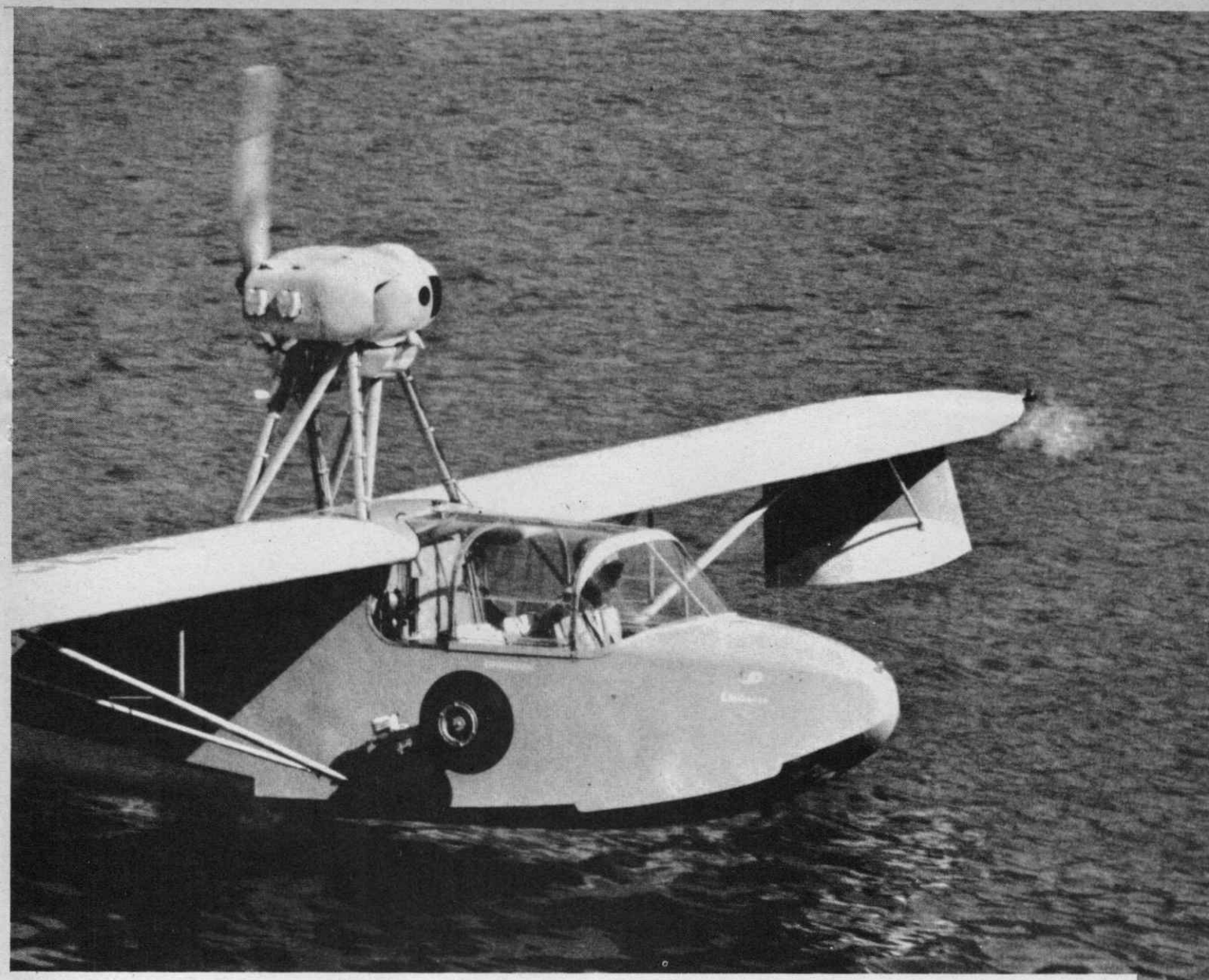


HOME-BUILT AMPHIB

If this here report doesn't result in a "run" on old Airknocker wings & tail surfaces we'll eat our copy of A.P. And if you're thinking of a home-made job don't overlook this spry sprite which we fly...

...with DON DOWNIE

■ There's only one thing better than an interesting hobby. That's two of them.

For over thirty years, Volmer Jensen of Burbank, California, has had a hobby of building gliders and small powered aircraft. In recent years he acquired another hobby—skin-diving. These two avocations had little in common until he decided to build a backyard amphibian.

"I had flown into almost all the airports around California and neighboring States and there wasn't much that was really new about week-end airport hopping," said Jensen. "As a result, I virtually gave up flying for ten years and spent my spare time talking back to the fish."

Today, that's all changed. In the three years since Volmer Jensen completed his Sportsman amphibian, he has logged 400 hours on hops to Lake Mead in Nevada, far into Baja California and to most of the water resorts of the Southwest.

"I've had more enjoyment out of the combination of amphibian plane and skin-diving equipment than anything I've ever done," added the enthusiastic designer.

Volmer Jensen's "Chubasco" (Spanish for a warm, tropical storm) is the only two-place amphibian now flying in the United States, but it won't be for long since detailed plans have been sold to over 100 home-builders. Hobbyists in or near the town of St. Catharines, Ontario, Canada, have six different Sportsmans under construction.

"Chubasco" (means warm, tropical storm) taxiing at San Fernando. After operating off salt water, Jensen washes down little 2-place land-water craft in less than 10 minutes.

HOME-BUILT AMPHIB, Cont.

V.J. with prototype sample models he produces in his shop. Plastic underwater camera box, left. Models are tanker, gas-engine kart, Cutlass.

Others are being built in various States and in Europe.

"Chubasco" has many unusual features. It uses Aeronca wings and tail surfaces from any 1946 or later model of either the Chief or Champion. Thus, the home-builder can be well on his way to a completed airplane by touring local aircraft junk shops or checking regional aviation publications for an old set of wings and tail surfaces. The designer-builder considers $300 an average price for a set of uncovered wings and tail surfaces. However, Jensen is now designing a similar wing that can be built at home should the supply of "production" wings become exhausted.

The engine is a standard 85-hp Continental, mounted as a pusher. These powerplants can be purchased used from $400 upward or new for $1200. Jensen figures that the entire amphibian can be built for about $2,000 plus the cost of the Aeronca wings and powerplant.

"An average do-it-yourself builder with a comfortable, heated shop and a minimum of hand tools can put the amphibian together in about 1500 hours of work," Jensen pointed out

The 24-foot hull uses mahogany plywood from 1/16 to ¼-inch in thickness. The entire structure is then covered with 8-ounce boat grade fiberglass fabric.

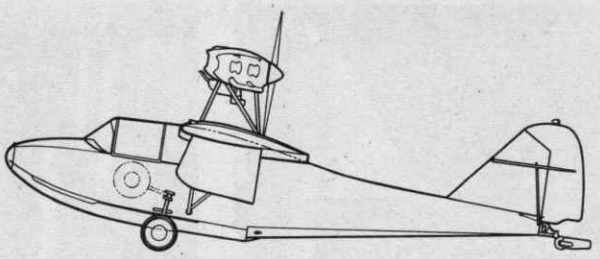
Construction of the home-built amphib starts with fabrication of the 24 bulkheads. These are mounted around a 4 x 4-inch redwood center jig selected for straightness. Hull longerons are made from 1 x 1-inch Sitka spruce, split with a saw where bends are required in the hull. These longerons have a thin sliver of spruce placed in the saw-cut with Weldwood watermix glue added and the whole curve formed over a simple forming jig. Once the glue sets, the longerons have a permanent set.

All plywood is applied with glue, then nailed down with cement-coated brass aircraft nails. Jensen reported that he used $25 worth of nails on the complete structure. The nail pattern is every ½-inch to one-inch, depending on the thickness of the plywood.

The hull is made up of sheets of 4 x 8-foot mahogany plywood with 10:1 scarf joints designed at a bulkhead point and backed-up with ¼-inch strip of spruce at the joint.

The fiberglass hood and instrument panel is made over a plaster mold.

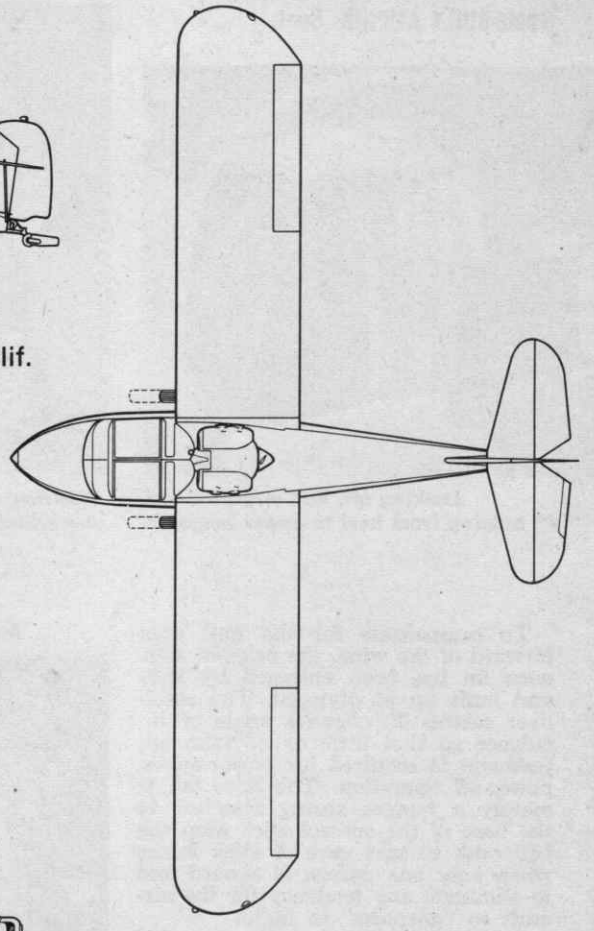
The designer reports that all steel tubing can be "tacked" together by an

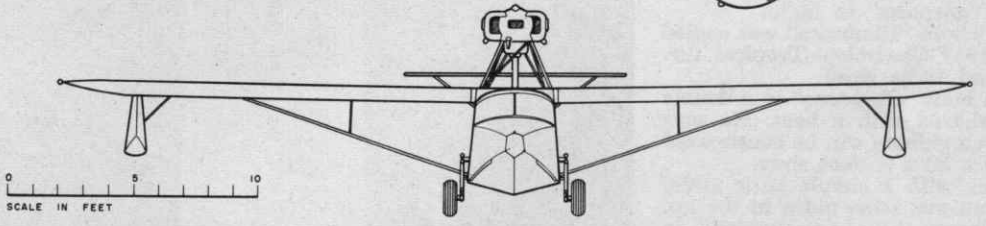


VOLMER AIRCRAFT'S VJ22 "SPORTSMAN"

Address: Dept. AP, 104 E. Providencia Ave., Burbank, Calif.

Length, 24 feet
Height, 8 feet
Span, 36½ feet
Empty-weight, 1,000 pounds
Useful load, 475 pounds
Gross weight, 1,500 pounds
Power, Continental C-85
Fuel capacity, 20 gallons
Range, 320 miles
Climb, 600 feet/minute
Cruising speed, 85 mph
Stalling speed, 45 mph
Service ceiling, 15,000 feet
Wings, struts & horizontal surfaces removable





amateur but that finished welds should be made by a certified aircraft welder. The motor mounts are made from ChromeMoly X4130 streamlined tubing.

The cockpit canopy is constructed of 80/1000-inch flat sheet Plexiglas, bent cold.

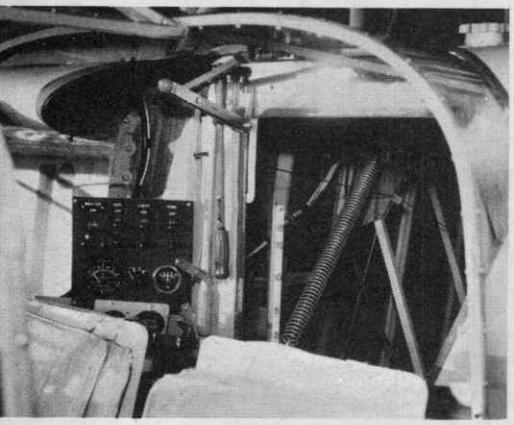
Wing tip floats, made of plywood covered with fiberglass, weigh only nine pounds each. They also serve as wing skids should a wing dip in extreme crosswind landings.

The retractable landing gear of "Chubasco" is spring loaded and works simply with a hand lever mounted between the seats. The gear rotates forward on a single axis as the gear is retracted. Each gear has a shock-cord loop to absorb landing loads.

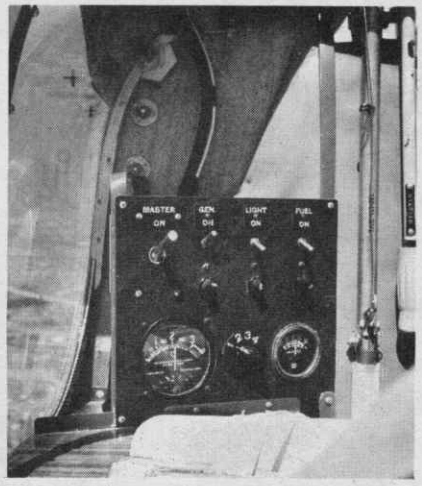
Jensen has a simple gear-up reminder hooked to his carburetor heat control. When he retracts the gear, he moves the position of a tiny plastic model airplane wheel from down to up.

Recent addition of Cleveland Aircraft Products aluminum wheels has replaced magnesium wheel castings that deteriorated rapidly in salt water. Tire size is 600 x 6 and mechanical brakes are controlled by heel brakes. Gear tread is 5'2".

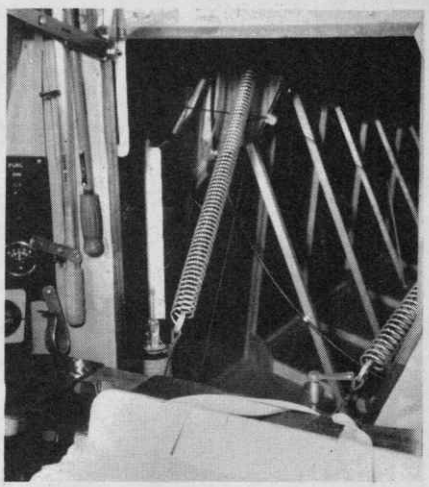
This construction photo (by Jensen) gives good idea of interior structure of "Sportsman" hull-fuselage before it is covered with its plywood skin.



Looking aft, hull structure with "V" bracing from keel to upper longeron.



Electrical control panel with ammeter and cylinder head temperature gages.



Long coil on left connects to landing gear to reduce loads during retraction.

To compensate for the hull area forward of the wing, the original Aeronca fin has been enlarged by 25% and built up of plywood. The stabilizer carries 3° negative angle of incidence so that little or no trim adjustment is required for power-on vs. power-off operation. The trim tab is merely a bungee spring attached to the base of the control stick atop the bellcrank to take care of stick forces when only one person is aboard and to eliminate any tendency for the aircraft to "porpoise" in flight.

Paint job on "Chubasco" was copied from a 1957 Chevrolet—Tropical turquoise and India ivory.

Jensen built "Chubasco" in a double garage, shared with a boat. He says that the amphibian can be constructed easily in a 10 x 25-foot shop.

Starting with a simple hang glider made from magazine plans at the age of 15, Jensen has been involved in some sort of do-it-yourself building all his life. He built eight different gliders in eight years and "finally learned how to fly turns" in the 8th glider. One of his most successful gliders was a single place secondary craft, the "Silver Bird," that he flew for eight years. He designed and built the first full cantilever side-by-side sailplane in 1940 and flew it for over 500 flights up and down the Pacific Coast at various glider contests.

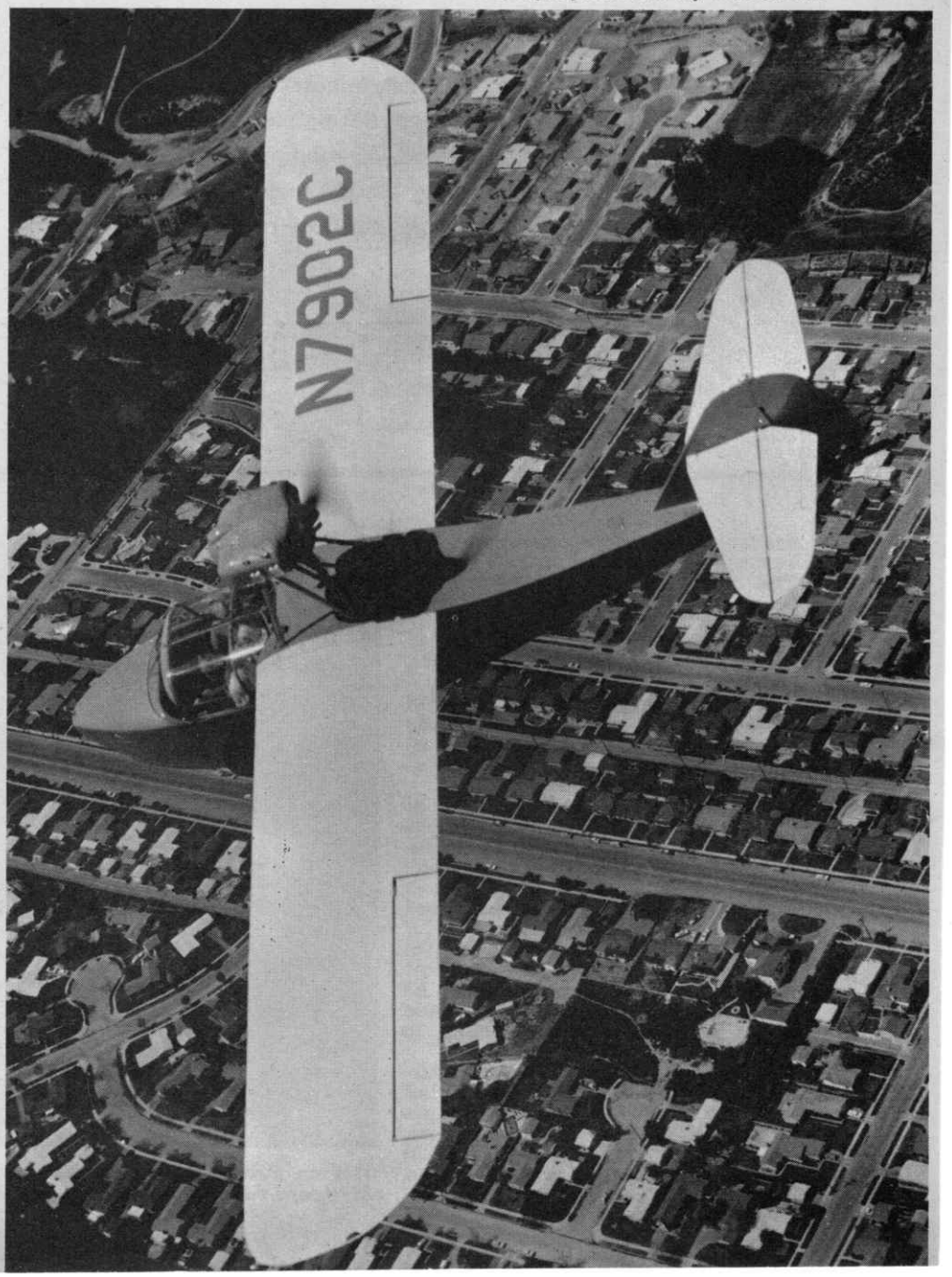
His first powered plane was the VJ-21, a two-place, side-by-side high performance ship powered with a 75-hp pusher engine. It has a single sailplane type landing gear with two retractable outriggers on the wings. Cruising speed was 117-mph, rate of climb was 1300 feet per minute.

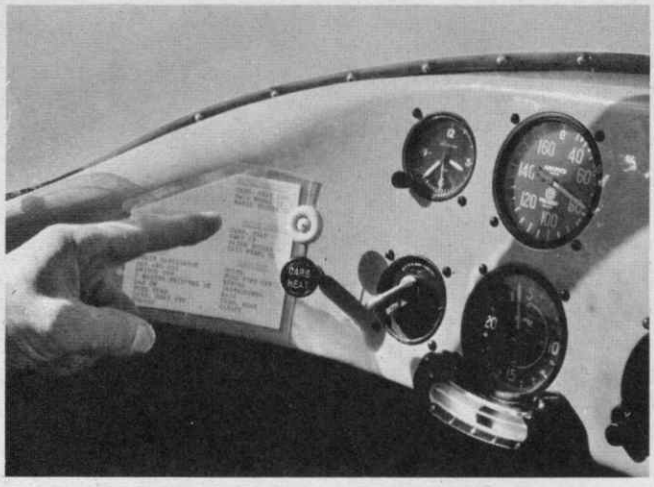
This ship is now owned by "Tex" Hilley, Southern California Continental Engine representative, and is flown regularly from the Hawthorne Airport near Los Angeles.

It was perfectly natural for Volmer Jensen to expand his building activity to the amphibian. In addition to the gliders and the VJ-21, he had constructed two sailboats and four 16 to 18-foot outboard motorboats.

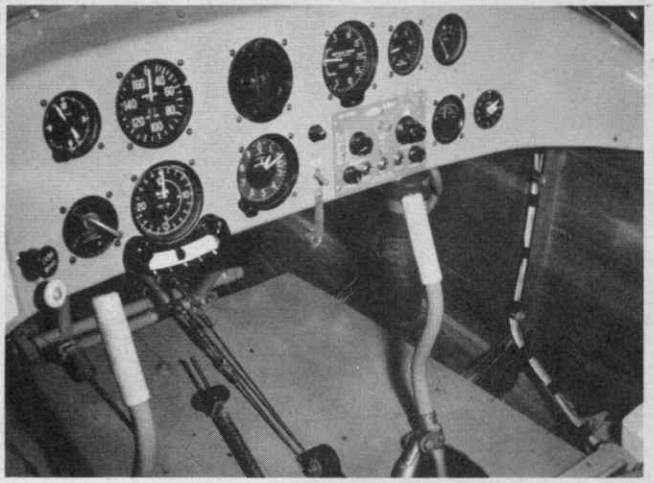
When he decided to build "Chubasco," Jensen checked with airports all up and down the West Coast for a used amphibian. He found a 30-year-old Savioa-Marchetti S-56 in

Aeronca wings will be quickly identified by light-planers in top shot below.





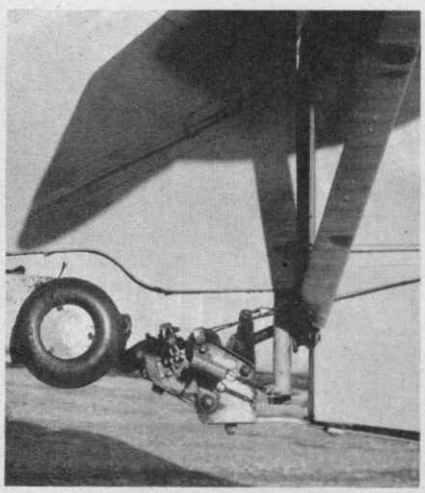
Instrument panel photo was made during flight. Jensen indicates check list; gear up/down indicator is model wheel.



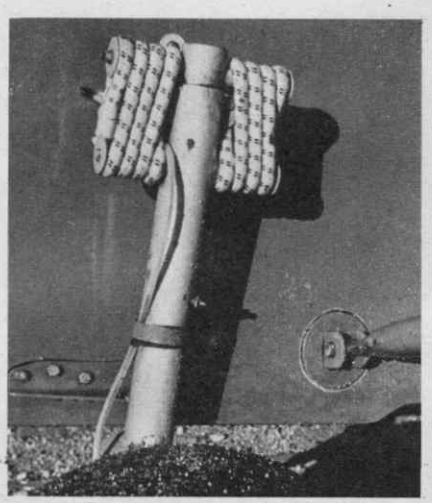
Cockpit arrangement shows standard instrument panel, dual sticks. Adjustable spring between seats is on trim tab.

Ah, for that Catalina Island type life! Couple repaint side-wheeler as Volmer glides by in Sportsman.

Anything so rare as a day in the air in your own made-at-home amphibian? V. J. in his appealing side-by-sider. Over 100 plans sold.

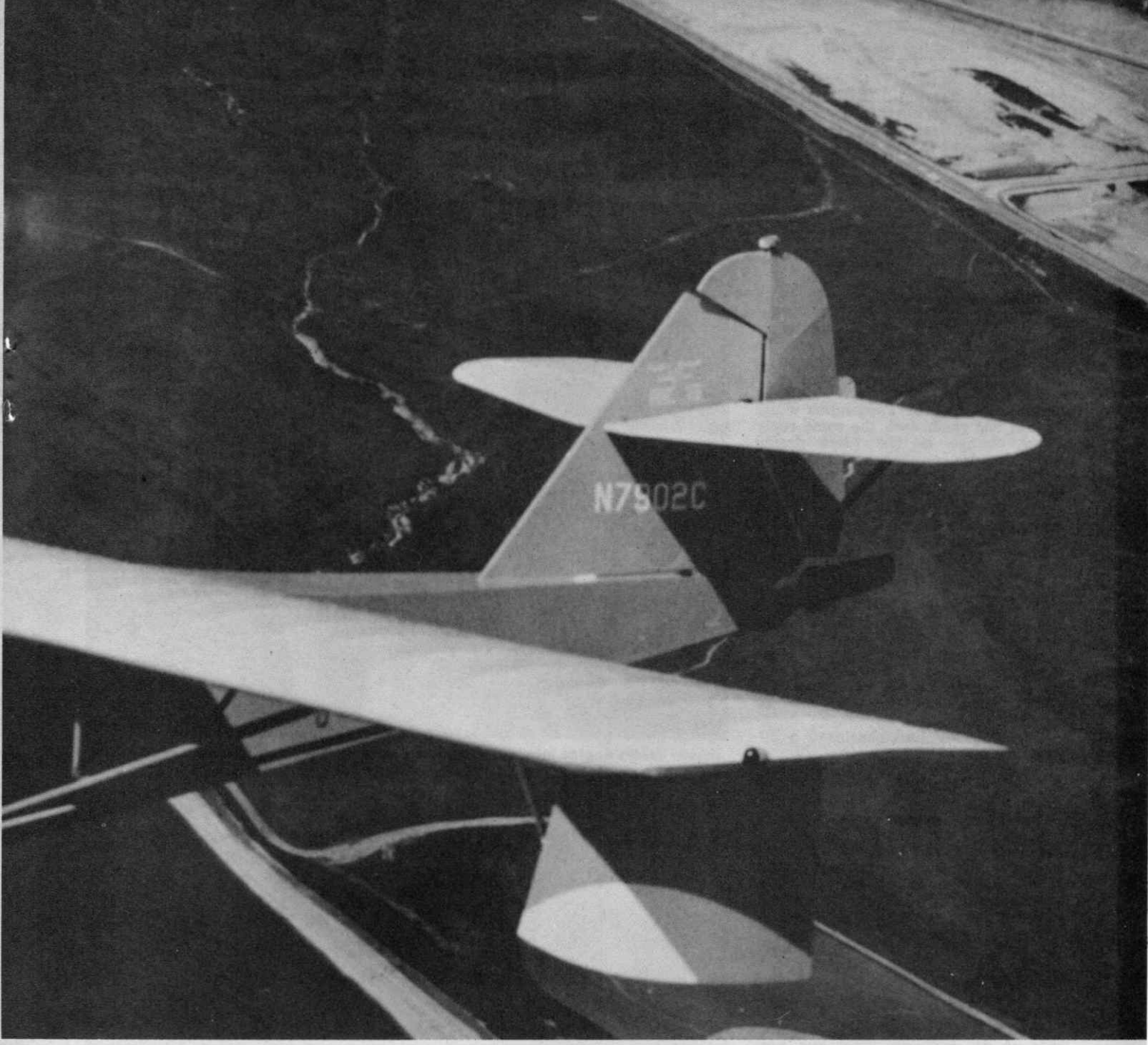


Retraction of tail-wheel during water operations cuts on-step time in half.



Landing gear shock-cord for jolt-absorbing system is simple, made easily.

In-flite photo of engine mount made from inside cockpit. That's Downie.



Podded power is Continental C-85 although plane is stressed for heavier mill. Jensen built 8 gliders, numerous powered jobs.

Seattle. The ship was in extremely bad shape and had not been flown for over five years. Jensen bought the complete airplane for $125 and considered rebuilding it. However, the plane was too far gone, so the designer finally used only the mag switch and sensitive altimeter in his "Chubasco."

"The S-56 was a great help in designing a modern, more efficient hull," said Jensen. "I changed the flat-bottomed hull to a 'V' to eliminate pounding in rough seas, added a deeper step and a larger longitudinal angle to the hull bottom, but I retained much of the internal design of the S-56 including the 'V' bracing on the bulkheads to transfer the keel loads to the top of the hull."

During design and construction, Jensen called on technical assistance from local aircraft engineers. Irv Culver, Lockheed research scientist and designer of the "Rigid Midget" sailplane, worked on much of the design and stress analysis. A. M. Caplin, president of Strato Engineering, checked the construction for FAA conformity.

"When Mr. Caplin saw the size of tubing that I was using on my engine mounts, he asked, 'What are you going to put up there, 300-hp?'"

Jensen figures that perhaps 75 pounds could be trimmed from the design of "Chubasco" by considerable expensive engineering.

"We figured everything just a little stronger and heavier than necessary, just to be sure," explained the designer. "The engine mount, for instance, is stressed for 20 G's."

Jensen installed a 20-gallon fuel tank in the bottom of the hull directly over the center of gravity. This gives him a range of 320 miles (4 hours flying time). The regular engine-driven fuel pump is supplemented with a Bendix electric pump used for take-off and landing.

After the aircraft was first flown, so many home-builders expressed an interest in duplicating it that Jensen had draftsman Dave Gengenback draw up a complete set of plans, 17 blueprints which total 250 square feet. These and 40 detailed photographs are for sale to interested home-builders.

Jensen reports that the most frequent inquiries he receives from these home-builders are questions about larger powerplants and different wings.

"Many builders want to know if they can put in more horsepower, 100 or 125," said Jensen. "The answer to this one is simple. The airplane was designed around an 85-hp engine. Anything larger would require a com-

plete re-engineering. After all, that 600-fpm rate of climb isn't too bad with two full-sized people, 65 pounds of baggage and temperatures that can go up to 115 degrees. Since most water landing spots are near sea-level, I feel that this powerplant is completely adequate. The 85-hp also has the advantage of being inexpensive to purchase, either new, remanufactured or used, and burns slightly less than 5 gallons per hour.

"With a full load, it now takes 16 seconds to break free of the water. Before I worked out the tail-wheel retraction, it required 16 seconds to get up on the step and another 8 to get off the water."

To the many who have inquired about using Cub or Taylorcraft wings Jensen has given each the same reply —any change in the basic design would require complete re-engineering.

Jensen is not the type to let his home-built amphib linger in the hangar to collect dust. He flies it almost every week-end with his skin-diving equipment aboard when the weather is warm enough to combine the two hobbies.

Not long ago he made a trip to Baja California with Bob Rowley, a local pilot who had crash-landed his Stinson near the beach some 35 miles north of Santa Rosalia. The plane went over on its back during the forced landing caused by a complete engine failure, but no one was injured.

Pilot Rowley had chartered a 50-foot cruiser to salvage the Stinson. He was able to get the wings aboard but had lost the fuselage in 30-feet of water when the weather became rough.

Rowley and Jensen returned to the scene a few weeks after the mishap. From "Chubasco" they spotted the fuselage after only 15 minutes flying. It was about a half-mile from where it went down, still in 30-feet of water.

When we had the opportunity to fly in "Chubasco" with the designer, we took off from the San Fernando Airport, cruised out over busy Los Angeles International Airport and headed across the 26-miles of Pacific Ocean to Catalina Island.

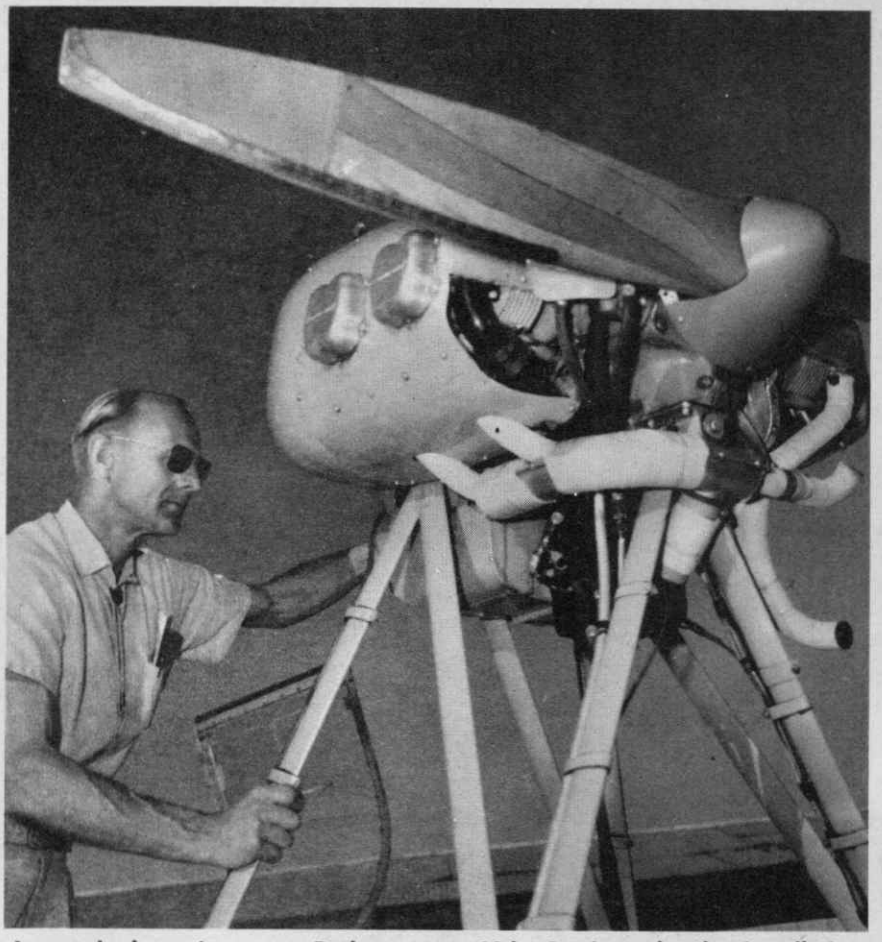
We landed in the water on the west side of the Isthmus. Pilot and passenger visibility was excellent throughout the flight. The amphib skipped lightly on the water then eased to a straight-ahead stop without any strain. We taxied in toward the sandy beach, Jensen dropped the landing gear, applied power and we pulled up onto the shore. Nowhere during the flight did anyone get his feet wet.

We climbed out and had some lunch while Jensen looked over the picturesque bay.

"You know, it always amazes me to fly over here in an hour. It's a two-day trip in my 16-foot outboard," the home-builder commented. "I have to leave early in the morning and come across the channel before the weather gets too rough. We spend the night here and return the next morning."

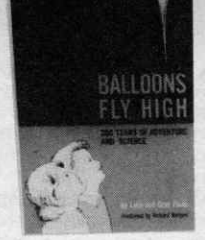
Jensen then took off solo and made a few passes by the hills surrounding the Isthmus while I shot a series of photographs. After the picture-shooting session, he landed in the water

(*Continued on page* 97)



Jensen checks engine mount. Pusher prop on 85-hp Continental makes installation run exceptionally cool. We say the entire project is a real cool deal!

Another appealing, and may we add charming, Jensen model is daughter Carillon. Author-photog Downie didn't identify the fellow, but what an attractive co-pilot!



Star-Raker by Donald Gordon; 288 pgs., 5½ x 8¼, $3.95 (William Morrow & Co., 425 Park Ave. S., New York 16, N. Y.). As the book-jacket rightly claims, this first novel is in the tradition of Nevil Shute's *No Highway,* which started a trend in "whatdidits," as distinct from "whodunits"! Gordon (that's a pseudonym concealing the identity of a high-ranking ex-RAF pilot) has given us a good story concerning the trials and tribulations of various people, from the test pilots to the manufacturer's research-biologist daughter, who venture aloft in the revolutionary new Star-Raker jet airliner. This one doesn't fall apart in the air through metal fatigue or other causes. Instead, anyone flying in her for a few hundred hours, at altitudes around 80,000 feet where the Star-Raker is designed to operate, is certain to be stricken with cancer. Is it a fault of the aircraft itself . . . could there be foul play . . . is man vulnerable to prolonged contact with the mysterious forces of cosmic radiation? It's more than a book reviewer's life is worth to give the secret away, but you can be sure of at least one thing—it wasn't the butler!

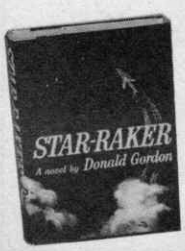
National Air Race Sketchbook by Fred W. Buehl and Harry S. Gann; 84 pgs., 8½ x 11, $2 (Floyd Clymer, 222 North Virgil Ave., Los Angeles 4, Calif.). Published in 1949, the year Cook Cleland won the last Thompson Trophy Race in his clipped-wing F2G-1 Corsair, this slim volume provides a nostalgic glimpse of the golden age of American air racing—1930 to 1949. Well-drawn sketches of most of the top aircraft of the period, graphic accounts of each year's races, and results (down to last-place competitors) make this an invaluable reference for all air-race fans.

How a Jet Flies by Gil Paust; 72 pgs., 6¾ x 8½, 100 photos and drawings, $2.95 (Sterling Publishing Co., 419 Park Ave. S., New York 16, N. Y.). The author, an aviator of long experience and an able interpreter of the mysteries of modern jets, has written a book that many adults will also appreciate. The photos and other illustrations are superb.

Bush Flying in Alaska by Charles Coombs; 195 pgs., 6½ x 8½, numerous illustrations by Morgan Henninger, $2.95 (William Morrow & Co., 425 Park Ave. S., New York 16, N. Y.). This is an exciting account of Alaskan flying, from the time it all started at Fairbanks in 1923, up to the present, when bush pilots still take on such varied jobs as spotting salmon migrations and flying sportsmen to hunting areas.

Balloons Fly High by Lynn and Gray Poole; 72 pgs., 6¾ x 10, numerous illustrations by Richard Bergere, $2.75 (Whittlesey House, Div. of McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 36, N. Y.). Sub-titled "200 Years of Adventure and Science," this delightful book ranges over the entire history of man-carrying balloons, winding up with the Echo 1 balloon which was rocketed 1000 miles out into space in 1960 to become a satellite around our earth.

How Helicopters Are Made by David C. Cooke; 64 pgs., 7¼ x 9¼, numerous photos, $2.50 (Dodd, Mead & Co., 432 Park Ave. S., New York 16, N.Y.). Prepared with the cooperation of the Sikorsky Aircraft Corporation, this book takes the reader on a tour of a modern helicopter factory. Weaving text and photographs skillfully together, the author describes step-by-step how a whirly-bird is conceived, designed and finally taken into the air for its first flight.



Jensen

(*Continued from page* 82)

and again ran up on the beach. "Chubasco" can land in water as shallow as one foot.

With both of us aboard, we taxied into the water, retracted the gear and took off. Jensen's estimate of 16 seconds from opening the throttle to take-off seems completely accurate, despite the load of still and motion picture cameras that we had stowed in the baggage compartment behind the seats.

We circled back over the Isthmus, flying low along the shoreline to the town of Avalon. It is a truly exhilarating experience to skim 100 feet above the water and streak by the pleasure boats that plowed along. At this altitude, that 80-mph cruising speed seems like 200, and there's "no sweat" about forced landings with this flying-boat hull when you're out over the water.

After circling Avalon twice, we headed back toward the mainland, taking the heavily-traveled Avalon-to-San Pedro route then turning up the shoreline west of the Los Angeles International Airport. We called the tower on the small NovaTech "Aero-Ear" VHF radio to advise them of our position while watching the big jets take off under us, adding their contributions to the Southland smog.

As we crossed over the Hollywood

hills into the San Fernando Valley, Jensen lowered the landing gear, applied carburetor heat and went through the remainder of his check list. The engine instruments are divided between the regular instrument panel and a small panel behind the co-pilot's seat. This rear panel contains a cylinder head temperature gage with selectors for each cylinder, an ammeter and switches for fuel pump, lights, generator and the master switch.

We still had 4 gallons of gasoline remaining aboard, despite nearly 45 minutes of flying for photographs and that detour around Avalon. The fuel gage, a very accurate thermometer-type tube that fits directly into the tank, can be read by looking back into the hull section.

Jensen maintained a fast 70-mph on final approach and we touched down in the first 100 feet of runway. Despite the fast final approach, we turned off halfway down the 3,000-foot strip without difficulty.

It took less than ten minutes at the wash rack to rinse the salt water from "Chubasco" and we pushed the amphib back into its hangar.

This small home-built is lots of fun to fly. It makes isolated coves, rivers and reservoirs almost as accessible as that airport across town.

"Chubasco" has won a number of awards for "best home-built design" and "best workmanship" at fly-ins sponsored by the Experimental Aircraft Assoc. Some credit for the meticulous workmanship should go to Jensen's full-time business since he operates a model shop that specializes in constructing prototype toys, underwater camera housings or just about anything that Southern California's inventors want built-up.

The steady sale of plans for the Sportsman indicates that the waterways of the country will soon see many of these trim two-seaters. This proven design would make an ideal shop project for the outdoorsman who wanted to combine flying with hunting and fishing, skin-diving or just exploring. (Inquiries concerning construction plans and data should be addressed to Volmer Aircraft, Dept. AP, 104 E. Providencia Ave., Burbank, Calif.)

Chance Vought

(*Continued from page 69*)

two-placed advanced training and observation planes. In 1929, the company consolidated with Pratt & Whitney Aircraft Co., engine manufacturers of Hartford, Conn., and Boeing in Seattle to form United Aircraft and Transport Corp.

Chance Vought lived to see his aircraft plant housed in a 175,000-foot scientifically-designed factory at East Hartford and turning out new and improved Corsairs for the Navy. He died on Long Island on July 25, 1930.

The following is a list of Vought aircraft of special significance to air progress historians.

The VE-7 (1919), Chance Vought's first production airplane, was described By Brig.-Gen. William Mitchell: "This Vought machine, a training type, has all of the air qualities of the single-seater chasse machines and will outmaneuver the French Spad, the Nieuport and the English SE-5."

The VE-9 (1921) was the original catapult plane used by the Navy for observation and gunnery spotting. When the USS Langley—the Navy's first aircraft carrier—received its planes, it was equipped with VE-9s fitted with arresting gear for deck landings. First deck takeoff was made by LCdr V. C. Griffin in a VE-9 in October, 1922.

The UO-1 (1923) was one of the first airplanes to be catapulted from aboard a battleship and the first to be issued in quantity to the Fleet. First to hook onto a dirigible in flight, July, 1929. First Coast Guard plane was UO-1 (1925).

The FU-1 (1925) was the first military airplane equipped with an air-cooled engine to be placed in production with a blower for high altitude work.

The O2U-1 (1926) was the first military airplane to be powered with the Pratt & Whitney Wasp engine. It established four world records—altitude, 22,178 feet; speed for 100-kilometer closed course, 147.26 mph; speed for 500-kilometer closed course, 136 mph; and speed for 1,000-kilometer closed course, 130 mph.

The SBU-1 (1935) was the first dive bomber with a top speed of more than 200 miles an hour. First Navy plane specifically designed for both scouting and dive bombing missions to go into service use.

The SB2U-1 Vindicator (1935) was the first aircraft to use its propeller as a dive brake by giving it negative pitch. Also the first plane to use its retractable landing gear as a dive brake.

The OS2U (1940) was the first monoplane to be put into catapult service on cruisers and battleships. First to use "spoilers" in place of ailerons.

The F4U (1940) was the first U. S. fighter to exceed 400 miles an hour with a full military load. It also was the first U. S. fighter to mount a 2,000 horsepower engine and the first U. S. fighter to outperform the Japanese Zero airplane under most conditions. It was the first fighter to carry a bomb load of 4,000 pounds. A Corsair was the only fighter to receive an official citation for outstanding performance of duty. The Corsair remained in production longer than any other U. S. combat airplane and fought in World War II, the Korean War, and in Indo China.

The F7U Cutlass (1948) was the first U. S. jet fighter designed from the outset for use of afterburners. It was the Navy's first swept-wing airplane and was the first swept-wing fighter, equipped with afterburners, to fly from an aircraft carrier. It was the first Navy transonic fighter, the first to use an irreversible power controls system on elevator and aileron, and the first tailless airplane in the world to go into production for service use. First U. S. plane to incorporate artificial "feel" system in its controls. First Navy plane to have supersonic separation of stores. The Cutlass is the first Navy fighter to have a steerable nose wheel. First jet to carry its rockets in fuselage pack.

Regulus (1950) was the first surface-to-surface missile to be equipped with a landing gear and to be recovered successfully. First to use a parachute brake. It was the first guided missile with which two flights were made in one day with the same missile and the first guided missile to fly 18 times (one vehicle). It was the first guided missile to be flown successfully from all of the following: an aircraft carrier, a cruiser, a guided missile ship, a submarine, converted LST and a mobile launcher.

F8U-1 Crusader. First supersonic Navy aircraft. First plane to boost National speed record above 1,000 miles an hour. First plane to fly across the continent supersonic (Los Angeles to New York). First supersonic plane to land aboard an aircraft carrier. First high-wing Navy fighter plane. First operational plane in the world to incorporate a two-position variable incidence wing. First plane to take off a carrier in one ocean (Pacific) and land on another carrier in another ocean (Atlantic).