

WP-3D-0124 (24 Jan 2020)

Chris Fairall

1. Objective

Coordinated research flight with Ronald H. Brown. The Brown was expected to be at 14.4 N 55 W. WP-3D intended to fly a circle (90 km radius) at FL100 around the Brown, a double size AXBT(FL100) pattern north of the Brown (in the same area as the SWIFT buoys were previously) and a second circle centered on the HALO circle (center point 13.3N, 57.717W). Two isotope profiles were to be worked in between. Cloud profiles were not planned because cloud physics probes are still awaiting a computer repair.

2. Crew

Eleven crew, four science team members: C. Fairall (flight scientist), Adriana Bailey (isotope sampling), Peter Blossey (Isotope observer), K. Emanuel (observer), M. Gehne (PSD observer).

3. Synoptic Situation

The Brown was located on the northern edge of what was interpreted from satellite images to be a 'fish' pattern. North of the Brown was a large region with low cloud fraction – occupied by scattered 'sugar'. On the northern end of the AXBT lawnmower was a region of 'flower' clouds. The P3 clipped the southern edge of the flowers.

4. Flight Elements

Element	(°N, °W)	Flight Level (FL)	Time (UTC)	Notes
Takeoff-Ferry	GAIA	Ascent to FL100	13:20	
Circle 1	(14.4, 55)	FL100	14:06	12 sondes
Isotope profile	(14.4, 55)	FL100 to FL005	15:18	Ron Brown 1542
AXBT 1	(14.4 54.75)	FL090	16:08	1.5X1 deg 40 drops
Circle 2	(13.2 55.75)	FL100	19:46	12 sondes
Transit		FL100	21:00	

Circles: Two circles were executed at an altitude of 3.2 km; circles were 90 km in radius. Dropped twelve sondes with roughly even spacing, turning and flying straight legs between drops. The first circle sampled the edges of fish and flowers. The second circle was planned to be centered on the HALO circle but that air space was occupied by ATR so circle was located to E, where we encountered considerable precipitation.

Overflights: The first circle had RHB in the centered. We overflew the ship at 150 m after a 10 min approach. Aircraft and ship measurements of air temperature and SST were compared. SST ship=26.73, P3=26.55 C; Ta ship 25.66 P3 (corrected to 20 m) 25.90 C.

5. Instrument Status

Dropsondes: Launched on circles and AXBT (total of 38). All provided good data.

Cloud physics: probes were not operational due to a failed data acquisition computer.

W-band radar: operational after 1350Z; turned off below ~1500 m during cloud modules
WSRA surface wave radar: operational
SFMR: operational
Picarro isotope sampler: operational

6. Figures

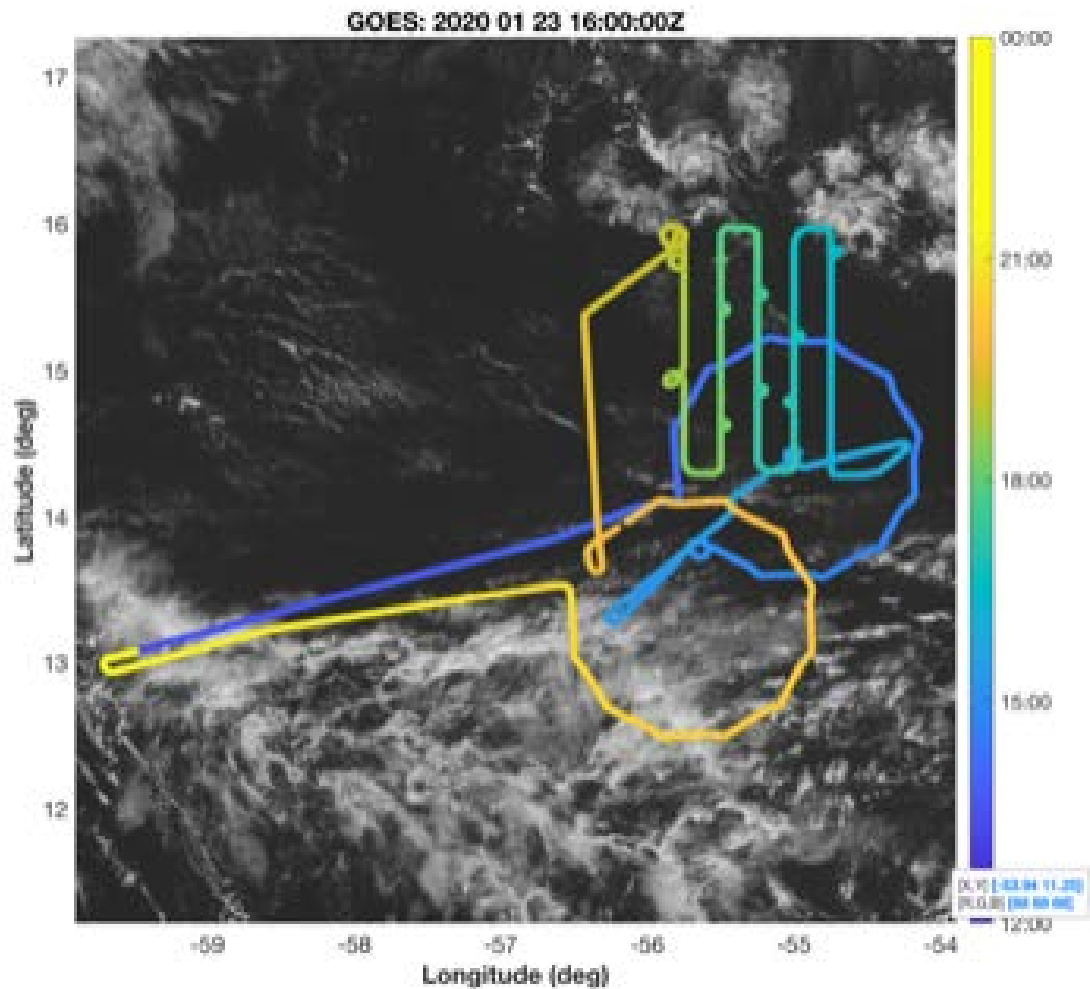


Figure 1, Plan view of flight path for WP-3D RF03. The track is superimposed on a satellite image from GOES-14 Channel 2 (red wavelengths in the visible) at 16:00Z

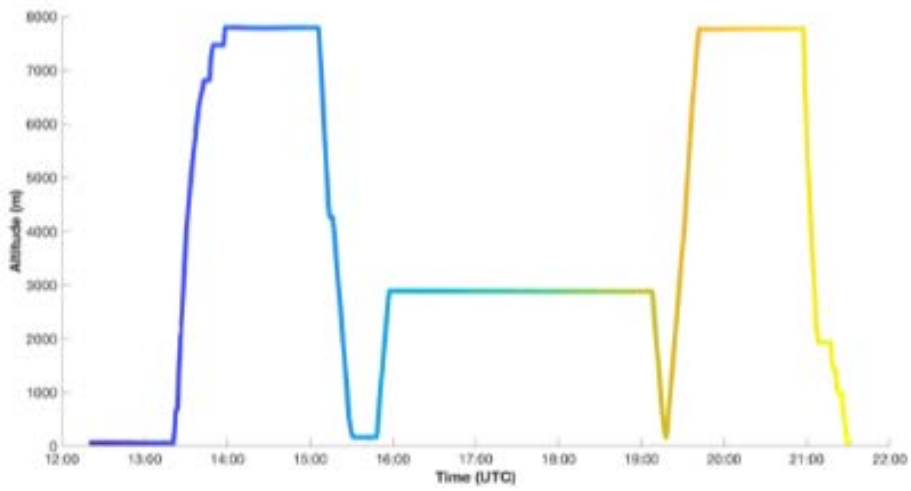
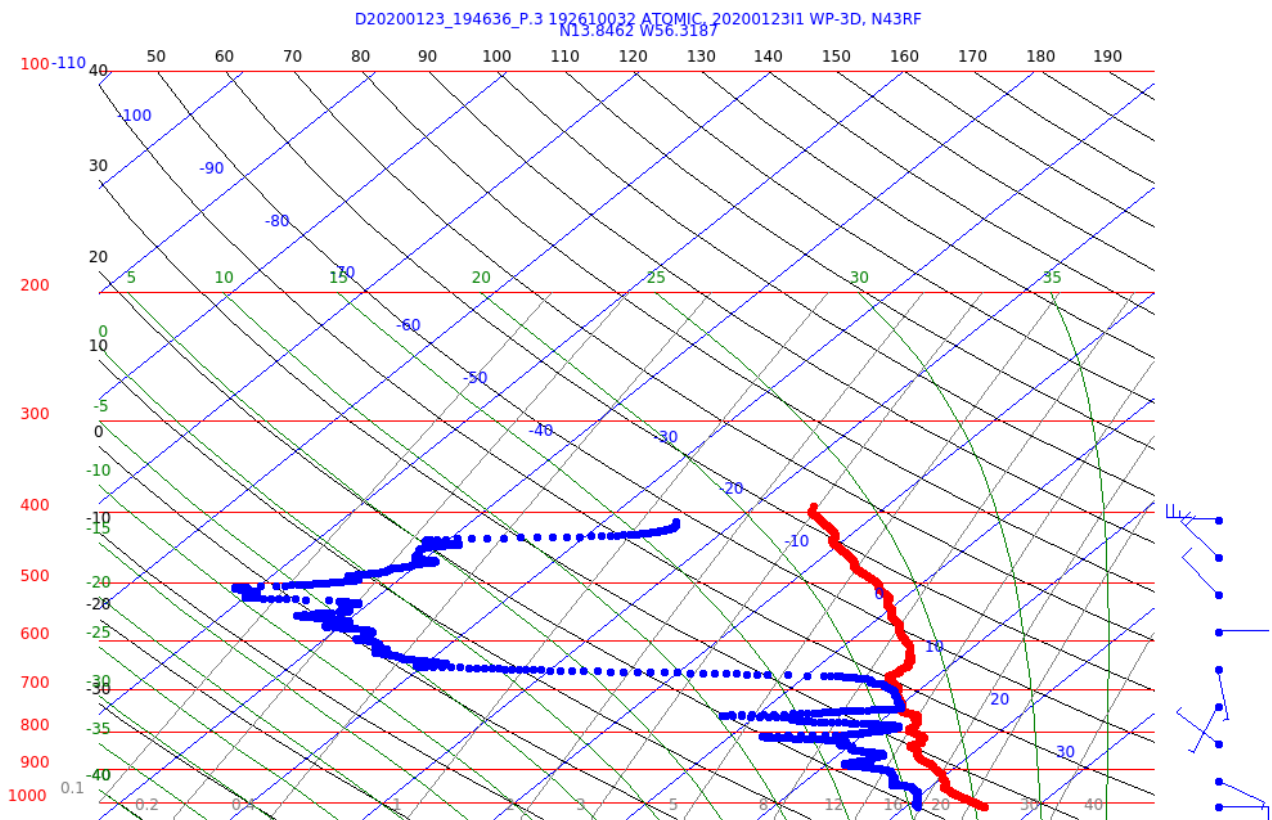


Figure 2. Profile view of flight plan.



Aspen V3.4.2, 23 Jan 2020 20:00 UTC

Figure 3. Dropsonde skew-T from first drop of second circle.

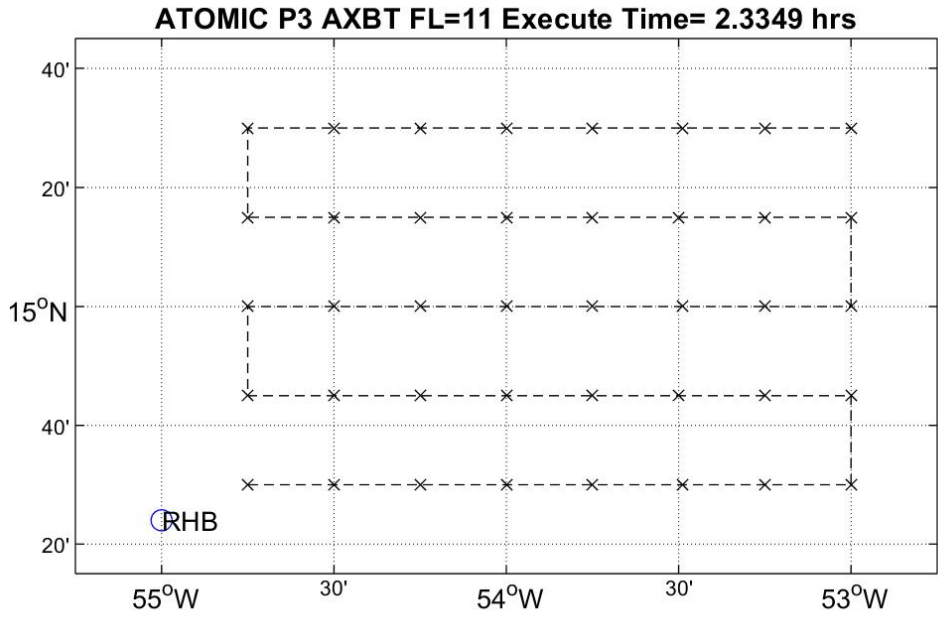


Figure 4. Grid for AXBT pattern.



Figure 5. WSRA values of significant wave height (SWH) in ft.