

K. Ryan

## Lead Project Scientist

Storm or Project Michael Experiment type EMC-TDR  
Flight ID 20181008W1 Mission ID ALI4

### 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 occasionally 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 Michael Experiment name Ocean-UM TDR-EMC  
 Flight ID 2018100841 Mission ID AL14

## A. Participants:

HRD		AOC	
Function	Participant	Function	Participant
Lead Project Scientist	<u>Ryan</u>	Flight Director	<u>Holmes</u>
Radar/Workstation	<u>Cione</u>	Pilots	<u>Price Mitchell</u> <u>Rossi</u>
		Navigator	<u>Freeman</u>
Cloud Physics		Systems Engineer	<u>Green</u>
IWRAP	<u>Sapp</u>	Data Technician	<u>Mascaro</u>
Droptwindsonde	<u>Wadler</u>	Electronics Technician	<u>Mac</u>
AXBT/AXCP	<u>Stevens</u>	Other	<u>AVAPS</u> (McAlister)
Photographer/Observer	<u>Stevens</u>		
s/Guests			

## B. Take-off and Landing Times and Locations:

Take-Off: 2002 UTC Location: Lakeland  
 Landing: 0252 UTC Location: Lakeland  
 Number of Eye Penetrations: 3

## C. Past and Forecast Storm Locations:

Date/Time	Latitude	Longitude	MSLP	Maximum Wind kt
2100Z	22.2	85.2	978 AF	70
9/1600Z	23.7	85.7		85
9/1800Z	25.7	86.4		95
10/0000Z	27.9	86.6		105
10/1800Z	30.2	85.8		100

NE quad not sampled! (Cuba)  
 update 7pm (75kts)

## D. Mission Briefing:

Plan: Ocean survey + (TDR butterfly + ocean winds) → for details see attached @ end  
 @ 8kft @ 10kft or 8kft depends on AF/Cuba

Michael upgraded to 65kt hurricane this morning & continues to deepen. @ 10kft Eye is becoming visible via satellite; cold cloud tops near center. All outflow has been improving, but smudges over W side of storm. VWS = moderate, SSTs = warm, however steep gradient between Vautan; obvious inner core (T). Forecast calls for RI to Major in next 24hrs; SHIPS: 60% RI; landfall NE gulf coast.

Storm or Project Michael Experiment name TOR

Flight ID 2018100841 Mission ID AL14

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	↑	went ↓ 2x	↑	
Doppler Radar/TA	↑	↑	↑	
Cloud Physics	↑	↑	↑	
Data System	↑	↑	↑	
GPS sondes	↑	↑	↑	
AXBT/AXCP	↑	↑	↑	
Ozone instrument	—	—	—	
Workstation	↑	went ↓ 2x	↑	
Cameras	↑	↑ until sunset	↑	

REMARKS:

Sondes : all 94s

SFMR: no SST data → using previous data to estimate RESOLVED

~~REMARKS~~

All workstations crashed 2x (except ~~C3~~ C3x)

00:45Z & 0115Z

~~REMARKS~~



Mascaro & Green says its MMR



Resolved upon landing

# Lead Project Scientist Event Log

Date \_\_\_\_\_ Flight ID 20181008H4 LPS Ryan

Time	Event	Position	Comments
2002	take off		- impressive satellite representation
	IP - OHC		
2050	freefall BT	GOM 1	- Scattered showers/T-storms.
			- paralleling some convection & adjusting drops
			- visible white caps on surface ~35kts
			- 28.92 SST
	<del>XXXXXXXXXX</del>	GOM 2	-
2055	↑ CP CP2		
2101	<del>XXXXXXXXXX</del>		Set 5 for weather * CP
2106	<del>BT</del>	↑ GOM 3	- 29.2 SST
		→ GOM 4	
2107	<del>BT</del> CT	GOM 5	
2112	<del>BT</del> CP	GOM 6	
2118	CP	GOM 7	
2123	CP	GOM 8	
2129	<del>XXXXXXXXXX</del>	GOM 9	
2134	CP CT <del>XXXXXXXXXX</del>	GOM 9	I launched this one!
2144	BT/sonde	GOM 10	

2100Z  
CARCAH: ~~000~~  
22.8 N  
85.4 W  
350 @ 9kts  
for 00Z

# Lead Project Scientist Event Log

Date \_\_\_\_\_ Flight ID \_\_\_\_\_ LPS \_\_\_\_\_

Time	Event	Position	Comments
2153	CP	<del>XXXXXXXXXX</del>	
		GOM 11	
2202	CP	GOM 12 <del>XXXX</del>	
2210	CT	GOM 13 <del>XXXX</del>	
2220	BT/sonde	GOM 14 <del>XXXX</del>	
2229	CP	GOM 15	
2239	BT/sonde	GOM 16 <del>XXXX</del>	
2254	climbing to 10 kft for storm (ATC issues)		
2250	IP/combo	N and	SPMR 41 kts FL 50 kts
	<del>XXXX</del>		
2304	COMBO	mid 1 N	SPMR 43 kts FL 55 kts
2306			SPMR 50 kts FL 57 kts

SST 28.6

\* Seeing TDR return ~17-18 km!

# Lead Project Scientist Event Log

Date \_\_\_\_\_ Flight ID \_\_\_\_\_ LPS \_\_\_\_\_

Time	Event	Position	Comments
2313		N eyewall	SPMR <del>75</del> 75 kts FL 89 kt SST 27.1
		eye	- spiral clouds below - can see some sky - eyewall open to South
2319	center fix	22°30' N 85°14' W	971 mb * asym. eyewall → strongest on W side
2330	RMW combo <del>SPMR</del>	S eyewall	SPMR 65 kts FL 85 kts SST 28.8
			- sonde did not hit surf
	SE-NW leg ↓ * end point sonde just beyond Cuba		* TDR return ~ 14 km ! clearance?
		SE end	FL 83 kt
		mid center	
0015	22°44' N 85°11' W	combo	973 mb

asym eyewall; well organized  
0018

enough time for back

# Continuing log

- \* now, lots of probs, data & science lost power  
lost TOR/MMR display;
- \* Crew miscounted BTS so final leg only has 4  
(1 put halfway between NW end & SW end)

Observer's Flight Track Worksheet

Date \_\_\_\_\_ Flight \_\_\_\_\_ Observer \_\_\_\_\_

0054

SW end combo

SST 28.5

0106

SW mid combo

0114

center 972.2

27°54'N  
85°20'W

(972mb)

0118

VMW sonde

eyewall super asymmetric

SPL 78kts

SPL 77kts

sonde: 74kts @ 100°

↓ strongest precip  
SE side  
NW side

\* early & not enough  
time to backup because  
lost workstations AGAIN  
→ MMR problem

Latitude (°)

NE mid combo

SPL 88kts

→ sonde fail (SPL 60kts)

0138

NE end sonde

0144

Still 40kts (SPL) at surface

Longitude (°)

23.88 N  
83.33 W

## Mission Summary

### Storm name

YYMMDDA# Aircraft 42RF

### Scientific Crew (4 RF)

Lead Project Scientist Ryan

Radar Scientist Cione

Cloud Physics Scientist \_\_\_\_\_

Dropwindsonde Scientist Wadler

Boundary-Layer Scientist \_\_\_\_\_

Workstation Scientist \_\_\_\_\_

Observers (affiliation) Stevenson (NHC)

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

- See attached track
- 2 part mission: ① ocean survey ② TDR-EMC tasking (90nm)
- may have to adjust pattern due to center location & Cuba overflight clearance
- possible Cygnus overpass on SW-NE leg

Mission Synopsis: (include plot of actual flight track)

- Actual track shockingly similar to planned
- Cuba Clearance approved → able to sample SE/NE portion of TC
- Flight ~30 min b4 Cygnus overpass during SW-NE leg
- Due to power shutdown(s), 2 TDR analyses transmitted to EMC for OZ  
1 transmitted for OZ

Evaluation: (did the experiment meet the proposed objectives?) - YES!

Vortex structure very organized, ~~asymmetric~~ asymmetric eyewall w/ open

Sides → orientation changed throughout mission where strongest wall on each leg

was (W, W & NE, NW & SE) as shown via LF radar. Avg SLP = 972mb, pretty steady state during flight; TDR returns as high as 17km on N side; SSTs ~29°C; peak FL ~90 KTS, peak SLP ~80 KTS; satellite structure improving further ~~TC~~ → TC appears to migrate dry air to W

Problems: (list all problems)

MMR caused all workstations except C3X to crash 2x ~~during~~ passes 2/3

VWS remains  
~20 KTS

eye = very  
large! ~35mi wide!  
AND wind field very large as well

Expendables used in mission:

GPS sondes: 19

AXBTs: 11

Sonobuoys: \_\_\_\_\_

BT = 8

CP: 8

~~BT = 8~~

CT: 3



Cygnus overpass  
 Oriented SW-NE  
 0149-0214

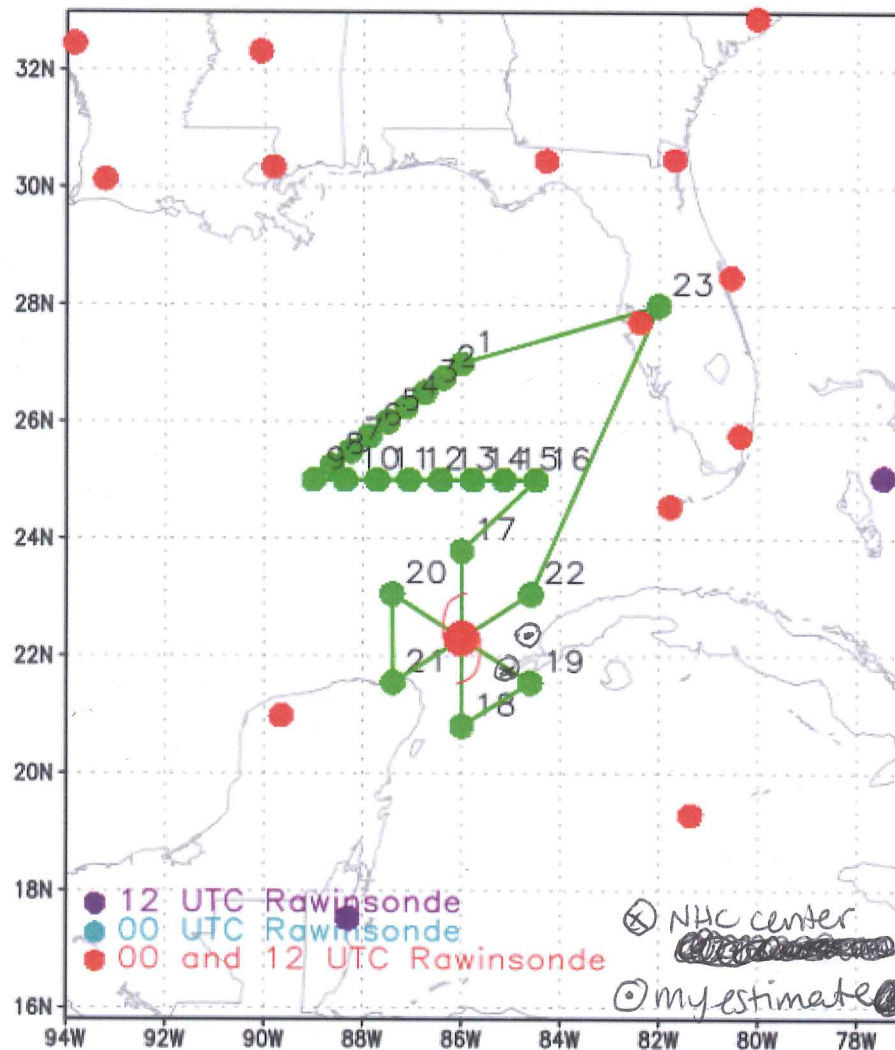
2018/008H1  
 Michael

Mission Briefing  
 2pm EST  
 K. Ryan

90 N mi legs

combos

10, 14, 16  
 + butterfly ends,  
 mids, centers  
 + (>1)mw



position/motion uncertain  
 - NHC ~~forecast~~ forecast (1P)  
 21.7 N  
 85.1 W  
 N @ 6 knots } as of 2pm

Depending on speed/  
 location of Michael  
 AND

Pending overflight (Cuba)

\* if no clearance  
 & Michael 2 far S  
 (close to coast)  
 may start on NE quad  
 & end N (switch 17-22)

for ~ 8pm EST