

Soaring Meteorology a Labour of Love

by Doug Armstrong - 2002

Soaring meteorology can be a labour of love. This past summer I've been involved with morning emails trying to highlight significant weather for soaring. It seems in recent summers the soaring out of Minden has fallen victim to a wide variety of weather that had left old timers scratching their heads and wondering when the diamond and greater flights of summers past would return. Some soaring enthusiasts claimed the diamond pastures had moved east to Tonopah, Ely and Parowan. This summer had wildfires that for many weeks caused the bright friendly soaring skies of Minden to become engulfed with smoke.

Soaring weather began to clear up during the last weeks of August. In fact on the last Wednesday of the month I received a request for help with some soaring weather that would support a 300 km diamond goal badge flight and the pilot only wanted 5 days advance notice. Toss in the challenge of determining the soaring weather 5 days in advance and I took the bait hook line and sinker. A quick check of my website resources, namely the AVN's Medium Range Forecasts of 500 mb Heights and Vorticity:

<http://www.iges.org/pix/avnmr.vort.html>

The charts revealed that a promising great soaring weather pattern would develop for the upcoming Labor Day weekend. The meteorological trend would make Labor Day the best, actually Saturday would still have a little too much moisture with local afternoon overdevelopment (OD) Sunday's weather would be warmer with some drying and could easily support a 300 km diamond goal flight, however Labor Day still looked even better. Steve Fossett changed his flight proposal to make the 300 km goal flight on Sunday and would attempt another diamond badge 500 km distance flight for the better soaring weather on Labor Day.

On Sunday while monitoring the weather for Steve Fossett's successful 300 km goal diamond badge flight I noted in Labor Day's soaring weather email that a cloudstreet had developed from around Quincy down the Sierra to Mexico. This helps set the stage for Rick Walters to conjure up a flight proposal with Peter Deane for an attempt at racing over a total distance of 750 km. The selected halfway turnpoint would be located in the extreme southern Sierra near Walker Pass, more appropriately known now as Rick's Turn.

Labor Day's weather dawned looking much like the forecast models had predicted back on Wednesday. The 500 mb level chart at 5 am provided by Unisys showed a strong ridge of high pressure along the California coast and a small cold vorticity center over Las Vegas (see figure 1). Twice daily charts are available on the following website:

http://weather.unisys.com/upper_air/ua_500.html

Morning surface weather plotted on charts provided by UCAR indicated a pressure gradient of as much as 8 millibars between Reno and Sacramento and other Nevada weather stations into the central California valleys. This indicated a very strong thermal trough in the central valley: strong enough to redirect air over the Great Basin elevated plateau up into the Sierra for weak orographic lift. By 3 pm PDT the max heating of the afternoon occurred with Reno at 93 degrees Fahrenheit and the central valleys of California around 100 degrees. Also noteworthy was the light west wind at Bishop (see figures 2 & 3). The pressure gradient weakened to less than 4 millibars between Reno and Sacramento and this developed late afternoon west winds in the Sierra's leeward valleys from the Carson Valley north. Strong heating continued with calm winds at Bishop at 5 pm PDT. Hourly charts are available on the following website:

http://www.rap.ucar.edu/weather/surface_wmc.gif

The plot of atmospheric sounding data for Reno and Desert Rock provided by UWYO at 5 am PDT revealed indices in a favorable range and light winds within the convective boundary layer. The Desert Rock sounding had a noticeable inverted ? configuration for the dewpoint (line on the left) and temperature (line on the right). This dryness in the convective boundary was conducive to strong downdrafts or microbursts from well developed convective clouds (see figures 4 & 5). Morning plotted soundings and figures 6 & 7 afternoon plotted soundings. Twice daily charts are available on the following website:

<http://weather.uwyo.edu/upperair/sounding.html>

Desert Research Institute (DRI) weather monitoring stations located at Stead just north of Reno and atop Slide Mountain (elevation at 9694 ft MSL) just north of Minden has weather information updated every 10 minutes and projected on a graph showing the previous 24 hours. Both stations showed increasing west winds in the late afternoon. The data time is given in PST and 1 hour must be added during the PDT season (see figures 8 & 9). Real time charts are available on the following websites:

<http://www.wrcc.dri.edu/weather/sage.html>

<http://www.wrcc.dri.edu/weather/slide.html>

Water vapor weather satellite pictures provided by NWS, Reno of the 16 km and 4 km scale showed dynamics taking place within the atmosphere. The small upward hump in the flow detailed the ridge of high pressure along the California coast and a cyclonic flow around the vorticity center over Las Vegas there was also a cold front in the state of Washington and a hurricane southwest of Baja taken in the afternoon of Labor Day (see figures 10 & 11). Water vapor and visible real time weather satellite pictures are available on the following website:

<http://www.wrh.noaa.gov/Reno/index.shtml>

This visible satellite picture with 3 km scale taken at 3:30 pm PDT indicated cyclonic rotation around the vorticity center over southern Nevada and a cumulus (Cu) cloudstreet along the Sierra south into Baja. The Cu cloudstreet over the Sierra covered the first half of task route planned and flown by Peter Deane and Rick Walters (see figure 12)

This visible satellite picture with 1 km scale taken earlier at 3:15 pm PDT gave a closer view of the Cu cloudstreet over the Sierra mainly from around southern Douglas County south and Cu development over the Whites. Both pilots noted mixed showers aloft mainly in the Mt. Whitney portion of the Sierra and diverted off the crest toward the east having navigated around these dark bumps in the cloudstreet estimated by some soaring pilots to be nearly 30 miles wide (see figure 13) at 3:30 pm PDT the Cu cloudstreet continued to intensify over the Whites. Strong vertically stacked thermals were reported over the Twin Lakes canyon and directly over the southern most turnpoint at Rick's Turn. The light wind regime reported during the racing flight down the Sierra was beneficial toward the overall success of a speed record performance (see figure 14).

This visible satellite picture taken at 4:00 pm PDT indicated the Cu cloudstreet that developed on the Whites and extended toward Mt Patterson and Gimmey's Bowl was used on the return leg of the out and return. High speeds of over 100 mph were maintained for about 100 miles along this portion of the flight by both pilots. Any smoke or blur that might be seen in these satellite pictures is not from wildfires but from soaring pilots maximizing their love for sailplane racing mode. Also in this picture are Steve Fossett soaring for his successful 500 km diamond distance badge. Pete Williams on a final glide from 160 miles out starting from the Whites heading back to Minden and a gaggle of soaring pilots having their all time personal best flight experiencing their love of soaring (see figure 15).

These visible satellite pictures taken at 4:30 and 5:00 pm PDT indicated the Cu cloudstreets were getting a little frayed and the valleys leeward of the Sierra from the Carson valley north were getting late afternoon west winds, a not uncommon event when soaring along the

Sierra and western Nevada (see figures 16 & 17). The Cu cloudstreet extended to the finish line on the Pinenuts for a good finish. Congratulations to Peter Deane on setting a new national speed record of 94.73 mph for a 750 km O&R distance. See figure 18 for actual flight path of 750 km O&R distance flown by Peter Deane.

In conclusion, the majestic skies of Minden despite the shortness of the soaring day this late in the summer season can still put forth the charm and luster for a diamond performance, when the soaring meteorology is right, a true Labour of Love on a sparkling Labor Day.

Doug Armstrong/Nov 2002