4875 NORTH RAVENSWOOD | CHICAGO, ILLINOIS 60640 | (773) 728-0565 | FAX (773) 728-7321

APPLICATIONS NOTE

Losses in Balanced Twisted-Pair Audio Cables

The Audio Systems Group Inc.

As part of my research for a recent AES paper (AES preprint 5747), I accumulated data for the losses in digital audio cables at the frequencies used for digital audio. To a first approximation, that data can be interpolated to much higher frequencies.

There are important implications of this data with respect to radio frequency interference to audio systems. For all practical purposes, any VHF or UHF interference that is injected into audio cables more than a few tens of meters from their associated electronics will be significantly attenuated before it can be detected. This means that what matters to the system is the signal strength in the immediate vicinity of the potential detector (victim electronics).

My research on RF susceptibility of condenser mics, published as AES preprint 5720, confirms this hypothesis. A 5 watt VHF and UHF transceiver and a 2 watt 850 MHz digital cell phone were used to inject interference into more than 50 mics. For all but a few mics with extreme susceptibility, no interference could be caused to the mics more than about 1.5 m along the cable from the mic using standard digital audio cables, and even within that distance, susceptibility was confined to one or two maxima along the transmission line. Similar results have been observed with mic and line level input and output stages.

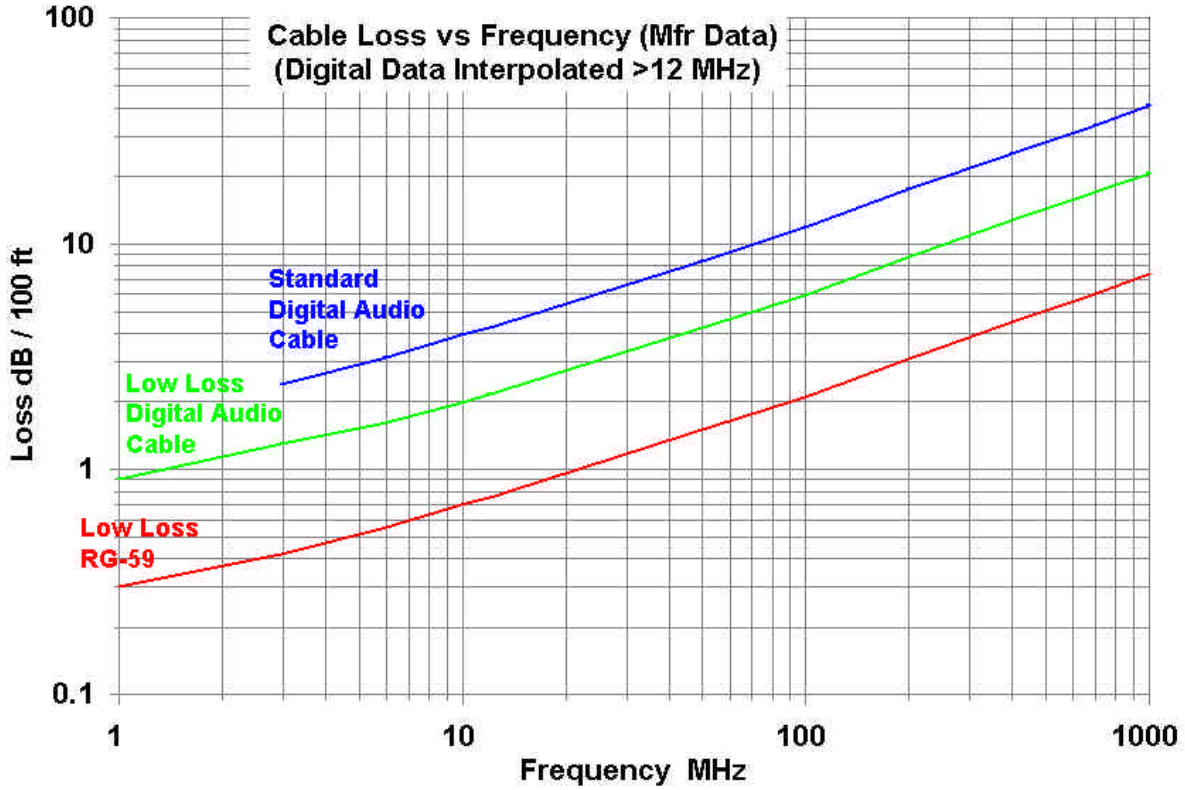

Fig 1 - The Cable Data The RG-59 cable is a very low loss type designed for MATV and CATV service. The low loss digital audio cable data is for Gepco 5596 and 5596M, the lowest loss cables for which I could find data. The "standard" digital audio cable, Gepco 5526EZ, is typical of many other digital audio cables. This is all manufacturers data -- I have not measured it. I have not seen published data for analog audio cables, but I would expect their losses to be significantly greater than for digital cables.

Jim Brown