

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

August 28, 2020

Flight Control System

Specialist's Factual Report
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1. EVENT SUMMARY

Location: Mechanicsburg, Pennsylvania
Date: January 9, 2020
Aircraft: Robinson R66
Registration: N450MC
Operator: Private
NTSB Number: ERA20FA074

On January 9, 2020, about 2029 eastern standard time (EST), a Robinson R66, N450MC, experienced an in-flight break-up near Mechanicsburg, Pennsylvania. The private pilot and one passenger were fatally injured and the helicopter was destroyed. The helicopter was operated under the provisions of title 14 *Code of Federal Regulations Part 91* personal flight. Night visual meteorological conditions prevailed at the time and no flight plan was filed for the flight. The flight originated about 1958 from Martin State Airport (MTN), Baltimore, Maryland, and was destined for Buffalo Niagara International Airport (BUF), Buffalo, New York.

2. GROUP

A group was not convened.

3. DETAILS OF INVESTIGATION

The National Transportation Safety Board (NTSB) Vehicle Recorder Division received the following flight control system devices:

Device Manufacturer/Model:	Genesys Aerosystems Flight Control Computer (FCC)
Serial Number:	01311-1746-00030

Device Manufacturer/Model:	Genesys Aerosystems HeliSAS Control Panel (HCP)
Serial Number:	01309-1746-00016

3.1. Genesys Aerosystems HeliSAS Description

The Genesys Aerosystems HeliSAS (Helicopter Stability Augmentation System) is an attitude-based flight control system that provides a significant reduction in pilot workload

from takeoff to landing. SAS may be engaged or left engaged during any phase of flight from before liftoff to after touchdown. The autopilot modes become available at airspeeds above 44 knots.

The basic SAS consists of two electromechanical servo-actuators, a flight control computer (FCC), HeliSAS Control Panel (HCP) for autopilot mode selection, a panel-mounted attitude indicator or an attitude heading reference system (AHRS), two control buttons on the cyclic stick, and interconnecting cables. One servo-actuator controls pitch, and the other servo-actuator controls roll. The servo-actuators are connected to the cyclic through electromagnetic clutches. An optional BeepTrim four-way momentary switch on the cyclic can be used to modify the attitude target in SAS mode on certain models.

The HeliSAS can be interfaced with other avionics and instruments, including GPS navigation receiver, VHF (Very High Frequency) navigation receiver, Horizontal Situation Indicator (HSI) or a functional equivalent on an Electronic Flight Instrument System (EFIS) display, or a directional gyro.

3.1.1. Genesys Aerosystems HeliSAS Data Recovery

Upon arrival at the Vehicle Recorder Division, an exterior examination revealed the two devices had no damage, as shown in Figure 1. According to the manufacturer, the system does not have a running data stream recording, thus it does not record flight data. It only records a SSM (System Safety Monitor) failure binary stamp when there is a fault in the system. A download of the binary stamps was attempted with procedures provided by the manufacturer; however, downloaded data did not match any standard failure binary stamp and were unrecognizable by the manufacturer. Thus, no accident related data was recovered from the two devices.

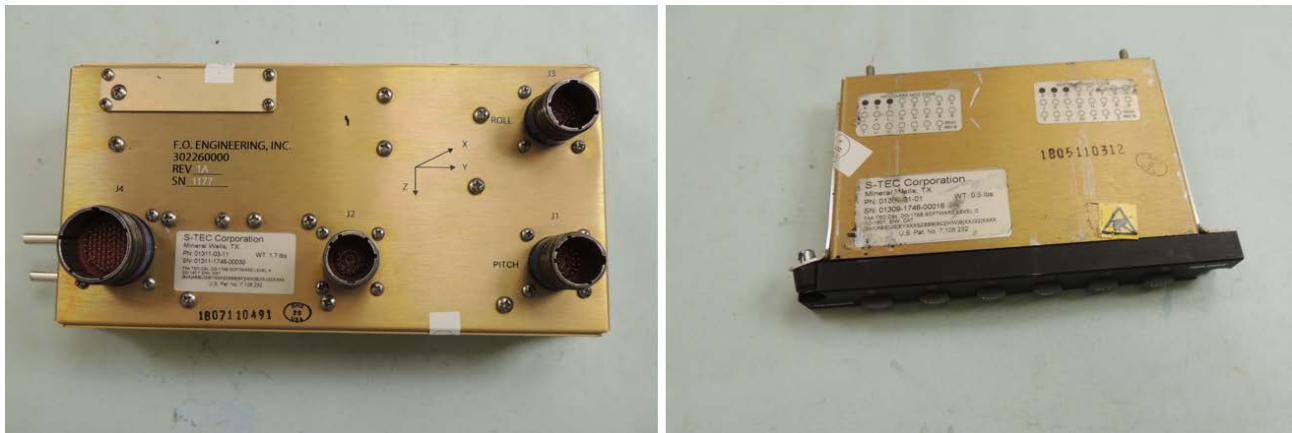


Figure 1: Genesys Aerosystems Flight Control Computer (left) and HeliSAS Control Panel (right) as received.