

19930827I1-LPS

Mission Summary

930827I Aircraft 43RF

Scientific Crew (43RF)

Chief Scientist	Franklin
Doppler Scientist	Marks
Cloud Physics	
Omega-dropwindsonde	Burpee
Work-station	Griffin

Mission Briefing:

Vortex interaction as in the OPS Plan, 43RF high, 42RF low (8000'), recover in Bermuda. 42RF and 43RF ferry to MIA to pick up the HRD crew and expendables, then conduct full endurance mission in Emily. Aircraft take off from MIA as close to 1800 Z as possible. AF reconnaissance aircraft will arrive on station at ~2330 Z at 5000'. 43RF will coordinate drops with the AF aircraft and 42RF. 42RF is requested to pick up a 2100Z fix for NHC.

Mission Synopsis:

42RF and 43RF arrived in MIA at 1600Z, we briefed at Signature and then took off late—1845-1850Z. Almost immediately 42RF had problems with the TA radar and 42RF had problems with the ODW system, before reaching storm. Repairs were made and we pushed on. Started pattern at 2126Z, 43RF 160 nm W of center and 42RF moving to a position 40 nm N of center (radars working at the time). At 2136Z the ODW system crashed with the first sonde in the air, requiring an 18 min restart time. At 2147Z 42RF started inbound from 40 nm N of center and 43RF was inbound from 50 nm W of center on first coordinated Doppler fig. 4. 42RF TA radar went out shortly there after never to come back up for any extended period until the ferry back to Bermuda. Both aircraft continued with planned pattern hoping the ODWs and 42s TA radar would be repaired.

Excellent radar presentation from 43RF for radar composites and Doppler radar mapping (EVTD). Both drops in the inner core failed or were missed because of problems. Drop 50 nm S of center was marginal, as was the one at 100 nm. 42RF kept to their pattern still hoping for the radar to be repaired. On the leg to point 6, 160 nm SSW of the center James became concerned that we had compromised the experiment because of the sonde failures in consecutive outer legs. 42RF decided to try and orbit outside the storm to repair the radar. Decision was made that if the radar wasn't working and the ODWs any better by the next time of a coordinated fig 4 we would abort the mission. 43RF completed first LF composite and sent it via ASDL. The buffer had to be cleared somewhat to get it out, but it went.

No joy on 42RF TA radar, and despite marginal ODW 160 nm SE of center we decided to end pattern after one more pass through the center for LF composite and EVTD purposes. At 0009 started last run across the eye, 43RF 50 nm SE of center, 42RF 40 nm NE of center. 0020 we hit eye roughly together and both exit out to NW to have 43RF Doppler over C-SCAT swath. Past info to AF aircraft just arriving on station, 42RF last fix was 0017Z: 26° 38"N, 65° 23"W—982mb extrapolated from 8000'. Sent second LF composite on ferry back to Bermuda. Landed in Bermuda at 0136Z.

Evaluation:

We cut our losses after 1/3 of the pattern was completed (point 9) and returned to Bermuda because of numerous ODW failures and the TA radar problem on 42RF. James

Franklin deemed it unnecessary to continue pattern with so many failed drops already. 42RF radar problems cinched the decision. Better to cut our losses and regroup for the next day. Part of the ODW problem may have been operator error. James and Al Goldstein will try to work out a solution to improve ODW performance on the next mission. 42RF radar problems are more of a mystery. The radar started working fine on ferry to Bermuda. Jim Roles thinks it was a radar control unit (RCU) card.

We did have some successes. 43RF transmitted two LF radar composites via ASDL and managed to run VTD on 3 legs with very good success. Not our best performance, but not too bad considering the circumstances - (1) new pattern, (2) first mission of the season, and (3) attempting to do a mission during a deployment ferry. We will evaluate our problems and improve (**I hope**).

Problems:

1. 42RF never had a working TA radar. No data in the storm. Jim Roles thinks it was a radar control unit (RCU) card.
2. 43RF had numerous ODW failures, compromising the flight. Dropped 7 sondes and 5 were failures. Combination of operator error and equipment malfunctions. ODW station is cramped and the position of the line printer is awkward to see (need flashlight). Also felt James should be in the ODW seat because he can then better interact with ODW operator.
3. Some initial ASDL glitches caused the buffers to back up forcing 43RF to request some of 42RFs ASDL buffer slots to clear our buffer. ASDL computer had initial problems talking to HRD workstation which were repaired followed by similar problem with AOC main system. Apparent that 30s data rate for ASDL coupled with radar images and ODW messages push the ASDL communication system near its max capacity and any little glitch can cause it to real gum up the works.
3. We had some problems with the pickup in MIA that will also need to be evaluated. We need to improve briefing. Brief should start with important details for pilots and Navs, then leave them to file flight plans, while scientists and flight directors deal with mission specifics and data requirements. We delayed filing time, and subsequent departure time because the brief was too detailed for everyone. Also, someone on 42RF shut down the INE, which caused a long delay on takeoff.

Frank Marks

Hurricane Research Division

CHIEF SCIENTIST CHECKLIST

Date: <u>27 Aug. 1993</u>	Aircraft IDs: <u>42RF, 43RF</u>
Proposed Takeoff Time: <u>1800 UTC</u>	Base of Operations: <u>MIA</u>
Primary Mission: <u>Vortex Interaction</u>	Alternate Mission: <u>N/A</u>
Scientific Crew:	
<i>42RF</i>	<i>43RF</i>
Ch. Scientist: <u>Gamache</u>	<u>Franklin</u>
Doppler Sci.: <u>M. Black</u>	<u>Marks</u>
Doppler Op: <u>DeMaria</u>	
Cloud Phys: _____	
Others: <u>Paylor (UMASS)</u>	<u>Burpee (ODW)</u>
Others: _____	<u>Griffin (workstation)</u>
Others: _____	
Others: _____	
Others: _____	

Mission Briefing (including proposed flight pattern numbers):

Vortex interaction as in the OPS Plan, 43RF high, 42RF low, recover in Bermuda
 Numerous problems- 42RF never had a working TA radar, 43RF had numerous
 ODW failures, compromising the flight. Hence, we cut our losses after 1/3 of the
 pattern was completed (point 9) and returned to Bermuda. We did have some
 successes though. We transmitted 2 LF radar composites via ASDL and managed to
 run VTD on 3 legs with very good success. Not our best performance, but not too
 bad considering the circumstances - new pattern, 1st mission this season, and stretch
 for mission during deployment ferry. We will evaluate our problems and improve
 (I hope). We had some problems with the pickup in MIA that will also need to be
 evaluated.

SIGNATURE Frank Marks

Hurricane Research Division
LEAD PROJECT SCIENTIST CHECKLIST

Flight Number: 930827I

Date: 27 Aug. 1993_____

Aircraft ID: 43RF

Proposed Takeoff Time: 1800 UTC

Base of Operations: MIA

Primary Mission: Vortex-Interaction

Alternate Mission: N/A

Flight Crew:

Scientific Crew

AOC Crew

Designated Ch. Sci: Franklin

Flight Director: Bogert

LPS: Franklin

AC Commander: McKim

Omega-Dropwindsonde: Burpee

Pilot: Player

Doppler Sci.: Marks

Data Tech: Lynch/McMillan/Prada

Doppler/Sonde Operator: _____

Sys Engineer: Goldstein

Cloud Phys. Sci.:_____

HF Radio: San Souci

Specialist: Griffin

Navigator: Kozak/Rathbun

(Circle one: WPL Radiometer, SRA, workstation)

Other Scientific Crew, Observers, and Visitors:

Name

Function

Name

Function

McFadden

Airborne Mission Coordinator:

Location: MIA

Mission Briefing (including proposed flight pattern numbers):

Vortex interaction out of MIA with recovery in Bermuda. 43RF is the high plane and 42RF is the low plane. Lots of problems with ODWs. we launched 7 and 5 failed, severely compromising the mission. Because of 42RFs radar problems (they never got the TA radar working) we decided to abort mission 1/3 of the way through. Excellent success with ASDI radar transmission-2 were sent to NHC, after some initial ASDL glitches caused the buffers to back up.

Mission Summary:

Takeoff Time: 1852	UTC	Landing Time: 0136	UTC	Location: Bermuda
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Official Mission Duration: 9.8h (includes ferry from MacDill) (from Flight Director)

Tapes Utilized: *Data Sys:* 1 *Radar:* 6 *Cloud Phy:* 1 DAT *Gust Probe:* _____

Dropsonde: _____

Number of Sondes Dropped: 7, 1 LOD2 Sonde Failures: 5

SIGNATURE Frank Mendis

AIRBORNE CHIEF SCIENTIST LOG

Flight Number: 930827I

Date: 27 August 1993

Aircraft ID: 43RF

Scientist: Marks

Event Log

Time (UTC)	Position (Lat, Lon)	Comments
20:06:32	26 1.3, -74 17.0	checking the formats for time - TO 1852 UTC
20:08:02		running radar tape to get data for Wen Chau's algorithm
20:32:20	26 12.5, -72 6	42RF TA having problems, 43RF ODW having troubles as well. We are going to replace some cards on the ODW, while 42 tries to shut down radar system to cool it off
20:50:47	26 22, -70 34	43RF ODW all fixed, 42 still has radar problems. Will keep 42 in the air if possibility the radar system can be repaired by the time of second coordination point. Otherwise do single plane mission with 43RF and 42RF go direct to Bermuda to fix radar and be ready for tomorrow.
21:17:38	26 29.4, 68 20	picked up the eye at the 200 nm range due east of our position, 42RF has their radars working as well. UNBELIEVABLE!!
21:26:01	26 30, 67 34	first ODW (ch 1) at 160 nm mark
21:37:04	26 30.0, 66 42.1	ODW system failure need to restart (18 min)
21:47:33	26 29.8, 65 50	42RF starting inbound, we are at 50 nm nice radar presentation spiral to a hook open to ENE majority of precip on N side of spiral-real pretty!!!
21:53:18	26 29.9 65 18.6	entering west eyewall chop nice smooth undulation ODW up and we can drop in 5 min (LOD@ dropped at 50 nm ring, 42 had 85 kts at 8000'
21:57:31	26 29.9, 64 56	passed wind center at 6 km
21:59:50	26 29.9, 64 42.6	SE corner had good cell with nice up downdraft couplet, couldn't see PMS but would be nice data set to look at. taalking to TEAL 16
		26 34, 64 47 center at 8000' good, xtrap 983 mb
22:08:48	26 30, 63 55.6	turn TK 317 to pt 50 nm N of center go to FA CON and ODW drop
22:18:48	27 09.7, 64 38.9	just passed along NE edge of the principle band, pretty bumpy, ASDL is fine
22:22:39	27 24.4, 64 56.3	tk 180 no ODW
		42 RF fix at 8000': 2229 26 34, 65 05
22:34:01	26 34.9, 65 10	over top of surface swirl in eye
22:43:50	25 46.7, 65 15	turn TK 220, F/A CON, ODW (ch 2)
23:09:13	24 13.2, 66 37.3	turn TK 090 160 nm from center
23:41:27		turn TK 330
		James feels ODW failures have compromised the outer pattern, he recommends we stop dropping and find out if 42RF can get Doppler up for one fig 4 and then head to Bermuda. If not we just finish our penetration for VTD and head for the barn
23:55:31	25 14.9, 64 16	At our point 8 (~0005 UTC) we will make our decision - 50 nm SE from center
00:04:40	25 53.1, 64 45.5	pearl on SE edge of anvil
00:09:41		end pearl TK to NNW (030)

SIGNATURE Frank Marks

27 August 1993

page 2

AIRBORNE CHIEF SCIENTIST LOG

Flight Number: 930827I

Date: 27 August 1993

Aircraft ID: 43RF

Scientist: Marks

Event Log

00:18:41	26 34, 65 00	passing inside SE eyewall, little choppy big cell cut off in the eye eye open to S 42RF fix at 8000' 0017Z: 26 38 65 23 982mb xtrap. 42RF has no luck with TA will follow us out to NW for Cscat intercomparison leg, tehn back to Bermuda
00:31:23	27 29.3, 65 37.6	at pt 9 cut and run for Bermuda
		land at Bermuda

SIGNATURE

Frank Marks