



## TECHNICAL INFORMATION LETTER

TIL N°            T-139-22-003  
DATE:            April 29, 2022  
REV.:             /

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To:            Leonardo Helicopters products  
                Owners / Operators / Service Centres

**SUBJECT:        AW139 "PRIMUS EPIC®" Flight Software Release 8**

Helicopters Affected:    All AB139/AW139 helicopters

Dear Customer,

Leonardo Helicopters (LH) is pleased to inform you that the new kit PRIMUS EPIC® PHASE 8 (P/N 4G4600F00311) has been certified with EASA and covered by AW139 RFM Supplements 101 and 102.

### OVERVIEW

Phase 8 is the latest development of "PRIMUS EPIC®" avionic suite for AW139 Helicopter and it is designed to provide additional functionalities and features aimed to increase situational awareness, reduce pilot workload and improve integration of cockpit display information.

"PRIMUS EPIC®" Flight Software Release 8 also inherits AFCS improvements implemented in "PRIMUS EPIC®" Flight Software Releases 7.12.2 and 7.14.2. Annex A of this TIL provides an overview on:

- software changes and new functionalities (and some comparison with "PRIMUS EPIC®" Flight Software Release 7)
- hardware changes and configuration requirements

### EMBODIEMENT

#### Production Helicopters

New "PRIMUS EPIC®" Flight Software Release 8, as part of the new KIT PRIMUS EPIC PHASE 8 P/N 4G4600F00311, is available in production as auxiliary installation. It is composed by a basic ENAV package and additional optional functions available upon Customer request.

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### Optional Functions:

- SVS (including Path Mode)
- Offshore Approaches

### Basic ENAV Package:

- All the features introduced with "PRIMUS EPIC®" Flight Software Release 8 excluding the above optional Functions.

### In-service Helicopters

LH is working on the following Service Bulletins (SB) for in-service fleet upgrades.

Customer are kindly invited to verify that the relevant RFM Supplements (and related kit P/Ns) for certification with relevant Aviation Authorities are published in the applicable RFM.

#### SB139-600:

This SB will provide the instructions to upgrade all AW139, starting from any "PRIMUS EPIC®" Flight Software Release, to "PRIMUS EPIC®" Flight Software Release 8; such SB will be applicable to in service AW139 (from Short Nose to subsequent variants).

The SB will be divided in

- several parts providing all necessary instructions on how to comply with the prerequisites required for the installation of Software release 8, starting from "PRIMUS EPIC®" Flight software release 4.8, 5.6, 6.2 or 6.5 and 7.12 or 7.14 and 7.12.2 or 7.14.2 respectively;
- a dedicated part dealing specifically with "PRIMUS EPIC®" Flight software release 8 installation (basic ENAV package and optional functions based on Customer request).

#### SB139-651:

For aircrafts installing EGPWS kit, this SB will provide the instructions to upgrade the EGPWS computer (P/N 965-1595-024, 965-1595-026, 965-1595-030) to P/N 965-1595-034. Such upgrade can be performed, at Customer choice:

- on field by Operators, through software loading and changing the equipment label (for new P/N);
- sending the computer to the OEM to perform the modification at shop level.

Please note that:

- SB139-651 does not cover Kit EGPWS -034 P/N 4G3440F00311 installation but only the upgrade from any EGPWS kit to version -034. For some old version of the kit installed on the helicopter equipped with Display Controller P/N 7016683-964 or 7016683-864 (NVG), the replacement of the controller is required.
- EGPWS -036 is an option to EGPWS -034; for detailed information on the new EGPWS, part of kit P/N 4G3440F00411, please refer to Information Letter AW139-20-109.

### COMMERCIAL AND LOGISTIC INFORMATION

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## AW139 "PRIMUS EPIC®" Flight Software Release 8

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"PRIMUS EPIC®" Flight Software Release 8 upgrade is sold at a price policy, applicable to Civil/Dual Use Customer/Operator, agreed between LH and Honeywell.

As already implemented for "PRIMUS EPIC®" Flight Software Release 7 upgrade, also for upgrade to Phase 8, specific forms are available to clearly define the hardware modification to be implemented and the related specific quotation to be applied on top to the standard price policy, which depends upon the initial helicopter configuration and Phase 8 functionalities needed.

Should you need any additional information, please do not hesitate to refer to the point of contact provided with the Customer Support & Training Worldwide Directory, available on Leonardo Customer Portal at this [link](#).

Yours Sincerely,



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Gabriele Bordino  
Head of Product Support Engineering

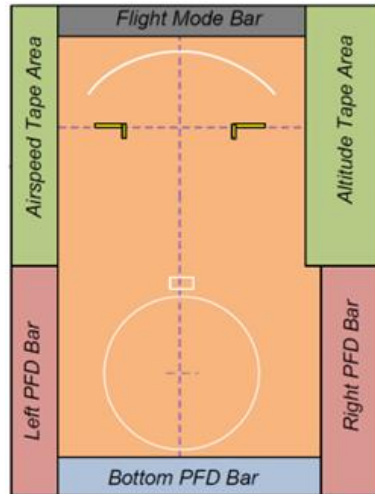
ANNEX A – “PRIMUS EPIC®” Flight software release 8 visualization

NEW FUNCTIONALITIES AND SOFTWARE CHANGES

PFD Layout Changes



Phase 7 PFD



Same symbology, in same positions



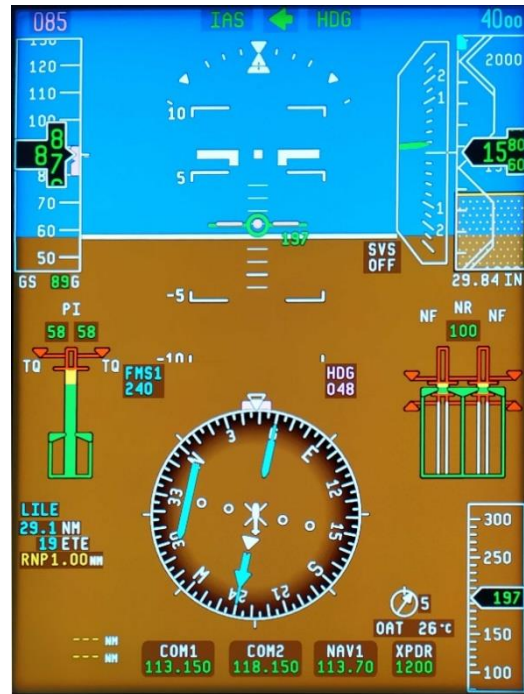
Phase 8 PFD

Flight Path Symbol (FPS)

The Flight Path Symbol (FPS) is introduced on the PFD to represent the actual path angle of the aircraft.

When combined with the SVS, the FPS provides a conformal representation of the aircraft trajectory with respect to the scene represented.

FPS is introduced as additional primary cue for helicopter’s maneuvering in conjunction with Aircraft Symbol, that remains the primary cue for attitude’s control.





**Enhanced 2D Terrain MAP HSI in PFD and MFD**

An enhanced 2D terrain map is introduced in PFD Horizontal Situation Indicator (HSI) and in Multi-Function Display (MFD).

The enhanced Map is intended to provide awareness of terrain, obstacles, geopolitical boundaries and other elements as airways, airspace, airports, nav aids, roads and railroads.

It is also integrated with the optional Weather Radar, TCAS and EGPWS.

If EGPWS is installed, the Absolute Terrain layer is improved by Situational Awareness (colorization based upon vertical separation) and Threat Alert layers (flash of area causing a EGPWS alert).



Phase 7



Phase 8



HSI Absolute Terrain ONLY  
(EGPWS not installed or SA deselected)



HSI Absolute Terrain + Situational Awareness  
(EGPWS installed)

## Synthetic Vision System (Optional)

The Synthetic Vision System (SVS) is introduced as an optional feature on Customer request, enabled via option file. It consists in a selectable DB-based 3-D perspective representation of the external scene, integrated in the PFD. It provides terrain, obstacles, runways, helipads and approach symbology, to maximize awareness of external environment with respect to aircraft path.

Peculiar characteristics of AW139 are:

- the excellent graphics, which support an intuitive perception of aircraft motion with respect to surrounding environment;
- the conformal representation of displayed objects, which are neither shrunk nor flattened, but preserve 1:1 ratio for vertical vs horizontal dimensions;
- the conformal representation of aircraft path with respect to the external scene by means of the Flight Path Symbol, which indicates where the a/c will intercept the terrain if keeping the current flight conditions;
- the lateral centering, which automatically set by the system over aircraft track or heading, depending upon groundspeed and drift, without any pilot's selection.



## Improved EGPWS Integration

EGPWS representation has been enhanced via integration with both SVS and 2D Map in PFD HSI and MFD.

For SVS, areas associated of threats is colored of yellow or red, coherently with the alert being displayed and played in the headsets.

For 2D Map, the situational awareness colorization is superimposed over absolute terrain to provide information about vertical separation. In addition, in case of alerts, the area over the map associated with the alert flashes.





Offshore Operations



Mountain Operations



Urban Areas

### Custom Approach (Off-Shore Approach Optional)

The Custom Approach functionality is introduced as assistance to reduce pilot workload allowing fully automated and 4D coupled approaches to any navigation or custom database or pilot entered waypoint.

Custom Approaches are provided with (optional) or without a final level segment under radar height based control operated by AFCS.

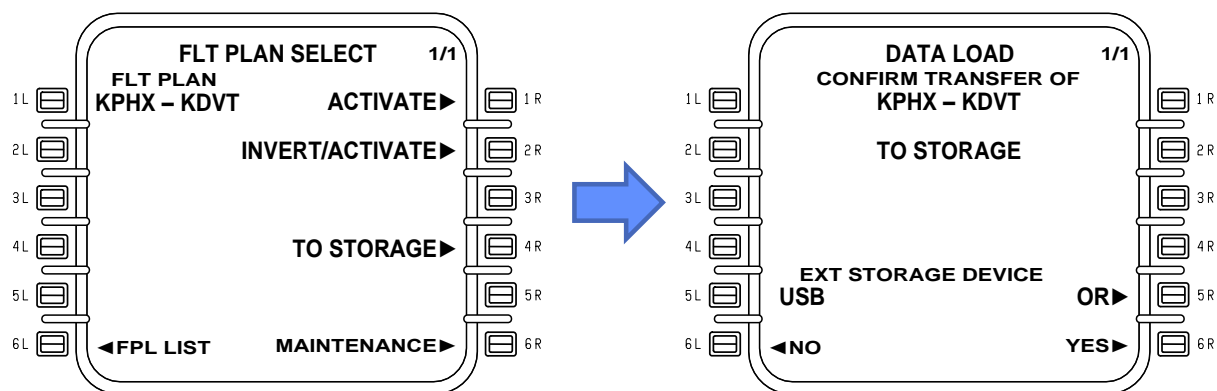
Custom Approaches without a final level segment are intended for VFR operations, to assist in approaching locations where published procedures do not exist.

The Offshore Custom Approach is as an optional feature, enabled via APM Options.

### Flight Management System Improvements

#### Flight Plan Upload/Download improvements

The Flight Plan Upload/Download is a functionality introduced to allow the export of single Flight Management System (FMS) flight plans to external memory devices and the import of flight plans created off the helicopter into the Custom Database. The option to transfer flight plans wireless from an iPad is added.



### Continued PERF on Landing

The Continued PERF on landing is a function of the FMS introduced to preserve specific performance data and calculations after temporary landing, avoid the need to re-enter necessary data and re-initialize.

### Reduced Leg Length for Search Patterns

The Reduced SAR leg length is introduced to lower (down to 0.2 NM) the minimum selectable length of the legs for the creeping ladder and expanded square search patterns (previously not lower than 0.5NM).

### MCDU Surface Page

A new MCDU Surface Page is introduced, in order to support the activation of an approach independently from the destination surface under the same airport.

For example, an approach to a runway can be activated, selecting a helipad in the same hub as destination surface, for insertion in the flight plan and enhanced representation in SVS.

### Increased Threshold for VTA annunciation:

The threshold to display VTA annunciation during FMS approaches is increased from 100 ft to 200 ft above the MAP altitude.

This will give more time for the pilot to react and take control of the aircraft while approaching.

### Automatic RNP for RN 0.3 Airways

For RNP 0.3 airways, the automatic retrieval of RNP value from Navigation Database is introduced, this to avoid manual entry from the pilot.

### New 100BaseT Lan

The legacy daisy chain 10Base2 Lan is replaced by the new 100BaseT Lan, having a star topology and the DLMU-W as hub.

This enhancement will allow quicker software and database uploads and facilitate on ground trouble-shooting operations



## HARDWARE CHANGES AND CONFIGURATION REQUIREMENTS

### New Cursor Control Device (CC-701)

The Cursor Control Devices (CCD) CC-701 replacing the existing CC-700. The main difference is the free floating cursor introduced on the CC-701 to provide an optimal interface with the INAV function and the new pushbuttons labelled as SVS.

The CC-701 has the same mechanical interfaces of the CC-700, but requires additional electrical connections for its power supply, a direct communication with the displays and the display controllers.



### New Data Loader Management Unit - Wireless (DLMU-W)

The DLMU-W is a data loader derived from the DMU 3 that adds the capability to act as a hub for the new 100BaseT Lan.



### New EGPWS SW -034 or following (Optional)

If EGPWS is required as option, the only P/Ns compatible with Phase 8 Software are 965-1595-034 or subsequent.

The only difference of version -034, part of kit P/N 4G3440F00311, with respect to the already certified P/N 965-1595-030, is the SW loaded into the Mark XXII computer. The new SW allows providing the displays with the additional information required to colorize the terrain and obstacles depicted by the SVS and INAV, based on EGPWS alerts.

EGPWS -036 is an alternative option, including enhanced offshore mode in accordance with CAP 1519; for detailed information on the new EGPWS -036, part of kit P/N 4G3440F00411, please refer to IL AW139-20-109.

All EGPWS kits are covered by RFM Supplement 81 (applicable kit P/Ns are reported in the supplement).

**Modular Avionic Unit (MAU)**

MAU cabinets in same configurations supporting "PRIMUS EPIC®" PHASE 7.12.

**Display Unit (DU)**

Display units series DU-1080-3, P/N 7036340-802 or 7036350-802, or series DU-1080N-3 hardened P/N 7036350-812.

**Network Interface Module (NIM)**

NIM 3 modules P/N 60000091-919.

**Attitude Heading Reference System (AHRS)**

AHRS LCR-100 units P/N 145130-1002.

**Dual SBAS GPS System**

Dual SBAS GPS System composed by Internal SBAS GPS CMA4024 (KIT GPS SBAS AND FMS P/N 3G3450F00413) and External SBAS GPS CMA3024 (KIT 2ND GPS SBAS P/N 4G3450F00613).