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**Doc No.:** TN20-75  
**Version:** 1.3  
**Date:** 14<sup>th</sup> April 2010  
**Subject:** MC206 - Upgrade to Electrolytic Capacitors

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## Technical Bulletin

### Background

A total of 5342 MC206s were manufactured between 2001 and 2007. Experience has shown that certain electrolytic capacitors in the MC206 power supply may suffer reduced life expectancy where the MC206 is heavily loaded or runs at high temperatures. This document describes which MC206 *Motion Coordinators* are likely to be affected and the recommended solution.

### Products Affected

Products with serial numbers below P135-03356; these require attention as detailed below.

Serial numbers between P135-03356 and P135-03790; these may require attention as detailed below. Inspect the power supply capacitors to see if they are of the correct high temperature type.

All MC206s shipped from the UK after 20th Jan 2005 or serial number P135-03791 and above, are fitted with high temperature/long lifetime capacitors. These do not need any rectification.

MC206X, MC224, Euro205X, PCI208 and all other *Motion Coordinators* are NOT affected.

### Conditions Likely to Cause Reduced Life

There are a number of factors that may indicate potential for early failure of one or more electrolytic capacitors:

- a) Operation with a daughter board fitted in the expansion slot.
- b) Connection of an external encoder or other device that draws current from the encoder power supply feature of the MC206. (Pin 8 of the D-type encoder socket)
- c) Operation in high ambient temperature environments, including high temperature inside an enclosed control cabinet. (Temperature at or close to the +45° Celsius maximum rating)
- d) Continuous running or high duty cycle operation.

### Symptoms of Failure

MC206's that have failed or partially failed capacitors may be audibly noisy, either buzzing or with a high pitched noise. They may also show intermittent power-up problems or have blown the internal 500mA fuse and fail to power up altogether. The green front panel LED may flicker.

## Remedial Action

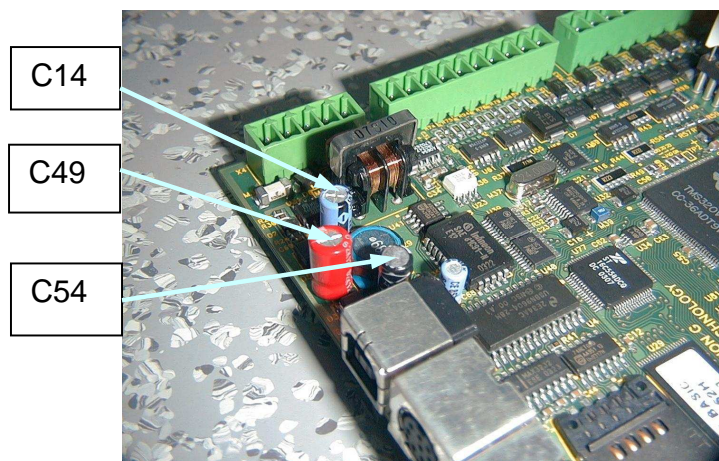
Where a customer has a MC206 *Motion Coordinator* in use and one or more of the above conditions are present, Trio recommends that the MC206 has 3 of its power supply capacitors replaced with specific high temperature/long lifetime replacements. Suitable capacitors can be supplied free of charge by Trio.

If the MC206 is returned to Trio for this work to be done, it will be treated as a normal repair and the standard repair charge applied.

Alternatively, this work can be done by arrangement during a planned shutdown, at the customer's factory by an authorised Trio distributor, or Trio appointed service engineer, provided the machine builder and user agree.

## Rework Procedure

1. Equipment required: 24V d.c. power supply, a PC running *Motion Perfect 2*, serial cable PC to Trio, a soldering iron with suitable fine tip and de-soldering suction tool. A static controlled workstation is recommended.
2. Unplug all connectors, remove the *Motion Coordinator* from the machine and take it to the prepared workplace.
3. As a precaution, where possible, save a copy of the MC206 project to the PC using Motion Perfect. Where the controller is LOCKed, or the project is encrypted and saved in Flash EPROM, the programs are very unlikely to be lost during capacitor replacement so it is possible to proceed without making the backup copy.
4. Open the plastic case by gently squeezing the longer sides of the back to release the clips holding the front. The main board and daughter board, if fitted, will remain attached to the case front.



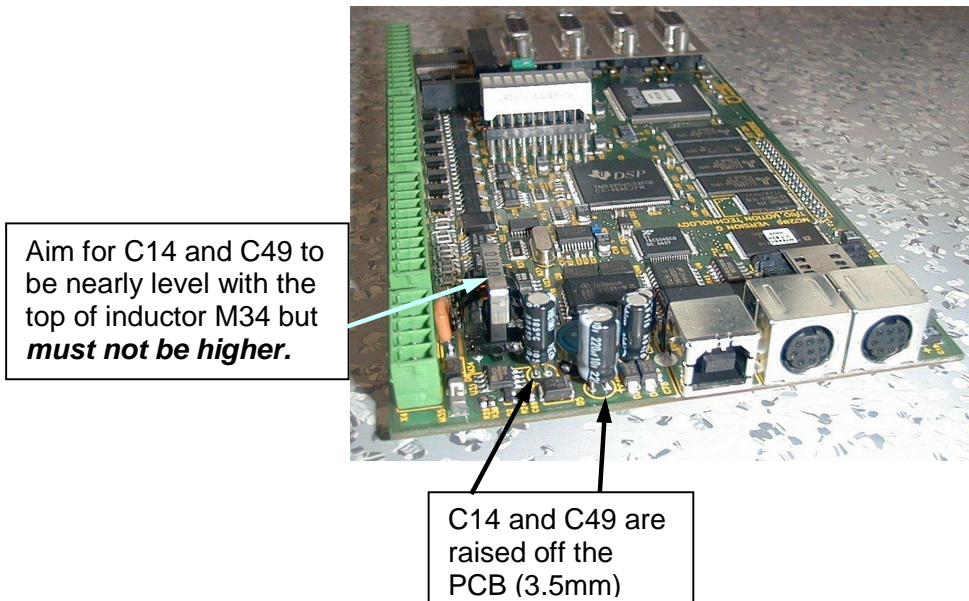
5. Unplug the daughter board and P399 adapter, if fitted. It is best to keep these plugged together as a pair and gently rock the P399 to and fro to release it from the socket on the MC206.
6. Press on the D-type connectors to push the board out of the case front.
7. De-solder and remove capacitors C14, C49, and C54. These are all through-hole parts.

8. Fit the new parts **supplied by Trio**, paying attention to correct polarity. The parts should be located as follows:

Id	Rating
<b>C14</b>	22uF 50V 105°C
<b>C49</b>	220uF 10V 105°C
<b>C54</b>	100uF 10V 105°C

(no other parts should be used without consulting Trio):

9. Capacitors C14 and C49 are to be mounted 3.0/4.0 mm clear of the PCB surface (to minimize heat transfer, and allow good ventilation). However, the top of the capacitors **must not be higher** than the top of inductor M34.



10. Reassemble the board into the plastic case. If working on more than one MC206, ensure the serial numbers match.
11. Mark the case to indicate that the modification is done.
12. Each unit should be given a simple test as follows:
- 12.1. Run the Trio *Motion Perfect2* terminal window and connect the serial cable to the MC206.
  - 12.2. Power up the MC206.
  - 12.3. Check that the start-up messages appear in the terminal window.
  - 12.4. Check that the messages at the end of power-up show the correct compiling and linking of the BASIC programs, and that the correct programs start to run. This will be different for each machine.