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

April 10 , 2013

Spoiler Control Unit 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 following device:

EGPWS Manufacturer/Model:	Moog Spoiler Control Unit
Part Number:	233700
Serial Number:	270

4.1 Spoiler Control Unit Description

The Spoiler Control Unit (SCU), manufactured by Moog Inc, is part of the spoiler system that provides Roll Augmentation, Air Speed Brakes, and Lift Dump functions. The SCU consists of seven circuit card assemblies in an aluminum card rack chasis. The Non-volatile Memory[1] (NVM) is contained on the bit and diagnostics card.

The SCU interfaces with the hydraulics and controls hydraulic actuation of the six spoiler panels across the wing. The SCU is responsible for providing surface position commands, and monitoring of hydraulic components for malfunction detection and protection.

When a malfunction or error is detected, a fault code is generated and stored to the unit's NVM. If more than one fault exists, fault codes will be displayed as a series string of up to eight codes. The SCU stores up to 250 fault codes with the most recent one first, and overwrites the oldest entry as new faults appear. The fault codes do not contain a time tag.

4.1.1 Spoiler Control Unit Condition

Upon arrival at the Vehicle Recorder Laboratory, an exterior examination of the device revealed major fire and impact damage to the unit's housing (figure 1). An interior inspection was performed and the SCU's bit and diagnostic card was located and removed (figure 2). The internal inspection of the card revealed fire damage consisting of bubbling to the cards conformal coating, displacement of memory chips, and a noticable hot spot with burn damage to the card.

The NVM chip was located, removed, and cleaned. Upon completing a preliminary binary reading of the chip, the chip was sent to Moog for downlaod and readout.

Figure 1. Spoiler Control Unit as received.

[1] Non-volatile memory is semiconductor memory that does not require external power for data retention.

Figure 2. Bit and diagnostic card as removed from SCU.

4.1.2 Data Description

The download was performed by the manufacturer, Moog Inc, with oversight by the National Transportation Safety Board. The fault code history was downloaded and analyzed by Moog Inc. The following conclusion was drawn:

“Based on the codes reported, it is difficult to determine a sequence of events before and during the accident”

A follow up from the NTSB determined that no conclusion could be made based on the faults present in the SCU.

The complete report from Moog Inc is provided as Attachment 1 to this report.