

Lead Project Scientist

Storm or Project Chris Experiment type TDR
Flight ID 20180709#2 Mission ID 0903A Chris

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 Chris Experiment name TDR
 Flight ID 20180709H2 Mission ID 0903A Chris

A. Participants:

HRD		AOC	
Function	Participant	Function	Participant
Lead Project Scientist	<u>Alaka</u>	Flight Director	<u>Henning</u>
Radar/Workstation	<u>Marks</u>	Pilots	<u>Price/Didia/Abitbol</u>
	<u>—</u>	Navigator	
Cloud Physics	<u>—</u>	Systems Engineer	<u>Heystack/Darby</u>
	<u>Christophersen</u>	Data Technician	<u>Richards</u>
Dropwindsonde	<u>—</u>	Electronics Technician	<u>T. Lynch</u>
AXBT/AXCP	<u>—</u>	Other	
Photographer/Observer s/Guests	<u>Tyler Young (Hallings)</u>		

B. Take-off and Landing Times and Locations:

Take-Off: _____ UTC Location: LAL

Landing: _____ UTC Location: _____

Number of Eye Penetrations: _____

C. Past and Forecast Storm Locations:

Date/Time	Latitude	Longitude	MSLP	Maximum Wind

D. Mission Briefing:

TDR rotating flights (see plots)

Storm or Project Chris Experiment name TDR

Flight ID 20180709#2 Mission ID 0903A Chris

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	↑↑	↑		5 analyses
Cloud Physics	↑	↑		
Data System	↑	↑		
GPS sondes	↑	↑		
AXBT/AXCP	—	—		
Ozone instrument	—	—		
Workstation	↑	↑		
Cameras	↑	tilt down		

REMARKS:

WSRA had to be restarted.

①

Lead Project Scientist Event Log

Date 7/9/18

Flight ID 20180709H2 LPS Alaka/Marks

Time	Event	Position	Comments
202517	TD	LAL 28082.15	
2040	TDR	turn down	
220223	(1P)	30.70 74.6	TK 310 + 0.6 drop #1
2225	6	32.25 74.5	drop #3
2252	(2)	34.05 74.5	drop #5
2325	(3)	32.3 76.5	drop #6
2353	6	32.25 74.33	drop #8
0015	(4)	32.25 72.32	drop #10
0031	(5)	33.33 73.0	climb to FL 10000' drop #11
005526	6	32.15 74.35	wave #2 is now 030 - 210
0117	(6)	31.05 75.6	
0147	(7)	31.05 73.0	climb to 12,000'
0213	6	32.25 74.33	
0225	(8)	32.9 75.1	truncate leg at 30nm desced to 8,000'

6
⑥

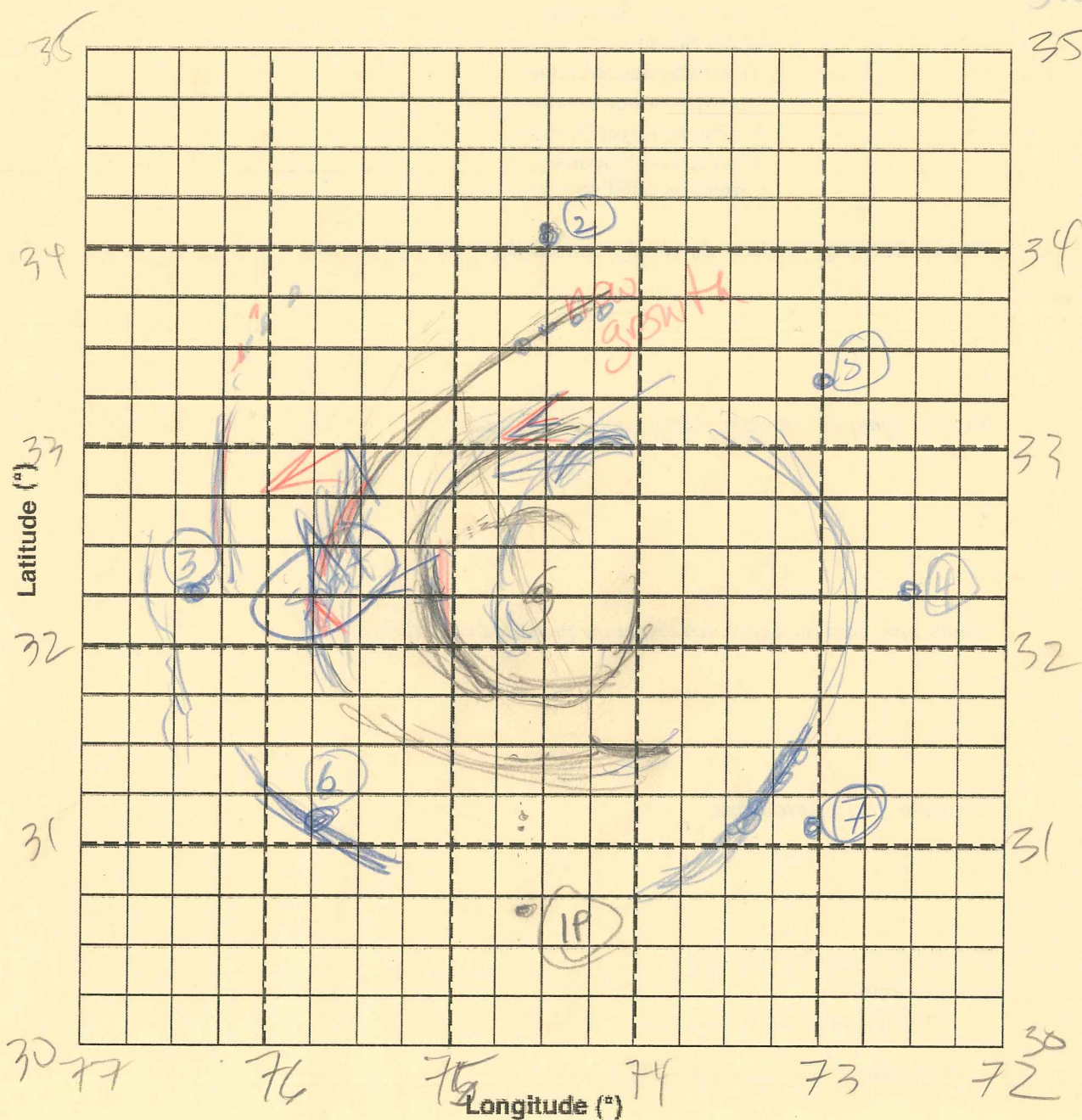
appear, that bands are rotating clockwise

1

Observer's Flight Track Worksheet

Date 7/9/18 Flight 20180709H2 Observer Marks

family of 6 NB of 6 and then swapping 35 down wind



- wave #2 asymmetry clearly evident
- wave #2 precessed during mission from NW to NE

Lead Project Scientist

Storm or Project Chris (03L) Experiment type EMC TOR; Early Stage/Genesis
Flight ID 20180709H2 Mission ID 0903A

Preflight

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- ☒ 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.
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- ☐ 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 Chris (03L) Experiment name EMCTOR; Early Stage/Gen

Flight ID 20180709HZ Mission ID 0903A

A. Participants:

HRD		AOC	
Function	Participant	Function	Participant
Lead Project Scientist	<u>ALAKA</u>	Flight Director	<u>HENNING</u>
Radar/Workstation	<u>MARKS</u>	Pilots	<u>PRICE</u>
			<u>DIDIER/ABITOL</u>
		Navigator	<u>FREEMAN</u>
Cloud Physics		Systems Engineer	<u>HEISTER/DARBY</u>
		Data Technician	<u>RICHARDS</u>
Dropwindsonde	<u>CHRISTOPHERSEN</u>	Electronics Technician	<u>PEEK</u>
AXBT/AXCP		Other	
Photographer/Observer		<u>AVAPS</u>	<u>LYNCH</u>
s/Guests	<u>ZAWISLAK</u>		
	<u>YOUNG</u>		<u>CAMERON</u>

B. Take-off and Landing Times and Locations:

Take-Off: 20:25 UTC Location: KLAL

Landing: _____ UTC Location: _____

Number of Eye Penetrations: _____

C. Past and Forecast Storm Locations:

Date/Time	Latitude	Longitude	MSLP	Maximum Wind
<u>7/9, 22:25Z</u>	<u>32.26°N</u>	<u>74.51°W</u>	<u>994mb</u>	<u>53 kt</u>
<u>7/9, 23:53Z</u>	<u>32.26°N</u>	<u>74.34°W</u>	<u>994mb</u>	<u>42 kt</u>
<u>7/10, 00:48Z</u>	<u>32.19°N</u>	<u>74.36°W</u>	<u>993mb</u>	<u>61 kt</u>
<u>7/10, 02:13Z</u>	<u>32.25°N</u>	<u>74.35°W</u>	<u>993mb</u>	<u>42 kt</u>
<u>7/10, 02:43Z</u>	<u>32.29°N</u>	<u>74.29°W</u>	<u>993mb</u>	<u>57kt</u>

D. Mission Briefing:

EMC-tasked this TDR mission. Also, good data for Early Stage & Genesis experiments. Start from South, then rotated Fig-4 at 8kft. After, climb to 10+kft, then another Fig. 4. Maybe a module if time permits (C.B. or SFMR circles)

Storm or Project Chris (03L) Experiment name ENCTDR; Early Stage / Gen

Flight ID 111 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/ W FMMR	Up			
* Doppler Radar/TA	Up			
Cloud Physics	Up ↑			
Data System	Up			
GPS sondes	Up			
AXBT/AXCP	O			
Ozone instrument	O			
Workstation	Up			
Cameras				

REMARKS:

- ozone instrument hasn't been used in maybe 10 yrs
- precip probe replaced last mission — worked great
- WSRP had an issue on first pass. Problem was fixed

Lead Project Scientist Event Log

Date 2018-07-09 Flight ID 20180709HZ LPS ALAKA

Time	Event	Position	Comments
20:00Z	AF measured 73 kt Flight level - SFMR of ~55kt		
	Chris appears to be intensifying		
	Everything is WORKING		
	Requested 12kft instead of 10kft (climb)		
	IFO said this is possible *		
20:25Z	Take-off from KLAL → 1.5h ferry to IP		
	TDR analysis posted on Twitter		
	Radar transfer bug fixed by John Hill		
	P. Reason's software can see data on seab monitor 'radarsync-a' issue		
20:40Z	MMR online and functional		
	TDR online and functional		
	Where/If to extend legs to 105 nmi?		
	extend N and E (2+3) after first pass → confirmed		
21:41Z	NOAA42 sondes not getting into HWRP		with F.D.
	semicolon syntax issue with WMO msg		
	Hui will test by manually adding it to WMO msg		
	for endpoint sondes		
21:45Z	Confirmed backup sondes for CENTER & ENDPOINTS		
① 22:02Z	IP-1, endpoint drop, good launch, splash		at ①
22:05Z	outer rainband to S of CTR picked up nicely by MMR		
	AVAPS-PRIMARY not loading on Drop Computer → notified PEEK		
② 22:12Z	Midpoint drop, good launch, splash		
22:15Z	Passed through outer rainband S, SFMR 49kt, TDR 15kft CTOP		
③ 22:25Z	CENTER 32.26°N, 74.51°W		
	drop, good launch, splash		53 kt S of CTR
	PMIN ≈ 993mb → deepening		

ISSUE *

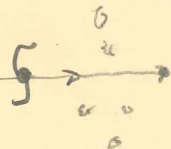
Lead Project Scientist Event Log

Date 2018-07-09 Flight ID 20180709H2 LPS ALAKA

Banding



	Time	Event	Position	Comments
	22:31Z	spiraling rainbands on E/S of CTR are looking more like an eyewall		
		intense new band NW of CTR		
④	22:38Z	Midpoint Drop, good launch, splash		
	22:42Z	Issue with ASPEN Synoptic map → fixed by Hui/Rich		
⑤	22:52Z	Endpoint Drop, good launch, splash		at ②
	23:10Z	Downwind NE of CTR outside outermost bands		
		WSRA not functional on first pass		
		Todd is testing → if it doesn't work, we will climb to 10kft at ③ instead of ④		
	23:16Z	WSRA Problem fixed! Will stay at 8kft for next CTR pass		
		Will climb to 10 kft at ④		
⑥	23:25Z	Endpoint Drop, good launch, splash		at ③
⑦	23:38Z	Midpoint Drop, good launch		
		TDR velocities showing flight level HU winds W of CTR		
⑧	23:53Z	CENTER 32.26°N 74.34°W		
		drop, good launch		
		PMIN = 994mb		
*	00:03Z	We need clarification on "Hit Surface" in ASPEN		
⑨		Midpoint Drop, good launch, splash		
	00:10Z	Supercells on E of CTR		
⑩	00:15Z	Endpoint Drop, good launch, splash		at ④
		Climb to 10 kft		
⑪	00:31Z	Endpoint Drop, good launch, splash		at ⑤
⑫	00:42Z	Midpoint Drop, good launch		



Lead Project Scientist Event Log

Date 2018-07-09 Flight ID 20180709H2 LPS ALAKA

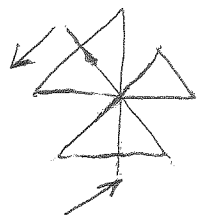
	Time	Event	Position	Comments
	00:48Z	Scattered convection in NE quadrant → no banding		
(13)		CENTER	32.19°N 74.36°W	tucked up near southern eyewall
		drop, good launch, splash		
	00:59Z	eyewall echo tops to 16km on TDR		
		60kts on SFMR		
(14)	01:06Z	Midpoint Drop, good launch, splash		
(15)	01:17Z	Endpoint Drop, good launch, splash		
	01:35Z	FLIGHT PLAN ADJUSTMENT		
		• truncate CTR → 8 to 50 n mi		
		• only drop endpoint sonde		
		• return to CTR, drop to 8kft		
		• exit SW and drop maxwind sonde		
		• 7 → 8, climb to 12kft		
	01:45Z	Climbed to 12kft high before reaching ⑦		
(16)	01:47Z	Endpoint Drop, good launch, splash		
	01:54Z	IR representation: asymmetric, cold CTOPs are S		
(17)	02:00Z	Midpoint Drop, slow launch detected		
(18)	02:13Z	CENTER	32.25°N, 74.35°W	
		drop, good launch, splash		almost complete eyewall
		PMIN = 993 mb SFMR ~ 50kt		
(19)	02:26Z	Endpoint Drop, good launch, splash		
(20)	02:43Z	CENTER	32.29°N, 74.29°W	
		drop, good launch, splash		
		PMIN = 993 mb SFMR ~ 57kt		
(21)	02:51Z	MAXWIND		
		drop, late launch		
	02:57Z	Last outbound leg: 105 n mi to SW, then home		

Mission Summary
Storm name
YYMMDDA# Aircraft 4_RF

Scientific Crew (4 RF)

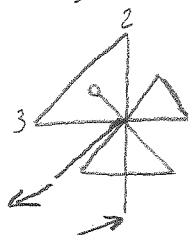
Lead Project Scientist ALAKA
Radar Scientist MARKS
Cloud Physics Scientist _____
Dropwindsonde Scientist CHRISTOPHERSEN
Boundary-Layer Scientist _____
Workstation Scientist _____
Observers (affiliation) ZAWISLAK, YOUNG

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



Two rotated Fig 4's at 8kft, climb if possible
EMC-Tasked TDR mission, 3hrs
20 drops (center, mid, end) 90 nmi legs
Potential for extra module/leg, time permitting

Mission Synopsis: (include plot of actual flight track)



(1) rotated Fig 4 at 8kft
(1) rotated Fig 4 at 10-12 kft
Extend Leg 2+3 to 105 nmi
Shortened Leg 8 to 50 nmi, returned to CTR
maxwind drop in SW eyewall

Evaluation: (did the experiment meet the proposed objectives?)

Yes : 8kft ideal for WSRA
10-12 kft for deeper drop coverage
TDR and Drops transmitted in real time
Great coverage of an intensifying T.S.

Problems: (list all problems)

- 1) NOAA42 sondes not making it into HWRF
- 2) WSRA not functional for first pass
- 3) MAXWIND drop was a late launch

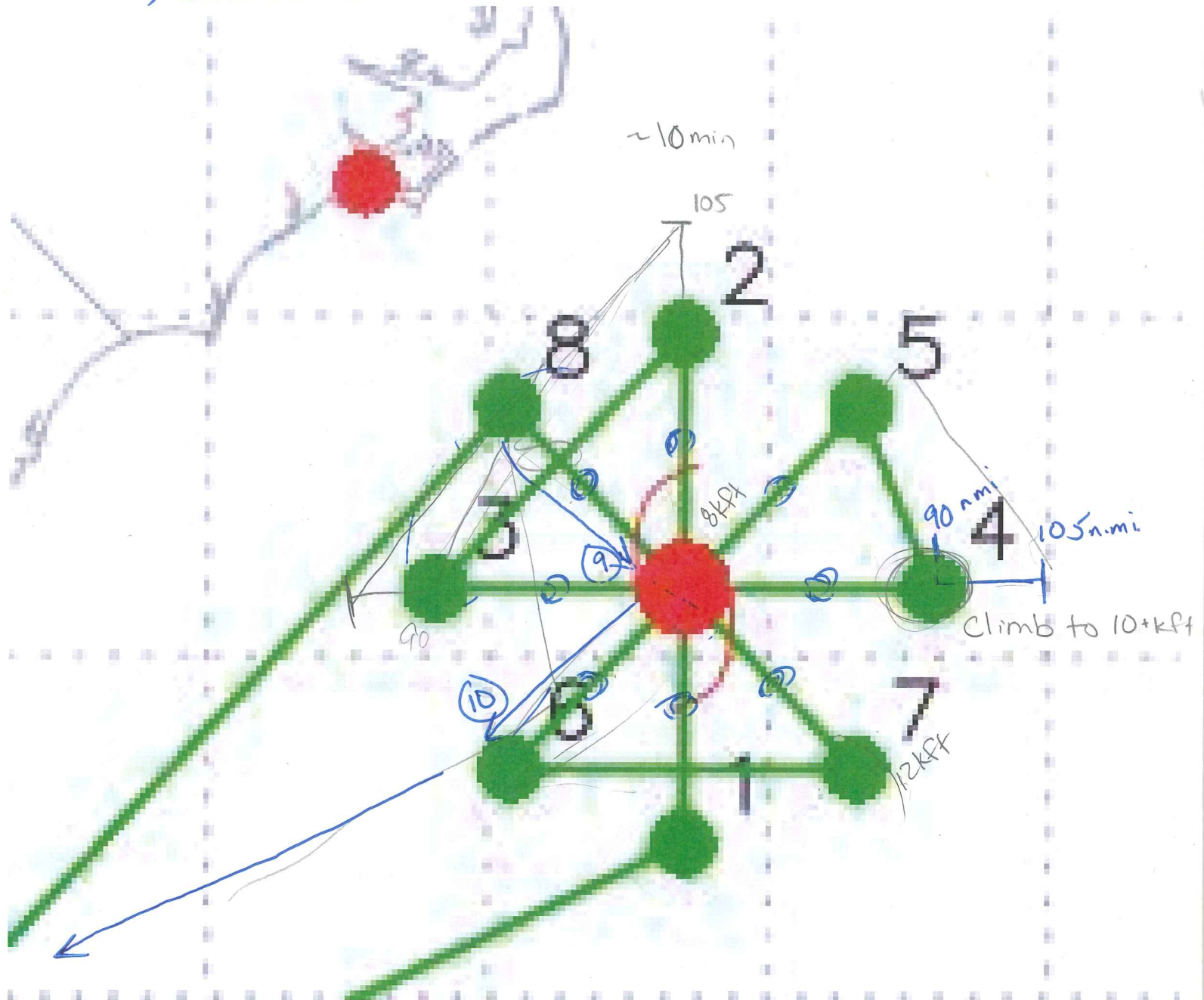
Expendables used in mission:

GPS sondes : 21

AXBTs : 0

Sonobuoys: 0

- 1) 20 drops (center, midpoint, endpoint)
 - 2) potentially extend legs to 105 nmi
 - 3) first 2 legs: 8 kft; Second 2 legs: 10 kft
 - 4) Module potential:
 - a) convective burst
 - b) SFMR circles
 - 5) Straight legs!
 - 6) Collect data on HDs
- Ask for 12 kft



Remember to copy all data off plane on external HD

- 1) SFMR
 - 2) HDOB - Flight Level
 - 3) Drops
 - 4) TDR (raw + processed) → Todd + Frank
 - 5) Cloud Phys → Todd
- Rick, F.D.

12 + 30 + 60
1:42 h
+ 2:00 h