



U.S. Department  
of Transportation  
**Federal Aviation  
Administration**

AUG 20 2004

**Transport Airplane Directorate  
Aircraft Certification Service**

1601 Lind Avenue S.W.  
Renton, Washington 98055-4056

In Reply  
Refer To: 130S-04-426

Ms. Colleen M. Portch  
Certification Services Administrator  
Honeywell International, Inc.  
15001 N.E. 36<sup>th</sup> Street  
Redmond, WA 98052

RECEIVED  
AUG 30 2004

Dear Ms. Portch:

Technical Standard Order (TSO) Approvals for  
TSO C92c Authorization of Ground Proximity Warning Functions; and TSO C151b Class A  
Authorization of Terrain Awareness and Warning System Functions  
of the Honeywell MK VI and MK VIII Enhanced Ground Proximity  
Warning Computer (EGPWC) Part Numbers (P/N)  
965-1180-022, 965-1190-022, 965-1210-022, and 965-1220-022  
TSO C117a Authorization of Reactive Windshear Warning Functions of the  
Honeywell MK VIII EGPWC P/N's 965-1210-022, and 965-1220-022

We received your letter 04FAA157, dated July 13, 2004, in which you certified that a major change to the EGPWC constitutes a change in EGPWC function resulting in four new part numbers, and identified as "Release - 022". You also certified that the new MK V and MK VIII EGPWC part numbers listed below meet the applicable requirements of TSO-C92c, TSO-C117a, and TSO-C151b Class A and are in conformance with 14 Code of Federal Regulations (CFR) Part 21, Subpart O.

| EGPWC Type | Unique Characteristics                          | Certification Baseline | New Part Number |
|------------|---|------------------------|-----------------|
| MK VI      | None  | 965-1180-020           | 965-1180-022    |
| MK VI      | Internal GPS Receiver                           | 965-1190-020           | 965-1190-022    |
| MK VIII    | Larger Memory Card                              | 965-1210-020           | 965-1210-022    |
| MK VIII    | Internal GPS Receiver and<br>Larger Memory Card | 965-1220-020           | 965-1220-022    |

You submitted Honeywell Document 060-4314-050, Revision New, dated July 13, 2004, entitled "MK IV/VI/VIII/XXII Enhanced Ground Proximity Warning Computers (EGPWC), Honeywell P/N's 965-XXXX-022 Summary of Compliance with TSO-C151b, TSO-C117a, TSO-C92c; Including DO-178B Software Data," with your letter, along with the other supporting data required by TSO-C151b.

A minor hardware change notification was also received via letter 04FAA157, dated July 13, 2004. A change was made to a Complex Programmable Logic Device (CPLD) within the EGPWS configuration Module, Honeywell P/N's 700-1710-020 and 700-1710-021.

The EGPWC enhancements and optional features meet the qualification testing and software testing standards; however the actual performance standards for additional features are not under these TSO's. These functions have not been evaluated for certification installation and should be evaluated under the Supplemental Type Certification process and listed in the aircraft installation manual.

We acknowledge the Federal Aviation Administration (FAA) Forms 8110-3, signed by Designated Engineering Representative (DER) Gary A. Ostrom, that were submitted approving the software accomplishment summary and other related data for this application.

TSO-C151b identifies RTCA DO-161A as the minimum operational performance standard for the equipment. DO-161A specifies in paragraph 2.1.2 and Appendix A page 4, a dynamic envelope of 1250 feet to 1050 feet AGL in Mode 2A conditions. Honeywell requested a deviation to reduce the Mode 2A maximum altitude from 1250 to 950 feet. The deviation only affects Excessive Closure Rate to Terrain and is activated only under a defined set of conditions that ensure that Terrain Awareness and Warning Systems (TAWS) functions provide terrain avoidance protection. The Seattle ACO (SACO) reviewed the deviation request and forwarded it to FAA Headquarters for concurrence via SACO memorandum 130S-04-342, dated July 07, 2004. Concurrence was provided via the enclosed AIR-100 memorandum, dated July 15, 2004.

Your certification is acceptable. Your quality control manual has been previously approved by the FAA and is on file in the Seattle Manufacturing Inspection District Office (ANM-108S).

The following documents, submitted with your letter, have been reviewed and added to our files in support of your application:

**Honeywell Data Items**

| <b>Item #</b> | <b>Title</b>  | <b>Document Number</b> | <b>Rev.</b> | <b>Date</b> |
|---------------|---|------------------------|-------------|-------------|
| 1.            | Product Specification for the MK IV Enhanced Ground Proximity Warning System (EGPWS)  | 965-1610-601           | A           | 29 JUN 04   |
| 2.            | Product Specification for the MK VI and MK VIII Enhanced Ground Proximity Warning System (EGPWS)                                      | 965-1180-601           | A           | 29 JUN 04   |
| 3.            | Product Specification for the MK XXII Helicopter Enhanced Ground Proximity Warning System (EGPWS)                                     | 965-1595-601           | A           | 21 JUN 04   |
| 4.            | Interface Control Document (ICD) for the Mark IV/VI/VIII/XXII Enhanced Ground Proximity Warning System (MK IV/VI/VIII/XXII EGPWS)     | 993-1180-401           | D           | 22 JUN 04   |
| 5.            | Plan for Software Aspects of Certification For the Enhanced MK IV/VI/VIII/XXII Ground Proximity Warning Computer (EGPWC) Release -022 | 992-1176-002           | New         | 26-APR-04   |
| 6.            | Configuration Index Document (CID) for the MK IV, MK VI, MK VIII and MK XXII EGPWS  | 993-1176-000           | AA          | 29 JUN 04   |
| 7.            | TSO-C151b Test Procedure for the MKVI and MKVIII Enhanced Ground Proximity Warning Computer (EGPWC)                                   | 060-4324-000           | B           | 01 APR 03   |
| 8.            | TSO-C151b Test Results for the MKVI and MKVIII Enhanced Ground Proximity Warning Computer (EGPWC) Part Number 965-1XX0-022            | 070-4613-006           | New         | 30 JUN 04   |
| 9.            | TSO-C151b Test Procedure for the MKIV Enhanced Ground Proximity Warning System (EGPWS)  | 060-4369-000           | A           | 01 APR 03   |
| 10.           | TSO-C151b Test Results for the MKIV Enhanced Ground Proximity Warning Computer (EGPWC)  | 070-4643-003           | New         | 30 JUN 04   |
| 11.           | TSO-C151b Test Procedure for the MKXXII Enhanced Ground Proximity Warning Computer (EGPWC)  | 060-4341-000           | A           | 01 APR 03   |
| 12.           | TSO-C151b Test Results for the MKXXII Enhanced Ground Proximity Warning Computer (EGPWC) Part Number 965-1595-022                     | 070-4634-004           | New         | 30 JUN 04   |
| 13.           | Windshear Test Procedure for the MKVIII Enhanced Ground Proximity Warning Computer (EGPWC)  | 076-0961-000           | New         | 29 JUN 01   |
| 14.           | Windshear Test Results for the MKVIII Enhanced Ground Proximity Warning Computer (EGPWC)  | 076-0961-204           | New         | 30 JUN 04   |

| Item # | Title  | Document Number | Rev. | Date      |
|--------|--|-----------------|------|-----------|
| 15.    | Test Report: TSO-C117a Windshear Testing of the Enhanced Ground Proximity Warning System (EGPWS)<br>ASAI PN 965-0976-001-100-100                         | 997-0129-501    | A    | 22 AUG 96 |
| 16.    | DO-161A System Validation Test Requirements for the Enhanced Ground Proximity Warning Computer (EGPWC)   | 060-4204-000    | F    | 29 APR 04 |
| 17.    | DO-161A System Validation Test Procedure for the Enhanced Ground Proximity Warning Computer (EGPWC)  | 060-4205-000    | G    | 30 APR 04 |
| 18.    | DO-161A System Validation Test Results for the EM6 / EM8 / EM22 Enhanced Ground Proximity Warning Computers 965-1xx0-022 (EM6/8) and 965-1595-022 (EM22) | 070-4612-006    | New  | 29 JUN 04 |
| 19.    | Software Accomplishment Summary for the MK IV/VI/VIII/XXII Enhanced Ground Proximity Warning Computer (EGPWC)  | 992-1176-816    | New  | 01 JUL 04 |
| 20.    | Test Results Summary Document for the MK IV/VI/VIII/XXII Enhanced Ground Proximity Warning Computer (EGPWC)  | 997-1176-711    | New  | 30 JUN 04 |
| 21.    | Hardware/Software Acceptance Procedure for the Enhanced Ground Proximity Warning System (MK IV/VI/VIII/XXI/XXII and GA EGPWS)                            | 076-0901-001    | AA   | 13 JUN 03 |
| 22.    | MKIV Enhanced GPWS (with GPS)  | 965-1610        | J    | 30 JUN 04 |
| 23.    | Outline – MKIV EGPWS (with GPS)  | 965-1610-201    | New  | 21 MAR 03 |
| 24.    | MKVI Enhanced GPWS (without GPS)   | 965-1180        | J    | 30 JUN 04 |
| 25.    | Outline – MKVI EGPWS (without GPS)   | 965-1180-201    | New  | 21 MAR 03 |
| 26.    | MKVI Enhanced GPWS (with GPS)  | 965-1190        | J    | 30 JUN 04 |
| 27.    | Outline – MKVI EGPWS (with GPS)  | 965-1190-201    | New  | 21 MAR 03 |
| 28.    | MKVIII Enhanced GPWS (without GPS)   | 965-1210        | J    | 30 JUN 04 |
| 29.    | Outline – MKVIII EGPWS (without GPS)   | 965-1210-201    | New  | 21 MAR 03 |
| 30.    | MKVIII Enhanced GPWS (with GPS)  | 965-1220        | J    | 30 JUN 04 |
| 31.    | Outline – MKVIII EGPWS (with GPS)  | 965-1220-201    | New  | 21 MAR 03 |

| Item # | Title  | Document Number | Rev. | Date      |
|--------|--|-----------------|------|-----------|
| 32.    | MKXXII Enhanced GPWS (with GPS)  | 965-1595        | K    | 07 JUN 04 |
| 33.    | Outline – MKXXII EGPWS (with GPS)  | 965-1595-201    | New  | 21 MAR 03 |
| 34.    | Configuration Module Assembly – MKIV, MKVI, MKVIII and MKXXII EGPWS  | 700-1710-020    | A    | 29 JAN 03 |
| 35.    | Label – EGPWS Computer Top Assembly  | 402-6094        | B    | 18 FEB 03 |
| 36.    | Label – EGPWS Top Assembly   | 402-6075        | M    | 17 FEB 03 |
| 37.    | Label, Software Version  | 402-6070        | C    | 03 JUN 02 |
| 38.    | Label – MKVIII EGPWS   | 402-6082        | G    | 18 FEB 03 |
| 39.    | Label – MK XXII EGPWS  | 402-6083        | G    | 07 APR 03 |
| 40.    | Failure Modes Effects and Criticality Analysis for the MK IV Enhanced Ground Proximity Warning Computer  | 060-4314-014    | New  | 02 JUL 01 |
| 41.    | Failure Modes Effects and Criticality Analysis for the Enhanced Mark VI/VIII EGPWC w/wo GPS  | 070-4610        | New  | 02-DEC-99 |
| 42.    | Failure Modes Effects and Criticality Analysis for the Enhanced Mark XXII EGPWC  | 070-4629-000    | New  | 23 NOV 00 |
| 43.    | Flammability Report for MKVI EGPWS PN 965-1176-0XX, 965-1180-0XX, 965-1186-0XX, 965-1190-0XX and MKVIII EGPWS PN 965-1206-0XX, 965-1210-0XX, 965-1216-0XX, 965-1220-0XX and MKXXII EGPWS PN 965-1590-0XX, 965-1595-0XX and MKIV EGPWS PN 965-1610-0XX and 965-1686-0XX | 060-4298-000    | C    | 03 APR 03 |
| 44.    | Qualification Test Procedure for Enhanced Ground Proximity Warning System EGPWS MK XXII, PN, 965-1595-020 With Configuration Module, PN, 700-1710-020  | 965-1595-120    | A    | 23 APR 03 |
| 45.    | Qualification Test Report for Enhanced Ground Proximity Warning System EGPWS MK XXII, PN, 965-1595-020 With Configuration Module, PN, 700-1710-020   | 965-1595-420    | New  | 13 MAY 03 |
| 46.    | Qualification By Similarity  | 904-0161-401    | New  | 15 APR 03 |
| 47.    | Database Development Process for Enhanced Ground Proximity Warning System (EGPWS)  | 992-0109-100    | H    | 29 SEP 03 |

| Item # | Title  | Document Number | Rev. | Date      |
|--------|--|-----------------|------|-----------|
| 48.    | Configuration Module II Hardware-Software Interface Document   | 993-0157-500    | A    | 08 JUL 04 |
| 49.    | Software Qualification By Similarity Report for Application Code Release -022 Used on EGPWS MK IV/VI/VIII/XXII | 904-0193-401    | New  | 22 JUN 04 |
| 50.    | EGPWS Mode 2 Nuisance Alert Reduction Engineering Report   | 060-4199-223    | New  | 15-AUG-03 |
| 51.    | Config. Module II CPLD Device Design Document  | 718-1562-602    | New  | 08 JUL 04 |
| 52.    | Altered Item Drawing (AID), CPLD Programming Procedure for Configuration Module (RTC)                          | 718-1562-002    | New  | 08 JUL 04 |

Effective this date, you are authorized to use TSO procedures as prescribed by Subpart O of 14 CFR Part 21 and to identify the MK VI and MK VIII Enhanced Ground Proximity Warning Computer for the referenced part numbers above, with the applicable TSO markings as required by TSO-C92c, TSO-C117a, and TSO-C151b.

Any design changes made to these TSO's must be forwarded to this office as outlined in 14 CFR 21.611(a), with minor change submittal intervals not to exceed six months. As a TSO manufacturer, you are required to report to the FAA any failure, malfunction, or defect related to your TSO authorization within 24 hours in accordance with the provisions of 14 CFR 21.3. You must also notify the FAA when you no longer manufacture a TSO approved article as required by 14 CFR 21.613(b).

This authorization pertains only to the manufacturing operations at the below address, and this office must be notified in advance of any proposed relocation.

Honeywell International, Inc.  
Aerospace Electronic Systems  
15001 NE 36<sup>th</sup> Street  
P. O. Box 97001  
Redmond, WA 98073-9701

As required by the TSO, the following statement must be furnished with each manufactured unit:

"The conditions and tests required for TSO approval of this article are minimum performance standards. It is the responsibility of those installing this article either on or within a specific type or class of aircraft to determine that the aircraft installation conditions are within the TSO standards. TSO articles must have separate approval

for installation in an aircraft. The article may be installed only if performed under 14 CFR Part 43 or the applicable airworthiness requirements.”

This authorization is not transferable to another person or location and is effective until surrendered, withdrawn, or otherwise terminated by the Administrator.

Please note that technical data retained by the FAA may be subject to the Freedom of Information Act (FOIA) request. As such, this office will notify you of all such requests pertaining to your data and afford you the opportunity to defend the release of the data.

If you have any questions, please contact Mr. Patrice Adjibly of the Systems and Equipment Branch at (425) 917-6459.

Sincerely,



Angelos G. Xidias  
Manager, Systems and Equipment Branch  
Seattle Aircraft Certification Office

Enclosure  
AIR-100 memorandum dated July 15, 2004.



U.S. Department  
of Transportation  
**Federal Aviation  
Administration**

**RECEIVED**

**JUL 20 2004**

ANM-100S  
FAA-SACO

04-6678  
**Memorandum**

Subject: **ACTION:** Request for Deviation to TSO-C151b

Date: **JUL 15 2004**

From: Manager, Avionic Systems Branch, AIR-130

Reply to  
Attn. of: **Sheila I. Mariano**  
**(425)227-2675**

To: Manager, Systems and Equipment Branch, ANM-130S,  
Seattle Aircraft Certification Office

Cc: **Bobbie Smith, AIR-103**

This memorandum is in response to your request dated July 7, 2004, reference number 130S-04-342, for a deviation to Technical Standard Order, TSO-C151b, Terrain Awareness and Warning System, by Honeywell International Inc., for the MK VI/VIII/XXII Enhanced Ground Proximity Warning System (EGPWS) Release -022.

After a review of your recommendation, past approvals, and their letter, dated June 4, 2004, Reference 04FAA149, which contains their formal request and supporting documentation, we concur that it meets the intent of 14 CFR §21.609, Approval for deviation. We, therefore, grant the deviation request.

If you have any questions regarding this response, please contact Ms. Sheila I. Mariano at (425) 227-2675.

*Stephen Van Trees*

Stephen Van Trees

| ROUTE                    | DATE | BY |
|--------------------------|------|----|
| ANM-100S                 |      |    |
| ANM-102S                 |      |    |
| ANM-130S                 |      |    |
| ANM-130S                 |      |    |
| ANM-130S                 |      |    |
| ANM-130S                 |      |    |
| ANM-160S                 |      |    |
| ANM-160S                 |      |    |
| FILE                     |      |    |
| 8150/TSO-C151B/Honeywell |      |    |

✓ JBA PFA  
NAR 7/28/04  
NAR