

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



**GPS Factual Report**

**DEN08MA116AB**

by

**Joseph A. Gregor**

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September 3, 2008

## **17 - GPS Factual Report**

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**A. EVENT**

Location: Flagstaff, Arizona  
Date/Time: June 29, 2008 / 1547 Mountain Standard Time (MST)  
Aircraft Type/ID: Bell 407 / N407GA  
Operator: Air Methods Corp., Englewood, Colorado  
NTSB Number: DEN08MA116AB

**B. GROUP - No Group**

**C. SUMMARY**

On June 29, 2008, at 1547 Mountain Standard Time, a Bell 407 emergency medical service (EMS) helicopter, N407GA, and a Bell 407 EMS helicopter, N407MJ, collided in mid air while approaching the Flagstaff Medical Center helipad (3AZ0), Flagstaff, Arizona. N407GA was operated by Air Methods Corp., Englewood, Colorado, and registered to Flagstaff Medical Center, Flagstaff, Arizona. N407MJ was operated by Classic Helicopter Services, Page, Arizona, and registered to M&J Leisure, L.L.C., Ogden, Utah. Visual meteorological conditions prevailed, and company flight plans were filed for each of the Title 14 Code of Federal Regulations Part 135 air medical flights. N407GA's flight departed the Flagstaff Pulliam Airport (FLG), Flagstaff, at 1544, and N407MJ's flight departed the Grand Canyon National Park Service South Rim helibase, Tusayan, Arizona, at 1517.

**D. DETAILS OF INVESTIGATION**

On July 1, 2008, the NTSB Vehicle Recorder Laboratory received the following device:

GPS Manufacturer/Model: Garmin GPSMAP 496

Serial Number:

19703117

### **GPS Description: GPSMAP 496**

The Garmin GPSMAP 496 is a battery-powered portable GPS receiver with a 256-color TFT LCD display screen. The unit includes a built-in Jeppesen database and is capable of receiving XM satellite radio for flight information including NEXTRAD radar, lightning, METARs, TAFs, and TFRs. A built-in AOPA Airport Directory and Safe Taxi Airport Diagrams are included for selected fields. 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 exceeds 250 feet, and ends when groundspeed drops below 30 knots for 10 minutes or more. A detailed tracklog – including latitude, longitude, date, time, and groundspeed information for an unspecified number of points – is stored within the unit whenever the receiver has a lock on the GPS navigation signal. Position is updated within the tracklog as a function of time or distance moved, depending on how the unit has been configured. Once current tracklog memory becomes full, new information either overwrites the oldest information or recording stops, depending on how the unit is configured. The current tracklog can be saved to long-term memory and 15 such saved tracklogs can be maintained in addition to the current tracklog. Tracklog storage may be activated or de-activated at user discretion. All recorded data is stored in *non-volatile*<sup>1</sup> memory. The unit contains hardware and software permitting the download of recorded waypoint, route, and tracklog information to a PC via a built-in serial port using the NMEA 0183 version 2.0 protocol. The unit can also communicate with external devices such as a computer using a built in USB port. An internal button-battery is used to back-up power to the internal memory and real-time clock during those periods when main power is removed.

### **GPS Data Recovery**

Upon arrival at the Vehicle Recorder laboratory, an exterior examination that the unit had sustained no significant damage. Power was applied to the unit and all observed startup indications were consistent with normal operation.

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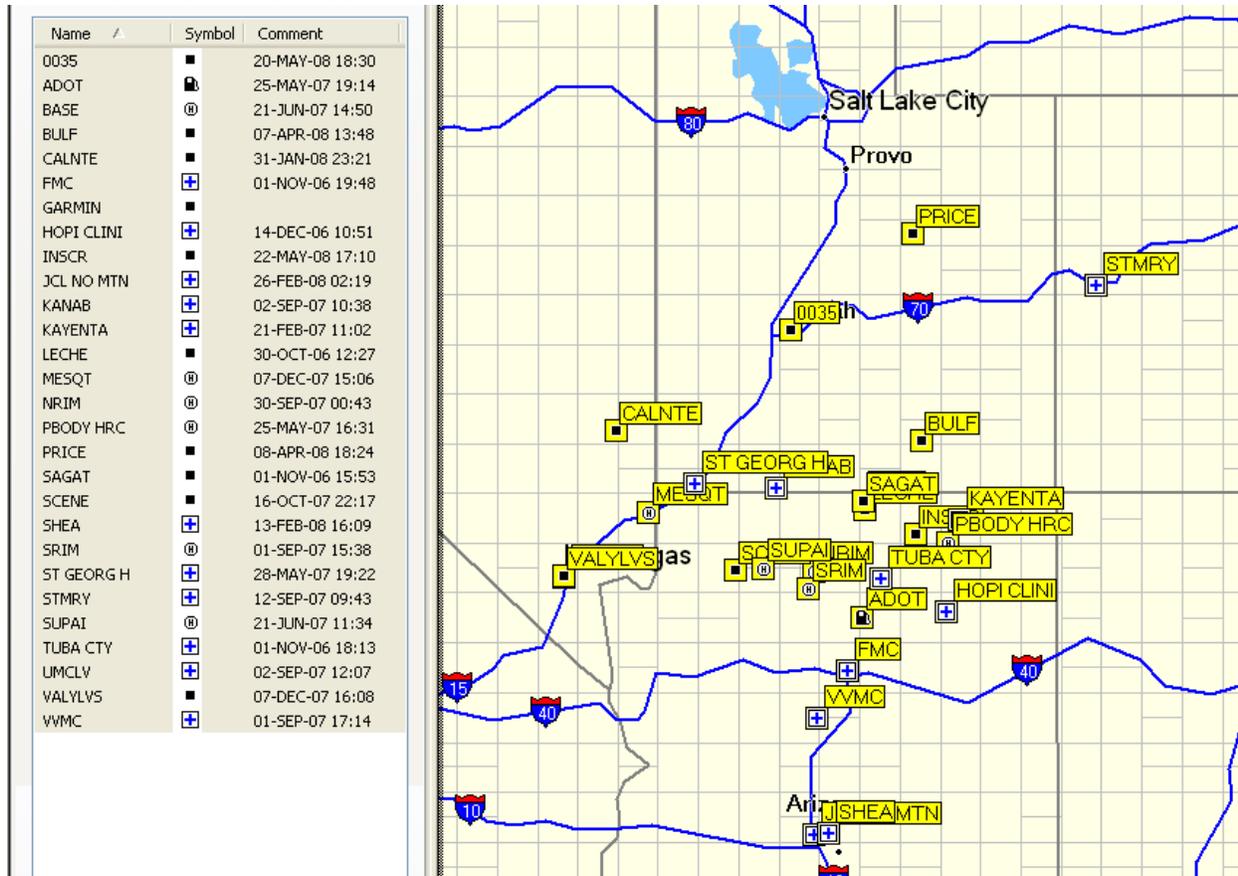
<sup>1</sup> Non-volatile memory is semiconductor memory that does not require external power for data retention.

## GPS Data Description

Upon activation the GPSMAP 496 was found to contain the following records / settings:

Last Logged Flight:	<i>29 June / SRIM – 3A20 / 0.5 (5 flights logged on 29 June)</i>
Track / Record Mode:	<i>Off</i>
Track / Interval:	<i>Resolution</i>
Track / Value:	<i>82 ft</i>
Active Track Memory Used:	<i>0%</i>
System / WAAS:	<i>Enabled</i>
Aircraft / Current Aircraft:	<i>N407MH</i>
Message / Log:	<i>Lost Satellite Reception / 29 Jun 08 15:47:31</i>
Setup / Time / Time Zone:	<i>US-MTN</i>
Setup / Time / Daylight Savings Time:	<i>Off</i>
Setup / Welcome Msg:	<i>“Classic Lifeguard 2”</i>

The unit was powered up successfully and data downloaded using Garmin *MapSource v6.13.7*. Twenty eight (28) user defined waypoint(s), zero (0) user defined routes, and zero (0) tracklogs were found stored within the GPSMAP 496. Figure 1 gives a screenshot of the stored waypoint list with overlay on a State map of the region. The waypoint for SRIM identified the following latitude / longitude coordinate point: N36° 02.114' / W112° 07.782'; altitude 6888 ft.



**Figure 1.** Screenshot showing a listing of waypoints stored within the GPSMAP 496 overlaid on a state map of the area.

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