DWR Snow Surveys

Newest Addition, Current Site Maintenance and future plans

By

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Outline

- Previous work and background
- Site Maintenance and lessons learned
- Upgrades
- Instrumentation Parameters
- Design
- Challenges

Background

Bryan Prestel

Electrical and Electronic Engineering (EEE)

Analog and Digital Controls emphasis

California State University Sacramento (CSUS)

Graduated December, 2013

Previous Work

China Lake Naval Air Weapons Station

- Instrumentation Engineer/Intern for 3.5 years
- Calibration Management
- Measuring Harsh Environments
    - Explosive Forces (Pressure Transducers)
    - Aircraft Frame Vibration (Accelerometers)
    - Forces Exerted, point load or surface area (Load Cells)
- Controls for GPS guided Missile Fins, Circuit Design and Analysis

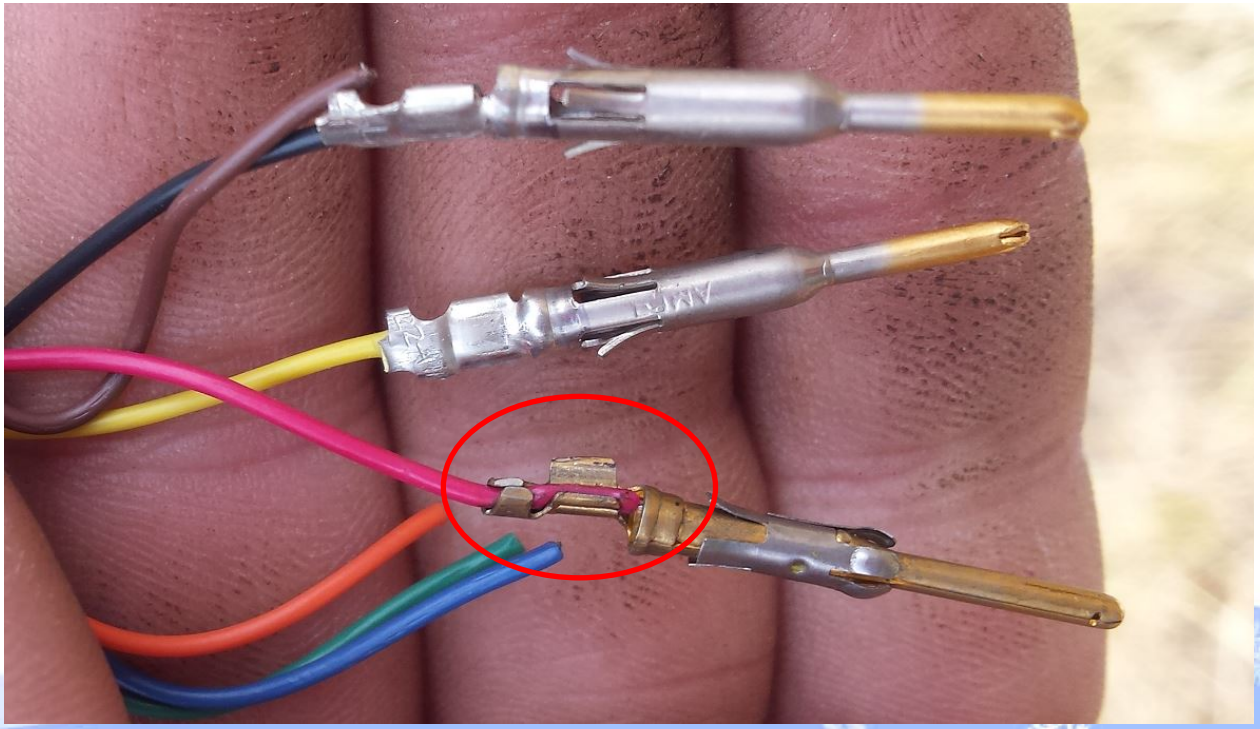
DWR Snow Surveys New Addition

FNG
Fun New Guy

Site Maintenance

Lessons Learned

- Environmental Protection
- Crimping
- Programming



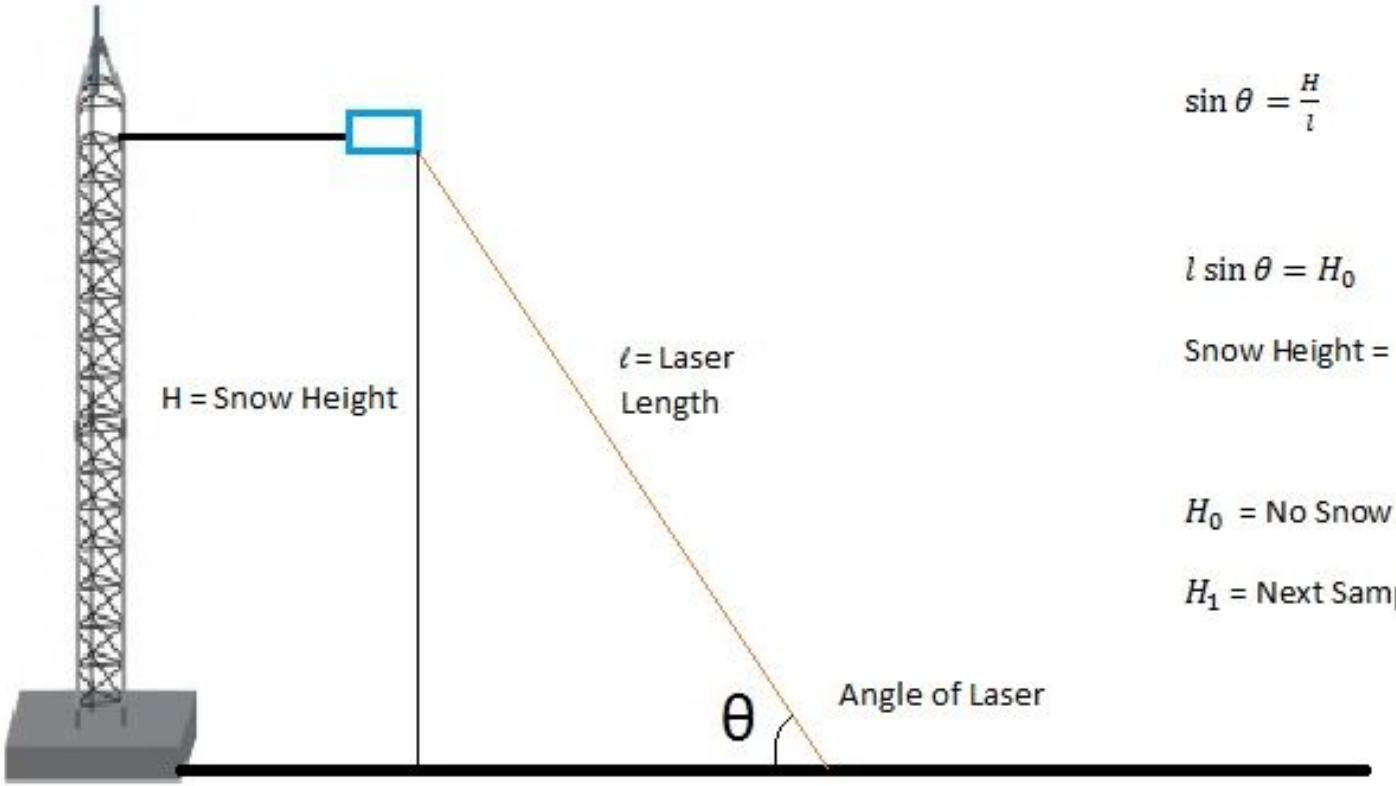
Instrumentation and Data Acquisition

- Robust
- Reliable
- Accurate
- Ease of maintenance
- Life Cycle
- Interoperability
- Cost to Benefit

Instrumentation continued

How They Work

Electrically and Mathematically



$$\sin\theta = \frac{H}{l}$$

$$l \sin\theta = H_0$$

Snow Height = $(H_0 - H_1)$

H_0 = No Snow on Ground

H_1 = Next Sample

Ugrades

Fresh Start

- Standardizing Sites
  - Instrumentation (Wind, Radiation, Soil, SWE, Snow Height…etc)
  - Pin Outs
  - Universal Program
- Uniform Data Acquisition

Design

- Independent Sensors
- Easy Installation of Sensors (Pig Tails Mil Spec)
- Power Redundancy
- Fail Safes
    - Software and Analog
    - Vital Instruments
- Two Way Communication
    - Relay Control
- Din Rail Mounted

Challenges

- Environmental Factors
- Electrical
- Data Acquisition
- Access

Summary

- Background and Knowledge
- Lessons Learned
- Upgrades
- Design
- Challenges


Questions??