

K1DM3 Design Note

Come-along Procedure – Manual Control of Swing-arm

December 20, 2016

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## Overview

In order for K1DM3 to repeatedly seat into the kinematic couplings, there needs to be a compliance in the swingarm as to not over-constrain the kinematic system. This has adverse effects when attempting to actuate the swingarm at/or near horizon. Due to the compliance in the system, the swingarm doesn't seat into the kinematics and needs additional assistance to fully deploy. The UCO team has come up with a procedure to complete deployment at horizon using a come-along.

## Operation

Figure 1 shows the come-along attached to the eye plate on the swing-arm. The come-along attaches to this eye when used to support the mirror assembly and swing-arm. The eye plate was re-designed to better clear the swing-arm and make it easier to insert the hook. The new eye plate is shown in Figure 2.

## Procedure at Horizon

From Deploy to Retract:

1. Attach tie-down strap to tertiary tower
2. Connect crank end of come-along to tertiary tower strap
3. Attach long end of come-along to swingarm hook
4. Tighten come-along until taught
5. Under computer control, open clamps
6. Loosen come-along until there is slack
7. Detach come-along from swingarm
8. Under computer control, command swingarm to retract
9. Disassemble come-along from tower

From Retract to Deploy:

1. Attach tie-down strap to tertiary tower
2. Connect crank end of come-along to tertiary tower strap
3. Command swingarm to Deploy, Unclamped
4. After actuators stop, attach come-along to swingarm hook
5. Tighten come-along until swingarm is engaged in kinematics

## Additional Notes

- Since UCO does not have a complete tower, we had to connect within the K1DM3 module itself to practice the come-along procedure. This will not be the operation at Keck. There will have to be a short practice period on site.
- In the first photo, the crank is near the swingarm, this will not be the case at Keck since this would require the use of the JLG which is too risky. Normal operation at Keck will have the come-along oriented the other way.



Figure 1 - Lifting eye plate with come-along attached. Fasteners are M12 fine thread SHCS



Figure 2 - Redesigned lifting eye for easier connection with hook.

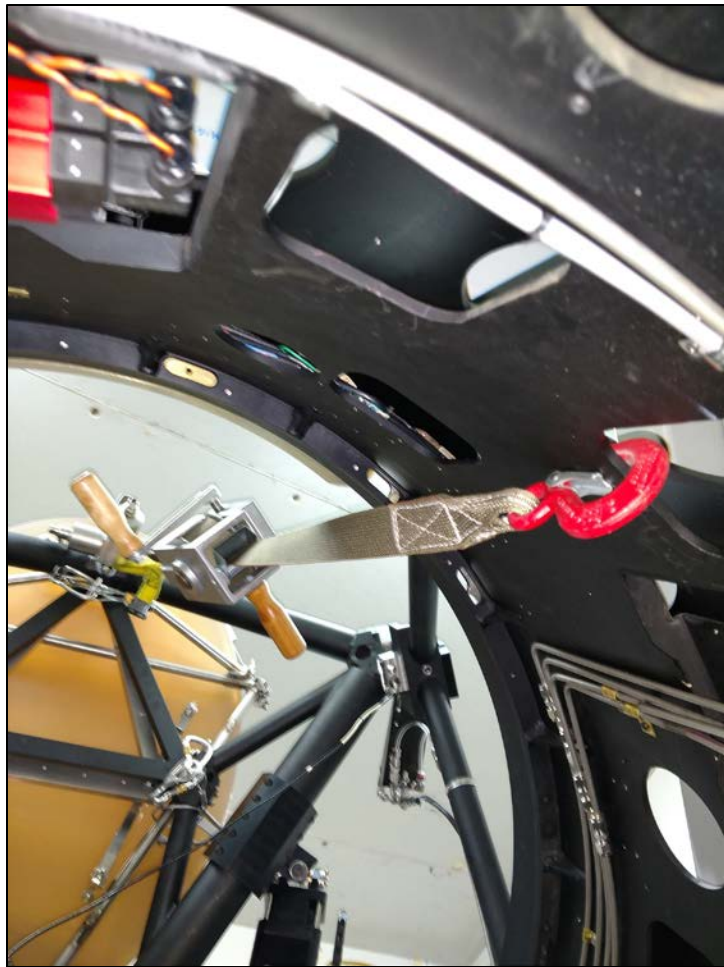


Figure 3 - Picture of come-along attached to swingarm