

Bone Conduction Audio Communication System for Musicians
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Musicians often perform their music live with an in-ear device to monitor select audio signals and specific tempos. While wearing conventional earphones as audio monitors enables musicians to coordinate rhythmically, it weakens the user's awareness to their surrounding acoustic environment by closing off one, if not both ears. Disorientation is common for many musicians, such as saxophonists, violinists, and singers due the inability to fully hear one's own musical instrument and surrounding ambient environment. This presents the necessity of a better solution for musicians. Bone conduction is an open ear design that allows audio transmission to be heard through vibrations of the bone while allowing the ambient sound of a stage environment to be heard by live performers. Bone conduction, as a means of audio transmission, is a method of sonic communication already shown of value. It is currently implemented in hardware produced by the military and law enforcement. Unfortunately, military oriented products and solutions are not readily available or adaptable to the on-stage performance. Hence, designing a peripheral device specific for live musicians is needed. In our model/research, actual transmission of conducting signals was done with a BCE-1 22x 14mm bone conducting exciter in conjunction with a CBL ASSY 3.5mm slim adapter and ample THHN building wire. The adapter was soldered onto the exciter, which may be powered through the 3.5 mm output of user defined signal generating device of the user's preference. Future testing of the device will be performed and ultimately used in live performance during one of Dr. Robin Cox's ensemble rehearsals in the IUPUI Department of Music & Arts Technology.

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