

Moog Flight Simulation Field Service Bulletin (FSB)

Level: Recommended

FSB Title: CL Interface Card and Pentium3 computer obsolescence
Number: **MTB53131**

Effected System: **ECOL 8000 Control Loading systems**

Affected Component(s):

CIC97043-401; CIC97043-402; CIC97043-404;
CLC97033; CLC97033-301; CLC97033-302;
CLC97033-304; CLC97033-306; CLC97033-307;
CLC97033-310; CLC98163-210; CLC98163-211;

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Revision History

Rev	Pages	Description	Status *1)	Initials	Date
1.00	All	Initial release	FF	TP	01-01-2018
*1)		Document Status description:			
FI:		For Information,	FA:	For Approval,	
FR:		For Review, Comments requested, no hold point	FF:	For Final, Final Issue	
			FC:	For Construction	

References

[CIC EoL]	CIC97043-801 End-of-Life Notification
[Jetset EoL]	MTB53971 Software (jetset) End-of-Life-Notification

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

Model	Description	Start Serial Number	End Serial Number
CIC97043/CIC97043-401	Control Interface Card ISA-bus	001	All
CIC97043-402	Control Interface Card ISA-bus	001	All
CIC97043-404	Control Interface Card ISA-bus	001	All
CLC97033 / CLC97033-301	Pentium3 RT Computer 2U 19" rack mount	001	All
CLC97033-302	Pentium3 RT Computer 2U 19" rack mount	001	All
CLC97033-304	Pentium3 RT Computer 2U 19" rack mount	001	All
CLC97033-307	Pentium3 RT Computer 2U 19" rack mount	001	All
CLC97033-310	Pentium3 RT Computer 2U 19" rack mount	001	All
CLC98163-210 /CLC98163-211	Compact RT Computer tray mount	001	All

2. Obsolescence statement

Between the years 1998- 2008, Moog (FCS Control Systems in those days) supplied Control Loading systems of the EcoL8000 generation that included Pentium3 computers. Partnumbers of these computers are in the range of CLC97033 up to CLC97033-307. Within the period of 1999 to 2003, Control Loading Systems for specific a large helicopter programs were shipped with the realtime Pentium3 computer CLC98163-210/-211. Starting 2004 the EcoL8000 systems got phased out. After 2004 Moog's customers could rely on Moog supplying spares, Moog repairing EcoL8000 products or Moog supplying an alternative solution (like the CLC97033-306 and -310 replacing the before mentioned range of CLC97033-xxx) .

Over the more recent period, Moog experienced significant difficulties in acquiring parts for repairing Pentium3 computers. This has resulted in limited repair capability, long lead times (several months) or higher probability of "beyond repair" situations. Moog has therefor decided to announce end-of-service for the before mentioned computers .

The legacy computer utilizes ISA bus based communication with EcoL8000 actuators using CIC97043 interface cards. The CIC interface card is out of production since 2013, with only a few cards in inventory. As the computer these cards have also reached their end-of-life, see [CIC EoL].

As mentioned in obsolescence statement [Jetset EoL] the Jetset software, running on a VxWorks operating system has also been declared end of maintenance and support.

Obsolescence of the CIC97043, the Pentium3 computers and the software running on these computers has led to the upgrade as described in the next section to mitigate this obsolescence.

3. Product migration

For Control Loading applications, the upgrade offering comprises a replacement of the computer, the software and interface cards.

The interface cards will be replaced by a box that converts the analog signals that are transferred over the high density connector to a digital signal over EtherCAT. This CIC-to-EtherCAT interface box connects up to 4 channels to an EtherCAT interface (see figure on next page).

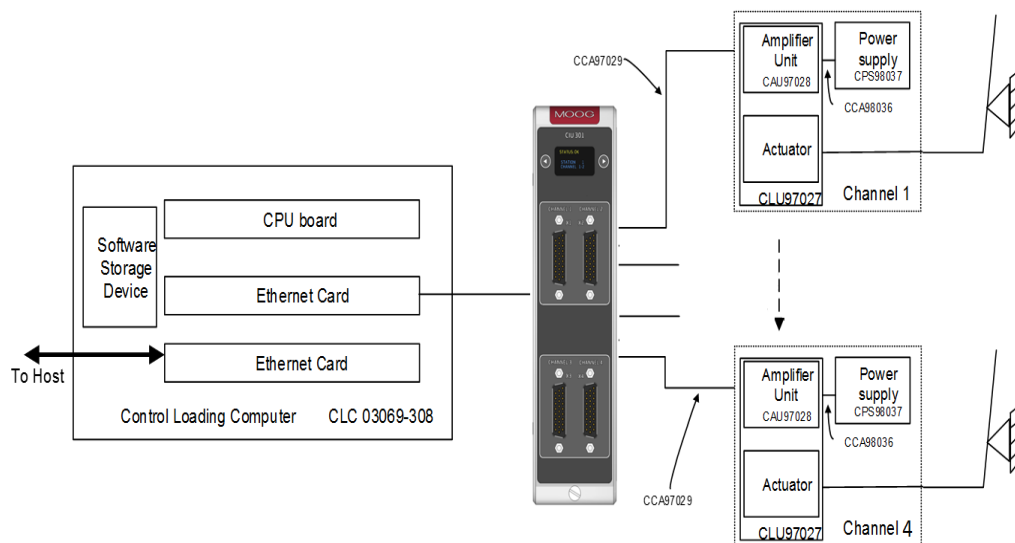
The computer platform will be upgraded to the latest generation RT computer (2U 19" rack mount computer with part number CLC03069-308 or higher) with Linux operating system.

The software will be upgraded from Jetset to Middleware software. As a consequence a conversion of the control loading models to the new software architecture is required.

The Host communication is also based over Ethernet and uses UDP protocol for communication. The application will be based on the same protocol with data words that are in identical order as the original application (so no Host programming needed for UDP protocol). For the Host the presentation of status words will reflect the new architecture, resulting in status words that have some changes on the values with detailed messages presented by the User Interface.

Parameter naming is subject to change resulting 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.

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.



If the above is not desired, then a complete system upgrade towards CL-R-E-HD/MD actuators can be offered. Adapter frames are present to mount the control loader actuators to the footprint present for H/HHF-motors without impact on installation volume. For other type of ECoL8000 control loaders please contact Moog to determine upgrade possibilities.

4. Required Activity

Converting models towards middleware can be solved in different ways:

- Model plug-in. The middleware architecture supports model plug-ins that are made with Matlab-Simulink.
- Re-coding of model input and output to be compiled to the middleware libraries. This is done in C++ (as the legacy models are also in C++).

As an option, a model response will be drawn before and after the upgrade. Model response is defined as the collection of static plots and the dynamic plots per channel made by automated testing. To verify proper responses, reference plots can be drawn for both static and dynamic conditions in an offline computation by recording computed force and computed position for the legacy and converted models.

During the upgrade session the following will be done:

- Prepare the application with the converted models and parameter configuration;
- Install the new application on the new RT computer;

- Perform offline model response comparison;
- Dismount the RT Computer;
- Install new RT Computer and install the conversion box between the analog interface cables and the computer using EtherCAT communication
- Wrap-up

It is assumed that an eventual re-run measurement (QTG tests for flight controls) will be done by the customer.

The following documentation will be provided:

- Moog Simulation Software GUI User Manual, CDS45333
- Installation manual, the Linux OS comes with different installation procedures, CDS45433
- Maintenance manual, CDS45432
- Interface manual, CDS40298 (?)
- System Specification, PSS45434
- Mechanical Drawing, CIU box
- Document of proof: equality CIC card vs CIU box
- Document of proof: equality old Jetset software model vs new ported Middleware software model

5. Safety Precautions and Special Instructions

The procedure described in this bulletin must be supported by Moog service personnel.

Replenishing the spare part stock with the replaced spare part afterwards is necessary.

IMPORTANT:

Together with respect to the CIC97043 obsolescence, the following information requires your attention:

- For a few ECoL8000 applications, a SCRAMNet SC150 Host interface was deployed in some specific cases. This SCRAMNet interface has been declared end-of-life and has also resulted in support constraints on us. Please evaluate a migration to Ethernet based Host communication when considering an upgrade. Note: the migration option above perfectly allows for easier architecture for master-slave applications due to the EtherCAT fieldbus.
- Please indicate to Moog if models have been created with a Model Development Environment as this platform has to be upgraded as well to allow for model conversion.
- As an alternative for the CLC98163-210 /CLC98163-211, a dedicated small size computer can be offered.
- Moog has the ability to offer a final last-time-buy opportunity for the CPS98037. Please inform us about your interest and the quantities you would like to obtain.

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