

EGPWS Download CEN18FA149

Background

Download of flight history data from EGPWS MKXXI SN 5993 was performed at the Honeywell Aerospace facility in Redmond, WA on June 5, 2018. Attendees:

Ed Malinowski – NTSB
Dave Keenan – FAA Office of Accident Investigation
Bryan Larimore – Safran Helicopter Engines
Cory Cummins – Air Methods Corporation
Manny Figlia – Airbus Helicopters
Dana Metz – Honeywell Product Integrity
Bob Champion – Honeywell Advanced Technology
Maggie Wintermute – Honeywell Engineering
Steve R. Johnson – Honeywell Engineering
Gary Ostrom – Honeywell Engineering
Yasuo Ishihara – Honeywell Advanced Technology

EGPWS Configuration

PART NUMBER: 965-1227-005
MOD STATUS: 3
SERIAL NUMBER: 5993

APPLICATION S/W VERSION: 005.1
TERRAIN DATABASE VERSION: 487NAM
BOOT CODE VERSION: B101.1

CONFIGURATION MODULE DATA:

Aircraft Type = 129
Air Data Type = 14
Position Input Type = 1
Terrain Display Type = 4
I/O Discrete Type = 129
Audio Menu = 128
Volume Select = 0
Altitude Monitor Type = 0
Options Select = 0
Attitude/Heading Type = 2
Display Option Type = 2
Normal Pop Up Range 5 Selected
Low Altitude Pop Up Range 5 Selected

The 965-1227 MKXXI EGPWS is designed to provide terrain and obstacle awareness and alerting for light and medium sized helicopters. The MKXXI does not interface with a radio altimeter and does not provide alerts for excessive descent rate or bank angle. MKXXI terrain and obstacle alerting is disabled below a configurable groundspeed threshold in order to support helicopter operations (landing anywhere). This threshold was configured to 60 knots on MKXXI SN 5993.

Recorded Data

Prior to powering up the unit in the lab, the flight history memory chip was removed from the SN 5993 processor board and read with a chip reader. The chip was then reinstalled on the processor board and power was applied, which allowed the flight history data to be downloaded to Compact Flash card.

The following records are from the initial download of flight history data from the SN 5993 processor board to Compact Flash card (data contained in MKXXI_CEN18FA149_Honeywell_Proprietary.zip). Times shown below are EGPWS operating time (total time powered on) in hours:minutes:seconds format.

Takeoff events (Status.txt):

FLIGHT LEG 16529: (6105:31:41)
Lat/Long: 43.07649 / -89.43179
Geometric Alt: 988.00 True Hdg: -90.00
GPS Alt: 990.00 VFOM: -2.00
Pos. Uncert: 0.0000 Pos. Source: GPS1
Airport: C29

FLIGHT LEG 16530: (6105:44:54)
Lat/Long: 43.14037 / -89.32745
Geometric Alt: 860.00 True Hdg: -33.75
GPS Alt: 860.00 VFOM: 52.00
Pos. Uncert: 0.0049 Pos. Source: GPS1
Airport: KMSN

Warning events (Warn.csv): None on flight leg 16530. TAD (Terrain Alerting and Display) alerts recorded on flight leg 16529 at operating times 6105:32:05, 6105:32:09, and 6105:32:13.

Terrain Inhibit/Not Available events (TANA.csv): None on flight leg 16530. TAIN ON (Terrain Awareness Inhibit selected) on flight leg 16529 at operating time 6105:32:09.

INOP events (Event.txt): None on flight leg 16530. GPWS INOP and TAD INOP recorded on ground on flight leg 16529 at operating time 6105:41:02.

Faults (Faults.txt): No recent faults recorded.

Operating time (Counts.txt): 6105:42:16

After the initial download of data was performed, a TAD alert was generated in the Honeywell lab. The operating time recorded for this alert was 6105:50:44. Following this activity, data was downloaded to Compact Flash card a second time (data contained in MKXXI_CEN18FA149_Second_Download_Honeywell_Proprietary).

Summary

The flight leg of interest is 16530, indicated by the takeoff event at KMSN at operating time 6105:44:54. This takeoff is the only data recorded on flight leg 16530 in the initial download.

During operation, EGPWS operating time is stored in the RAM portion of the EGPWS NVM chip. When power down occurs, the data from RAM is committed into the non-volatile cells of the NVM chip. The total operating time shown for the initial download in the lab is 6105:42:16 (more than two minutes earlier than the takeoff record at KMSN), which indicates that the operating time that accumulated during flight leg 16530 was not committed into non-volatile memory. Therefore it cannot be ascertained how long the EGPWS remained powered on during this flight.