

near the Davis Mountains, some 4,850 feet ASL. Many pilots prefer the Marfa area due to the additional lift of prevailing low-level winds riding up the mountain slopes.

### Unstable Lapse-Rate

As mentioned, the average maximum temperature of 94 degrees F is not in itself outstanding; but at 3,000 feet ASL it is unusually warm and is probably the most significant contribution to good soaring. The 700 MB temperature is not greatly affected by surface heating, therefore, the lapse-rate becomes quite unstable. In fact, the average lapse-rate to 700 MB is 1°C. per 100 meters at the time of maximum heating. Since, in theory, the maximum lapse-rate (the dry adiabatic lapse-rate) also is 1°C. per 100 meters, Southwest Texas rates perfect in the realm of low-level instability.

Local soaring pilots have a rule of thumb: "Do not venture east of the 100° meridian." Why? There is a significant loss of instability near this meridian. This is partly due to more cloudiness but primarily due to terrain effect. The average maximum at this longitude is nearly as warm (93.5°F.) as Odessa, but the general height of the terrain is about 1,000 feet lower. The resulting lapse-rate 150 miles east of Odessa is 1°C. per thousand meters more stable. Contrary to popular belief, areas with the highest temperatures are not necessarily the best for soaring. This paradox is true even for locations noted for exceptionally high temperatures. For example, Yuma, Arizona and Thermal, California often have maximum temperatures of 110° to 115°F. However, these cities are near sea level. When a sea level temperature of 110°F is projected dry adiabatically to 3,000 feet, it is 94°F—the average surface maximum at Odessa.

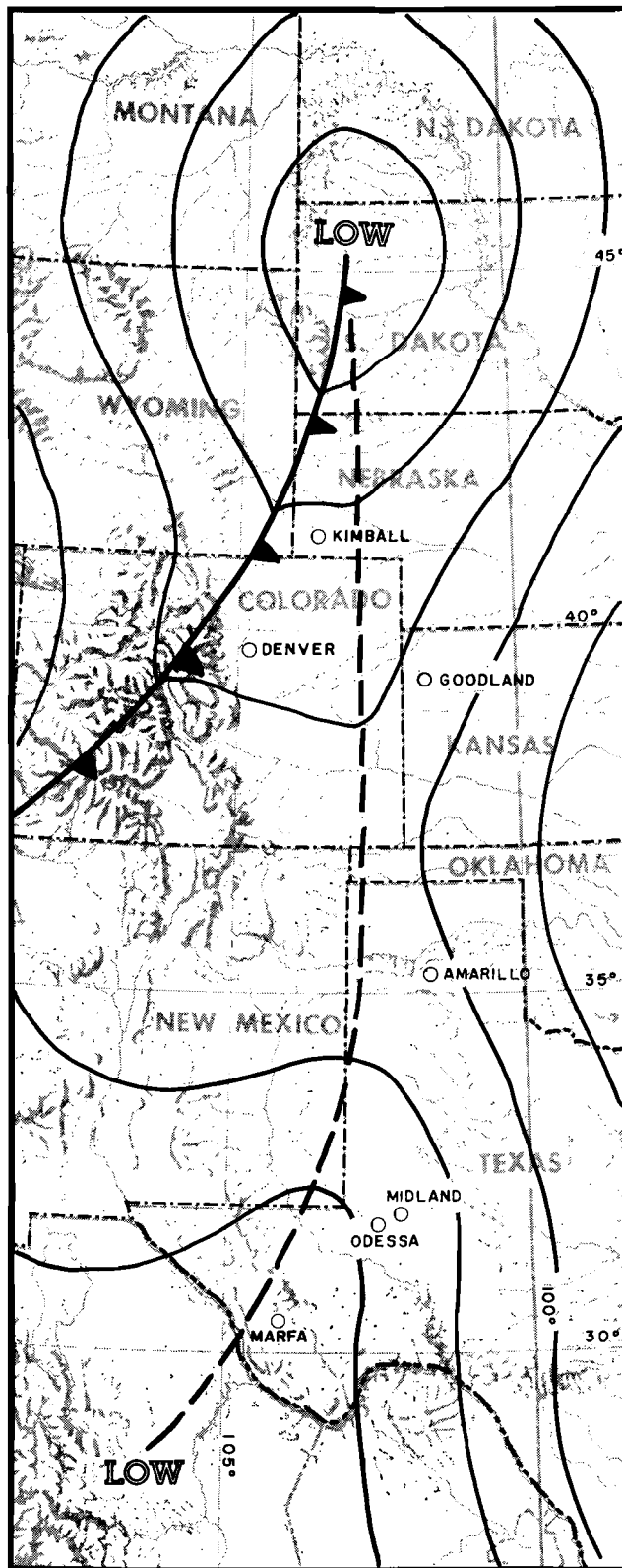
Bear in mind that the 94° temperature at Odessa is a three-month average. On days most favorable for soaring the temperature usually is 95°F to 100°F. Any temperature significantly below normal is caused by either heavy cloud cover or precipitation—weather unfavorable for soaring at any rate.

### Cloud Cover and Type

Cloud cover and type also are important to the soaring pilot. Most favorable in this area is 2/10 to 5/10 cumulus with no significant cloud layer above. Clouds covering more than one-half the sky restrict surface heating, reducing the strength of the thermals.

During daylight hours of June, July and August, Odessa averages twenty-five days per month of clear-to-partly-cloudy skies with a mean sky cover of 4/10. Good soaring conditions can be experienced on cloudless days. Although cumulus clouds are not essential for thermal soaring most pilots prefer them. These cumulus always develop above the stronger thermals and become the pilot's "eyes" for finding the updrafts essential to sustained flight. Any building cumulus indicates a well-developed thermal. However if the cloud becomes over-developed, that is, producing rain showers, or is in the dissipating stage, it no longer indicates updrafts but more likely produces downdrafts.

Dust devils are also excellent indicators of thermal activity and are quite prevalent in Southwest Texas. They are very turbulent up to a height of 1,000 feet above the surface, and the core can be hazardous up to 500 feet. Still they are extremely helpful in the critical stages of low-level flight.



### Low Level Synoptic Features

A thermal low, in its near stationary position about 100 miles southwest of Presidio, Texas, is one more major contribution to the excellent soaring in Southwest Texas. This low is a semi-permanent summer feature. It is the center of a continental tropical air mass—characteristically unstable but quite dry, resulting in a very high condensation level. Southwest Texas often is