**MProbe Problems August 1, 2016**

**Most pressing**

The stage controls seem to be malfunctioning intermitently. When using the joystick to move the stage in, say, the +x direction the stage will sometimes move in the +x direction briefly before inexplicably going backwards.

The stage positioning motors have started making much more noise than they had. This happened around the time when users were frequently having substantial difficulties getting samples onto the stage, so it may have been caused by someone using an inappropriate amount of force on the arm. It seems that this might be related to the previous issue.

It can be difficult to load samples onto the stage, sometimes not possible to get a stub on the stage.

The claw that grabs the stub is sometimes not strong enough to pull the stub off the stage. I have never seen this issue prior to a few months ago. This could be related to the stage loading difficulty.

The filament will sometimes turn off for no discernible reason. The filament can be brought back online as usual, typically without issue. I noticed once that when I was bringing the high voltage back up following an outage, there was a popping sound like what you might hear when ramping the voltage too quickly after venting the analysis chamber. This was strange since the chamber had been at UHV pressures for more than a month by that point. The anode had been changed 4 months prior, so it should have been fine.

There are interface errors (a window with the words “Interface error” and a black box pops up on screen) that necessitate restarting the instrument. When this error occurs during an experiment, no more data is collected and the run is essentially wasted.

There is a slow leak through gate 5. When the load lock is vented, the pressure in the analysis chamber will rise to ~1.5 E-8 Torr. As soon as the load lock pump comes on, the analysis chamber pressure will fall back to the low E-9 range almost immediately, even when the pressure in the load lock is still in the tens of Torr range.

The stage drags against the horizontal bar that it rests on during sample loading.

I have occasionally seen something strange happen with the count rate when far off the sample. Typically, you might see ~50 counts per second when your sample is far away from the correct height. Sometimes I will see ~2000 counts per second as the baseline count rate, even when very far from the correct height. I will try to replicate this issue on my own, since this I have described seems to intermittent.