| **MISSION PLAN** | | | |
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| **FLIGHT ID** | 20240926H1 | **STORM** | AL09 |
| **MISSION ID** | 1709A | **TAIL NUMBER** | NOAA-42 |
| **TASKING** | NHC/EMC TDR | **PLANNED PATTERN** | Rotated Fig-4 |
| **MISSION SUMMARY** | | | |
| **TAKEOFF [UTC]** | 1952 | **LANDING [UTC]** |  |
| **TAKEOFF LOCATION** | KEFD | **LANDING LOCATION** | KEFD |
| **FLIGHT TIME** | Fractional hr, Takeoff to Landing Time | **BLOCK TIME** | Get from onboard LPS or Flight Director |
| **TOTAL REAL-TIME RADAR ANALYSES**  **(Transmitted)** | 4 (4) | **TOTAL DROPSONDES Deployed (Tx to GTS)** | 24 (20) |
| **OCEAN EXPENDABLES deployed (good)** | 8 UM AXBTs (7) | **sUAS (Type)** | 2 Blackswift s0 |
| **APHEX EXPERIMENTS / MODULES** | Exact name of the Experiment in the HFP Plan; identify relevant experiments / module even if not a research tasking | | |
| **HRD CREW MANIFEST** | | | |
| **LPS ONBOARD** | Hazelton | **LPS GROUND** | Holbach/Aberson |
| **TDR ONBOARD** | Hazelton | **TDR GROUND** | Gamache/Hollingshead |
| **ASPEN ONBOARD** | n/a | **ASPEN GROUND** | Sippel/Dahl |
| **NESDIS SCIENTISTS** | Chang, Jelenak | | |
| **GUESTS (Affiliation)** |  | | |
| **AOC CREW MANIFEST** | | | |
| **PILOTS** | Abitol, Wood, Keith | | |
| **NAVIGATOR** |  | | |
| **FLIGHT ENGINEERS** |  | | |
| **FLIGHT DIRECTOR** |  | | |
| **DATA TECHNICIAN** |  | | |
| **AVAPS** |  | | |

| **PRE-FLIGHT** | |
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| **Flight Plan** | Planned flight pattern is a modified butterfly with a coastal run. 105 n mi legs. |
| **Expendable Distribution** | Endpoint, midpoint, and center drops. Coastal drops every ~10 n mi. AXBTs at locations noted in the flight plan. |
| **Preflight Weather Briefing** | As of 5pm ET Helene is a category 3 hurricane with max winds of 110 kt and minimum pressure of 951 mb. It is moving north-northeastward at 025/20 kt.  NHC 5pm discussion:  *Helene has rapidly intensified today while nearing landfall in the*  *Florida Big Bend. Doppler radar and aircraft data indicate that the*  *eyewall is now completely closed and the eye has become more*  *circular and is clearing out. The aircraft data also indicated*  *that the inner core has contracted significantly today while the*  *tropical-storm-force winds have expanded. Based on all of the data,*  *the initial intensity is set at 110 kt. The latest minimum pressure*  *based on the aircraft data is around 951 mb. Tropical-storm-force*  *winds are occurring across portions of west-central and southwestern*  *Florida, and conditions are expected to deteriorate rapidly in the*  *hurricane warning area during the next several hours. It should be*  *emphasized that Helene is at the upper bound of hurricanes in*  *terms of storm size and impacts are and will occur well away*  *from the center.*  *The large hurricane is now accelerating north-northeastward, with*  *the latest initial motion estimated to be 025/20 kt. This general*  *motion is expected to continue, taking the core of the major*  *hurricane to the Florida Big Bend later this evening. After*  *landfall, a turn to the north over Georgia is expected late tonight*  *and early Friday, followed by a slowdown or a complete stall over*  *the Tennessee Valley late Friday and Saturday when Helene merges*  *with a mid- to upper-level low.*  *The hurricane has intensified by 30 kt since sunrise and given the*  *conducive environmental conditions and contracting inner core, it*  *seems likely that Helene will be at or very near category 4 strength*  *when it makes landfall in the Florida Big Bend this evening.*  *The fast forward speed when Helene moves inland will result in a*  *far inland penetration of strong winds over parts of the*  *southeastern United States, including strong gusts over the higher*  *terrain of the southern Appalachians. Accordingly, a*  *higher-than-normal gust factor is indicated in the official forecast*  *while Helene is inland.* |
| **Instrument Notes** | *[What instruments are working, not working, not functioning nominally, not installed?]* |

| **IN-FLIGHT** | |
| --- | --- |
| **Time [UTC]** | **Event** |
| 1952 | Take-off from EFD |
| 2038 | Modified flight track:  ahazelton\_n42\_LPS Looks very soupy for the coastal run, and the TC is further S than anticipated  ahazelton\_n42\_LPS So we are doing an audible to what's basically a rotated figure 4  Droning\_On A second audible is we are doing only 1 sUAS (@ the IP 105nmi west of the center)  ahazelton\_n42\_LPS We will do a W-E run first, downwind, NE-SW, downwind, S-N, downwind, NW to the center, and from there either out SE or W depending on if we can land in Lakeland or have to go back to Houston  Droning\_On It will be an inflow mission ending with (hopefully, time permitting) a partial orbit in the eyewall |
| 2123 | Drop 1 IP west with S0 |
| 2130 | S0 at 1000m. Following a trajectory that should get it to the storm center/eyewall. Wind direction 245 deg. |
| 2135 | Drop 2 midpoint, combo drop BT 1, started reporting when T=20C |
| 2142 | Onboard LPS notes an elliptical eye with possible mesovortices |
| 2149 | Drop 3 center, combo drop BT 2 29.5C  URNT12 KWBC  VORTEX DATA MESSAGE AL092024  A. 26/21:50:06Z  B. 27.90 deg N 084.56 deg W  C. NA  D. 948 mb  E. 190 deg 08 kt  F. OPEN W  G. C30  H. NA  I. NA  J. 317 deg 97 kt  K. 220 deg 12 nm 21:47:05Z  L. NA  M. NA  N. 185 deg 136 kt  O. 090 deg 31 nm 21:57:21Z  P. 20 C / 2448 m  Q. 23 C / 2441 m  R. 14 C / NA  S. 12345 / NA  T. 0.01 / 3 nm  U. NOAA2 1709A HELENE OB 99  MAX FL WIND 136 KT 090 / 31 NM 21:57:21Z  MAX FL TEMP 24 C 089 / 13 NM FROM FL CNTR  TDR center info from 240926H1\_2150\_xy.nc:  Alt (km) Lat (deg) Lon (deg W)  0.5 99.99 99.99  2.0 27.89 84.49  3.0 27.91 84.47  6.0 27.94 84.41  2-6-km Vortex Tilt: 10.0 km at 53 deg |
| 2156 | Drop 4 RMW E |
| 2200 | Drop 5 MP combo drop BT 3 29.4C |
| 2210 | Drop 6 EP |
| 2218 | Lost comms with S0 |
| 2220 | NHC upgraded Helene to a category 4 hurricane with winds 115 kt and min pressure 947 based on data from our first pass. |
| 2225 | Drop 7 IP NE |
| 2226 | Regained comms with S0 |
| 2234 | Drop 8 MP |
| 2238 | Drops 9, 10, 11, 3-sonde sequence in northeast eyewall |
| 2247 | Drop 12, center combo BT 29.1  URNT12 KWBC  VORTEX DATA MESSAGE AL092024  A. 26/22:46:11Z  B. 28.26 deg N 084.42 deg W  C. NA  D. 944 mb  E. NA  F. CLOSED  G. E14/35/25  H. NA  I. NA  J. 150 deg 127 kt  K. 066 deg 20 nm 22:40:35Z  L. NA  M. NA  N. 298 deg 85 kt  O. 033 deg 1 nm 23:30:39Z  P. 17 C / 2441 m  Q. 25 C / 2306 m  R. 18 C / NA  S. 12345 / NA  T. 0.01 / 2 nm  U. NOAA2 1709A HELENE OB 99  MAX FL WIND 136 KT 090 / 31 NM 21:57:21Z  TDR center info from 240926H1\_2246\_xy.nc:  Alt (km) Lat (deg) Lon (deg W)  0.5 99.99 99.99  2.0 28.25 84.35  3.0 28.27 84.33  6.0 28.31 84.31  2-6-km Vortex Tilt: 7.2 km at 34 deg |
| 2250 | Turned in eye to reposition. Looked like center was tucked to west side where eyewall curved in. Continued circling due to comms issues |
| 2321 | Onboard LPS noted that eyewall seems to be closing off on the MMR and nose |
| 2322 | Plan is to go out SW, then downwind to S, S to N, downwind to NW, inbound from NW and then either out SE or back out NW depending on time and where they will be landing |
| 2323 | Release of second S0 |
| 2326 | Onboard LPS noted lots of small scale and medium scale features in the eyewall |
| 2338 | Droning\_On update for s0....100kts at 900m...just entering east eyewall...plan to drop to 700m soon...should get north semicircle of eyewall...maybe more cov  Droning\_On 140kts..  sim\_home You measured 140 kt, or hoping you do?  ahazelton\_n42\_LPS It did  ahazelton\_n42\_LPS I think there was a 148  Droning\_On whats crazy is winds are HIGHLY variable...not usually what we see...140, 110, 130, 100...all within a min of flight time...meso vortex action ??  Droning\_On we are at 700m..droppong to 500m |
| 2345 | Sonde 13 MP combo BT bad |
|  |  |
| 2328 | Inadvertent eye/eyewall mixing module |
|  |  |
| 2340 | S0 reported 148 kt at 900 m |
| 2353 | Sonde 14 EP |
| 2347 | Trimming SW leg a little to save some time and there is not much precip out that way |
| 0011 | Sonde 15 IP S |
| 0019 | Sonde 16 MP, bad sonde |
| 0020 | Sonde 17 MP combo BT bad |
| 0030 | No center sonde  TDR center info from 240926H1\_2430\_xy.nc:  Alt (km) Lat (deg) Lon (deg W)  0.5 99.99 99.99  2.0 99.99 99.99  3.0 99.99 99.99  6.0 28.95 84.09  2-6-km Vortex Tilt: 999.9 km at 999 deg |
| 0031 | Decided not to go out north, going out northeast. Scalloping in eyewall |
| 0032 | URNT12 KNHC 270056  VORTEX DATA MESSAGE AL092024  A. 27/00:32:30Z  B. 28.98 deg N 084.20 deg W  C. 700 mb 2622 m  D. 942 mb  E. 175 deg 11 kt  F. OPEN S  G. C30  H. 101 kt  I. 059 deg 17 nm 00:27:00Z  J. 136 deg 123 kt  K. 056 deg 23 nm 00:25:00Z  L. 79 kt  M. 202 deg 15 nm 00:37:30Z  N. 301 deg 100 kt  O. 199 deg 14 nm 00:37:00Z  P. 10 C / 3045 m  Q. 20 C / 3047 m  R. 14 C / NA  S. 12345 / 7  T. 0.02 / 1.5 nm  U. AF306 1809A HELENE OB 09  MAX FL WIND 134 KT 085 / 28 NM 23:46:30Z |
| 0034 | Sonde 18 RMW NE |
| 0042-3 | Sondes 19-21 RMW NE |
| 0044 | S0 got 138 kt at 150 m |
|  | Quick turnaround, back in northeast |
| 0047 | Lost comms with S0 |
| 0050 | Sonde 22 Center  URNT12 KWBC  VORTEX DATA MESSAGE AL092024  A. 27/00:49:57Z  B. 29.01 deg N 084.17 deg W  C. NA  D. 943 mb  E. 285 deg 09 kt  F. OPEN S  G. E12/40/25  H. NA  I. NA  J. 165 deg 136 kt  K. 068 deg 23 nm 00:43:27Z  L. NA  M. NA  N. 302 deg 87 kt  O. 239 deg 8 nm 00:52:05Z  P. 17 C / 2535 m  Q. 22 C / 2437 m  R. 16 C / NA  S. 1234 / NA  T. 0.01 / NA  U. NOAA2 1709A HELENE OB 99  MAX FL WIND 139 KT 172 / 33 NM 00:35:17Z  MAX FL TEMP 24 C 076 / 16 NM FROM FL CNTR  TDR center info from 240926H1\_2449\_xy.nc:  Alt (km) Lat (deg) Lon (deg W)  0.5 99.99 99.99  2.0 29.00 84.08  3.0 29.06 84.10  6.0 29.11 84.08  2-6-km Vortex Tilt: 12.0 km at 0 deg |
| 0100 | Sonde 23 MP W |
| 0116 | Sonde 24 EP |
|  |  |

| **POST-FLIGHT** | |
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| **Mission Summary** | *[Short description of interesting observations from the flight; what objectives were successful? What was unsuccessful? Was the planned pattern flown? What deviations occurred?*  *[Don’t forget to fill in Tables on page 1]*  *[Sonde and ocean expendable accounting: how many total of each? How many are charged to each account?]* |
| **Actual Standard Pattern Flown** | *[Butterfly, Rotated Figure-4, Lawnmower, etc]* |
| **APHEX Experiments / Modules Flown** | *[Linked to HFP Plan; fill in regardless of whether the mission was operationally or research tasked]* |
| **Plain Language Summary** | *[Boil down the above into a couple of bullet points in “plain language”. This will help us when we report to management & OAR Public Affairs and prepare storm mission summaries]* |
| **Instrument Notes** | *[Notes about instrument status from during and after the mission]* |
| **Final Mission Track** |  |