



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

**Transport Airplane Directorate
Aircraft Certification Service**

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

JAN 21 2005

In Reply
Refer To: 130S-05-34

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

RECEIVED
JAN 27 2005

Dear Ms. Portch:

Technical Standard Order (TSO) Approvals for
TSO C92c Authorization of Ground Proximity Warning Functions;
TSO C151b Class A Authorization of Terrain Awareness and Warning System Functions
of the Honeywell MK V and MK VII Enhanced Ground Proximity
Warning Computer (EGPWC)
TSO C117a Authorization of Reactive Windshear Functions;
and TSO C129a Class C3 Authorization of Airborne Supplemental Navigation Equipment
using the Global Positioning System of the MK V with Mercury GNSSU

We received your letter 04FAA316, dated November 1, 2004, in which you certified that a major change to the EGPWC constitutes a change in EGPWC function resulting in nine new part numbers. You also certified that the new MK V and MK VII EGPWC part numbers listed below meet the applicable requirements of TSO-C92c, TSO-C117a, and TSO-C151b Class A and the new MK V EGPWC/GNSSU part number listed below meets the applicable requirements of TSO-C129a Class C3 and are in conformance with 14 Code of Federal Regulations (CFR) Part 21, Subpart O.

EGPWC Type	Unique Characteristics	Certification Baseline	New Part Number	TSO Application
MK V	115 VAC, -40°C, no GPS	965-0976-003-220-220 (ref: 960-0329-023)	965-0976-003-222-222 (ref: 960-0329-024)	C92c, C151b, C117a
MK V	115 VAC, -40°C, Internal GPS Receiver	965-0976-020-220-220 (ref: 960-0336-010)	965-0976-020-222-222 (ref: 960-0336-011)	C92c, C151b, C117a
MK V	28 VDC, -55°C, no GPS	965-0976-040-220-220 (ref: 960-0335-018)	965-0976-040-222-222 (ref: 960-0335-019)	C92c, C151b, C117a
MK V	115 VAC, -40°C, w/Mercury GNSSU	965-0976-060-220-220 (ref: 960-0337-006)	965-0976-060-222-222 (ref: 960-0337-007)	C92c, C151b, C117a, C129a Class C3
MK V	115 VAC, -40°C, Upgraded CPU, no GPS	965-1690-051	965-1690-052	C92c, C151b, C117a
MK VII	115 VAC, -40°C, no GPS	965-1076-001-220-220 (ref: 960-2226-013)	965-1076-001-222-222 (ref: 960-2226-014)	C92c, C151b, C117a

MK VII	115 VAC, -40°C, w/Pxpress GPS	965-1076-020-220-220 (ref: 960-2225-011)	965-1076-020-222-222 (ref: 960-2225-012)	C92c, C151b, C117a
MK VII	28 VDC, -40°C, w/Pxpress GPS	965-1076-030-220-220 (ref: 960-2230-007)	965-1076-030-222-222 (ref: 960-2230-008)	C92c, C151b, C117a
MK VII	28 VDC, -55°C, no GPS	965-1076-040-220-220 (ref: 960-2224-013)	965-1076-040-222-222 (ref: 960-2224-014)	C92c, C151b, C117a

The TSO-92c, and TSO-C151a (Class A) approval applies only to Terrain Awareness and Warning System (TAWS) functions. The TSO-117a approval applies only to the airborne windshear warning and escape guidance functions. The TAWS and the windshear warning system meet the performance standards of the TSO's. The added features incorporated in the equipment meet the same qualification and software testing of TAWS and the windshear warning system. However, TSO-C92c, TSO-117a, and TSO-C151a do not include performance standards for these added features. Therefore, the actual performance of these features was not evaluated and is not included in this TSO approval. The performance of these additional features should be evaluated at aircraft installation under the Supplemental Type Certificate (STC) process and should be documented in the aircraft installation manual.

We also acknowledged receipt of your notification of minor changes to the Software Accomplishment Summary in your letter 04FAA347, dated December 03, 2004, and the accompanying Federal Aviation Administration (FAA) Forms 8110-3, signed by Designated Engineering Representative (DER) Esko Mannisto, that were submitted approving the software accomplishment summary and other related data for this application.

The documents listed in the Honeywell document titled, MK V/VII Enhanced Ground Proximity Warning Computers (EGPWC), Honeywell P/Ns 965-0976-XXX, 965-1690-052 and 965-1076-XXX Summary of Compliance with TSO-C151b, TSO-C117a, TSO-C92c and TSO-C129a; Including DO-178B Software Data document number 060-4314-049, Rev. B, dated January 20, 2005, have been reviewed and added to our files in support of your application.

The FAA confirms your certification is in conformance with the 14 CFR Part 21, Subpart O, as described in your letters. Your quality assurance manual has been previously approved by the Federal Aviation Administration (FAA) and is on file in the Seattle Manufacturing District Office (ANM-108S).

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 above ground level (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 TAWS functions provide terrain avoidance protection. The Seattle Aircraft Certification Office (SACO) reviewed the deviation request and forwarded it to FAA Headquarters for concurrence via SACO memorandum 130S-04-385, dated August 3, 2004. Concurrence was provided via the enclosed AIR-100 memorandum, dated August 9, 2004.

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 V and MK VII 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. You are also authorized to identify the MK V with Mercury GNSSU, part number 965-0976-060-222-222, with the applicable markings as required by TSO C129a, Class C3.

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."

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).

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

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

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

Sincerely,



Jeffrey E. Duven
Manager, Seattle Aircraft
Certification Office

Enclosure



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

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SEP 27 2004

ANM-100S
FAA-SACO

04-2012
Memorandum

Subject: ACTION: Request for Deviation to TSO-C151b

Date: AUG 9 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 August 2, 2004, reference number 130S-04-385, which supports Honeywell International Inc. request for a deviation to Technical Standard Order, TSO-C151b, Terrain Awareness and Warning System, for its MK V/VII Enhanced Ground Proximity Warning System Release -222-222/-052.

We reviewed your recommendation, past approvals, and the Honeywell letter, dated July 1, 2004, Reference 04FAA197, which contains their formal request and supporting documentation. Based on this information, 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

ROUTE	NOTE	ACTION
ANM-100S		
ANM-102S		
ANM-120S		
ANM-130S		✓
ANM-140S		
ANM-150S		
ANM-160S		
FILE		

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NAR

8150/TSO C151B/Honeywell