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). Currently this document will focus on Horizon limits but the basic ideas could be ported to Equatorial limits as well.

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 goto functions in TCS.

S_2

S_2 will be a no go zone by goto 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. As soon as it is hit it will cut power to the drive system either by powering off the drives or by activating the Safe Torque Off option.

Differences From Previous System

The limits at each telescope currently varies quite a bit. But in general we have one software limit that stops goto functionality but you can get passed the limit with bias, paddle and tracking rates.