EST Board Study

1/23/2012 – 1/30/2012

On the 23 of January at 15:00, EST board number 26 was cleaned with alcohol and connected to a 10000 picofarad capacitor signal readout. Signal readout channel four was connected to UA Test Bench while channels one through three were terminated with 50 ohm resistors. High voltage was connected and set to 1.8 kilovolts. A plastic enclosure was placed over the EST board to create a semi-isolated state. At 15:00 UA Test Bench was started and set to run for 10000 triggers.

External humidity data was collected from atmo.arizona.edu and from that data hourly averages were made. These were graphed alongside hourly spike and noise rates.

On the 25 of January, a humidity sensor was connected and placed within the plastic enclosure. At 13:20, it was set to take humidity and temperature readings every 30 seconds. This humidity data was later averaged hourly and graphed, as well.

On the 27 of January at 13:40, a small plastic tray containing water was placed within the plastic enclosure. The intent was to increase the humidity within the enclosure to see any possible correlation between internal humidity and spike rate.

UA Test Bench was stopped around 09:00 on January 30. At this point, there had been 1786 triggers recorded. 1548 of these triggers, or 86.7% of the total, were classified as spikes.

There appears to be a loose correlation between the average hourly humidity and the spike rate. When the water tray was added to the plastic enclosure, both internal humidity and spike rate rose steadily until the water was fully evaporated. At this point, both averages fell off sharply. The correlation can also be seen between January 24 and January 25. A storm came through Tucson, increasing the external humidity from 15% to an average high of 75%. A corresponding increase was seen with the spike rate, which increased from 5 spikes per hour to 25 spikes per hour over the same time period.

A future test will be to completely isolate the EST board from the room humidity within a plastic enclosure. During this test we will add a water tray to the sealed environment and continue to observe.