ABSTRACT

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ABSTRACT: Musicians and audio professionals are constantly confronted with an abundance of signal processing devices to alter or improve the quality of both recordings and performances. The last few decades have brought digital signal processing forward as a viable alternative to traditional equipment. Despite this, analog systems still represent a large part of the market. While digital systems provide us with the convenience and flexibility of modern technology, they present their own unique constraints on sonic quality and signal latency. For this reason, a more attractive solution would be to implement analog components which can be controlled with digital systems. Such a scheme would ideally give analog systems the flexibility of modern technology. Introducing new components to an electronic system can alter a signal by adding distortion and frequency attenuation. Analysis was done on an Analog Devices AD5282 Resistive Analog to Digital Converter to evaluate its viability for use as a replacement for potentiometers in analog audio circuits. The device was fed a sinusoidal signal at various frequencies and amplitudes, and the resulting distortion and signal attenuation was measured. The device was shown to introduce distortion below the threshold of human detection, but attenuated signals at frequencies half the upper limit of human detection. For this reason, the AD5282 would be useful for any signals that don't contain significant amounts of high frequency information. This would include guitars, basses, and vocals. It would not be useful for general audio purposes such as stereos, or microphone preamplifiers.