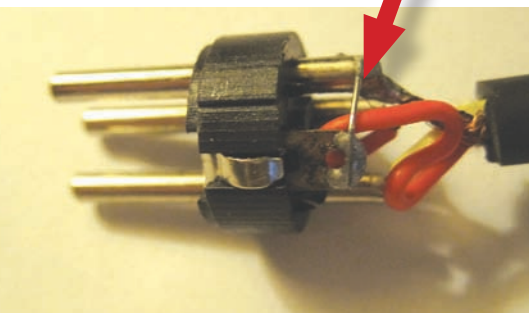


## Mic Cable Wiring 101: Connecting the Ground Lug - or Not?

Due to a production error in the last issue of Broadcaster Magazine, images in this article were reproduced and labelled improperly. Our apologies for any confusion that may have resulted. The original article and corrected images are re-printed here.

By Alan Hardiman

Trying to repair a broken microphone cable the other day, I noticed that pin 1 of the XLR connector was connected to the ground lug with a small jumper wire, thereby bonding the cable shield to the connector shell. Here's what it looked like: The cable was a cheapie



from one of those electronics shops on Queen St. West in downtown Toronto; you know the one, with the stuffed gorilla by the door.

From the quality of the components and the crummy soldering job, it's a good illustration of you-

get-what-you-pay-for, so I am paying penance for buying it with this article and online blog.

Hey, I was caught in a weak moment!

By way of contrast, shown at right are quality connectors from Switchcraft and Neutrik, with the ground lugs identified by arrows.

Should the ground lug be connected to pin 1, as shown in the photo above, or not? I've read opinions pro and con over the years, so I decided to ask an acknowledged expert in the field, Neil Muncy.

Before I get to his answer, you should know that Muncy — a Fellow and Life Member of the Audio Engineering Society — is the author of the ground-breaking 1994 AES paper, "Noise Susceptibility in Analog and Digital Signal Processing Systems," in which he explored the relationship between the physical construction of shielded twisted-pair cable and induced noise in a signal circuit due to cable shield current.

This paper was published, along with others by authors

including Philip Giddings of Toronto's Engineering Harmonics, in the June 1995 issue of the *Journal of the Audio Engineering Society*, which has become the most widely accessed issue of the *Journal* in history.

When Muncy wrote his paper, most commercially available audio gear had pin-1 problems. It was, indeed, difficult to find equipment without it—even the most highly revered consoles had serious pin-1 problems. Since then, a number of leading manufacturers have redesigned their products to correct their mistake, but unfortunately, many have not yet done so.

Muncy is also a member of the task group that produced the standard AES48-2005, "AES Standard on Interconnections-Grounding and EMC practices -Shields of Connectors in Audio Equipment Containing Active Circuitry," the published standard that deals with the pin-1 problem.

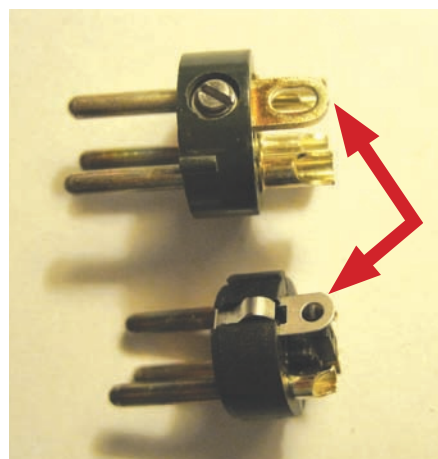
Based on all this, I figured he should know how to wire up a microphone cable. In close to 30 years, he hasn't failed me yet. Here's his answer to the question, 'Under what circumstances do you solder the ground lug (aka pin 4) to pin 1?'

"The short, long, and infinitely long answers are NEVER, NEVER, & NEVER. To do so would introduce ground loops which could totally compromise an otherwise working Isolated Ground (I.G.) installation, and raise Hell with any front-end equipment that is plagued with Pin-1 Problems. Terminal #4 was introduced by Switchcraft back in the late '50's/'60's to address an application in very high impedance medical interfaces. It has no use whatsoever as far as portable A/V cables are concerned. They are simply extension cords."


There you have it. But if the lug shouldn't be used in general audio applications, why is it still there? Wouldn't it be advantageous for manufacturers such as Switchcraft and Neutrik to produce a line of connectors *without* the ground lug for normal stage and studio applications that have nothing to do with medical interfaces?

*Alan Hardiman, Producer & Creative Director with Associated Buzz Creative in Toronto, is a dedicated audio technophile and occasional equipment developer. You can comment on this article at his blog, or write to the Editor, Broadcaster Magazine.*

[http://producingforaliving.blogspot.com/2010\\_09\\_01\\_archive.html](http://producingforaliving.blogspot.com/2010_09_01_archive.html)



Switchcraft (top) and Neutrik connectors



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