Appalachian Underground Corrosion Short Course

Fundamentals

Of

Pipe & Cable Locating

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Pipe and Cable Locator

- A device that is usually made up of two components, a transmitter and a receiver, that is used to transmit an electro magnetic signal onto an intended target (conductor).

How does a Pipe or Cable Locator work?

- The transmitter generates a signal on a specific frequency to energize the target.
- The receiver is tuned to the same frequency as the transmitter.
- The target (conductor) is “energized” by the signal from the transmitter.

Transmitter Frequencies

- Low Frequency 800Hz to 20Khz
  - Advantages: Distance & Adherence
  - Disadvantage: Poor Penetration
- High Frequency 250Khz to 480Khz
  - Advantages: Good Penetration
  - Disadvantages: Distance & Adherence
- Medium Frequency:20Khz to 250Khz
  - Best frequency for general locating

Modes of Operation

- Inductive (indirect)
  - Easy to setup, least accurate way to locate
- Conductive (direct hook up)
  - Often hard to find contact point, better accuracy
- Inductive Clamp
  - Better accuracy than inductive
- Passive
  - Detects 60Hz AC “ripple” on conductor

Choosing the Right Tool

- Simple Split Box vs. Electronic Locator
  - Split Box Locator should be used for short incidental locates, C&M crew, leak repair, etc.
  - Single Frequency Electronic Locator is recommended for more accurate locates where depth measurements are needed.
  - Multi-Frequency Electronic Locators are recommended for Damage Prevention and trouble shooting Cathodic Protection Systems.

Other Types of Locators

- Valve Box Locator
  - Treasure finder type instrument
- Ferromagnetic Locator
  - Locates iron based objects only
- Ground Penetrating Radar
  - Must interpret readings

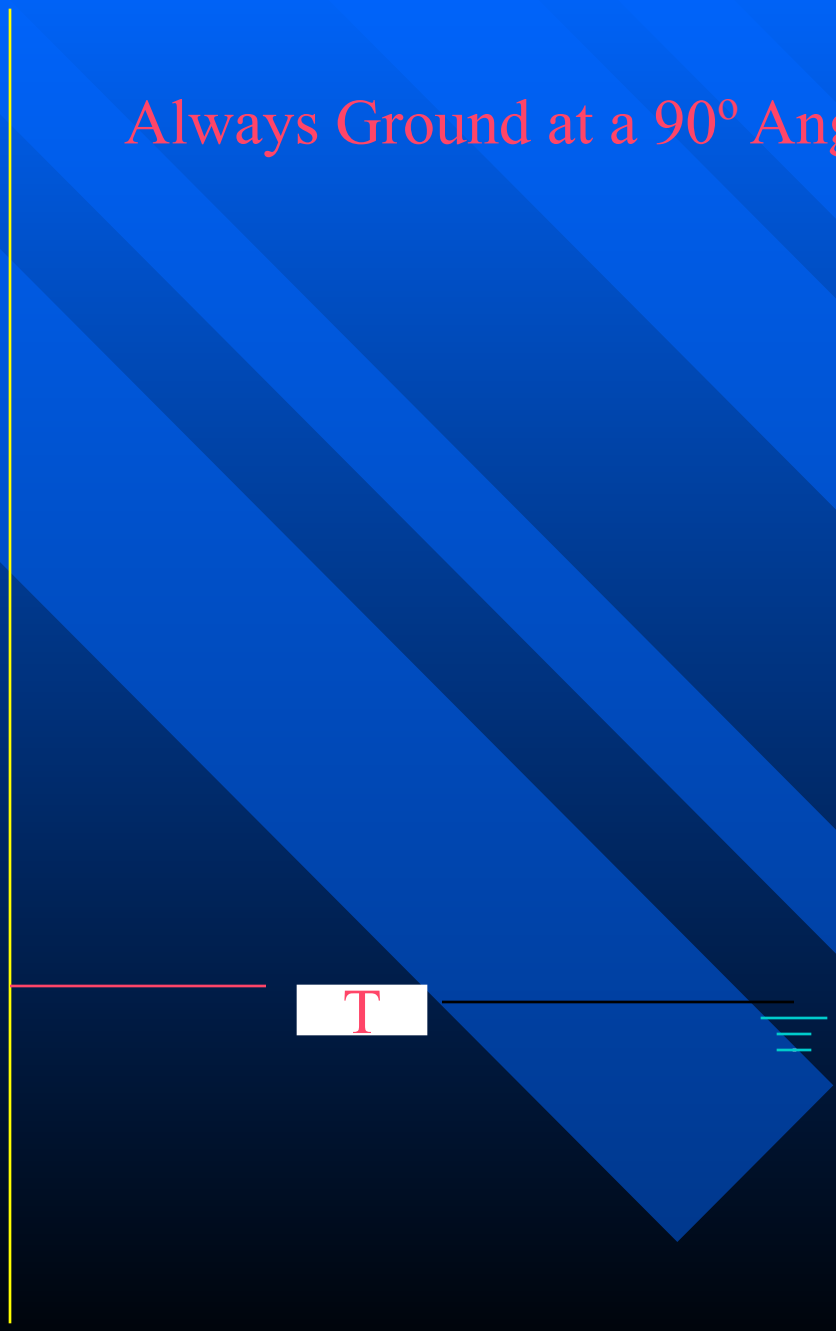
Keys to Accurate Locating

- Always read instruction manual provided with instrument.
- Request on-site training by qualified person.
- Become familiar with operation of instrument on “known” locates.
- Research conductor to be located:
  - Maps, Service Records, Inspection Reports

Keys to Accurate Locating

- Read the Street before locating:
  - Look for visual indicators, valves, hydrants, pedestals, test stations, etc.
- For best accuracy, always use the Conductive Mode .
- When grounding the transmitter, try to run ground cable at a 90° angle to the conductor.

Always Ground at a 90^{o} Angle



Keys to Accurate Locating

- Always connect cable assembly from transmitter to “clean shiny metal”.
- Never run ground wire over or near other conductors.
- When locating in the inductive mode, make sure transmitter is aligned properly with the intended conductor.

Keys to Accurate Locating

- Depth measurements using a “split box” type locator are most inaccurate.
- Depth measurements using an Electronic Locator are only accurate when used in Conductive Mode.
- Depth measurements are for your information only.

Keys to Accurate Locating

- If in doubt, hand dig to confirm location of conductor.
- If still in doubt, don't mark it out.
- A guess is the shortest distance between an accurate locate and a reportable incident.

The End