



MTEST-1

<http://mackie.com/products/mtest-1>



What would I need a cable tester for?

If you have in the past, or plan on in the future, doing your own repairs of your audio cables...then having a cable tester around is an invaluable asset. They are especially helpful when trying to troubleshoot a problem in your audio or network system. They can help you quickly determine if you have a bad connection in one of your cables, test connectivity and/or continuity in the wiring of your cables, or simply figure out if you have a bad cable.

What are the different cable connectors out there?

Typically you will find six primary types of cable connections in Pro Audio. For your balanced connections you will use XLR and TRS; Speakon, TS, RCA and Banana Plugs will be used for unbalanced connections.

XLR – This 3-pin XLR connector (XLR3) is the widely used microphone connector in balanced professional audio applications. Pin 1 in the XLR plug is always connected to the shield. The reason for this is that the connectors are designed so that pin 1 makes contact first; ensuring that the ground connection is made before the signal connection. This greatly reduces the transient clicks and pops that can occur when a circuit is patched with the power turned on.

XLR cables are most commonly used for transporting signal between microphones and mixers, and between mixers and speakers. Since the cables are balanced they help prevent things like RF (radio frequencies)/EMF (electromagnetic force) from interfering with the audio signal.



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TRS – or Tip/Ring/Sleeve, is a type of connector that is found on patch cords used for balanced audio signals. It is a three conductor connector where the tip is the “hot” or “signal positive”, the ring is the “low” or “signal negative” and the sleeve is connected to the shield or “ground” of the cord. The tip and ring are connected to the twisted pair of wires inside the shield.

When a TRS is used as a mono cable it is a balanced professional quality cable with the sleeve being attached to the shield within the cord. TRS type connectors are also seen on stereo Y cables and headphone cables with the tip and ring going to right and left sides of the headphones and the sleeve acting as the “low” or “signal negative”. A stereo TRS is unbalanced.

Because XLR and TRS cables both have the same amount of conductors, one can be used on either end of the cable. For example, if you have XLR outputs on your mixer but your speaker only takes TRS connectors you could use an XLR-TRS cable.

TS – or Tip/Sleeve, is another type of phone connector that is typically used on instrument cables. It is a two conductor connector where the tip carries the positive or “hot” signal and the sleeve is connected to the shield or “ground” of the cord. TS connections are unbalanced.

If used for long lengths they can begin to pick up radio frequencies, electromagnetic interference or noise.

Cables going between power amps and passive speakers usually use a TS connector, but the cable itself is usually a smaller gauge (meaning the cable itself is larger in diameter).

Speakon – is a trademark for a high-power audio connector from the Neutrik Company used for loudspeakers. They are used for connecting amplifiers to speakers similar to the TS speaker cable mentioned above, but have the additional security of locking into the speaker cabinet.

RCA – You see this term used mostly when referring to phono connectors that are used to connect consumer stereo and DJ equipment. RCA connectors can also be used in digital audio with connections like S/PDIF, but still have a commonplace in the pro audio world.

They have the advantage of small size but are unbalanced cables, having just 2 connectors.

Banana Plugs – Are an electrical connector used to connect audio (speaker) wires to amplifiers or speakers using traditional binding posts. This makes it easier and safer to connect those speaker wires as there is less chance of stray wires strands creating a short across contacts.



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MIDI – Adding a bonus cable type here as the MTEST-1 does have MIDI jacks. MIDI is an acronym for Musical Instrument Digital Interface and is the music industry’s standard serial communication protocol for the interface and control of musical instruments. That is a fancy way of saying that it allows you to have a variety of different electronic instruments like keyboards, some electronic drums, drum machines, etc. connect and communicate with computers or other audio devices.

What is the difference between balanced and unbalanced cables?

Unbalanced connections use a two conductor, unshielded cable. The cable consists of a signal wire and ground wire.

Inside unbalanced cables, the ground wire is typically wound around an internal wire that carries the signal. The ground wire serves two functions in this design: it carries the negative part of the audio signal and helps to shield the main positive signal wire from external interference. The downside is that the ground wire itself also acts like an antenna and can pick up noise. Unbalanced cables are generally only good for running signal up to 15 feet. This is not acceptable in most professional applications because of these limitations.

A balanced cable, by contrast, has two signal wires as well as a separate ground wire. Just like the unbalanced cable, the ground wire wraps around the signal wires serving as a shield against interference. XLR mic cables and 1/4 inch TRS are the most commonly found types of balanced connectors in audio. On a balanced cable, the pair of signal wires carries identical copies of the signal on each, except that one of the wires is 180 degrees out of phase with the other. This creates what is called a differential. Any noise that is induced will be equal on both signal wires. The receiving equipment will bring the two signals back into phase with one another. This flips the noise 180 degrees out of phase between the two signals serving to cancel out the induced noise. This is known as “Common Mode Rejection”.

Why does the MTEST-1 show three LEDs when testing a TS connector?

The MTEST-1 TRS connection is wired so that the tip is connected to selection 2, the ring is connected to selection 3, and the sleeve is connected to selection 1. On a Tip-Sleeve (TS) connector, the sleeve extends to where the ring should be, so when you have 1 or 3 selected on the MTEST-1 both the yellow LEDs on 1 and 3 should illuminate. This means it is reading that the sleeve (and since it is extended to where the ring should be), the ring are testing as good. The tip of the TS connection is only tied to selection 2 on the MTEST-1 and only that LED should illuminate when selected.



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What connections are on the MTEST-1?

You have a total of 14 input jacks on the MTEST-1. There are two input jacks for each of the following types of connectors. This allows you to plug each end of your cable into those jacks to test. The MTEST-1 is equipped with the most commonly used connector types including:

- 1/8-inch (3.5mm) TRS or TS
- Banana Plugs
- 1/4-inch TRS or TS
- MIDI
- RCA/Phono
- XLR (1 - male and 1 - female)
- Speakon

Why is there a continuity option on the MTEST-1?

Continuity is the existence of a complete circuit, or path, for current flow. A continuity test is a quick check to make sure current is flowing in that circuit or path. This will tell you if the circuit is open or closed. Only a closed, complete circuit has continuity.

In the case of the MTEST-1, you can use the supplied probes in the “Banana/Continuity” jacks to test continuity between any two points. When continuity occurs, the LED in the middle of these jacks will light up and you will hear a beep.

Things that continuity testing can help determine:

- If you have a good or blown fuse.
- If conductors are open or shorted.
- If switches are operating properly.



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