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

April 10 , 2013

EGWPS Factual Report

Specialist's Report
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1. EVENT

Location:	Thomson, GA
Date:	February 20, 2013
Aircraft:	Beechcraft 390 Premier 1A
Registration:	N777VG
NTSB Number:	ERA13MA139

2. GROUP - No Group

3. SUMMARY

On February 20, 2013, at 2006 eastern standard time, a Beechcraft 390 Premier 1A, N777VG, was destroyed following a collision with a utility pole, trees, and terrain following a go-around at Thomson-McDuffie Regional Airport (HQU), Thomson, Georgia. The airline transport-rated pilot and co-pilot were seriously injured, and five passengers were fatally injured. The airplane was registered to the Pavilion Group LLC and was operated by the pilot under the provisions of 14 Code of Federal Regulations Part 91 as a business flight. Night visual meteorological conditions prevailed, and an instrument flight rules flight plan was filed. The flight originated at John C. Tune Airport (JWN), Nashville, Tennessee, about 1828 central standard time (1928 eastern standard time).

4. DETAILS OF INVESTIGATION

The NTSB Vehicle Recorder Laboratory received the downloaded files from the following device:

EGPWS Manufacturer/Model:	Honeywell MK V EGPWS
Serial Number:	25720

4.1 MK V EGPWS Description

The MK V EGPWS is an Enhanced Ground Proximity Warning System (EGPWS) that provides aural and visual alerts and warnings to prevent Controlled Flight into Terrain (CFIT) and for low altitude windshear conditions.

The MK V takes inputs from aircraft sensors and systems such as, Air Data Inertial Reference Unit (ADIRU), Weather Radar, GPS, and Radio Altimeter to calculate projected position and potential collision with nearby terrain. If a potential collision is detected, audio alerts messages will sound over the flight deck speakers and visual warnings will appear on the Electronic Flight Indication System to the flight crew.

An EGPWS is designed to protect against seven different scenarios categorized by modes. Mode 1 is excessive descent rate, Mode 2 is excessive closure to terrain, Mode 3 is altitude loss after takeoff, Mode 4 is unsafe terrain clearance, Mode 5 is excessive deviation below glideslope, Mode 6 is advisory callouts, and Mode 7 is windshear protection. Each mode has soft and hard limit alert criteria with the hard limit requiring more urgent attention by the crew.[1]

The MK V is designed to record events triggered by exceeding the hard and soft limits set by the device. Once a limit has been exceeded a new event will be recorded at one sample per second that includes 20 seconds before and 10 seconds after the exceedence. Each record is identified by the unit's operating time, the mode that was exceeded, and a unique event number from the device. A status log is also recorded that contains each landing and takeoff.

4.1.1 Data Description

The download was performed by the manufacturer with oversight by the National Transportation Safety Board. The downloaded files were sent to the Vehicle Recorder Laboratory for analysis. The total operating time of the device was 1063:45:31 and consisted of 265 events. The accident event was identified as event number 793 with a Mode 6 Bank Angle exceedence at 1063:44:03.

The data from the Bank Angle exceedence is provided in electronic comma separated value(*.csv) format as Attachment 1 to this report.

4.1.2 Engineering Unit Conversion

The conversion of the data to engineering units was done by the device manufacturer. Descriptions of the parameters are included in Appendix A of this report.

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[1] More information on the MK V can be found on the manufacturers website:
http://www51.honeywell.com/aero/common/documents/Mk_VI_VIII_EGPWS.pdf

APPENDIX A

This appendix describes the parameters provided and verified in this report. Table A-1 lists the parameters and table A-2 describes the unit abbreviations used in this report.

Table A-1. Verified and provided FDR parameters.

Parameter Name	Parameter Description
1. Oper Time (hh:mm:ss)	Operating Time
2. Lat (deg)	Latitude
3. Lon (deg)	Longitude
4. Pos Uncert (nm)	Position Uncertainty (nm)
5. CAS (kts)	Computed Airspeed
6. TAS (kts)	True Airspeed
7. Gspd (kts)	Ground Speed
8. VFOM (ft)	Vertical Figure of Merit
9. GPS Alt (ft)	GPS Altitude
10. Uncorr Alt (ft)	Standard Altitude
11. Rad Alt (ft)	Radio Altitude
12. TACAlt (ft)	Terrain Awareness Corr Altitude
13. Alt Rate (ft/min)	Altitude Rate (feet/min)
14. Mag Trk (deg)	Magnetic Track
15. Tru Trk (deg)	True Track
16. True Hd (deg)	True Heading
17. Pitch (deg)	Pitch Angle
18. Roll (deg)	Roll Angle
19. BAOA (deg)	Body AOA
20. L. Accl (g)	Longitudinal Acceleration
21. N. Accl (g)	Normal Acceleration
22. Gr Dn (discrete)	Landing Gear Down
23. FlpSel (discrete)	Landing Flaps Selected
24. InAir (discrete)	In Air
25. WSApprch (discrete)	Windshear Approach

Table A-2. Unit abbreviations.

Units Abbreviation	Description
deg	degrees
kts	knots
g	g
discrete	discrete
ft/min	feet per minute
ft	feet
nm	nautical miles
hh:mm:ss	total hours, minutes, seconds

NOTE: For parameters with a unit description of discrete, a discrete is typically a 1-bit parameter that is either a 0 state or a 1 state where each state is uniquely defined for each parameter