

Enhanced Ground Proximity Warning Computer - NFF Reduction

In reference to the RIMP 2 investigation, 17 % of the removed EGPWC resulted in NFF are related only to an External Fault in the fault history of the computer.

Recommendations

BA CSE and Honeywell CS recommend the following steps to reduce the NFF rate.

Do not replace the EGPWS Computer before performing a Level 2 Self-Test.

1. Before starting troubleshooting, ensure that:
 - Power to the EGPWS is on
 - All systems connected to the EGPWS are operational. (Aircraft may require to be removed from the hangar to get GPS operational.)
 - Radio Altimeter indicates less than 5 feet.
 - E Airspeed indicates less than 60 knots.
 - NAV radios must not be tuned to a valid ILS/GS frequency unless reception is good (to avoid nuisance external faults during Level 2 Self-Test).
2. Run Level 2 Self-Test via PMAT CAIM and check the three diagnostic LED's on the front panel of the EGPWC.

LED (name)	Color (indication)	Descriptions
External Fault	Yellow	External Fault detected
Computer OK	Green	Computer is ok.
Computer Fail	Red	Computer has failed

A matrix of the LED combination and a probable corrective action are listed below:

Note: The illumination of the RED Computer Fail LED does not guarantee that the EGPWS has failed. It is possible that invalid strapping causes the LED to illuminate. Therefore, verify strapping/wiring before replacing the EGPWS computer.

External Fault	Computer OK	Computer Fail	Action
OFF	GREEN	OFF	Normal operation.
YELLOW	GREEN	OFF	Troubleshooting External Fault using Level 2 Self-Test. Do not remove or replace the EGPWS.
OFF	OFF	OFF	Ensure that the EGPWS is installed in the rack correctly and power to the EGPWS is applied.
OFF	OFF	RED	Perform Level 2 Self-Test and Bench Test. Remove EGPWS if required.
OFF	GREEN	RED	Invalid state; perform Level 2 Self-Test if possible. Remove EGPWS if required.
YELLOW	OFF	OFF	Invalid state; perform Level 2 Self-Test if possible. Remove EGPWS if required.
YELLOW	OFF	RED	Perform Level 2 Self-Test and Bench Test. Remove EGPWS if required.
YELLOW	GREEN	RED	Invalid state; perform Level 2 Self-Test if possible. Remove EGPWS if required.

In addition to the LED monitoring, if the EGPWS computer is not accessible, use the CAIMS PMAT GPWS LRU TEST MENU to initiate the different self tests and record the audio vocal information during the tests to establish the next T/S action.

Note: CAIMS Active Fault page can also be monitored for any active fault.

Note: Do not replace the EGPWS Computer before performing a Level 2 self test, especially if the only fault reported is define as external fault.

3. Perform Level 3 Self-Test - Fault History if CAS message or fault is not longer present (no active fault),
Note: CAIMS Ground and Flight Fault History page can also be monitored for fault.

EGPWS Self-Test Levels

Level 1 Self-Test can be initiated for quick go/ no go check of the EGPWS.

Level 2 Self-Test provides enunciation of all internal and external current faults at the time of the test request. Level 2 Self-Test enunciations are as follows:

- NO FAULT if no current fault exists
- GPWS COMPUTER OK if only external fault exist
- GPWS COMPUTER FAULT if any internal fault followed by the list
- List of external fault if any

Internal Fault(s) usually indicates a problem with the EGPWS. However, experience has shown most internal faults at initial installation are due to aircraft wiring errors. Internal faults on in service installations are more often attributed to the EGPWS. Therefore, the computer should be replaced, if any of the internal fault messages Enunciation listed below:

- ROM FAILED
- RAM FAILED
- NVM RAM FAILED
- NVM FAILED
- WATCHDOG TIMER FAILED
- VOICE GENERATOR FAILED
- ARINC 429 TRANSMITTER FAILED
- ARINC 429 RECEIVER FAILED
- FLASH FILE SYSTEM WRITE FAILED
- APPLICATION DATABASE FAILED
- APPLICATION DATABASE CRC FAILED
- TERRAIN DATABASE FAILED
- ENVELOPE MODULATION DATABASE FAILED
- CONFIGURATION DATABASE FAILED
- SUPPORT TASK FAILED (erase fault history)
- SYSTEM OR MODE TASK FAILED
- ANALOG CONVERTER FAILED
- INTERNAL GPS FAILED (not applicable to GEX)

External Fault(s) indicate a problem with the system(s) providing input to the EGPWS. The LRU(s) output to the EGPWS and associated interfacing wiring should be verified. Refer to the [Honeywell Troubleshooting Card](#) for definition.

Note: Replacement of the EGPWC should be done as a last resort for External Fault(s).

Level 3 Self-Test can be used to monitor current EGPWS configuration (e.g. INTERFACE - PROGRAM PIN FAULT)

Typical messages Enunciation are as follows:

- "SYSTEM CONFIGURATION"
- Part Number
- Mod Status
- Serial Number.
- Application Software Version
- Configuration Software Version
- Terrain Database Version
- Envelope Mod Database Version
- Boot Code Version
- "AIRCRAFT TYPE NINE SEVEN"
- "AUDIO MENU ZERO"
- "ALTITUDE CALLOUT MENU TWO ONE" Baseline, mat be different base on operator selection
- "SMART CALLOUT SELECTED"
- "ALTERNATE GLIDESLOPE CANCEL SELECTED"
- "DUAL GPS SELECTED" (if GPS 2 is installed)

- “BANK ANGLE SELECTED”
- “MODE 6 LOW VOLUME”
- “OBSTACLE AWARENESS ENABLED”

Level 4 Self-Test enunciations are as follows:

- NO FAULT if no current fault exists
- If fault(s) exist the number of flight for which a fault exist will be enunciated, followed by the list of internal and external fault on a given leg.
- Based on the reported faults, initiate troubleshooting as per the previous sections.

Other Self-Test modes:

Level 6 Self-Test can be used to monitor each discrete operation, if discrete fault is reported.
(e.g. GPWS FLAP OVRD function, GPWS G/S MUTED function etc.)