Dismantling a Meade ETX

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WARNING: Doing this will invalid any Meade Warranty and may render your scope useless.

These notes concern my Meade ETX105. Meade have since replaced this model with the ETX-PE (Premier Edition) but there are still plenty of people using these and there are lots for second hand sale.

My ETX105 conked out during a slew. Declination motor was still working so my attention was drawn to the RA.

Firstly I decided to take the OTA out of the fork. This involves removing 4 cap head screws (two either side). Two are arrowed in the photo below (Fig. 1):-

Fig. 1 – OTA Retention screws arrowed

Remove them with an hex key (Fig 2).

Fig. 2 – Removal of OTA retention screws

Once all four screws have been removed (two either side) you then have to ‘slide’ out the Optical tube Assembly (OTA). This involves levering up the plastic retainer arms (which were previously held onto the OTA by the screws you just removed). This needs to be done to release some lugs that clip into recesses in the back of the OTA. You really need three hands for this; ideally you need to simultaneously lever up both sides (the photo below shows me doing one side) and then push the tube with your third hand. You need to be reasonably forceful in the operation so there is an obvious danger here of damaging the plastic arms – be careful.

Fig. 3 – Raising up one arm to release the lugs

Fig 4 below shows one arm now raised up enough to clear the OTA.

Fig. 4 – One arm raised up to clear the OTA

And now slide out the OTA:

Fig. 5 – Sliding out the OTA

The OTA is now out and free:

Fig. 6 – The OTA is free

I could now concentrate on the fork arms assembly:

Fig. 7 – The OTA and forks separated

Out of curiosity I decide to have a look at the declination bearing assembly. The declination scales just screw off. Nothing great of note – steel bearings and worm and wheel assembly as one would expect, and besides the RA was my main area of focus.

Fig. 8 – Declination scale removal – First Arm

Fig. 9 – Declination scale removal – Second Arm

Back to the RA assembly now which is where I believed my problem to reside. Firstly remove the base cover. To do this remove the glued on felt pads to reveal three screws:

Fig. 10 – Reveal the three base screws

Remove the screws and lift free the cover. Be careful as the battery compartment has two wires going onto a circuit board so you can only lift the cover free by a few centimetres.

Fig. 11 – Lift free the cover – carefully

Now you can see the motor, great train assembly and the worm and wheel assembly for the RA drive. Three things of note here:-

- I have disconnected a multi-plug from the circuit board (red arrows);
- One wire to the motor (black) is broken - arrowed in yellow;
- There was a great big crack in the plastic gear train housing – arrowed in blue;

Clearly the crack and/or wire break were the causes of the RA drive failure. I was quite disappointed by the amount of plastic being used here.

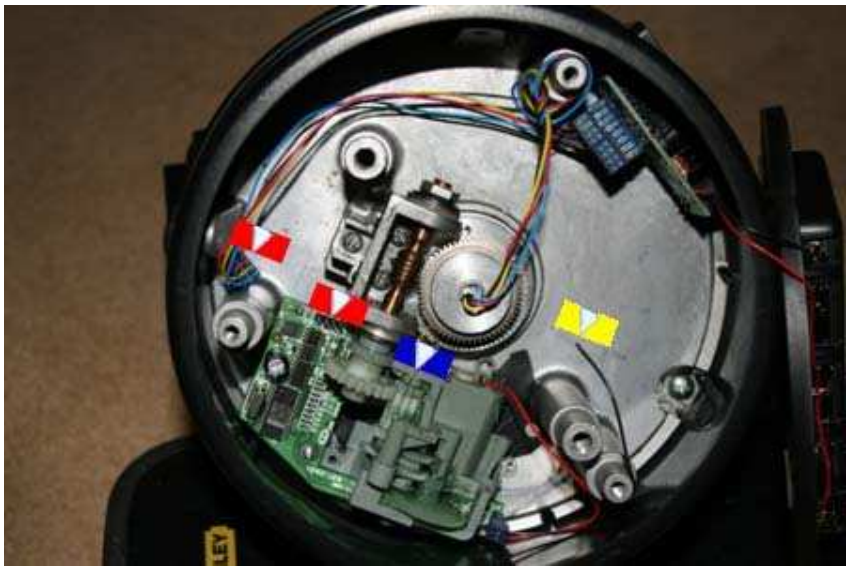

Fig. 12 – Interesting use of materials; a plastic gear assembly!

To remove the assembly there are three screws holding down the worm:

Fig. 13 – Remove the three screws holding down the worm

And three screws holding down the circuit board and gear assembly:

Fig. 14 – Remove the three screws holding down the circuit board and gear assembly

You can now lift free the assembly, which in my case promptly fell into two parts showing that the crack was in fact a complete sheer and failure. Clearly the plastic had suffered a stress fracture.

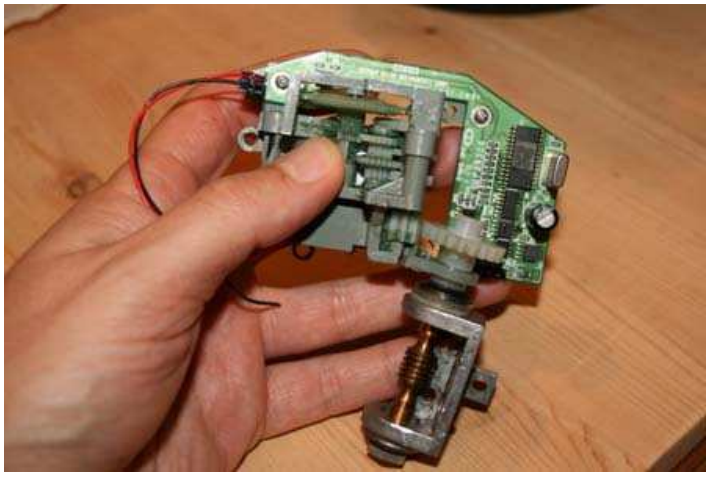

Fig. 15 – Broken gear assembly about to fall into two parts

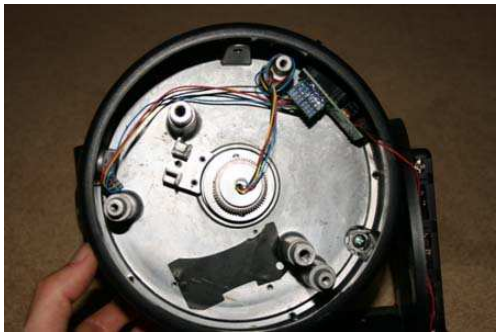

Fig. 16 – Base is now empty.

At this point my feeling of a rather disappointing piece of manufacturing and assembly was heightened upon inspection of the assembly. No fewer than five stress fractures were present; most of which were possibly due to the screws having been over-tightened during assembly breaking the plastic. They looked like failures just waiting happen.

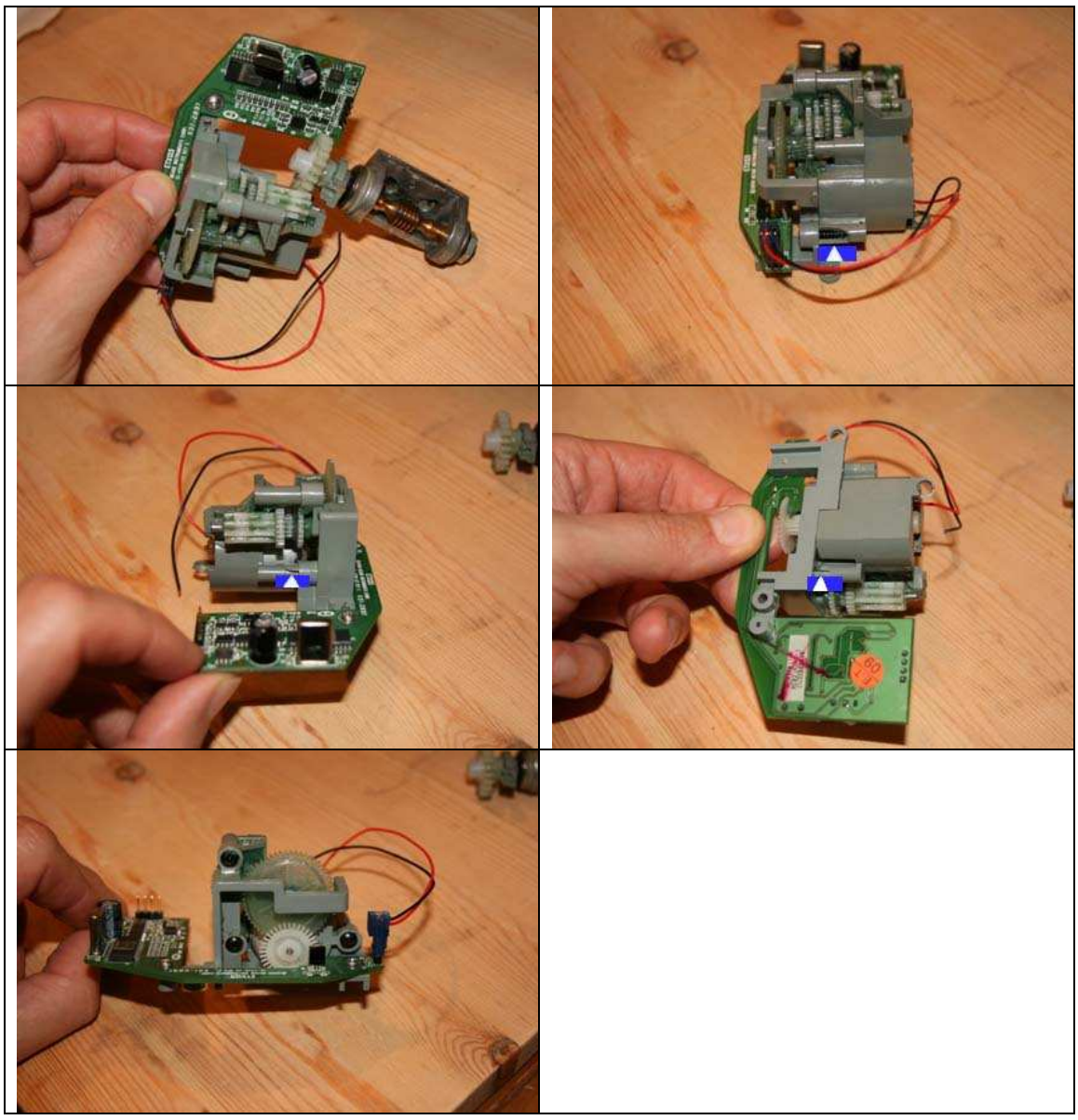

Fig. 17 – Numerous stress fractures in the plastic assembly

Conclusion.
My ETX was fine while it was working (about 2 years) and for the cost you can't have many complaints. However I was not impressed by the quality of the materials used in the RA gear assembly and I would draw anybodies attention to this who is thinking of buying a second hand ETX. Perhaps this proves the old saying that you get what you pay for, but hopefully the PE models have addressed some of these issues.

With liberal and very careful use of super glue I am now back up and running.

Top Tip: I now always slew at slow speeds to limit the torque peaks and therefore stress being placed on the gear train (something I also do on my LX200). So far it's holding out!

Update: Jan 2009 – The super glue fix has finally failed so I have now purchased a Celestron Nexstar 102SLT. I will be adding a review of this scope soon to my website.