

CUPIDO06: 20060808a

Flight 11

Flight notes: System Scientist (3rd seat)

Crew:

Pilot: Tom Drew
Flt Scientist: Bart Geerts
System Scientist: Jeff French
4th Seat: Qun Miao

Pre-flight:

Radar faulted a few times during startup, rest of startup was uneventful

Conditions on ground 1551Z: T30/Td23, winds 180/3kts, skies clear

No cu evident from over mountain at time of takeoff (or before), decided to takeoff earlier today because cu blewup so quickly yesterday. As was the case yesterday, a layer of alto-cu (strato-cu??) at roughly 18 kft over most of valley and mountain all morning.

Flight:

Wheels up 1559 UTC (all times hereafter are in UTC)

1601: on climb out, we can see the formation of the very first cu over the Catalinas

1604: begin box 1, 1000 ft AGL, clockwise around mountain

radar file 26-04-44 up looking, 250 ns

1609: Trad~94.9

1617: Trad~98.8

1621: Trad~99.5

1623: end box 1, stop radar, climb to FL100 MSL to try pass under cu. Cu building along ridge roughly 290-110 magnetic (between Bigelow & Mt. Lemmon)

1629: setup for run at FL100

radar file 16-29-33 up looking, 250 ns

1631: under cloud

1633: end leg, climb to FL120

1635: at FL120

radar file 16-35-17 up/dual down 500 ns (*radar pulse remains 500 ns remainder of flight*)

1637: pen 1, CLWC~0.7-1 g/m³, w~5 m/s (?)

1638: end leg, climb to FL140

1640: at FL140

radar file 16-40-47 up/dual down, Trad~98.3

1642: Pen 1, clipping tops, LWC>1 g/m³

90/270

1645: over tops, towers collapsed a bit, we are now above everything

1647: 90/270, continue working this alt and let clouds grow through this altitude

1649: on track

radar file 16-49-37 dual down

1650-51: Pen 3, above tops, a few bubbles approaching our level
90/270

1655: pen 4, some tops just above our alt.
90/270, Trad~99.9

radar file 16-58-31 up/dual down

1659: pen 5, growing cells, ~0.3 g/m³
90/270

radar file 17-02-49 up/dual down

1704: clipped top of growing cells
90/270

1708: pen, tops to ~17kft, w~8m/s, LWC~1.5 g/m³
90/270

1713: pen, tops a bit higher, but tower looks like beginning to collapse
90/270

1717: pen, tower collapsing, almost all downward moving
90/270

radar file 17-20-52 up/dual down

1722: pen, w~7-8 m/s, CLWC~1.6-1.7 g/m³
90/270

1726: pen, tops to 17-18 kft, tower bit broader than earlier pens (??)
90/270

1731: pen, primary tower collapsing, almost all 5-6 m/s down
90/270

1735: pen, tops to 18 kft, possibly higher (??)
90/270

1740: pen, new growth, w~5 m/s, collapsing towers~-4 to -6 m/s
90/270

1745: pen, new growth tower→tops to 17 kft
90/270

1750: pen, mostly collapsing towers
90/270

1755: pen, w~10 m/s, LWC~1.5 g/m³
90/270

1759: pen, this time just clipping tops
90/270

1803: pen, tops about 200 m above us
90/270

1809: pen, tops ~ 500 m above us
90/270

radar file 18-12-00 up/dual down

1814: pen, w~8 m/s, LWC~1.9 g/m³
90/270

1818-19: pen, w~10 m/s, LWC 1.9-2 g/m³
90/270

1823: pen, clippin north side of line, cu tilted to south somewhat, w~9-10 m/s, LWC~1.9 g/m³

1825: setup for box around clouds
radar file 18-26-01 side looking, 500 ns, 9 km range
1832: finish box 1, setup to try another, upwind side of box 1 clipped cloud line
183345: start box 2
1839: end box
1841: ascend to FL150
radar file 18-42-45 up/dual down
1844: pen 1, w~10 m/s, LWC>2 g/m³
90/270, climb to FL170
radar file 18-48-14 up/dual down
1850: pen, tops to 20 kft, max w~12 m/s
90/270
1854: pen, tops to 20 kft
90/270
1858: pen, max LWC~1.8 g/m³, w~5-8 m/s, no 2D particles showing up yet
90/270
1904: pen, w~8-9 m/s
90/270
1908: pen, tops 500→600 m above us
90/270
1912: pen, just missing strongest turrets on penetration
90/270
1917: pen, missed most (all?) main turrets, on next pass will displace leg ~1 km further south
90/270
1921: pen, hit clouds a bit better (more centered) this time
90/270
1926: pen
1927: end legs at FL170, climb to FL200, should be just at tops of strongest growing turrets
radar file 19-30-25 dual down
1933: pen 1 at FL200, just through top, T~-6C, picking up a little graupel on 2DC, nothing on the 2DP
90/270
1936: pen....
90/270
radar file 19-39-18 up/dual down
1940: pen, LWC 2 g/m³, some graupel
90/270
1943: pen, LWC ~3 g/m³!!, w~18 m/s!!!!
90/270
1947: pen, still vigorous growth, w>10 m/s, LWC> 2 g/m³
90/270
1951: pen, tops to 21→22 kft
90/270
1955: pen, w~6-7 m/s, LWC>2 g/m³, graupel few mm in diameter
90/270
1958: pen, downwind side mostly glaciated, tops just above us

90/270

radar file 20-01-10 up/dual down, will target new growth on upwind side (or just over Mtn Lemmon)

2003: pen, growing, very little ice evident in growing turret

90/270

2010: pen, (a) new growth just below us

90/270

2014: pen, (a) new growth through 20 kft, just a mature stage (??)

90/270

2017: pen, (a) still very little ice evident

90/270

2021: pen (a) picking up little more ice

2022: 90/270, descend to FL170, one more pass through clouds then need to RTB

2023: pen (a) at FL170, yet a bit more ice

2024: RTB

2032: wheels down

Post-flight/impressions

Clouds did not blowup quite as fast as we might have expected. Very nice study of these cu, but unable to stay out long enough to see them punch through. Within 10 minutes of leaving, by time we landed, turret had punched through and anviled!

No known significant problems with data system/instruments

Gerber PVM fogged on descent into airport and was fogged (??) on ground when data system was shut down. Upon restarting in hangar, however, it looked fine.