Ormerod troubleshooting guide

I have only included issues where I have evidence of at least two people having the same one. Most users will experience only a few of these issues, or none at all. I believe the Ormerod is fundamentally a sound design and all of these issues can be resolved. Numbered solutions represent alternatives that may be used independently, or (where appropriate) in combination. RRP stands for RepRapPro.

Change log	
Date/time	**Changes**
2014-09-01 16:50Z	Added Electrical 5a and Electrical 8

Mechanical issues

#	Symptom	Cause	Solution(s)	Notes
1	X-rib and x-plate do not fit together well and may break during assembly (early kits)	X-rib tabs and x-plate slots do not align perfectly	File the tabs and/or slots until they fit together **without the x-plate bending at all**	If already broken, ask RRP for replacements. Later kits have modified x-rib and x-plate designs with larger slots.
2	X-plate nut trap breaks during assembly (early kits)	X-rib nut trap too small and/or not aligned with hole in z-nut trap	File out the hole in the z-nut trap and/or the jaws of the x-rib nut trap until the nut fits easily in the nut trap and the threaded rod is clear of the hole in the z-nut trap	Later kits have no nut trap in the x-rib, instead they have a modified z-nut trap which captures the nut
3	Y-belt comes off	Y-belt too loose in slot in y-carriage rib	Use a cable tie to hold the two ends of the y-belt together, and wedge the belt into the slot with paper etc.	The slot width seems to vary between kits
4a	Print head sags at all x-carriage positions (cause 1)	When the print head is held level, there is a gap between the x-runner	Loosen the screw securing the x-runner bearing and slide it along the slot towards the x-plate. If insufficient travel to resolve the problem, do one or	

		bearing and the x-plate	more of: 1. File out the slot and deepen the nut trap to increase the range. 2. Substitute a 623ZZ (10mm) bearing for the 9mm bearing. 3. Replace the cap screw by a countersunk screw, and use several washers or a combination of nuts and washers to stand the bearing off the x-carriage by a few mm, making sure that the screw head will still pass under the extruder motor. 4. Put tape or a hacksaw blade on the x-plate bearing surface to reduce the gap.	
4b	Print head sags at all x-carriage positions (cause 2)	Nozzle mount is vertical but print head is not parallel to it	1. Adjust and tighten the screws securing the head to the nozzle mount. 2. Replace the nozzle mount by a design with holes instead of slots, see http://forums.reprap.org/read.php?340,287002	
5	Print head sags a variable amount depending on x-position	X-plate is bent or curved due to misaligned tabs and slots	See (1)	
6	X-runner bearing doesn't rotate freely	X-runner bearing tight against washer	1. Turn the washer over so that the side with the sharper edges is away from the bearing. 2. File the washer down to a smaller diameter. 3. Substitute a 10mm bearing (see 4a).	
7	When the print bed is secured by the foldback clips, the clips foul various parts of the print head	Foldback clips protrude too much above bed	1. Replace foldback clips by Swiss clips, see http://forums.reprap.org/read.php?340,285430 2. Modify the foldback clips, see http://forums.reprap.org/read.php?340,289587	
8	X-plate and carriage rotate about z-axis	Z-bearings not tight about extrusion	1. Put tape on extrusion to remove the gap 2. Download and print improved z-bearing clamp from RRP.	Later kits include improved z-bearing clamp

#	Symptom	Cause	Solution(s)	Notes
9	Back corners of MDF bed sag, causing unstable z-height over time	MDF not strong/stable enough to support back corners from the back bearings	1. Reinforce the MDF bed, especially along the back. 2. Replace MDF bed by 5mm aluminium, perhaps in a triangular shape (i.e. no front corners) to reduce weight.	

Electrical, electronic and commissioning issues

#	Symptom	Cause	Solution(s)	Notes
1	Duet can't read config.g from SD card	SD card too slow or otherwise unsuitable	Replace SD card by a better one. 4Gb Class 10 SDHC works well.	
2	Arduino serial monitor connects OK but Pronterface thinks the printer is offline, even though it shows that the printer is responding to its M105 commands with the temperatures	Duet has not processed config.g due to SD card problems, even though the contents of config.g are correctly reported in response to M503 from the Arduino serial monitor	See (1)	
3	Pinging the Duet Ethernet port fails even though a suitable IP address has been set in config.g	Same as (2)	Same as (2)	
4	ATX power supply cuts out after a while	Not known, possibly insufficient load on +5V/+3.3V	Try a different ATX power supply, or use a 12V 25A industrial-type PSU (£21-80	Only a few ATX PSUs have this issue

			on eBay UK)	
5a	Machine freezes during printing or testing when the USB cable is connected, but ATX PSU is still running,	Mains-borne interference and/or ground loops, especially when other devices powered from the same mains socket as the Ormerod switch on or off	1. Put ferrite beads on the USB cable, or on the power cable between the ATX distribution board and the Duet board. 2. Power the host computer and Ormerod – and nothing else – from the same mains socket strip.	
5b	Machine freezes during printing or testing (whether or not the USB cable is connected), but ATX PSU is still running	Believed to be caused by electrical noise created by bed heater and/or limited resilience to power supply brownout	Most solutions require modifications to the Duet electronics board, which will probably invalidate the warranty. Modifications that have been used include: 1. Add 470uF or 1000uF capacitor in parallel with C3. 2. Add capacitor across 12V input. 3a. Add capacitor (not more than 1uF) between bed heater mosfet drain and source. 3b. Add resistor of about 200 ohms in series with gate of bed heater mosfet. Some users also add a Schottky flyback diode in parallel with the bed heater.	
6a	Z-height sensor readings are unstable (cause 1)	Sensor is responding to ambient light	1. Shield the Ormerod from bright sunlight, and use only fluorescent or LED artificial light. 2. Replace the 165 ohm resistor on the sensor board by 51 ohms, and the 15K resistor by 4.3K, to reduce sensitivity to ambient light by a factor of 3.	May also introduce on/off modulation to the IR sensor in future
6b	Z-height sensor readings are unstable (cause 2)	Tiny scratches on the aluminium tape cause the reading to vary with slight changes in x and y position	Replace the aluminium tape by white PVC tape or white paper	
7	Can ping the Ethernet port, but on attempting to connect it gets stuck at the password page	Network errors occurring (cause unknown), followed by failure of the	1. Try connecting a different host computer. Slower computers and network connections seem to work	Modified firmware is ready for submission to

		firmware to recover from them	better than fast ones. 2. Try modified firmware with improved error recovery, see http://forums.reprap.org/read.php?340,288727	github
8	Can't connect to Ormerod via USB from Pronterface or Arduino serial monitor from a PC running Windows 8	Driver is not being installed	See http://forums.reprap.org/read.php?340,290805	

Printing issues

See also related mechanical and electrical/electronic issues.

#	Symptom	Cause	Solution(s)	Notes
1	Warping when large prints are made, only on the die behind the fan	Backwash from fan	Print and install fan backwash deflector, see http://forums.reprap.org/read.php?340,287558	
2	Strings and blobs when printing	Insufficient retraction	Increase extruder 1 retraction setting in slic3r to about 4mm	