Rogers
050201

# Lead Project Scientist

## Preflight

1. Participate in general mission briefing.
2. Determine specific mission and flight requirements for assigned aircraft.
3. Determine from field program director whether aircraft has operational fix responsibility and discuss with AOC flight director/meteorologist unless briefed otherwise by field program director.
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 appropriate HRD operations center (MGOC in Miami).
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 members have life vests
7. Perform a headset operation check with all HRD flight crew members. Make sure everyone can hear and speak using the headset.
8. Collect "mess" fee ($2.00) from all on-board HRD flight crew members.

## 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. Complete Lead Project Scientist Form.
5. 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. Report landing time, aircraft, crew, and mission status along with supplies (tapes, *etc.*) remaining aboard the aircraft to MGOC.
3. Gather completed forms for mission and turn in at the appropriate operations center. [**Note**: all data removed from the aircraft by HRD personnel should be cleared with the AOC flight director.]
4. Obtain a copy of the 10-s flight listing from the AOC flight director. Turn in with completed forms.
5. Obtain a copy of the radar DAT tapes. Turn in with completed forms.
6. Obtain a copy of the all VHS videos form aircraft cameras (3-4 approx.). Turn in with completed forms.
7. Obtain a copy of CD with all flight data. Turn in with completed forms.
8. Determine next mission status, if any, and brief crews as necessary.
9. Notify MGOC as to where you can be contacted and arrange for any further coordination required.
10. Prepare written mission summary using **Mission Summary** form (due to Field Program Director a week after the flight).

## Lead Project Scientist Check List

**Storm or Project** Hurricane Rita **Experiment name** Rita NHC-SFMR-tasking
**Date** 9/20/05 **Aircraft** N43RF **Flight ID** 20050920I

**A. Participants:**

| HRD | | AOC | |
|---|---|---|---|
| **Function** | **Participant** | **Function** | **Participant** |
| Lead Project Scientist | Rogers | Flight Director | |
| Radar | M. Black | Pilots | |
| Workstation | Murillo | Navigator | |
| Cloud Physics | — | Systems Engineer | |
| Photographer/Observer /Guests | Tripoli - U. Wisc. | Data Technician | |
| Dropwindsonde | | Electronics Technician | |
| AXBT/AXCP | | Other | |

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

Take-Off: 1451 UTC Location: MacDill

Landing: 1820 UTC Location: MacDill

Number of Eye Penetrations: 3

**C. Past and Forecast Storm Locations:**

| Date/Time | Latitude | Longitude | MSLP | Maximum Wind |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

**D. Mission Briefing:**

NHC-tasked SFMR mission into newly-upgraded Hurricane Rita, which is just south of Key West. Conduct a single Figure-4, beginning on NW side, 105 nm leg lengths. Storm has gotten better organized, with eye becoming clear on EYW radar and in infrared image. Drop MRD sonde at Key West, and in each eyewall quadrant (NHC has requested a drop in NW eyewall). Do overflight of Key West for comparison of TA with Key West VAD's. Fly at 8000 ft.

**E. —Equipment Status** (Up ↑, Down ↓, Not Available —, 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 | O | O | O | |
| Ozone instrument | — | — | — | |
| Workstation | ↑ | ↑ | ↑ | |
| Videography | ↑ | ↑ | ↑ | |

**REMARKS:**

## Lead Project Scientist Event Log

**Date** 9/20/05 **Flight** 050920I **LPS** Rogers

| | Time | Event | Position | Comments |
|---|---|---|---|---|
| | 1451 | takeoff | MacDill AFB | takeoff |
| | 1525 | pattern | IP, 105 nm NW of storm | IP reached, bands at 90 nm from storm, T.S. force winds 120 nm N of storm. |
| H | 1547 | winds | NW of Key West | ~~FL~~ 60 kt, SF 45 kt |
| | 1549 | drop1 | Key West | FL 60 kt, SF 50 kt, band over EYW now, GPS SF 40 kt |
| | 1550 | radar | 35 nm NW of eye | eye open on N side on LF, 40-50 nm diameter eye |
| N | 1554 | drop 2 | NW eyewall | FL 80 kt, SF 65 kt, GPS drop 54 kt |
| | 1556 | winds | NW eyewall | peak FL 85 kt, SF 74 kt, looks like an inner eyewall on NW side, but open on SE, outer eyewall open on N side |
| N | 160150 | fix, drop 3 | eye, 23°49' 81°10' | extrap 977 mb, GPS 979 |
| | 1604 | pattern | eye | track 110 |
| H | 1605 | drop 4 | SE eyewall | FL 65 kt, SF 90 kt, GPS 91 kt |
| | 1609 | winds | outside SE eyewall | peak FL 85 kt, SF 90 kt, marked asymm. in SF from NW to SE side, peak winds on SE side; not so much of an asymm. at FL |
| | 1615 | radar | 60 nm SE of eyewall | little echo on this side, rotation of asymmetry with height, slope of eyewall all indicative of easterly or southeasterly shear, Eyewall is steeply-sloped in SE eyewall, less so on NW side |
| | 1622 | winds | 75 nm SE of center | SF winds 35 kt |
| | 1629 | pattern | 105 nm SE of ctr | turn to downwind leg |

## Lead Project Scientist Event Log

**Date** 9/20/05 **Flight** 050920I **LPS** Rogers

| | Time | Event | Position | Comments |
|---|---|---|---|---|
| A | 1635 | drop 5 | downwind leg | SF 90 kt, FL 50 kt, GPS 90kt |
| | 1652 | ~~turn~~ | 105 nm NE of eye | turn to track 235, begin 2nd inbound leg |
| | 1704 | winds | 55 nm NE of eye | sf winds 50 kt |
| | 1711 | radar | 33 nm NE of eye | elliptical eyewall, major axis oriented ENE-WSW |
| | ~~17~~ 14 | winds | 22 nm NE | 80 kt FL, 60 kt SF |
| | 1716 | winds | 15 nm NE | triple |
| H | 1716 | drop 6 | NE eyewall | FL 95 kt, SF 80 kt, no winds |
| | 1721 | ~~obs~~ | eye | eye more clear on this pass |
| | 1723 | fix | 23°45' 81°29' | extrap SLP 972 mb |
| | 1728 | obs | | |
| H | 1729 | drop 7 | SW eyewall | FL 80 kt, SF 70 kt |
| | 1731 | winds | SW eyewall | peak FL 90kt, SF 75 kt, broad wind field in SW eyewall, many bands on SW |
| | 1746 | winds | 85 nm SW of eye | SF winds TS force now |
| | 1751 | turn | 105 nm WSW of eye | reverse track, do 1 more penetration, then track north. |
| | 1759 | radar | 70 nm SW of eye | eye appears more circular again on radar, but will wait until a little closer and through SW side, band is primarily stratiform, multiple bands |
| | | | this band on the mixed convective & on this side | |
| H | 1810 | drop 8 | SW eyewall | FL 65 kt, SF 75 kt |

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23 46

81 31

## Lead Project Scientist Event Log

**Date** 9/20/05 **Flight** 050920I **LPS** Rogers

| Time | Event | Position | Comments |
|---|---|---|---|
| 1814 | obs | eye | eye brightening, eyewall still appear elliptical, but rotated 90° cyclonically |
| 1817 | turn | eye | tracking 0° now, heading outbound and RTB |
| 1821 | obs | eye | elliptical eye still, major axis has rotated 90° cyclon.; eyewall is open N, NE side |
| H 1822 | drop 9 | N eyewall | FL 854 SF 80 kt |
| 1835 | wind | 83 nm N of eye | SF winds still 40 kt here |
| 1837 | radar | 90 nm N of eye | stratiform rain N of eye |
| 1920 | landing | MacDill AFB | land at MacDill AFB |

# Mission Summary
## Storm name
YYMMDDA# Aircraft 43 RF

Scientific Crew (43RF)

Lead Project Scientist Rogers
Radar Scientist M. Black
Cloud Physics Scientist —
Dropwindsonde Scientist Murillo
Boundary-Layer Scientist —
Workstation Scientist Murillo/Black
Observers Tripoli

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

See previous

*Mission Synopsis: (include plot of actual flight track)* conducted fig. 4, found storm getting better organized. SFC wind max of 90 kt was on SE side; worked asymmetry, low NW and SE side. That, along w/ LF reflectivity asymm. and variable slopes of eyewall, indicates storm experiencing some easterly shear. Initial pass showed double eyewall structure; outer eyewall was open on N side, inner eyewall open on E and SE side. On subsequent passes eye became elliptical, rotating cyclonically as we were in storm. MSLP dropped to 976 mb, peak SFC winds were ~90 kt on SE outbound leg

*Evaluation: (did the experiment meet the proposed objectives?)*
Yes, SFC wind field was mapped out. Dropped 6 HRD sondes, all worked except for one. Saw complex and highly evolving structure for Rita. Saw primary bands on SW side, indicative of easterly shear. Possible target region for tomorrow's 2-plane RAINEX mission.

*Problems:(list all problems)*
None. SFMR seemed reasonable. May have been an inertial 10-kt high bias, but sondes on SE side compared quite well with it.

*Expendables used in mission:*
GPS sondes : 6 HRD, 2 NHC, 1 AUX
AXBTs : 0
Sonobuoys: 0

# Hurricane Rita 050920i