NATIONAL TRANSPORTATION SAFETY BOARD

Vehicle Recorder Division Washington, D.C. 20594

November 20, 2012

17 – Electronic Devices Factual Report

Specialist's Factual Report by Bill Tuccio

1. EVENT

Location: Chuckey, Tennessee
Date: October 11, 2012
Aircraft: Arion Lightning

Registration: N290AL Operator: Private

NTSB Number: ERA13FA017

On October 11, 2012, about 1350 eastern daylight time, an experimental amateur-built Arion Lightning, N290AL, operated by a private individual, was substantially damaged when it impacted the ground during takeoff from Hensley Airpark (04TN), Chuckey, Tennessee. The commercial pilot was seriously injured and a pilot-rated passenger sustained minor injuries. Visual meteorological conditions prevailed and no flight plan had been filed for the local personal flight that was conducted under the provisions of Title 14 Code of Federal Regulations Part 91.

2. DETAILS OF DEVICE INVESTIGATION

The Safety Board's Vehicle Recorder Division received the following devices:

Device 1: Grand Rapids Technology (GRT) Engine Information

System (EIS) 6000

Device 1 Serial Number: 21511

Device 2: Grand Rapids Technology (GRT) Electronic Flight

Information (EFIS) System Sport SX

Device 2 Serial Number: 1031

2.1. GRT EIS 6000 Device Description

The GRT EIS Model 6000 is a panel mounted engine monitor. The device contains a back-lit, sunlight readable display providing the operator graphical and digital displays of various engine parameters. The device also assists the pilot to lean the engine, and allows for various alarms when monitored systems exceed various settings. Engine parameters that may be monitored and displayed include:

- Exhaust Gas Temperatures (EGT);
- Cylinder Head Temperatures (CHT);
- Tachometer (engine rpm);
- Oil Temperature;
- Oil Pressure;
- Manifold Pressure:
- Fuel Pressure; and
- Flight Timers.

The device also contains a serial output port for the operator to allow for data recording to a laptop PC or a compatible Electronic Flight Information System (EFIS) display. The device does not contain any internal memory for the recording of engine information.

2.1.1. GRT EIS 6000 Data Recovery

Upon arrival at the Vehicle Recorder Laboratory, an exterior examination revealed the unit had not sustained any damage, as shown in figure 1. Power was applied to the unit and information extracted by manually navigating the screens.



Figure 1. GRT EIS 6000 photograph.

2.1.2.2.1. GRT EIS 6000 Data Description

Two values were extracted from the device pertinent to the investigation. The unit displayed total engine hours of "15.1." The prior flight time displayed was "0:08:00."

2.2. GRT EFIS Sport SX Device Description

The GRT EFIS Sport SX is an integrated avionics panel. The non-TSO'd Sport SX displays primary flight information including information form an integrated attitude and heading reference system (AHRS). Depending on installation options, the unit can display engine information, navigation information, synthetic vision, XM weather information, and aircraft state information (i.e., flight control positions). The unit can integrate with ARINC 429 radios and navigation equipment, magnetometers, and another Sport SX unit for redundancy and dual AHRS integrity monitoring.

The unit contains non-volatile memory¹ capable of maintaining unit configuration information and limited flight information. When a USB memory device is inserted into the rear of the unit, parameter information may be recorded onto the USB memory device.

2.2.1. GRT EFIS Sport SX Data Recovery

Upon arrival at the Vehicle Recorder Laboratory, an exterior examination revealed the unit had not sustained any damage, as shown in figure 2. Power was applied to the unit and information extracted by manually navigating the screens.



Figure 2. GRT Sport SX unit photograph.

2.2.2. GRT EFIS Sport SX Data Description

The unit retained numerous configuration settings. The configuration settings indicated the device was connected to an engine monitoring system, an "SL40" radio, a GPS, an autopilot, and a fuel/air data system. Various speeds were configured in the system in knots, as shown in figure 3. As shown in figure 4, auxiliary functions configured included flaps, elevator trim, and left and right fuel.

Figure 5 shows the initial screen display after power was applied to the unit at the NTSB laboratory. Many values were not displayed as the unit was not connected to external sensors in the laboratory.

ERA13FA017

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

The GRT Sport SX retained limited historical information consisting of an event log history. Figure 6 contains a screen capture of the last 5 events recorded on the unit. The source of the dates and times and other information were not verified. The unverified information indicates two events on September 27, 2012, one from KLUG to KSYI, and another event recorded at KSYI. On September 29, 2012, an event from KSYI to 04TN was recorded. On October 11, 2012, two events were recorded at 04TN.

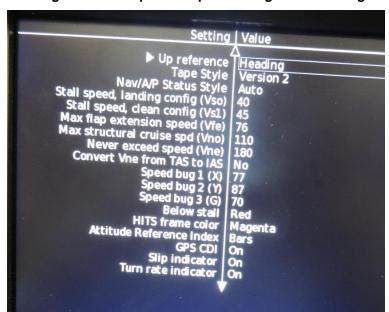


Figure 3. GRT Sport SX speed configuration settings.

Figure 4. GRT Sport SX auxiliary functions configuration.

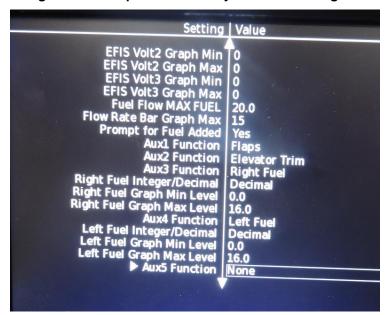


Figure 5. GRT Horizon SX flight display screen.



Figure 6. GRT Sport SX logbook screen.

Saved Date A Eng-Hr V/I	Orig		Dest	LOGBOC Hrs) Dep	Arr
N 2012-10-11 15.1 VFR	Pas 04TN	FA	04TN	0.0	0.1	17:55	17:56
N 2012-10-11 15.1 VFR	04TN	0.0	0.0 04TN	0.1	0.1	17:53	17:54
N 2012-09-29 14.9 VFR	KSYI	0.0	0.0 04TN 0.0	1.9	11.0	16:34	18:17
N 2012-09-27 13.0 VFR	KSYI	0.0	KSYI 0.0	0.9	6.0	20:49	21:40
N 2012-09-27 12.0 VFR	KLUG	0.0	KSYI 0.0	0.6	2.1	L9:49	20:15