Lead Project Scientist

Storm or Project Michael **Experiment type** TDR
Flight ID 18100911 **Mission ID** 0914A

Preflight

✓ 1. Participate in general mission briefing.

✓ 2. Determine specific mission and flight requirements for assigned aircraft from the Field Program Director.

✓ 3. 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.

✓ 4. Meet with AOC flight director and navigator at least 3 hours before take-off for initial briefing.

✓ 5. Determine from AOC flight director the mission designation and whether aircraft has operational fix responsibility.

✓ 6. 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.

✓ 7. Report status of aircraft, systems, necessary on-board supplies and crews to Field Program Director.

✓ 8. Before take-off, brief the on-board GPS dropsonde operator on times and positions of drops.

✓ 9. Make sure each HRD flight crew member has a life vest.

✓ 10. 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 (information).

✓ 2. Confirm camera mode of operation.

✓ 3. Confirm data recording rate.

✓ 4. Request AOC flight director to leave radar in non-sector mode for initial Figure 4.

✓ 5. Once at IP, request AOC flight director adjust radar tilt to minimize sea clutter.

✓ 6. Complete Lead Project Scientist Form.

___ 7. Check in occasionaly 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 turn in to data manager at HRD.

___ 3. Obtain a copy of the Dropsonde raw and processed files from the AVAPS operator on thumb drive.

___ 4. Obtain a copy of the radar LF files from the radar technician on thumb drive.

___ 5. Obtain a copy of the tar'ed radar TA files from the radar scientist on thumb drive.

___ 6. Obtain a copy of serial flight data and raw NetCDF file on thumb drive from the data technician.

___ 7. Obtain a copy of SFMR data on thumb drive from the data technician.

___ 8. Obtain a copy of DMT data on thumb drive from the data technician.

___ 9. Report landing time, aircraft, crew, and mission status to the Field Program Director.

___ 10. Determine next mission status, if any, and brief crews as necessary.

___ 11. Prepare written mission summary using **Mission Summary** form.

Lead Project Scientist Check List

Storm or Project Hurr Michael **Experiment name** TDR

Flight ID 18l009Hl **Mission ID**

A. Participants:

HRD		AOC	
Function	**Participant**	**Function**	**Participant**
Lead Project Scientist	Rogers	Flight Director	Sears
Radar/Workstation	Hazelton	Pilots	Kibbey, Abitbol, Kahn
		Navigator	Richards
Cloud Physics		Systems Engineer	Peet
		Data Technician	Richards
Dropwindsonde	Sellwood	Electronics Technician	Paul
AXBT/AXCP	James (UM)	Other	
Photographer/Observers/Guests			

B. Take-off and Landing Times and Locations:

Take-Off: 0750 UTC Location: KLAL

Landing: 1537 UTC Location: KLAL

Number of Eye Penetrations: 5

C. Past and Forecast Storm Locations:

Date/Time	Latitude	Longitude	MSLP	Maximum Wind

D. Mission Briefing: Conduct TDR mission into Hurricane Michael, an 80-kt hurricane in the SE Gulf. Michael is experiencing some westerly shear (moderate), and is currently steady-state, though it has strengthened 50 kt in ~36 h up to now. Large eye has not cleared out. Repeated convective bursts evident in eyewall, developing downshear and wrapping around upshear side. Fly stated Fig-4, IP on NSide, and on SE side. 105 nm leg lengths. Drop sondes at end, mid, RMW points, plus center. Drop BTs on 10 w/ sondes at all end, mid points. Drop CPs outside RMW at 6 radials (not S and W). Drop CTDs on 1st and 3rd inner pass. If opportunity arises for CB module after pattern complete. Fly at 8000 ft pressure.

Storm or Project Michael **Experiment name** TDR

Flight ID 18100944 **Mission ID** _____

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

Equipment	Pre-Flight	In-Flight	Post-Flight	# DATs / CDs /Expendables/ Printouts
Radar/LF	✓			
Doppler Radar/TA	✓			
Cloud Physics	✓			
Data System	✓			
GPS sondes	✓			
AXBT/AXCP	✓			
Ozone instrument				
Workstation				
Cameras	✓			

REMARKS:

Lead Project Scientist Event Log

Date 10/9/18 **Flight ID** 18EP09 HC **LPS** Rogers

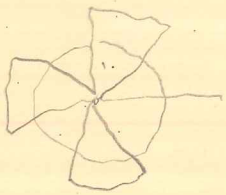
Time	Event	Position	Comments
0750	takeoff	KLAL	takeoff
0838	obs	near IP	IR imagery shows reported CB development, initiating on WNW side, moving out on N, NW, SW sides; classic CB initiation and evolution in moderate shear
0839	drop 1, BT 1	at IP, 105 nm N of center	FL 25, SF 20 m/s some chaff
0852	drop 2, BT 2	just outside midpt	dropped a little outside midpt, b/c it was just outside convection; sample a little inflow; FL 30, SF 20-25 m/s
0858	obs	inbound from N	in precip, all start fixes here
0903	cp 1	outside eyewall N	
0906	drop 3	N RMW	FL 45, SF 40 m/s
0911	obs	in eye	eyewall looks open on W side
0912	drop 4, CTD 1	24° 9' 85° 59'	center mark
0916	drop 5	S eyewall	FL 40, SF 30 m/s
0918	BT 3	S eyewall	
0923	drop 6, BT 4	S midpt	FL 30, SF 20 m/s
			25.5 C SST, in the cold eddy. Could explain why bursts are initiated, but then do not persist around storm; reduced θe
0940	drop 7	S endpoint	FL 20, SF 15 m/s
0943	obs	on downwind leg	on upshear side, perhaps VSR; limited precip, perhaps some Cu on NW side of plane, but trait's limited too

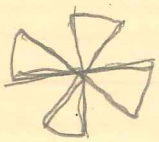
Lead Project Scientist Event Log

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

Time	Event	Position	Comments
1012	obs	near E endpoint	on DS side, good
			deep; mostly strat, though
			some stubby Cu here from
			tail sweeps
1014	drop 8, BT5	E endpt	FL 25, SF 20 m/s
			27.9 SST
1024	obs	inbound on E side	widespread strat precip,
			some shallow/moderate convection too
1027	drop 9, BT6	midpt E	FL 40, SF 30 m/s
1032	CP2	outside E eyewall	
1036	drop 10	E eyewall	peak FL 50, SF 48 m/s
1040	drop 11, center	24 25' 86 05'	min extrap SLP 968
1044	drop 12, BT7	W eyewall	FL 55, SF 25 m/s, 28.3 SST
1046	obs	W side outside	nearly devoid of precip
		eyewall	here, except perhaps
			for anvil
1057	drop 13, BT8	W midpt	FL 15, SF 12 m/s, 28.8°
1105	drop 14, BT9	W endpt	FL 12, SF 12 m/s, 28.7°
1120	drop 15, BT10	SW endpt	FL 15, SF 12 m/s
1120	obs	SW endpt	radar analysis show
			altitude of peak w high, above 12 km;
			on upshear side; south (USR) side
			of storm; some more CB development
1132	drop 16, BT11	SW midpt	FL 25, SF 20 m/s;
			eyewall still open on SW
			side;
1139	CP3, drop 17	SW eyewall	after peak wind, peak wind
			was 38, SF 32 m/s

24.5/85.6





Lead Project Scientist Event Log

Date 10/9/18 **Flight ID** 18100911 **LPS** Rogers

Time	Event	Position	Comments
1141	center drop 18, sfc 02	24°32' 86°10'	28.0°C
1146	drop 19	NE eyewall	FL 45, SF 35 m/s
1148	CP4	outside NE eyewall	
1150	obs	near NE midpt	strongest winds so far on E side, mostly strat here
1155	drop 20, BT 12	NE midpt	FL 35, SF 25 m/s
1208	drop 21, BT 13	NE endpt	FL 25, SF 15 m/s
1243	drop 22, BT 14	NW endpt	FL 22, SF 12 m/s, 29.0C
1259	drop 23, BT 15	NW midpt	FL 25, SF 20 m/s
1309	drop 24, CP 5	NW eyewall	FL 45, SF 38 m/s (peak)
1313	drop 25, center	center, 24°46' 86°06'	
1317	drop 26	SE eyewall	FL 50 SF 38 m/s
1324	CP 6	outside SE eyewall	
1332	pattern	on SE leg	Going to do a modified CB module, start end of outbound leg, go downwind to 105 nm/090, then inbound to center, then outbound track 045 to 105 nm, then home; IR sondes at mids, reg. at eyewall,
1343	drop 27	SE endpoint	FL 25, SF 12 m/s BT Combo in NE eyewall
1402	pattern	E side ~20 nm out	begin CB module, track 270
1411	drop 28	E midpt, CB module	FL 37, SF 24 m/s
1414	obs	in CB module	extensive strat, limited vertical extent, no clouds above 10 km
1417	drop 29	E eyewall	FL 50, SF 40 m/s, getting brighter in eye
1424	center	24°54' 86°16'	
1430	drop 30, BT 16	CB module, NE eyewall	
1434	obs	in NE	still mostly strat, some echoes (convection),
1445	drop 31 (IR sonde)	NE midpoint	getting to 14 km
1452 end pattern			

Mission Summary

Storm name

YYMMDDA# Aircraft 43RF

Scientific Crew (4 RF)

Lead Project Scientist Rogers

Radar Scientist Hazelton

Cloud Physics Scientist

Dropwindsonde Scientist Sellwood

Boundary-Layer Scientist James (UM)

Workstation Scientist

Observers (affiliation)

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

See previous

Mission Synopsis: (include plot of actual flight track) Flew mission as planned, plus added a convective burst module. At end of outbound leg to SE, went downwind to a point ~90 nm E of center, then inbound to center, then outbound track 045 for 105 nm. Dropped sondes at mid and eyewall points on E, NE legs; IR sonde at mid on NE. Dropped BT for combo in NE eyewall.

Evaluation: (did the experiment meet the proposed objectives?) Mission was a great success. Flew 4 passes for EMC, plus 5th pass for HRD (CB module). Storm is steadily intensifying even though it's asymmetric. Asymm. may be reducing, though, as repeated cycles of CBs develop DSL, wrapped around DSL and onto west (upshear) side, presumably moistening mid levels as it progs around. Shear may be reducing too, and higher OHC/SST environment also promoting deeper convection. Tilt also reduced to <5 nm. Looks like this storm could be on the verge of an RI event. Strong updrafts apparent on upshear side inside RMW.

Problems:(list all problems)

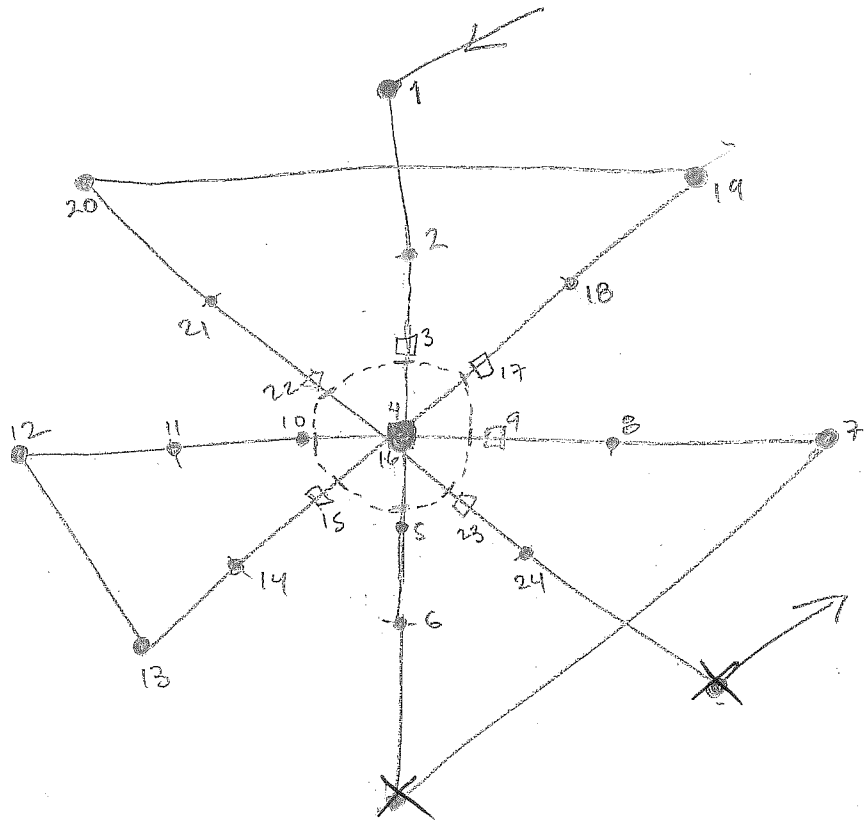
No problems w/ the mission.

Expendables used in mission:

GPS sondes : 32

AXBTs : 16

Sonobuoys: 6 CP, 2 CTDs



- BT 16 (6+10$_D$)
- CP 6
- CT 2

Total 24