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

September 10, 2014

Global Positioning System (GPS) Device

Specialist's Factual Report
by Bill Tuccio, Ph.D.

1. EVENT

Location:	Highmore, South Dakota
Date:	April 27, 2014
Aircraft:	Piper PA-32R-300
Registration:	N8700E
Operator:	Private
NTSB Number:	CEN14FA224

On April 27, 2014, at 2116 central daylight time, a Piper PA-32R-300 airplane, N8700E, was destroyed when it impacted the blade of a wind turbine 11 miles south of Highmore, South Dakota. The commercial pilot and three passengers were fatally injured. The airplane was registered to and operated by a private individual under the provisions of 14 *Code of Federal Regulations* Part 91 as a personal flight. Instrument meteorological conditions prevailed for the flight, which operated without a flight plan. The flight originated from Hereford Municipal Airport (KHRX), Hereford, Texas, approximately 1700.

2. DETAILS OF DEVICE INVESTIGATION

The National Transportation Safety Board's (NTSB's) Vehicle Recorder Division received the following device:

Device 1:	Apollo GX-50[1]
Device 1 Serial Number:	6015444

2.1. Apollo GX-50 Description

The Apollo GX-50 is a panel-mount 8-channel GPS receiver equipped with a 160 x 80 pixel electro-luminescent display and soft-key controls. The unit includes a waypoint database with information about airports, VOR, NDB, enroute intersections, and special use airspace. Up to 500 custom user-defined waypoints may be stored, as well. The GX-50 is a TSO-C129a class unit capable of supporting IFR non-precision approach operations. Thirty flight plans composed of a linked list of waypoints may be defined and

[1] The unit contained an "AT Flybrary Data Card."

stored. The real-time navigation display can be configured to show: latitude/longitude, bearing, distance to target, ground speed, track angle, desired track, distance, and an internal course deviation indicator (CDI). The unit stores historical position information in volatile memory[2]; however; by design there is no method to download this information.

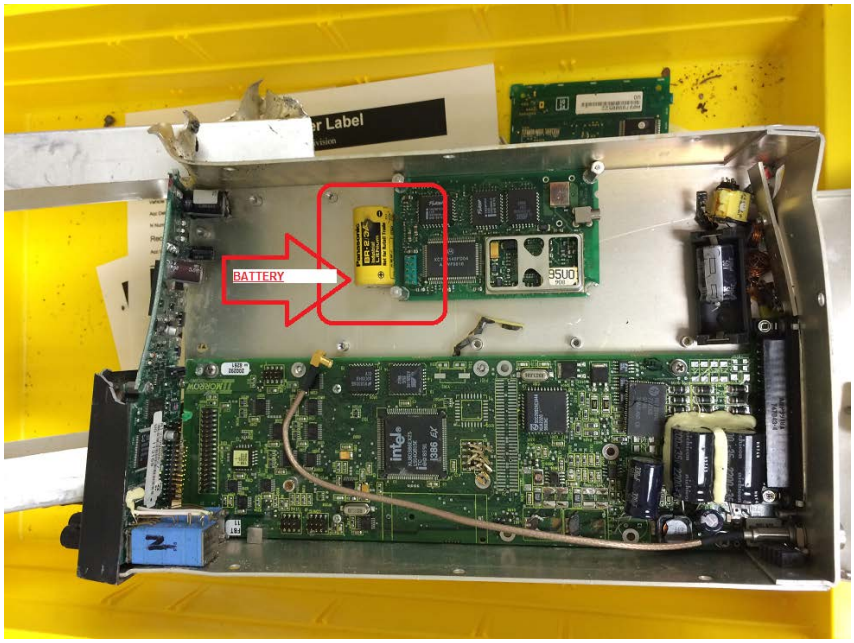
2.1.1. Apollo GX-50 Data Recovery

Upon arrival at the Vehicle Recorder Laboratory, an exterior examination revealed the unit had sustained significant structural damage, as shown in figure 1. An internal inspection revealed most internal components, including the battery, were dislodged, as shown in figure 2. Since the internal battery was dislodged and the unit relied upon volatile memory to record information, no further recovery efforts were attempted.

Figure 1. Apollo GX-50 as received.

[2] Volatile memory requires power to retain information.

Figure 2. Apollo GX-50 internal inspection (annotated).



2.1.2. Apollo GX-50 Data Description

No data was recovered.