Lead Project Scientist

Flight ID 121027H2 **Storm** Sandy **LPS** Ryan

Preflight

- ✓ 1. Participate in general mission briefing.
- ✓ 2. Determine specific mission and flight requirements for assigned aircraft.
- ✓ 3. Determine from AOC flight director/meteorologist whether aircraft has operational fix responsibility and the mission designation.
- ✓ 4. Contact HRD members of crew to:
  a. Assure availability for mission.
  b. Review field program safety checklist
  c. Arrange ground transportation schedule when deployed.
  d. Determine equipment status.
- ✓ 5. Meet with AOC flight director and navigator at least 3 hours before take-off for initial briefing.
- ✓ 5. Meet with AOC flight crew at least 2 hours before take-off for crew briefing. Provide copies of flight requirements and provide a formal briefing for the flight director, navigator, and pilots.
- ✓ 6. Report status of aircraft, systems, necessary on-board supplies and crews to HFP Director.
- ✓ 7. Before take-off, brief the on-board GPS dropsonde operator on times and positions of drop times.
- ✓ 7. Make sure each HRD flight crew member has a life vest.
- ✓ 7. Perform a headset operation check with all HRD flight crew members. Make sure everyone can hear and speak using the headset.

In-Flight

- ____ 1. Confirm from AOC flight director that satellite data link is operative.
- ____ 2. Confirm camera mode of operation.
- ____ 3. Confirm radar recording set-up.
- ____ 4. Confirm data recording rate.
- ____ 5. Complete Lead Project Scientist Form.
- ____ 6. Check in with the flight director to make sure the mission is going as planned (i.e. turns are made when they are supposed to be made).

Post flight

- ____ 1. Debrief scientific crew.
- ____ 2. Gather completed forms for mission and bag separately from other missions. Turn in to data manager at HRD.
- ____ 5. Copy serial flight data, dropsonde files, and radar data onto thumb drive. Turn in with completed forms.
- ____ 6. Report landing time, aircraft, crew, and mission status along with supplies (tapes, *etc.*) remaining aboard the aircraft to HFP Director.
- ____ 7. Determine next mission status, if any, and brief crews as necessary.
- ____ 8. Notify HFP Director as to where you can be contacted and arrange for any further coordination required.
- ____ 9. Prepare written mission summary using **Mission Summary** form.

Lead Project Scientist Check List

Storm or Project Hur Sandy **Experiment name** TDR
Date 10/27/12 **Aircraft** N42RF **Flight ID** 121027H2
Mission ID

A. Participants:

HRD		AOC	
Function	**Participant**	**Function**	**Participant**
Lead Project Scientist	Rogers	Flight Director	Williams
Radar	Gamache	Pilots	Nelson, Sweeney, Merlin
Dropwindsonde	Gamache	Navigator	Sloane
Sea-Air	Rogers	Systems Engineer	
			Peek
Photographer/Observer/ Guests (give affiliation)		Data Technician	
			Smith
Cloud Physics		Electronics Technician	Lynch
		Other ( )	

B. Take-off and Landing Times and Locations:

Take-Off: 2000 UTC Location: KMCF
Landing: 0316 UTC Location: KMCF

Number of Eye Penetrations: 4

C. Past and Forecast Storm Locations:

Date/Time	Latitude	Longitude	MSLP	Maximum Wind

E. —Equipment Status (Up ↑, Down ↓, Not Available —, Not Used **O**)

Equipment	Pre-Flight	In-Flight	Post-Flight	Number of Expendables
Radar/LF	✓			
Doppler Radar/TA	✓			
Cloud Physics	✓			
Data System	✓			
GPS sondes	✓			
AXBT/AXCP	✓			
Ozone instrument	—			
Cameras				
Other ( )				

D. Mission Briefing: Fly TDR mission into Hurricane Sandy, which had weakened to tropical storm status this morning but has since reintensified to minimal hurricane status due to a burst of convection near the circulation center. Fly rotating-fig 4 pattern, IP on S side, leg lengths of 105 nm. End up on NW side, consider extending outbound leg to ~120-130 nm to better sample precipitation and wind field on coastal side. Fly at 12,000 ft, drops GPS sondes at all ext and mid pts, BT's also at all these points. GPS only on first and last center passes.

Sandy continues to struggle with very dry air around the south and east sides, primary precipitation band is at a large radius on the NW side. Shear also impacting system. Cold front is approaching the storm from the west, which is likely going to trigger more significant rain in advance and to west of storm.

Lead Project Scientist Event Log

Date 10/27/12 **Flight ID** 121027H2 **LPS** Rogers

Time	Event	Position	Comments
2000	takeoff	KMCF	
2114	obs	55 nm from IP	Can see crescent feature
2124	pattern	105 nm S, at IP	
2124	drop 1, BT	endpt S	FL 29, SF 21, SST 26
2132	obs	inbound from S	all stratocu below, blue
		skies above, glaciated cumul ahead	
		about 50 nm probably assoc. with	
		convection around NW side of overall	
2136	drop 2, BT		FL 19, SF 13 m/s, SST —
2140	drop 3	center	~958 mb, peak FL
	ASPEN press	959, sfc wind 15 m/s	30 m/s, SF 25 m/s on S side
2145	obs	outbound on N side	on inbound leg noticed
		extrap SLP	was low (<960), thinking we
		passed over	or just to left of low-
		level center	on inbound; consistent w/ storm
		whose FL center tilts to N from sfc	
2152	drop 4, BT	midpt N	FL 17, SF 21 m/s, SST 25
2203	obs	near endpt N	peak FL & sf winds on
			S side of EW, ~10 m/s diff.
			at FL
2204	drop 5, BT	endpt N	FL 20, SF 18 m/s, SST
2220	pattern	inbound leg	complicated radar structure
		on LF, "eyewall" convection	
		and then multiple bands out to	
		NW about 20-30 nm NW, we've	
	flying	just outside it; we're flying outside multiple	
	bands → took them turn to left to better sample precip		

30° 11'
75° 09'
2140 UTC
03/28/12

Lead Project Scientist Event Log

Date 10/27/12 **Flight ID** 121027H2 **LPS** Rogers

Time	Event	Position	Comments
2233	pattern	105 nm W endpt	setting up for next inbound leg
2237	drop 6, BT	100 nm W endpt	FL 19, SF 17, SST 26
2245	obs	midpt W	pretty choppy here, going from precip band along W eyewall at 55 nm
2247	drop 7, BT	midpt W	FL 30, SF 20 m/s, SST 26
2257	obs	eye	peak FL 34 m/s, SF 22 m/s on W side, broad circulation
2259	drop 8	center	PSURF ~962
2312	drop 9, BT	midpt E	FL 20 SF 18 m/s SST —
2320	obs	near endpt E	looking at analysis from middevel inflow peak on N side,
	First S-N pass, good coverage, see around 4-6 km, sharp return flow above about 8-10 km, inflow appeared to descend		
2320	pattern	endpt E	turn for 2nd fig. 4
as you look radially inward; almost looked like rear inflow jet; consistent w/what looked like strat. prec. on ref. drove of strong W just taking inner edge of secondary eye,			
2324	drop 10, BT	endpt E	FL 20, SF 23 m/s, SST 26
	and narrow band of higher wind speed consistent		
	w/all these features, all seems internally consistent		
2336	pattern	endpt NE	turn to track 225, begin inbound
2337	drop 11, BT	endpt NE	FL 19, SF 20 m/s, SST 25.5
2346	obs	near midpt NE	peak FL about same from W to E, ~34 m/s, SF about same
			same too, ~25 m/s
2346	drop 12, BT	midpt NE	FL 22, SF 22 m/s, SST 25.5
2359	drop 13	center	PSURF 959, sonde 960.2

30°23', 74°55', 2300Z 034/10

2359Z 30°32', 74°46', 050/12

Lead Project Scientist Event Log

Date _____ **Flight ID**_____ **LPS** _____

Time	Event	Position	Comments
0010	drop 14, BT	midpt SW	FL 28, SF 19 m/s, SST 22
0021	drop 15, BT	endpt SW	FL 25, SF 17, SST 23 (spotty)
0027	obs	downwind leg to SE	radar analysis from W-E pass shows mid level inflow
	low-level outflow	on W side, low-level inflow mid level	
	outflow on E side, SHIPS diagnoses	850-200 hPa shear	
	at 205° at 40 kt, putting wing	in upshear left, E	
	leg in downshear	right quad → quite consistent w/ Dopp	
	composites of radial flow variations	in high-shear storms	
0052	drop 16, BT	endpt SE	FL 30 SF 16 m/s, SST 25.5
0105	drop 17, BT	midpt SE	FL 27, SF 23, SST
0107	obs	past midpt SE	on downwind leg on S side
		of storm	saw strongest FL
		winds, ~35 m/s	
0114	drop 18, BT	center	PSURF 960, SST 25
0117	obs	outward to NW	precip pattern has
		from center	been spiral; convective
		case near center on NW side, then	
		spiraling around to N, E, then SE	
0126	drop 19, BT	midpt NW	FL 22, SF 17 mi, SST
0132	obs	near endpt NW	Doppler analysis from
		NE-SW	shows vortex pretty
		aligned b/w 1 & 4 km, above 5	
		km starts	to tilt toward NW
0141	drop 20, BT	endpt NW	FL 23, SF 17 m/s, SST 25
0145	obs	outside NW	peak winds on S side
0146	drop 21, BT	outside NW	FL 22, SF 16 m/s, SST 26
0316	landing	land, myrtle	

DL
UL DR
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Mission Summary
Storm name
YYMMDDA# Aircraft 42RF

Scientific Crew (42RF)
Lead Project Scientist Rogers
Radar Scientist Comache
Dropwindsonde Scientist Comache
Sea-Air Scientist Rogers
Cloud Physics Scientist
Observers

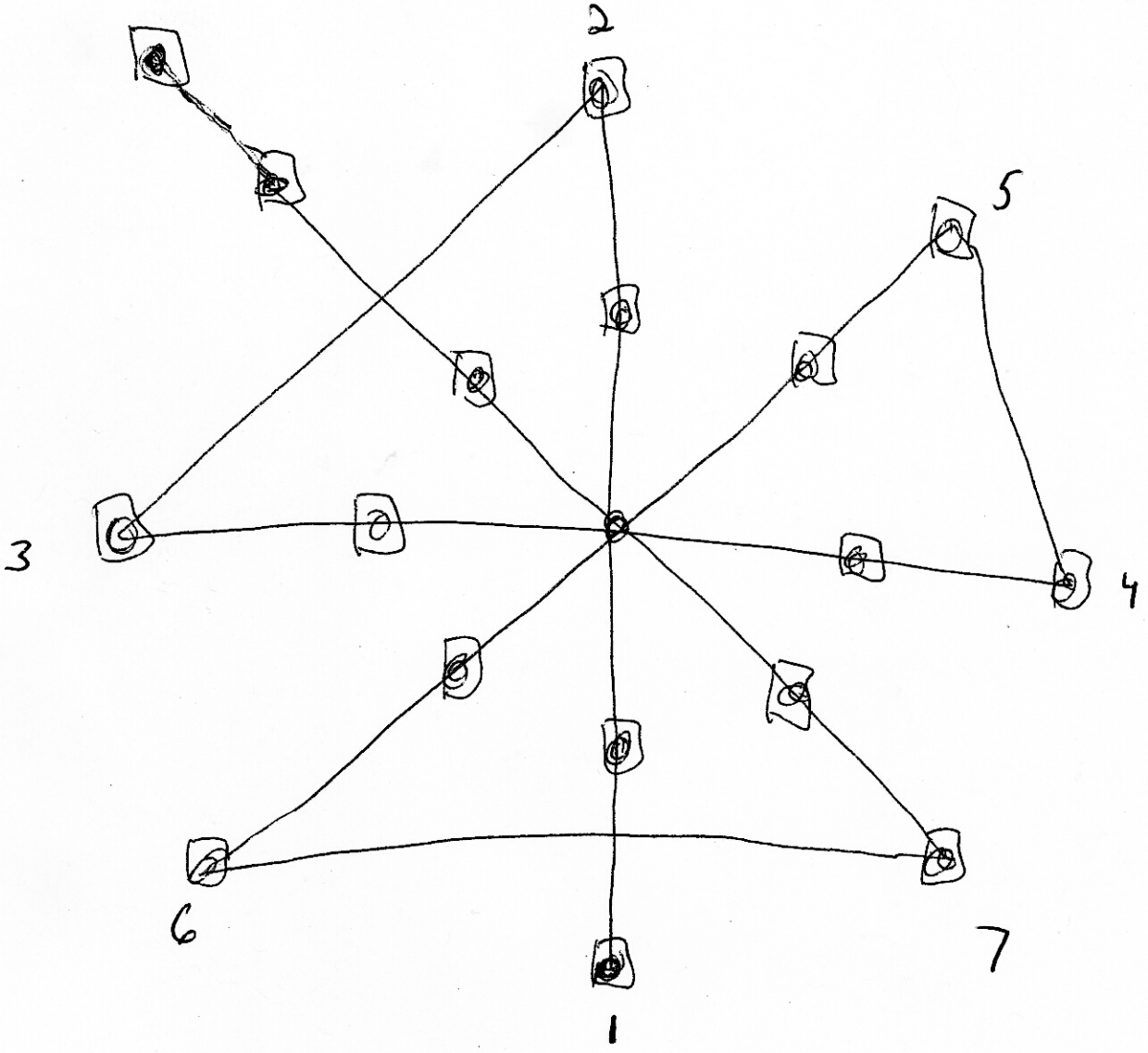
Mission Briefing: (include sketch of proposed flight track or page #)
See previous

Mission Synopsis: (include plot of actual flight track)
flew pattern exactly as planned. Storm experiencing strong shear from SW, dry air. Precip was spiralled around - head of spiral had low-level center, then banded precip on NW side w/ 2 convective bands separated by ~ 20 nm, wrapping around NE, E, & SE sides while spiraling outward. Storm seems better organized, at least in terms of precip coverage and vortex alignment. Vertical x-sects showed clear pattern of sheared vortex from W-E; other passes showed vortex well aligned up to ~4 km, tilting above 5 km toward N (3rd) and aligned up to 7 km on 4th pass; strongest winds on S side, not NW side

Evaluation: (did the experiment meet the proposed objectives?)
Experiment was successful. Good dataset collected, with good Doppler coverage revealing many interesting features including vortex in shear, possible realignment.

Problems:(list all problems)
all sondes worked, most BT's worked.
No major problems. About 20% of BT's did not work.

Expendables used in mission:
GPS sondes : 21
AXBTs : 18
Sonobuoys: ~



○ - GPS sonde

□ - AXBT