

Searching *from*

WHEN an airplane is lost it requires the prompt organization of a searching party of qualified pilots well versed in low-flying over dangerous terrain. Searching is a job requiring intelligent direction and the highest type of flying skill. How to conduct a search by airplane and what the searching pilots should do to minimize the hazards to their own persons and planes are told here by Mr. Steele, head of the Richfield Oil Company's aviation department, himself a pilot with many searches to his credit.—The Editors.

By DUDLEY STEELE

WHEN the first word comes in of a plane lost, competent pilots and executives should immediately get together to decide the following points: The points between which the plane was flying, the last known point at which it was sighted or heard, and the condition of the weather along the line of flight and on both sides for a distance of at least 100 miles.

It is quite likely and has often happened that a pilot flying into bad weather on his regular route and with knowledge that weather is clearer on either side of his route, may attempt to go around a storm and be forced down before he gets around, or by motor failure after he has gotten around. The condition of the weather at the time he was last heard from is the most important factor, because upon that is usually based the location

of the search, the base from which planes will operate, and, depending upon the weather, the radius and extent of their operation.

If a plane is overdue at its home port, sufficient time should be given, having in mind the character of the country over which the plane would fly in normal flight, for the pilot in case of a normal forced landing to get to some form of communication. After this time has elapsed, search should begin immediately, especially in case he is reported down in mountainous country in the winter time when the weather is severe. A delay of only a few hours may mean the difference between life and death.

The base of operations should be located as near as possible and practical to the point where he was last seen or reported. At this point, searching ships should congregate as rapidly as possible. Maps of the locality should be at hand. The maps should cover territory immediately adjacent to the lost pilot's line of flight and for upwards of 50 miles on either side. Areas should be carefully drawn on the maps and assigned to individual pilots to cover thoroughly.

Where to Look

After sufficient time has elapsed for the pilot to have reported in case he was able, then it must be assumed that it is not a forced landing but a crash and the search must then include not only possible available points where forced landings could be made in safety, but every portion of the country including canyons, mountain sides and tops, plateaus, etc., must be scrutinized.

When starting a search for an airplane over dangerous, mountainous or heavily wooded and broken coun-



the AIR

try, care should be taken by the executive in charge of the search to see that planes which report to him for the search are in good mechanical condition. Naturally he can not put them in condition himself, but at least the question should be asked concerning their mechanical condition before they are assigned an area and sent out.

Some care should also be taken with respect to pilots. In other words, do not send an inexperienced pilot out over exceptionally rough and dangerous country, but rather send the older heads over this kind of country and keep the less experienced ones for more open, flat country.

During a recent search which covered rough, mountainous country north of Las Vegas, most of the flying was done at high altitudes in bitterly cold weather. A forced landing in that country with even a slight injury could very easily have resulted fatally before help could be secured.

It is also necessary when starting a search to be sure that every searcher is supplied with a map and understands his area and how to get back to base. He should be sent out with full tanks of gas and sufficient oil, and warned to return within a certain period of time. Each searcher should be checked in carefully in order that no stragglers may be missed in the confusion which usually comes with a search.

Emergency Equipment

Another important factor is the searcher's own emergency equipment. Such equipment should consist of the following: At least three red flares and three smoke smudges, the former for signalling at night and the latter for daylight; at least three cans of tomatoes, the same of beans, and at least a one gallon canteen of water; a plentiful supply of matches in a waterproof case, and a revolver with several rounds of ammunition, if possible.

This equipment for searching planes may seem to be superfluous, but if you have flown over and around mountains at 7000 or 8000 feet within 150 or 200 feet of the tree tops for hours on end, realizing that you were depending entirely upon your motor, and if you were doing this over the wildest kind of country without seeing a human habitation for an hour, you would realize that if you had a forced landing and were successful in escaping unhurt from the crash, you would welcome the food and matches, and the smudges to attract attention to your plight, as much as you would welcome anything else on the face of the earth.

To be down without ability to travel except on foot in some of the country over which searching has been done, is highly dangerous to say the least, and certainly is fatal without food or the ability to get it and quickly. Therefore, the injunction as to emergency supplies for searching planes is highly necessary.

In a search conducted in clear weather, the method of operation is different than when the weather is thick or threatening. Over wild, mountainous and uninhabited country in clear weather, it is not always necessary to send two searching ships together. In overcast weather that might produce rain, snow or



Dudley Steele, the author, in addition to being head of the Richfield aviation department, is an experienced pilot and member of many searching parties

fog, it is wise to send two searching ships over the same area, one to be flown by a pilot who knows the country, the other by one of the volunteers who is new to that particular area.

It is recalled that in the case of one search which extended over a long period of time in Nevada, the pilots flying the regular run were used to team up with volunteers who came to aid in the search. Even at best, flying over rugged, snow covered mountains, it is hard to keep your companion in sight and, to get lost, run out of gasoline or have a forced landing in this kind of country is exceedingly dangerous.

Where to search: A recent search for a tri-motored plane lasted some 12 days before it was located. The area in which it fell had been crossed and recrossed dozens of times by the pilot who found it, but the wreckage was not discernible from the air because of about two or three inches of snow which covered the ground and the wreckage.

What to Look For

Another thing which pilots on a search of this kind for the first time must realize is that the object for which they are searching will probably bear little or no resemblance to an airplane as it originally was. In other words, in their mind they picture an airplane lying on the ground with its wings outstretched, when in reality all they will probably see is a twisted ball of wreckage which has no resemblance whatever to an airplane.

The tri-motor plane in question was found in a small canyon that had been looked into many times. The covering of snow completely hid the wreckage and a portion of one wing which lay on a hillside 2000 feet away. Rain came and washed away the snow, so the following day the wing was located easily.

One reason why we have to know weather conditions at the time the pilot is lost is because if there is a heavy snowstorm raging at the time he disappears, it is only by a miracle that the plane under its covering of snow will be located from the air. The case of a

plane lost in Nevada proved that the pilot had received only minor injuries and only minor damage was done to the plane.

Apparently, this pilot remained with his plane for some time thereafter. He attempted to walk out, carrying his provisions and gun with him. He was found nearly six months later, frozen. The plane was not found for some four months after he disappeared and was then found by sheep herders on foot.

A recent search in California revealed that several planes flew over the wreckage without recognizing it from the air. A rancher stumbled upon it. The actual wreckage was found within one and one-half miles of the base of operations for the search. It did not in any way resemble an airplane. It had hit apparently on one wing tip in a vertical bank, and had rolled itself up into an unrecognizable mass of wreckage which, when covered with only one-half inch of snow, could not be picked out from even 100 feet in the air.

If the weather is clear and the ground is not too rough, flying on a search may be done at altitudes of from 500 to 1000 feet. If the ground is dangerous with many canyons, the searching must be done from an altitude of from 150 to 250 feet above the mountains or trees, as the case may be. It is not pleasant work, by any means. In fact, it is highly dangerous to all searchers, particularly in rough country.

To fly in a search over rough country at altitudes exceeding 250 feet means that the wreckage, if it is lodged in a small box canyon or on the side of a hill in underbrush, might easily be passed by. Particularly is this too true in case a fire occurs after the crash. If this does occur, you have only to look for a few charred remains and you must realize that these remnants blend into the underbrush in such a way that detection is almost impossible if the searcher is more than 200 feet above it.

Pilots who have never been on a search should be thoroughly instructed before going out; else their work will be practically useless. The type of plane that is lost, the color, the territory over which the pilot is to fly, all must be carefully gone over or the pilot will possibly be looking for an object totally unlike that which he will find.

Another thing, although not as important, is to have some idea of the flying ability of the pilot who is lost. The reason for that is that if a man is known as a good pilot but one who will take chances, it may be that he would fly over certain territory and his plane and wreckage be found in that territory, where a more conservative pilot would take an entirely different route and the search could be concentrated on one of the other routes, depending upon the flying ability of the pilot who flew the lost plane.

WHAT *to* DO *About* MOTORLESS FLIGHT

By CAPT. ROBERT E. POLLOCK

WHY has motorless flight remained in the back-ground in this country? Is it due to a lack of public interest or to the failure of designers of these craft to take full advantage of their opportunities in a sound business-like manner? What steps should be taken to increase the popularity of this sport?

These problems are continually harassing the minds of all persons interested in gliding or soaring flight. As one of those who have been "harassed," I would like to submit the following suggestions as to what would help place gliding and soaring flight on a sounder basis:

The first need is the establishment of a national body with sufficient finances to secure the services of technical experts who will devote their time to research in aeronautical problems and make practical tests of new designs which show merit. It would make recommendations as to whether financial assistance should be given to any particular investigator to facilitate the completion of his experiments.

Substantial prizes should be offered for duration and distance flights. The entire industry owes a debt of gratitude to Edward S. Evans for his generosity. After awarding a prize of \$2,500 to Jack Barstow for his unofficial flight of 15 hours and 13 minutes over Point Loma, Calif., he renewed the prize of \$2,000 for an official flight of 10 hours and \$100 for each additional hour, but not exceeding 20 hours or a total prize of \$3,000.

It would seem fitting and helpful if some individual, newspaper or organization would offer prizes of a small sum for each hour of sustained flight over 10 hours, at which point Mr. Evan's \$2,000 prize is to be awarded, and a substantial prize for continuous flights of 15 hours, 20 hours and 25 hours duration. This

would be a great factor in inducing people to finance the construction of new-type planes.

Glider clubs should see that at least one of their members secures flight training at a recognized glider school.

Designers of new-type planes should secure the services of the best trained business men that their finances permit. Such men should handle all of the designers' business affairs without interference.

Manufacturers should jig and standardize all parts and make as few changes as possible. All parts of any plane of the same type should be interchangeable and planes should be so designed that repairs can be made with a minimum of work and expense.

Prices should be reduced to the lowest possible point. Production should only keep pace with sales, as it is easy to get the entire capital tied up in unsold ships and find that there is no money left for sales promotion. One can usually secure money from a local bank to manufacture planes to fill orders, but no money can be secured for the purpose of covering sales expenses on completed, unsold ships.

An accurate cost record should be kept at all times, so that the quality can be increased or prices decreased at the earliest possible moment.

The aim should be for constantly improved design and better performance, because motorless flight will someday be a commercial factor and not merely a sport.

Practically no advantage has been taken by any of the manufacturers of motorless craft, of the priceless publicity given to this sport.

The opinion of the public at the present time is that gliding and soaring is merely a sport and a pastime, but we may soon see that it will in reality form one of our most safe, rapid and economical means of transportation.



Dudley Steele, the author, in addition to being head of the Richfield aviation department, is an experienced pilot and member of many searching parties