

National Transportation Safety Board

Office of Research and Engineering

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WPR23FA299

ELECTRONIC DEVICES

Specialist's Factual Report

November 7, 2024

TABLE OF CONTENTS

A. ACCIDENT.....	3
B. GLOBAL POSITIONING SYSTEM DEVICES SPECIALIST	3
C. DETAILS OF THE INVESTIGATION	3
1.0 DYNON SV-D1000 DEVICE DESCRIPTION.....	3
1.1 Data Recovery	4
2.0 GARMIN AERA 796 DEVICE DESCRIPTION.....	6
2.1 Data Recovery	6
2.2 Recording Description	7
2.3 Parameters Provided	7
D. OVERLAYS AND TABULAR DATA.....	8

A. ACCIDENT

Location: Van Nuys, California
Date: August 2, 2023
Time: 1036 pacific daylight time (PDT)
1737 coordinated universal time (UTC)
Airplane: CZECH SPORT AIRCRAFT SportCruiser, Private, N384SC

B. ELECTRONIC DEVICES SPECIALIST

Specialist Charles Cates
Mechanical Engineer/Recorder Specialist
National Transportation Safety Board (NTSB)

C. DETAILS OF THE INVESTIGATION

An electronic devices group was not convened. The NTSB Vehicle Recorder Division received the following GPS and cockpit display devices:

Recorder Manufacturer/Model:	Dynon SV-D1000 (SkyView)
Part Number:	Unknown (data plate destroyed)
Recorder Serial Number:	Unknown (data plate destroyed)
Recorder Manufacturer/Model:	Dynon SV-D1000 (SkyView)
Part Number:	Unknown (data plate destroyed)
Recorder Serial Number:	Unknown (data plate destroyed)
Recorder Manufacturer/Model:	Garmin Aera 796
Part Number:	aera 796
Recorder Serial Number:	2CY009547

1.0 Dynon SV-D1000 Device Description

The Dynon SV-D1000 is an uncertified 10-inch wide screen display suitable for mounting in the cockpit of non-type certificated aircraft. Its capabilities include engine monitoring, synthetic vision, moving map, traffic, airport diagrams, autopilot control, and radio integration.

The display receives input from multiple modules for flight instrumentation including modules for air data/attitude/heading (ADHARS), engine monitoring (EMS), GPS, Transponder, radios, and intercoms.

Data is recorded on a Serial-ATA (SATA) based Disk on Module (DOM) mounted to the main memory board. The DOM contains a user-configurable log file

that can record between 2-150 hours of data at sampling rates ranging from 0.1-16 Hz. There is also an alert log file that is recorded whenever the device triggers any kind of alert and a "Black Box" recent flight data log file which contains the most recent 15 minutes of flight recorded at 16 Hz.

1.1 Data Recovery

Upon arrival at the Vehicle Recorder Laboratory, an exterior examination revealed both Dynon devices had sustained significant impact and thermal damage. The first unit, shown in figure 1 with the memory module annotated, was too significantly burned to attempt a recovery. The second unit, shown in figure 2, had also suffered fire damage, but the DOM was intact enough to attempt a recovery of data.

The DOM was installed in a laboratory SATA reader however no file system could not be mounted. A forensic image was created of the memory device and the data appeared to be random with no file structure. Multiple attempts were made to mount and access a valid file system, and none were successful. The heat damage was too extensive to allow for a successful recovery of the data.

No data was recovered from either Dynon device.



Figure 1. Photo of first Dynon as received with location of DOM device annotated.

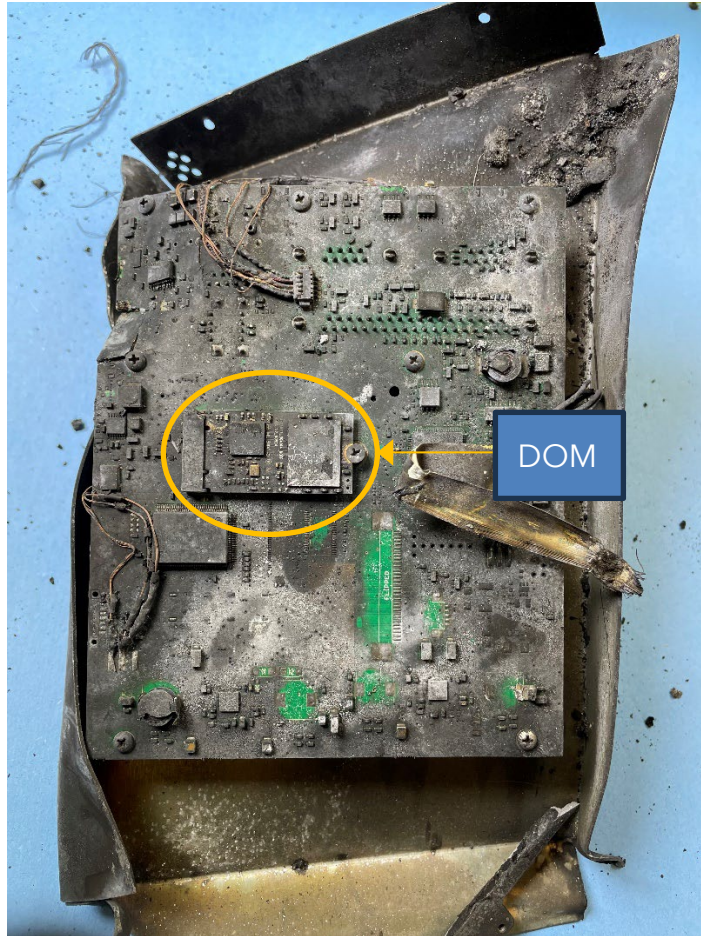


Figure 2. Photo of second Dynon device as received with burned SATA DOM annotated.

2.0 Garmin Aera 796 Device Description

The Garmin Aera 796 is a battery-powered portable GPS receiver with a 7-inch high-definition touchscreen display. The unit displays terrain, obstacles, airports, and traffic in 3D to the pilot. It also has options for use as an electronic flight bag for display of VFR sectional and IFR enroute charts, approach charts, and airport diagrams.

The unit stores date, route of flight, and flight time information for up to 50 flights. A flight record is triggered when groundspeed exceeds 30 knots and altitude increases by more than 250 feet. The flight record ends when groundspeed drops below 30 knots.

2.1 Data Recovery

Upon arrival at the Vehicle Recorder Laboratory, an exterior examination revealed that the Garmin had undergone mechanical impact damage. The screen was cracked and the unit could not be powered on. See figure 3 for the as-received condition of the device.



Figure 3. Garmin Aera 796 as received by the vehicle recorder laboratory.

The unit was disassembled and the chip containing the device's memory was removed and read out in a laboratory chip reader.

2.2 Recording Description

The data extracted included 2 track logs from August 2, 2023, the date of the accident.¹ The accident flight was recorded starting 16:52:09 UTC and ending 17:35:54 UTC on September 24, 2011.

2.3 Parameters Provided

Table 1 describes data parameters provided by the GPS device. Date, Time, Latitude, Longitude, and GPS Altitude are recorded by the device. Groundspeed and Track are derived from the recorded parameters.

¹ All dates and times are referenced to coordinated universal time (UTC).

Table 1. GPS Data Parameters.

Parameter Name	Parameter Description (units)
Date/Time	Date and Time (UTC) for recorded data point (YYYY-MM-DD hh:mm:ss)
Elevation	Recorded GPS Altitude (meters)
Latitude	Recorded Latitude (degrees)
Longitude	Recorded Longitude (degrees)

D. OVERLAYS AND TABULAR DATA

Data obtained from the Garmin Aera 796 was used to produce the following overlay. Figures 4 and 5 are graphical overlays generated using Google Earth for the accident flight. The recorded data ended about a minute prior to the end of the flight, based on ADS-B data. Figure 4 shows the full accident flight and figure 5 shows the final portion of the recorded data with the wreckage location annotated. The weather and lighting conditions in Google Earth are not necessarily the weather and lighting conditions present at the time of the recording.

The corresponding tabular data used to create figures 4 and 5 are provided in electronic comma-separated value (CSV) format as attachment 1 to this report.

Submitted by:

Charles Cates
Mechanical Engineer/Recorder Specialist



Figure 4. Map overlay of the accident flight recording.



Figure 5. Final portion of recorded data with wreckage location annotated.