

Moog Flight Simulation Field Service Bulletin (FSB)

Level: Recommended

FSB Title: Pentium4 computer and OS obsolescence
Number: **MTB53133**

Effected System Model Number: **60" Motion systems
MB-EP-6DOF-60-8000kg and MB-EP-6DOF-14000kg**

Affected Component(s):

CLC97033-308;

MRC02079-302; MRC02079-303; MRC02079-304;

UKI06100-301

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Revision History

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FI: For Information,		FA: For Approval,			
FR: For Review, Comments requested, no hold point		FF: For Final, Final Issue			
		FC: For Construction			

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1. Table 1 – Model / Serial Number List Requiring Verification

Model	Description	Start Serial Number	End Serial Number
CLC97033-308	Pentium4 RT Computer Shoebox Model; VxWorks	AEC9010042001	AECC112356075
MRC02079-302	Pentium4 RT Computer Shoebox Model; Vxworks	001	002
MRC02079-303	Pentium4 RT Computer Shoebox Model; VxWorks	AEC9010042	AECA090560
MRC02079-304	Pentium4 RT Computer Shoebox Model; Linux	AECB081065	AECC111999

2. Obsolescence statement

Over the years 2003 until 2013, Moog has delivered Motion Systems with a real-time computer within the range of models shown in section 1. This type of computer contains a PCA-6186 main board that holds a Pentium4 processor. This mainboard assembly is out of production for several years and Moog has been able to provide spare part and repair capability up until now. Moog now regrettably has to inform that the inventory at Moog has been depleted. No guarantee can be given on longer term availability of parts as only a few are left in inventory at the moment of publication of this Field Service Bulletin. With the publication of this FSB, Moog announces the end of life for this computer platform.

With this computer platform, Motion applications were provided that were based on the Moog Jetset software architecture and running on the VxWorks Operating System up till 2010. The Jetset software architecture has reached end of maintenance and support of the VxWorks OS is ended. In the period of 2010 to 2013, motion applications were delivered that were based on middleware architecture and Linux OS.

An upgrade is possible to mitigate this obsolescence as described in the next section.

3. Product migration

The legacy computer has an ethernet interface to the motion servo drives and runs a proprietary Fnet protocol for communication. This interface is affected by the obsolescence as the interface boards in the servo drives are approaching end-of-life shortly. In addition, digital IO is being attached by using ISA based interface cards. Both interface cards and backplane are obsolete and Moog has kept a service stock for support purposes. No guarantee can be given on longer term availability of parts as only a few are left in inventory at the moment of publication of this Field Service Bulletin.

As a mitigation to overcome this obsolescence, Moog offers an upgrade kit that covers the following:

- Replacement of the FNet fieldbus card mounted in the servo drive by an EtherCAT fieldbus card
- Replacement of the real time computer by the latest generation core-i5
- Replacement of ISA based digital IO card and distribution board by EtherCAT IO modules
- Link all EtherCAT devices through CAT 6 Ethernet cables
- Implement a ventilation roof in the cabinet top section above the real time computer

As a result, the motion software application will be upgraded to support this new interface and computer platform. Since the software is of the Middleware generation, structure of the software and configuration files will change however cueing performance is not affected as same APK control algorithms are used. Parameter naming is subject to change requiring in some conversion of legacy configuration files present in the real time computer. Moog will support this conversion when a backup of the existing legacy software is provided.

Due to migration towards the middleware architecture, changes are present in the status words that are sent to the Host computer. Besides this, a legacy Host computer application will be able to communicate with the new motion application. A verification on the buffer lay-out will be conducted by Moog prior to the upgrade.

With the new software, the customer gets access to the latest generation web-based User Interface (Moog Simulation Software) which is on long term support. This software has optionally Automated Testing to the customer disposal.

4. Required Activity

An upgrade kit with part-number CC17936-301 is present for Motion bases MB-EP-6DOF-60-8000kg and MB-EP-6DOF-60-14000kg that have FNet fieldbus, providing the following:

- Replace Computer: shoebox model Pentium4 by a 2U 19" rack mount computer (core-i5)
- Operating system change from VxWorks to Linux with real-time extension
- Change Application software: 'Jetset' or 'Library' to 'Middleware'
- Replace digital IO with MACL7122-101, MTB04007 and MTB04008 by Beckhoff EtherCAT IO
- Replacement of servo drive fieldbus card UKI06100-301 by EtherCAT card
- Additional ventilation of the cabinet rooftop for better cooling

Solving the following life cycle issues:

- Limited amount of exchange parts present
- Obsolescence issues with the Fieldbus and computer and IO cards limits support over the next couple of years.
- Support of VxWorks and corresponding application software is limited.
- Fnet card is very limited available
- Exchange of obsolete or obsolescence sensitive parts to state of the art electronics
- Switch software to latest and maintained developments.

During the upgrade session the following will be done:

- Install the acceleration kit on the actuator joints
- Perform reference measurement with the Automated Test module
- Dismount the RT Computer, Fieldbus cards and IO modules
- Install new RT Computer, Fieldbus cards, IO modules and cabinet roof part
- Re-run Automated Testing
- Test result comparison
- Wrap-up
- Note: Tuning verification is recommended after update.

The following documentation will be provided:

- Interface manual, CDS40298
- Acceptance Test Procedures Cabinet Upgrade, MRA48888
- Moog Simulation Software GUI User Manual, CDS45333
- Electrical Schematics

5. Safety Precautions and Special Instructions

The procedure described in this bulletin must be performed by Moog service personnel. Replenishing the spare part stock with the replaced spare part afterwards is necessary.

TAKE A CLOSER LOOK

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