

**NOAA / AOML / Hurricane Research Division  
Hurricane Field Program  
Advancing the Prediction of Hurricanes Experiment (APHEX)**

**FLIGHT LOG - 20210907I1 LARRY**

| MISSION PLAN                                       |  |                  |            |
|--|--|------------------|------------|
| FLIGHT ID  | 20210907I1   | STORM            | AL12/LARRY |
| MISSION ID   | WE12A  | TAIL NUMBER      | NOAA43     |
| TASKING  | NESDIS   | PLANNED PATTERN  | Alpha      |
| MISSION SUMMARY                                    |  |                  |            |
| TAKEOFF [UTC]                                      | 1709   | LANDING [UTC]    | 0108       |
| TAKEOFF LOCATION                                   | STX  | LANDING LOCATION | STX        |
| FLIGHT TIME  |  | BLOCK TIME       |            |
| TOTAL REAL-TIME<br>RADAR ANALYSES<br>(Transmitted) | 4  |                  | 4 (1 bad)  |
| OCEAN EXPENDABLES<br>(Type)                        | 0  |                  |            |
| APHEX EXPERIMENTS /<br>MODULES                     | Mature Stage Experiment: NESDIS Ocean Winds; Surface Wind and Wave Validation; <del>End Stage, Tropical Cyclones at Landfall (Coastal Survey Module)</del> |                  |            |
| HRD CREW MANIFEST                                  |  |                  |            |
| LPS ONBOARD  | Holbach  |                  | _____      |
| TDR ONBOARD  | Holbach  |                  | Avey       |
| ASPEN ONBOARD                                      | Hazeltov   |                  | _____      |
| NESDIS SCIENTISTS                                  | Chang, Jelenak, Sapp   |                  |            |
| GUESTS (Affiliation)                               | _____  |                  |            |
| AOC CREW MANIFEST                                  |  |                  |            |
| PILOTS   | Didler, Capore, Stateles   |                  |            |
| NAVIGATOR  | Hough, B. Richards   |                  |            |
| FLIGHT ENGINEERS                                   | Darby, Bennet  |                  |            |
| FLIGHT DIRECTOR                                    | Holmes   |                  |            |
| DATA TECHNICIAN                                    | Mascaro  |                  |            |
| AVAPS  | Warnecke   |                  |            |

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**FLIGHT LOG - 20210907D**

| PRE-FLIGHT                 |  |
|----------------------------|--|
| Flight Plan                | Alpha w/ 75 nmi legs then spokes left radar until Teal arrives then left pressure<br>Aiming to be inbound through eyewall for Sentinel-1B overpass at 2146Z  |
| Expendable Distribution    | WTC requested fixes + center sondes for both passes of Alpha. NESDIS Planning 1 sonde for SAK overpass   |
| Preflight Weather Briefing | 0715Z 24.4N 55.6W 100 kt 967mb NW 315/8kt<br>Larry looks less organized today. Possibly entraining dry air. Maybe impacted by upwelling. MW imagery shows eyewall open SW which matches data from Teal. Forecast calls for gradual weakening as it rounds the ridge + passes just east of Bermuda on Thursday. HU winds extend 110km out |
| Instrument Notes           | MNR reflectivity was questionably low yesterday  |

Teal arrives then left pressure

TS 295 km

| IN-FLIGHT  |   |
|------------|---|
| Time [UTC] | Event   |
| 1709       | Takeoff   |
| 1718       | TDR online  |
| 1813       | MNR Online  |
| 1828       | maybe approaching outermost bands of Larry                            |
| 1916       | Inbound from IP   |
| 1912       | Goes GLM showing lightning in SE eyewall                              |
| 1917       | FD noted winds are shifting which is unusual for this part of eye     |
| 1922       | Mark Center Sonde #1 965mb 26kts                                      |
| 1934       | Very broad region of ~45 m/s CFMR outbound to NE                      |
| 1941       | gradually coming to 360° to get out of precip region a little quicker |

WTC

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|                 |  |        |
|-----------------|--|--------|
| 1949            | radarsync error. Restarted it.   |        |
| 1952            | turning downwind from NE to NW   |        |
| 1958            | FL winds ~75 kts SFMR ~26 m/s on downwind  |        |
| 2013            | turning inbound from NW  |        |
| 2017            | inbound 330° then will go outbound 090°  |        |
| 2030            | surface roughness on MMR looks like<br>it might be showing the seilops on N side<br>Sim was referencing on yesterday's<br>flight |        |
| 2037            | Mark center sonde #2 96 Smb 2 kts  | PHC    |
| 2043            | TDR analysis of first leg had 115 kts<br>at 0.5 km. on NE side   |        |
| 2045            | heading outbound 090°  |        |
| 2108            | Very broad wind field w/ broad<br>area of squipy precip on E side  |        |
| 2109            | slowly turning downwind. Looking<br>for a place to head inbound on<br>NE side for <del>SIB</del> <sup>SIB</sup> overpass         |        |
| 2120            | turning inbound from NE  |        |
| 2136            | sonde #3 outer wind max  | NESDIS |
| 2137            | Backup for #3 sonde #4   | NESDIS |
| 2145            | sonde #5 inner wind max  | NESDIS |
| 2204            | Overflight of sonde. Zorana noted<br>that the SFMR matched the<br>sonde.   |        |
| <del>2204</del> |  |        |
| <del>2230</del> | <del>stop 2518MVAZ inbound from</del>  |        |

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FLIGHT LOG - 20210907II

|      |   |
|------|---|
| 2243 | Mark center heading outbound to SW since there is a little finger of eyewall to S.      |
| 2246 | Barely any eyewall to SW. MMR isn't painting anything + nose only has some light green. |
| 2249 | Some clear air turbulence where SW eyewall should be.                                   |
| 2254 | deviating a little to line up better with rainband ahead of us.                         |

|      |   |
|------|---|
| 2301 | Passing through rainband. Very cellular. Cells seem to be growing.                                  |
| 2308 | Beginning climb to head back to STX. There was very little precip on SW side besides the rain band. |
| 2327 | TDR offline   |
| 0108 | Sondes: NESDIS 3 (1 bad) NHC: 2<br>Landing STX  |

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FLIGHT LOG - 20210907II

| POST-FLIGHT                       |   |
|-----------------------------------|---|
| Mission Summary                   | NESDIS was able to complete their science objectives & we were passing through                            |
| Actual Standard Pattern Flow      | The NE eyewall almost exactly at 2146Z. We successfully transmitted 4 TDP analyses & 4 scenes.            |
| APHEX Experiments / Modules Flown | Hurricane force winds extended outwards from the center ~175 km N, 200 km E, ~100 km SW at 0.5 km. Precip |
| Plain Language Summary            | • field on NW to E was extensive. Fairly solid w/ some embedded   |
| Instrument Notes                  | cells. Eyewall was open <del>from</del> from SW to SE for most of the flight,                             |
| Final Mission Track               | but appeared to be building in a little during our final pass. Eye appeared to still be ~50 nm diameter.  |

Alpha-15  
 + 2 spokes  
 (4 permits)  
 SFC wind  
 SAR

3 used  
 for composite

We also observed a very broad region of max winds on NW to E w/ double wind max.

Rain: • Larry is a very large hurricane w/ hurricane force winds expanding outwards from the center ~200 km at 0.5 km altitude.  
 • Successful data collection coinciding w/ SAR satellite overpass

Ins: MMR is still showing very low reflectivities compared to nose. Appeared to perform a little better on cellular precip that wasn't embedded. SFC roughness was showing more details than N1W (Hwx even worse).