

# Playback of Mechanical Recordings Using Laser Heterodyne Interferometer

William Penn, Ph.D.

Department of  
Electrical Engineering  
and Computer Science

## Invention

Prior to the advancement of magnetic tape and digital technology for storage of sound recordings, sounds were recorded through undulating grooves on cylinders. Playback is allowed by running a stylus within the groove and transferring the movement to either a vibrating diaphragm or piezoelectric source for speaker output. However, repeated playback leads to degradation of the cylinder and the quality of the audio signal due to friction between the stylus and the recording medium. Although this is particularly significant with the soft wax cylinders used from around 1895 to 1929, LP records also suffer from the same degradation. This invention provides a system and device that can play back or digitally copy sounds recorded on grooved mediums without degrading the medium on which the sound is recorded.

## Technology

U.S. Patent No. 7,042,811

An optical system is mounted on an optical platform, and an audio recording medium is mounted on a platform operatively positioned relative to the optics platform. The optical system includes a coherent beam of light in either a free space propagation system or a fiber based interferometer arrangement. The beam is split into two, a reference beam and a signal beam. In the free space propagating system, the reference beam passes through a frequency shifter while the signal beam passes through various devices for altering its polarization and is focused to reflect off the groove. In the fiber guided system, the signal beam passes through the frequency shifter while the reference beam is simply transduced in its original state. The two beams are recombined in a beam splitter, and the phase difference is determined in a detector. The optical energy is then converted to electrical energy. The modulated frequency (the phase difference) is amplified, demodulated, and played back to the listener or recording device through a conventional FM receiver.

## Applications

- Playback of original Edison cylinders for public redistribution in other formats
- Playback of 33, 45, or 78 RPM LP records

## Advantages

- Non-destructive playback or digital recording of fragile cylinders through frictionless playing
- Maximum playback fidelity

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