$25. Awards of \$5 will go to runners-up.

News and highlights of Senior and Cadet activities from Coast to Coast. Cadet membership is open to boys and girls, 15-17

Civil Air Patrol Newsletter



● Capt. Eugene Bolling, Public Information Officer, N. J. Wing CAP, with map of state at Newark Air Base showing active sqdns.

C.A.P. At Work

THERE'S a lot more to the C.A.P. than its good looking uniforms, as any active Senior or Cadet member will tell you. To qualify for that uniform, every CAP'er is required to put in a specified number of hours each year on general Patrol activities. In addition, members are permitted to specialize in one or more of many highly skilled fields. These include radio communication, engine and aircraft maintenance and repair, piloting, observing, control tower work and scores of other jobs that provide valuable background for future aviation jobs. Air-interested youngsters 15, 16 and 17 are eligible for membership as Cadets. Write Air Trails if you want to join.



● Boy and girl Cadet members get a lesson in the workings and use of an A-5 gyropilot from M/Sgt. S. Fain, USAF, at Newark Hq.



● You've got to keep everything spick and span to pass inspection. Cadets John Fontenelli (left) and Tom Moore, Westfield, N. J., Sqdn.



● The mechanics are getting mighty pretty. Cadet Peg Bell of the Essex, N. J., squadron checks hydraulic system of a CAP AT-6 ship.



● The class gets down to brass tacks and an AT-6 power plant during engine maintenance course at Newark AFB. AF personnel aid.

Civil Air Patrol Newsletter

(CONTINUED)

The CAP is civilian auxiliary of the U. S. Air Force. Let's all support it.

Cross-Country with C. A. P.

Squadron of the Month

For having developed a program to obtain a more effective leadership by Cadet Officers the Minneapolis, Minn., Squadron CAP has been nominated "Squadron of the Month."

Under the guidance of Lt. Raymond J. Johnson, Commandant of Cadets, a program consisting of a Cadet Officer's Candidate School was initiated and results, although still brand new, appear most promising.

The Minneapolis Squadron Cadet OCS operates to provide an academic background for potential Cadet Officers. Emphasis of the course is upon elements of leadership and command, with study and practice in: qualities of a leader and how to obtain them, responsibilities of a leader and effective leadership. Other topics cover discipline, courtesy, applied military organization, appearance and inspections.

The initial class, only recently graduated, shows marked increase in poise, self-confidence, and general improvement in performance of all assignments. Indications are already at hand that the Cadet OCS idea will spread rapidly to other Squadrons and Units.

This Cadet on the Ball

Does the Civil Air Patrol really curb juvenile delinquency? The California Wings says "yes" with emphasis.

One of the Wing's Groups recently publicized the following excerpts from a grateful father's letter:

"I wish to compliment your organization in bringing about a transformation in my son. Before joining CAP he was very belligerent both at school and at home, and his school work was poor. Shortly after joining your junior group a marked improvement all around was noticed and has continued up to the present, and the interest he is showing in the CAP gives me reason to believe that the improvement will continue. More organizations like the CAPC would go a long way toward curbing juvenile delinquency."

Cadet Ronald W. Lambert of Bridgeport, Conn., Squadron was chosen to represent that state's CAP at the Presidential Dinner in Washington, D. C. . . . Regional Cadet Drill Competition at Bolling Field Air Force Base, Washington, D. C., drew more than 1,000 spectators . . . Cadets attending summer encampments will be authorized to wear a cloth sleeve patch upon satisfactory completion of the activities prescribed for Cadet summer encampments.

Cadet Staff Sgt. Julian Dan Isenhower of Florence, S. C., Squadron represented his state at the Presidential Dinner, and received a silver bracelet from Gen. Hoyt Vandenburg . . . New Haven, Conn., Squadron has formed a girl's drill team under direction of M/Sgt. Edith Gordon . . . The 17 members of the Canaan, Conn., Squadron who made an inspection of USAF Westover Field are still talking about the planes and other equipment examined.

Maj. Gen. Charles C. Curtis of the Pennsylvania National Guard has publicly commended Pa. CAP for its co-operation in flying missions for the field exercise of the Nat. Guard's 51st AAA Brigade at Allentown . . . Portland, Me., CAP Cadets aided that City's recent big drive to raise funds for cancer research.

A recent huge parade in Hollywood, Calif., witnessed 37 CAP radio-equipped mobile units, operated while in motion so spectators could hear the actual transmissions via two sound systems moving with the convoy . . . Virginia Wing has originated, through cooperation of the State's Division of Motor Vehicles, a special block of license plates so that Va. CAPer's can easily identify one another. All plates have the prefix number 32 (the Wing designation) followed by three digits commencing 001 and ending at 500.

Maj. Gen. Lucas Beau's (National CAP Commander) comment about CAP, "sometimes the trouble with us is too many chiefs and not enough Indians," has been used as a stimulant motto by several Wings to step up new recruiting drives . . . The Burley, Idaho, Squadron will start a Cadet communications class Aug. 15.

Minnesota Wing finally got the C-45 they wanted, completely equipped for winter flying, as well as with stretcher equipment for emergencies . . . How to organize a CAP unit without dawdling has been shown by Caldwell, Idaho, where 275 letters were sent to community leaders, a mass meeting held and 10 of the possible 14 staff positions filled in one evening . . . Carey, Ida., has formed a new Squadron, is now the eighth unit in the Potato State.

Two young Texas CAPers are believed to be the youngest and only rural school commuters-by-plane. They are Dan McGee, 16, and Leroy Kimball, 17, of Lamar County . . . High ranking Louisiana Wing officials participated in a recent Air Medal award to 16 men who served with the CAP Coastal Patrol during the war at Grand Isle, La. The group was headed by Wing CO Col. W. D. Haas.

W. Va. Wing has organized three new flights, at Martinsburg, Grafton and Potomac . . . Maj. Connie Black, attractive, popular and efficient adjutant of the Louisiana Wing staff is believed to be the only remaining active woman in CAP with a record of first joining the organization before Pearl Harbor . . . Huntington, W. Va., Squadrons A and B have been combined into one large unit under command of Capt. J. Kelly Blankenship.

Westerly, R. I., Squadron found it's easy to raise funds for uniforms—just put on a good musical comedy revue. The Westerly unit naturally called their show "CAP Capers."



● National Headquarters of the Patrol is located in Building 626, Bolling Air Force Base, Washington, D. C. Here top brass works.



● T/Sgt. Thomas E. Brooks in Communications (A-6) section of National Hq. conducts national radio roll call two nights a week.

If you're 15 or older and want to join CAP send postcard to Air Trails. We'll send it to your nearest unit.

Omaha All-Girl Sqn.

One of the most successful all-girl units of the Civil Air Patrol is Omaha, Neb., Squadron Two, organized as far back as June, 1943. During the war many of the members became WASPS, WACS and WAVES, control tower operators and weather observers.

Part of the success of this Squadron is due to the active Cadet program for girls now underway, with classes in First Aid, Meteorology, navigation, photography and map reading.

The members have been flown in C-47's to various CAP air shows throughout Nebraska where they serve as photographers, operate refreshment stands and guard military aircraft on display.

Idaho Flies Red Cross Mission

The Idaho CAP and Red Cross recently joined forces to deliver blood plasma to an operating table.

Capt. E. W. Davies, Wing Operations Officer, answered the Red Cross call to fly blood plasma from Boise to Council, an isolated mountain community, for an emergency operation already underway at the time Capt. Davies received the call.

Fast coordination between Red Cross and Capt. Davies resulted in the plasma making a quick flight to Council. The transfusion was credited with saving the patient's life.

Squadron Fights and Dances

Mark down the Parkersburg, W. Va., Squadron CAP for one of the most original training maneuvers ever held by a CAP unit.

Using five teams, the Squadron opened a mock invasion with a reconnaissance flight to spot invaders traveling up the Ohio River in landing craft.

The invaders were Marine Corps Reservists from Wheeling, Huntington and Charleston. The operation was complete with mock artillery and naval gunfire, simulated air attacks—and a big dance and party after the maneuvers were finished.

IS LEGION LESS ANTI-CAP?

CAP Group of the Month

One of the outstanding CAP Groups in the nation is the 9th New York Group which covers Westchester County and its surroundings, commanded by Lt. Col. Joseph F. Crowley.

Most of its Senior Officers and some of its members have been working with this Group since Pearl Harbor days. In the middle of the war the Group constantly had from 600-700 Cadets on the drill floor on meeting nights.

The 9th Group supervises Squadrons in Yonkers, White Plains, Peekskill, Mount Vernon and New Rochelle, N. Y., and a Flight in Greenwich, Conn., together with an Operating Base at the Westchester County Airport.

The Group has nearly a dozen planes at its disposal, AT6's, BT-13's, Piper Cubs, L-4's loaned from USAF, PT-26's and several others. In addition Col. Crowley's 45-foot twin screw cruiser is occasionally used for search and rescue service. The Group's radio communications network is alerted 24 hours a day.

Last year the Westchester Cadet drill team won the national championship. Senior Officers keep stimulating new activities, plus constant recruiting to keep the Group growing. Its constant outstanding accomplishments make it a natural for "Group of the Month."

Squadron for Solo Flyers

New York, the world's largest city, has one of the finest CAP units—Manhattan Squadron. Capt. Frederic S. Schleger, CO, recently presented Arthur Godfrey with an honorary membership in Manhattan Squadron Flying Club, a separate organization within the CAP unit composed solely of pilots who have reached solo status. Godfrey was made an honorary member in recognition of his efforts and contributions to the advancement of aviation and his work in stimulating flying among the youth of the nation. Manhattan Squadron CAP runs its flying activities from Miller Field, Staten Island.

Patrol Members Who Are Also Legionnaires Protest Action

A ground swell movement has begun within the American Legion to rescind action taken at their 30th Annual National Convention in Miami last year which urged that "no further funds be allocated by USAF to the support of the Civil Air Patrol."

The Legion's resolution last year was passed after some argument, and opposition, when it was claimed that the Patrol was draining funds from the U. S. Air Force which were sorely needed to pay for flight experience of AF reservists.

According to information in the nation's capital, a determined move was to be made by officials of the American Legion, as well as by Legionnaires also members of CAP, to have the resolution rescinded by action at the 31st Annual National Convention to be held in Philadelphia Aug. 29 to Sept. 1.

The Alger County, Michigan, post of the American Legion has already begun the ground swell for rescinding the National resolution, by declaring:

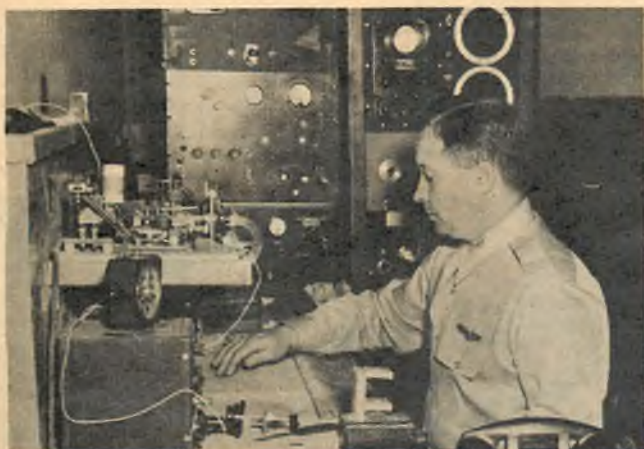
"To date the only assistance given CAP has been in the form of surplus radio equipment, Link trainers, surplus small aircraft. The only allocation received by CAP from the USAF is in the capacity of supervisory personnel who in themselves are acquiring valuable training in civilian public relations."

The Alger post resolution, which must make its way up through District and Department of Michigan Legion to the National Convention, cites the value of CAP in creating and maintaining a national radio net which is, and can be, used by CAP during times of disaster and even hostilities.

The Alger resolution also notes the hundreds of missions by scores of CAP units in air search and rescue, floods, forest fires and mercy missions, mostly at CAP members' own expense.

Scores of CAP units throughout the nation who cooperate closely with local

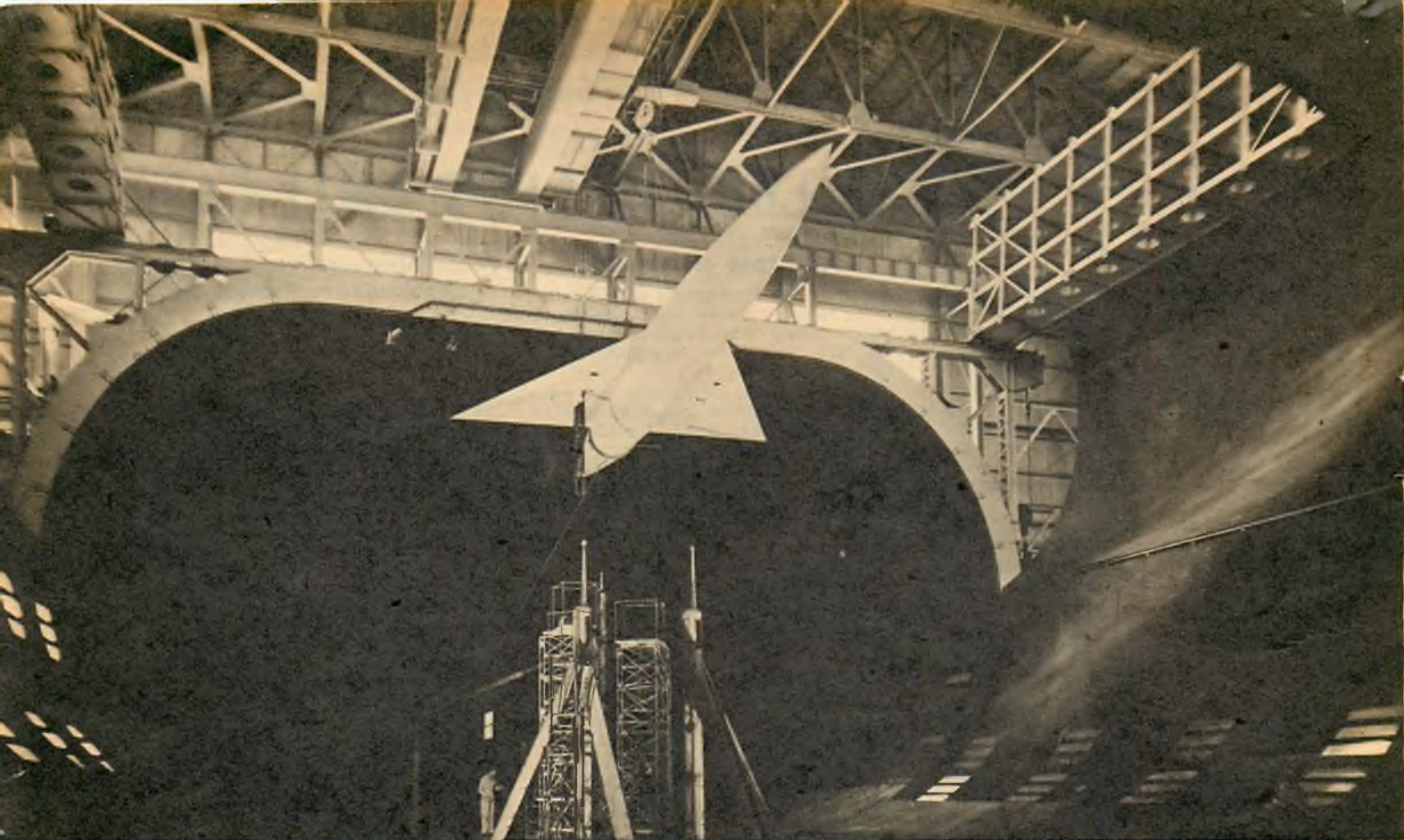
(Continued on page 92)



● Major Arthur D. Rhodes grinds a crystal for use in national CAP radio network. Capt. Ralph E. Tilton, assisting, allocates supplies.



● Capt. Frederic S. Schleger, CO of Manhattan (NYC) Squadron, presents flyer-funster Arthur Godfrey with honorary membership.



● Before design ideas are tested in this size at NACA's Ames Lab, they get a going over in the reduced versions shown on these pages.

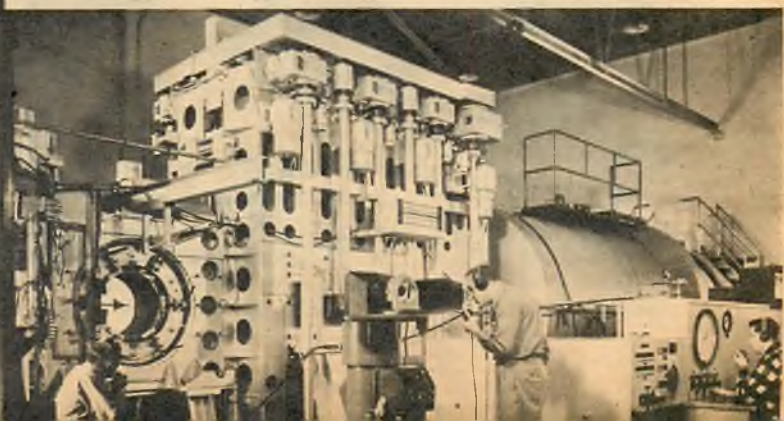
Supersonic Miniatures



AT the NACA's Ames Aeronautical Laboratory in California, aerodynamic shapes smaller than your hand with leading and trailing edges ground razor-sharp, explore mysteries posed by airstreams flowing faster than sound. Swept wings, triangular wings and other unpublicized airfoils move regularly from the model shops to the wind tunnels for test. Some of these shapes will make their appearance as military aircraft within a few years.

Unlike the aluminum alloys from which the real planes are fabricated, lead, plastics, tough Central American mahogany, and steel make up the models. For the larger ones, steel provides strength, wood facilitates contouring and makes possible chiseling out ducts to carry pressure-recording tubes.

● Triangular wing model (left) mounted in test section of Ames 12' high pressure wind tunnel. Protractor is used to measure dihedral angle of wing. Wing and fuselage machined from steel. Below—to vary Mach number in 1' x 3' supersonic tunnel, flexible throat expands, contracts. Schlieren photos record shock waves.



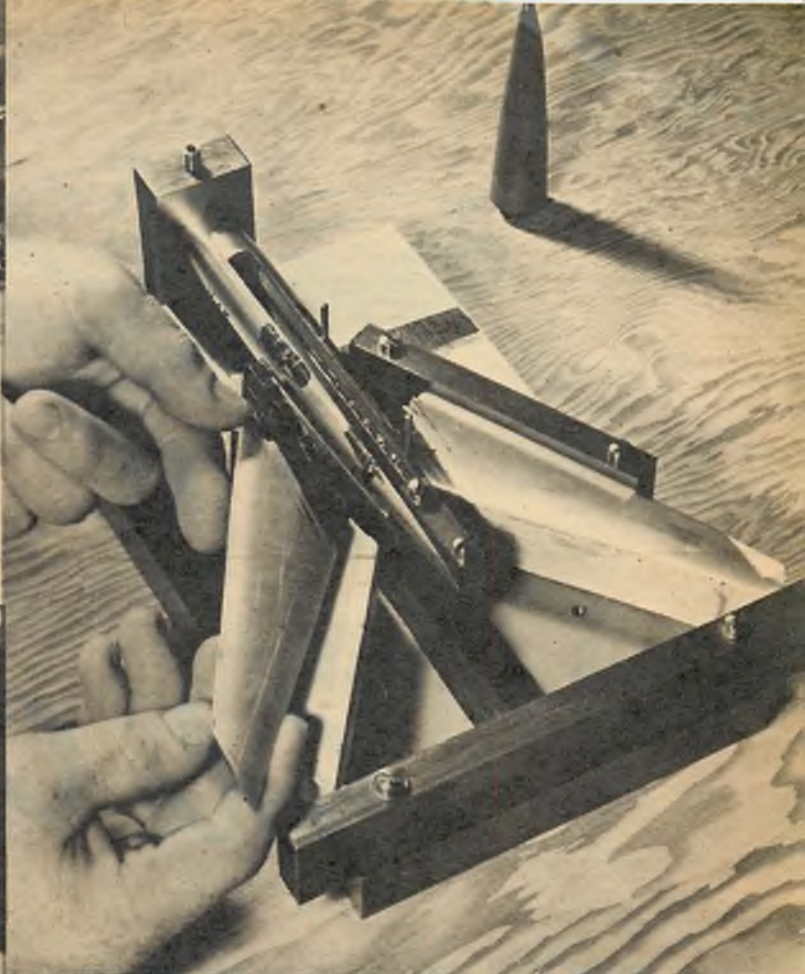


● Not all models enter wind tunnel. Typical of those used to measure reactions in transonic region is this tiny jet fighter mounted on F-51. Readings transmitted to remote instruments.



● Test models vary in size and shape, from this needle-nose job capable of withstanding supersonic speeds, to full-size planes. This shape made of low-cost commercial phenolic resin plastic.

● How well will new plane fly? Before NACA engineers complete tests, tunnel runs will reveal both strong points and weaknesses of design. Nacelle and fuselage effects under test here.



● Angle of swept duralumin wings may be changed quickly in this wing setting fixture. Wing held by cerro-matrix and dowel pins; for change cerro-matrix is melted, pin positions altered.

● Machine steel-tipped lead nose holds model steady during supersonic run. Model is held by a rod called a "string," which transmits forces to instruments for myriad measurements.





• Above towering cumulus clouds, a Rawdon T-1 demonstrates its fine flying qualities.

AIR TRAILS

Solo Club

WHENEVER your rudder-pushing headquarters staff gets to feeling low about some of the problems of private flying, and the apparent difficulty of doing something about it with just a page of type each month, a quick, sure lift can always be had by spending an hour with the latest batch of mail from the members. The basket always contains encouraging comment, from far and near, from student to airline and fighter pilot. If only we could get across this feeling of good will, of enthusiastic intent to make private flying better, every last one of our nearly 9,000 active members would take renewed faith in the good that these monthly meetings are doing for private flying. Here at least we have a rallying point, a place to make our voices heard on matters of safety, utility, cost. We can cuss out the show-offs, exchange information on clubs and other matters, and express our own thoughts—both little and big, but all of them useful.

"I have just returned from a wonderful vacation, and, as usual, put in some flying time," says D. W. Shaw, station manager, Transocean Air Lines, Gander, Newfoundland, "suddenly having the urge to

fly something out of the 65-85 horsepower class which always has been my speed. So I went out to Beaver Field, Des Moines, Iowa, and requested it. I got it! The instructor and I climbed into a Cessna 170.

"Everything went lovely until I started to land. I was advised about the stall warning horn and, just as we flared out, the thing blurted in my face. Not having heard one of the things before, I practically bolted out of my seat and was on the way out the door—heck, it could have been a fire warning for all I knew! After calming myself down and making a few more landings, I was soon flying this sleek job like a natural. That cross-wind gear is out of this world. I am not a salesman for Cessna but this job sure does the trick. The field was not large, and had trees all round at the end-of the gravel runways, yet with a little flap and just a little power, this baby handled like a dream.

"I am now back at Gander, keeping our plush Skyliners on the move, and looking about for something to fly. Up here all the lightplanes are on floats, and it's quite an experience. Drop me a line someone?"

See what we mean, (Continued on page 80)

HOW TO BECOME A SOLO CLUB MEMBER

This club is open only 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. Once a member, always a member.

To obtain sterling silver Solo Club wings and life membership card, send coupon, with 75¢, to Solo Club Membership Committee, Air Trails Pictorial, Box 489, Elizabeth, N. J.

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, Navy air forces, either as a rated pilot or having received flight training including solo time (attach).

Applicant Age.....

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

CURTISS P-6E HAWKS
By DOUGLAS ROLFE
An Air Trails Air-Pix



Minutemen of the air

By LEONARD MORGAN

The farmer-fighters of '75 were the
ancestors of this air defense group

THE four F-51 Fighters approached the field, banking steeply to align themselves with the runway. Moving as one ship, the element flashed down the initial approach in a slight dive and raced towards the airport boundary at 300 miles an hour. Directly over the end of the runway, the formation leader peeled off to the left and into a climbing arc; the others followed in rapid succession, dropping into line behind their leader and killing speed for a landing. A minute later, the entire flight was on the ground, the individual ships touching down seconds apart—a beautifully executed tactical approach.

"Those Air Force fellows must put in a lot of practice on that stuff," remarked a bystander. He was wrong, for none of the pilots in those fighters are now

in the regular Air Force. Two of them are college students, one is an insurance salesman and the other a taxi-driver. Their flying practice consists of time flown on weekends, or other time their work or studies will allow. A close look at any one of those snappy Mustang Fighters would reveal the letters, "NG," stenciled on the fuselage behind the cockpit. These ships belong to one of our newly-organized Air National Guard Squadrons. Except for a skeleton crew of permanent employees, these squadrons are manned entirely by volunteer officers and enlisted men who hold down full time civilian employment. A network of such squadrons, with training supervised by the United States Air Force, now exists for the protection of this country from outside attack.

George Washington's idea about defense was that "... every citizen who enjoys the protection of a free government owes not only a portion of his property but even of his personal services to the defense of it." This sentiment has always been supported by the American people and is the basis for the National Guard of the United States. The famed Minuteman of the Revolution, who left his plow in the furrow to become a soldier, was the ancestor of this modern civilian defense plan.

Today, a substantial portion of American air power is in the hands of citizens who stand ready and prepared, like the militiamen of 1775, to assume active duty on a moment's notice and engage in actual combat if necessary. The ancient musket has been replaced by an assortment of scientific weapons which would have bewildered a Minuteman; the underlying purpose of the citizen-soldier—and now, citizen-airman—is the same.

On June 30, 1916, the first air unit of the National Guard was Federally recognized. It was the 1st Aero Company of New York City. Captain Raynal C. Bolling, for whom Bolling Field at Washington, D. C., is named, became its commanding officer. As a Colonel in 1918, Bolling was the first American officer of high rank to lose his life in a World War I battle. The 1st Aero Company was called into active service in 1917 and redesignated the 26th Aero Squadron. From this nucleus, the Air Guard grew to its current strength.

Before World War II, there were 29 organized Air

● F-47 Thunderbolts of Georgia Air National Guard. ANG flies F-80's, F-51's, B-26's, C-47's, T-6's, T-11's, no 4-engine ships.



● F-51's of 160th Fighter Sqdn, Alabama Air National Guard. Air Guardsmen put in busy 15 days yearly at strenuous "summer camp."



● Lt. Col. Fred Hook, senior air instructor, 155th Fighter Sqdn., Tennessee ANG. First air unit set up in New York City in 1916.

Guard squadrons, ten of which were activated just prior to Pearl Harbor. All were observation outfits attached to ground divisions, acting in a subordinate, though important, capacity. 250 type observation planes were involved, including the Douglas O-38 and North-American O-47. Total pre-war strength was 800 officers and 4,000 enlisted personnel. The members of this small force served with distinction in the USAAF after the 1940-41 mobilization and during the war years, although the individual squadrons lost their identity in the Air Corps expansion.

In itself a formidable air force, the new Air Guard currently operates from 79 bases located in the 48 states, Puerto Rico, Hawaii and the District of Columbia. It boasts, at present, of 70 fighter and 12 light bombardment squadrons. 413 other units—signal companies, communications squadrons and weather stations—function in support of the tactical activities. By 1951, when the organization is complete, 72 fighter and 12 bombardment squadrons will fly a total of

2,753 aircraft. The total number of Air Guardsmen (now about 41,000) at full strength will be 59,290.

These new units have a two-fold duty. First, the individual squadrons are required to keep themselves fit and ready for immediate combat service anywhere in the world. In the event of attack, they would supplement the Regular Air Force, acting with it in repelling the invasion, whether it came by land, by sea or through the air. A high degree of operating efficiency is maintained during peacetime by a systematic and intensive training plan. Units are trained largely within themselves during weekly "drill periods," at which times all personnel attend. For a few hours, usually on Saturday afternoons, the squadron comes to full life, functioning as though it were on a seven day working basis.

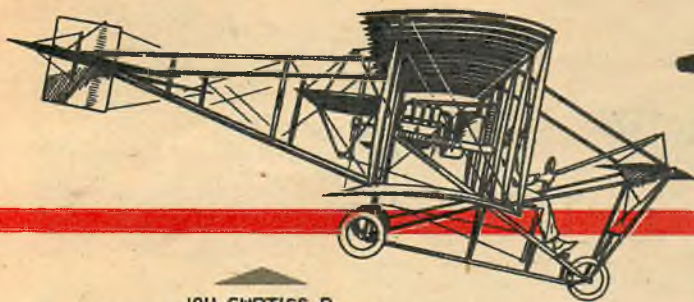
Each department, from the CO's office to the supply sergeant's stockroom, is equipped for every routine job. Major aircraft repairs, parachute repacking, physical examinations, sup- (Continued on page 69)

● Tech Sgt. makes repairs on engine of B-26 (new designation) Invader. Air Guard has 70 fighter, 12 light bombardment squadrons.

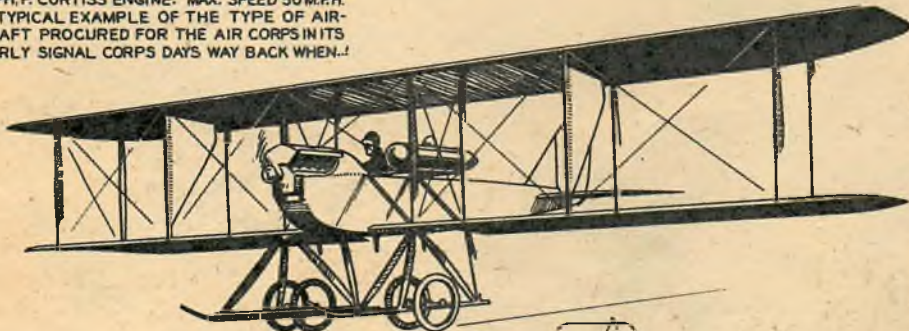


● South Dakota's 175th Fighter Sqdn. flies F-51's. C.O. is Lt. Col. Joe Foss, ex-Marine holder of Congressional Medal of Honor.

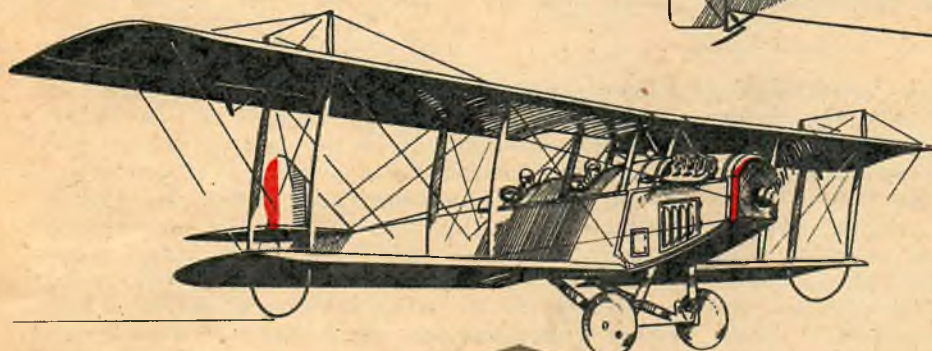
Air Progress



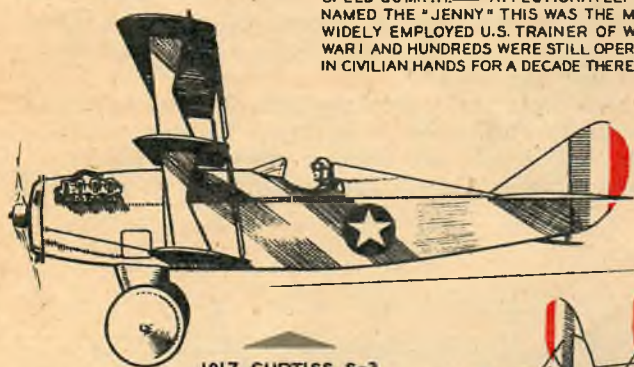
1911 CURTISS D
50-H.P. CURTISS ENGINE. MAX. SPEED 50 M.P.H. A TYPICAL EXAMPLE OF THE TYPE OF AIRCRAFT PROCURED FOR THE AIR CORPS IN ITS EARLY SIGNAL CORPS DAYS WAY BACK WHEN!



1912 BURGESS H
70-H.P. V-8 RENAULT AIR-COOLED ENGINE. MAXIMUM SPEED 57 M.P.H. — ONE OF THE FIRST TRACTOR AIRPLANES ACQUIRED BY THE FLEDGLING ARMY AIR FORCE



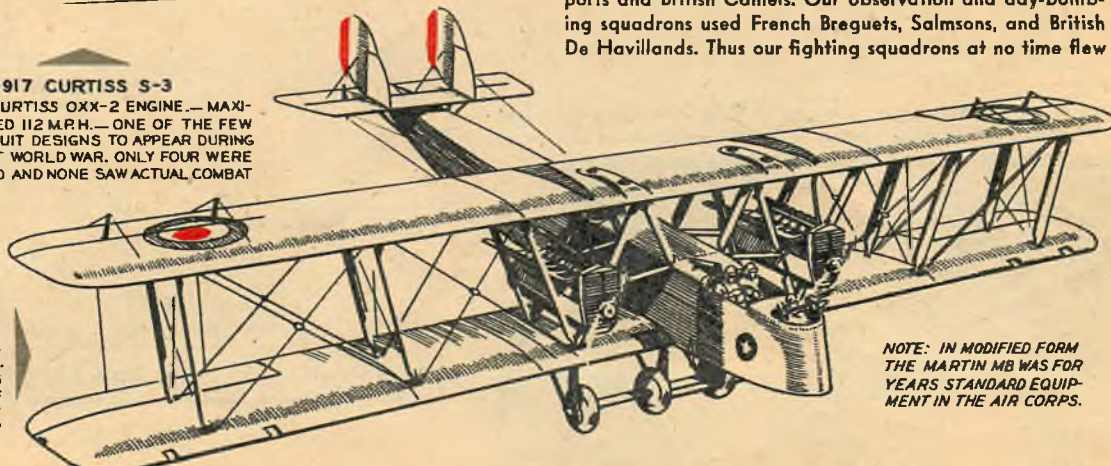
1913 GLENN MARTIN T.T.
VARIOUSLY POWERED. — WITH 90-H.P. CURTISS OX-2 V-8 ENGINE THE TOP SPEED WAS OVER 90 M.P.H. — ONE OF THE FIRST ARMY PLANES TO BE PROCURED IN (FOR THE PERIOD) SOMETHING LIKE QUANTITY (INITIAL ORDER 17 SHIPS!)



1917 CURTISS JN-4D
90-H.P. CURTISS OX-5 ENGINE. — MAXIMUM SPEED 80 M.P.H. — AFFECTIONATELY NICK-NAMED THE "JENNY" THIS WAS THE MOST WIDELY EMPLOYED U.S. TRAINER OF WORLD WAR I AND HUNDREDS WERE STILL OPERATIVE IN CIVILIAN HANDS FOR A DECADE THEREAFTER

1917 CURTISS S-3
100-H.P. CURTISS OXX-2 ENGINE. — MAXIMUM SPEED 112 M.P.H. — ONE OF THE FEW U.S. PURSUIT DESIGNS TO APPEAR DURING THE FIRST WORLD WAR. ONLY FOUR WERE DELIVERED AND NONE SAW ACTUAL COMBAT

1918 MARTIN MB-1
TWO 400-H.P. LIBERTY V-12 ENGINES. — MAXIMUM SPEED 113 M.P.H. — ONE OF THE BEST U.S. HEAVY BOMBERS IN ITS DAY AND A PRODUCT OF THE STILL TOP-FLIGHT GLENN MARTIN COMPANY



NOTE: IN MODIFIED FORM THE MARTIN MB WAS FOR YEARS STANDARD EQUIPMENT IN THE AIR CORPS.

The United States Air Force came into being as a small section of the Signal Corps in 1907 and took delivery of its first airplane, a Wright biplane, in 1908. When the U. S. entered World War I, total strength of the fledgling service was 65 officers (of whom only 35 were pilots) and less than 1,500 enlisted men. By European standards, none of the total of 55 aircraft could be classed as military planes. They were merely trainers, and pretty crude ones at that.

Apart from the Curtiss JN and a few other trainers, the Air Service in World War I was wholly dependent upon aircraft purchased from our allies. Most were obtained from France, smaller quantities came from England and Italy. Our pursuit squadrons used French S.P.A.D.'s, Nieuports and British Camels. Our observation and day-bombing squadrons used French Breguets, Salmsons, and British De Havillands. Thus our fighting squadrons at no time flew

The AIR FORCE Story

PART I

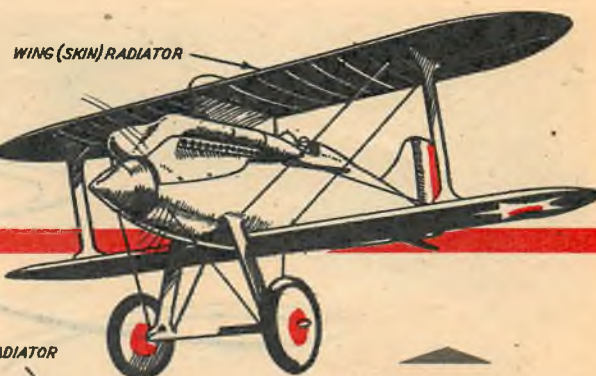
By DOUGLAS ROLFE

1923 CURTISS XPW-8

440-H.P. CURTISS D-12 ENGINE. MAXIMUM SPEED 168 M.P.H. PROTOTYPE MODEL OF THE FABULOUS HAWK SERIES. DEVELOPED FROM THE CURTISS R-8 ARMY RACERS

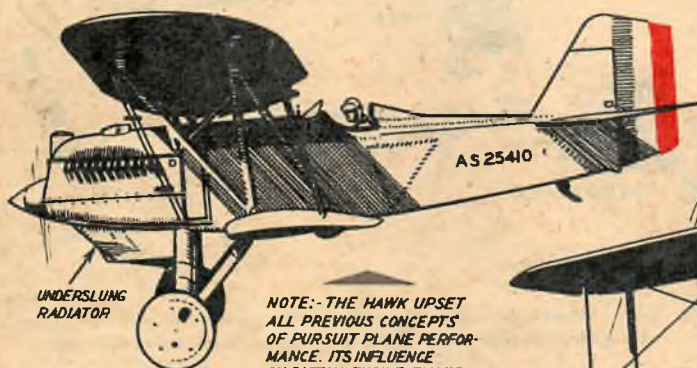
1926 CURTISS PI-A HAWK

435-H.P. CURTISS D-12 ENGINE. MAXIMUM SPEED 170 M.P.H. — FOR MANY YEARS (WITH VARIOUS MODIFICATIONS) THE STANDARD PURSUIT MODEL OF THE U.S. ARMY.

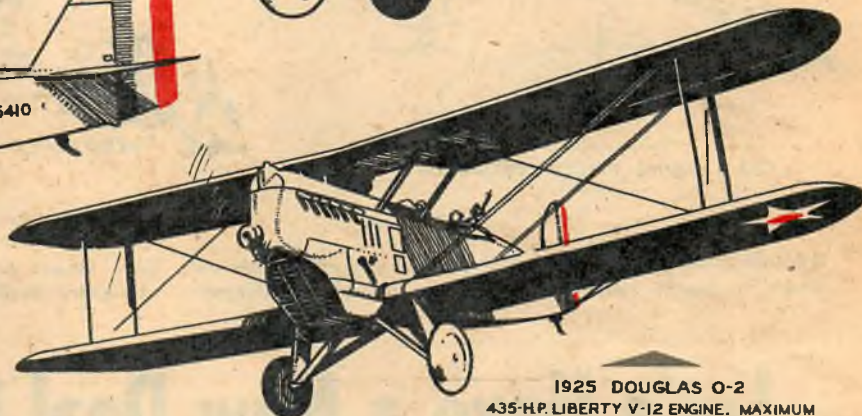


1922 CURTISS R-6

460-H.P. CURTISS D-12 ENGINE. MAXIMUM SPEED 236 M.P.H. SPONSORED BY THE ARMY, TWO OF THESE RACERS PLACED 1-ST AND SECOND IN THE PULITZER RACES OF 1922. THOUGH NOT STRICTLY SPEAKING A MILITARY TYPE, THE R-6 PLAYED AN IMPORTANT, AN INDISPENSABLE, ROLE IN THE DEVELOPMENT OF THE FAMED HAWK PURSUITS.



NOTE: THE HAWK UPSET ALL PREVIOUS CONCEPTS OF PURSUIT PLANE PERFORMANCE. ITS INFLUENCE ON PISTON-ENGINE FIGHTER DESIGN PERSISTS EVEN NOW.



1925 DOUGLAS O-2

435-H.P. LIBERTY V-12 ENGINE. MAXIMUM SPEED 140 M.P.H. — THIS REPLACED THE DE HAVILLAND D.H. 4-B AS THE STANDARD OBSERVATION PLANE OF THE AIR SERVICE

American-designed aircraft, though probably the majority of our pilots trained on one of the numerous American training types.

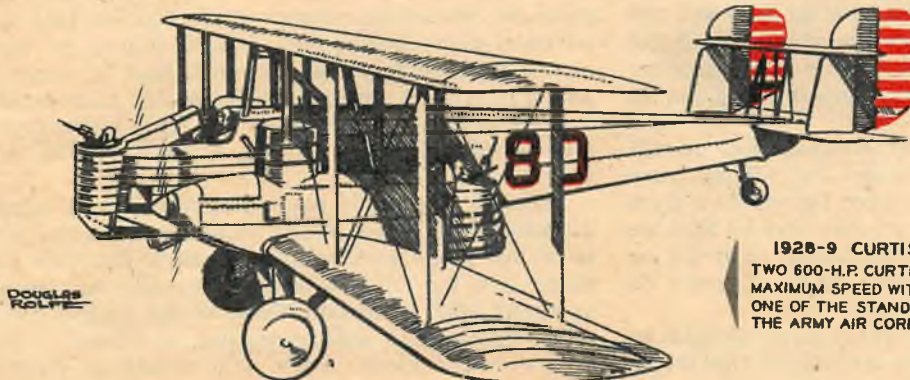
Even after the war our standard observation plane was for many years the British-designed De Havilland biplane. But in 1922 the advent of the Curtiss Army and Navy racers—later developed into the revolutionary Hawk pursuits—and the product of Douglas, Boeing and Martin put the U. S. Air Force into the dominant position it has enjoyed ever since.

Shown on these pages are but a few of the strictly U. S. designs used by the Air Corps from the time of its inception until 1929. The second installment of the Air Force Story will illustrate the remarkable developments starting around 1932 which led to the extraordinary air power mounted by the U. S. Air Force in World War II.



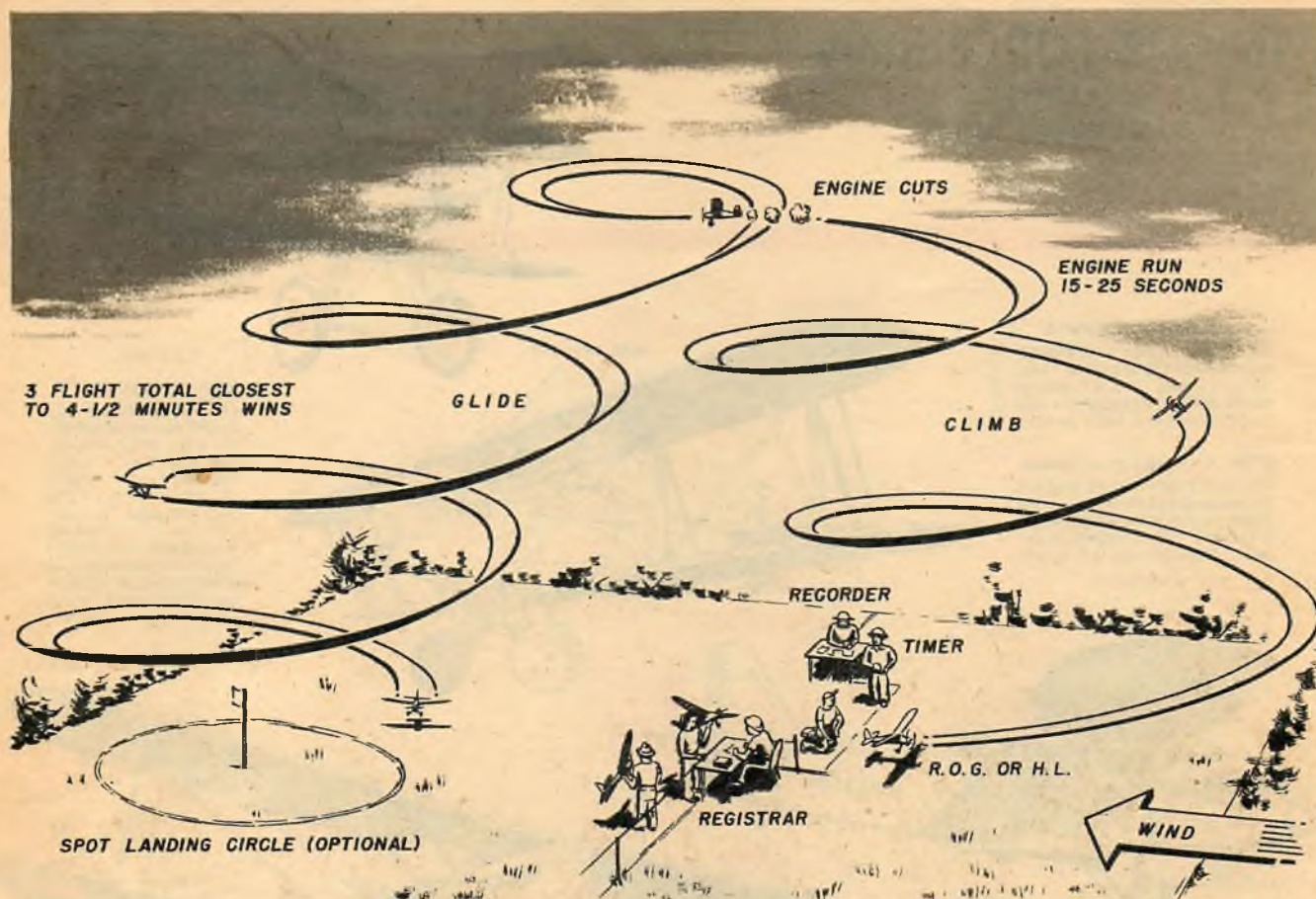
1925 CONSOLIDATED PT-1

180-H.P. WRIGHT V-8 ENGINE. MAXIMUM SPEED 92 M.P.H. THE CONSOLIDATED "TRUSTY" WAS FOR A LONG PERIOD THE MOST WIDELY USED PRIMARY TRAINER, IN BOTH ARMY AND NAVY AIR SERVICES. ONE OF THE BEST AND MOST SERVICEABLE (AND SAFEST) TRAINERS EVER PRODUCED, NOT EXCEPTING TODAY



1928-9 CURTISS B-2 CONDOR

TWO 600-H.P. CURTISS V-1570-7 ENGINES. MAXIMUM SPEED WITH FULL LOAD 133 M.P.H. ONE OF THE STANDARD HEAVY BOMBERS OF THE ARMY AIR CORPS FOR SEVERAL YEARS.



● Precision, limited-duration (call them what you will) events are catching on rapidly. Here's general setup for some of these competi-

tions. Figures are general, actual rules differ in various parts of country. English have been pioneering such flying for years.

Let's Have a New Deal in Free-Flight

By "CONTESTOR"

Now that we've got engines of all sizes, why not develop new and better free-flight events?

DOES anyone believe that free-flight is not here to stay, even with the present concept of ships, flying, and contests? Have the rules of the past two years done any good, or have they simply made the free flying gas model events less attractive? What does control-line have that free-flight doesn't have? Let's get to the point: Does free-flight have a chance?

Not only has it a chance, but given a break the free-flight gassie can run control-line a neck-and-neck race. We can produce the kind of ship and the type of flying that will restore free-flight's rightful appeal to the American modeler. This is not another way of saying that the current contest setup should be junked—far from it!

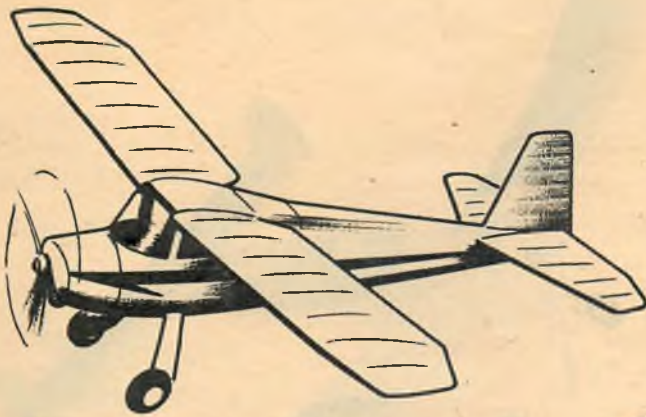
Unlike the attractiveness of control-line, up till just recently the free-flight model has offered very little in the way of realism or sport flying. Few fly a Class D monster for fun. The trouble may be that we have strayed so far along the primrose path we no longer know the answers to free-flight. Can we do more than guess?

If we assume that the old rules have carried us further and further away from free-flight that's fun,

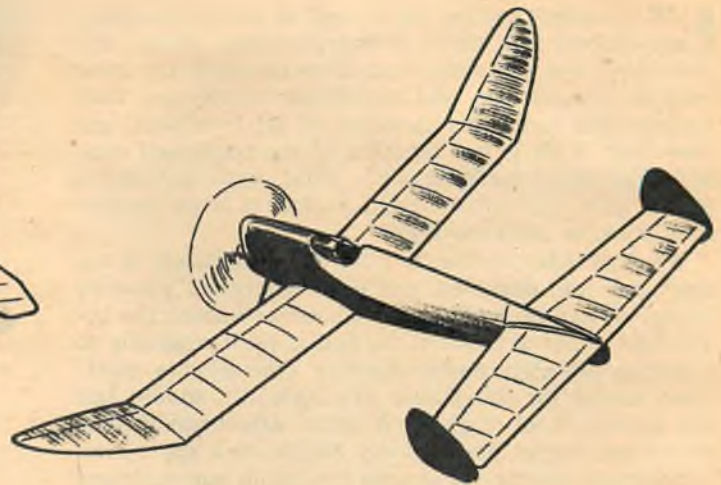
should rules and contest flying be guided to gradually remold the looks of free-flights into something attractive to both contest goers and the great number of sport flyers? If you look back over the rules changes of yesteryear, you soon realize that every rule designed to limit performance has, over a period of time, failed.

When Maxwell Basset first upset the Nationals by competing against rubber with a gas model, there were no limitations whatever, a situation that hung on until ships began out-of-sight flights on power alone. So then fuel was rationed, first ¼ ounce per pound of weight, then ⅛ ounce. Motor runs came in, first 30 seconds, then 20, then 15. Wing loadings were introduced. Timers were not allowed to follow the ship by car.

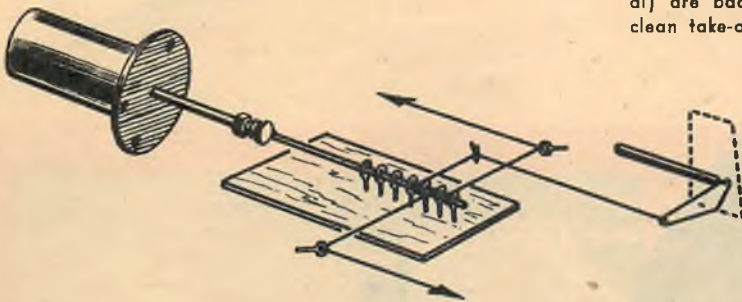
"Should free-flight models compete on a straight duration basis?" ask many thinking builders. From so many years of competition on a duration basis many are too muscle-bound mentally to visualize anything else. Duration alone is the logical ground for competition, it will be argued. Is it really? What does duration alone prove, (Continued on page 95)



● Semi-scale or true scale lightplane types are a cinch for realistic stable flights with the new small engines. Designers like Joe Weathers have long advocated them.

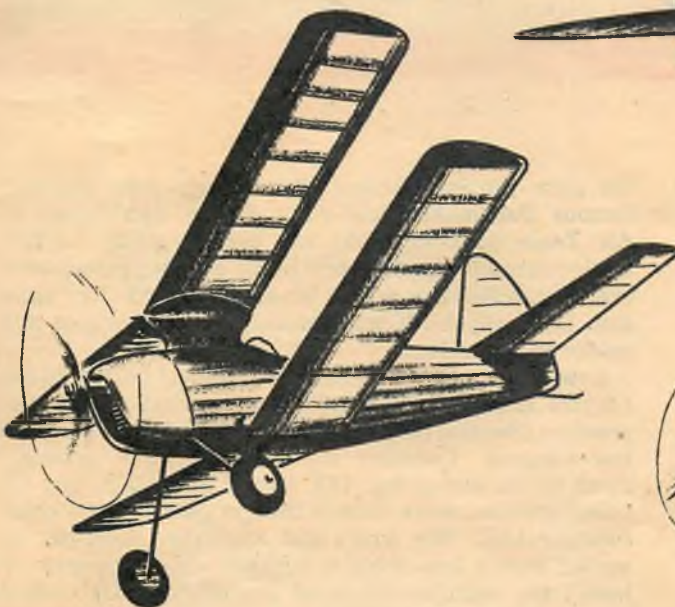
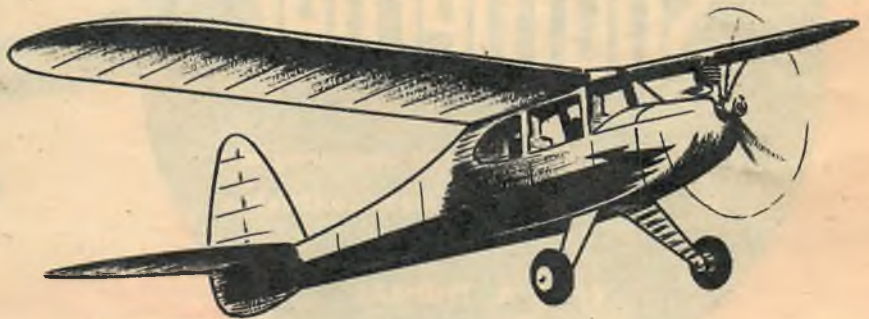


● The Little Rock, Ark., low-wing boys (Sadler, Thomas, et al) are back with this excellent type. Low-wings make clean take-offs, soft landings. Natural for spot landings.

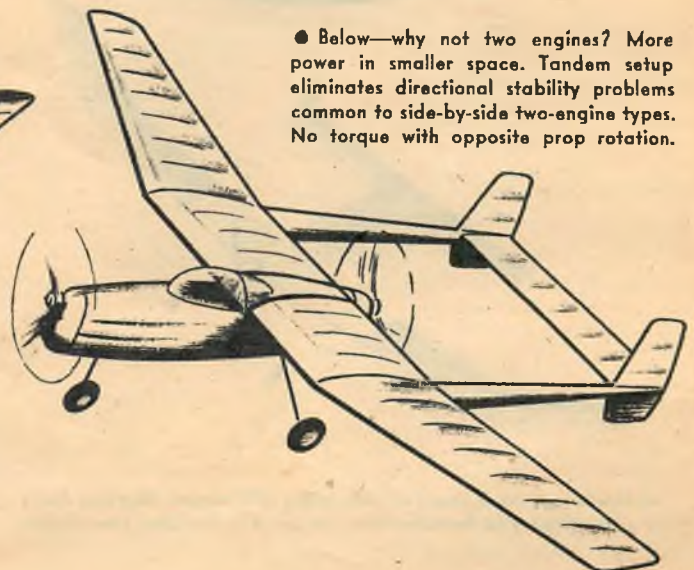


● Armand Vasquez's "Flight Control" (shown at left in simplified form) is typical system for dethermalizing and performing maneuvers in flight. Timer provides sequence of control operations. An extension slides through eyelet guides releasing various lines.

● Fly a Pan-American PAA-LOAD ship in precision, too. Extra weight and higher power loading will calm down flight patterns for better control. Ship at right shows how far realism can go in this popular event.



● Below—why not two engines? More power in smaller space. Tandem setup eliminates directional stability problems common to side-by-side two-engine types. No torque with opposite prop rotation.



● The popular biplane can be flown effectively in free-flight precision events (ask Henry Struck or Bill Effinger). Have good maneuverability and stall characteristics.

FEW modelers realize the extent to which the average contest gas model is overpowered. Never appreciating the fact that this is responsible for their critical adjustments and numerous crack-ups, they assume this to be the criterion of all free-flight gas modeling. This is the reaction of the confirmed control-line flyers particularly. What with screaming power spins and out-of-sight flights, it is no wonder they stick to tethered flight!

What so many modelers miss out on entirely is the sport gas job, designed and built solely for pleasure flying. It can be realistic to whatever extent the individual cares to make it so, and if built ruggedly to a somewhat high power loading (meaning a good-sized model for the power available), it should last for hundreds of flights. A calm afternoon during which we logged nearly forty flights on a sport low-wing gassie stands out as tops for fun in our modeling experience. This is gas modeling at its very best, sir!

The Southerner is a low-wing, four-footer built for



the Southerner

Something different and appealing in
free-flight for precision contests

By H. A. THOMAS



the glow-plugged Arden .099 engine. John Sadler's famous Pacemaker low-wing design (published in Air Trails back in 1938) has been a guide; in fact Sadler himself checked our plans and suggested several design features which we incorporated. The little ship is stoutly built with cleanly-cowled engine and monocoque fuselage.

Low-wing models, contrary to general belief, do not require excessive dihedral. Many pylon models use greater dihedral than we have found necessary in low-wingers. Consider the compact force arrangement of the low-wing: CG, thrust line, CLA, and CL being grouped more closely than in possibly any other configuration. We won't kid anybody, however, by saying that a low-wing is superior in every way. It hasn't the peculiar effect of the pylon model which makes right hand power turns and straight take-offs a normal tendency. Torque is the chief factor in adjusting a low-wing. On (Continued on page 64)

● The Southerner is powered with Arden .099 engine. Working drawings to speed your building time are on AT's Full-Size Plan #1049.



● Secretary-treasurer Norman Goyer of Look Park Aero Club (Northampton, Mass.) sends along this shot of friend Robert Longtin with his O & R 60 powered Fokker D VII.



● Eugene Licker, Paterson, N. J., made this fine photo of Erwin Stein (of Passaic) with 4 x 5 film pack camera. Shot at 1/200, f/8. Kodak Super XX film, printed on Defender.

NEWS, VIEWS, AND PHOTOS FROM MODEL BUILDERS THROUGHOUT WORLD

Model Matters

● Payment of \$2 to \$5 is made on or before publication for photos of unusual interest sent exclusively to AT. Since no photos can be returned, be sure to send glossy prints (at least 4" x 5") and retain negatives.

DOPE CAN

BY "DOPESTER"

IT'S pretty much old stuff to the average reader of Air Trails now, but we can't get over our initial enthusiasm for the small engines that are opening up so many new exciting events for contest flying and enabling the sport flyer to experiment as he never has been able before.

One very good feature of the new small free-flight models that are making their appearance in the original design field is their trend toward realism. We've no bone to pick with the pylon-elongated fuselage crowd. In endurance contests, we say use the best possible combination to capture that climb and hook that thermal. But the sport flyers have latched on to the wee engines as a means to fulfill their desires for realistic flying, and in many instances actual scale free-flight models.

Already Dopester has seen several twin-engine free-flight jobs powered by small motors. One was a pusher-tractor combo that performed very well. If you're in an experimental mood some evening why not try doodling a multiple-powered design. We'll bet a

2-oz. can of banana oil that it won't be long from the first pencil drawing to the finished model!

Speaking of banana oil brings to mind the Independence Model Airplane & Supply Co.'s very old catalog that Ev Tasker of Boston, Mass., sent along recently. Let us quote from the brochure and tell you all about "The Cloud-Breaker R.O.G. (Rise-off-the-Ground)" model. Wing span is 14 inches; length overall is 14 inches. Catalog says, "The Cloud-Breaker is primarily designed for beginners who have no previous experience in this field. This is a model that will not disappoint them. The kit furnishes enough materials to build 2 Cloud-Breakers and a full sized drawing, which eliminates all complications.

"Parts List of the Cloud-Breaker: 1 set of drawings, 15c; 1 rubber motor, 3c; 1 package of fittings, 25c; 1 fuselage, 2c; 1 piece of flat balsa, 3c; 2 drams of banana oil, 8c."

We can smell that banana oil now! To say nothing of the scorched bamboo which we once used for wing tips! (Never could bend that darn stuff without weakening it!) And thrust bearings were called "hangars," while standard covering was tissue scrounged from suit box wrappings.

Do we long for the good old days? No, sir, not for one minute. We think

that it's a lot more fun to design, build and fly models right now. Lot of exciting things happening. Take the Plymouth meets for instance. . . .

The local, state and regional Plymouth qualification meets in a short two-year period have built up like nothing we can recall in the annals of model aviation. We're swamped with notifications of contests sponsored by Plymouth dealers all over the country. To mention only a few: Los Angeles, New Orleans, Bismarck, N. D., Washington, D. C., Chicago, Ill., Boston, Mass., San Francisco—the list goes on and on. And the winners all compete in Detroit against the cream of the foreign modelers.

What—swap the yesteryears for today's big meets and top-notch prizes? Don't even mention it.

GOOD news for the team racing enthusiasts comes from Johnny Young of Hagerstown, Md., a member of the A.M.A. Team Racing Committee. John reports that the committee has been going to town on semi-scale U-control proto racing proposals and has come up with what appears to be a fine idea. Inasmuch as many of the newer control-line fans are somewhat loath to pit their fine models against competition with 2, 3, 4 or 5 flyers all performing at the same (Continued on page 83)

● While living in Sweden, John K. Laumer (now of St. Petersburg, Fla.) built this speedy flying diesel-powered 25-inch-span job. The motor was installed after photo was taken.



● Here's a 6' 1/4" Cessna 195, with Edo floats and scale Cessna spring gear (interchanges in 10 minutes), powered by an OK Twin. By Sgt. C. P. Pelletier, of Wichita, Kan.





● For a rugged towline glider look at this, designed and built by Th. van Teunenbroek of Holland. Note the position of the stab, and the location of the towline hook and drag.



● George C. Moritz of West Haven, Conn., says he's married, has 3 daughters, so had to build this Aeranca "on trips to cellar to take care of furnace." It was his first gas job.



● This scale Fleet M-7 is a fine hunter, says designer-builder Glenn Peterson, Rockland, Mass. Span is 50 inches, length is 35 inches. Super Cyke powered. A nice job, Glenn.



● Joe Bablasky of Piasecki Helicopter Corp., with accurately scaled models of firm's HRP-1. Joe has a P-47 that took one year to build, complete with pilot and oxygen mask.



● Piero Gnesi, noted Italian designer and contest-winner, with one of his free-flight designs. Gnesi won the Eaton Bray contest for gas jobs on trip to England two years ago.

● Another Continental control-line model. It's interesting to note that U-control flying has now become an accepted part of English and European events, although first scoffed at.

● Gene Morrow and Bill Batchelder, Stillwater, Okla., have been experimenting with U-control amphibians. Here's their free-flight Flamingo. Working now on single, twin floats.





Nightmare

No, you're not dreaming. It's an honest-to-goodness T-56 rubber job with a new slant (or two). Performance is unusually good.

By AL CASANO

THE unusual appearance of this ship prompted its name, so henceforth, Nightmare it is.

This design is no accident, but rather the result of long, and sometimes painful, experimenting with different combinations of wings, stabs, props, airfoils, and ideas. The author has been designing and building for twenty years and believes that rubber-powered jobs give more satisfaction, and afford more opportunities to really study model aerodynamics than any other class of models.

Take this job, for instance—the requirements were a crate of unusual appearance, combined with good flight characteristics. We built a thirty-degree swept-forward wing, with equal sweepback in the stabilizer. It was not so good—the stability wasn't there. Larger rudders, smaller rudders, deeper fuselage—they were all tried, but still the stability was only fair. So we tried again, with a twenty-five degree set up—and that was it! A total of three ships were built, and the third, Nightmare, was the ship we wanted. This plane is really easy to build—only one size wing rib, only one size stab rib, sheet rudders, no body formers—it's a cinch!

But talking won't build it, so let's go. First build the two fuselage sides. Pin down the top longeron (you can stick pins through wood without damage if you use the thin steel pins and not the fat ugly brass ones). Place a drop of cement on side of longeron at each point where cross brace meets longeron. Put in cross braces, cutting off at bottom longeron outline. Now put in diagonal braces, cut to length, and then

cement in bottom longeron. Work carefully here.

When first side is thoroughly dry (in about two hours) make the second side, and let dry. It is important that sufficient time be allowed for drying on all parts. Take the two finished sides and place over plan view in a "standing up" position. Cement together at back, put in the two cross-pieces at nose block end, and allow to dry, using steel squares or any fairly square objects to keep the two sides braced upright. Next add all cross-pieces and landing gear, taking sizes from plan. When dry, sand well, and cover with Silkspan. Don't let fuselage hang around uncovered for too long a time—it may warp or twist. Now make nose block per plan, and drill out planked section at rear for dowel, to hold rubber at rear.

The prop may be carved by hand from a solid block, or any machine-cut prop of 12" dia. may be used. Jasco prop-folding hinges will simplify the "tool making" end, and for the boys who don't like to bend shafts for props, that concern (*Continued on page 72*)

PLANS FOR CASANO'S NIGHTMARE

If September's dog days have got you down and you don't feel up to making full-size plans, save yourself time and trouble by ordering Air Trails Plan #1049.



Topsy Junior

Scale? Roger! A good stunter? You betcha!
Takes McCoy, OK, Bantam 19, even .29 motors.

By AUBREY KOCHMAN

HOW many times at a control-line stunt contest have you heard the expression, "It sure does everything in the book, but it doesn't look like an airplane to me." Or, "It's a beautiful model but I'd hate to see it crack up, it sure must have taken plenty of time to build."

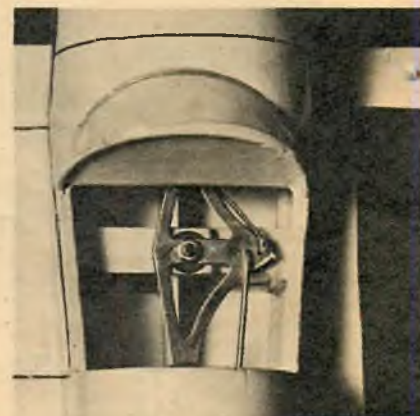
With these thoughts in mind, I set out to find a model that would be a perfect scale model, or as near to scale as practical, a good stunt ship and a cinch to build. Things didn't look too well until I ran across the Topsy Junior. It looked like the answer, and after carefully scaling up the plans, I found that this definitely was an ideal stunt model.

The Topsy was designed by O. E. Tips who has been associated with the design of successful light aircraft since the middle thirties. The registration letters show that the airplane was licensed in Belgium. It is an ultra-light aircraft, having for a power plant a 60-hp four-cylinder in-line inverted air-cooled Walter Mikron, while another version is fitted with a 36-hp J.A.P. horizontally opposed twin-cylinder engine.

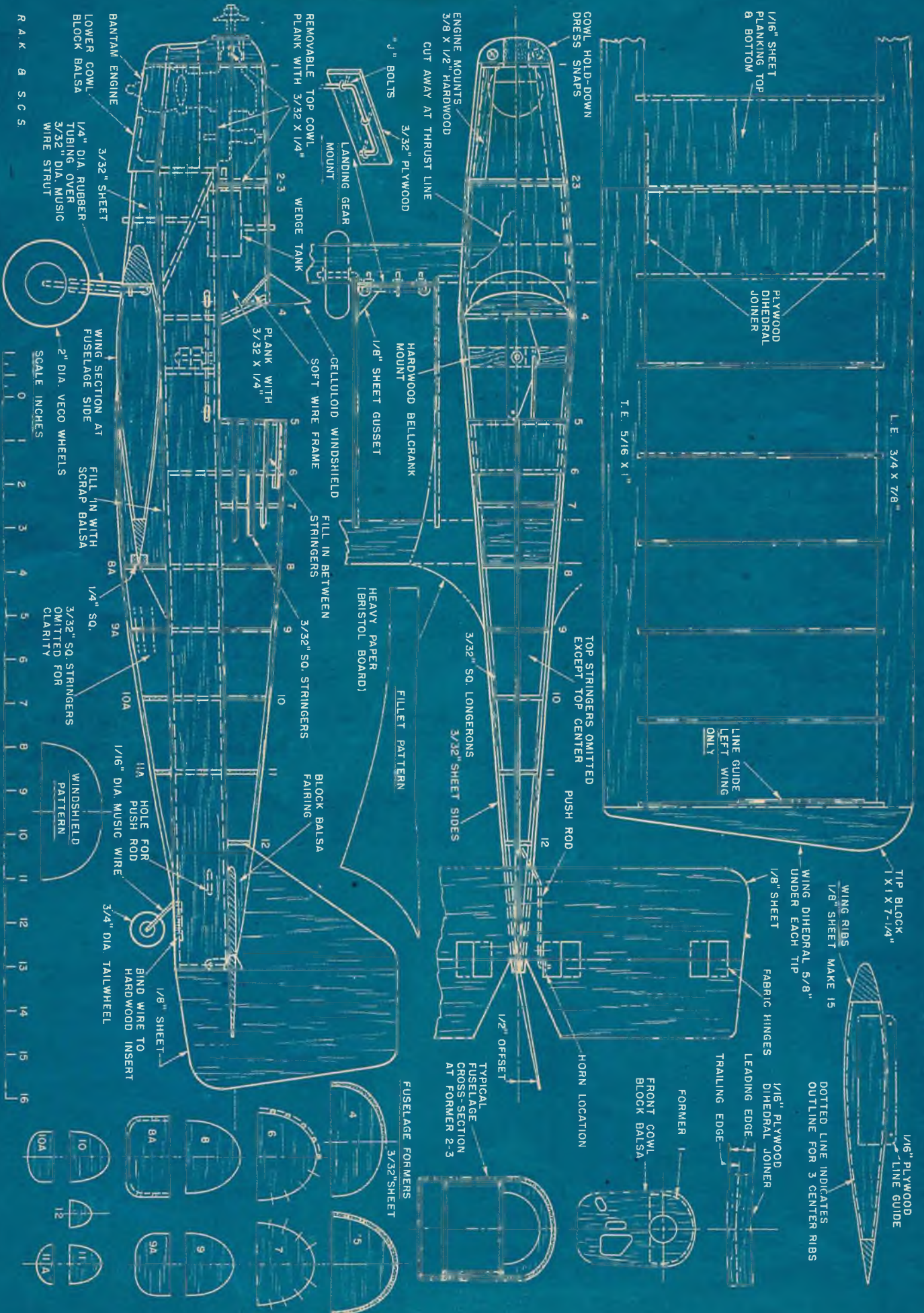
The model as presented here was scaled up from the three-views to a size that would take a Bantam or McCoy 19 fully enclosed, except for the glow plug, and have good performance with either engine. A Bantam powers the model shown and construction was planned to keep the weight to a minimum without sacrificing strength. Choose your wood with this thought uppermost and you should have little trouble in keeping the weight to about 15 ounces. If you like to fly control-line with models that look like the real

thing and yet are not too fussy about exact scale, engines like the Ohlsson 23 or 29, McCoy 29 or OK 29 may be used if the nose of the model is widened just enough to take the engine and the cylinder head is allowed to protrude either in an upright or inverted position.

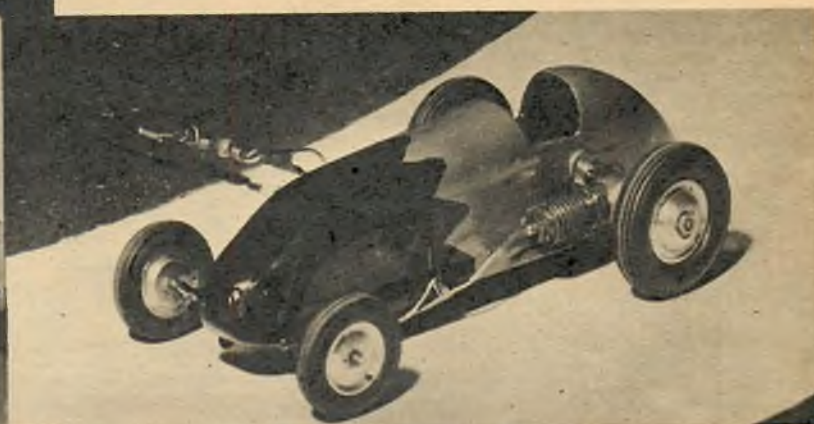
To begin construction you will first have to scale up the drawings. Better still, order a set of full size plans from Air Trails. In either case start by laying out the two sides on sheets of quarter-grained balsa 3/32" x 2" x 21". Check both the top and side views when doing this as you will lose almost 1/2" in fuselage length if you work only from the side view. With the two sides cut to shape, cement the 3/32"-square longerons and uprights directly on to the sides. Next cut through the longerons and lightly score the sides at the points in the fuselage where, seen from the top view, it bends sharply just forward of the cockpit at former 4 and again at former 3. Apply glue at these breaks and



● Bellcrank detail seen through cockpit opening of Topsy's fuse.



• Actual size working drawings for building Tipsy are part of Air Trails Full-Size Plan #10491



● Any large table or flat surface can be used for racing. Roller skate wheel makes a good center pylon. Above: an example of installation needed for rear-wheel drive. Cartridge holder is located in front. Note bridle position.

Mini-Racers

There's lots of fun ahead for you and your club with small race cars for CO₂ and glow plug motors

NO matter how deeply we become engrossed in aviation and model plane building, it seems that every aeromodeler has a soft spot in his heart for racing cars. Perhaps that is why so many enthusiasts participate in both model plane and model race car meets.

The introduction of the Herkimer carbon dioxide motor several years ago set off a building spree, as far as the small racers were concerned. For the first time it was possible for the modeler to build race cars according to his own designs without having the expensive metal castings and machined fittings made for him if he lacked machine tool facilities. Built mostly from scrap box findings, these half-pint spin dizzies provided a much needed shot-in-the-arm to the racing sport. Now the tiny glow plug compression ignition engines permit a new class of miniature racing automobiles (see photos in Model Matters, September 1949 Air Trails).

Shown here are a bevy of beauties and masterpieces of original design which race in Toledo, Ohio, under the encouragement and sponsorship

of the proprietors of the Hobby Center, Inc., of that city. Although these are all Herkimer OK CO₂ engine powered jobs they should suggest what could be done with the glow plug compression ignition Infant and Cub motors. Full-size plans and working drawings of the car shown, the Blue Devil CO₂ Special, are available on Air Trails Full Size Plan #1049.

To build the Blue Devil: Select soft but firm balsa to be used for the body. Pick wood that is on the light side rather than hard. Hollow out the balsa body as shown from the underside view to receive the capsule holder.

Now lay out the center lines and pencil in the shape of the top and side views of the body. Carve away the surplus wood and finish shaping and sanding the outer body contours to correspond with the plan. Cut a flat notch for the plywood motor mount and carefully check alignment by using the motor with wheel mounted for toe-in. This is important since you are using a front wheel drive. To assure accurate mounting a good idea would be to make a small assembly jig so that the correct angles will be maintained. Cement the motor mount in place. This measures 1 7/8" x 7/8" and is cut from 1/16" plywood. Note the offset which is shown on the top view of the body.

The motor is mounted with round-head 4-40 machine bolts or #3 wood screws through the plywood. Watch the tension of the bolts or screws to see that unequal pressure does not pull the motor out of line. Coil up the gas tube. Be care-

● These Herkimer OK CO₂ powered half-pint spin dizzies are economical to build, fun to run. Designs here by Toledo, O., enthusiasts.



ful not to kink it. Install four #3 wood screws to hold the rubber bands which are used as "holder-uppers" for the capsule holder.

Install the front idler wheel as shown. Here again make certain that it is carefully aligned with the center line of the body.

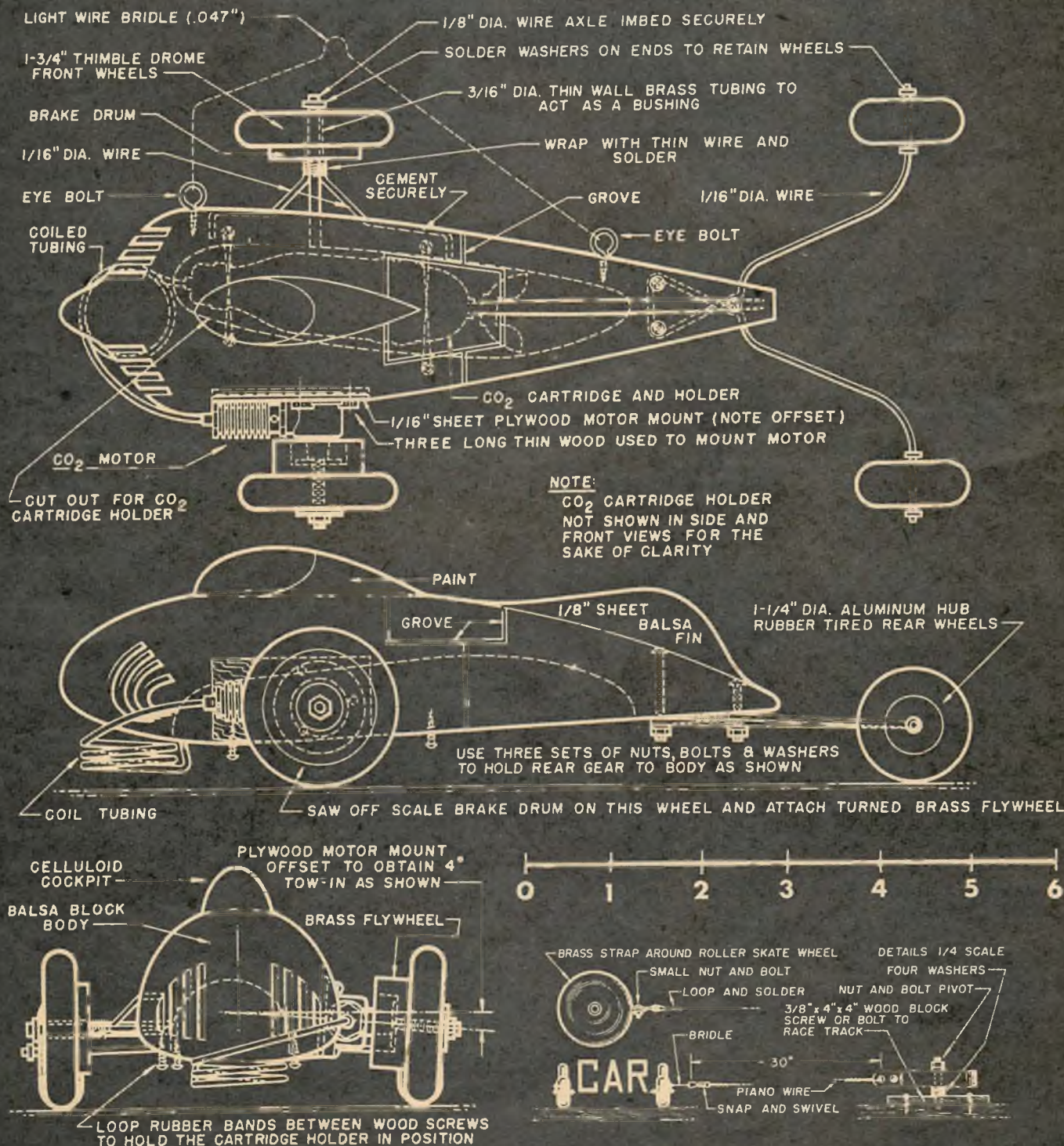
Bend rear axle wire; solder washers to it for mounting. Install this unit with 4-40 bolts or #3 wood screws. Align the rear axle and wheels so that the car curves in a circle approximately 8 feet in diameter.

Bend bridle and attach using large screw eyes—small ones will pull out. Eye bolts made of

washers soldered in the slot of 6-32 bolts are even better. Balance the car by affixing capsule in place and hang the car from the bridle "V" point. Car should hang level. If rear wheels hang lower (or vice versa) change "V" point by bending wire until wheels are level.

For operation, capsule is pierced in conventional manner with thumbscrew. To start car, spin wheel with hand and as motor catches, give the vehicle a firm forward push.

The best center pylon developed for these mini-racers is one incorporating a wheel from a roller skate and mounted as shown on the plan.



Now here is Air Trails' idea of a
real U-control speed trainer.

The model is almost crash-proof.

It's covered with crinoline.

Roscoe

By EARL C. FABRITZ



IN Roscoe a need is fulfilled for the high-speed aspirant who would find progression from a 40-mph trainer to a 120-plus-mph speed model an overambitious and costly step. This model becomes a transition type for such a builder and flyer. This model will provide the opportunity of developing confidence in dolly take-offs. To lessen the potential of propeller breakage, a very real possibility with any model, Roscoe may be flown with the dolly in place. It has been so designed that the center of gravity is not affected by affixing or dropping the dolly. The model may also be used in acquiring hand launching techniques. In all of these things this model will be able to shrug off "rough handling."

Roscoe turns in consistent speeds in the 75-plus-mph region. Wind or temperature have never proved a deterrent. The model has been flown in zero weather from ice and in winds that would have made shorter lines a discretion. Under all conditions it takes off with a short run and is smooth and responsive in control. Roscoe has been flown by expert and complete novice alike. Many a beginner has been amazed that he could control a fast flying model so successfully on the first attempt. Experienced control-line flyers have been pleased with so much performance from a comparatively small and modestly powered model.

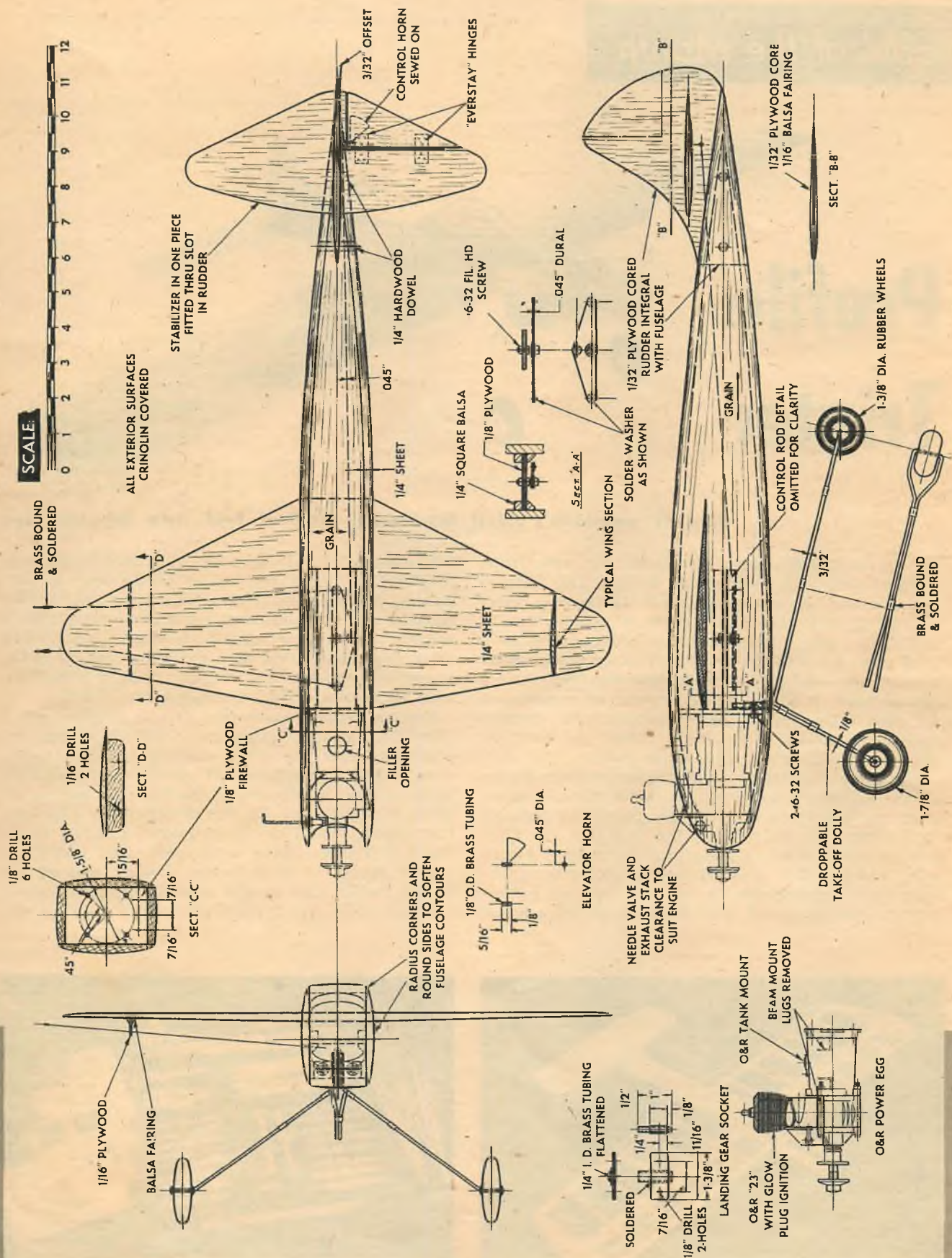
So here is Roscoe, a rugged control-liner that flies fast. For those who prefer their models simple, swift, smooth and strong

this is one in which to revel. The choice of engine is the Ohlsson "power egg" consisting of the "23" engine, rotary valve conversion, gas tank type mounting and glow plug. The author's cylinder and crankcase are of 1939 origin. The ingenuity and requirements of the individual builder may suggest other possible engine applications.

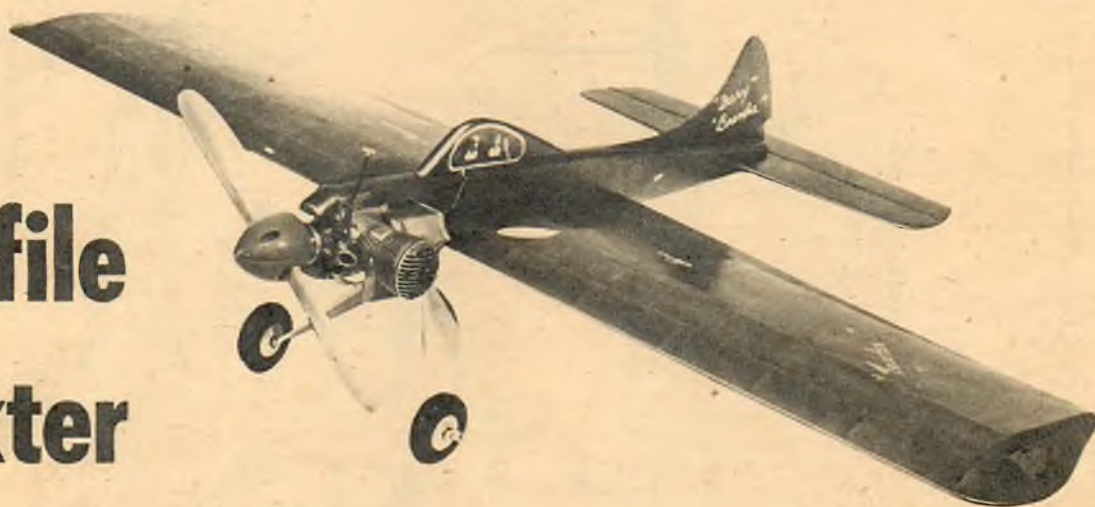
The advantage of glow plug operations is, of course, in the elimination of weight and complexity. Roscoe boasts of having no hatches, inspection panels or removable sections. Internal construction is limited to a firewall and bellcrank (*Continued on page 68*)



● Designer-author Fabritz aptly describes Roscoe as a "transition control-liner." The dolly may be dropped after take-off, or model may be flown with gear fixed.



Profile Trixter



One of modeldom's oldest firms enters contest field with this slick job

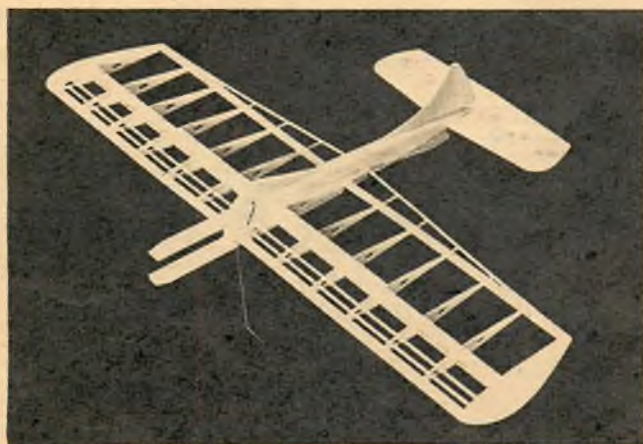
IT IS said that every airplane, big and little, represents a compromise in design. The faster a big airplane flies, the faster it lands; the more heavily loaded, the more poorly it maneuvers. In models we have different compromises. And in a good stunt job like the Guillow Trixter, designed by stunt-champion Lou Andrews, these compromises are unavoidable. It should be understood, of course, that all good ships, regardless of manufacturer, involve such compromises. One might almost say that, by their compromises you shall know them.

We do not refer to the compromise between degree of prefabrication and cost which all manufacturers must make in deciding what you are willing and able to pay for. We do refer to the fact that the ultra maneuverable stunt ship must, perforce, have a light wing loading. This consideration poses further problems for the manufacturer. He can turn out a completely prefabricated kit that is a miracle of

ingenuity and it will fly very well. But he can also back off a little, combining prefabrication with finished parts and built-up construction and thereby enhance a ship's ability to get around those square corners. Among the popular U-control stunts and sport ships, are found both extremes and all gradations in between. Once again, it is a matter of what you want. Now let's analyze the Trixter.

Guillow manufactures two Trixter Profiles, one a Class B-C job for engines above .299 cubic inch displacement, and the other an A-B job for engines from .199 to .35 displacement. Both are profiles with built-up wing construction; the big ship selling for \$2.95, and the small job, the object of our affections this month, for \$1.95. To get down to brass tacks, the A-B Trixter has a wing span of 32 inches, an overall length of 25 $\frac{3}{8}$ inches, a wing area of 250 square inches, and weighs in at an even 20 ounces.

Structurally, the Trixter (*Continued on page 63*)



● The Trixter is simple to assemble, and rugged. Fuselage combines hardwood motor-mount section and balsa rear. Wing position slotted.



● Photo shows how easy construction has been made. Features complete flying instructions by designer Lou Andrews, stunt champion.

E-Z is right!

*E-Z to Build! E-Z to Fly!
and E-Z on the pocketbook!*

each E-Z kit only

50¢

All parts shaded on this accurate drawing of the E-Z "Bonanza"—a typical E-Z kit—are die-cut, and ready for assembly!

FOR GREATER CLARITY
SOME PARTS ARE
OMITTED

Biggest Half-Dollars Worth In Model Aircraft History!



20" span
GREAT LAKES TRAINER

**Get These Other
New "C-D" E-Z
Kits, Too!**



18" span
BRITISH WWI SE-5



16" span
MIDGET MUSTANG



20" span
AERONCA SEDAN



16" span
THUNDERJET

36" span
"BABY CONDOR" GLIDER
E-Z 032 only 50c



20" span
1917 FOKKER D-7 Fighter
E-Z 15 only 50c

**3 Brand
New E-3's**



20" span
RYAN NAVION
E-Z 107 only 50c

**All America's Wild About
These Super Kits, ea. Only \$1**



PIPER CUB



AERONCA CHIEF



GLOBE SWIFT



LUSCOMBE SEDAN



BEECHCRAFT BONANZA



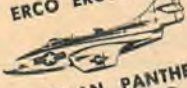
STINSON VOYAGER



F-80 SHOOTING STAR



ERCO ERCOUCPE



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MINNOW

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MODELS ARE
Plus!**

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flight perform-
ance, ev-
ery thing
except
price!

Boy! What Gas Models!

PLAYBOYS
C. Sr. 70" \$6.00
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LUSCOMBE
SILVAIRE
43 Span \$3.00



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Flying Station Wagon
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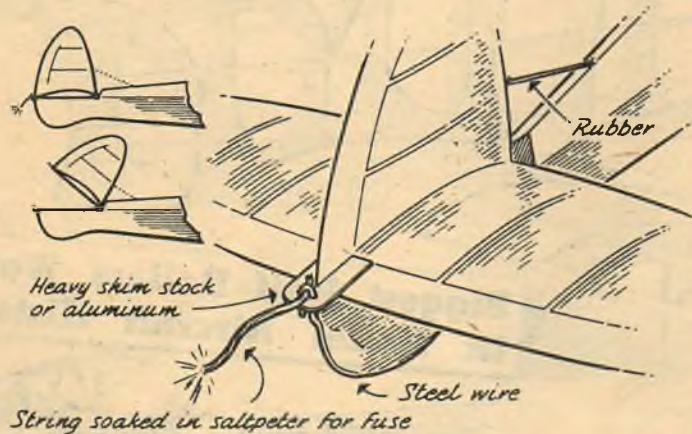
HOW TO ORDER: SEE YOUR LOCAL HOBBY DEALER FIRST. HE HAS THESE MODELS AND OTHER CLEVELAND DESIGNS AS WELL. If you are then unable to get C-D's, do not accept substitutes or imitations, but order direct, including 25c for packing-postage. Minimum order \$1.00. No C.O.D.'s. Special Delivery

in U.S.A. is 25c extra. (Ohio residents: add 3% sales tax). Military men stationed outside continental U.S., Possessions, Canadian and all foreign customers, add 20% for special handling, etc. in addition to 25c packing-postage charge. SEND 5c or (2) 3c STAMPS FOR VERY LATEST ILLUSTRATED CATALOG

CLEVELAND MODEL & SUPPLY CO., 4515 K2 Lorain Ave., Cleveland 2, Ohio. World's Finest Models, Since 1919

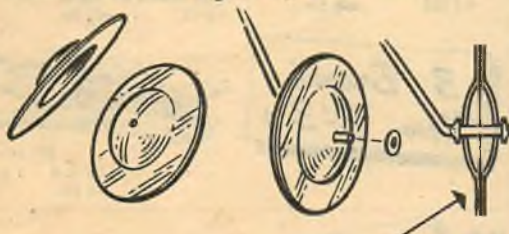
Sketch Book

HAVE YOU DEVELOPED SOMETHING NEW IN CONSTRUCTION, CONTROL, OR FLYING THAT MIGHT INTEREST OTHER MODELERS? SEND A ROUGH SKETCH—WE'LL REDRAW IT AND PAY \$2 FOR EACH ONE ACCEPTED



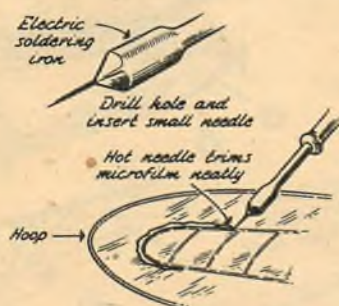
● Modelers always shop for simpler, more dependable dethermalizers. This one, submitted by Henry Lansford, Laurel, Miss., is one answer. Built like timer-tripped pop-up tail type, it uses burning fuse instead. Extreme light weight makes it suited to rubber, midget gas jobs. With fuse type dethermalizers object is to find fittings that will not carry heat away from fuse when it burns down, putting the fuse out without tripping the gadget.

Metal roofing caps



Sweat-solder faces together

● Hugh Gordon, Ont., Canada, thinks the lowly metal roofing cap has been overlooked. He uses them for thrust bearings on models with radial nose, and for wheels.

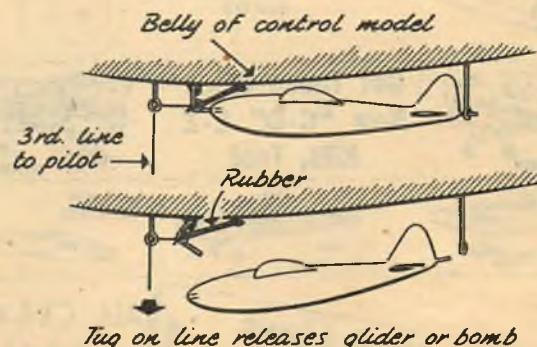


● Trimming microfilm from edges of newly covered surfaces done quickly with needle in point of soldering iron. Better than holding hot wire. Frank Danuskie, Pittsfield, Pa.

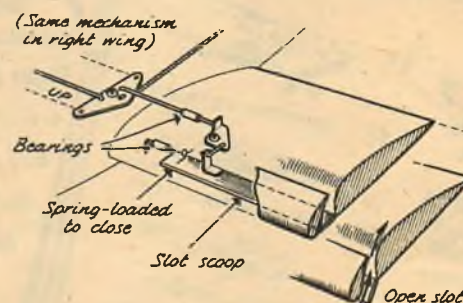
Remove chemicals from flashlight cell



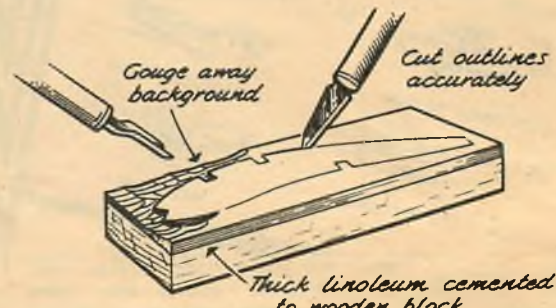
● From Karachi, India, comes neat tank idea by M. U. Begg. Part of flashlight battery cell housing replaces plastic tank if damaged on motors. Hot fuel proof, of course.



● Release device for novelty control-line jobs is brainchild of Hubert Birnbaum, New York City. Third line releases glider or bombs held securely under tension of rubber.

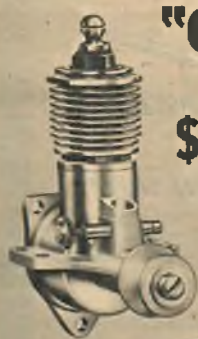


● Clarence Wells, Bristol, Pa., goes step beyond usual wing slot with automatic scoops, coupled to flippers, which open to increase lift during full "up." Closed by springs.



● Not exactly new, but highly practicable is rubber stamp rib profile. Thomas Shaudis, New Philadelphia, Pa. (Penna. clicking this month) uses stamp pad or printer's ink.

Top Performance!



"OK" CUB

ONLY

\$5.95

INCLUDING
GLOW PLUG

Develops up to 15,000 RPM!

HOBBYISTS—here's the small displacement glow plug engine you've been waiting for! It's easy on your pocket—a cinch to install—a snap to start.

This new "O.K." CUB is a "natural" for free-flight and control-line flying. Its small frontal area offers low wind resistance. No limitations in installation, either—you can use radial or lug mounting.

SPECIFICATIONS

Displacement	.049
Bore	.390
Stroke	.415
Weight	1 1/2 oz.
RPM	Up to 15,000 using a 5 1/2" low pitch prop.

Higher power on a weight-ratio basis results from the unique and patented port design which provides radial fuel injection, higher turbulence and more effective scavenging.

Like all "O.K." engines, the new CUB gives you all the qualities of a full-scale engine: easy starting, reliability, wearability, long range and economical speed. All built in by "O.K.'s" skilled engineers.

Look over the "O.K." CUB at your dealer's. Examine its sturdy construction . . . heft it . . . you'll agree it's a honey!



The *Only* Complete MINIATURE ENGINE LINE

**An Engine for Every Class
A Model for Every Purse**

NEW!

The Improved 1950 Models are Here! Now at your dealer's—the new advanced Hot Head, Super 29 and Super 60. Redesigned with ebonized cylinders and gold anodized cylinder heads. Smoother performance! Higher output!



Class A "O.K." BANTAM

—an improved 1950 model of the record smashing engine, designed by Ben Shereshaw, noted model engine designer. Wt. 3 1/4 oz. RPM 2,500 to 11,600. Complete with spark plug and tank for only

\$11.95

Class A "O.K." BANTAM

—**GLOW PLUG MODEL.** Features all the championship performance and construction details that won world-wide fame for its brother spark plug model. Complete with plug, less tank.....

\$9.95



Class B "O.K." SUPER 29

—with high-compression head, rotary valve and ram induction. Complete with spark plug and tank, an outstanding bargain at only.....

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Class B "O.K." HOT HEAD

—extra rugged for the extra stresses of pre-ignition firing. Will exceed spark ignition speed when "O.K." Hot Head Fuel is used. Wt. 7 oz. Complete with plug less tank, only

\$9.95



Class D "O.K." SUPER 60

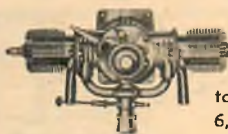
—aluminum crankcase for lightness. Large size ball-bearing and new domed cylinder head for smooth performance. With 3-position timer located at rear for easy access. Complete with spark plug and tank.....

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Class D "O.K." SUPER 60—

—**GLOW PLUG MODEL.** With steel cylinder, hardened crankshaft and hardened and lapped piston for long wear. Complete with plug, less tank. You can't beat this value at only....

\$9.95



"O.K." TWIN

—an experimental engine for large models and radio-controlled ships. Wt. with tank 23 ozs. RPM 1,000-6,000. Complete, less coil.....

\$49.00

"O.K." COILS



—fat spark, low battery drain. Models for A to D Class engines. Complete with lead.....

\$1.75

In coil pack with lead and matched condenser.....

\$1.95

Twin Coil with leads and matched condenser.....

\$5.00



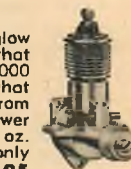
"O.K." CO 2

—the basic trainer in the compressed gas class. No gasoline, battery, timer, coil or spark needed. Wt. bare 3/4 oz. RPM 3,000-7,000. Complete, ready to run.....

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"O.K." CUB

—a new class glow plug engine that "reys up" to 15,000—far beyond what you'd expect from such a tiny power plant. Wt. 1 1/2 oz. Including plug, only a low, low.....



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EXPORT: 120 Wall St., New York 5, N. Y. (All cables: Concordia, N. Y.)

RECORD REVIEW

[illegible]

"It is really a shame that there are not more opportunities for these unusual craft to be flown at meets, for we always turn out a mob of fascinated citizenry wherever we fly the flappers. This particular design is the only one which I happened to have in flying shape when the two opportunities to set records arose."

GM Silkspan pre-doped on a frame, then cemented to flapper span

Power 18 Str. $\frac{1}{8}$ th 400 turns

Bamboo

16 $\frac{1}{2}$

8

Grain

All hinges & Bearings .025 Alum.

5 $\frac{1}{2}$

3 $\frac{1}{2}$

1 $\frac{1}{2}$ sq

22

8

3 small BB

.046 Shaft extended $\frac{3}{4}$ for hand winding

Fuselage $\frac{1}{8}$ sq. framework tissue covered.

Rudder Area not critical

Winding plug

$\frac{1}{8}$ Alum. Weld. rod to adjust tail inc.

Stab incidence varies from 15° to 20° negative

Tapered Balsa tube

4

$\frac{1}{2}$

18

Wt. 2 $\frac{1}{4}$ oz.

P. Schoenty

Have More Fun
with the New

MONOGRAM SPEEDEE BILT flying models

Three SENSATIONAL
NEW KITS!

MIDGET MUSTANG
KIT G6

ERCOUPE
KIT G4

BOEING KAYDET PT-17
KIT G5

FUN to Build!
FUN to Fly!

"Even better than you promised" — "You're right, they are all fun!" — "So easy I could build one in the dark." That's what model builders everywhere are saying about the three new SPEEDEE-BILT KITS. Don't miss the fun fellows! Get a MONOGRAM SPEEDEE-BILT KIT today. They're fun to build and fun to fly.

Only Monogram Kits Give You All These Features

All balsa parts, completely and accurately cut, with smooth clean edges and printed in colors — Monofoil wings (Patent Pending) with leading and trailing edges, spars and top planking built in — simplified fuselage with finished parts, ready to cement together — plastic propellers — decal license numbers — bent landing gear parts — shaped and finished cowl blocks — finished plastic cabin closures — rubber wheels — all models furnished with rubber for power, or can be

engine powered with CO-2 Campus "Bee" — "A-100" and similar engines.

AT YOUR FAVORITE STORE

See the can't-be-copied Speedee-Bilt Kits at your dealer today. See why Speedee-Bilt leads the field in building and flying fun. If no dealer near you order from address below and add 25c for packing and postage from nearby dealers stock.



EXCLUSIVE SPEEDEE-BILT FEATURES

BOEING KAYDET

Molded plastic engine with fins and spark plugs — TWO shaped Monofoil wings — shaped cowl block — other special features.



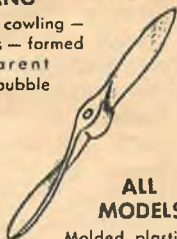
MIDGET MUSTANG

Plastic spinner — plastic cowl — plastic engine fairings — formed transparent plastic bubble canopy.



ERCOUPE

Finished tricycle landing gear struts — cut out plastic canopy — plastic cowl.



ALL MODELS

Molded plastic props.

Now 6 Speedee-Bilt Models — Each 75c



PIPER CUB KIT G1



MONOCOUPÉ KIT G3

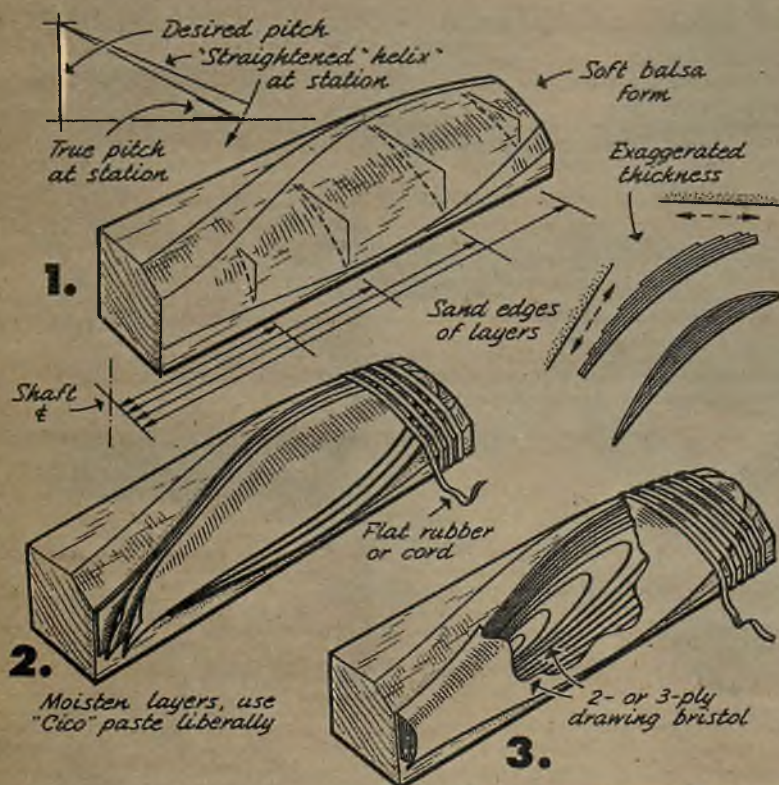


AERONCA KIT G2

Monogram MODELS, INC.

225 NORTH
RACINE AVENUE
CHICAGO, 7

Laminated Blade



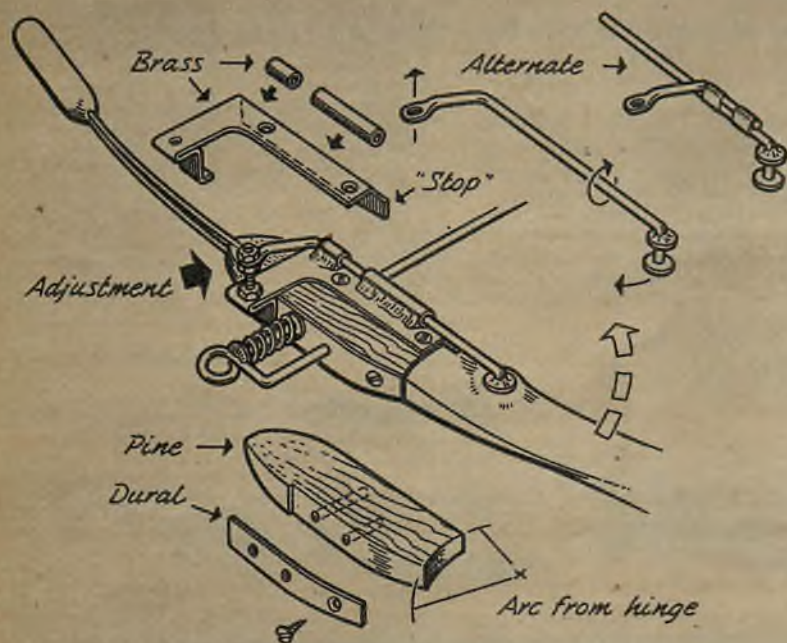
WAKEFIELD models nowadays are receiving more attention than ever before with respect to aerodynamic and structural refinement. And in this class of model, perhaps to a greater extent than in some other classes, the propeller is regarded as the heart of the ship. Here you don't always buy a ready-made item as in gas-powered categories; you frequently build your own. A folding propeller with tensioner and hinging mechanisms is one of the toughest items the builder encounters in any phase of aeromodeling. But a first rate job done here will yield rich rewards of performance in the finished model.

It has been the belief of many that propellers of rubber models, particularly of Wakefield size, would center on the two-blade folding type but, oddly enough, the awkward one-blade counterbalanced folder continues to be the favorite. The ease of construction and the absence of any problem of "tracking" plus the very satisfactory performance obtainable have combined to keep the one-blade folder in the picture.

Our contention is that the conventional one-blade folder can stand some further

A New Twist In Props

By CRISTO RUSSO



Adjustable Pitch

development making it even more suitable for models improved otherwise. Following are some suggestions which we hope may prompt other modelers to experiment in this direction.

To mention a laminated paper propeller blade with library paste as the adhesive calls for a lot of quick explaining. Being built on a true-pitch form in the familiar indoor micro prop style assures an efficient pitch and permits near duplicates to be produced. As to the material, we've always thought a rag-content paper had many possibilities for model use and after turning out several blades we have tangible proof of it. The blades were made by stacking, three at a time, layers of two-ply drawing bristol and binding them to the form. Layers were dampened and Carter's Cico paste was brushed on evenly and generously. Finally the "inside" laminations were in place and dry. The crisp edges were feathered out with a sanding block and a final over-all layer pasted down and bound. Thoroughly dried, the blade was trimmed and (Continued on page 75)

Tipsy Junior

(Continued from page 48)

start cementing in the cross braces top and bottom where the formers are shown.

When completed this should give you a square box-like crutch on which the formers are glued. All formers are cut from 3/32" quarter-grained stock. The stringers are added and these are cemented to the formers and lined up to give a neat appearance and a smooth covering job. The bottom stringers may now be added as far forward as former 8A and extended into the bottom center section of the wing, after it is in place; or you may choose to leave them off and add them in one piece later on.

The motor mounts are next. These should be cut from any close-grained hardwood. Apply plenty of cement and set them in place. While the cement is still not dry, place your engine in position and check to make certain there is no up or down thrust but that there is a slight amount of right thrust (to the outside of the circle). Now carefully remove the engine without disturbing the mounts, and after the cement is dry apply a second coat.

Next install your favorite stunt tank between formers 3 and 4, and plank this section—allowing the filler tube to protrude. If the filler tube is too short, as was the case in the original model, leave a small opening in the planking and later on enlarge this opening so that a piece of neoprene tubing fits snugly through it onto the filler tube. Don't forget to fill in the stringers between formers 5 and 6. The full scale airplane is planked here, so the model is, too.

The nose blocks are carved from soft balsa, with the bottom one carved first. Hollow it out as shown and cement it in place. The front block is cemented in place and carved to conform with the general outlines. Split this block on the line of thrust. The top piece becomes part of the engine hatch, so we make the hatch next. Pin former 2 against former 3, and former 1 to the nose block. Start planking both sides. When enough planks have been added to insure against any distortion, remove the pins and complete the planking. If these simple instructions are followed you will have a very snug-fitting hatch that will not necessitate the use of dress snaps. However, they are shown on the plans, if required.

Add the top piece of the nose block to the hatch and with this section in position on the model, sand the planking and nose block into a smooth unit. Later on, when you temporarily install the engine to make the necessary holes for exhaust, needle valve, etc., you can cut the cooling hole and the hole for the glow plug.

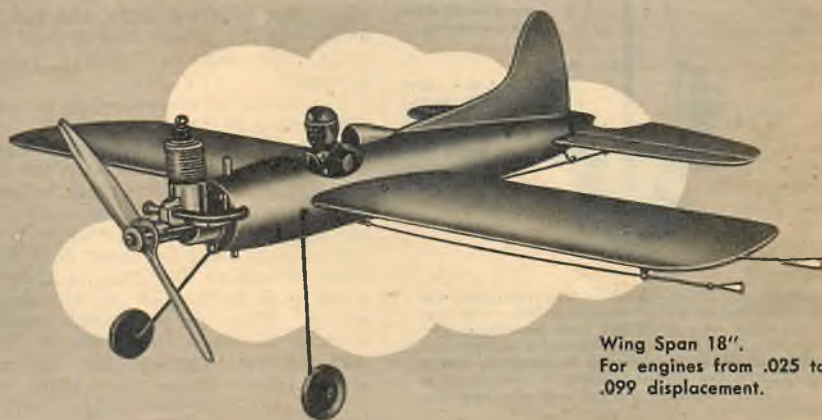
With the fuselage thus far completed, build the tail surfaces. Make these from fairly light 1/8" quarter-grained balsa. Cut them to outline shape and sand smooth. Add the control horn as shown and apply the cloth hinges to the elevators. Cement the stabilizer in place and then the rudder. Add the soft balsa blocks to each side of the rudder and carve and sand to conform with the top turtle deck. Make the push rod; secure it to the control horn and pass it through the fuselage at the point shown. It will

INTRODUCING WING DING

CONTROL-LINE STUNT & SPORT

THE GREATEST \$2 MODEL EVER OFFERED

MORE FEATURES THAN ANY \$2.50 KIT



Wing Span 18".
For engines from .025 to .099 displacement.

Leon Shulman, designer and Master Modelcraft, builder, bring you the greatest \$2 model ever developed. WING DING was created for beginners and experts alike. WING DING gives you the most STUNT & SPORT fun you ever saw before. WING DING needs so little work, you'll be amazed. Really, all you do is assemble it.

\$2 WING DING BEATS ANY \$2.50 KIT FOR VALUE SURPASSES ANY PRICED KIT FOR PERFORMANCE

WING DING performs all Official AMA Stunt Maneuvers. Only WING DING has a plastic pilot . . . anchor-tite control mount that prevents injury to the wing . . . finished wing tips . . . and the most complete hardware seen anywhere. WING DING IS WORTH MORE THAN \$2.50 BUT SELLS FOR ONLY \$2.00.



PLASTIC PILOT

Only WING DING has the plastic pilot that makes every flight tops in realism—and at no extra cost to you.

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At your Dealer
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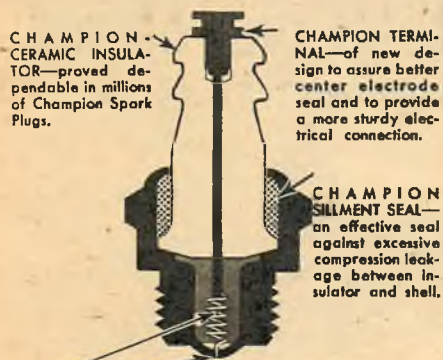
WING DING FEATURES

Design by Leon Shulman
For Beginners and Experts
Plastic Pilot for Realism
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(Anchor-tite control mount prevents control from ripping out of the wing.)

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ANNOUNCING CHAMPION V GLOW PLUGS



CHAMPION "THERM-O-FLEX" CONSTRUCTION*—an exclusive feature of Champion Glow Plugs which provides longer element life and more dependable performance. The special alloy coil element is held in proper alignment under all operating temperatures and is designed to flex without tendency to short circuit or break under repeated thermal expansion and contraction.

Champion Glow Plugs are designed to operate efficiently and dependably. Follow recommendations of plug types and fuels approved by engine manufacturer.

*Patent Pending

To the celebrated Champion V type Spark Plugs for model gas engines, Champion now adds V type Glow Plugs.

The cross-section above, with patented construction features indicated, illustrates the extent to which Champion's unexcelled research, engineering and manufacturing facilities combined to produce a glow plug with traditional Champion dependability. Available in three sizes for model gas engines.

"V" GLOW PLUGS	VG-1	VG-2	VG-3
"V" SPARK PLUGS	V	V-2	V-3
HEX	1/2"	3/8"	3/16"
THREAD	3/8"-24	1/4"-32	1/4"-32
THREAD LENGTH	1/2"	1/2"	3/2"
"V" GLOW PLUGS WEIGHT, GRAMS	8.7	3.7	2.8
"V" SPARK PLUGS WEIGHT, GRAMS	8	3 1/2	2 1/2

Champion Spark Plugs for model gas engines give the same dependable performance as regular Champions. Champion Ceramic insulation—Sillment sealed. Alloy needlepoint electrodes for easy starting. One piece construction.

CHAMPION

SPARK PLUG COMPANY • TOLEDO 1, OHIO

require a slight amount of bending to get it to operate smoothly without rubbing the fuselage side. When it is working smoothly, mount the bellcrank on a piece of hardwood as shown (a piece of the motor mount wood will do), connect the push rod and move the bellcrank fore or aft until the elevators are in neutral along with the bellcrank. If the crank unit has to be moved from its position on the plan more than 1/8" in either direction, make a new push rod.

The wing is a simple sparless type, and no difficulty should be encountered in its construction. Just make certain it is perfectly true—without warps. To gain in performance, some of the scale dihedral was taken out. 3/8" in each tip allows for inverted flight and yet does away with the droopy look of most stunt ships. The section, however, remains authentic.

Use plenty of cement when installing the landing gear and tail wheel.

To install the wing, first crack a piece of 1/4" square to coincide with the dihedral angle. Cement this piece to former 8A as shown. The trailing edge butts up against this piece. It may be necessary to trim away the lower edge of the fuselage side at this time, to allow the wing to fit flush with no incidence as shown. When in its correct position, without incidence and lined up square with the stabilizer, add the other piece of 1/4" square under the trailing edge.

Now finish up the fuselage stringers allowing them to taper into the wing center section in a smooth curve, as seen on the side view. Push a piece of neoprene tubing onto the overflow tube

from the tank and let it extend out the bottom of the model. A piece of 3/32" sheet, with allowance made for the tubing to pass through it, is now cemented in place. This piece is also tapered off into the wing center section. Round the edges of this piece.

Hold the engine in place and cut all necessary holes. Remove the engine and go over the model with fine sandpaper, to insure a smooth covering job. The entire model is covered with gas model grade Silkspar. If applied wet, but not dripping, you will find little trouble in getting around the so-called double curves, and you will be able to use larger pieces. When completely covered, give the entire model two or three coats of clear dope.

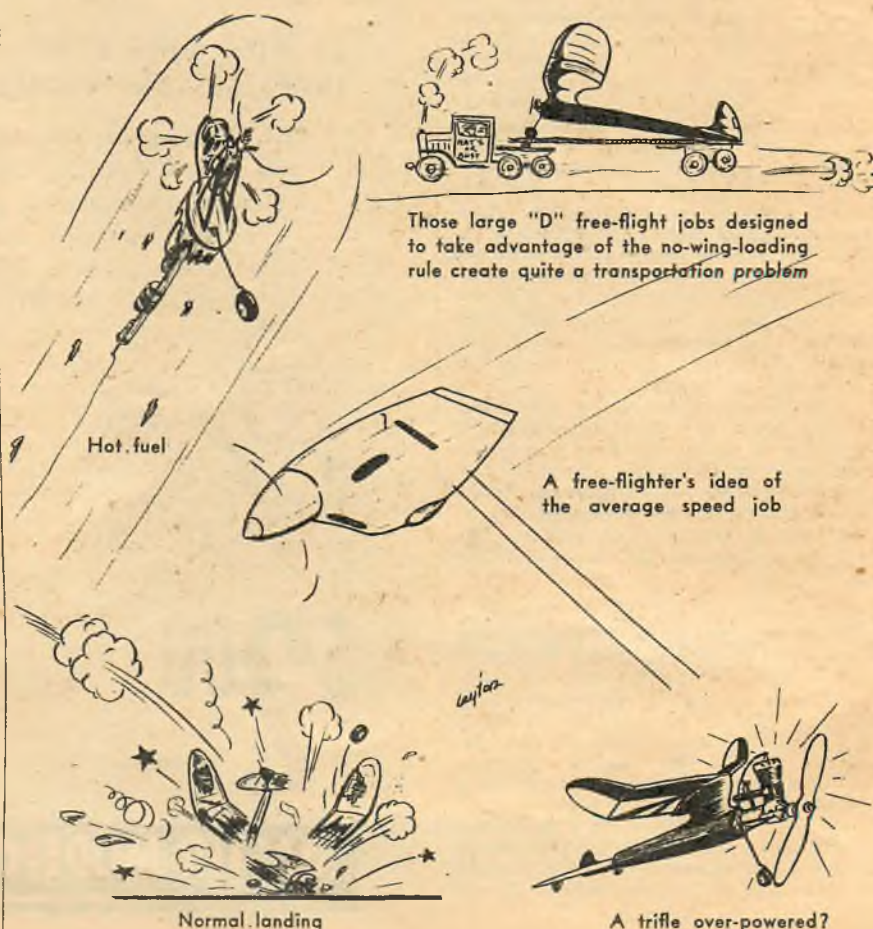
The wing fillets are made of heavy paper such as Bristol board. Take care in fitting them and you will be more than repaid for your patience with many "ohs" and "ahs" on the flying field. One coat of clear dope is sufficient on the fillets.

The full scale ship—and our model—is painted as follows: Fuselage is bright yellow (Testors fuel-proof dope is perfect). The fin is also yellow with the thin tapering scallops extending on to the rudder, which is silver. The wing and stabilizer are silver with a yellow leading edge—5/8" wide on the stab and 3/4" wide on the wing. The registration letters and the stripe on the fuselage are dark blue.

Two coats of colored dope were found sufficient for a beautiful finish. On the wing, one coat of silver was brushed on and the second coat, thinned out

CONTEST TYPES

by Cayton



considerably, was sprayed on with an ordinary Flit gun. Aileron and cowling markings were done with India ink and a ruling pen. Don't forget to paint inside the cockpit and engine cowl. When the dope is completely dry, a piece of copper wire or soft wire of any kind is bent to form the windshield frame. Bend the ends over sharply and push them through the planking. Spot-cement this wire in place, and the celluloid windshield to the frame.

Use four 1/2" round-head wood screws when mounting the engine, if you use a Bantam or McCoy 19. Use screws slightly larger and heavier with a bigger engine. Don't worry about their pulling out under normal engine running. They prevent bent crankshafts on crashes by pulling loose. To re-install the engine again, either use a heavier gage screw, or fill the hole with Plastic Wood and when hard use the same size screw used originally.

With your Topsy completed you now possess a scale control-line model that is different in appearance, simple to build and capable of every stunt in the book.

Profile Trixter

(Continued from page 54)

is one of the more unique prefab kits. Despite the innumerable and ingenious approaches to the prefabricated "fall-together" kit, Andrews managed to come up with yet another. The fuselage is assembled from two pieces or sections, the forward or motor-mount section, and the rear section. The forward section is of hardwood, the rear is of hard balsa, and both are approximately 3/4 inches thick by 2 1/4 inches deep. The rear piece is slotted out neatly to take the rudder and stabilizer assemblies and, running vertically on its front end, is a 1/4-inch slot to take the motor section. The latter is cut out, roughly U-shaped, to handle the engine which is mounted on the side, with its head to the outside of the clockwise circle flown.

The two sections dovetail beautifully together, leaving a 5/8-inch square hole at the joint. Through this hole runs a heavy square spar extending about half way out on the wings and being slotted in turn at both ends to take the lighter tip spars. Die-cut wing ribs and profile-sawed tail surfaces are provided. The wing is unusual in that in addition to the sturdy main spar an additional three auxiliary spars are called for, one on top forward, and two underneath the wing, between the spar and leading edge positions. A permanent flap is built out from the trailing edge by means of rib extensions. Nicely curving lines of tail and dummy cockpit lend an air of realism.

Proving that good things can come in small as well as large packages, the Trixter comes out of a little yellow kit box, hardly larger than some of the solid boxes. Possibly this packaging had something to do with the interesting breakdown of wing spars and fuselage into convenient short sections. This kit certainly is one of the most compact. The medium size plan is drawn on both sides, is neatly done and easy to read. Since Guillow is one of the firms that uses the Walker system under license, the plans include details on mounting of the bellcrank and hook-

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Here is the real McCoy—the midget racer you have been waiting for... beautifully streamlined and finished in the new brilliant iridescent colors... **EASY TO START**... **DUAL** ball-bearing rear axle... packed with power for **MORE SPEED**, because it's engine is a **REAL McCoy**—holder of most **Official AMA and IMRCA World Speed Records**.

The easy way to have the thrill of your own racing car, without all the patience and skill required of experienced hobbyists in building their own cars. The McCoy Midget is a **COMPLETE** race car, ready to go—nothing to put together... simply pour fuel in the tank (field tested with **TESTORS "39"** the fuel for easy starting, that's easy on the engine), start 'er up and have fun. Runs anywhere you have a flat surface 25 feet or more in diameter.

Made by the leading manufacturer of racing car engines, the McCoy "19" is easy to start, easy to run. Has more power for more speed, with the superior advantages of **TWQ** ball bearings! (Our experience in designing racing car engines has shown us that double crankshaft ball bearings is a must.) Other features include: disc rotary valve, two piston rings, Hot-Point simple wireless glow plug ignition.

RIGHT ANGLE JET

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up of the entire control system.

One of the best features of the kit is a pamphlet of instructions written by Lou Andrews to explain the technique of various maneuvers from take-off to a four-leaf clover. Thirteen white on black illustrations accompany the text.

The firm of Paul K. Guillow is a living contradiction of the saying that it does not pay to hide your light under a bushel. But the fact is that Guillow is one of the oldest and most industrious firms in the business. If this comes as a surprise, the explanation is to be found in the proprietor who disparages his record with this one-sentence history: "As to myself, I just try to build better models." Model Industry Association members still remember a talk that Guillow gave at a New York meeting during the war when shortages of materials threatened to strangle the business. While most manufacturers were tinkering with substitutes, Guillow dragged out of a huge box an assortment of demonstration hardwood and paper flying scale models built especially for the occasion. On another occasion, while serving on a committee of the MIA, he had built an entire series of historical airplanes predating the Wrights, just to point up his report.

Present activities of the Guillow company cover dozens of kits of virtually every type and variety, as well as ready-to-fly models selling at anywhere from a nickel (in this day and age!) to twenty-five cents. The nickel job is a profile Thunderjet glider with the wing sliding through; the quarter job, a 12-inch all-wood r.o.g. with prop and rubber ready to perk. For a dime, there are six different profile types, with rubber and prop, one even being a bi-plane—those being printed on sheet balsa, thus leaving some work to the builder. Ten-cent shelf model construction numbers include all manner of craft from Piper Cubs to moon rockets. Then there are two-bit construction sets of numerous subjects, both flying and shelf models. Other flying model kits sell at fifty cents and a dollar.

More recently, Paul Guillow purchased Lou Andrews' hobby business, including designs, stock, and so on, and put Lou on his payroll. The Trixters were one result. There have been others, too. For example, there is the Trixter Babe for the K&B Infant, OK Cub, and Baby Spitfire. With 100 square inches of area and but 2½ ounces of weight, this little job is one that will peddle along on the Infant. Then there is the Trixter Pixy, a two-ounce free-flight of about the same area and weight for the same engines, and the Trixter Piper Cub Special, a \$2.00 number for engines up to .30. The Trixter, Invert Junior, a 40-inch stunt job, took the Open Stunt Event at the 1948 Plymouth meet in Detroit.

For years, Guillow has done a respectable business through stores and other outlets that do not attract the contest modelers' attention. But the addition of Andrews and his designs to the old Guillow firm so far indicates that Guillow is getting into the contest model field. Lou Andrews started building when he was nine years old. That was 25 years ago. After ten years with the engineering department of Chance Vought, in Bridgeport, Connecticut, he gave up that job when the firm made its famous trek, machines and all, to its Texas inland plant. Then

president of the Bridgeport Aeronauts club for three years, he is now a member of the Norwood (Massachusetts) Hobby Club. Connecticut state champ for three years, Lou also was New England champ in 1947-48, a member of the East team in 1947.

While old-hand Paul Guillow, veteran of hundreds of kit projects over decades of manufacturing, has little to say about his own historic efforts, he gets highly enthusiastic over the new-fangled Trixters. These Guillow models are simple, sturdy, and easy to fly, says the oldtimer.

"Lou believes that a model with performance will teach a modeler without experience, and I believe the performance of his models justifies his belief," explains Guillow of the Trixter profiles.

The Southerner

(Continued from page 42)

take-off there is the tendency to get right into the left power turn, the wing tucking down slightly as the model leaves the ground. By using thrust adjustments, torque becomes a dependable force, giving the desired left turns; rudder tab takes care of glide turns.

In addition to its realistic appearance in flight, the low-wing is a lulu on landings. The reasonably low CG makes for a sledding effect in place of the familiar toppling and, given half a chance, the low-wing will land safely, upright. Low-wing experience has made us wary of two things, however: We never use high thrust lines (inverted engines) and we never attempt right power turns.

Building the ship by the full-size plan is a cinch. You will find the fuselage easy, there being only one small portion requiring planing because of compound curves. This is a sport model and the little Arden has plenty of power so do not hesitate to use the tougher grades of balsa. Toward the tail, however, stick to the lighter woods so the model will trim properly.

Cut out all fuselage parts including the plywood front formers. The gear is bent and assembled, with the balsa filler pieces, between the two plywood parts. Next cement the 1/8" sheet reinforcements inside the sheet sides, add the lengthwise central strips, then proceed to locate the formers and stringers. One large sheet of 1/16" balsa will cover each side from center line to top and from cockpit to front former. These pieces are trimmed to shape, and when moistened on the outside, they will virtually fall into place. Add other fitted sheets between the center line and where the planking begins. The planking strips may be tapered, being wider at the headrest than at the tail. Use cement liberally. The bottom is sheet-covered and a soft balsa block is carved and hollowed to fit between wing leading edge and front former. Mount the tail skid securely by binding it to a wedge of hard balsa that fits between the converging lower stringers.

Sand the fuselage smoothly and dope thin Silkspan over it completely, piecing and lapping it where necessary. Rough out the exterior of the cowl, making the front opening about 5/16" wide and carving a rear vent on each side. Spot-cement the cowl in place and sand it to conform to fuselage lines. Next remove it, saw it in half and hollow it to about 1/8" wall thickness. In

the meantime mount the engine by means of wood screws and see that the cowl clears it. Small alignment blocks are cemented to the firewall to prevent the cowl shifting; it is held by small rubber bands, top and bottom. Cover it with Silkspar and dope it thoroughly, inside and out. The streamlined wheels are secured by soldering washers to the axles. Addition of windshield, wing and tail hooks completes the fuselage.

Assemble the wing spar completely, then pin and cement all ribs in place along it. Beginning with the center section, add leading and trailing edges. Next attend to the outer panels, finally the tips. The curved tip leading edges are added last; these being two strips cemented together to facilitate bending. Shape the tips and leading edges, then carefully sand the complete wing. Leading edge and center section sheeting comes next, and finally all ribs are capstripped, top and bottom. Final light sanding precedes Silkspar covering.

The tail is of simple construction, having sheet covering at the center, top and bottom, similar to the wing. Cover the stabilizer before attaching the fins, which, you will notice, are both toed-in slightly. The precise setting of stabilizer incidence is important; there is slight positive incidence, obtained by tapering down the central body stringers. When the angle is fixed, add former "L" and blend the fairing to the turtle-deck lines.

We found a gray primer (Pittsburgh's Lavax) which resists all glow fuels; consequently we built our color scheme around it. The gray is used where we thought the fuel might spatter, and Testors red colored dope is sprayed elsewhere.

Though not entirely necessary, we made a special tank, mounted inside the fuselage with control-line type filler tubes. This permitted us to use the integral Arden tank as a ballast box. Do not hesitate to use lead pellets at tail or inside cowl if necessary to bring the model into balance.

Prior to any test glides, check the model for warps. The outer wing tips may have a tendency to develop slight washout. This is desirable if it is not excessive and if the amount is equal in both tips. Balance at the wing spar location and make test glides in tall grass if possible. Toss it, slightly nose-down, directly into the wind at what you would guess to be its gliding speed. Adjust balance or add slivers of balsa under wing and tail edges to get a smooth glide with no tendency to stall.

The engine will produce considerable power, glow-plugged, so for the test hop you may choose to mount the prop backwards. Thus with trailing edges in front it will lose efficiency to give a safer test flight. The prop, incidentally, ought to be fairly large and of low pitch. A 9-inch diameter, 4-inch pitch will do for a starter.

To attach booster cells, wire a lead from the glow plug out through a cowl vent. Clip battery to this and to the needle valve for starting. Find out how long one medicine dropper of fuel will run the engine and use this as a basis to determine length of flights. Control engine thrust, right or left, by adding a washer behind the mounting flange. Adjust for moderately large left power turns and right glide turns. And remember, *right power turns are poison to a model of this layout.*



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New Look In Tactical Aviation

(Continued from page 25)

setup similar to that of the United States. It consisted of the area west of the Mississippi made up of Louisiana and Texas. The aggressive Deluvia controlled the terrain east of the Mississippi, including Alabama, Florida, and Georgia. In it each military service had an independent status. In the past, Deluvia had acquired by force some of the Namoran oil fields.

Expecting further aggression, Namora embarked on quiet rearmament. In a surprise move, it refused the Deluvian ultimatum and declared war on its traditional foe. The two countries had an equal military potential, but the Namorans had built their bid for victory on the element of surprise and on their unified military establishment. *Tactical Air Power* was a most potent means of insuring the surprise. As he addressed the chiefs of staff, the Secretary of Defense made it obvious that the Deluvian war potential had to be destroyed before it prostrated Namora.

An accelerated Preparedness Program was being rushed to completion. M-Day neared. Namora's air strength was at virtually its full war potential. In the presidential palace, the Defense Secretary and military chiefs heard the following from the head of state:

"History may condemn us; however, after full and prayerful consideration of our nation's dilemma I see no alternative, consistent with national survival, except war. The Assembly, in secret session, has concurred. Our belligerent neighbor leaves us no choice. We do not want war. The Deluvian government, we know, will declare war upon our country in the near future. For once, at least, in the course of history, a peaceful nation will strike first. Ninety days from this date, the armed forces of this country will assault Deluvian shores in the vicinity of Eglin, Florida, and with divine guidance we feel the campaign will meet success."

So much for political and strategic thinking behind the decision. In the mission of invading the enemy territory, in occupying its "heart," and in destroying its armed forces, the striking air arm was charged with the all-important duty of gaining and maintaining air superiority.

Generally speaking, in the warfare of today and tomorrow the modern air force has a four-fold objective:

1. It must overwhelm hostile aviation on the ground by means of mass attacks on the very first day of its offensive. This constitutes an effort to attain air superiority at one fell swoop.

2. It must simultaneously insure air defense of the homeland.

3. It must isolate initially, at least to a limited extent, the battle areas.

4. It must provide air support to its country's surface forces in the various arenas.

There are all sorts of auxiliary considerations in the operation of tactical air power. Carrier aviation is coordinated with strategic air attacks on enemy harbors and known naval installations. This compels the enemy navy to be preoccupied defensively.

Today it is a firm belief in the high-

est-level military circles that without air superiority and without surprise, the United States has but a small chance of avoiding a long, bitter, exhausting war. It is further believed that successful large-scale land and/or sea campaigns are impossible without air superiority.

Because tactical aviation has come to play so enormous a role, military planners insist that the enemy air bases be blanketed with mass air attacks during the first day of hostilities. While plans are flexible and simple, there is no compromise on this: Our air power must throw its Sunday punch at once, with a maximum nationwide effort.

Such an effort is most effective when all services cooperate as a team. Unfortunately, as is known to any newspaper reader, rivalry and squabbles are still the order of the day among the powers that be. Fortunately, in tactical practice at least, there is a good deal more smoothness and coordination between the air and surface arms. For instance, in Operation Combine III the naval task force with its aircraft carriers and various warships did not lack "air safety corridors." And the airborne operation was effectively geared into the subsequent beaching operation.

To gain an idea of the variety of responsibilities and commitments of modern tactical aviation, just consider a few of the chores it had to accomplish on D-Day at Eglin. Tactical Air Forces furnished air cover to airborne troops; 10 Fighter Groups did the job.

Then 12 Fighter-Bomber Groups and 10 Light Bomber Groups, coordinated with Strategic Air Command strikes by four VHB Groups, isolated the Eglin battle area along a previously specified arc, hitting Montgomery, Birmingham, Craig, and Mobile. There were four such missions, with the Navy's F4U5 planes escorting these air strikes.

Three Fighter Groups furnished flak suppression missions preceding and during the Airborne drop, and close support of Airborne troops in the assault area. These groups used F-80's.

Perhaps the heaviest Tactical Air commitments of D-Day, along with the Strategic and Air Defense Commands, were in counter-air work. As the nationwide maximum effort mounted against enemy air bases, it became less and less necessary for Namora to defend the terrain from which it launched its offensive. Thanks to the strikes on the seats of Deluvian air power, Namora's surface and air forces were enjoying sufficient air security.

As the battle went into high gear, Tactical Air's Bomber Groups swung into flak suppression and neutralization ahead of the Airborne assaults. Army, Navy, and Air Headquarters received from Tactical Air both visual and photographic reconnaissance. Providing this and other coverage, TAF was landing jet reconnaissance aircraft in the Eglin—beg pardon, Deluvian—area as early as D-1. Lightning-fast photo printing and reproduction was provided.

It is possible in a comparatively short article to present only the general "new look" picture of the missions and functions of modern tactical aviation in coordination with other air services as well as with the land and sea contingents. One fact is obvious—in a war between major powers, the quality, size, and employment of tactical air forces are a key factor.

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Roscoe

(Continued from page 52)

support. It has no formers, bulkheads, ribs, spars, or stringers. No unusual tools or special equipment are required in constructing this model.

Cross-sections, areas and profiles were developed with the intent of approaching workable minimums without sacrificing realism of appearance.

Generous applications of sheet balsa with an all-embracing covering of crinoline has brought about a gratifying strength-to-weight ratio. The use of crinoline may come as a complete revelation to the uninitiated. The strength that this material imparts to an airframe cannot in the knowledge of the author be obtained in any other manner. The designer points out that the extra time involved in applying the crinoline covering will provide manifold benefits.

As a first step in beginning construction it will be necessary to enlarge the drawing if you do not send for the full size plans. This can be simply and quickly done by connecting a border line grid completely across the reduced plan on both vertical and horizontal axes. Full size drawings of fuselage side elevation, rudder, wing and stabilizer are all that will be needed. Prepare individual gridded sheets of paper large enough to receive each of these components full scale. Transfer reference points from the reduced plan to similar points on the full scale sheets. Interpolation can be simplified by the use of a smaller grid at critical points. When the outlines and cutouts have been developed, the shapes may be cut from the plan and used as templates.

Trace the rudder outline, with the cutout for the stabilizer, on a piece of 1/32" or 1/20" plywood. Cut to exact dimensions and add fairing slabs of 1/16" soft balsa to either side. It is advisable to compress these three pieces while drying by placing under heavy weights or by the use of clamps. As considerable time will be required for drying, work may be started on the fuselage. When completely dry sand the rudder to a streamline shape and cut in the offset. Horizontal cut is made all the way through and vertical cut is sufficiently deep on the right side to allow cracking to the left. Cut openings in fairing slabs to receive stabilizer.

Trace side elevation of fuselage on two medium hard 1/4" balsa sheets and cut to rough outline. Pin halves together and trim to exact outline. Cut opening to receive wing and drill holes for rudder anchoring dowels. Cut 1/8" maple plywood firewall to size and drill holes for mounting gas tank and landing gear socket. Mount gas tank and engine assembly on firewall and cement nuts and washers in position on the inside of the firewall.

Separate fuselage halves by removing pins and tentatively position the engine and firewall assembly. Join fuselage halves at the position of the rudder and control width at position of trailing edge of wing by the insertion of temporary spreaders. Strands of 1/8" rubber wrapped around the work serve to hold the components in position while cement is drying. A generous quantity of glue is used around the firewall plus the addition of filleting pieces which may be added

in the corners for further strength. Remove engine and tank from the firewall and install landing gear socket and bellcrank assembly. Lightly cement rudder in position and drill for dowels. Install dowels and apply cement generously.

The top and bottom of fuselage are now closed using 1/4" sheet balsa with the grain running laterally. The last portion of the fuselage to be closed will be that part directly below the bellcrank. The lead-out wires and control rod must, of course, be in position. Round fuselage corners and contour sides. Sand smooth. Cut opening in the nose sufficiently large to allow mounting the gas tank. Remove necessary additional material to permit mounting the engine on the gas tank. Provide aperture for filling the gas tank. Engine and tank are now removed and not reinstalled until after completion of the model.

The wing is made in a manner similar to the building of a balsa glider or a solid model wing. It will be necessary to glue several pieces of 3" sheet together to obtain stock of sufficient width. Trace the top elevation of the wing on a 1/4" balsa slab and cut to shape. Carve and sand to typical airfoil shape. Line guide is cemented to wing after crinoline covering.

Make stabilizer in a manner similar to wing. Do not cut in elevator until after the application of crinoline covering. Completely cover the control-line with crinoline. Most any department store will have crinoline in 3" rolls and by the yard.

Apply two thin coats of dope on the surface to be covered, allow to dry and sand. Cut crinoline to approximate size and moisten with water. A few moments will be needed for the water to soften the starch in the crinoline. While this is taking place brush on a heavy coat of thick dope to the surface to be covered and apply the crinoline while the dope is still wet. Limpness of the crinoline permits its application to compound curves. Work dope into and through pores of crinoline. When more than a single piece is required it will be better from a workmanship standpoint to butt the edges of the crinoline rather than allow them to overlap. Considerable time for drying will be needed due to the moisture present in the crinoline. When dry, sand smooth and obtain a finish by filling pores with a mixture of dope and talcum powder or by covering with gas model Silkspan.

Cut out portion of stabilizer used for the elevator and install internal type hinges. Sew elevator horn to elevator, and cement. Insert wing and stabilizer in their respective slots and fill it with generous applications of cement. Affix line guide to wing, apply colored dope.

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Page 21—Kaman; W. F. Miller & Co.
Page 22—Sikorsky S-51; Harold G. Martin; Sikorsky S-52; Smith-Coda; Marquardt; Don Downie.
Page 23—JOV-3; Howard Levy; Kaman; W. F. Miller & Co.; Brantly; Harold G. Martin; Landgraf; Ross-Pix.
Page 26—Tom W. Collins.
Page 27—Harold G. Martin.
Page 28—T. & L. Photo Service.
Pages 32-33—NACA.
Page 34—Henry W. Dittmer.
Page 46—Ed Pettish.
Page 48—Smith-Coda.
Page 50—Biddy McKinnon.

Your completed model should weigh approximately 15 ounces, minus dolly, and will balance about $\frac{1}{2}$ " back of the leading edge at the wing root. An 8-6 or 8-8 propeller is suggested. Always fly the model with the engine developing near to maximum power. Adjust the dolly to give a positive angle of attack during take-off. The dolly may be flown with the model to cut down speed while the flyer is gaining experience. Spreading the main struts slightly will cause the dolly to remain in the socket.

Roscoe is long lasting to the point of being nearly indestructible. It will survive all but intentional abuse. The original version served durably for nearly a year before going into retirement.

Minutemen of the Air

(Continued from page 37)

ply and administrative duties—all are handled by the squadron itself. The Air Force provides every unit with an Air Instructor who oversees the entire process of training. A small group of permanent Air Technicians form the backbone of the organization, accomplishing necessary daily tasks relative to the aircraft maintenance and administration.

The second main mission of an Air Guard unit is to the State in which it operates. It is obligated to assist in the protection of life and property and may be mobilized by State authorities for this purpose when the need arises. The value of such service to the individual States in times of peacetime disaster already has been proved. Within hours of the Texas City catastrophe, 18,000 pounds of medical and other supplies were on their way to the scene aboard planes of the Louisiana Air National Guard. The 196th Fighter Squadron, also a Guard outfit, responded to the call for aid from 1,300 miles away, bringing relief from the people of Ontario, California. During 1947 and 1948, many other instances of flood, fire or hurricane havoc saw Guard aircraft transporting urgently needed equipment to areas of destruction.

Standard Guard fighter-planes at this writing are the Lockheed F-80 Shooting Star, Republic P-47 and the North American P-51, now designated the F-47 and the F-51, respectively. Light bomber units use the Douglas A-26, or B-26, under the new listing. C-47's find their place with utility flights for transport and administrative work. Instrument flight training is conducted with the AT-6 (now the T-6), which also serves in bringing the proficiency of newly recruited pilots up to snuff before fighter checkouts. T-11's (formerly AT-11), are being utilized in limited numbers. No four-engine ships are flown by the Air Guard at present.

The Mustang and Thunderbolt, whose combat capabilities are legendary, will see their final military service (at least, in the U. S.), as Air Guard fighters. These famous types will pass from the scene within the near future, due to the current conversion to jet power. The switch from propeller-driven fighter aircraft within the Guard is normally scheduled to follow Air Force conversion by twelve months. Five

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Double spring action. Will fit any needle valve. Extension only 25c.



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Set contains crank, bolt, lock-nut, brass bushing, 2 steel washers. Sets come with either large or small crank. A big value at a low price. 15c.



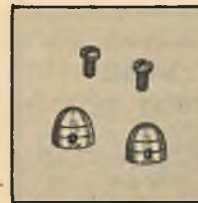
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A big value. $1\frac{1}{4}$ " rubber tired wheels with aluminum hubs. Really dress up that race car or automobile. 25c pair.



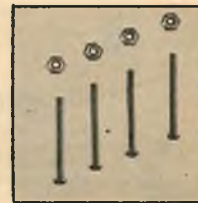
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This is a KAP-PAK special. $1\frac{1}{2}$ " rubber tired wheels for race car or as tail wheel. 15c per pair.



WHEEL COLLAR SET

Beautifully designed. Strong and sturdy. No set screw to fool with. Any common small screw driver will tighten. 15c.



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Practically vibration-proof. Motors mounted with KAP-PAK nuts & bolts never come loose. 10c.

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"PAULOWNIA" PROPS

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equalled by none—
hand made—perfect
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6"	12c	each
7"	15c	"
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out in front at every contest for beginner or expert

SPORT TYPE

	PITCH	PRICE
5"	3"	2 for 35c
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6"	3"	20c ea.
7"	5½"	25c "
8"	6"	25c "
9"	6¾"	25c "
10"	7½"	25c "
11"	8 + "	25c "

SPEED TYPE

	PITCH	PRICE
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9"	9"	
10"	10"	
11"	11"	

ADJUSTABLE PITCH 2-3 & 4 BLADE SCALE GAS PROPS

CAN BE USED AS TRACTOR OR
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ALUMINUM HUB—BLADES INTER-
CHANGEABLE—

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8-9 or
10" diameter
95c complete

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10" diameter
\$1.95 complete

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EXTRA BLADES—20c each

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a miniature replica of
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board—operates from
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R.P.M. at 6V. Easily
attached to any boat
—set steering for
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cles—5 1/2" long—high-
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SPEED BOAT SETS

For small electric motored
boats—1 1/2" 3-Blade BRASS
Prop mounted on 4" of 1/16"
shaft-tube, stuffing box & 2 1/2"
rudder & helm—complete set
(all brass) 75c.
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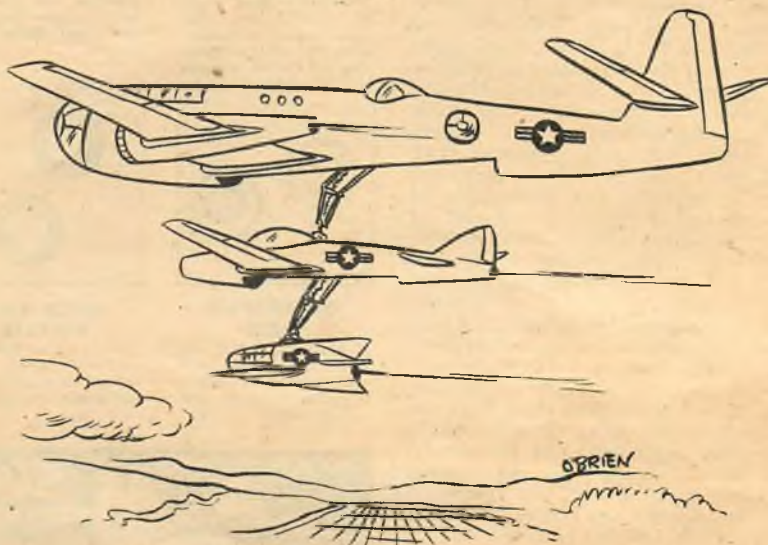
Guard squadrons were converted to jets by the end of 1948. Present plans call for the assignment of jet aircraft to all squadrons, thus causing a tremendous reduction in the number of propellers along our first line of air defense.

The original plans for our air protection against outside attack were formulated some time before the conclusion of World War II. The hard-learned lessons of the war years changed every concept of warfare, necessitating a completely new defense policy. Military and political leaders, faced with the fact that we are no longer geographically isolated, realized what modern air power, in the hands of an aggressor, could do. They were thinking of our Eastern industrial belt, our congested rail centers and our skyscraper cities in terms of the havoc wrecked by one bomb at Nagasaki. They also knew that any future assault would probably take the form of an aerial onslaught, launched at us with little or no warning. It was imperative that we should organize and maintain an adequate system of immediately available air protection. The Air National Guard helps meet this requirement for air security with a plan that affords the nation protection, while at the same time saving the taxpayer millions of dollars.

The tremendous task of getting the National Guard air arm out of the "paper stage" and into actual existence ran into many problems. Among them was the acquisition of suitable airfields near large centers of population. Few large American cities can at present provide hangar space enough for private flying interests, not to mention the demands of commercial airlines. With the Air Guard and other reserve components also bidding on the facilities, compromise settlements were often difficult to obtain. In addition, there was the air traffic question. Some cities have only one airport large enough to handle the weight and speed of modern military and commercial aircraft. This situation often results in hazardous flight conditions during hours when air traffic is heavy. In most cases, the establishment of special flying regulations for each field relieved the congestion. In some States, it was possible to make use of Regular Air Force Bases.

Progress made so far has been encouraging, in spite of the obstacles. Under the Aviation Group, National Guard Bureau, with Colonel W. A. R. Robertson as Chief, the Air National Guard had realized more than half of its ultimate strength in personnel and organization of more than 88% of its planned units by October, 1948. Then, in accordance with the 1947 National Security Act, the Bureau was reorganized into an Air Force and Army Division, with Major General George G. Finch as Chief of the Air Force Division. Since that time, with Colonel Robertson remaining as Deputy Chief of the Division, the Air National Guard has added approximately 10,000 officers and airmen to its strength with better than 96% of the planned units organized.

Among the ranks of Air Guardsmen may be found a cross section of the men who fought with the Army Air Forces in all theaters of action during the war. All pilots have been drawn from the vast reservoir of war-trained airmen, although a few of them did not fly with the AAF. A few Navy and Marine flyers, finding themselves in cities not covered by the naval reserve plan, have donned the khaki. The relative merits of the Corsair as compared to the Mustang is a subject which now is being thoroughly discussed in operations offices throughout the country. Also present on the pilot rosters are a few who served with the Royal Air Force in the early days of the war. Because most of the squadrons are fighter equipped, few multi-engine pilots have been able to qualify for flight positions. Some have entered utility flights in which C-47's and A-26's are flown; others took desk jobs, acquainting themselves with fighter plane procedures on the side. Waiting lists exist for all flying jobs. Competition among pilots within the various squadrons is keen for rigid flying time requirements must be met during every six-month period. Those failing to log the minimum hours of day, night and hood time are quickly dropped from the rolls. Despite the fact Air Guardsmen are usually able to fly only on week-ends and holidays, they must fly as many hours per year as pilots of the Regular Air Force.



Every possible phase of training is included in the flight operations. Formation flying is stressed; routine day and night cross-country hops are made to points as far as 1,000 miles from the home base. Theoretical problems of air attack and defense are worked, by dividing the planes into two or three opposing teams which either "attack" or "cover" some given target. Fighter combat tactics are practiced at low and high altitudes. Each part of the program is designed to keep the pilots as much in trim as they were during the war. Training films and lectures aid in keeping abreast of new developments in the Air Force.

Many men, working at ground jobs, are needed to keep a squadron of planes in the air. Maintenance, supply, communications, transportation and administration are but a few of the necessary departments which function in support of the actual flight activities. Since an Air Guard squadron must be prepared to enter full-time active duty as an independent unit, its membership includes truck drivers, cooks, office personnel, carpenters and numerous other types of specialized workers.

There are still vacancies for both veterans and young men with no aviation experience in the Air National Guard. To high school students who seek careers in aviation, the Air Guard has much to offer. On-the-job training with the latest military air and surface equipment, supervised by war-trained technicians, enables recruits to learn the flying game firsthand. Interested applicants between the ages of 17 and 35 may obtain complete information from any post office or by contacting the nearest Air Guard unit or Air Force base. All Air Guardsmen receive pay at the rate of one day's pay for each of the weekly drill periods attended. All uniforms and technical equipment are furnished.

Once a year an Air Guard unit goes to "summer camp." This field-training period lasts for 15 days and places every man on full active duty pay. Gunnery practice, checked by gun cameras, is part of these summer maneuvers. Into the two-week encampment, often conducted in conjunction with other similar Guard squadrons or units of the Air Force, is packed every possible aspect of training. The daily schedule is long and hard.

Many USAF staff and technical schools are open to Guard personnel. Applicants accepted for courses, which run from two weeks to a year or more in length and cover a wide range of subjects, are recalled to active duty with full pay and allowances for the period of training. Members unable to spare the time for schools are urged to avail themselves of the opportunities offered through correspondence courses. Special credit is granted for all outside study accomplished.

The all-important job of making and keeping America strong in the air is well under way. Recent action by Congress authorizing a 70 Group Air Force will add dynamite to the punch of American air power, causing would-be aggressors to think twice before starting trouble. With its up-to-date equipment, intensive training and enthusiastic membership of capable airmen, the new Air National Guard is playing a major role in this plan of air security.

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Here are some of the winnings . . .

☆	1st CLASS "D"	McCOY 60	155.12 MPH
☆	1st CLASS "A"	McCOY 19	108.5 MPH
☆	2nd CLASS "A"	McCOY 19	113.6 MPH
☆	3rd CLASS "B"	McCOY 29	113.5 MPH
☆	1st CLASS "½A"	ARDEN	32.5 MPH
☆	2nd CLASS "½A"	O. K. CUB	38 MPH

Plus many lower places . . .

STUNTWAGONS were there too, placing well for all concerned!

SPORT FLYERS-- Coming soon! A dmeco model design engineered just for you. It will be the envy of the gang!

"Proven America's Fastest Models!" . . .

STUNTWAGON 30

If it is a "died in the wool" 100% stunt model you want, the Stuntwagon "30" is for you! Power it with any engine from .23 to .36 disp.

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☞ \$4.95



Stuntwagon

The stunt model that leaves nothing else to be desired, truly the "Cadillac" of the model world.

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Infantwagon

For fun and flyability it can't be beat! With the new .05 engines this model really comes into its own, and will perform all of the stunts with ease!

Assemble in 1 evening

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The deBolt MODEL ENGINEERING CO.
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"Home of Design-Engineered Models"

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EASY TO ASSEMBLE
PLASTIC DISPLAY MODELS



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PIPER CUB	.50
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Name

Address

Coming Air Events and Contest Calendar

Contest directors are invited to send listings of meets to Contest Calendar, c/o Air Trails, Box 489, Elizabeth, N. J. Such announcements must be received at least 90 days before contest date.

To secure more information on a contest, write to the individual listed. His or her city and state address is same as location of meet unless otherwise noted. Where different city is listed in address, the state is the same.

Air Trails makes every effort to check listings. It should be noted, however, that contests carried in this Calendar are subject to change without notice.

- Sept. 11—Los Angeles, Calif., Los A. Aeromodelers glider meet.
Sept. 11—Rochester, N. Y., Ray C. Edmunds, 675 South Ave.
Sept. 11—Trenton, N. J., M. G. Michlik, 237 E. State St.
Sept. 11—Pittsburgh, Pa., Box 4439, Pittsburgh 5
Sept. 17-18—St. Louis, Mo., Air Age Exhibit, Lambert Field.
Sept. 18—Chanute AFB, Ill., Lt. Harry G. Vogler, Jr., Hq. 3499th Mobile Trn. Group.
Sept. 18—Royal Oak, Mich., J. R. Kates, 604 S. Edison Ave.
Sept. 18—Pittsburgh, Pa., Box 4439, Pittsburgh 5
Sept. 18—Antioch, Calif., control-line meet.
Sept. 18-20—Spokane, Wash., 13th Annual International Northwest Aviation Council Convention, Box 1143.
Sept. 24-25—Sullivan, Mo., Airport, dedication ceremonies.
Sept. 25—Pittsburgh, Pa., Box 4439, Pittsburgh 5
Oct. 1-2—Adelanto, Calif., Soaring regatta (7th heat), El Mirage Field.
Oct. 9—Modesto, Calif., Control-Line Flying Circus.
Oct. 16—Gilroy, Calif., free-flight meet.
Oct. 29-30—Adelanto, Calif., Soaring regatta (8th heat), El Mirage Field.
Oct. 30—Fresno, Calif., free-flight meet.
Nov. 11-19—Philadelphia, Pa., World Hobby Exposition at Commercial Museum.
Jan. 13-15, 1950—Miami, Fla., All-American Air Maneuvers.

Nightmare

(Continued from page 46)

has come to the rescue with a ready-made shaft and spring tensioner that is really good—so now you don't have to be a pro to build your rubber-power prop and shaft.

The wing and stab are built by identical procedure. Pin down bottom spar, cement in ribs, put in leading edge, trailing edge and rear spar in that order. But remember—one left and one right panel for the wing and stab. There is 3¼" of dihedral, at each wing tip. Stab has no dihedral.

When dry, sand and cover with Silk-span or regular rubber model tissue. Water-spray all covered parts, let dry, and dope with two coats of clear dope, allowing a half hour between coats for drying. Install wing saddles, and make sheet rudders, while dope is drying on covered parts.

Next cement rudders to stab per plans, and cement stab to fuselage. The wing is held to fuselage by tying on with one strand of ¼" rubber.

Power for Nightmare is twenty strands of ⅛" flat T-56, with six inches of slack.

Glide and power run is to the right. Slide wing forward to correct diving tendency, back to overcome stall. Trim tab in left rudder controls turn. These are glide adjustments, and should be made first. For correcting under power, use thrust line at nose block—down thrust to correct stall, right thrust to give more turn.

DON'T FIGHT FELLAS



CONTROL LINE

FREE FLIGHT



They're Both Terrific!



\$2.95

plus 20c by mail

SEE IT —

BUY IT — FLY IT TODAY!

"PHANTOM ERA"

Exact size stunt version of the world famous "New Era."

Wingspan 28" Length 20"
For .19 to .36 Displacement Engines
(Glo-Plug or Diesel Engines)

Perfect for sport and stunt—beginner or expert—complete with the famous Enterprise "Hollow-Structured" Wonder Wing.

A completely prefabricated profile model, combining all the "easeability and flyability" of the great "New Era."



\$1.50

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TRY FREE-FLIGHT —

IT'S FUN — IT'S GREAT!

"THE SHADOW"

Semi-scale miniature free-flight at its finest!

Wingspan 32" Length 22"
For .05 to .09 Displacement Engines
(No Engine Timer Required)

"The Shadow" is ideally suited to contest and sport flying. You will thrill to its full scale appearance and flight characteristics.

The complete kit for "The Shadow" features die cut parts, wheels, hardware, and easy to follow plans and instructions.

AERO-CUT Balsa

By cutting our own wood to our exacting specifications, we can assure the modelers of the finest kits, and the most uniformly perfect balsa possible.

ENTERPRISE

MODEL AIRCRAFT AND SUPPLY CO., INC.
5107 AVE. D DEPT. AT-109 BKLYN. 3, N. Y.

We Fly the Luscombe Sedan

(Continued from page 27)

Exceptionally wide deep windows and a great double curvature windshield, undisturbed by airplane looking tubes, provide as much if not more vision than the average auto. The only construction breaking up the solid mass of windows are upright corner posts and another member just behind the door. Everything has a clean, rugged look, that suggests the robust design. To the builder's credit, the panel is not awesome. This particular ship does not have blind flying instruments installed and the effect is a Cub-like simplicity.

You wonder if Luscombe's effort to imitate or duplicate auto stylings was a factor in the ultimate simplicity of the machine. First, besides the auto-type interior, there are few gadgets. No manifold gages, and so on, which are more for the professional than the average pilot. Manufacturers always show you how their ships have automobile simplicity in operation. Most of them don't, as any dub who has balked a landing with flaps, retracting gear, variable-pitch prop, will quickly tell you. Luscombe has made an extraordinary try to make their Sedan familiar looking inside to people accustomed to costly cars. Trager doesn't harp on the point but the overall simplicity, ruggedness, and quality of the Sedan cannot be ignored.

To the usual questions of best climb, glide, cruising rpm, and so on—essential information before you fly—Trager

says that best climb is 80 mph, glide 75-80 mph, and cruise is at only 1,850 rpm. Eureka! With everybody winding up their engines more and more to beat competitors, with rpm's averaging 2,500 and better, Luscombe has gone the other way. The reduction in engine and prop noise, plus cabin soundproofing, makes easy conversation possible.

The 165-hp Continental turns 700 rpm less than the typical 2,500—500 less than more conservatively cruising engines. That 700 becomes 42,000 in an hour or 4,200,000 by 100-hour check time. Since this ship has 700 hours on it, the Continental has turned some 30,000,000 revs less because of the lower rpm. If you take the viewpoint that purchasers of better airplanes have money to burn, this may not be too important but it seems only logical that the man who expects a long lived motor in a good auto, would expect the same of his airplane. Tens of millions of revs must make some difference. With its fixed pitch prop, the Sedan has a range of 500 miles plus with 42 gallons of gas, and a rate of climb fully loaded of 900 feet per minute.

Tighten your belts, Trager warns you and your fellow passenger, as the ship rolls slowly cross-wind going out to the runway. Taxiing down-wind you notice how the airplane tries to weathercock into the strong wind like a seaplane, and you hold moderate right rudder to steer straight down the pavement. Trager takes it off, working busily in the gusts, holding down the nose to get safe speed before lifting it off. The air is extremely rough now, pouring in ahead over low hills, so he climbs out at 90 mph then slows it up

to 80 mph. He trims the ship and turns it over to you. Already you have been amazed at the way the Sedan handles the bumps. Days like these turn you into a human milkshake and stiffen your shoulders from wrestling controls, but the Sedan will fly hands off. You even have time to note that lower rpm's remove that irritating hum so common to high-speed engines. Uneasiness gives way to relaxation as the ship goes on up at about 1,000 feet a minute to the two-mile height where smooth air will permit feeling things out.

Trager turns on broadcast music which comes in loud and clear over the speaker. The effect is the same as banks that play beguiling music for nervous borrowers in the waiting room. This boy can sell airplanes!

At 10,000 you level off in the satiny air. Even from this height the ground slides sideways at a terrific clip. The view in all directions is breathtaking. Off to the left, the Catskills and the Hudson, to the right Long Island Sound, the Island and the ocean beyond; well beyond 75 miles to the south the Sound and the Hudson converge on the New York skyscrapers. Straight behind there is the unconventional view (in a high wing ship) of your own tail. The watch says it took just over ten minutes to get where you never get in the little low-powered ships on cross-country.

In level flight the nose rides way down and the view forward and down over the nose tends to make you pull up in the turns, particularly when turning toward the far seat. Then things look like a spiral. Properly trimmed the Sedan perks along at 120 mph in-

**VERY FINE
ENGINES AT
VERY LOW PRICES**

the famous twins

**FORSTER
"29" and "305"
PROVEN WINNERS**

FEATURE:—

**BALL BEARING CRANK-
SHAFT, MODERN DESIGN,
HIGH SPEED & POWER
OUTPUT, UNSURPASSED
WORKMANSHIP, GLOW
PLUG OR SPARK IGNITION,
2-SPEED TIMER OPTIONAL,**

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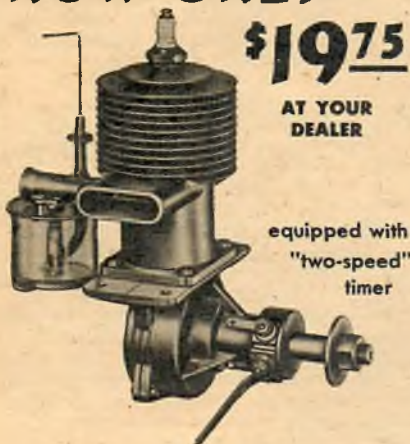
**AT YOUR
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★ ★ ★
for **RADIO-CONTROL, for
STUNT or U-CONTROL
CHOOSE THE POWERFULL
FORSTER "99"
NOW ONLY**

\$19⁷⁵

**AT YOUR
DEALER**



equipped with
"two-speed"
timer

write for free literature

**FORSTER BROTHERS
LANARK, ILLINOIS**

licated, or a probable 130 actual air speed when altitude and temperature are considered. There is no difficulty in holding altitude in turns either to the right or left, only slight occasional corrections. You can relax and watch the low wing pivot on the ground far below, scan the altimeter and air speed occasionally. A lightplane pilot should have no trouble with the Sedan. The ship does not jump as it comes back to straight and level, as when rolling from a steep left to a steep right hand turn, and you don't have to move the wheel forward at that point. Coming back to straight and level, however, does require anticipating things by neutralizing the wheel well before the ship is back to level and, in fact, moving the wheel the opposite direction to stop the rate of roll. If you don't do this, the Sedan will continue on slightly past the level-wings position. As far as high work is concerned, the manufacturer has managed to keep things simple. Simple airplane, simple technique.

Stalls don't amount to a hill of beans. The nose works up, a slight or moderate buffeting is felt, then you simply relax the wheel for a recovery. Stalled in a turn, the Sedan resists rolling to the outside wing and tends to hold the same degree of turn and bank. With flaps this stall comes at 55 mph, without flaps at 58. Trager mentions the abnormal back pressure which is a stall warning. Trim makes no radical difference on the Sedan, although it must be used. This is nice in a balked landing or when recovering from one landing to make another immediately further down the runway. Through all this maneuvering your passenger who has fallen asleep in the climb slumbers on peacefully.

In the rowdy turbulence close to the ground it is difficult to check the effectiveness of the flaps. Their generous proportions, however, suggest that they get adequate results in slowing the airplane and in steepening the glide path. A small wobble pump handle between the seats enables you to crank down the flaps with several quick strokes; when ready to retract them, you depress a grip on the pump handle and up they go. By pressing and releasing this grip you can get any degree of flap you want while retracting, and the same action is true of the pump handle that brings them down. As the flaps come down, the ship noses over into a moderately steep gliding angle. If you leave the trim alone, a slight back pressure is needed to hold the 80-mile glide. Relax and the nose drops a trifle more, speed going to 90 or so. The position of the ship reminds you of the full-flapped approach on the Stinson, but does not seem as steep as the Navion. It is a sufficiently steep angle to facilitate aiming accurately at a spot over the end of the runway.

That the Sedan is a rough-weather airplane cannot be doubted. Trager takes fiendish delight in getting down where the bumps are. "I want you to see how easy it is to fly in rough air," he tells you. "Take another notch in your belt, be sure it is tight. You can't get rougher air than this. We'll fly low over that range of hills. I'll set it up and then you take over."

He advances the throttle, air speed comes up to 130 and moves on up as you take over the wheel. As the hills

slide nearer and nearer, you think of past rough rides in lighter ships and wait for the bumps. Then you are in it. Unless there is something sissified about New England bumps and gusts, this Sedan does a remarkable job of smoothing them out. Oh, you bounce around, but you can almost fly hands off. Once you bring up a low wing, twice move the wheel forward as the nose tosses up.

From the standpoint of landing technique the Sedan is one of the most interesting machines you have encountered. Conventionally geared ships—if you can term tricycle gears *unconventional*—are meant for three-point landings. Luscombe claims this is a throw-back to the days when no brakes made necessary the added ground drag of a tail skid to halt the landing roll. It is this manufacturer's belief that all landings should be wheel landings and, as a matter of fact, you will make a monkey out of yourself if you try to three point the Sedan without two passengers in the back. Once on the ground, the Sedan stays there without forward stick, running along tail high even though your hands be removed from the wheel. During the earlier part of the run brakes can be used safely for air pressure prevents the tail from raising excessively high. There is an exaggerated prop clearance, too.

There is no doubt that the wheel landing has its place. There are times, like today, when a wheel-landing is a must. Three-pointing some of the lighter machines today would leave you suspended momentarily in mid-air. Many professional pilots maintain that the wheel-landing is the easier, although, like most lightplane pilots, the writer has not found them so. This probably depends on the machine; it is probably easier for the DC-3 pilot to wheel-land his heavy smooth flying machine than it is for us to put down our jumpy little fivver planes. But most of us dislike to put a lightplane on its wheels then have to move forward the stick. It requires finesse, too, to hit it just right, especially when it is windy. Luscombe, then, has removed this tricky bit of technique by building the wheel-landing into its Sedan. How do you land it?

Trager lets you make the approach. You carry half flap. It is windy and full flap isn't required but the approach began high so some flap is required to hit the head of the runway. The nose goes way over to the right as you crab. Trager starts to talk you through the landing but it is no dice. The technique is simple but the combination of strange and bigger airplane, wind, gusts, is too much and you pick up a little added drift just before touching down. You have to let the pilot make the recovery by adding throttle and dragging the nose back into line farther down the runway. He gets squared away, flares out, but doesn't work the wheel back completely as for a three-point landing. With the upwind wing way down, the ship drops on one wheel, shudders a bit as the other wheel comes on and then, so help us, Trager holds both hands up from the wheel. That wide-tread soft gear allows a lot of abuse, too. Seeing it perform, in such abominable landing conditions, you can vouch for its strength.

While the Sedan compares market-wise with other four-placers, it cannot

be compared too accurately performance-wise with a machine like the Bonanza or the Navion. It fills a niche of its own. That it can slam through rough air with aplomb is proven to you. It is ruggedly built, but the faster machines hit the same bumps a lot harder and to stress them equally at their speed would require performance-losing weight. There is a big difference between a 160-mile machine and one that cruises 30 miles less in rough air. On the other end of the scale, the Sedan smooths out the bumps better than lighter machines with less power.

It would seem to us that the combination of cost, quality, simplicity, comfort, and strength make the Luscombe Sedan a ship that deserves every consideration when choosing a four-place airplane, regardless of what you can spend.

A New Twist In Props

(Continued from page 60)

sanded. Several coats of dope seal the edges against moisture and from this point on you may forget all about the paste. Our test blade is too heavy; it can be lightened by using fewer than our fourteen layers and these might be three-ply rather than two-ply thickness. Generous perforating with a ticket punch, especially toward the tips of each inside lamination, will further lighten the prop by about ten percent. The small holes can be bridged by the thicker layers and the punching should be at random pattern.

A word about the form: Remember that in computing the pitch angles at the various stations along the blade you must figure diameter from the center of the finished propeller. Thus you must have an advance notion of hub dimensions to include the dimension between the hinge point and the shaft or centerline. Using the diameter of each of the several stations and the pitch in inches, figure the length of the helix—the spiral path of each point in one revolution.

$$\text{Length of helix: } l = n\sqrt{\pi d^2 + t^2}$$

l = length of helix, n = number of turns (one), t = pitch.

Swing an arc, its radius equal to the helix, from a point above the baseline equal to the pitch. The angle formed at the baseline is the pitch angle for the particular section. Remember to leave the form surface slightly convex to provide undercamber in the blade.

You die-hard balsa addicts may use 1/32-inch A cut balsa layers on the same form. Wax the form first and use either Cascamite or slow-drying model cement. Bind layers, one at a time, with flat rubber or heavy cord and shift the patterns to obtain slight angular grain on alternate layers. Before the top layer is applied, sand the edges of the inner ones for smooth contours. You will be amazed at the strength and flexibility for such blades, whether made of balsa or paper.

Your layers will stack up like contour lines, falling closer together near the entering edge and farther apart at the trailing edge to produce the desired blade section. Near the hinge point, depending on the style of hinge

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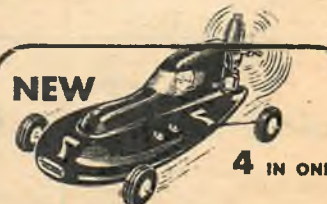
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1st Supersonic Guided Missile

(Continued from page 24)

not controlled after leaving the ground but was operated like an ordinary artillery shell in that it followed a predetermined path to a predetermined destination as a ground-to-ground missile and was stabilized with gyros and an internal pre-set mechanical control system. To secure the necessary maneuverability, however, the Wasserfall had to simulate an airplane more nearly than an artillery shell so that the four sets of wings and an improved rudder system were necessary for control. The wings were required in order that the missile could develop enough lift to perform maneuvers and to provide a more constant degree of stability so that the servo motors operating the rudders and elevators could stay within certain practical limits of power and allow a smooth, controlled flight.

The V-2, incidentally, had rather poor stability characteristics and was barely able to get through the transonic range without becoming unstable and tumbling—a condition that occurs when the center-of-pressure moves forward of the center-of-gravity—but this problem was successfully solved in the Wasserfall.

Some 300 Wasserfalls were built and some 35 fired in testing—the first experimental firing being on February 28, 1944. However, by early 1945 the in-

dustrial situation in Germany was so critical that development was stopped in favor of smaller and simpler unguided missiles because of the critical shortages in manpower and materials caused by Allied bombing. The internal disruption was now so complete, as a result of our strategic bombing, that it was almost a case of having to stand on the ground and throw stones at the bombers. Actual stoppage of the development program, incidentally, was ordered by the SS who were given wide powers after the attempted assassination of Hitler. In fact, it was Kemmler who issued the order after succeeding General von Dornberg, the father of German military rocket development and director of the Peenemunde station.

At any event, a great many difficulties were encountered in perfecting the missile for practical military use, and in spite of the concentrated efforts of a large number of Germany's best scientists working at fever pitch, the guidance problems were not all solved by the end of the war. However, the Wasserfall is of extreme importance since it was actually the first supersonic missile, and as such demonstrates the many varied technical and engineering difficulties associated with flight into the supersonic region and of the various stratagems devised to solve these problems.

The basic shape and arrangement was developed in the Peenemunde supersonic wind tunnel. (This tunnel, which could reach a Mach number of 4.4 was moved to Kochel early in 1944 after the bombing raids on Peenemunde in August, 1943. After the war, it was moved to America and is now in operation at White Oak, Maryland, at the

U.S. Naval Ordnance Laboratory.) After several dozen wing and tail combinations were tested, one was finally selected as being suitable for a full-scale test missile. The body shape, like that of the V-2, was basically that of an artillery shell, slightly boat-tailed at the rear and with a long ogival-shaped nose which carried the fuses and warhead.

Since it was intended to approach high speed enemy bombers and fighters, it had to be extremely maneuverable and consequently build up high accelerations in turning and banking at high speeds to make contact with a moving target. Consequently, the vertical "wings" were added aside from those in the horizontal plane so that large lateral lift and accelerations could be built up to allow a short turning radius.

The Wasserfall was therefore designed for a 12-g acceleration in either plane, horizontal or vertical, since the wings of the missile remained in a given plane in space after launching in the manner of the V-2. That is, one set of wings were always substantially in a horizontal plane, while the other set were substantially in a vertical plane. This was necessary since radio control from the ground had to be sent to one specific pickup within the missile and to that set of servo controls which provided the desired action—that is, the elevators always had to remain as horizontal controllers while the rudders always had to act as vertical controllers and steer the missile, although the missile was perfectly symmetrical and the fins and rudders were identical in shape. The missile then, had a "top"

and a "bottom," like an airplane.

The Wasserfall was designed to attack airplanes of the 550-mph class up to 55,000 ft. altitude while presumably maneuvering at 2-g's. Consequently, the missile had to be able to achieve an angle of attack of about 8° at supersonic speeds while at subsonic speeds about 15° was necessary to develop enough lift to curve the missile from its vertical launching trajectory and over into a collision course, which could of course, be horizontal after a minimum flying speed was attained.

The stability of missiles, like airplanes, is measured by the difference between the center-of-gravity and the center-of-pressure (this difference is called the static-margin, or margin of static stability in an airplane). To have stability, the center-of-pressure must always be behind the center-of-gravity, and this distance should remain reasonably constant with increasing Mach number from subsonic through transonic and into the supersonic speed range and be small enough for the servo motors to handle the torques represented by the hinge-moments of the rudders and elevators and so control the missile.

Basically then, the problem is something like this. Since the range and speed of a rocket depend on the ratio of fuel weight to overall weight, it follows that a very large percentage of the weight consists of fuel which varies, of course, from a given amount at launching to practically zero at fuel cut-off time. Consequently, the c.g. of the missile may change quite a bit in the process and it is necessary that both the most rearward c.g. position (caused by draining the fuel tanks to-

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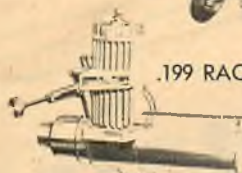
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wards the bottom) and the c.g.-full and empty remain about constant. With a bi-propellant fuel, one tank is located ahead of the c.g.-empty while the other is located to the rear. This was done in the case of the Wasserfall so that the c.g.-travel was extremely small, and even with the tanks half-empty (critical for stability), the center-of-pressure was still somewhat farther to the rear and so allowed positive stability. The c.g. then, and the c.p. variation with Mach number were carefully coordinated to provide a constant stability—no mean accomplishment.

The center-of-pressure and its travel with Mach number, of course, depended on the precise arrangement of the wings, tail and body. Remembering that the c.p. of a rectangular airfoil moves from 25% of the chord to 50% in going from subsonic to supersonic speeds, it can be seen that this trend somehow had to be cancelled out to obtain a constant stability. The wings were of trapezoidal planform and were very short—about 2 diameters in span with sharply swept leading and trailing edges and with a thin airfoil section.

It is a well known fact that sharply swept (even triangular) wings, wings of small aspect-ratio, and wings with very thin profiles are suitable for supersonic speeds from the point of view of low drag and small changes in center-of-pressure. The wings of the Wasserfall then, may be considered to be somewhat of a combination of all of these types.

In adding the wings to the basic body of the V-2, the drag was increased about 50% but since the lift was increased in about the same proportion, the L/D ratio and gliding ability remained substantially unchanged. The drag, of course, determines the range for a given total thrust while the attainable lift determines the degree of maneuverability. Since the Wasserfall was an anti-aircraft rocket, the maneuverability, of course, mattered more than the range.

The rudders were never completely perfected. A large number of various planforms, sizes and types were tried out. However, the standard type used for the initial tests was of the overhanging balance type and was very simi-

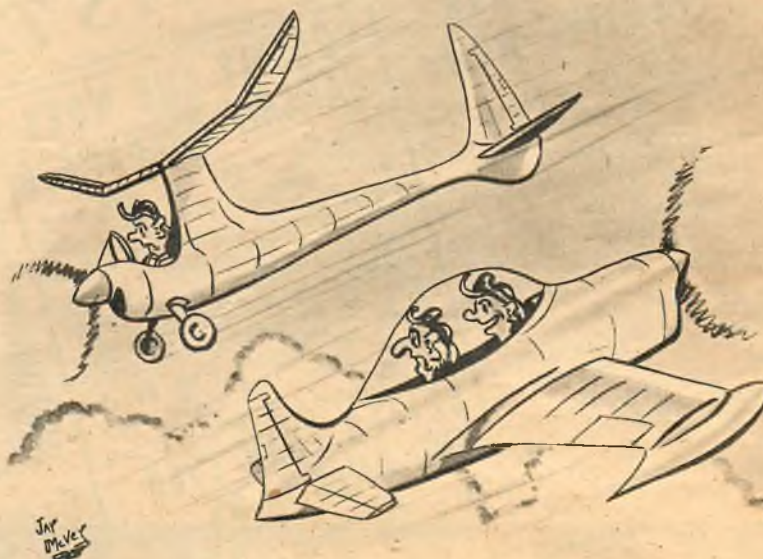
lar to that of a conventional airplane. At the end of the war, they were still attempting to reduce the hinge-moments and hence the power required from the servo-motors in order to reduce their weight and complexity.

Small carbon jets were inserted in the exit nozzle of the rocket motor to aid the control at low speeds before the air controls could become effective—similar to the V-2. The external surfaces were used to control any spinning tendency as well as to control the missile, since any inaccuracies in manufacture or misalignment of the wings or fins would cause the missile to spin and, of course, foul up the guidance system. In this case, all of the "rudders" would rotate in the same direction, clockwise or anti-clockwise to stop the spin and this action was initiated by the gyros.

It was believed that about 25° elevator deflection was required to obtain the necessary 15° angle of attack at subsonic speeds and 8° at supersonic speeds, while an additional 2° differential deflection was available to prevent spinning.

A very important requirement of the Wasserfall was that it had to be designed as a self-contained weapon and unlike the V-2, had to be ready for firing without filling the warhead or adding fuel at the last moment prior to launching. It had to be easily transported and be capable of being stored for as long as a year without excessive corrosion or deterioration which would cause misfiring. It was to be launched from a simple pedestal over a small concrete pit and had to be made ready for firing without any great retinue of servicing trucks and equipment such as the V-2 required and launched without trained specialists or technicians.

Largely for these reasons, a pressurized fuel delivery system was chosen and the propellants were a combination of "Visol" (vinyl isobutyl ether—a hydro-carbon) and nitric-acid (as the oxidizer) which is a "hypergol" combination, i.e., one that is self-ignitable upon coming in contact with one another when aided by the catalytic action of an organic compound added to the fuel. About 770 lbs. of Visol was carried and



"They say he used to be a model airplane designer."

about 3,300 lbs. of nitric-acid, allowing a combustion time of about 45 secs., and a thrust of about 17,000 lbs.

The fuel and acid was delivered from the tanks to the rocket motor by the displacement of high pressure nitrogen which was stored in a spherical tank under about 260 atmospheres. Since the nitrogen pressure decreased during flight and so in turn reduced the fuel flow, the motor thrust decreased so that after some 25 secs., it had dropped to about 12,000 lbs. Burst-type diaphragms, electrically operated, were used to release the nitrogen pressure and start the fuel flow, which in turn, escaped from the tanks through other burst-type diaphragm valves; the fuel then went to the combustion chamber where it ignited spontaneously.

The combustion chamber itself was very similar to that for the V-2 and used the acid to cool regeneratively as it flowed through the double walls of the chamber. The fuel and acid was led to the orifices of the combustion chamber and impinged one against the other in about $\frac{1}{4}$ of the orifices in order to facilitate combustion. Through the remaining $\frac{3}{4}$ of the orifices, fuel was injected against fuel and acid against acid in order to obtain good atomization and a good mixture within the combustion chamber.

There were many problems connected with the practical operation of the Wasserfall. The greatest, perhaps, was simply the corrosive effect of the nitric acid and the difficulty of storing it in the tank, lines, and fittings, etc. On the test stand, aluminum or alloy steel tanks were used as well as for tubes, valves, control parts, etc., and worked satisfactorily. However, such materials were very scarce in Germany at this time and could not be used for production missiles. Even though the tanks were flushed with water immediately after use on the test stands, only some 6-8 runs could be made before the equipment had to be discarded. Consequently, production tanks and parts were coated with a special enamel which was found to give adequate protection and allowed the missiles to be filled and stored prior to launching.

Other types of malfunction also occurred. Reaction failures of the sleeve valves in the servo mechanism jammed under the acceleration of launching. Other parts broke under the strain of firing. Occasionally, the combustion chamber burst under the initial shock during ignition, or burned through in the 45 secs. burning time since the chamber material was only ordinary sheet steel.

Also the nozzles gave some trouble due to premature impingement of both propellants in starting which would rupture the combustion chamber dome or cause leaks and failures of the nozzle seats. Since the missile was designed for mass-production at the lowest possible cost (in man-hours of labor) swirl-type nozzles were not used.

In control and guidance apparatus, the Germans apparently left this phase of development until the last since it was, in general, inadequate and considerably inferior to the level of thought in America on radar tracking, radio signaling, etc.

The Germans, in fact, intended to use a visual control system wherein the missile was guided by optical de-

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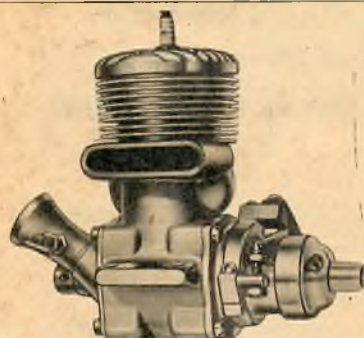
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vices from the ground—a system which considerably lessened the effectiveness of the entire scheme of things because of clouds and haze and the difficulty in using the missile at night. The missiles were launched vertically from the ground and then through telescopic observation, directed by radio by a ground "steersman" straight towards the target—hardly the shortest course, and certainly not the most effective.

Apparently, several guidance systems were considered, all of which were in the formative stages of development. The first system, which was actually used and perfected within the limits possible, has been described above.

Radar tracking was to be used later and from the ground, of course. However, the Germans also had gone into the matter of infrared homing problems wherein the heat transmission of the enemy aircraft could be picked up and used to direct the missile to the target where it would be exploded with a proximity fuse. Since jet-propelled aircraft have considerably greater heat transmission than do airplanes with internal-combustion engines, such a system would be particularly feasible against such craft.

Optical homing devices were also considered and developed as a part of their guidance program as a whole. In this case, of course, the target would be picked up optically with a photo-cell scanning device in the nose of the missile which would then automatically guide it towards the target.

At any event, the guidance system was undoubtedly the weakest link in their chain of thought and while they showed considerable ingenuity and skill in designing the missile itself, they were considerably behind American thought on matters of guidance, communication and control problems in general. At any event, the Wasserfall does represent the first successful guided missile capable of being "flown" through the difficult transonic region and into the supersonic; but there will be many more to follow!

Solo Club

(Continued from page 34)

fellow members? Shaw's experiences are more than interesting. Just the telling suggests some good thoughts. Have you ever been checked out in one of these heavier ships, or even tried to fly one? They are no harder to fly than the real light-planes. Oh, there are some differences in feel, of course, but the instructor quickly gives you the lowdown. Mostly, these bigger jobs are distinguished for their smoothness and lack of noise and vibration, as compared with the noisy Cubs, Champs, and the rest of them. That 170, for instance, actually flies itself. All you have to do is set the trim for speed, or condition, such as climb or glide, and it slides along like velvet. What a wonderful feeling. Of course, there are comparable ships, like the Luscombe Sedan, or the Stinson, that are just as good. If you want to go on from there, try the Navion and Bonanza, which add retractable gear and higher speeds. And how about writing Shaw up there in Gander?

Yes, indeed, what good does the Solo Club do! No lack of real alive members to tell us. Here's Jack Kennett

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Brown, Commercial and Instructor #494169, and Solo Club Member #1733. There is a real story behind Jack's certification of the solo flight of Richard B. Geppelt, in an Ercoupe, on November 5, 1948. Your airplane, Jack Brown!

"This all began in 1946 when I obtained my private license," begins Brown. "Richard and I both belonged to the Civil Air Patrol. Dick was 18 and I was 17 at the time. After I joined the Solo Club, Dick expressed his desire to solo. He had one purpose in mind, and that was to qualify for the Solo Club, and also to carry other CAP cadets aloft for their orientation rides. In the meantime, I had won my commercial ticket for airplanes, gliders, single- and multi-engine land and single-engine sea. I also got my flight instructor's rating and am designated a student pilot examiner and am 19 years old. I had all these ratings when I was 18.

"Now I have been giving dual to Dick in gliders, a Luscombe seaplane, twin-engine Beech, Ercoupes, and other single-engine aircraft, and am proud to see Dick apply for membership in the Solo Club."

Thanks, Jack Brown. With comments like yours, we can push back our sleeves and really beat the drum for better and more enjoyable flying. Lots of our fellow members, including this one, will be drooling over those ships you guys fly. Hear tell, too, that gliders are an experience that should not be missed. Anyone else had a go at motorless flight?

"The Solo Club column is very good," chimes in James Stapenhill, Higgins Classical Institute, Charlestown, Maine,

"because it gives a good idea of what other pilots do and some of their experiences.

"I read about giving rides to first fliers. I have had the opportunity of giving six persons their first airplane ride. Other pilots tell about the great thrill they gave that 'guy,' the one that never had been inside an airplane. I don't go for that. My first ride was a smooth one, and I want to give a smooth ride, too, so I can hear him say that it wasn't bad after all. The one time one of these first fliers was a bit sick it happened to be a rough day.

"I have a private land and sea rating," concludes Jim, "and am interested in the stories of other pilots. I am interested, too, in the types of aircraft flown by other members and wish they would mention these ships. Have flown quite a few myself, from a 40-hp T-Craft to a 175-hp PT-19."

Good thinking, Jim Stapenhill. It would be wise for us to be more considerate of first riders. Try to set your dates for the morning when the air is more smooth, or perhaps in the evening, and keep those turns as flat as possible. Don't even approach a stall! By all means, don't sell private flying short by trying to give a thrill to some landlubber. All you do is lose a customer, another potential pilot. A thrill is nothing but a kick in the teeth for our interests. You are out to sell private flying, not knock it down. There are too many people now who boast that you'll never get their feet off the ground.

"The boners that pilots pull, should wake up the ones who are still alive,"

sagely comments Jerry Wallick, who received his flight training at LSU, Baton Rouge, La. "Only recently a Cub came back to the field in Baton Rouge with power lines wrapped around his landing gear and the pilot claimed he did it on take-off after a forced landing in a pasture. Where the power company reported the break, there didn't happen to be a clearing."

Too much of this sort of thing goes on. Don't buzz the girl friend's house, or circle the old homestead low and slow. High-speed stalls, secondary stalls, and aileron spins are tricky foes that always lurk for the "too smart pilot." And how about that take-off after a forced landing, if one had been made? When we learned to fly, regulations said you had to get a mechanic after a forced landing. For our part, we'd never try to take off a forced-down ship, even if it had been ice in the carburetor that had caused the mischief, until some qualified person made sure the engine wouldn't quit again—perhaps on a short field take-off. Moreover, if the field was short or not too good, we'd let the operator send out his own pilot. Too many cocky characters bite off more than they can chew!

You know, the number of members who want the floor would keep this meeting going indefinitely. But we have to see what the Bulletin Board holds this month. But let's make a date for next month, when headquarters will try to arrange a longer meeting. To all you pilots of both sexes who have written in, don't be discouraged. All letters are carefully read and, if you don't hear from us, it is only because your staff is swamped. Perhaps your message is important enough to be brought before

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future meetings; watch the Solo Club page. And, please, fellows—and girls—how about those snapshots? Everyone wants to know more about their comrades and the ships they fly. Make a point of getting in those pictures for the earliest possible meeting. The picture file grows slowly; in this one department we could stand more action.

Bulletin Board: It is now possible for private flying plane owners and pilots to subscribe in advance to Coast & Geodetic Survey Aeronautical charts, and receive revisions as they come off the government press every six months. Write the Coast & Geodetic Survey, Washington, D. C.

From Oregon Air News, this startling tip to operators, re veterans' applications: "... a letter of insufficient justification from the VA does not mean that you have been rejected from flight training; this is merely an invitation by the VA to meet with their advisory council. ... Both veteran and flight operator ... who are following through their applications, even after the letter of insufficient justification, have been rewarded by better than 60% approval, while approvals on applications not followed through were about 12%." There is food for thought!

Speaking of first riders. ... At Flat River Junior College, Southeast Missouri State College, and Southwest State College, the Aviation Consultant from Aviation Section worked with teachers attending summer school. Lectures, teaching demonstrations, airport tours, and movies were included. Flight experience for teachers was part of the program. One hundred and thirty took rides at Flat River (80% for the first time), and 180 at the other two colleges (65% for the first time). Every bit helps.

Ability to pilot an airplane is becoming an important qualification when applying for a job in many industries today, according to a survey being conducted by the Personal Aircraft Council. More than 95% of the executives who replied to questionnaires in the survey stated that ability to fly would be a definite advantage in an employee's career.

From Oregon Air News (by Oregon State Board of Aeronautics) comes this dope on portable traffic control light signals. Flashing Green means cleared for take-off or, if in flight, cleared to land. Steady Red means stop on ground, give way to other aircraft and continue circling in air. Flashing Red, taxi clear of landing area, or, in air, airport unsafe; do not land. Flashing White, return to starting point on airport, when on ground. Alternating Red and Green is a general warning signal, requiring extreme caution in air. A flashing Amber light in the center of the segmented circle or on top of the control tower or adjoining buildings or L-shaped traffic pattern indicators, means that traffic flow is clockwise, to right, unless otherwise authorized by Air Traffic Control.

Iowa pilots now get weather and other information over at least five radio stations. WHO broadcasts weather information daily at eight A. M., plus ten A.M. on Sundays; KBIZ, Ottumwa, gives weather seven times a day; KWDM, news and guest appearances every second Thursday at 7:45 P.M.; KIOA, news and weather daily; KASI weather at

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French lightplane touring contest held July 2-10 admitted 30 domestic, 30 foreign ships for 2,600 mile circuit. Two-placers of under 2,204 pounds, and three-placers of under 2,976 pounds, and four-placers of under 3,478 permitted, full passenger load to be carried. Awards on point basis.

Like old soldiers, the Monocoupes never die. In the picture intermittently for some 25 years, the Monocoupe name pops up this year in Florida, where the Monocoupe Aircraft & Engine Corp., Melbourne, announced three two-place models. Each is highly stressed for aerobatics, including 115-hp standard, 115-hp deluxe, and a 185-hp Clip wing that spans only 23 feet. Less powerful models are priced at \$3,890 and \$4,490.

A good idea is being tried by Regan Flying Service, Shawnee, Okla. G. Ray Cullman, manager, put out a form letter advising pilots that there are available at Shawnee: free, hot coffee, at any hour, free beds in heated rooms for overnight transients, showers, free towels and soap, free transport to town, lounge room, table tennis to kill time when weathered in, free stenographer-typist service. "Make this your office," says Cullman, "why go to town?" With acid comments today about the sad state of private flying once you reach the destination, touching down on a strange airport, we can hope that Cullman's plan will expand. And soon.

The Missouri State Division of Resources and Development have, on request, plans for a combination wind sock holder and traffic indicator. Shows both direction of wind and traffic. Students may be surprised that tee's don't always show the wind, but some-

times are locked in the proper landing direction. (Hint!) Anyhoo, this tee is made from 55-count 'em—gallon gasoline drums to form body and wing. Complete cost, including labor, runs from \$100 to \$200. Armco Drainage and Metal Products Co., Topeka, Kansas, will construct similar gadget from 24" corrugated metal pipe for \$104.15, less bearing, which consists of rear axle housing, bearings, and hub from an old truck, set in concrete.

CAB is considering granting waivers to a few schools anxious to try a novel training program proposed by State Aviation Officials. Fifty-five hours would be required for private, but 30 hours of this would be observer time spent flying with two other students and instructor in four-place ship, instruction being given class-room fashion on a 300-400 mile cross-country. Fifteen hours dual, ten solo, presumably for same overall figure.

54,000 people arriving in 27,000 private planes at San Francisco were estimated to have spent over \$1,000,000 last year. Aviation income in S. F.: \$32,000,000 topping such groups as banks and trust companies, hotels and lodgings, and water transportation.

Students of Cal-Aero have redesigned and built a Travelaire 12Q biplane—great stuff in the twenties!—substituting a 125 opposed engine for the old 90-hp Wright Gypsy said to have powered the original. Other change was metal skin for the once fabric-covered fuselage. In those days Walter Beech founded the Travel Air Mfg. Co., Wichita, with Clyde Cessna. Lloyd Stearman was chief designer. Beech and Stearman had been associated until then with the old Swallow Aeroplane Mfg. Co.

Dope Can

(Continued from page 44)

time in the center of one circle, two classes of models have been suggested.

One team racing event would be for profile models which could be quickly turned out and therefore somewhat expendable. Contestants would "break in" with these planes. Then after acquiring sufficient skill, they'd move on to the advance event for built-up semi-scale jobs. In that way more fellows would be encouraged to try their hand. In California, home of team racing, many flyers in Northern California held back from the grand free-for-all idea of many contestants flying at one time, and for that group a special Proto Type class was created. Same rules apply to the model as for the F.A.S.T. club's team racers, but instead of multiple flying, each contestant performs solo and his model is clocked from its take-off run until it completes a specified number of laps.

Probably the next development in Southern California's team racing rules will be that the model must be equipped with engine cut-off so the motor can be stopped after a specified number of laps and the plane brought in quickly for a dead stick landing and refueling.

Russian and Czech builders seem to have "discovered" microfilm models recently and are going all out for indoor endurance events. The first photos that came our way of such activities showed very crude ships of about 1933 vintage (by American standards). Now, however, new pictures indicate that better indoor models are making their appearance and some very interesting pushers are showing up (paging Hank Cole!). Control-line flying has penetrated the iron curtain, too. The latest Czech model motors are dead ringers for the big McCoy's and Doolings.

That's a natural opening for us to talk about the latest Australian speed record. It's held by Jack Fineran of Kingsford, who flew a McCoy 29-powered Invader to a speed of 123 mph. He improved his previous speed of 105 mph by borrowing a "36" back plate from a pal of his.

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PLAN #949

Long Midget — Cal Smith's grand plans for .29-powered scale job.

Maechi—full-size drawings for this fine Italian light-plane.

Roland — U-control fans will find this scale job a "must."

Cub Controller—working drawings for this OK Cub stunter.

PLAN #849

Three Vagabonds—for powering with T-56 rubber, Infant motor, O&R 23 or Herkimer's OK Cub.

Baby Boomer—slick, small free-flight design. Takes the new Cub or Infant-type motors.

Air Boat—a real thrill for any model builder. This O&R g.p.-powered sea sled is great fun.

PLAN #1049

Southerner—unusual low-wing free-flight using Arden .099. Nightmare — a Wakefield-type job with swept-forward wings. Topsy Junior—Red Kochman's fine U-control scale stunter. Blue Devil—a very easy-to-build race car for Herkimer OK CO₂. Roscoe — rugged transitional trainer for U-control speed.

PLAN #749

Boeing P-12C — Dick Ealy's fine U-control scale biplane for motors of Cl. B displacement.

Blitz Buggy — Jack Norris' famous Class A-B free-flight record holder. Takes Arden .199.

Aloha—a scientific design in the CO₂ category by Henry Jex. A good endurance winner.

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Minnow—famous winner of Goodyear trophy. U-control scale model of 38" span for Cl. D.

Super Phoenix—remarkable Cl. A free-flight plane by Frank Ehling. Span is 64". For new rules.

PLAN #103

Laird Super Solution biplane for U-control. Has span of 26 inches. Takes Class A engine.

Jerseyette—Frank Ehling's Cl. A or B free-flight or U-control "goat." Span of 40 in.

Hand Launched Gliders—take your choice: Fizzle is 12" Class A job; Sizzle is 18. Cl. B.

Sizzler — hot rock U-control speed ship by Bill Seidler. Class D power, span is 22 inches.

PLAN #108

Senator—Carl Wheeler's B & C free-flight record holder for new rules. Wing span is 61".

Upstart—Claude McCullough's 57" stunt model for Class D engines. Trim, easy to build.

PLAN #105

Jet Job—world's fastest model powered by Dyna-Jet engine. Wing span is only 18 inches.

Rubber Biplane—neat, easy-to-build rubber powered cabin biplane of 24" span for sport flying.

Cabin Pylon—a magnificent 54-inch wing span free-flight model for large Class A and Class B motors. Realistic appearing plane which looks much like the current crop of light planes, yet gives pylon-type performance as an endurance model.

PLAN #109

FAA—Load Winner—for the Pan American Airways events which will be held throughout country.

Radart—McElwee's dependable radio-control job for use with D-E Aerotrol system and Drone.

Georges Vallet of Geneva, Switzerland, way 'round on the other side of the globe, has been active in the speed circles, too. He recently established a new European record of 127.81 mph at Paris with a sharp looking Dooling-powered job. Mr. Vallet's model had a long fuselage, no rudder, in typical U.S. fashion.

Not long ago in England the Royal Air Force ran off its first large scale, officially sponsored gathering of aeromodelers (we note from a "Flight" report). Free-flight models, both rubber and engine powered, were flown and Air Marshal Sir John Whitford Jones, commander in chief of the R.A.F.'s Technical Training Command, was on hand to give his blessing. We can't understand why in this country the Air Force has permitted the Navy to run away with the sponsorship of so many model events. We more than welcome the wonderful support by the U.S. Navy, but why in heaven's name doesn't the Air Force officially get behind the model movement?

Speaking of the unlikely brings us to the amazing report by William Bornscheuer of Baltimore, Md., who participated in the 4th annual National Capital Model Air Show held at Andrews Field, Md., sponsored by the National Airport Club, the "Evening Star" newspaper, and the V.F.W. in cooperation with local Plymouth dealers.

Last year Bill flew in the 3rd annual shindig and lost a fine free-flight job. He hunted and hunted, but couldn't locate it. This year, one of the Plymouth retrieving trucks out after somebody else's ship found his 1948 entry! Bill says the ship needs recovering.

Experience exchange is what Rudolf Friedrich, Heimstattenweg 14, Wolfenbuttek (near Brunswick in the British Zone of Germany) wants to get started. He's an engineer who has designed his own miniature diesel (compression ignition?) engines and would like to correspond with similarly interested individuals in other parts of the world.

This pen-pal stuff can really get you going, we might point out. Inglewood, California's Bill Butler said he offered to correspond with British modelers last Fall and received so many letters he had to pass on several dozens to fellow modelers—he just couldn't cope with all the inquiries that came in from Great Britain!

Cholon (or Roland, or Poland, or Loland) Boetz (or Bootz or Boitz)—will you guys please print your name and address—of Anamoose, N. D., says he lives on a farm 2½ miles from the nearest town. He has expanded to 4 planes in his 10 years of modeling (models, we assume—no?) and is now thinking of making himself a little airfield. He asks for some ideas on how to plan a field with clubhouse and several U-control circles. He wants to start a club, too.

Well, C.B., we suggest you get ahold of Arthur J. May, RFD 2, Bismarck, and set down for a chat. Art is an activities leader and can give you all the dope you need. Mr. May, incidentally, reports that North Dakota's first jet team, made up of Don Carlson, Leo Hamlin and Freddy Roberts (all of Bismarck) have really been going places in the jet speed field. Art secured the backing of Plymouth dealers in the state who kicked into a kitty (dealers were assessed \$1 for every car they received in 1948) and the results have been wondrous to behold. Mr. May asks why the parent Plymouth concern didn't sponsor the American Wakefield team to the British International finals.

Well, Art, we don't speak for the Plymouth outfit, but our guess is that the concern is so wrapped up in its qualification meets, its international finals and the sponsoring of teams to Detroit from many foreign countries, that it could scarcely think of entering into some entirely different phase of the aeromodeling activity such as the Wakefield competition.

Fifteen-year-old Rolf During, Rosenlunds-gated 5, Jonkoping, Sweden, has built Parker Hubert's Gay Lady V speed job featured in Air Trails. He'd like to correspond with speed-minded modelers in this country. He writes that "there is not anybody in Sweden who flies with piston engines." We think he refers to ignition engines and got his Swedish-American dictionary opened to the wrong page.

Oklahoma City heard from at long last by means of the mimeographed bulletin "The Okla. Modeler" sent us by Dan Marek of the Glo-Bugs club. From the bulletin we gather that a number of clubs are active in the oil city. Now, why don't those clubs

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Back to Oklahoma City: the "Modeler" presents an entertaining comic strip in which the central character is a talking glow plug. Moral of this month's strip is that "a little soldering (on the push rod) saves a lot of digging (i.e., gathering the debris of your U-control model out of the dust when it crashes because the parts don't hold)."

The 4th annual Arizona State Championships were run off in Phoenix under the sponsorship of the Exchange Club and radio station KTAR. Weather was usual—clear and a bit warm with plenty of thermals. Mr. D. Van Dyke spotted far-flying models from his Navion with the splendid result that only 3 jobs were lost. Five thousand spectators turned out and cheered till the final flight. The onlookers liked especially the team racing event which was run off under the F.A.S.T. rules. Jim McElroy of Phoenix did 149.07 with his McCoy-powered original Class D speed job which appears to be a record since application was made for same to the A.M.A. in Washington, D. C. Chuck Sutton won the grand championship and is believed to have set a new national duration mark of 14:53.6 in one of the rubber cabin categories.

If the ladies will leave the room, we'll quote from a letter by Earl Merrifield of Portland, Ore. Addressed to the Air Trails staff, he says among other things, "Just keep up the fine work, you're doing one hell of a good job!" Thanks, Earl, and we'll supply you with the name of a prospective correspondent in Germany. E.M. reports that he writes to a model builder in England, in fact, entered a subscription to A.T., in the chap's name, but doesn't want his address published "since I'm running a paint store and two apartment houses all by my little self, so couldn't answer a hundred letters."

He talks turkey does Capt. W. V. Symes (c/o Bellavale, 6 Park Ave., St. Ives, Cornwall, England) while on a recent visit to Turkey. The good Capt. could scarcely wait to get back to England to start work on A.T.'s. De Havilland IV. He'd like to hear from some American modeler who would like to exchange ideas on control-line scale and who also has some leanings toward stunt types. Our friend from G. B. is 28 and a mining engineer.

One of the most interesting news bulletins to come our way is "Slip Stream" put out by the Prop-Twisters club of Greensboro, N. C. Harold "Squirt" Bunting is editor, John Stuart is chief reporter, Charles Knowles is field reporter and Bill Shields is the "pressman." A recent "Slip Stream" editorial is so very illuminating we reprint it in full:

"Well, fellow modelers, this time I am going to let you know how it feels to be at a real honest-to-goodness contest where Sportsmanship rules. On the week end of June 12 Stuart, Knowles, Shields, Bill Pardue and myself (Bunting) went up into 'them thar hills' to be shown just how neighborly model builders can be.

"Beckley, W. Va., was the place where the most friendly people in the country held the contest. Mrs. Gene Keatley was the contest director. This is definitely an asset to any meet for no arguments were had all day. The Beckley Modeleers really took good care of their out-of-town guests. The fellows from Johnson City, Tenn., were tops. All in all, more hospitality was observed by our group than at any meet ever attended.

"The 'Modeleers' welcomed us into town Saturday night and all the model builders and out-of-town contestants that could attend held a real ole fashioned 'Bull Session.' After hours, the group broke up and turned in for a good night's rest (we needed it). The next morning we awoke with the most beautiful scenery surrounding us (we had driven at night). An early breakfast and we were ready for the meet.

"Upon arrival at the field, all were anxious to help us get our headquarters set up and the Modeleers even furnished the fuel free. All kept asking, 'Is there anything we can do to help you get ready?' Getting such an enthusiastic bunch of fellows was certainly surprising. All during that afternoon, the Modeleers made you feel right at



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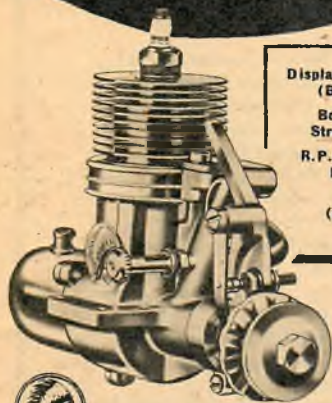
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home and most of the time made you feel like a king. It truly was an honor to be able to participate in a meet with such a fine group of fellows. Mrs. Keatley was superb.

"Nine out of 10 contestants from the Carolina area should go to Beckley and see for themselves and learn how to participate in a meet and be able to fly and leave with a smile on their faces even if they have been beaten. Most contests in this area have a half dozen arguments and many of the contestants claim dirty deals. To be a good winner you must be a good loser. I am sure most of the fellows that gripe at the meets in this state will find out that if they cooperate with one another as the boys do in Beckley, they would benefit from the meets more than they do now."

Amen!

For some reason or another H. Maseles, press secretary of the Royal Oak, Mich., Cloudbusters club says his organization has not been getting much publicity. But starting now he hopes to remedy that situation. Shortly after the war was over the model builders that were away in the service came home to Royal Oak to tackle the problem of securing a U-control site. After 18 months of pleading with the city commission, as well as with the citizens of the community (in the meantime being run off all the school grounds in the city) a piece of property was allotted for model flying by the city fathers. After using this land for 1 year and spending close to \$150 for plowing and leveling the ground, a new settlement of homes went up within a quarter mile of the site and—boom—no more flying. Modelers and their creations were adjudged a nuisance. So now the club members are out looking for a new model airport.

Correspondent Maseles wonders why with all the cry about more constructive activity to fight juvenile delinquency more consideration isn't extended to model clubs and their work. That's a mighty good question, as the politicians are wont to remark. So now the Cloudbusters find themselves operating outside the city limits with high hopes for continuing activity.

The club boasts several Dyna-Jet powered models, one by president John Kates, another built by Gene McKechnie.

Clean sweep by dentist-modeler was the amazing performance by Dr. C. A. Welgemoed of Pretoria, South Africa, flying in that country's national contest. He entered McCoy 19, 29 and 49-powered Little Rocket speed jobs (love those designs that appear in A.T.) and walked off with top honors in Classes A, B and C with times of 87.14, 99.9 and 119.3 mph respectively. All the more remarkable were the speeds when you consider the comparatively "tame" fuels the winner and his fellow contestants are forced to use over there.

Dr. Welgemoed says considerable difficulty was experienced with needle valve settings during the contest since Pretoria is at 6,000 ft. and Capetown, where the S.A. Nationals were run off, is at sea level.

Robert Neal of Willow Run Village, Mich., is an enterprising chap with lots of new ideas. Proof of that is his latest stunt job which is powered by two O&R 60's which operate on glow fuel. Ship has big, symmetrical wing and does very well inverted. He flies on 100 feet of .016" line. Twin profile fuselage-booms are used. Motors are mounted upright on crutches which extend into wing.

A slick Minnow built from A.T. plans by Don Malley of Cresson, Pa., is brought to our attention by fellow Cressonite Bruce O'Malley. Power is an OK 60. Bruce says the model really steps around and boasts an especially nice finish made of DuPont clear lacquer mixed with bronze powder. This was sprayed on. We're sorry the accompanying photo was too small to be included.

The Calif. Assoc. of Model Clubs (CMAC) at last report included 19 model organizations. An emblem has been selected for the association. It consists of a drawing of the state of California in gold with wings on the side and the letters "CMAC" blocked in vertically. Wings and letters are blue. The group has recommended that free-flight rules be changed to require that all models carry an added weight equal in ounces to the displacement of the engine. That is, a plane powered by a motor of .29 cubic inch displacement would be required to tote an added weight of 29 ounces. "The basis for this idea," contends CMAC representatives, "is that there has been no improvement in free-flight for many years."

Maybe they've got something there. We did hear that Jim (precision free-flight advocate) Walker and Dallas (dreamer-upper of Pan-American's PAA-LOAD event)

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Sherman had their heads together in San Francisco during the Model Industry Association's annual trade show and convention with the result that Jim now feels the free-flight precision class which he has been pushing should include a payload lifting requirement such as the Pan American rules specify. Could be that is the beginning of a brand new, grand new era in free-flight competition and sport flying.

We're rapidly running out of space here, but before we sign off we want to express our appreciation to all those who have been showing us with reports, personal accounts of model flying and contest results. We try to cover every section of the country as the columns go by, and if we miss you the first time, don't give up—try us again. America is a mighty big place, and there are just so many pages we can squeeze into Air Trails. But keep all that material coming our way and we'll do our level best to give good coverage to you and your club. In the meantime, be sure your group registers with A.T. for the next Model Aero Club Directory.

Interest And Props at high pitch in Miamisburg, Ohio, reports Paul Langworthy of E. Richard St. In this town of 5,000 the hobby shop is doing a fine business, he says, but there are only two others besides Paul who do any flying! There are, however, a number of fellows among the spectators who claim to have super-super models at home. Apparently, Miamisburg has the makings of a club, but what to do? From where we stand, it seems that the fellows claiming to have the swell models are too proud to admit that there are some things about modeling on which they need a little advice. It is therefore suggested that the hobby dealer, when selling a kit or engine, inquire in a quiet way whether or not the purchaser would be interested in having the benefit of the experience of Paul or his two friends. If so, said purchaser could leave his name and address, with the idea of having one of the three drop in some evening. Betcha the three active flyers there soon become six, the six become twelve and the twelve a club!

From The Ashes of what once were the Vineland "Aeronauts" and the Bridgeton "Whirlwinds" of New Jersey, has come a newer, better club. The "Garden State Aeronauts" is its name, writes William L. Horton Jr., 99 Rutgers Ave, Bridgeton the club's secretary-treasurer who would like to hear from your club. E. N. Angus once AMA President and now NAA Vice-President for Air Youth was a guest at the re-organization meeting in February and gave those present a fine sendoff talk. Flying, and lots of it, is done at the Millville Airport and contests are "in the works."

Kanadian Korner: "A line," he calls it! Hank Biggs of Regina, Sask., doesn't write often, but when he does his idea of "a line" runs into 5½ pages! Lack of space forbids complete coverage but the high spots can be hit. First, he thanks this corner for letting him know about Jim Zerr of Regina, whose letter was mentioned in the April issue. Hank, as former secretary of the Model Aircraft League of Saskatchewan, thought he knew every modeler in the province. It took us to find Jim Zerr for him, though. The rest of his letter contains his model autobiography and his expressions of regret at probably not being able to get to the 1949 Nationals because of the necessity for keeping the schnozz at the grindstone so that his potential balsa chopper will grow up to be a real one. His description of early gas modeling brought on many recollections of past years. Sure hope he keeps his promise of writing often.

South Africa Checks In with an account of the successful exhibition of models held in East London, described in the pages of the ever-faithful "Flypaper, Mark II." All types were on display and the show drew quite a crowd. When it was noted that the affair was held in the Manning and Patterson showroom, a bell rang. Is the "Patterson" the same Patterson we met in Detroit in '47? If so, the South African "bods," as they call themselves, have a real friend.

D'ya Wanna Write to Reginald D. Chapman, 64 Hamlet Road, Southend-on-Sea, Essex, England, who wants dope on scale control-liners... To Gus Gunter 21A Windmill Road, Hampton Hill, Middlesex, England, who has designed hydulignum gas props now being manufactured and who knows one end of an engine from another... To Alan Davenport, 34 Bamber Avenue, Sale Moor, Sale, Cheshire, England who's 24 and who's ga-ga about free-flight... To William Rocher, 7 Alders Road, Benchill, Manchester, England, who likes anything so

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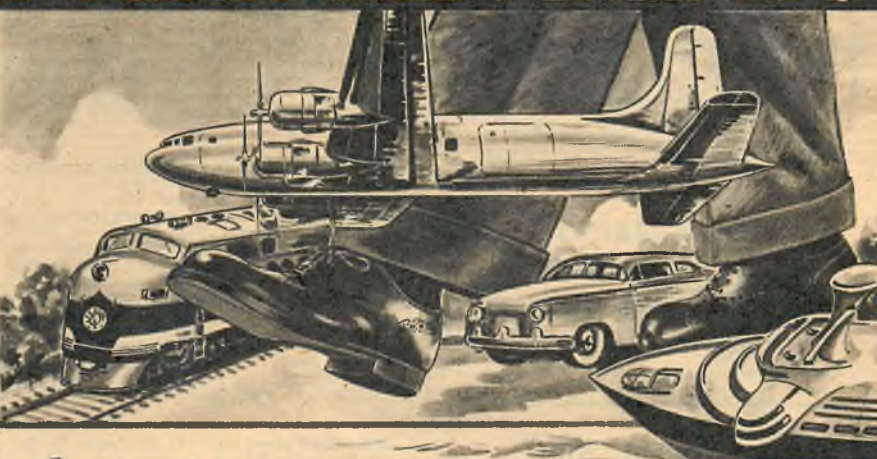
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long as it's models. . . . To Gunter Kunze, 128, Schutzenstrasse, Hilchenbach, Westphalia, Germany, who is Technical Leader of the Hilchenbach Aero Club which has been permitted to resume operations by occupation authorities; club is interested in gliders, both big and little. . . . To Kurt Kirchner, Linz-Danube, Landstrasse 57/I, Upper Austria, whose club is also "starting from scratch" following the war. . . . And in our own backyard, to Floyd Carter, 9632 San Vincente Ave., South Gate, Calif., and to Mart H. Cooley, Alton, Kansas, who wants plans for a Spitfire in which he can put his "Infant."

Enthusiastic Fledglings are the 15 members of the recently-formed control-line club in San Bernardino, Calif. Indication that they're on the right track is shown by their plans for a public show to attract new members and to stimulate public interest. Air Trails is bettin' on 'em to be a success, and this corner in particular will be looking for further news from secretary Connie Devitt.

Better 'n' Better gets "Prop Wash," publication of the Akron "Rubber City Aero-nauts." Besides the regular club news and contest activities, the latest issue we have has described a neat spring "hatch katch" for fuselage compartment covers and plans for an indoor glider by Dick Obarski and for a stick pusher by Hubie Wise. Good for them!

Snazzy Is The Word for the "Official Aero-modeling Bulletin" recently received from Argentina. Printed on slick paper and full of illustrations of models which look suspiciously like some of our popular kit jobs, the "Bulletin" is an indication of the amount of official interest in the activity. We got a big charge out of the record listing as of November 9, 1948; high time is 2:19.6 with a gas model. . . . What, no thermals? Contests are officially begun with the raising of the flag, and high military "brass" is plentiful. Flyers vie for the beautiful "President of the Nation Trophy," Argentine parallel of our Exchange Club National Champ award.

Speed Gets Boostin' From Houston: Mark Valerius, student at Rice Institute, has kept mum for many years, but recent articles on rules to limit speed, team racing, etc., have aroused his ire and he hastens to tell us so, and why. Says Mark, "Regardless of what the free-flight boys say, control-line speed has been reduced to the most highly scientific phase of model building, since luck plays a negligible part in determining the winners of today's contests." Agreeing that all speed models look alike, he points out that it's the little scientific refinements in cowlings, props and fuel that keep an ace speed merchant on top. To which we say, "Amen," but at the same time add the reminder that models, like human beings, have varied tastes and that this peculiarity accounts for the interest in other types of models.

Eight Pages from Gerald Wiles, Bradford, Ohio, appear to prove what was said in the paragraph above. Gerald goes for scale control-line in a huge way, suggesting engine weight rather than engine displacement as a basis for classification for scale stunt and scale speed events. With such a basis, the Fox—with which we suspect he's fallen in love—would have a chance to show its tremendous efficiency, as would the other lightweight. Wiles contends that engines primarily designed for model aircraft use could then compete on an equal footing with the race car engines. However, he hastens to add, nothing is better than a jet. . . .

Radio-Controllers will get lift from the letter sent us by Edwin C. Schunke. Ed has sent all of his congressman and the Federal Communications Commission a request that consideration be given the AMA's perennial request for simplified FCC requirements for RC flyers. In his fine presentation, Ed calls the recipient's attention to the fact that liberalized regulations would result in the country's having a great pool of technical personnel trained in the guiding of aircraft by radio, from which it could draw in time of national emergency. He asks that you show your congressmen and the FCC the amount of interest there is in radio-control for models by writing to them. Those who attended the '39 Nats in Detroit will remember modeler Schunke, who got a second place in Class C gas—or Unlimited, as it was then called.

What Do We Think of the wood sent us by Robert E. Edney, Forestry School, U. of Georgia? He doesn't mention its name, merely calling it an "exotic species," but gives its weight as 16 lbs. per cu. ft. and says

it's twice as strong as balsa. What checks we've made of it appear to indicate that its "graininess" prevents its general use for flat parts with curved outlines, since it's difficult to cut across the grain. Its strength in bending is swell, though, and it might prove useful for spars and longerons. We had quite a time getting one of the samples sanded smooth, since there are alternate hard and soft fibers. This latter characteristic makes the wood prone to sudden splitting when bent in a line parallel to the grain. Weight checks made with our trusty Jasco scale show a weight of 18 to 22 lbs. per cu. ft., but this may have been due to the pickup of a tremendous amount of moisture, since humidity was high. Generally speaking, the wood has merit for specialized applications, but it's a reasonably safe bet that balsa is here to stay.

No Bull in the Bulletin of the Connecticut Chapter of AMA. Full of info about what gives in the Nutmeg State, the publication also offers Connecticut flyers a chance to put their opinions, suggestions and gripes in print. Carl Kieburg, secretary of the group, asks whether we want to receive it regularly—as if he had to ask!

Did Jamaica Control-liner? And wanna fly it with the gang? If so, and if you live in or near Jamaica, Long Island, contact Lawrence Sadowski, secretary of the "Baisley Park Prop Busters" who wants you to be a member. The address: 150-28 115 Drive, Jamaica 4, N. Y.—the telephone number: OL9-6304.

The "General" Situation seems to be well in hand in Honolulu. By this is meant Brig. Gen. Robert F. Travis, Commanding General of the Pacific Air Command. What we don't mean is that General Travis has made some vague remarks about model aviation, giving it a verbal pat on the head, so to speak. On the contrary, we mean that in addition to being sold on models, General Travis gets out there in the circle and proceeds to whup the ears off'n the hot shots. Latest exploit reported—by Bert Takemoto, incidentally—is the General's feat of garnering two first places in the American Legion Meet at Hickam Field Feb. 12 and 13, and in events where class tells—Acrobatics and Novelty. On top of all this, General Travis is nice people, for which we can vouch personally, having made his acquaintance while he was in Washington at the War College prior to his Pacific assignment. Now, if there were only a few more General Traviges. . . .

Sharp Contrast: As this is written, Washington, D. C., is just about ready to open up a "trial balloon" 2-circle control-line area. Idea is that "should sufficient interest and activity be shown," serious consideration will be given a project to do the job right. As it is, it represents heaven to the local flyers who have been chased off playgrounds and out of parks in the past, since in addition to adequate flight surfaces the area is surrounded by a fence, which to the modeler represents more of a protection to his models from spectators rather than the reverse.

On the other hand, the mail brings a card from Jim Wilkinson of Salina, Kansas, to which he has pasted a newspaper clipping containing an account of the grounding of gas models within city limits by the authorities in Arkansas City, Kansas, who say that such models are "a danger to pedestrians and a nuisance to people who live near where they are being flown." Jim says that since he's a modeler himself he's against the attitude taken by the Arkansas City officials, and we fear that possibly the flyers there have the same resentment, which will get them nowhere. It is therefore suggested to them—and to all others who have suffered a similar calamitous blow—that they make a formal request of the city fathers that space be allotted the activity where the whine of engines won't disturb anyone and refer the authorities to the February '49 issue of "Parks and Recreation," published by the American Institute of Park Executives, Rockford, Ill. In it is a fine article on the subject of control-line facilities written from the standpoint of the public official which will answer those questions the modelers themselves cannot answer.

They're Pretty Smart in University City, Mo. Harry Bartell, secretary of the Universal-Aires, writes that the club, while rolling out the welcome carpet for all new members, is particularly interested in the "younger set." Harry's address is 8518 Elmore Ave., University City. He also says—and notice this, city officials of Arkansas City, Kansas—that the University City Park Board opened the Municipal Model Flying Field on April 29 and that more flight circles are planned there.



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Best Glider Ever, writes Harley Christy of the "Towliner C." This Benton Harbor, Mich., modeler passes along a tip to those building it. In addition to adding weight as called for on the plans, he suggests that if further weight is needed the nose should be boxed in with 1/16" sheet. This corner bows in gratitude in the direction of Benton Harbor, and wishes him many happy flights.

Wanna Sell Those Old AT's? Get in touch with Alex G. Sinclair, 10 N. 8th Ave., Mt. Vernon, N. Y. He wrote to ask if we had old copies for to sell, but we no can do. "Starting with Vol. 1," he says.

"Copy-Cat" Walker's In Again! Reason for tagging Jim with this nickname is that a copy of one of his recent letters we've received has 21 names at its end slated to receive copies of it! Those of you who marvelled at the performance of his radio-control job at the Nationals and in many exhibition flights made in various parts of the country last year will be interested to know that Jim wasn't satisfied with it, and that as this is read, an "improved" version will probably be in the flight test stage.

If any clubs have tried his proposed "Flight Plan" contest, outlined in a previous column, write him and tell him what you think about it.

Beeyootiful is the word for Fred Bertam's pencil slinging. Using H. A. Thomas' solid model drawings as a basis, Fred incorporated in his drawing of an F-86 all of the details he could pick out from photos of the airplane. The result is really good, and we shed a tear when we think that Fred's town of Westwood, N. J., is denied the privilege of seeing any of his ships fly; you see, he writes that he hasn't time to build. Being such a stickler for detail, we're sure that the flying scale jobs he'd build would be showpieces.

You're Nuts, says Arnold Penenberg, if you live in New York City and don't become an Aero-Nut. One of the oldest model clubs in that section, he says there's nothing ancient about their designs, what with the terrific Hornet and McCoy free-flight jobs they've had such success with during last summer's contest season. Penenberg, publicity director for the club, can be reached at 305 Martense St., Brooklyn 26.

Away Back Home in Indiana, they're on the ball. Cause of the foregoing outburst is the first issue of the official bulletin of the Indiana Association of Model Airplane Clubs, recently formed for the purpose of straightening out the contest schedule for the year and of representing the unified voice of model clubs throughout the state. Set-up will be similar to that of the Mid-States group, which has functioned with so great a degree of success. More power to 'em, say we!

It's Darker In Australia than it is at night. So writes Walter M. Albert, aeronautical engineering student at Melbourne Technical College, of the model aviation picture there. No decent gas engines, no Air Trails, no nothing. One thing which is a reasonably safe bet to make Mr. Albert swoon with happiness would be your bundling up your old copies of AT and sending them to him at Welsley Lodge, South Warrendyte, via Ringwood, Victoria, Australia.

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Air Briefs

All-Weather Pilot

The Navy's latest contribution toward solving the all-weather flying problem is a new auto-pilot that can fly large transports under the most unfavorable weather conditions and is capable of a fully automatic letdown to a runway. The "angle of attack auto-pilot," official designation for the device, has been tested for the past 18 months on a Douglas twin-engined Navy transport. Still in the experimental stage, it is now considered sufficiently perfected for demonstration.

Landing Aids of Tomorrow

Three new and highly complex electronic devices to facilitate the landing, departure and taxiing of aircraft in instrument weather may be one of the first steps in the government's 15-year, billion-dollar, all-weather airways program. Air Navigation Panel of the Air Coordinating Committee has requested development of: Airport Approach Control Timer, Interim Private Line Visual Communications System, and Airport Surface Movement Detection Equipment. This last device would enable a control tower operator to see "electronically" planes taxiing on the ground and any obstructions to them, regardless of visibility.

Marks of Distinction

USAF's status as an independent, co-equal branch of the armed services is established more firmly by recent breaking of two old Army ties. Airmen will now have distinctive slate blue uniforms, and rather than the Army General Classification Test they'll be tested for aptitude by a new Airmen Classification Test.

Cruises for the Reserve

The Navy has designed a new training program to requalify Reserve pilots and crewmen in carrier aircraft operations. Several groups of civilian Naval Air Reservists will do their annual two weeks of training duty this year aboard fleet aircraft carriers. The new program got under way in February. Training operations aboard ship will include carrier take-offs and landings, catapult launchings, flying of combat air patrol and anti-submarine patrol, gunnery, bombing, and rocket firing exercises.

Southward Bound

U.S.-built airplanes are helping to expand the aviation strength of many South American countries. Small five- and eight-place U.S.-built transport planes are being used to supplement the larger types now in service on internal feeder lines, according to an aviation expert who recently toured South America. Also among the southbound aircraft are many U. S. personal planes. Of a recent typical month's production, about 12 percent was exported, and half these planes went to countries in South America. Military planes serving with Latin American air forces are still another example. Recently an order of 20 T-6 Texan trainers were flown to Venezuela.

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Jets For The Airlines

Jet-propelled commercial airline service probably is still 10 years or more away, particularly in the United States, which lags far behind in jet transport development, but it will rate an increasing share of attention, especially after news-making flights due in the next few months by the world's first two jet airliners. One of these is the British de Havilland Comet, the D.H. 106, about which three years of silence have now been broken; the other is a Canadian plane, the Avro C-102, first jet airliner to be built in North America.

The Canadian C-102, scheduled to be flying this summer, is built for transcontinental and inter-city operation. It will carry 36-40 passengers, 400 miles an hour, at 30,000 feet.

The United States is far behind in jet airliner development, but Douglas and Lockheed are known to be thinking of a short-range inter-city jet airliner, and Boeing has expressed interest in developing a good transport design from the speedy B-47 Stratojet bomber.

Farming From The Air

A great and as yet scarcely developed potential of the airplane is its use in agriculture, particularly for dusting and spraying to kill insects and weeds. There are some 250 million acres of grain crops in the United States which could be rapidly and effectively sprayed from the air. Last year a few million, perhaps five, were covered by this method. The field for expansion is obvious and tremendous.

Some 1,600 planes will be used in spraying and dusting work this year. They will be of various and sundry types, many of them with homemade applicators. Improved equipment now being developed will help to speed acceptance and economy of this field of flying in the future. Early last spring Luscombe announced its first special sprayer plane, a version of one of its popular personal models. Now Aerona has come out with a similar development, the Spray Champ version of the Aerona Champion. Piper has fitted out 17 PA-11 Cubs as dusters for export to France. Other personal plane manufacturers may be expected to follow these leaders. Some officials even think the business is getting big enough for a special sprayer design rather than modified personal planes and trainers.

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The slope line system of airport runway approach lights has been adopted by the Army, Navy, Air Force, and CAA as the uniform standard for military and civil use. The system uses a line of high intensity fixed-beam lights on each side of the runway. When the pilot is properly lined up on the glide path, the lights appear as two converging luminous lines.

Safeguards

Two awards have been set up to encourage safe performance by Air National Guard units. One cup will be awarded each year to the ANG fighter squadron with the lowest aircraft accident rate. Another on the same basis, will be for one of the 12 light bombardment squadrons. The first awards will be made early next year, based on pilot time and accidents during 1949.

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Is Legion Less Anti-CAP?

(Continued from page 31)

Legion posts, and in many cases are donated space in Legion buildings, are at a loss to understand the action of the National Convention of last year.

Advices reaching Washington indicate that many CAP officials who also hold membership in the Legion, who feel that the Legion "pulled the rug out from under us last year," were planning to attend the Philadelphia Convention, and urge rescinding the 1948 resolution.

Meanwhile other American Legion posts are now working actively through their District and State Department Conventions, such as the Darrell Dunkle Post No. 1 of Reno, Nev., to have the National Legion action rescinded, and urging instead "continued cooperation."

Lepers Provide Radio Link

The first air organization of lepers in the world is a Civil Air Patrol Flight, an active unit of the Hawaiian Wing CAP, National Headquarters revealed recently.

The flight is made up of patients at the Kalaupapa Settlement in Molokai, Territory of Hawaii, and also includes nurses, superintendents and various employees of the Settlement.

Primary mission of the newly organized Flight will be to fill the island link in the radio communication's network of the Hawaiian Wing.

A special dispensation had to be made in the case of patient members to waive fingerprint requirements. Even minor infections in a leper's hand can damage the fingerprint pattern sufficiently to make accurate prints impossible.

Blow Your Own Horn

How can you get good radio coverage of CAP activities? The Ayer, Mass., Squadron has demonstrated how it's done, with several thousand spectators as a result. Here's the special radio spot announcement they composed which turned the trick:

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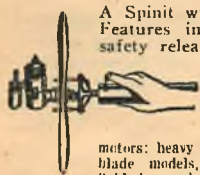
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Nearly 2,000 Cadets from Connecticut, Massachusetts and New York participated in a huge air show at Canaan, Conn., to give thousands of civilians a real taste of aviation.

A competitive drill by the Cadets was one of a score of highlights. Units of the USAF, National Guard of the three States and CAP units joined to present a spectacle that featured spot landings, skip bombing, balloon bursting and formation flying.

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A special two-way radio developed by Lt. Waldo S. Heath, Communications Officer of the Torrington-Winsted (Conn.) Squadron, is paying big dividends to the Connecticut Forestry Department.

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Creating Friends for Aviation

Acts of mercy and kindness, even though they may result in nought, bring sincere appreciation and boost the prestige of the CAP.

Last spring a Rhode Island farm woman reported her 3½-year-old daughter as lost and appealed to CAP to help find the child. Planes of the Rhode Island Wing patrolled a 15-mile area, but in the meantime the child fortunately was located. Later the woman, Mrs. Rosewell Gay of Manville, R. I., wrote to the Rhode Island Wing:

"We thank you from the bottom of our hearts for helping us in our time of need. I have lived up here for nine years and have waved to many planes and many planes have dipped their wings to me, but I never thought that some day they would help me. I can never repay you for your kindness to us, but I know what good friends I have flying over my house."

Hawaii Wing Very Active

Hawaii, and the paradise that it is, may sound far off, but the Civil Air Patrol is really going places in "the islands."

The Hawaiian Wing, activated in the middle of 1947, has seven senior Squadrons on the island of Oahu, and one each on the islands of Hawaii and Molokai. Squadrons are being activated on Maui and Kauai.

Under the direction of Col. B. F. Dillingham, Wing CO, an inter-island radio net has been formed and the Wing Net Control holds weekly communication with National CAP Headquarters.

Six Squadrons of Cadets have been formed under senior units on the island of Oahu and comprise about 500 Cadets.

Search-and-rescue operations with the local Navy, Coast Guard and AF Headquarters of S&R have progressed into actual operating missions on a coordinated plan.

Norfolk High Has Air Course

Norfolk, Nebraska, High School claims credit for having established the first complete aeronautics course in cooperation with the Civil Air Patrol.

In cooperation with the Norfolk CAP Squadron, leading educators of Nebraska as well as the Superintendent and Principal of Norfolk High worked out the course. It includes communications, aerodynamics, navigation, meteorology, nomenclature and aircraft structures.

Under the new course, the high school assumes the job of all classroom and laboratory work. The local CAP Squadron has responsibility for orientation and navigation flights.

A Link trainer, an L-4 liaison plane and licensed pilots, three short wave radios, mock-ups of aircraft instruments, two aerial cameras and staff personnel are all furnished by the Norfolk Squadron.

Cadet of the Month

"Striving to share with other Cadets in his Squadron all that he has learned." That's the kind of accolade which gained for Cadet Sgt. Donald Ross Hopkins of Headquarters Squadron, New Jersey CAP, the title of "New Jersey's outstanding Cadet for 1949."

Cadet Sgt. Hopkins is 17, joined Headquarters Squadron nearly two years ago and has displayed unusual active interest in all phases of CAP work. A student at high school in Newark where his academic standing is excellent, he also is president of the "Aviation Interest Club" and instructs a class of club members in aerodynamics.

A member of the New Jersey drill team in both '48 and '49, Cadet Sgt. Hopkins is also editor of his Squadron's newspaper, "The Minuteman." He is in charge of basic training for all Cadet recruits of Headquarters Squadron.

As the outstanding New Jersey Cadet, Sgt. Hopkins will be eligible as an Exchange Cadet to be sent on a tour to either England or Canada.

Weather Doesn't Down 'Em

The Downriver Squadron, Detroit, Michigan, CAP didn't let poor visibility and low ceilings stop their activities recently, they used the bad weather to advantage by finding an opportunity to do "hangar flying."

"Hangar flying," the inspection and study of planes in a hangar, can be mighty interesting with a good instructor and guide.

The Downriver Squadron, which had planned a search-and-rescue mission that was frustrated by the bad weather, used the time to inspect planes at the Pontiac Municipal Airport. For many of the Cadets it was their first experience sitting in a plane's cockpit and handling the controls.

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A New Deal in Free-Flight

(Continued from page 40)

other than the million-times demonstrated fact that any reasonable airplane, with any reasonable motor and adjustments can hook a thermal? There are easier ways of measuring the relative intensity of thermals! The question then becomes, "Shall we continue to compete on a duration basis alone?" One might add further questions, such as what form of competition offers opportunity without swamping contest

management with hopeless details.

Jim Walker proposed a precision flying event for the '49 Nationals. The idea was successfully put to the test in a contest in which Infant-powered models placed along side of ancient 8-ft. free-flights. Now precision is a broad word, applying with equal accuracy to controlling the flight path of the airplane, or to controlling its duration. As Jim sees it, more heavily loaded semi-scale ships would be flown according to a pre-announced flight pattern or plan, with points given for time on ground during take-off, circles (with a premium on circling in opposite directions) and closeness to a spot on landing. Like the idea behind the semi-

scale racers and proto models which should further popularize U-control, the underlying thought here is that the solid support of the contestants would put free-flight on a more popular basis. But the rub is that any event that makes necessary special ships, or that is presented as a special or novelty event, may be just that—a novelty.

As far as the basis of competition is concerned, any proposed solution must affect directly the monopoly of duration while altering only moderately the existing setup. Precision events are grand, of course, but the basic problem is the type of model and event that is the backbone of free-flight activity. But developing the idea further, Dan

AIR TRAILS

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While every precaution is taken to insure accuracy, we cannot guarantee against the possibility of an occasional change or omission in the preparation of this October 1949, index.

Calkin suggested to Jim that the proposed point system be simplified and that the number of circles merely be tabulated, and that the model be required to land within the circle or receive no points. But why have a special event? What is the matter with applying some of these worthwhile thoughts directly to free-flight competition as it now exists? Must we be afraid of changing free-flight? If the picture is awry, why shouldn't we put it right?

The everlasting emphasis on climb for duration, made possible by yearly boosts in available power, is one explanation of why the rules have never successfully checked the runaway horse of performance. Rules that impose penalties on performance have followed a straight line increase over the years, if we may compare rules for each year to points on a graph, while radical increases in power have at least squared performance capabilities. Each set of rules has lost ground.

Suppose some compromise is possible between a variation or simplification of Walker's idea and the existing method of timing three flights for maximum duration. As a matter of fact, a form of precision contest is being run on the Coast with considerable success.

Could we award precision points along with time of duration on each of the three official flights permissible under the present rules? Endurance could be paramount, at least for the time being, if necessary, but precision points would have sufficient bearing on results to sell the builder on improving the landing and take-off abilities of his airplane. Perhaps it would be enough to award additional points for take-offs, not compelling take-offs and leaving the method of launching optional, and for achieving landings on the flying field. Still another possibility might be a simple precision routine, perhaps on the third official flight only. This action would penalize anyone not able to put his ship on the line for its third flight, whether because it was lost in a thermal or cracked up in a spiral dive. If potential loss of an airplane on its first or second flight will cost a builder enough points for not making his third flight, then he'll shy away from thermal-happy stuff.

The point is that numerous possibilities exist and those mentioned above are valuable if they do no more than stimulate thinking. It should not be necessary to perform extra timing, or to measure distances on the ground, if precision is grafted onto duration. Extra details would defeat the purpose of the plan. If it is deemed important to have a spot landing award, a simple large circle could be provided. Then, if the ship lands on the field it might be given additional points, but, if it lands within the circle, it hits a minor jackpot. It would be a simple matter to place a standard size circle, a standard distance downwind from the take-off runways. Or, if you wish, no points for any landing outside the circle. Duration records could be maintained as at present.

When the builder makes an effort to garner additional precision points to boost his three-flight average, he will have to consider other design factors. When he does so, we shall have the beginnings of a trend toward realism and sport, still blended with reasonable performance. The present landing gears, for instance, may give trouble.

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The wise builder will move his gear back to give his ship a decent chance to take-off. Perhaps he'll stop blaming wind and weeds instead of inadequate landing gear design for his failures. If he can put down his wheelless speed job without breaking a prop, then he should be able to get a free-flight ship with a landing gear back on the ground without splintering the club. Floppy tires and unrotatable wheels will be out.

Perhaps his over-powered homesick angel may not take to hitting a spot from hundreds of feet in the air, especially with wind drift. Can he throttle back and still control and maneuver it close to the ground? The vital consideration is that precision be introduced without spoiling the endurance angle we have become accustomed to. If precision compromises duration sufficiently, then a compromise will follow on power for a given size model.

Power loadings can be increased enormously before performance falls off alarmingly. In years of competition we crept from 80 to 100 ounces power loading, at the same time losing far more than we gained in control of performance by progress in engine design and freeing wing areas from loading requirements. But to all intents and purposes it matters little whether the power loading be 100, 120, or even 140 ounces. Some builders who have experimented with power loadings, say that 140 and even 160 ounces permit reasonable flight. Experiments with a K&B Infant indicate that this same type of performance can be had with loadings up to 225 ounces and that level flight (but without take-off) is possible at close to 300 ounces. Nothing so extreme is suggested but what is so untouchable about a 100-oz. loading that we should be afraid to boost it?

If duration must be the yardstick by which a model's ability is measured, then at least let's concede that there is more than one way of skinning a cat. In California, for example, the Lakewood Model Club held the first of a series of contests for ships powered by the Infant. While duration was the yardstick, a clever variation in rules stressed precision in hitting a required flight time. The goal of the contest was to negotiate three flights as near as possible to 1½ minutes duration. Unlike an earlier Thermal Thumbers Contest which called for a 1½-minute average, the Lakewooders totalled the misses. Don Newberger, the famous U-control speed flyer, won first place with a total of 34 second misses, having three flights of 1:12.6, 1:43, and 1:26.4.

Simple rules were followed. All ships had to be cabin models, powered with stock engines and tanks; all flights were r.o.g.; five attempts to make three official flights; at any time up to 30 seconds after launching, the contestant could declare a delayed flight; after thirty seconds the flight was official. Consider this carefully: this novel contest was held in a block-square parking lot! It was the consensus of opinion that the 1½ minute par offered no difficulties. Longer durations are easily accomplished, but require a larger field when drift occurs. Shorter flights call for heavier models. The Lakewooders found that the little three-ounce jobs bounced off macadam, cars, and houses with little if any damage. Thus, the OK Cub and other small engines offer many possibilities.

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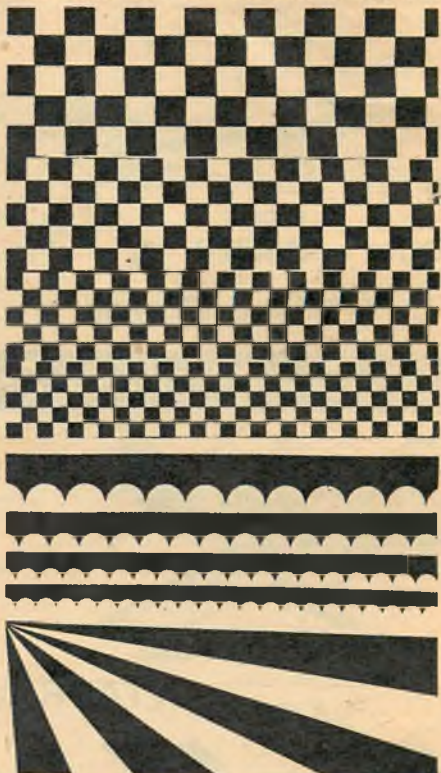
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The Last Word

More on English subscriptions: Last month we gave our reader-friends in Great Britain one source where they could enter a subscription to Air Trails. Now here's another: The International News Company, Ltd., 5, Bream's Building, London, E.C. 4. The firm says, "We wish to inform you that we can accept subscriptions for this publication (Air Trails); the rate is 16/3d. for one year."

More About Marquardt: We think Don Downie did a fine job last month on the Model-Plus-Marquardt-Equals-Ramjets yarn. The oldtime model readers will remember Marquardt for his magnificent geodetic construction indoor and outdoor models which were highlights of National meet held in Detroit. Among the model developments in which Marquardt participated besides geodetic construction (good idea, too tough for average builders) were microfilm-covered indoor props, folding propellers and a series of airfoils based on the B-7 indoor section.

Technical Aviation Editor Dawydoff reminds us that we left out an important note or two on Emil (We Fly the Long Midget, September AT) Lehecka. During the war Emil was chief test pilot for the Pratt-Read concern, builders of Navy gliders. Considered one of America's top gliding experts, Lehecka owns 3 sailplanes and a Boeing-Stearman PT-17. He teaches at the Manhattan (N. Y.) High School of Aviation Trades and is currently taking control-line flying lessons from Cal (Jim Walker, Jr.) Smith, while Smitty is taking up soaring under Emil's guidance. Fair exchange, wot?

What Does the Crystal Ball Reveal? We're speaking of the November issue of Air Trails, o' course. Well, there's a grand lead-off yarn that's so hot that we hope you'll forgive us if we don't name it at this point. (Now, what kind of publicity is that when the editors won't say what's in the next issue?) Well, here's some fine stuff we can talk about: "We Fly at Elmira," by Alex Dawydoff, gives you an inside account of the '49 National Soaring Championship Contest. The CAP comes in for its usual full coverage. Doug Rolfe's Air Progress drawings are concerned with Part II of the Air Force history.

Along with the usual Solo Club we have a specially prepared article on aviation clubs—how to start 'em and how to keep 'em growing. The feminine side of aviation gets a nice boost with a story on Mrs. Rebecca H. Smith, chief metallurgist of The Turbodyne Corp.

Of particular interest to model builders will be our extensive coverage of the National Model Plane Meet which will have some of those fine AT photos. Free-fighters can rejoice over Dennie Davis's San De Hogan model which was the first to set an official AMA National record of 30 minutes!

Some more brief glimpses: "Metal Forming for Models"; plans by Chet Lanzo for the Morane Saulnier control-line model; the OK Cub-powered Sportster; you will learn a lot about the model industry from the Model of the Month; and plenty more.

—THE EDITORS