

Chapter 15 - Care and Maintenance of Survey Equipment

Individual Responsibility

Each employee has a responsibility to reasonably care for County equipment. Reasonable care includes appropriate use of all equipment, proper storage and transport, protection from extreme environmental elements, and preventing theft. In the event that equipment is lost, damaged, or stolen, disciplinary action may be taken when damage or loss is a result of operator's negligence or abuse.

Crew Inventory

Each Party Chief is responsible for maintaining an inventory of all equipment assigned to them, including fixed asset ID numbers on major items. This inventory should include instruments (total stations, levels, GPS receivers, etc.), data collectors, tribrachs, prisms, tripods, GPS rover rods, layout rods, leveling rods, radio equipment, and any other items beyond basic hand tools. Should an item turn up missing which cannot be located during a cursory search, the first line supervisor should be notified.

Stolen Equipment

In the event County equipment is stolen or damaged, the employee assigned the equipment must follow the following procedures for reporting the loss:

- Notify the first-line supervisor immediately
- Contact the Orange County Sheriff and/or the local law enforcement agency with jurisdiction in the area where the loss occurred; file a stolen property report with said agency
- File an internal report, documenting a complete description of the equipment (make, model, serial number, fixed asset ID number, etc.)

Guidelines for Day-to-Day Care and Use

Following are specific rules ("shall") and general guidelines ("should") for daily care and use of County equipment:

- Before use, instruments should be visually inspected for damage. The instrument exterior should be cleaned frequently in accordance with manufacturer's recommended procedures.
- If an instrument has been exposed to moisture, it should be removed from the case and wiped dry with a clean cloth, and the case left open overnight.
- Instruments shall be stored each night at the field office, in the vault. Under no circumstances are instruments to be left inside a County vehicle overnight.
- Radios and data collectors shall be stored each night within the Party Chief's locked office or in the vault. Under no circumstances are radios or data collectors to be left inside a County vehicle overnight.
- Instruments shall be transported in their designated shock-proof cases, positioned within the vehicle in such a manner as to limit movement. Under no circumstances are instruments to be transported in the open bed of a truck.
- GPS receivers should be removed from the tripod or rover rod when transporting.
- Tripod-mounted instruments should not be carried "over the shoulder".
- Instruments shall not be left unprotected or unattended in unsecured areas. GPS receivers may only be left unattended when located within a construction site or County facility. Robotic total

stations are particularly vulnerable to theft, even with crew members within close proximity. Robotic operation should only take place within a construction site or County facility, or in an area with minimal vehicular and foot traffic.

- Instruments should not be left unattended during high winds, unless at least two tripod legs are secured by sandbags.
- GPS rover rods that are supported by bipods should not be left unattended (out of arm's reach).
- Data collector screens shall only be manipulated by stylus or finger-tip. Tapping the screen with a sharp object, such as the tip of a mechanical pencil, will cause damage to the screen and is not permitted.

Routine Maintenance Schedule

Following is the recommended schedule for routine maintenance of County equipment:

Check and Adjust Rod Bubbles:

Regular: Every two weeks

Additional: Before an RTK survey is conducted which uses a rod/bipod configuration; any time a rod is dropped or the bubble assembly suffers an impact

Notes: Bubbles of "four-legged" fixed height rods shall be adjusted each morning and checked during each occupation during the course of a static GPS control or boundary survey.

Check Tribrachs - User:

Regular: Every month

Additional: Before any survey requiring a higher degree of accuracy, such as settlement monitoring or use on the SAR Baseline; any time a tribrach is dropped or the bubble/optical plummet assembly suffers an impact

Notes: Number all tribrachs; keep a record of dates checked/adjusted

Adjust Tribrachs - Dealer:

Regular: No regular servicing required

Additional: When a tribrach is checked in-house and determined to require adjustment of the optical plummet; when a tribrach continually falls out of adjustment

Clean and Inspect Prism Assemblies:

Regular: Every 2 months

Additional: After exposure to extreme dust conditions; any time a prism assembly suffers an impact

Clean Data Collector and Replace Screen Protector:

Regular: Every 2 months

Additional: After exposure to extreme dust conditions; as needed

Calibration of Total Station - User:

Regular: Every month

Additional: At the beginning of a new project; weekly during the conduct of a control or boundary survey; after long periods of storage; after a change of altitude greater than 1500 feet; after a change in operating temperature greater than 20°; after transport on a particularly jarring roadway (4 x 4); any time the total station (inside protective case) is dropped

Notes: This process shall include tilt compensator calibration, HA/VA collimation, trunnion axis tilt (if applicable), and tracker (auto-lock) collimation. Generate an Instrument Collimation Report using the Style Sheet of the same name and keep on file

Calibration of Total Station - Dealer:

Regular: Every 12 months

Additional: Any time the total station (not inside protective case) is dropped

Calibration of Level (peg test) - User:

Regular: Every month

Additional: At the beginning of a new project; daily during the conduct of a second order precise leveling project; after long periods of storage; after transport on a particularly jarring roadway (4 x 4); any time the level (inside protective case) is dropped

Notes: See **Chapter 4 – Differential Leveling** for further information on peg test procedures

Calibration of Level - Dealer:

Regular: None

Additional: Any time the level (not inside protective case) is dropped