

# Wire Tracing Made Easier

6 May 2015 / Jim Aspinwall, No1PC

This article highlights a handy set of tools, test equipment actually, that can help you locate and identify a variety of wires in your home, tow vehicle or RV. This will help you work a little more safely and accurately with A.C. (120/240v), D.C. (12v), TV, phone, network and audio-visual system/speaker wires to find the right wires and not get them mixed up.

**Caution is offered and advised to turn off/disconnect any live power sources before venturing too deep into exploring for various wires.**

Many discussions about RV electrical issues, either adding devices or troubleshooting, can be really good about covering circuit protection, wire corrosion, connections, batteries and chargers. They can't always tell you where which wire comes from or goes to.

Whether or not you are familiar with DC/vehicle wiring or have the wiring diagrams for your unit, it's not always easy to *find* the wire(s) you want to work with. Some wires may run along the sides in the walls, some in the ceiling, others are hiding under the flooring. We often resort to "search-and-destroy" methods - pulling out drawers, digging in cabinets, removing panels and light fixtures looking for that elusive blue/yellow or green/white or some other wire. This pair of tools will save a lot of time, mess and frustration.

The tool set that makes wiring chores easier is called a signal tracer, also variously known separately or together as a beeper/tone generator, 'banana'/sniffer. Think of the pair as a souped-up metal detector, for wires.

Electronics technicians have used them for years to trace out wiring inside a variety of audio, TV and radio gear. Telephone technicians also use them to find open, shorted and correct pairs of wires for phone, intercom and network applications. Once an obscure item buried in specialty tool catalogs they now may be found at many home improvement stores, electronics suppliers like Fry's, as well as through Amazon and eBay. There are many different manufacturers of these units – I have three different makes/models from old "Bell System" to the Progressive Electronics model shown here.



*A typical signal tracer set consisting of a tone generator/continuity tester (small box marked "Tracer 2") and signal tracer amplifier/'banana' (marked 200EP.)*

## How It Works

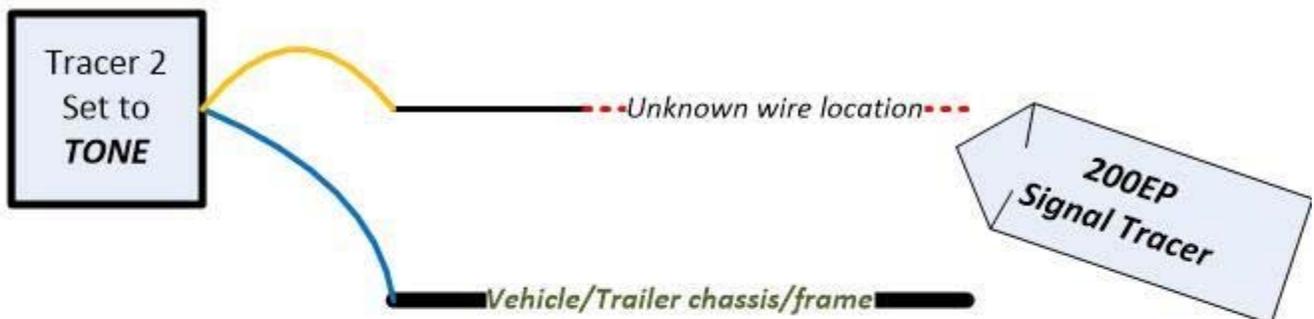
In our “metal detection” or signal tracing case the Tracer 2 is the signal we’re looking for and the amplifier is our ‘tracer’. The Tracer 2 or similar device generates and places a loud obvious electronic tone onto wires it is connected to. The Tracer 2 also has a Continuity mode using an LED to indicate a connection across/between ends of a wire or wires.

The amplifier can pick up, ‘sniff’ or trace the signal from the Tracer 2 up to a foot or so away, through many walls and surfaces *without* having to be in contact with the wire. All you have to do is start from where you connect the Tracer 2 to the wire(s), activate then wave the amplifier as-if a “magic wand” and progress away from the known end, across around and through your vehicle or trailer until you get to the “pot of gold” – the other end of the wire. Touch the end you found with the tip and the tone will get much louder, confirming you’ve found your wire.

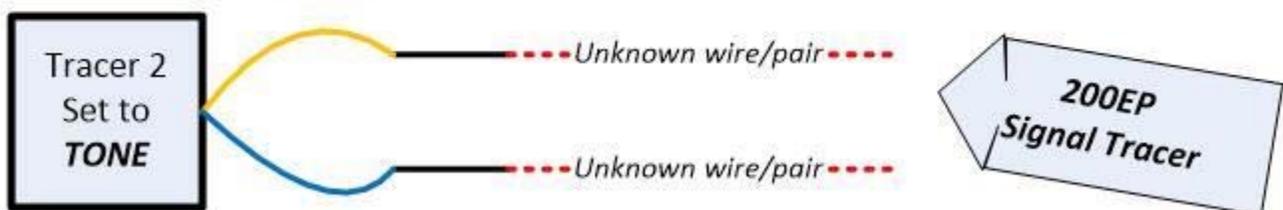
There are four common ways to use this signal tracing kit, as illustrated below:

- Finding the location or end of a wire, starting from one end where the Tracer 2 signal starts to and confirming the other when found by the amplifier
- Finding and confirming the location and end of a pair of wires, as indicated above
- Checking whether a single wire has continuity from one end to the other by attaching the leads to each end of the subject wire
- Checking whether a wire or wires are shorted across them or to other surfaces (trailer chassis) by connecting the Tracer 2 leads across both wires, or from one wire to vehicle/trailer chassis

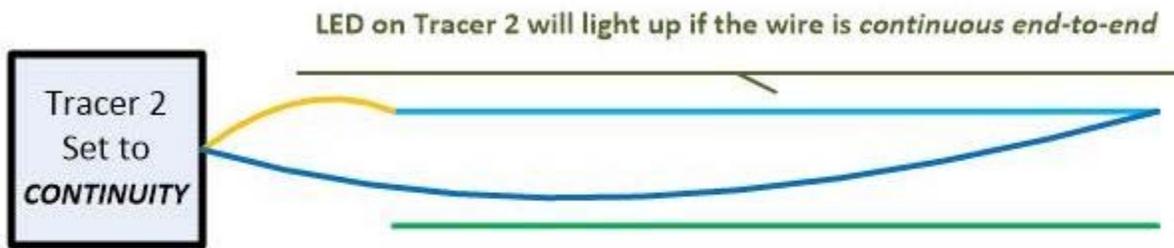
### Finding a single wire



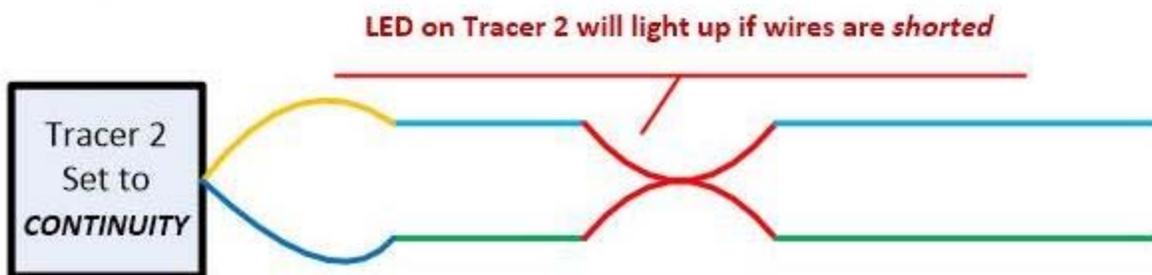
### Identifying a pair of wires



### Checking continuity of a single wire



### Checking for a short across two wires



When checking any two wires to see if they are improperly shorted together remove any light bulbs, LEDs, or other devices from the wires and as always turn off the power just to be sure you're measuring only the wires and not what is attached to them.

You can also use the CONTINUITY mode of the Tracer 2 to check fuses, switches, light bulbs, without the complexity of knowing exactly how to use a volt-ohm-meter (which should also be in your toolkit for voltage measurements.) Simply clip the leads of the Tracer 2 across the contacts of a fuse, switch or bulb and the "idiot light" will glow indicating a good/closed circuit or not.

Notice that the Tracer 2 unit also has a modular telephone style plug. This makes it very handy to plug into a phone jack and trace from the jack to other jacks or the main termination point to connect to a live phone line. While most of the beeper/tone generators can be plugged into live phone lines without damage, check the instructions for your unit, **and to be safe never connect either 'beeper' or 'banana' to live electrical wires.**

### How To Get One

A search of Amazon or eBay for "telephone signal tracer" will turn up dozens of examples ranging in price from \$15 to \$35. While you are "electronics shopping" look for a simple digital voltmeter (DVM) to have in your toolkit so you can test your vehicle, RV and various electronics batteries. A suitable 3-1/2 (3.5) digit DVM should be priced about the same as your "wire tracker." Be sure to include the proper battery(s) for these units.