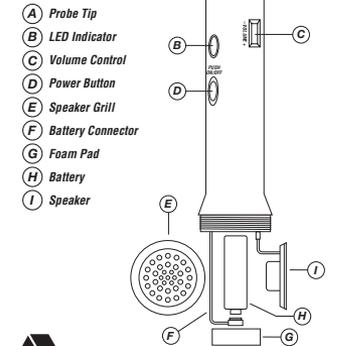


The Hound² Instruction Manual



TRIPLETT
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DESCRIPTION:
 The **HOUND 2** (PN 3236) is a small, hand-held Inductive Amplifier (also called a "Probe") that, when used in conjunction with the **Triplet FOX** or **LAN FOX**, aids in locating, tracing, and identifying wires, cables, and other conductors. Often, wires can be identified without piercing their insulation, and their location can be determined behind intervening non-conductive surfaces, such as plastic, wood, or dry-wall. The **HOUND 2**, with its convenient Volume Control and LED signal indicator, is useful for wire tracing in numerous applications, and has been used in the telephone, electrical, security, sound reinforcement, automotive, and boating industries, to name a few.

- HOUND 2 PROBE FEATURES:**
- 1) Contains a hi-gain, hi-impedance amplifier
 - 2) Has a rugged, moisture resistant, mylar cone speaker
 - 3) Volume / Sensitivity control
 - 4) LED signal indicator
 - 5) Powered by a standard 9V battery

SPECIFICATIONS:
Battery: 9 volt alkaline, NEDA 1604A, such as Eveready 522
Size: Diameter: 1.5" (body), 1.9" (at speaker)
 Length: 8.25" (including probe tip)
Weight: Less than 8 ounces with battery

BATTERY REPLACEMENT:
 Unscrew speaker grill cap. Remove speaker, being careful not to damage wire connecting to speaker. Remove foam pad. Replace the battery. Reassemble.

OPERATING INSTRUCTIONS:
 Two different basic tracing methods are commonly used. **Figure 1** illustrates the "LINE/GROUND" connection, and **Figure 2** illustrates the "LINE/LINE" connection.

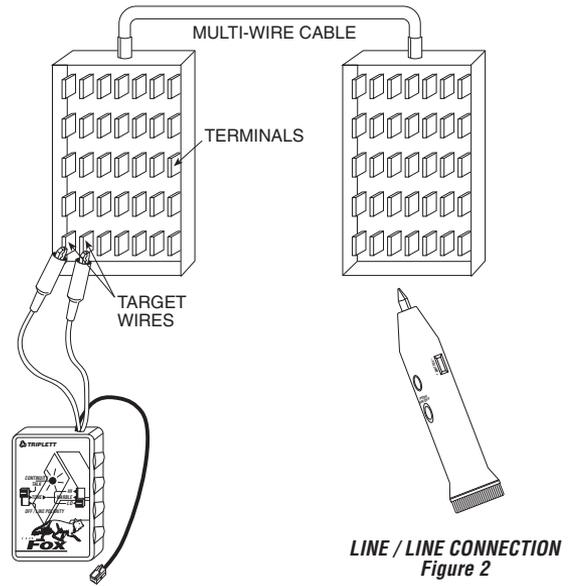
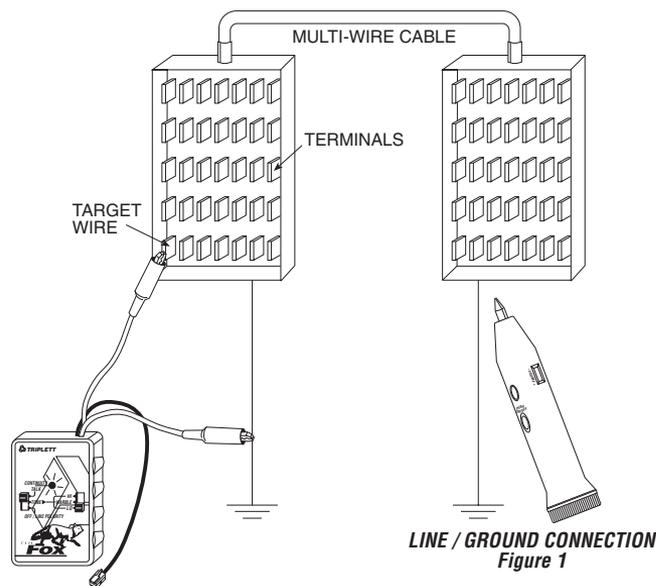
FOX LINE/GROUND Connection:
 The LINE/GROUND connection produces the strongest tracing signal, but also creates "crosstalk" of the signal into other wires in the cable. If the user is trying to identify a cable, and not an individual conductor in the cable, the LINE/GROUND method usually produces the best results. This method has been used to trace electrical wires (like Romex), speaker wires, intercom wires, thermostat wires, alarm wires, cable television wires, etc. through drywall, wood flooring, and carpeting.

A "good" earth ground is usually not required. In fact, a large metal object like an office desk, a file cabinet, or a metal plate on the floor, can be used. On vehicles, the metal chassis of the vehicle can be used as the ground. A metal hulled boat can use the hull as a ground, and a wood or fiberglass

hulled boat can use the surrounding water as a ground (make connection to a metal fitting in contact with the water or drop a wire into the water). The ground connection is only required at the **FOX** end of the cable or wire, however, a ground connection at the far end is handy for positive identification of the target wire (read following text on tracing).

To setup the LINE/GROUND connection, clip one alligator clip (either color) of the **Triplet FOX** to the "ground", and the other alligator clip to the wire being traced (see Figure 1).

FOX LINE/LINE Connection:
 The LINE/LINE connection is useful for identifying a pair of wires in a multi-wire cable, or for identifying a pair of wires in a bundle of wires. When wires are "paired" in a cable, they are often twisted together in a manner that reduces crosstalk of any signal on the wires into adjacent wire pairs. Telephone cables are constructed in this manner, so a LINE/LINE connection is often used to trace telephone cables (see Figure 2). The **FOX**'s modular plug applies a LINE/LINE connection when plugged into its mating modular jack (connected to a telephone line).



Initial Setup and Testing:
 Whether the LINE/GROUND or LINE/LINE connection is used at the **FOX**, the use of the **HOUND 2** for tracing the signal is the same. In general, the **HOUND 2** is used by bringing it into proximity with the wire/cable that is being traced, listening for the TONE signal from the **FOX**, and moving the **HOUND 2** in such a manner as to increase the loudness of the TONE signal from the **HOUND 2**'s speaker..... i.e. searching for the loudest TONE signal. The **HOUND 2**'s Volume Control is adjusted to a comfortable level. Usually, it is set to maximum when the tracing wires through walls and ceilings, and is set to a lower setting when in close proximity to the signal carrying wires. The **HOUND 2**'s LED glows brighter when the sounder from the speaker is louder. In situations where there is a lot of acoustic noise, observing the brightness of the LED may prove more useful than attempting to hear the signal from the speaker.

To begin using the **HOUND 2**, turn the volume all the way up by rotating the VOLUME thumbwheel towards the speaker. Depress the Power Button on the **HOUND 2**. It is normal to hear a humming or buzzing noise coming from the **HOUND 2**'s speaker when it is in an area with fluorescent lights, neon signs, transformers, etc. In fact, an easy test to verify the **HOUND 2** is working is to move it

toward an operating fluorescent light and note that the buzzing sound gets louder, and the brightness of the LED increases. When used out-of-doors, away from power wires, the **HOUND 2** may make only a slight hissing noise.

Before attempting to trace a wire/cable, set the **FOX** to the TONE mode, and depressing the **HOUND 2**'s Power Button, bring the **HOUND 2**'s probe near the **FOX**'s alligator clips. The TONE should be heard from the **HOUND 2**'s speaker. If the TONE is not heard, check the batteries of both the **FOX** and the **HOUND 2**.

After verifying that the **FOX** is generating a TONE, connect the **FOX** to the target wire/cable in the desired fashion. Once again, test the **FOX**'s output signal by depressing the **HOUND 2**'s Power Button and bringing it's probe near the **FOX**'s alligator clips (this is called "probing" the wire/cable). The TONE should be heard from the **HOUND 2**'s speaker. If the TONE is not heard, the wire/cable may be shorted. The **HOUND 2** cannot trace a shorted wire.

If the LINE/GROUND connection is being used, the alligator clip connected to the ground should have very little signal on it when probed by the **HOUND 2**. The other clip attached to the wire/cable should have a strong signal on it.

If the LINE/LINE connection is being used, both alligator clips should have about the same signal on them.... although it will be noted that neither of the signals are as strong as the signal produced by the LINE/GROUND connection.

Tracing Wires in Walls, etc.

With the **HOUND 2**'s Power Button depressed, bring the **HOUND 2** near the suspect wire/cable. The **FOX** signal can often be heard a foot or more away from the wire. If searching for wires in walls, move the **HOUND 2** along the surface of the wall, noting the location of the strongest TONE pickup. Using the **HOUND 2**, trace the wire through the wall by following the strongest TONE pickup.

If the end of the wire/cable is exposed, for example, in a junction or wall box, use the **HOUND 2** to determine if the **FOX TONE** is present. If so, you may have found the cable you are looking for. You may find that several cables in different junction boxes produce similar strength TONES. This phenomenon is caused by crosstalk.... or "bleeding" of the TONE signal into other wires or cables in proximity to the target wire. Sometimes, the junction box contains several different wires/cables, which due to size constraints of the box itself, cannot be separated apart far enough to identify the wire/cable with the TONE signal on it. To assist in identifying

the target wire, use the "Remote Tone Kill" technique.

The **FOX** supports the use of the Remote Tone Kill test method. When the wire or wires (pair) that the **FOX** is connected to, are shorted out, locally or remotely, the TONE signal from the **FOX** is "killed".

In situations where it is difficult to identify the target wire, because of crosstalk from other wires, the target wire can be identified by shorting the TONE to ground (if the LINE/GROUND connection is being used) or shorting out the wire pair with the TONE on it (if the LINE/LINE connection is being used). If you have found the correct wire(s), the TONE will be completely killed. If the TONE is still heard, but reduced somewhat in level, you have not found the target wire(s). This method is not foolproof, and experimentation, common sense, and experience must be used to apply it properly. However, in many instances, it will provide trace verification. A caution.... if you are at a location where the only wire is not the target wire, but it has a signal on it due to crosstalk.... it may appear that you have killed the **FOX TONE** when you short out the wire. To make sure, leave the short on the wire in question, and go back to **FOX**, and test the

alligator clips with the **HOUND 2**. If the TONE is still there, you have not shorted the target wire.

Note: Even with the **FOX**'s alligator clips shorted out, the case of the **FOX** unit will still radiate some TONE. Do not confuse this with the TONE coming from the alligator clips. Perform a few experiments by shorting out the clips and probing the **FOX** with the **HOUND 2** so you know what to expect.

Tracing Wires within a Cable:

When searching for specific wires within a bundle or cable, it is necessary to separate the individual wires apart from each other at the end of the cable opposite the **FOX** location. Probe the wires with the **HOUND 2**, attempting to identify the wire with the strongest TONE on it. Adjust the **HOUND 2**'s VOLUME control as necessary. It is not necessary to pierce the insulation of the wire. The wire with the strongest TONE is the target wire. In some cases, crosstalk into the other wires will make it difficult to determine which wire has the strongest TONE on it. Use the Remote Tone Kill method, previously described, to identify the target wire.

If tracing a pair of wires, such as those used for a telephone line, a lineman's talkset (also called a "handset", "buttset", or "craftset") can be used to positively identify the pair. Connect the suspect pair

to the talkset. If you have located the target pair, the **FOX TONE** will be heard, strong and clear, in the earpiece of the talkset.

Other Applications:

In general, the **FOX** and **HOUND 2** cannot be used to trace wires buried underground or in concrete. This is because the moisture content of the earth or of concrete allows the surface to be electrically conductive, causing it to act as a shield around the buried wire. If the moisture content of the soil or concrete is extremely low, it might be possible to trace a wire close to the surface. This can only be determined by experimentation at the installation site.

The **FOX** and **HOUND 2** have been used to locate OPENs in resistive heating elements embedded in plaster walls and/or ceilings. It is best to have a layout of the serpentine pattern of the heating wire. If the layout is not known, it is best if the user has knowledge of typical layout patterns. This will aid greatly in finding the OPEN.

Various techniques have been tried experimentally, but two basic techniques usually give the best results.

Technique 1: "Strength" Method: Disconnect both ends of the resistive heating element from all other connections. Ground one of the heating element wires to earth ground. The ground of an electrical outlet can be used. A plumbing, cable TV, or telephone ground can also be used. If necessary, use a jumper wire to make this connection (this jumper can be hundreds of feet long). Connect the **FOX** (set to TONE mode) to the ends of the heating element wires (one of which is grounded). Polarity is not important. Holding down the power button on a **HOUND 2**, test the ground connection. The ground wire should emit little or no **FOX TONE**. Move the **HOUND 2** over the surface of the ceiling (within an inch of the surface), listening for the TONE. The grounded side of the resistance wire will not produce a TONE.....the "live" side will. Move the **HOUND 2** across the ceiling, listening for an abrupt change in TONE level from the **HOUND 2**. The point at which the change occurs is in line with the location of the break. To identify the location more precisely, and determine the serpentine pattern in the area in question, unscrew the probe tip from the **HOUND 2**, and cover all of the **HOUND 2**'s case, except the end to which the probe was attached, with aluminum foil. Press the power button of the **HOUND 2**, through the foil, and place the exposed end of the **HOUND 2** against

the ceiling, on the "live" side of the heater wire. By following the path of the loudest signal, trace the heater wire across the ceiling, and note where the level changes abruptly..... this is the location of the break.

Technique 2: "Null" Method (This method is only useful if the OPEN is located in a straight run of the heater wire): Disconnect both ends of the resistive heating element from all other connections. Connect the clips of the **FOX** to the ends of the heating element. Polarity is not important. Holding down the power button on a **HOUND 2**, test the connections. Both of the **FOX** clips should emit a TONE signal. Move the **HOUND 2** across the ceiling, listening for sudden drop in TONE level from the **HOUND 2**. The drop in level is the "null". The TONE level will be strong on either side of the null. Follow the path of the null across the surface of the ceiling by moving the **HOUND 2** back and forth slightly while moving across the ceiling. At the location of the OPEN, the null will change direction (jog from the established path, often by about 45 degrees. The null will pass over the location of the OPEN, and again change direction, returning to a path that parallels, but is offset from, the original path. The OPEN is located at the midpoint of the null path in the jog between the parallel (but offset) null paths.

To understand these techniques, and their application, it is suggested that the user experiment with the tracing techniques using a large piece of cardboard (at least 3' x 3') and some wire. Use of resistance wire is not necessary.... any wire will work. Layout a serpentine pattern on the cardboard, zig zagging the wire back and forth, and holding it down with masking tape. Bring the ends of the wire off of the cardboard several feet, and attach them to the clips on the **FOX**. Create an OPEN in the wire by snipping the wire at a location of your choice. Apply technique 1 and 2, and familiarize yourself with the test method.

HINTS:

The **HOUND 2** works by capacitively sensing the electrostatic field radiated by wires carrying a signal (tone). The greater the radiated field, the better the **HOUND 2**'s ability to locate a wire. Anything that reduces the intensity of the field will impair the **HOUND 2**'s effectiveness in locating a wire.

In general, several things affect field intensity . . . shielding, signal (tone) amplitude on the wire, and wire dress. In instances where a system is shielded (shielded wires, metal junction boxes, metal conduit, etc.), the effectiveness of the **HOUND 2** is impaired. In multi-wire cables, grounded wires,

or wires connected to low impedance circuits, adjacent to the target wire can act as shields, reducing the **HOUND 2**'s ability to sense properly. Spreading the wires apart will reduce the shielding effect and allow the **HOUND 2** to work better. Defects in a cable or wires, such as shorts or opens, will reduce the signal amplitude and hence the **HOUND 2**'s ability to locate the target wire. Terminating a wire or line in a low impedance also reduces signal amplitude and the **HOUND 2**'s locating ability. It is also possible for wire dress to cause nullification of the field. This may happen with tightly twisted pairs or wires.

If the target wire is connected to other wires and circuits, for example, to switches, lights, relays, transformers, etc., the **FOX TONE** will pass through these devices and out onto other wires connected to these devices.... making tracing of the target wire very difficult, if not impossible.

The **HOUND 2** will not trace wires through a metal conduit. It can, however, identify the wires after they exit from the conduit.

General Rules for Effective Tracing:

- 1) Do what works best. Try both LINE/GROUND and LINE/LINE tracing.
- 2) Separate wires when possible.
- 3) Move wires away from shielding when possible.
- 4) Un-terminate wire if necessary.
- 5) Turn off noise sources to reduce buzzing

THE HOUND 2 AND ACCESSORIES:

The Hound 2 Probe	3236
The Hound	3380
The Fox	3390
Fox & Hound Kit (includes case)	3385-K
Fox & Hound 2 Kit (includes case)	3245-K
LAN Fox & Hound Kit (includes case)	3249-K
LAN Fox & Hound 2 Kit (includes case)	3248-K
F&H Carrying Case	10-3983

WARNING

The **FOX** and **HOUND 2** are designed to work on non-energized (except telephone lines) wires or cables. Attempting to test energized wires may damage the **FOX** and **HOUND 2**, cause user injury, or both.

ONE YEAR LIMITED WARRANTY

The Triplett Corporation warrants instruments and test equipment manufactured by it to be free from defective material or workmanship and agrees to repair or replace such products which, under normal use and service, disclose a defect to be the fault of our manufacturing, with no charge within one year of the date of original purchase for parts and labor. If we are unable to repair or replace the product, we will make a refund of the purchase price. Consult the Instruction Manual for instructions regarding the proper use and servicing of instruments and test equipment. Our obligation under this warranty is limited to repairing, replacing, or making refund on any instrument or test equipment which proves to be defective within one year from the date of original purchase.

This warranty does not apply to any of our products which have been repaired or altered by unauthorized persons in any way so as, in our sole judgment, to injure their stability or reliability, or which have been subject to misuse, abuse, misapplication, negligence, accident or which have had the serial numbers altered, defaced, or removed. Accessories, including batteries and fuses, not of our manufacture used with this product are not covered by this warranty.

To register a claim under the provisions of this warranty, return the instrument or test equipment to Triplett Corporation, Service Department, One Triplett Drive, Bluffton, Ohio 45811, transportation prepaid. Upon our inspection of the product, we will advise you as to the disposition of your claim.

ALL WARRANTIES IMPLIED BY LAW ARE HEREBY LIMITED TO A PERIOD OF ONE YEAR FROM DATE OF PURCHASE, AND THE PROVISIONS OF THE WARRANTY ARE EXPRESSLY IN LIEU OF ANY OTHER WARRANTIES EXPRESSED OR IMPLIED.

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