

PLANS TO EXPLORE THE ELSINORE SHEARLINE WITH THE OSTV GRANT

by JACK LAMBIE

The Elsinore shearline has developed into something of a mystery since I made my first observations and ventured to fly a sailplane along its edge. (See *SOARING* May-June, 1956 issue.) It had always seemed a rather straightforward phenomenon. Two air masses of different winds and composition came in contact with one another. At the contact point there is a wind shift and turbulence due to the differences in the air masses. These differences could only result in the air going up along this contact line which makes for some very interesting soaring conditions. The lift area is fairly easy to find because the differences between the air masses can be seen. One side is usually clear and the other side smoggy or hazy. Since the line stretches across some 40 miles it is excellent for out and return flights.

The shearline is especially good for practice and training. Many times I have had soaring students fly the shearline out and back so they could practice straight and level flying and holding a heading. There is seldom difficulty in getting back to the Elsinore Gliderport with the most inexperienced student because of the areas of strong steady lift along the shearline. To make the flight interesting on a day of very active shearline lift, I flew the 1-26 out to Beaumont and back deliberately staying under 2,000 feet. This is mentioned simply to acquaint you with some of the enjoyable aspects of the shearline.

The problems started after a day of heavy smog in Riverside. The next day the paper had an account of the smog invasion by Dr. John Middleton of the Riverside County Smog research. In describing the smog invasion he referred to it as a smog "front" moving in from the factories of Los Angeles County. I dropped by the University of California Agriculture Experiment station in Riverside to discuss this smog front with Dr. Middleton. I told him of my experience with the shearline in sailplanes. He expressed complete sur-

prise at such a condition and stated that his referral to a "front" in the newspaper was only in way of analogy. Middleton thought of the smog front in terms of a pall of pollution simply drifting with the wind. His instruments registered no wind shift, change in temperature or humidity! Only the oxidized particle graph showed a significant change as the smog moved in. He did feel that possibly the effect of the buildings, etc., near the instruments caused poor results because of the local heat given off by the buildings and the ground.

In looking at some of his air pollution charts I noticed one all marked up with red lines, one of which followed the shearline fairly closely according to my observations. I remarked on this similarity and Dr. Middleton explained that that line denoted the limit of plant damage due to smog. It appeared that another shearline should exist in the San Fernando Valley area according to the plant damage chart! We agreed to get together again to check data on good shearline days.

In the meantime, various periodicals had announced that the OSTIV was prepared to offer grants to interested parties to do research with sailplanes. I wrote to Betsy Woodward, who is on the OSTIV staff, at Imperial College, London, and received an encouraging reply. However, they did want some people recognized in the field of meteorology to approve and help plan the research methods before they would award a grant.

I got in touch with John Aldrich, the chief aviation weather forecaster at Los Angeles, Calif., and longtime friend of sailplane pilots. John contacted Dr. James Edinger of the University of California at Los Angeles who is head of the Los Angeles County smog research. We got together at an SCSA meeting where Paul MacCready was also on hand to lend his opinion. As a result of this meeting the shearline took on more wrinkles.

John Aldrich felt that the shearline was present because of the winds that converged in the area, probably caused by the Santa Ana and Temecula passes. He thought that there might not be any difference in the air masses at all!

The lift resulted from the air converging because the only direction it could go was up. I mentioned the plant damage chart to Dr. Edinger and told him about the possibility of a shearline in the San Fernando Valley. Edinger said that their stations were at times reporting a wind shift that often moved *against* the prevailing wind of 8 miles an hour.

Last summer, while several letters passed between the OSTIV and myself, Dr. Edinger flew all over the Los Angeles Basin area in a light plane with recording instruments to explore the air structure. He looked for and did find the shearline in the San Fernando Valley but it didn't seem to penetrate over 1,000 feet. He felt it was a low level surface wind condition. Dr. Edinger is very anxious to see the shearline as I have described it that will sometimes carry a sailplane to over 10,000 feet.

The shearline is an exciting and real phenomenon even from the ground. September 22, 1957, while watching the sports car races at the new International Raceway in Sunnymead, I observed the classic shearline pass. The visibility was unlimited in every direction except to the west. About 3:30 PM during the main event I saw the white hazy wall of the shearline approaching from the west. It was an exciting race but I was equally excited by the approaching shearline. The two leading cars had gone out and the race was now led by a very hot Maserati that seemed a cinch to win anyway. Collecting a bunch of discarded hot dog wrappings I prepared for the passing of the line.

At 3:50 the shearline began to pass over. By tearing bits of the paper and dropping them in the wind I got a rough check of the wind speed and direction. Wind was from the north at 5 miles an hour. Between 3:50 and 3:58 the line had passed and the wind shifted 87 degrees. The wind now came from the west northwest and the speed had increased to 12 miles an hour. Several swirling dust devils could be seen along its edge as it passed. The line moved at 5 miles an hour. Visibility was immediately reduced as the haze moved in but in a half hour the air