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Subject: Reflection of sound

Posted by [lilbill](#) on Wed, 06 Feb 2019 17:36:31 GMT

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Sometimes back, I read about researchers who had developed a device that reflects sound in the direction it came from, rather than deflecting it at an angle. Sound would be reflected across an operating range of 70 degrees in either direction. What kind of effect would such a device have, when listening to audio in a small room?

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Subject: Re: Reflection of sound

Posted by [Wayne Parham](#) on Wed, 06 Feb 2019 21:56:32 GMT

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I'm guessing what you read about was a device made for a specific purpose. So I'm guessing there's more to it than just something that reflects sound back to the source.

I say this because reflectors aren't particularly novel or interesting. Most everything is a reflector. The acoustic behavior of most things is frequency-dependent, being from partially to totally a reflector and partially to totally an absorber when acoustically large, and doing almost nothing when acoustically small, letting sound pass right by.

For frequencies where the surface or object is acoustically large, if it is rigid and flat then it will act as a reflector but if it is free to move at the frequency presented then it will act as an absorber. Most things do a little of both, often tending more towards one or the other.

Reflectors will "aim" the reflected sound at the angle of reflection. So a surface can be curved in such a way that surrounds a particular spot, reflecting the sound radiated in all directions from that particular spot back to the source. If the reflector is fairly close - close enough that a discernible echo isn't perceived - then it will sound like the reflector has "amplified" the source. This is because in free space, the source would radiate sound in all directions and a listener would only get the portion of the acoustic energy radiated in their direction. But if surrounded by a reflector, nearly all the acoustic energy radiated by the source is reflected back to the listener.

None of this is new. It is probably one of the oldest acoustic devices known to man. Hard rock surfaces do this trick nicely, especially if they are curved to focus the reflected energy. Man-made structures were built this way, so that they focused the sound from a stage towards the audience.

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Subject: Re: Reflection of sound

Posted by [Junior](#) on Fri, 08 Feb 2019 07:17:52 GMT

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With all the explanation that Wayne said about reflectors, I now wonder whether reflectors can be

made into a weapon. It might be science fiction or just imagination, but sound energy focused onto an object can destroy it with enough vibration. If I'm not mistaken, there is even research of using sound energy to clear out kidney stones or cancer tumors.

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