Locating & Tracing Electrical Circuits

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2

Why Is It Important?

Problem: Mis-labeled or unlabeled panels

Safety: Routine maintenance and troubleshooting. Serious issues in case of fire or emergencies

Efficiency: Computers & equipment must stay on while performing service

Required: NEC 408.4 & OSHA 1910.335 Hefty fines & penalties for non compliance

3

Correct Panel Labeling Saves *Time* And More Importantly *Lives*!

As an Electrician it is your responsibility to be sure your customers and clients are aware of these rules and why they are important.

4

Available Tools

Theory of Operation

- Live line circuit tracers
- Open line circuit tracers
- Live & open combination tracers
- Utility locators
- Multiple line circuit tracers / mapping systems

5

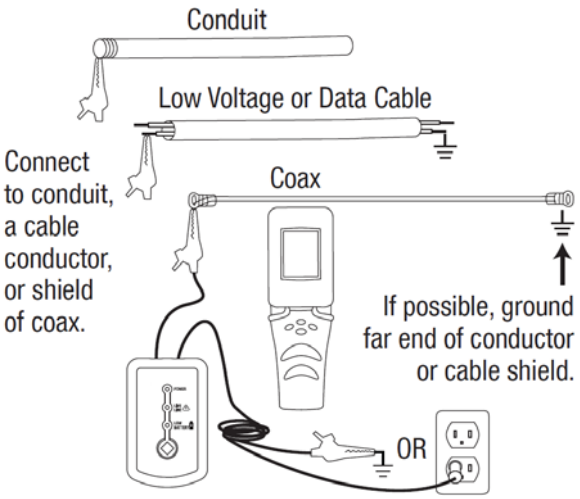
Key Techniques & Connections

Transmitter

- Energized vs De-energized
- Accessible vs Hidden
- In Conduit: Plastic vs Metal
- Faults, Shorts & Open Lines

6

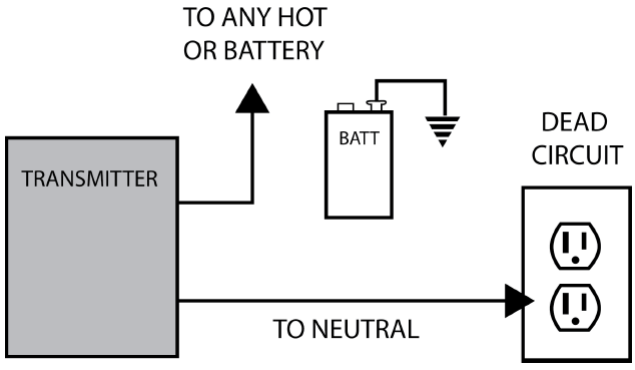
Key Techniques & Connections



7

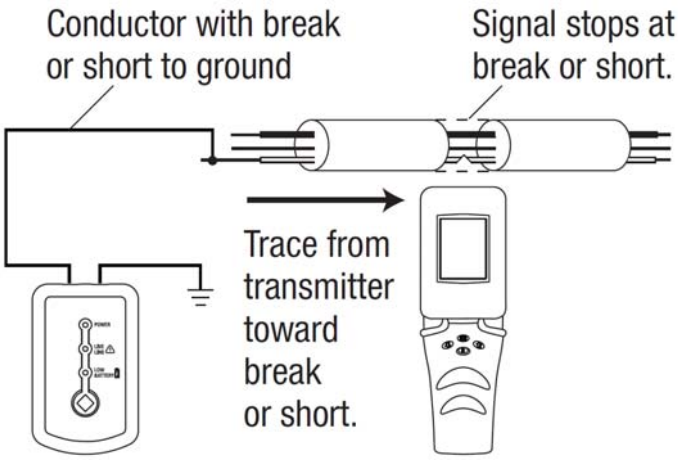
Key Techniques & Connections

Neutral connected to panel regardless of breaker open or closed, except in cases of fault (severed wires)



8

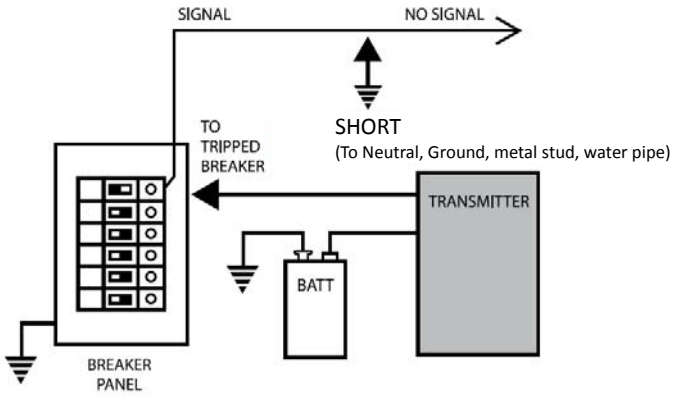
Key Techniques & Connections



9

Key Techniques & Connections

Possible to trace a shorted line, even with tripped breaker, using a live only tracer and 9V battery



10

Key Techniques & Connections

Multiple Circuits At Once

11

Key Techniques & Connections

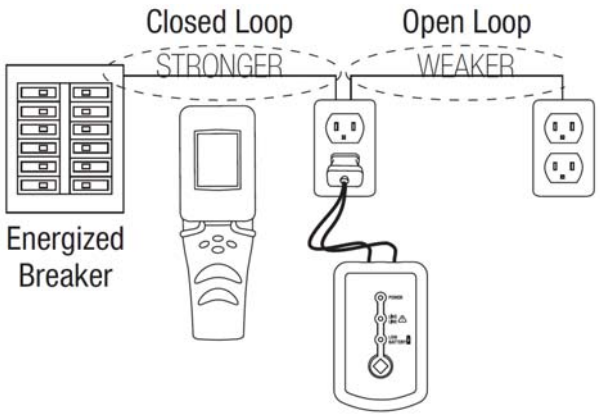
Other Factors to Consider

- Magnetic vs Static Signal
- Current flow affects signal level!
- Ground Connection – Why it is important
- Tracing wires vs. locating breakers

12

Key Techniques & Connections

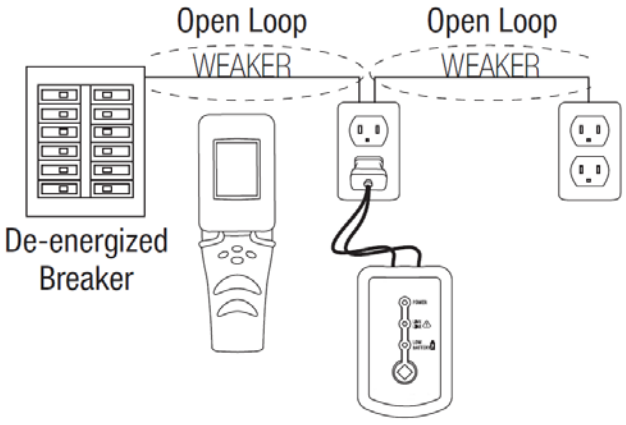
Magnetic vs. Static Signal



13

Key Techniques & Connections

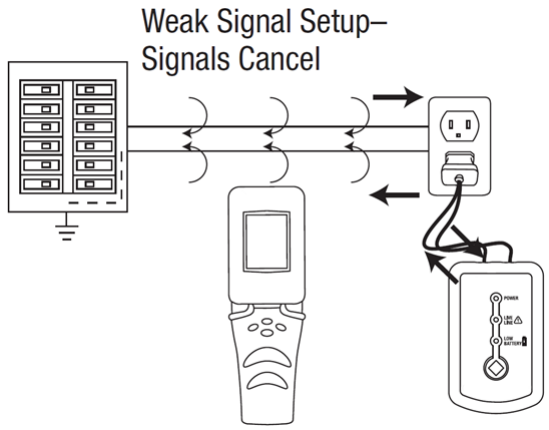
Transmitter signal different LIVE vs. OPEN



14

Key Techniques & Connections

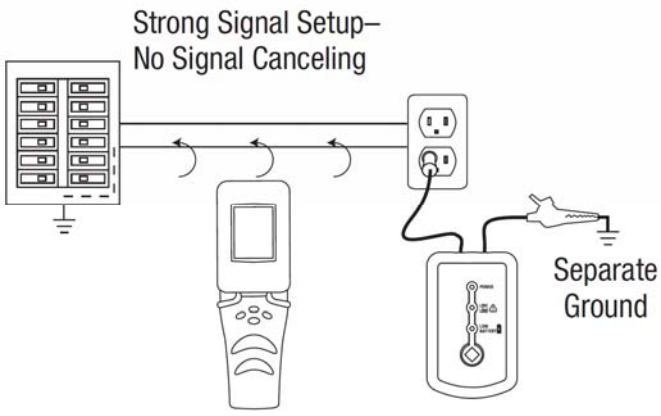
Current flow affects signal level



15

Key Techniques & Connections

Ground Connection (not separate w/GFCI)



16

Key Techniques & How to Use

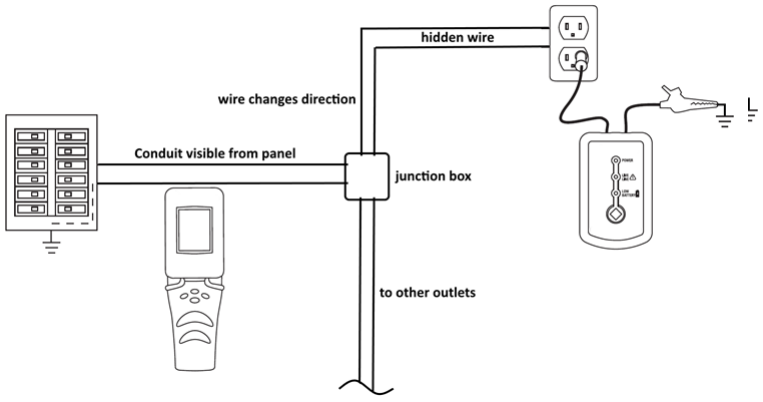
Receiver

- Transmitter connections – Important!
- Directionality of conductor
- Settings
- Auto vs Manual gain options
- Signal sensitivity vs distance from target
- Narrowing target area

17

Key Techniques & How to Use

Directional vs. Non-directional Receiver



18

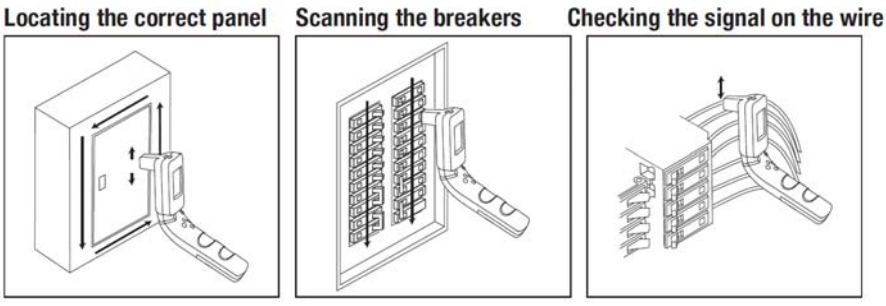
Gotchas – Watch Out For These!

- Return signals on Neutrals & Ground
- Live or Dead? Be sure to know and expect change, especially when troubleshooting!
- Multiple panels – hints & pointers
- Poor signal definition - do not accept!
- Digging deeper - poor breaker definition

19

Gotchas – Watch Out For These!

Panel confirmation, breaker definition, poor signal strength



20

Thank you!
Questions?

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For more Information:

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21