# Limit Logic in TCS

A new limit logic and overall telescope safety plan was discussed on 5/20/2019 for TCS NG. This document is a description of that discussion.

## Limits

The new limit logic discussed is a four tiered limit logic. There will be two software limits ($S_1$ and $S_2$) and two hardware limits ($H_1$ and $H_2$).

### $S_1$

$S_1$ will act like the current software horizon limits in that You can get passed $S_1$ by tracking, with bias rates or with the paddle guide and drift rates. You will not be able to move below $S_1$ using the standard go to functions in TCS.

### $S_2$

$S_2$ will be a no go zone by go to functions and bias rates or the paddle. Hitting this software limit will be functionally equivalent hitting the cancel button. The telescope will ramp down and come to a stop.

### $H_1$

$H_1$ will act the same as $S_2$ in that the telescope will come ramp down to a stop when the limit is hit. The only difference will be that this limit is a hardware limit and immune to bad initialization.

### Note it is possible $H_1$ can be above $S_2$

### $H_2$

This is the last hardware limit and will function the same as the final hardware limit currently at most of our telescopes. This is currently