



Laser Pointer

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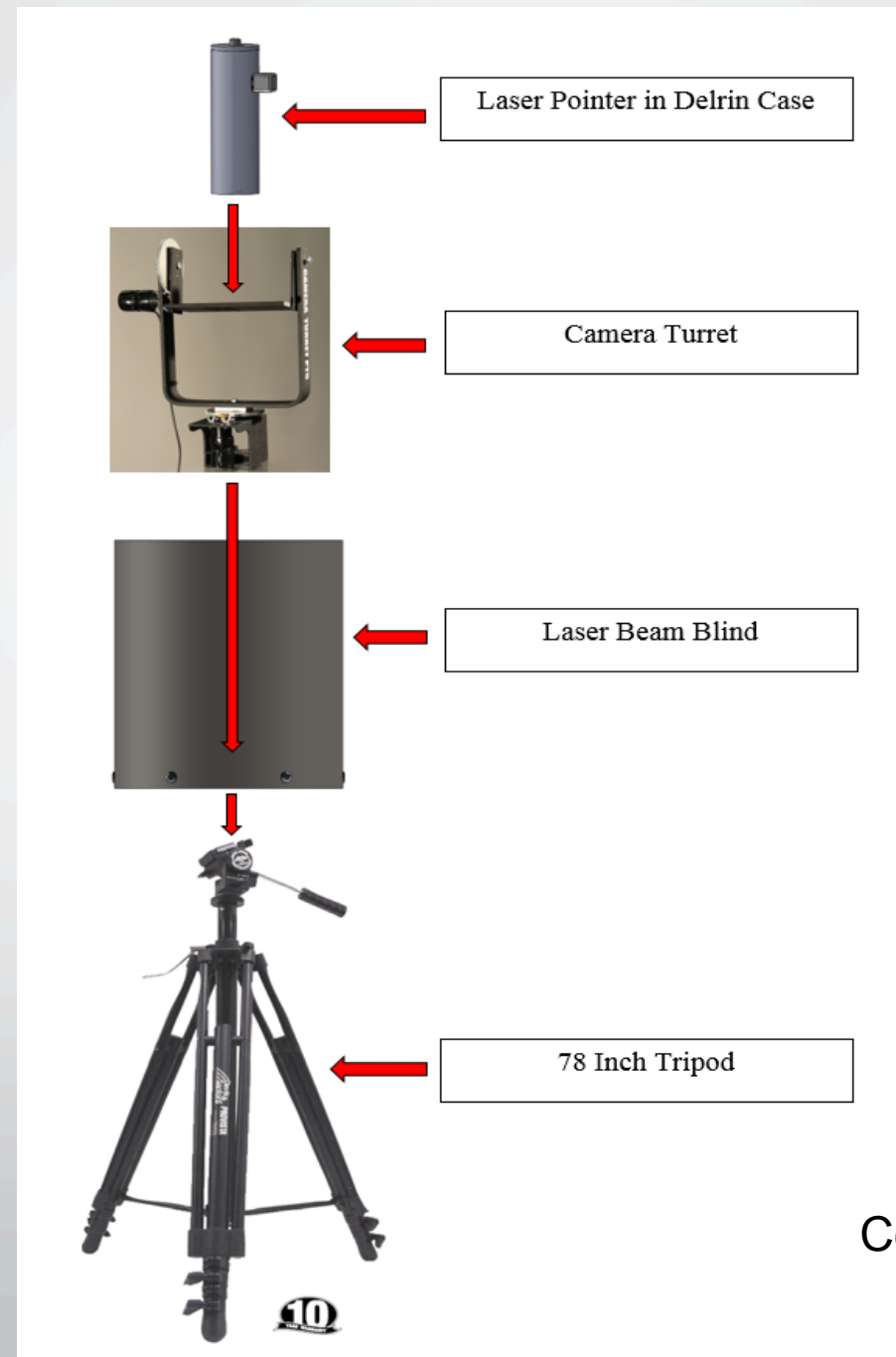
1/29/2014

Overview

- Project Background
- Ordered Parts
- Design Modifications
- Task Breakdown
- Spring Schedule 2014
- Conclusion

References:

- [1] "CAMERA TURRET TECHNOLOGIES, INC.." *PT5 Motorized Pan and Tilt System*. N.p.. Web. 9 Dec 2013. <<http://cameraturret.com/pt5.htm>>.
- [2] "Davis & Sanford ProVista F12." <http://www.tiffen.com/>. Tiffen Company. Web. 9 Dec 2013. <http://www.tiffen.com/userimages/D&S_Product_Sheets/D&S_ProVistaF12_ss.pdf>.



Project Background

- **Project Goal**: Design and construct a mechanism to safely focus the attention of an audience towards individual stars or constellations while observing the night sky.
- **Client**: Mr. Edwin Anderson of the NAU physics department.
- **Pertinent Constraints**:
 - 1) Must operate in a safe manner without the risk of blindness
 - 2) Laser must toggle on/off at user command
- **Operating Conditions**: Flagstaff cold climate (minimum 5 °F) and moderate to high wind speeds (max 30 mph)

Ordered Parts

Component	Supplier	Part
Davis and Sanford 78" Tripod	Amazon.com	N/A
Delrin Rod Stock 1'	McMaster Carr	8572K32
Aluminum Stock 1 1/4" X 1' X 3/4"	McMaster Carr	8975K487
Threaded Stud 1/4-20 1" Length (x2)	McMaster Carr	98750A011
12V Power Wheels Battery	Amazon.com	00801-0638
Battery Level Indicator	Amazon.com	V56G
Pipe Insulation	McMaster Carr	4463K163
Solenoid	Deltrol - Controls	53759-81
Copper Sheet	McMaster Carr	89675K14
PVC Sheet	McMaster Carr	

Design Modifications

Power Supply

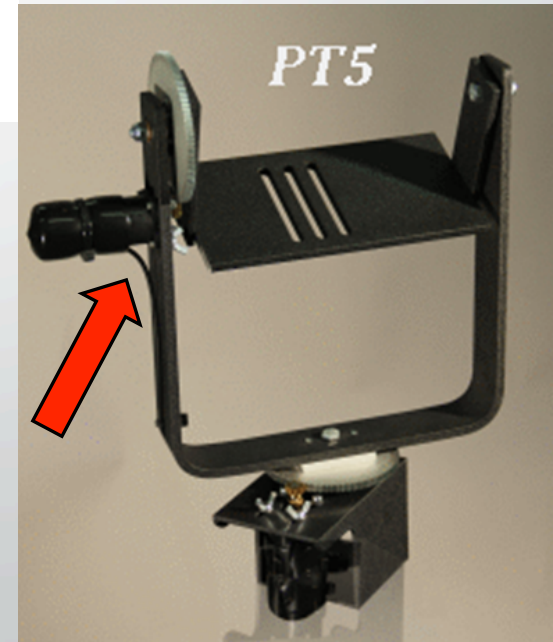
- Camera Turret requires 12V 2amp
- Allow for AC charging to power supply
- Supply approx. 3 hours of runtime
- **Design Modification:** 12V battery
- Battery Casing



[3] Amazon, . "Power Wheels Battery." *Amazon*. Amazon.com, 28 01 2014. Web. 28 Jan 2014. <[http://www.amazon.com/s/ref=nb_sb_ss_i_2_13?url=search-alias=aps&field-keywords=power wheels battery&prefix=power wheels ,aps,282](http://www.amazon.com/s/ref=nb_sb_ss_i_2_13?url=search-alias=aps&field-keywords=power+wheels+battery&prefix=power+wheels,aps,282)>.

Design Modifications

- Removal of Blind
- Design and construction of Slip Ring contacts for tilt head and pan body
 - Limit angle at which laser can receive power to 140°, 20° above horizon



[1] "CAMERA TURRET TECHNOLOGIES, INC.." *PT5 Motorized Pan and Tilt System*. N.p.. Web. 9 Dec 2013. <<http://cameraturret.com/pt5.htm>>.

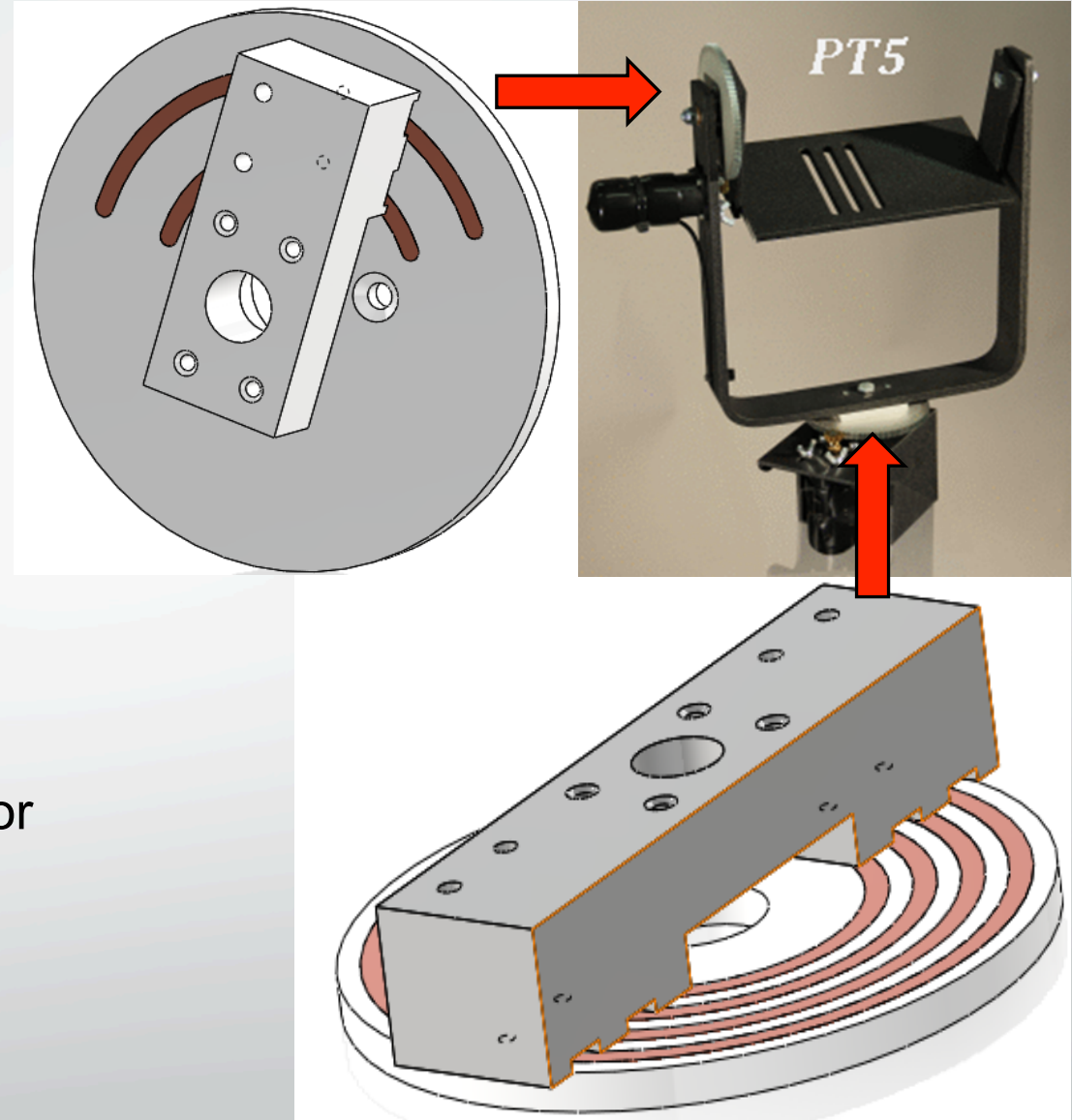
Design Modifications

Slip Rings

- Custom Slip ring to allow for 140° laser rotation
 - Laser limited to 20° above horizontal
- Dual Slip Ring electrical contacts
 - Motor Slip Ring 360° contact to allow for full rotation

References:

[4] Sibley, . "Slip Rings." *Sibley.com*. Sibley.com, 28 01 2014. Web. 28 Jan 2014. <Sibley.com>.

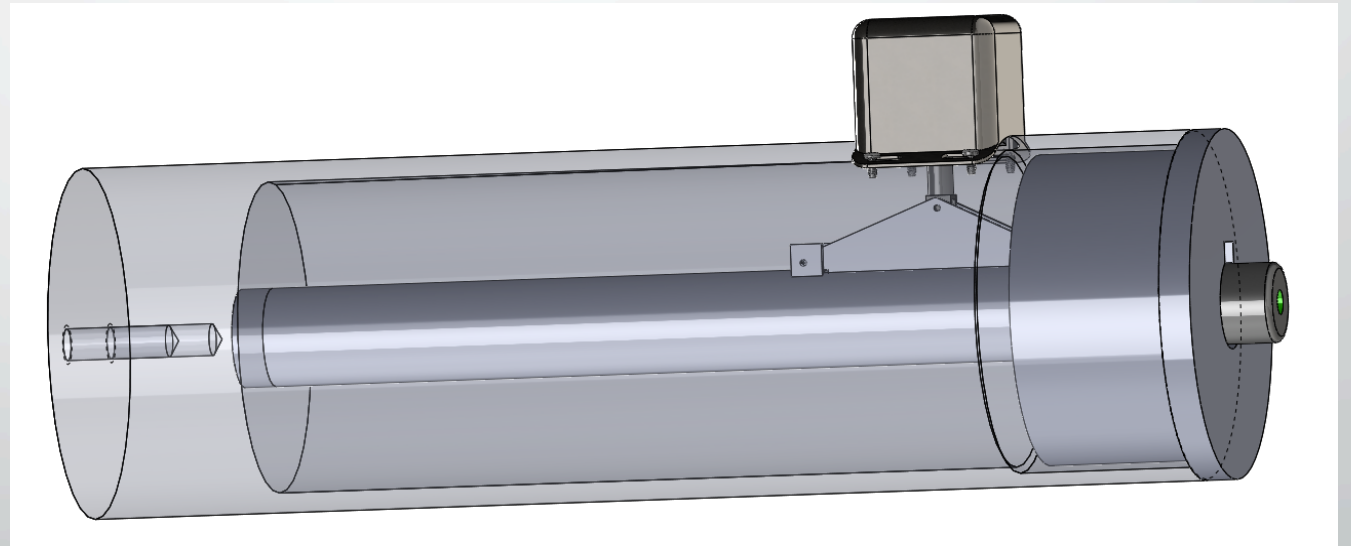


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Design Modifications

Laser Housing

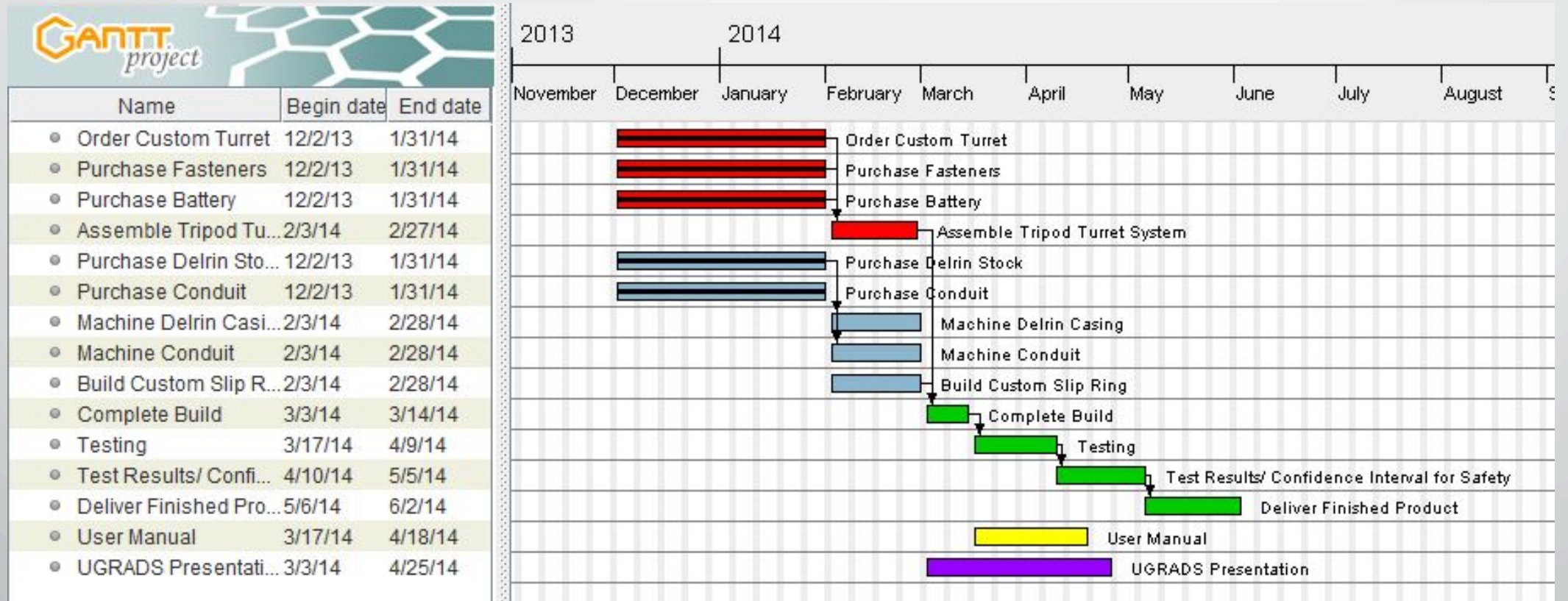
- Studding bottom attachment method
- Set screws for cap instead of threading
- Set screws to secure laser inside of conduit housing



Task Breakdown

Task	Team Member
Machine Laser Casing	Cole Middlebrook
Machine Switch Trigger	Cole Middlebrook
Design/Machine Battery Box	Cole Middlebrook
Machine Slip Rings	Jeb Duncan
Machine Copper Contacts	Jeb Duncan
System Assembly	Jeb Duncan
Wire Power Supply	Michael Orrill
System Testing	Michael Orrill
Safety Analysis	Eddie Hoopingarner
User Manual	Eddie Hoopingarner

Schedule Spring 2014



Conclusion

- **Project Background:** Laser Pointing devise for Mr Anderson
- **Equipment to Order:** Material Stock and Tripod
- **Purchased Equipment:** Joystick controlled laser turret with custom on/off toggle
- **Design Modifications:** Location specific custom laser blind, electrical slip ring
- **Spring Schedule 2014:** Testing in April

References

- [1] "CAMERA TURRET TECHNOLOGIES, INC.." *PT5 Motorized Pan and Tilt System*. N.p.. Web. 9 Dec 2013. <<http://cameraturret.com/pt5.htm>>.
- [2] "Davis & Sanford ProVista F12." <http://www.tiffen.com/>. Tiffen Company. Web. 9 Dec 2013. <[http://www.tiffen.com/userimages/D&S Product Sheets/D&S_ProVistaF12_ss.pdf](http://www.tiffen.com/userimages/D&S_Product_Sheets/D&S_ProVistaF12_ss.pdf)>.
- [3] Amazon, . "Power Wheels Battery." *Amazon*. Amazon.com, 28 01 2014. Web. 28 Jan 2014. <[http://www.amazon.com/s/ref=nb_sb_ss_i_2_13?url=search-alias=aps&field-keywords=power wheels battery&srefix=power wheels ,aps,282](http://www.amazon.com/s/ref=nb_sb_ss_i_2_13?url=search-alias=aps&field-keywords=power+wheels+battery&srefix=power+wheels,aps,282)>.
- [4] Sibley, . "Slip Rings." *Sibley.com*. Sibley.com, 28 01 2014. Web. 28 Jan 2014. <Sibley.com>.



Questions?