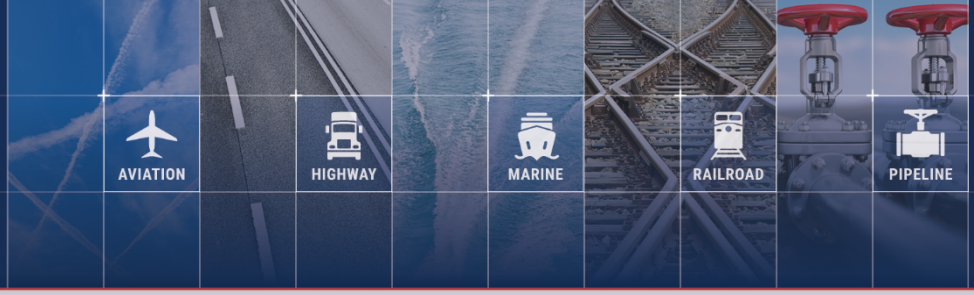

Aviation Investigation Final Report

Location:	Kahului, Hawaii	**Incident Number:**	DCA23LA172
Date & Time:	December 18, 2022, 14:51 Local	**Registration:**	N212UA
Aircraft:	Boeing 777	**Aircraft Damage:**	None
Defining Event:	Altitude deviation	**Injuries:**	281 None
Flight Conducted Under:	Part 121: Air carrier - Scheduled		

Analysis

United flight 1722 lost altitude about 1 minute after departure while in instrument meteorological conditions, which included heavy rain. The airplane descended from 2,100 ft to about 748 ft above the water before the crew recovered from the descent. No injuries were reported, and the airplane was not damaged. The NTSB was not originally notified of the event, since it did not meet the requirements of Title 49 *Code of Federal Regulations* Part 830.5. However, the NTSB learned of the event about 2 months later and chose to open an investigation. By that time, both the cockpit voice and flight data recorder durations had been exceeded. The investigation utilized flight crew statements and other records as information sources.

The captain (who was the pilot flying) reported that he and the first officer had initially planned for a flaps-20 takeoff (flap setting of 20°) with a reduced-thrust setting, based on performance calculations. However, during taxi, the ground controller advised them that low-level windshear advisories were in effect. Based on this information, the captain chose a flaps-20 maximum thrust takeoff instead. He hand-flew the takeoff, with the auto throttles engaged. During the takeoff, the rotation and initial climb were normal; however, as the airplane continued to climb, the flight crew noted airspeed fluctuations as the airplane encountered turbulence. When the airplane reached the acceleration altitude, the captain reduced the pitch attitude slightly and called for the flap setting to be reduced to flaps 5. According to the first officer, he thought that he heard the captain announce flaps 15, which the first officer selected before contacting the departure controller and discussing the weather conditions. The captain noticed that the maximum operating speed indicator moved to a lower value than expected, and the airspeed began to accelerate rapidly.

The captain reduced the engine thrust manually, overriding the auto throttle servos, to avoid a flap overspeed and began to diagnose the flap condition. He noticed that the flap indicator was

showing 15°, and he again called for flaps 5, and he confirmed that the first officer moved the flap handle to the 5° position.

The first officer stated that he "knew the captain was having difficulty with airspeed control", and he queried the captain about it as he considered if his own (right side) instrumentation may have been in error. He did not receive an immediate response from the captain. Both pilots recalled that, about this time, the airplane's pitch attitude was decreasing, and the airspeed was increasing. The first officer recalled that that the captain asked for flaps 1 soon after he had called for flaps 5, and when the first officer set the flaps to 1°, he then noticed the airspeed had increased further, and the control column moved forward.

Both pilots recalled hearing the initial warnings from the ground proximity warning system (GPWS), and the first officer recalled announcing "pull up pull up" along with those initial GPWS warnings. The captain then pulled aft on the control column, initially reduced power to reduce airspeed, and then applied full power to "begin the full CFIT [controlled flight into terrain] recovery." The first officer recalled that, as the captain was performing the recovery, the GPWS alerted again as the descent began to reverse trend; data showed this occurred about 748 ft above the water. After noting a positive rate of climb, the captain lowered the nose to resume a normal profile, ensured that the flaps and speed brakes were fully retracted, and engaged the autopilot. The remainder of the flight was uneventful.

Figure 1 shows a perspective view of the flight track.

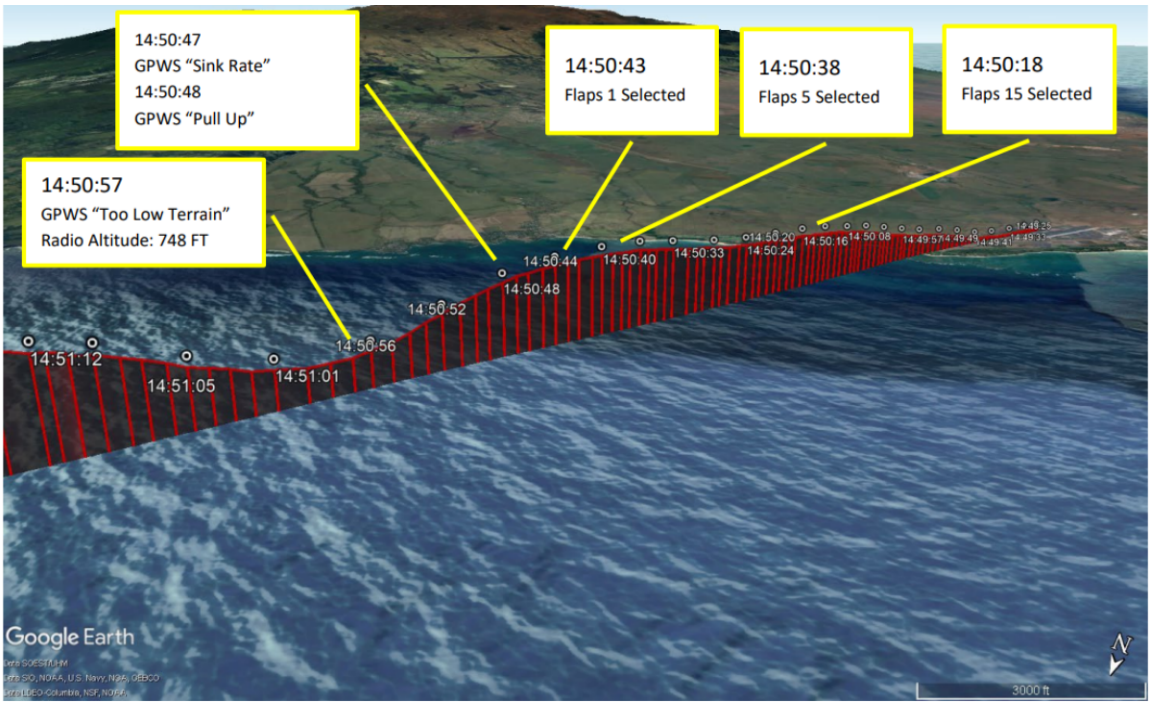

Figure 1- Flight Track with Annotations

As a result of the event, United Airlines modified one of their operations training modules to address this occurrence and issued an awareness campaign about flight path management at their training center.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this incident to be:

The flight crew's failure to manage the airplane's vertical flightpath, airspeed, and pitch attitude following a miscommunication about the captain's desired flap setting during the initial climb.

Findings

Personnel issues	Aircraft control - Pilot
Personnel issues	Identification/recognition - Pilot

Factual Information

History of Flight

Enroute-climb to cruise	Altitude deviation (Defining event)

Pilot Information

Certificate:	Airline transport; Flight engineer; Flight instructor	**Age:**	55,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	5-point
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	Airplane single-engine; Instrument airplane	**Toxicology Performed:**	
Medical Certification:	Class 1 With waivers/limitations	**Last FAA Medical Exam:**	October 12, 2022
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	April 8, 2022
Flight Time:	19600 hours (Total, all aircraft), 5000 hours (Total, this make and model), 10900 hours (Pilot In Command, all aircraft), 100 hours (Last 90 days, all aircraft), 30 hours (Last 30 days, all aircraft)		

Co-pilot Information

Certificate:	Airline transport; Flight instructor	**Age:**	Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Right
Other Aircraft Rating(s):	None	**Restraint Used:**	5-point
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	Airplane single-engine; Instrument airplane	**Toxicology Performed:**	
Medical Certification:	Class 1 Without waivers/limitations	**Last FAA Medical Exam:**	January 4, 2023
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	February 7, 2023
Flight Time:	5300 hours (Total, all aircraft), 120 hours (Total, this make and model), 2395 hours (Pilot In Command, all aircraft), 120 hours (Last 90 days, all aircraft), 30 hours (Last 30 days, all aircraft), 5 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Boeing	**Registration:**	N212UA
Model/Series:	777 222	**Aircraft Category:**	Airplane
Year of Manufacture:	2000	**Amateur Built:**	
Airworthiness Certificate:	Transport	**Serial Number:**	30218
Landing Gear Type:	Retractable - Tricycle	**Seats:**	381
Date/Type of Last Inspection:	August 14, 2021 Continuous airworthiness	**Certified Max Gross Wt.:**	545000 lbs
Time Since Last Inspection:		**Engines:**	2 Turbo jet
Airframe Total Time:	74017 Hrs at time of accident	**Engine Manufacturer:**	P&W
ELT:	C126 installed, not activated	**Engine Model/Series:**	PW4077
Registered Owner:	UNITED AIRLINES INC	**Rated Power:**	60000 Lbs thrust
Operator:	UNITED AIRLINES INC	**Operating Certificate(s) Held:**	Flag carrier (121)

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument (IMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	PHOG,50 ft msl	**Distance from Accident Site:**	0 Nautical Miles
Observation Time:	14:50 Local	**Direction from Accident Site:**	45°
Lowest Cloud Condition:		**Visibility**	3 miles
Lowest Ceiling:	Broken / 900 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	10 knots /	**Turbulence Type Forecast/Actual:**	None / Unknown
Wind Direction:	140°	**Turbulence Severity Forecast/Actual:**	N/A / Unknown
Altimeter Setting:	29.78 inches Hg	**Temperature/Dew Point:**	19°C / 18°C
Precipitation and Obscuration:	Heavy - None - Rain		
Departure Point:	Kahului, HI (OGG)	**Type of Flight Plan Filed:**	IFR
Destination:	San Francisco, CA (SFO)	**Type of Clearance:**	IFR
Departure Time:	14:49 Local	**Type of Airspace:**	Class C

Wreckage and Impact Information

Crew Injuries:	10 None	**Aircraft Damage:**	None
Passenger Injuries:	271 None	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	281 None	**Latitude, Longitude:**	20.898649,-156.43045(est)

Administrative Information

Investigator In Charge (IIC):	Brazy, Douglass
Additional Participating Persons:	Patrick Lusch; FAA/AVP-100; Washington, DC
Original Publish Date:	August 10, 2023
Last Revision Date:	
Investigation Class:	Class 4
Note:	The NTSB did not travel to the scene of this incident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=106734