

Flight Summary: WB-57F MidCiX – 2 May 2004



Cirrus observed during the flight over the Gulf of Mexico on 2 May.

Purpose of Mission: Sample cirrus under EOS Aqua satellite.

General Information

Flight date – 2 May 2004

Flight description – Flight #6, MidCiX mission, Aqua validation in cirrus

Flight duration – 6 hours

Crew – Andy Roberts and Brian Barnett

Flight Summary

The WB57 successfully sampled cirrus in the subtropical jet stream over the Gulf of Mexico under the Aqua. Spirals and level legs were conducted directly under the Aqua ground track. Aside from the cirrus the sky was relatively cloud free in the vicinity of the observations during the overpass.

Flight Profile

- We took off and climbed up to FL 410, missing the broken layer of clouds over EFD.
- Once we got to the coast, we descended down to FL 343 at 16:51 to get in the cirrus layer. We chased the cloud tops down to FL 320. Light turbulence was noted when in the cloud.
- We started a spiral down from FL 320 at 16:57:15, hitting the cloud tops at FL 306 at 16:58:20. This was optically a very thin layer. A broken/scattered layer was beneath us and easily visible.
- We came out the bottom of the cirrus layer at FL 266, 17:02:20. We turned toward the western point, staying in the cloud base at FL 270 – 275. This put us out over the ocean with no clouds beneath us.
- The bottom of the cirrus layer was very undefined, but for the most part, it looked

like we were out of the clouds, but we were getting counts on the CAPS display.

- At 17:16:09, a bright halo (22 deg) was seen. There was a faint halo the majority of the time.
- At ~17:12, a halo was seen without any visible clouds between me and the sun.
- On this western leg, we gradually climbed up to stay in the bottoms, and by the time we had turned for the 180, we were at FL 310, where the sky was very attenuated.
- The cirrus layer was much thicker at the western point at 17:25. When we turned to the east, we flew back over the scattered/broken layer at 17:35. A vibrant halo was noted at 17:40:50, sometimes with no clouds visible. Particles were seen to be racing through the colored streaks of the halo.
- Near the end of the east leg, 17:46, the cloud layer had thinned out to nothing, so we turned back west at 17:48.
- We ran this west leg in the middle of the cirrus layer, getting into good cloud at 17:53:40. There were pictures of fall-streaks taken at 17:53:30 that were just off our right wing.

- By 18:02, we were in a very thick part of the cloud, with the sky very attenuated and a cloud beneath us barely visible. Flying at FL 307, a 22 deg halo was present and there was light turbulence in the cloud. By the end of this run, we were at FL 330.
- We started a turn back to the east at 18:21:45 in thick cloud and stayed there until the very end of the line.
- We turned back west at 18:43 and climbed to the top of the clouds, which we got in at 18:53:30, FL 336.
- At 19:05, we were at the mid-point of our east/west line, right on the satellite track. We turned north to follow the satellite the track to find a good place to do some spirals.
- **(Bold text highlights Aqua overpass period) We started a spiral down from FL 350 at 19:11:45. The cloud tops were right at FL 350. At FL 315, the ocean became visible with no clouds beneath us. There was light turbulence again in the cloud.**
- **We came out of the clouds at FL 285, with my eyes and CAPS agreeing on where the bottom was.**
- **We started a spiral up at 19:19:15, and got out of the cloud tops at FL 355 at 19:25.**
- **We descended down to the thickest part of the cloud flew up to the north point. We started a leg from the north point to the south point on the satellite track at 19:32, FL 335.**
- **At 19:41, satellite overpass time, we were at FL 333, in cloud tops and mids over clear ocean water; no clouds beneath us.**
- **At 19:45, concentric halos were seen, with plenty of clouds above us.**
- **The layer then split into two distinct layers, so we opted for the upper layer. By 19:51, the cloud was much thinner, so we descended down to the lower cirrus layer. We got back in the clouds at FL 293, at 19:58:15.**
- We turned back to the north point at 19:59:30, in cloud at FL 286.
- We transited over near Corpus at FL 290. We climbed up to FL 317 to get in the cloud bottoms at 20:23. We soon ran out of clouds heading west, so we turned to the east to find more.
- We got in clouds again at 20:28:20, FL 333. We dropped down to FL 318 to get to the cloud bottoms. The sky was very attenuated, and the ground was clearly visible. There were no clouds beneath us, and no halo initially, but one formed a bit later by 20:43.
- There was light/moderate turbulence around 20:44, still in the bottom of the cloud. Another pilot reported there was light chop at the top of the cirrus layer at FL 370.
- At 20:47, we climbed up to FL 410 to do the MMS maneuvers. The cloud tops were at FL 345.
- After MMS turns, we transited to FL 420 to the west to find cirrus to spiral down through.
- We started a spiral down at 21:16:20, getting into the clouds at 21:19, FL 340.
- We came out of the bottom of the cirrus layer at FL 277, 21:21:10.
- We continued the spiral down to FL 040, into a broken layer of wet, puffy clouds. We penetrated that layer at FL 042, 21:30:55.
- We were in this very thick, wet cloud for about five minutes, and then RTB'd to EFD, keeping the gear down and staying at FL 040 for the whole transit.

Flight Log

Take off	1616 UTC	Landing	2202 UTC
----------	----------	---------	----------

Instrument Failures/Notes/Times

- MMS Box: 20:53:30 – 20:58:58, Mach .502
- MMS Pitch: 20:59:05 – 20:59:45, Mach .499
- MMS Yaw: 21:00:10 – 20:01:00, Mach .499
- Landing gear up right after takeoff, down at 21:16:16

Instruments flown: Full Compliment

Preliminary Instrument Notes:

Appears Good: CIN, MMS, CSI, CPI, NEV, SPP, Harvard TW, Harvard WV, CLH, CIN, VIPS, PIP/2DP
 Problems: JLH – data recorded for first half of flight.

Nav Data Information

- Nav data is uploaded to the MidCix website.

Compiled by Brian Barnett, Jay Mace