

# Inside the Meade LX200 Drive Assemblies & Corrector Plate Cleaning

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I recently (2011) moved house and unfortunately I had to leave my old roll off roof observatory behind as I custom made it and was most definitely not portable. One of the first things I set about doing after the move was building a new observatory for my Meade LX200. For my step by step instructions of how to build a roll off roof observatory with a permanent pier see the article on my website [www.astrosoft.co.uk](http://www.astrosoft.co.uk).

Before I installed my scope into the new observatory I decided to give my scope a bit of a clean-up. This article presents my photos and instructions on how to perform the following tasks for a Meade LX200 10" classic.

- Change the battery;
- Disassemble the RA and Dec drive assemblies to facilitate a clean-up and re-grease;
- Clean the front corrector plate.

Please note that by doing this on your own scope you may invalid any warranty and it is very much at your own risk.

Figure 1 below shows the two basic ingredients I used – Teflon grease for the gears and isopropanol alcohol for cleaning the optics.



Figure 1 – Teflon Grease and Isopropanol Alcohol

The rest of this document presents step by step instructions.

- 1) Lay the scope down and remove the back and front panels as shown in Figs 2, 3 and 4.



**Figure 2 – Lay Scope down**



**Figure 3 – Remove the six rear panel screws (arrowed)**



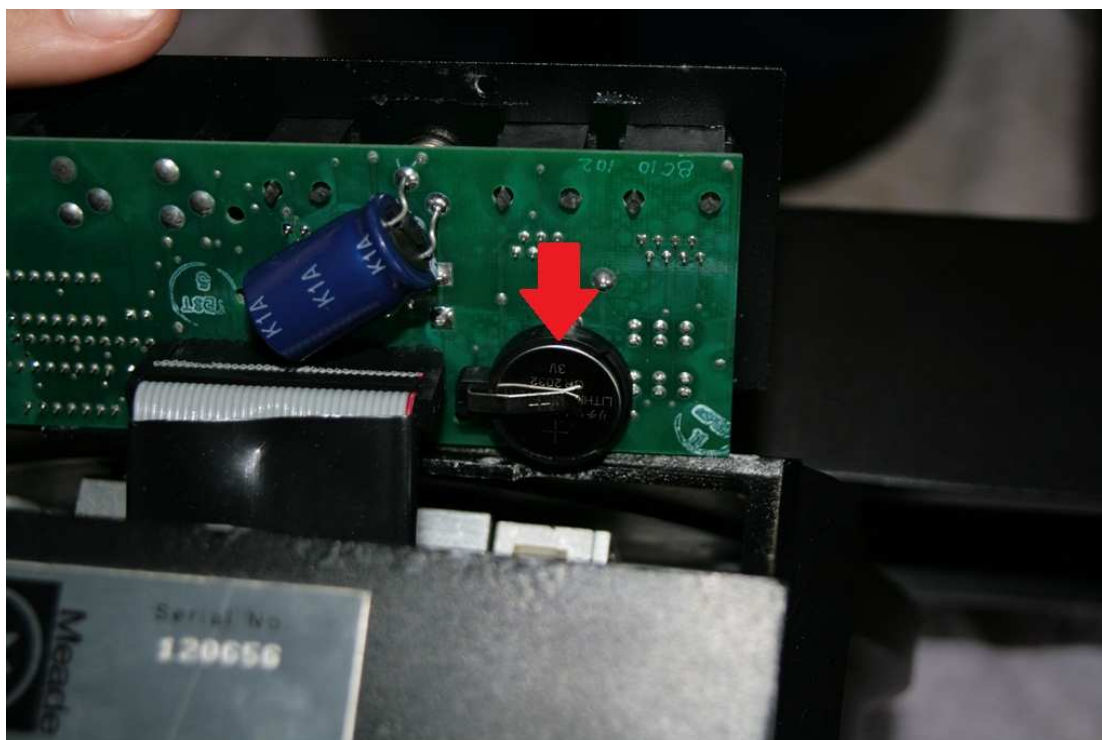
**Figure 4 – Remove the four front panel screws (arrowed)**

- 2) Figures 5 and 6 below show close up views of the circuit boards that are revealed once the back and front panels have been removed.





**Figure 5 – View of circuit board under rear panel**



**Figure 6 – Circuit board under front panel showing the battery (arrowed)**

- 3) I then replaced the battery shown in Figure 6 above with a new 3v CR2032 (check that yours is the same before replacing with this type).
- 4) I then replaced the front and back covers and started the RA drive disassembly. Ensure that all locks are off and then remove the two screws shown in fig 7 below.



**Figure 7 – Remove cover plate two screws (arrowed)**



- 5) The next step is to remove the single screw and plate as shown below in figure 8.



Figure 8 – Remove single screw (arrowed)

- 6) And now **gently** tap the shaft so as to release the friction seal on the RA shaft that is captive by the bearing. I used a piece of wood just less than the outside diameter of the RA shaft in the bearing (i.e. also less than the inside diameter of the bearing as you do **not** want to be hitting the bearing). Then give the wood a **gentle tap** from a hammer as shown in Fig 9 below.



Figure 9 – Position a piece of wood or similar (ensure no contact on the bearing)

- 7) A couple of gentle taps later and you can see the RA shaft is moving out and the bearing is left in place; as shown below in Fig 10.



**Figure 10 – RA shaft is moving out**

- 8) After a couple more taps you can lift out the base assembly. You can now see how the tapered RA shaft is held on the captive bearing in the base by just that one screw that was removed in figure 8.



**Figure 11 – RA base separated**

- 9) Figures 12 and 13 below show the RA worm wheel in the base and the RA main gear still on the main base.



Figure 12 – RA worm wheel and motor



Figure 13 - RA main gear



- 10) Figure 14 below shows the small RA slow motion gear and its corresponding gear (before cleaning!).



**Figure 14 - RA slow motion control gear assembly (before cleaning)**

- 11) The main RA gear is released by undoing three further screws, there locations are shown in figure 15 below (after they have been taken out and the RA gear lifted off).



**Figure 15 – Release the main RA gear via three screws (original locations arrowed)**

- 12) Figure 16 below shows the final results – the RA base removed to reveal the RA work wheel and the RA scale with the slow motion control removed and the main RA gear.



Figure 16 – The final results of the disassembly

- 13) It was then a case of cleaning off the dirt and old grease that had collected up and then re-greasing and reassembly. **I used a tooth pick and cotton wool to get every last bit of the old grease and dirt out of the gears and assembly before reapplying new grease.** Reassembly is just a reverse of the steps above, but ensure the main gear wheel is placed back the same way otherwise the worm and wheel will not mesh and you will damage it.
- 14) Figs 17 and 18 show the cleaned up RA assembly before the re-grease and the RA work wheel after the re-grease.



Figure 17 – Cleaned up before re-grease



**Figure 18 – RA work wheel cleaned up and re-greased**

15) After reassembly of the RA, I turned my attention to the Dec drive. Ensure all locks are off and remove the three screws arrowed in figure 19 below.



**Figure 19 - Remove the three Dec housing screws (arrowed)**

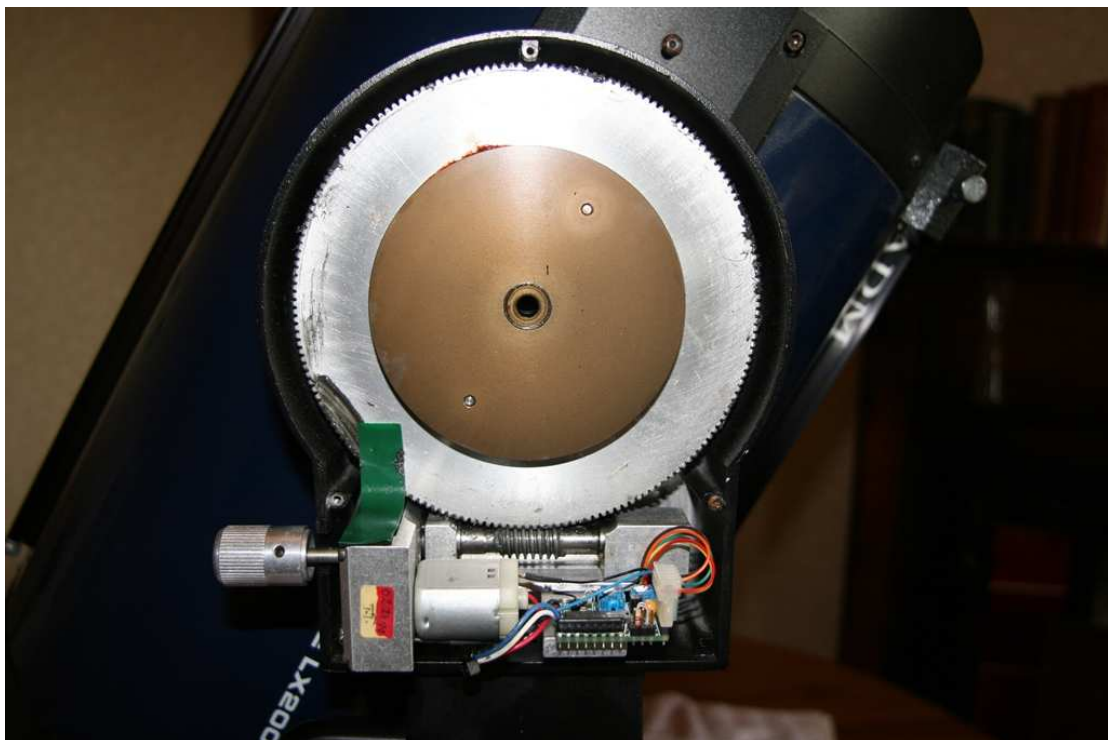


- 16) Remove the Dec locking wheel (just screw it all the way out anti-clockwise) and lift off the cover as shown in Fig 20 below.



**Figure 20 – The Dec locking wheel and cover removed**

- 17) The Dec gear assembly is now revealed, just lift off the locking plate as shown in figs 21 and 22 below.



**Figure 21 – The Dec gear assembly revealed**



**Figure 22 – Lift off the locking plate**

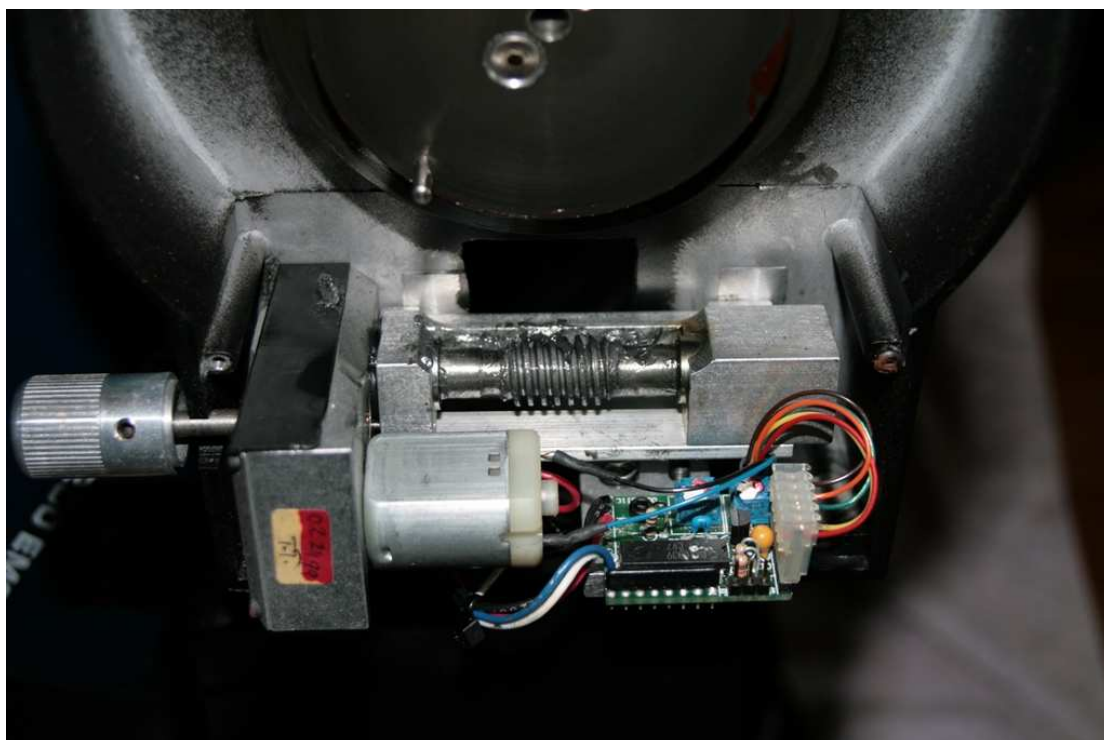
18) You can now lift out the Dec gear as shown in fig 23 below.



**Figure 23 – Lift out the Dec gear**

19) It is now a case of cleaning and re-greasing the Dec work and wheel. These are shown close up in figs 24 and 25 below.

20) Reassembly is then just the opposite of the steps above. Ensure the main gear wheel is placed back the same way otherwise the worm and wheel will not mesh and you will probably damage it.



**Figure 24 – The Dec worm wheel close up (before cleaning)**



**Figure 25 – The Dec gear wheel close up (before cleaning)**

The scope drives were noticeably quieter after the clean-up and re-grease and I will see if it has eradicated the small drive jumps that I have been having.



21) My final task was to clean the front corrector plate. To do a thorough job it would be best to take it off and clean front and back. However for this exercise I only cleaned the front, this took the phases:

- Tip the scope slightly so that the plate is also tipped towards you as you don't want any material creeping inside the scope during the clean;
- Use a camera lens blower to get rid of as much dirt as possible without making any contact;
- Use a camera lens cleaning brush to remove as much of remaining dirt as possible;
- Ensure that the cotton wool (or lens cleaning cloth) is of natural materials without any additives, new and clean;
- Get the cotton wool good and moist (not dripping) with the isopropanol alcohol and clean the plate by gently wiping radially from inside to out;
- If you find that you have smearing after cleaning then you can also finally use a 70% isopropanol alcohol, 30% distilled water mix for a final clean with cotton wool.



**Figure 26 – Before cleaning – loads of dirt on the plate**



Figure 27 – After cleaning – like new