

under the influence of this air mass — an area of large scale convergence and, therefore, positive vertical motion.

A smaller scale, less prevalent, but still common feature of the surface chart is the Marfa trough. This trough is most common in spring and early summer. It is a transition zone between dry air of the southwest desert region and the moist air from the Gulf of Mexico. For this reason, it is sometimes called the dew-point trough or, colloquially by the soaring pilots "the Marfa dew line". Along this trough is additional convergence and positive vertical motion. It is the area most favorable for convective activity. When active, the trough is marked by a line of cumulus clouds visible at great distances.

Local area soaring in summer generally is good in Southwest Texas. On days when all three factors are working together "this region is as good as any in the world" (as quoted from Mr. Philip Wills).

SOARING FOR DISTANCE

Southwest Texas is an ideal starting point when soaring for distance. Most of the favorable features in Southwest Texas continue, nearly undiminished, through a narrow corridor about 150 miles wide northward to the South Dakota border — about 800 statute miles. The terrain is fairly level and averages between 2,800 feet and 3,600 feet ASL. Prevailing winds are southerly at least to 12,000, surface temperatures remain high, and the low-level lapse-rates are fairly unstable. At times western Kansas and Nebraska are as hot as Southwest Texas, and on these days conditions are favorable for long flights up this corridor.

These conditions become most favorable with the synoptic situation shown in Figure 1: (1) a well developed low pressure center near 45°N tracking eastward; (2) a Pacific cold front extending south-southwestward from the low and moving eastward across the Continental Divide onto the High Plains; (3) a developing trough southward from the low to Southwest Texas. Instability and vertical motion are high along the trough line; surface temperatures are higher than normal. Ahead of the trough sufficient moisture provides the desired cumulus. Southerly winds are flowing toward the low in the Dakotas. This is the synoptic situation the soaring pilot has been anticipating, but still there are obstacles to overcome.

A pilot attempting a record must take off no later than mid-morning due to the great distance to be cov-

ered. Thermals are just beginning and cumulus clouds have yet to develop. In this case, if thermal activity is forecast to develop within an hour, the flight may be initiated. Needless to say this first hour will demand the utmost in soaring dexterity.

The next major obstacle is over-development of cumulus. Nearly all factors which make this synoptic situation ideal for soaring also are ideal criteria for showers and thunderstorms. Even if there are no well defined areas of thunderstorms, large areas of showers just as surely will terminate the flight. Vertical currents and thermals are poor or non-existent in areas where heavy showers have occurred. This probably is the most common cause of failure to attain the distance goal.

Assuming showers are well scattered and the pilot is able to by-pass them, the next problem is to determine the exact locations of the trough, the front, and the low-pressure center. It has been perhaps nine hours since the pilot has seen a weather map. The entire system has probably shifted to the east. As he flies northward the trough and the front become more closely oriented. At some point he may wish to leave the trough and take advantage of the instability along the front. If the front is now out of the mountains and on the plains it will probably give better lift than the trough. However, quite often there is reduced positive vertical motion between the front and the trough. Either the trough or the front has adequate instability for sustained flight, but in no case may the pilot cross the front, for here a head-wind component is sure to prevail.

At 9:46 a.m., July 31, 1964, Mr. Al Parker was launched at Odessa, Texas, and at 8:19 p.m. he landed his sailplane at Kimball, Nebraska for a total sustained distance of 647.17 statute miles.

On July 23, 1963, Wallace A. Scott made a flight of 497.562 miles northward out of Odessa which is now the world record for a goal flight. In 1965 more than a dozen 500-km triangles were flown in the Marfa area. Previous to 1965, a 500-km triangle had not been flown in the United States.

In the past two years soaring pilots have come to Southwest Texas from England, Israel, New Zealand, and Canada, and from locations in the United States ranging from California to New Jersey. All have been favorably impressed with the excellent soaring weather and the potentials this area offers.

Let's Swing

A recent glance in the cockpits of several sailplanes lined up at a well-known soaring site showed a variety of readings coming from the magnetic compasses! Swinging a compass is a relatively easy job. It can usually be done while waiting for the first thermal to pop, and will certainly give a feeling of satisfaction to the pilot when he gets over unfamiliar terrain — he'll at least know which direction he's heading!

The tools required are very simple: a small, pocket Boy-Scout-type compass, a brass or plastic non-magnetic screwdriver to adjust the compensator magnets, a clear spot on the airport well away from the overhead wiring, metal hangars and other sailplanes, and a few interested helpers to swing the sailplane, keep

by John Ryan

the wings level, and the tail in flying position.

Magnetic compasses are affected by the earth's magnetic field as well as the magnetic field surrounding the sailplane and its instruments. Before starting the swinging job, the compass should be mounted as far away from magnetic fields in the sailplane as possible. These include electric variometers, the metal stick, other compasses and electrical wiring, particularly that which carries fairly high DC currents. Special MU metal shielding is available to help eliminate the effect caused by electrical variometers, but the greatest panel separation possible should be used in addition to this shielding as this will permit a better job of compensating to be done.