

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

July 25, 2017

## **Multiple Electronic Devices**

**Specialist's Factual Report**  
**By Bill Tuccio, Ph.D.**

### **1. EVENT SUMMARY**

Location: Sebring, Florida  
Date: August 24, 2016  
Aircraft: Vans Aircraft RV-9A  
Registration: N379RV  
Operator: Private  
NTSB Number: ERA16FA297

### **2. GROUP**

A group was not convened.

### **3. DETAILS OF INVESTIGATION**

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

Device Manufacturer/Model: **AdventurePilot iFly720**  
Serial Number: **13080266**

Device Manufacturer/Model: **Dynon Electronic Flight Instrument System (EFIS) D10-A**  
Serial Number: **Unknown**

Device Manufacturer/Model: **Garmin GNC 300XL**  
Serial Number: **95104621**

Device Manufacturer/Model: **Dynon Autopilot Expansion Module**  
Serial Number: **001970**

Device Manufacturer/Model: **Garmin GTX 320A Transponder**  
Serial Number: **83809470**

Device Manufacturer/Model: **SkyGuard TWX**  
Serial Number: **137**

### **3.1. Device Descriptions**

The AdventurePilot iFly720 is a portable Global Positioning System (GPS). When a removable SD card is installed, it can record historical track information.

The Dynon EFIS D10-A is a panel mounted EFIS which can display primary flight instruments and navigational information on a 4-inch diagonal screen. Firmware versions beyond version 5.0 can record a limited amount of data to non-volatile memory.<sup>1</sup>

The Garmin GNC 300XL is an IFR-capable GPS receiver. Other than last frequencies and the date of the last navigational database update (on the removable database card), it does not record any historical information.

The Dynon Autopilot Expansion Module enables autopilot functions. It does not record any historical information.

The Garmin GTX 320A Transponder is a mechanic display, solid-state transponder. It does not record any historical information.

The SkyGuard TWX is an ADS-B transceiver and may be configured for ADS-B out operations. It does not record any historical information.

### **3.2. Device Condition**

Upon arrival at the NTSB Vehicle Recorder Division, an examination revealed the devices had sustained varying degrees of impact damage.

Figure 1 shows the AdventurePilot iFly720 as received, with a cracked screen. Figure 2 shows a side view with an empty SD card slot.

Figure 3 shows the Dynon EFIS D-10A as received, with significant impact damage to the housing and a cracked screen. Figure 4 shows the non-volatile memory chip (annotated in red) intact. The non-volatile memory chip was removed and read out using a Xeltek EEPROM programmer.

Figure 5 shows the Garmin 300XL as received, with significant impact damage. Figure 6 shows the removable navigational database card with impact damage to the card packaging.

Figure 7 shows the Dynon Autopilot Expansion Module, with minor impact damage.

Figure 8 shows a front view of the Garmin GTX 320A transponder, with significant impact damage and the front-face of the unit missing.

Figure 9 shows the top of the SkyGuard TWX as received, with minor impact damage.

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<sup>1</sup> Non-volatile memory is semiconductor memory that does not require external power for data retention.

Figure 1. AdventurePilot iFly720.



Figure 2. AdventurePilot iFly720, SD card slot view.



Figure 3. Dynon EFIS D10-A



Figure 4. Dynon EFIS D10-A, non-volatile memory chip.

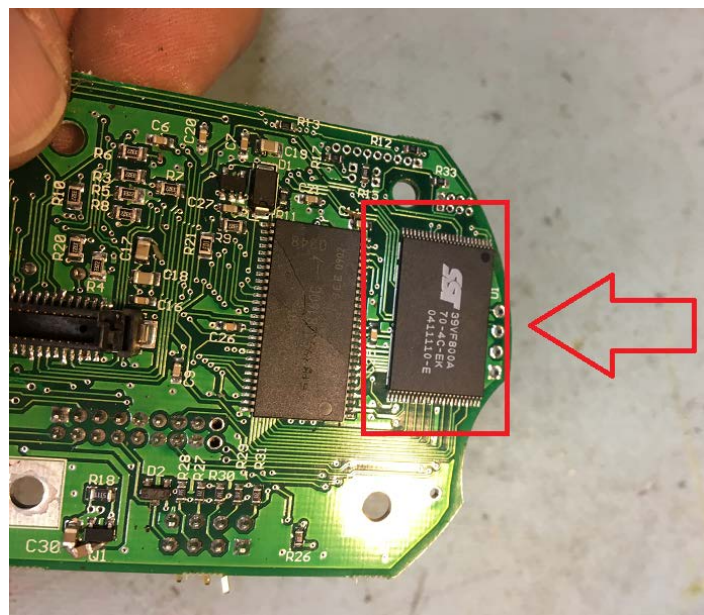


Figure 5. Garmin 300XL as received.

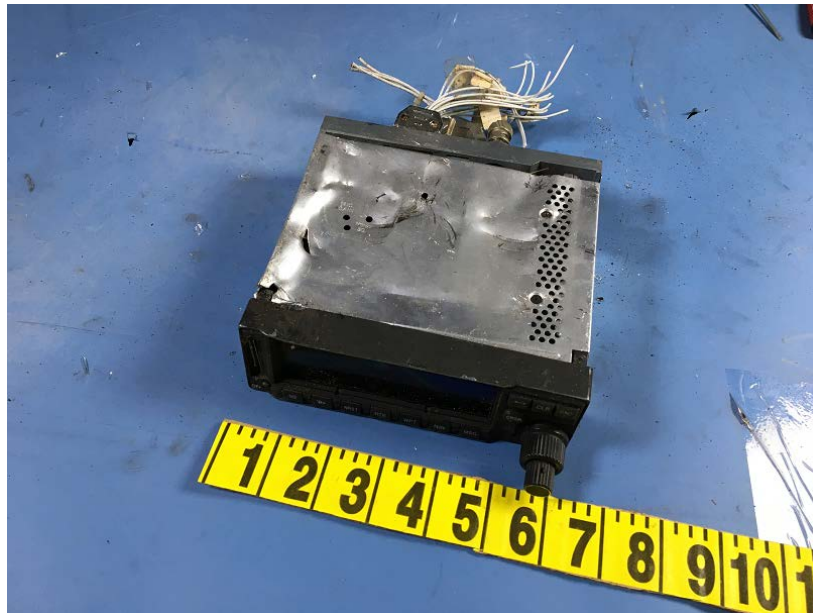


Figure 6. Garmin 300XL database card.



Figure 7. Dynon Autopilot Expansion Module.



Figure 8. Garmin GTX 320A transponder, front view.



Figure 9. SkyGuard TWX as received.



### 3.3. Data Description

#### 3.3.1. Dynon EFIS D10-A Data Description

With assistance from the manufacturer, the 1MB binary image of the non-volatile memory chip was examined and it was determined the firmware was version 5.4.0. While this version is capable of recording limited historical information, no historical data was found. Most likely, the firmware was upgraded from a pre-5.0 version and the upgrade process did not enable data recording. No temporal historical data existed.

#### 3.3.2. Remaining Devices Data Description

No data was recovered from the remaining devices for the following reasons:

- **AdventurePilot iFly720.** The SD data card was not installed or not recovered.
- **Garmin GNC 300XL.** No temporal historical data was recorded and, in agreement with the Investigator-in-Charge, the removable navigational database card was not pertinent to the investigation.
- **Dynon AP Expansion Module.** The device did not record temporal historical information.
- **Garmin GTX 320A Transponder.** The device did not record historical information and the missing front-face interface did not allow for a determination of last transponder code.
- **SkyGuard TWX.** No historical information was recovered; however, it was determined the device was ADS-B out capable.