| **MISSION PLAN** | | | |
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| **FLIGHT ID** | 20220919I1 | **STORM** | AL07 / FIONA |
| **MISSION ID** | 1607A | **TAIL NUMBER** | NOAA43 |
| **TASKING** | EMC/NHC | **PLANNED PATTERN** | Modified Butterfly |
| **MISSION SUMMARY** | | | |
| **TAKEOFF [UTC]** | 2004 | **LANDING [UTC]** | 0356 |
| **TAKEOFF LOCATION** | Lakeland | **LANDING LOCATION** | Lakeland |
| **FLIGHT TIME** | 7.9 | **BLOCK TIME** | 8.2 |
| **TOTAL REAL-TIME RADAR ANALYSES**  **(Transmitted)** | 3 (3) | **TOTAL DROPSONDES (Good/Transmitted)** | 35 (34 / 25) |
| **OCEAN EXPENDABLES (Type)** | 5 AXBT (ONR) (4 good) | **sUAS (Type)** | None |
| **APHEX EXPERIMENTS / MODULES** | Early Stage Experiment: AIPEX | | |
| **HRD CREW MANIFEST** | | | |
| **LPS ONBOARD** | Holbach | **LPS GROUND** | Alaka, Marks |
| **TDR ONBOARD** | Holbach | **TDR GROUND** | Gamache |
| **ASPEN ONBOARD** | Murillo | **ASPEN GROUND** | None |
| **NESDIS SCIENTISTS** | Chang, Jelenak, Sapp | | |
| **GUESTS (Affiliation)** | Camposano (CIMAS), Waddington (AOC) | | |
| **AOC CREW MANIFEST** | | | |
| **PILOTS** | Mitchell, Doremous, Keith | | |
| **NAVIGATOR** | Utamo | | |
| **FLIGHT ENGINEERS** | Darby, Pittman, Tyson | | |
| **FLIGHT DIRECTOR** | Carpenter | | |
| **DATA TECHNICIAN** | T. Richards | | |
| **AVAPS** | Warnecke | | |

| **PRE-FLIGHT** | |
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| **Flight Plan** | Pattern: Fly modified butterfly pattern with 105 nmi legs (shortened for overland restrictions)  Altitude: 10 kft (pressure altitude)  Potential add-on Modules:   * None |
| **Expendable Distribution** | 32 sondes (all dropsondes transmitted to the GTS); 5 ONR/NRL AXBTs (all AXBTs transmitted to the AOC ground server if possible)   * Release sondes at endpoints, midpoints, centers; possible supplemental rapid RMW drops |
| **Preflight Weather Briefing** | As of the 21Z advisory from NHC, Fiona’s intensity is 85 kt with a minimum central pressure of 972 mb moving NW at 9 kts. The center of Fiona is now off the northern coast of Hispaniola after passing over the eastern tip of the island last night. The mountains of Hispaniola do not seem to have caused too much weakening of Fiona as it still appears fairly healthy on satellite imagery. We will be the first plane into Fiona since it moved offshore earlier today.  An Air Force Reserve aircraft will be entering the system shortly after us, so we will be at 8 kft pressure altitude. Depending on how close the center is still to the coast of Hispaniola, we may need to modify pt 1- center to be along shore rather than strictly W to E. It is also possible that we may not have enough space for the outbound leg to pt 4, so we may need to exit more toward the S or SE before heading to pt 5. |
| **Instrument Notes** | None notes |

| **IN-FLIGHT** | |
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| **Time [UTC]** | **Event** |
| 1955 |  |
| 2004 | Take off from KLAL |
| 2039 | After consulting with NHC, decided to add drops on the ferry home every 90-120 n mi as resources allow. Only 3 extra sondes on this flight. Ferry sondes will be charged to NHC. |
| 2115 |  |
| 2215 |  |
| 2227 | IP, at 8 kft, track 090, start TDR leg |
| 2228 | Drop #1 (Endpoint W; EMC) |
| 2240 | Drop #2 (Midpoint W; EMC) |
| 2242 | Fiona’s eye has really cleared out in the last few hours. Deep convection with cloud tops colder than -80C is nearly symmetric around the center. Outflow is very healthy to the N, E, and S. Outflow is a bit limited on the W side likely due to vertical wind shear. Fiona remains impacted by moderate southwesterly wind shear of 20-25 kt |
| 2250 | Drop #3 (RMW W, ONR) |
| 2251 | Drop #4 (RMW W, ONR) |
| 2251 | Drop #5 (RMW W, ONR) |
| 2247 |  |
| 2253 | HRD Workstation (radar) issues. The backup was being used and was having network issues. Switching to the primary to see if that fixes the problem. John Gamache will work with Heather to make sure all software is properly updated. Syncing is an issue between the primary and backup. |
| 2253 | Mark center |
| 22:53:29 | Drop #6 (Center, EMC) |
| 2255 |  |
| 22:58:19 | Drop #7 (RMW E, ONR) |
| 22:58:38 | Drop #8 (RMW E, ONR) |
| 22:58:57 | Drop #9 (RMW E, ONR) |
| 23:09:24 | Drop #10 (Midpoint E, EMC) |
| 2315 |  |
| 2325 | Ist TDR analysis |
| 23:24:28 | Drop #11 (Endpoint E, EMC) |
| 23:30:08 | AXBT #1 (Endpoint E) no SST, bad |
| 2334 | While flying downwind in a moat region to the NE endpoint, cellular rainband ahead and to the right. Moat is between the inner core and rain band. |
| 23:53:00 | Drop #12 (Endpoint NE, EMC) |
| 23:53:00 | AXBT #2 (Endpoint NE), SST 29.02 C |
| 00:00:06 | Mid point drop #13 |
| 00:07:35 | Drop #14 (RMW NE, ONR) |
| 00:07:57 | Drop #15 (RMW NE, ONR) |
| 00:08:20 | Drop #16 (RMW NE, ONR) |
| 00:08:43 | Drop #17 (RMW NE, HRD) |
| 00:08:59 | Drop #18 (RMW NE, HRD) |
| 00:09:30 | Drop #19 (RMW NE, HRD) |
| 0010 | 48.6 m/s inbound (SFMR 1 sec) center is tucked up near SW edge of eyewall possibly some mesos in the eyewall too big overhang of the convective anvil on the west side saw some lightning inbound through NE eyewall |
| 0020 | Holbach: plan is only an EP sonde outbound since the leg will only be about 30 n mi long |
| 00:23:53 | Drop #20 (Center, EMC), orbiting in the eye to get the AXBT set up. Need to not be in Condition 5 to get the AXBT. **4 Orbits for Sim to use if he wants.** |
| 00:23:53 | AXBT #3 (Center), SST 29.06 C |
| 0025 |  |
| 0027 | Holbach: bigger moat on the SW side |
| 00:29:45 | Drop #21 (Endpoint SW, EMC), orbiting to catch up on the drops and other things. |
|  | Second TDR analysis |
| 00:47:00 | End orbit, track to pt 5 |
| 01:01:51 | At P5 5, orbiting to get AXBT ready |
| 01:05:42 | Drop #22 (Endpoint SE, EMC), tracking NW to center |
| 01:05:42 | AXBT #4 (Endpoint SE), SST 27.96 C |
| 01:19:14 | Drop #23 (Midpoint SE, EMC) |
| 01:20:59 | Drop #24 (RMW SE, ONR), TDR analyses show sharp RMW at 23 km (13 n mi) |
| 01:21:08 | Drop #25 (RMW SE, ONR) |
| 01:21:36 | Drop #26 (RMW SE, ONR) |
| 01:23:58 | Drop #27 (Center, EMC), passed to the east of the flight level wind center, center |
| 01:25:31 | Drop #28 (RMW NW, ONR) |
| 01:25:58 | Drop #29 (RMW NW, ONR) |
| 01:26:14 | Drop #30 (RMW NW, ONR), strange looking eye on this pass. Looks like a finger sticking into it. |
| 01:36:56 | Drop #31 (Midpoint NW, EMC) |
| 01:50:43 | Drop #32 (Endpoint NW, EMC) |
| 01:50:43 | AXBT #5 |
| 02:09:20 | Drop #33 1st ferry drop, fast fall |
| 02:10:00 | Drop #34 backup, fast fall |
| 0215 |  |
| 02:34:57 | Drop #35, Ferry drop #2 |
| 03:00:40 | Drop #36, Ferry drop #3 |
| 0356 | Land Lakeland |

| **POST-FLIGHT** | |
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| **Mission Summary** | Overall, the mission was a success. We found Fiona to be intensifying and reached a peak intensity of 95 kt during the flight. Max flight level winds observed were 105 kt and max SFMR were 94 kt. The eye evolved from an elliptical shape to square to open on the S side during each subsequent pass.  Some of the legs had to be modified to account for the location of rainbands or proximity to the coast of Hispaniola. A modified butterfly pattern was flown and 3 TDR analyses were completed and transmitted. There were some challenges with processing sondes. With the shortened legs on the S side and rapid RMW sondes it was hard to keep up with the processing. Ultimately, all end point, mid point, and center sondes were transmitted along with at least 1 RMW from each quadrant. Additional RMW sondes that were not processed during the flight will need to be processed.  Due to N49 aborting their flight, we added on 3 sondes on the ferry back to Lakeland. There were two released at the first point along the transit back and both were fast falls.  Sondes accounting: NWS: 17, ONR: 15, HRD: 3 |
| **Actual Standard Pattern Flown** | Modified Butterfly |
| **APHEX Experiments / Modules Flown** | None, though given the intensification ongoing, data collection could be considered supportive of the *Early Stage Experiment: Analysis of Intensity Change Processes (AIPEX)*. |
| **Plain Language Summary** | * Fiona was intensifying after emerging off the coast of Hispaniola shortly before the flight, reaching a peak intensity of 95 kt by the end of the mission. * Rapid RMW dropsondes were released on many of the passes through the eyewall to sample the rapid changes in the wind and thermodynamic structure that occurs in that region. * Fiona’s eye structure was rapidly changing throughout the flight. |
| **Instrument Notes** | Issue with HRD computer used for TDR during the first leg through the storm. Changes were made to have two computers at that station be able to be used for TDR. Both computers were on, which caused an issue with IP address collisions. Do not have both on at the same time! |
| **Final Mission Track** |  |