



Only engine hoods protect Navy's fabric-covered Boeing N2S trainers, yet they are ready to fly when the snow is cleared away.

# The Hangar Problem

*Weather-proofed with good paint and canvas hoods,  
your plane could spend its lifetime in the open air*

By Comdr. RALPH F. YAMBERT

**W**HY aren't more private planes being sold? There are dozens of answers to that question. But perhaps the most common is that there are not enough hangars, and that rentals on existing hangars are higher than the ceiling of the planes for which they are designed. If this be true (and you have only to visit any airport to see that it is) private flying may have some important lessons to learn from military aviation—lessons which indicate that airplanes can be kept in good condition, even if they must be left outdoors.

From almost a standing start, the Army and Navy doubled, tripled, quadrupled—then doubled again—the number of airplanes in their collective custody. During those years the services were not bothered with hangar trouble for the simple reason that there was not enough building material to build a roof for those acres of wings

even if there had been time and labor to do the job. As a matter of fact, military people had long ago given up the general use of hangars anyway. By studying their record for maintaining aircraft in all kinds of weather, it's possible for the private plane owner to learn a few pointers that will keep his airplane in first-class condition until he can get it under a roof. There are only a few basic rules to follow, which both the Army and Navy now use.

To investigate this point further I asked the opinion of Lieut. Comdr. John B. Spillsbury, engineering officer at Naval Air Reserve Command headquarters in Glenview, Ill. John is an old timer at the job of keeping airplanes in top shape. He began as a boot reserve seaman at one of the first Naval Air Reserve stations, at Oakland, Calif., back in 1928. For more than 18 years he has worked on all kinds of aircraft, from fabric-covered jobs with dozens of exposed parts to sleek metal models. He has personally re-covered scores of airplanes, rebuilt dozens of others from the wheels up. He *(Continued on page 68)*



## HOW NAVY WEATHER-PROOFS PLANES



**Paint tires**, protect from oil, says Lt. Comdr. John Spillsbury.



**Fabrics** should get 10 coats of sun-resistant dope, one of wax.



**Engine covers** are "must." Plexiglas, propellers also need covers.



**Exposed cables** must be kept clear of grease, rust or dirt.



**Hangarless planes** like these at Vail Airport, Los Angeles, will last just as long as those in storage, says author, if given proper care.



# Things to watch

## IN MAINTAINING A PLANE

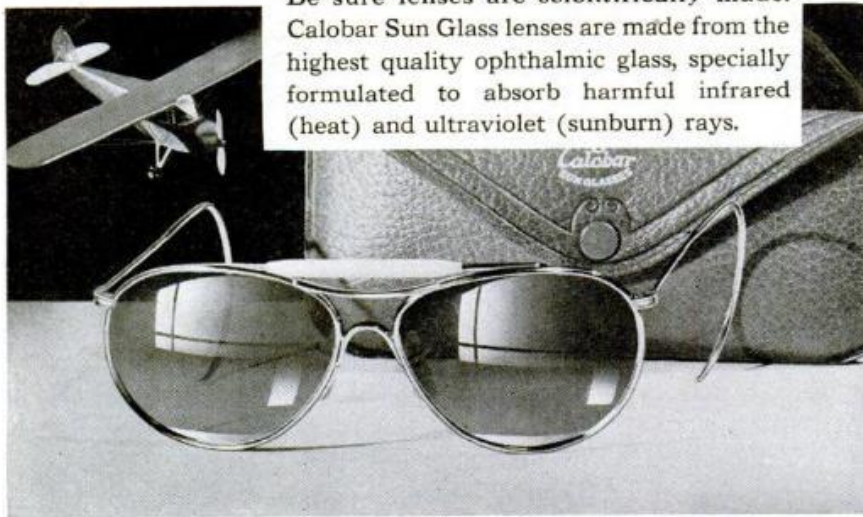
Check exhaust system for holes, thin spots, cracks, broken stack and pipe bolts to guard against fire.



# Things to watch

## IN CHOOSING SUN GLASSES

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## The Hangar Problem

(Continued from page 30)

was in charge of the Navy's rebuilding program on Beech airplanes, and supervised the turning out of beautifully appointed small transports that were an improvement on Beech's fine workmanship. In anybody's league he should qualify as an expert in aircraft maintenance. Here's what he says about the problem:

"Proper care will insure long life for any airplane, even if it's left in the open for years. Hanging an airplane is not an absolute necessity. From my experience even the most expensive model can be left outdoors if necessary."

Perhaps you say that Commander Spillsbury knows nothing of private flying problems, that all his experience has been with Naval aircraft—that he has no personal investment to protect, as you have. But the Navy is concerned with expenditures and—to their budget-worriers in Washington—a penny saved is a penny earned, even as it is to you.

Navy directives, according to Spillsbury, require that fabric-covered surfaces be re-covered once every four years. The directives demand only seven coats of dope on their surfaces—your fabric-covered plane has, or should have, many more.

"This directive came out in 1933," Spillsbury says. "Before that I saw many airplanes of all types which had worn the same fabric for much longer than four years. They were safe, passed all inspections, and appeared good for many additional years of service."

Builders of private planes, following the military lead, are putting more and more all-metal aircraft on the market. This development needs to be seen in relation to the fact that metal aircraft which were built before the war and which have been exposed to all kinds of weather in many parts of the world are flying for the Navy day after day. They are visible proof of Nature's inability to ruin a plane that is properly maintained.

Today thousands of Naval aircraft stand preserved at a number of fields throughout the country. The Navy figures these planes would be pressed into service if war were to come in the next several years. None are in hangars and only their engines are specially preserved. Those planes are expected to be in combat condition at any time during the next five years. And Navy experience indicates that they will be.

I was stationed for nearly a year in San Pedro, Calif., where airplanes are bathed constantly in the combination salt spray, fog and smoke that southern Californians call smog. I never saw an airplane that was so harmed by these conditions that a little elbow grease wouldn't quickly correct.

Later I spent a couple of years—including summers—in the Arizona desert. I saw blistering heat from a relentless sun beat constantly upon both fabric and metal clad planes. Some were parked in the sand, preserved, for three months and more. Without exception we turned to and safely flew them all. There was not a mechanical failure due to the effect



of the elements. Still later I watched huge seas douse the planes on a carrier's deck in the Pacific. When the time came, all flew and returned safely home.

The obvious reaction to all this is to say: But the armed services can afford maintenance which is out of reach for the civilian. But I happen to know that the Navy uses only a few, inexpensive procedures and that they are available to any airplane owner. Don't assume that the Navy—or the Army—has plenty of manpower for the job, either. Even in the palmiest days of the war there were precious few hands to rub down and wax airplanes. And there never was "owner interest," a priceless maintenance ingredient possessed by every man who looks with pride upon his own airplane.

"Outside protection starts with good paint," Spillsbury points out. "There are so many weather-resistant paints on the market that there is no excuse to buy a shoddy brand. Next step is to be certain that an adequate number of coats are applied. If the work is done well, each coat being rubbed down, then the final coat thoroughly waxed and rubbed, your maintenance worries will be half over," he continued.

I asked him how many coats of dope he prescribed. "At least 10," he answered. You can figure yourself that today's sky-high hangar rents are way beyond the cost of a good paint job. Of

course if yours is a metal plane, the paint problem is eliminated.

Did you ever see a boat owner "hangar" his craft? Here on Lake Michigan they bed them down in winter with plenty of grease and a few canvas coverings, then sit back and let the elements do their worst. Boat owners are among the most ecstatic in their pride of ownership. They, too, must stake their lives upon the safety of their craft. They achieve that safety with paint and care.

Down on the line at the Glenview Naval Air Station, Spillsbury showed me nearly a hundred Boeing N2S primary trainers. These are fabric-covered jobs similar in construction to many private craft. They are used in selective training of aviation cadets, still conducted at this former primary base.

Spillsbury explained that none of these planes received the care he recommends for your plane. He called a sailor and ordered him to ready a plane, one of the grimmest of the lot. An hour later we came back and inspected the little craft carefully. It looked quite all right to me. Spillsbury gave it his okay.

Down the line from the Stearmans are dozens of *Corsairs*, *Hellcats*, *Helldivers*, *Venturas*, as well as other combat models used in Naval and Marine Air Reserve training. Some have seen Pacific service and have thousands of hours. All are left in the open constantly. The only special

care given to any as far as I could see, was a canvas covering on each wheel of the *Venturas*. These are the big twin-engined bombers used for training multi-engined pilots. "You can see that wheels on these airplanes are directly under engine nacelles. These canvas covers are to keep oil from dripping on rubber tires," Spillsbury pointed out.

"Our biggest trouble here," he emphasized, "is lack of men. The planes are kept mechanically perfect. But we don't have time to be as fastidious about appearance as an owner would be." The Naval Air Reserve has had a conspicuous safety record, so it would seem that not even a well-groomed appearance is necessary to the safe condition of an airplane.

What does Spillsbury recommend if you leave your airplane in the open? Let's assume you've insisted on a good paint job when you bought your plane.

Next step is to wax it, whether it's a fabric or a metal job. Wash it down first with a mild soap and water solution. This takes off all mud and grime. Use a good cleaner—there are many on the market—then apply wax.

A good application of wax fills all the pores in paint, protects it from the sun, and makes future cleanings easier. It pays other dividends, too. You'll have a faster plane. Some models have been known to gain as much as an extra 10 m.p.h. in speed after a good waxing job.

Spillsbury recommends that you do the work yourself. He says this is the best way to spot small deficiencies that would escape you on ordinary inspections. "Anyway, it's easier to wax an airplane than a car," he adds.

"Next I'd recommend canvas covers for Plexiglas, propellers and wheels. These are desirable even if an airplane is hangared. They are essential when your airplane is outside. They don't cost much; almost any good seamstress can whip up a satisfactory cover in a short time." He says that the cover on the Plexiglas and tires prevents sun damage, the most devastating of all the elements.

Canvas sleeves for pitot heads are vital either in or out of hangars. In either situation moisture can collect and create a hazard. There is an instance on record where wasps built nests in the pitot heads of some large airplanes. They went in so deep a casual inspection did not disclose their presence. But the nests kept out the free flow of air. Result: no air speed. You can imagine the difficulty of flying a big airplane with a minimum of "feel" when there is no indication of air speed. Even in a private craft this could be disastrous. The wasp-nests were a prime mystery until several pitot heads were broken apart and the culprits discovered. After that, pitot covers were a requirement at this base.

Leaving a red flag hanging to the end of the canvas sleeve helps to avoid the chance of forgetting to remove the cover. If that occurs, you might as well have a wasp nest inside for all the good your air-speed meter will be.

Certain airplanes, according to Spillsbury, have exposed struts for which canvas boots should be provided. At the







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**D**ON'T BE "MIKE-SHY". Keep the microphone close . . . close to your lips. Talk loudly and distinctly. Give out with plenty of volume (you won't disturb the neighbors up there and it will make the tower happy to hear you). Bite off your words (good enunciation they call it in better books). That neon lamp installed in the panels of **BUT THIS** many planes will bear close watching. Glowing and fading, it gives a visual indication of proper modulation.



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very least, these struts should be carefully painted with a good, sun-resistant paint. "Watch out also for exposed cables," he cautions. "Many airplanes have small areas that sometimes go unnoticed. Look also for grime collecting in elevator, rudder and aileron hinges."

Most engines on private aircraft are so well cowled they need little extra covering. This is not so on military aircraft, most of which have exposed cylinders peeking from under the cowlings. The military plane stays in the open, notwithstanding, and gets a thorough checking only when it is prescribed by maintenance regulations.

Airports should provide tie-down facilities for their tenants, Spillsbury believes. It isn't even necessary to tail your airplane into the wind, as we used to believe—provided struts, wings and tail are securely hitched. "Battens for ailerons, rudder and elevators are a wise precaution if your airplane does not have a control lock. These keep controls from banging around in the wind with chance of damage."

I was interested in possible tire damage. Spillsbury doesn't believe it necessary to jack up your airplane unless it goes unused over a long period of time. Only a canvas covering to keep the sun away is necessary, plus frequent applications of good tire paint to eliminate checks and cracks in sidewalls. I remember that in Arizona we didn't jack up the huge four-engined *Privateers* that sometimes stood three months in the desert. Occasionally one would develop a flat spot on its tires. We soon learned that a fast taxi up and down our 6,000-foot runway would bring the tires back to a normal contour. This condition would probably never occur in a small airplane. Even when it did on the big ones we had no tire failure.

Commander Spillsbury not only makes it seem that a hangar is an unnecessary luxury, he envisions hundreds of small air parks throughout the nation, each with only a leveled plot of ground. Leveling is the most essential quality in a private airport; expensively surfaced runways such as are needed for heavy military and commercial aircraft are simply another luxury. He cautions against graveled or cinder runways. Particles thrown in propellers can cost plane owners a lot of money.

"Sod is best of all for a small airport," he says. "A good turf makes the finest of all landing surfaces for light aircraft."

Why, then, with so much available land of this sort, much of it close to centers of population, can't we have many, many more small airports? The answer is that we've grown to distrust the airstrip that has no hangars. But this is more of a habit than anything else. The present shortage of hangars has proved that the outdoor tie-down is safe in all weather.

It's a cinch that the removal of unnecessary extras is essential if private flying is to prosper. A pilot demands a sound airplane—safe, comfortable, fast. Give him one he can afford to buy, show him how he can keep it safely as well as conveniently, and there will be no slump in this flying business.

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