CONTRADICTIONS

The following are two recent posts by Clifford E Carnicom on the message board attached to www.carnicom.com:

A Contradiction:

Conditions in Santa Fe NM yesterday July 20 2000:

Clear blue sky early hours of the morning. Introduce heavy aircraft spray activity during morning hours, resulting in subsequent classic formation of extensive cirrus – cirrostratus – and cirrocumulus 'appearing' cloud decks. The now expected, formerly unusual, ring aroung the sun also developed, due to microscopic hexagonal crystals of uniform size existing in the atmosphere, the appearance of which also was directly associated with aircraft activity.

In Albuquerque, at flight level, immediately visible to the south:

Relative humidity at 35,000ft. MSL at 0500 (5am) 32%
Relative humidity at 35,000ft. MSL at 1700 (5pm) 41%

Relative humidity interpolated at 1030 observation time is 36%.

U.S. Naval Postgraduate School in Monterey CA and Vincent Schaefer, inventor of cloud seeding in 1946, both affirm that cloud formation is not expected to even begin below relative humidities of 70%. That case itself is considered unusual, exemplified with the introduction of hygroscopic nuclei, such as salts in the atmosphere along the coast. Persistent contrails stated by numerous sources to have the potential to exist only in conditions of near saturation to saturation. Comments regarding relative humidity with respect to ice are always welcome.

Conditions today in Santa Fe NM July 21, 2000.

Clear sky overhead, no significant observed aircraft activity.
No ring around the sun.
Relative humidity at 35,000 MSL at 0500 is 36%

Those interested in additional meteorological aspects of this issue may be interested in listening to the recent interview with Jeff Rense linked on carnicom.com

Clifford E Carnicom
July 21 2000

****

The Contradiction Remains:

The following reference summary on:

www.mmm.ucar.edu/asr97/science_high.html

brings to four the number of references that repeatedly and consistently state that cloud formation (specifically cirrus cloud formation at flight altitude in this case) is not expected to occur with relative humidities (with respect to water, per conventional and standard measurement) of less than 70%. And yet repeatedly since the early part of 1999 such formation of cirrus – cirro-stratus – and cirrocumulus cloud decks are observed forming repeatedly as a direct result of aircraft activity in conditions of extreme low humidity in the southwest desert. It is noted that the source stated here is from both NASA and NOAA researchers.

The four sources that are completely consistent are now:

The United States Naval Postgraduate School
Atmosphere, by Vincent Schaefer, inventor of cloud seeding
Meteorology, The Atmosphere and the Science of Weather, by Joseph M. Moran
Referenced NASA – NOAA study below.

Variance from these expectations, i.e., repeated, extended and sustained cirrus, cirro-stratus, and cirro-cumulus formation under conditions of extreme low humidity (avg. 30%, range 10%-60% predominant) in Santa Fe NM as a direct result of aircraft activity is most reasonably explained with an alteration in traditional modeling techniques. Such an alteration would reasonably consider the effects of the deliberate introduction of aerosol particles within that extreme low-humidity environment at flight elevations.

The relationship between relative humidity with respect to both water and ice is understood, and does not affect the conclusions reached herein.

****

“Andrew Heymsfield, Larry Miloshevich, and Steven Aulenbach, along with Glen Sachse (NASA Langley) and Sam Oltmans (NOAA) found that the relative humidities with respect to water which are required to form ice crystals in cirrus clouds decline from almost 100% near 40 degrees C to 75 or 80% from -55 to -65 degrees C. This is consistent with their earlier measurements and the notion of homogeneous nucleation of solution droplets. But it is noteworthy that high relative humidities, approaching 90%, were measured in clear air at -52 degrees C off the coast of California and relative humidities approaching 100% were observed in orographic wave clouds between -62 and -65 degrees C. These results indicate that very high relative humidities can build up at low temperatures in instances with high vertical velocities and possibly with depletion of cloud condensation nuclei, thus retarding the formation of ice crystals. These regions provide conditions highly favorable for contrail formation by aircraft.”

Posted by Clifford E Carnicom
August 4 2000

Re: The Contradiction Remains

Now five sources:

“Data from a wave cloud at temperatures below -60 C showed that nucleation of ice began at approximately 80% relative humidity with respect to water (~125-130 % saturation with respect to ice), consistent with earlier observations of Heymsfield and Larry Miloshevich in wave clouds at temperatures of -55 C.”

www.mmm.ucar.edu/asr96/part_h.html

Clifford E Carnicom
Edited September 9 2000

Now six sources:

Heymsfield, A.J., L.M. Miloshevich, C. Twohy, G. Sachse, and S. OLTMANS.

Upper-tropospheric relative humidity observations and implications for cirrus ice nucleation.

Geophysical Research Letters

25(9):1343-1346 (1998).

Abstract:

Relative humidity (RH) measurements acquired in orographic wave cloud and cirrus
environments are used to investigate the temperature-dependent RH required to nucleate ice
crystals in the upper troposphere, Rh-nuc(T). High ice-supersaturations in clear
air—conducive to the maintenance of aircraft contrails yet below Rh-nuc and therefore
insufficient for cirrus formation—are not uncommon. Earlier findings are supported that
Rh-nuc in midlatitude, continental environments decreases from water-saturation at
temperatures above -39°C to 75% RH at -55°C. Uncertainty in determining Rh-nuc below
-55°C results in part from size detection limitations of the microphysical instrumentation but
analysis of data from the SUCCESS experiment indicates that Rh-nuc below -55° C is
between 70 and 88%. A small amount of data acquired off-shore suggests the possibility that
Rh-nuc may also depend on properties of the aerosols.

http://www.cmdl.noaa.gov/publications/data/1998.html

Referred to and posted by C.E. Carnicom Oct 9 2000