NATIONAL TRANSPORTATION SAFETY BOARD
Vehicle Recorder Division
Washington, D.C. 20594

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Cockpit Displays – Recorded Flight Data

Specialist's Factual Report
by Kyle Garner

1. EVENT

Location:	Seward, Alaska
Date:	June 21, 2019
Aircraft:	Helio H-250
Registration:	N6314V
Operator:	Private
NTSB Number:	ANC19FA026

On June 21, 2019, about 1546 Alaska daylight time, a wheel-equipped Helio Courier H-250 airplane, N6314V, was destroyed after a collision with tree-covered terrain about 25 miles southeast of Seward, Alaska. The airline transport pilot and two passengers sustained fatal injuries. A post-crash fire incinerated a large portion of the wreckage. The airplane was registered to and operated by the pilot under the provisions of Title 14 *Code of Federal Regulations (CFR)* Part 91 as a visual flight rules personal flight. Day visual meteorological conditions prevailed at the time of the accident, and no flight plan was filed. The flight originated from the Seward Airport (SWD), Seward, Alaska, about 1450.

2. DETAILS OF INVESTIGATION

The National Transportation Safety Board (NTSB) Vehicle Recorder Division received the following devices:

Device 1:	Chelton Integrated Display Unit III (IDU-III)
Device 1 Serial Number:	36432
Device 2:	Chelton Integrated Display Unit III (IDU-III)
Device 2 Serial Number:	36407

2.1. Chelton Device Description

The Chelton IDU-III is a flight/navigation instrumentation system that provides information to a pilot via computer generated screens shown on panel-mounted hardware. The displays can be configured as either a Primary Flight Display (PFD), showing only information critical to flight, or a multifunction display (MFD) capable of showing a variety of system, navigation and weather information screens.

Chelton IDUs log all data associated with a flight, including all flight instrument and navigation data, which can be downloaded by the pilot for review. The data logging files contain recordings of flight and engine parameters at one second intervals of up to five hours each from the previous five operations of the system. Each time a parameter is recorded a Zulu timestamp followed by three lines of comma delimited ASCII text data are written, where the first line contains flight

parameters, the second line contains engine #1 parameters, and the third line contains engine #2 parameters (if equipped). A list of available parameters and engineering units are provided in table 1.

Table 1 – Recorded Parameters

First Line (Flight)	Second Line (Engine #1)	Third Line (Engine #2)
Latitude, deg	N1, RPM	N1, RPM
Longitude, deg	Fuel Flow, gph	Fuel Flow, gph
MSL Altitude, ft	Aux 1	Aux 1
Pitch Angle, deg	Left Fuel, gal	-
Bank Angle, deg	Right Fuel, gal	-
Magnetic Heading, deg	Fuel Pressure, psi	Fuel Pressure, psi
Magnetic Track, deg	Aux 5	Aux 5
IAS, kts	Oil Temperature, deg F	Oil Temperature, deg F
TAS, kts	Oil Pressure, psi	Oil Pressure, psi
Ground Speed, kts	Volts, V	Volts, V
VSI, fpm	EGT #1, deg F	EGT #1, deg F
Glidepath, deg	CHT #1, deg F	CHT #1, deg F
G-force, g	EGT #2, deg F	EGT #2, deg F
Wind Speed, kts	CHT #2, deg F	CHT #2, deg F
Magnetic Wind Direction, deg	EGT #3, deg F	EGT #3, deg F
OAT, deg F	CHT #3, deg F	CHT #3, deg F
Density Altitude, ft	EGT #4, deg F	EGT #4, deg F
Fuel Totalizer Qty, gal	CHT #4, deg F	CHT #4, deg F
-	EGT #5, deg F	EGT #5, deg F
-	CHT #5, deg F	CHT #5, deg F
-	EGT #6, deg F	EGT #6, deg F
-	CHT #6, deg F	CHT #6, deg F
-	Aux Temp #1, deg F	Aux Temp #1, deg F
-	Aux Temp #2, deg F	Aux Temp #2, deg F
-	Induction Temperature, deg F	Induction Temperature, deg F

The log files are written to an internal PCMCIA flash memory card that can be removed from the unit for download.

2.1.1. Device Condition

Upon arrival at the Vehicle Recorder Laboratory, an initial examination revealed that both units had sustained severe fire damage. The extent of the damage is shown in Figure 1 and 2.

Figure 1. Photo of damaged unit #1

Figure 2. Photo of damaged unit #2

The PCMCIA flash memory cards were located on each device and were found to also have severe fire damage. The extent of the damage to the flash memory cards is shown in Figure 3 and 4.

Figure 3. Photo of damaged PCMCIA flash memory card on unit #1

Figure 4. Photo of damaged PCMCIA flash memory card on unit #2

2.1.2. Chelton Data Description

This device is capable of storing data in the non-volatile memory (NVM)[1]. The extent of the fire damage precluded normal recovery procedures and additional attempts were unsuccessful in yielding usable data. Therefore, no data pertinent to the event were recovered.

[1] Non-volatile memory is semiconductor memory that does not require external power for data retention.