Technical Newsletter

A23-3944-005

System: Primus 880, 660, 440 Weather Radar

Product: WU-880, 660, 440 Receiver-Transmitter

Part No.: 7021450-801, -601, -401

Title/Purpose: Primus 880, 660, 440 Weather Radar Fault Code 11, Magnetron Fault

Transmittal Information

Honeywell Pub. No. A23-3944-005

Summary

This is the initial release of Technical Newsletter Pub. No. A23-3944-005.

Revision History

Technical Newsletter Pub. No. A23-3944-005 has had no revisions as summarized in Table 1.

Table 1. Technical Newsletter Revisions

Revision	Date of Release
Initial Release	9 June 2006

1. Introduction

In recent months we have been experiencing an elevated number of Code 11 magnetron faults. This TNL will discuss the reason for these faults and the corrective action that is taking place.

2. Background

A magnetron 'misfire' occurs if it does not transmit a pulse when excited by the modulator. Misfires are a normal occurrence in magnetron operation; it is part of the physics of how they work. Misfires during operation are allowed at a reasonable level. Most magnetrons that are prone to misfiring will misfire for a moment when they start transmitting and then work normally for the rest of the operational cycle. Others may misfire during operation.

Allowable misfiring during operation will not be detected by the radar operator. Excessive misfiring or more serious magnetron faults such as internal arcing may be seen by the

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operator as a 'negative spoke', a black line or wedge through targets (no target shown because the magnetron did not transmit).

The Primus 880, 660, 440 radars have circuitry that detects several types of magnetron faults, including 'misfiring'. If the number of misfires in a given time exceeds the allowable rate, it triggers a fault code 11. Unlike most fault codes which are removed when the condition is corrected, code 11 is "latched"; it remains set after the misfires stop. Therefore if the magnetron misfires for a moment and then works normally, the code 11 will continue to be annunciated and it is a 'nuisance annunciation', not an actual failure.

3. The Current Code 11 Issue

In recent months, we have been experiencing an elevated number of code 11 magnetron faults. The operators report that in the vast majority of these cases, the radar is working normally while displaying this fault.

We have discovered that the radar's monitoring circuitry for magnetron misfires has always been much more sensitive than the design specification. This leads to the annunciation of fault code 11, even when an allowable rate of misfiring occurs. Because the code 11 is 'latched', it remains annunciated after the misfires end and the magnetron is operating normally.

We have also discovered that recently manufactured magnetrons are more prone to misfiring than they used to be, and this combined with the over-sensitive fault monitoring, appears to be causing the situation that our operators are experiencing.

Service Center findings in radars removed for code 11 faults are commonly 'no fault found' and they are unable to duplicate the code 11. When it can be duplicated or if the fault history log contains a significant number of code 11 occurrences, the magnetron is replaced.

4. Corrective Action

Honeywell is actively working on corrective action.

- Modification P to the radar RT will correct the magnetron fault detection circuit so that it will not show a code 11 fault when a magnetron is misfiring at an allowable rate. It will detect true magnetron faults, such as internal arcing.

  Modification P will be available to our customers by September 2006. It will resolve the current nuisance fault code 11 issue.

- We are working with our magnetron vendor to identify the reason why many recently produced magnetrons are more prone to misfiring than they previously were and to correct the issue.

5. Interim Measures

Until Mod P is available and the radars can be modified, we recommend that if a radar fault code 11 is annunciated, but the radar is working normally, it should be treated as a nuisance fault annunciation.

In many cases, the code 11 can be cleared by turning the radar OFF for a half second and immediately back into WX mode. This will initiate a 'warm-start' and the radar will return to operation in about 5 seconds.

Occasional fault code 11 annunciations in a radar that otherwise is working normally are not a cause for concern and we recommend the radar does not need to be removed from the aircraft for them.

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