Low-cost Science

SCIENCE ON STAGE 2017 DEBRECEN
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Miklós Jendrék| György Boronkay Technical Secondary School Vác| Hungary

Musical Physics

The project deals with the problem of detecting and converting audio-frequency vibrations of electromagnetic and light signals. Transformations of electromagnetic energy make it possible to show a vast amount of physical effects in an unconventional and spectacular way.
During the signal converting process we have the opportunity to view and examine optical, acoustical and electromagnetic phenomena.

Creativity in science education

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Electroacoustic transducers




The electroacoustic transducers' two main elements are an iron cored coil of wire and an audio-frequency amplifier (PC speaker). This tool is suitable for creating mobile amplifiers, dynamic microphones, loudspeakers or pickups.

Miklós Jendrék

György Boronkay Technical Secondary School
Physics

jendrekmiklos@gmail.com

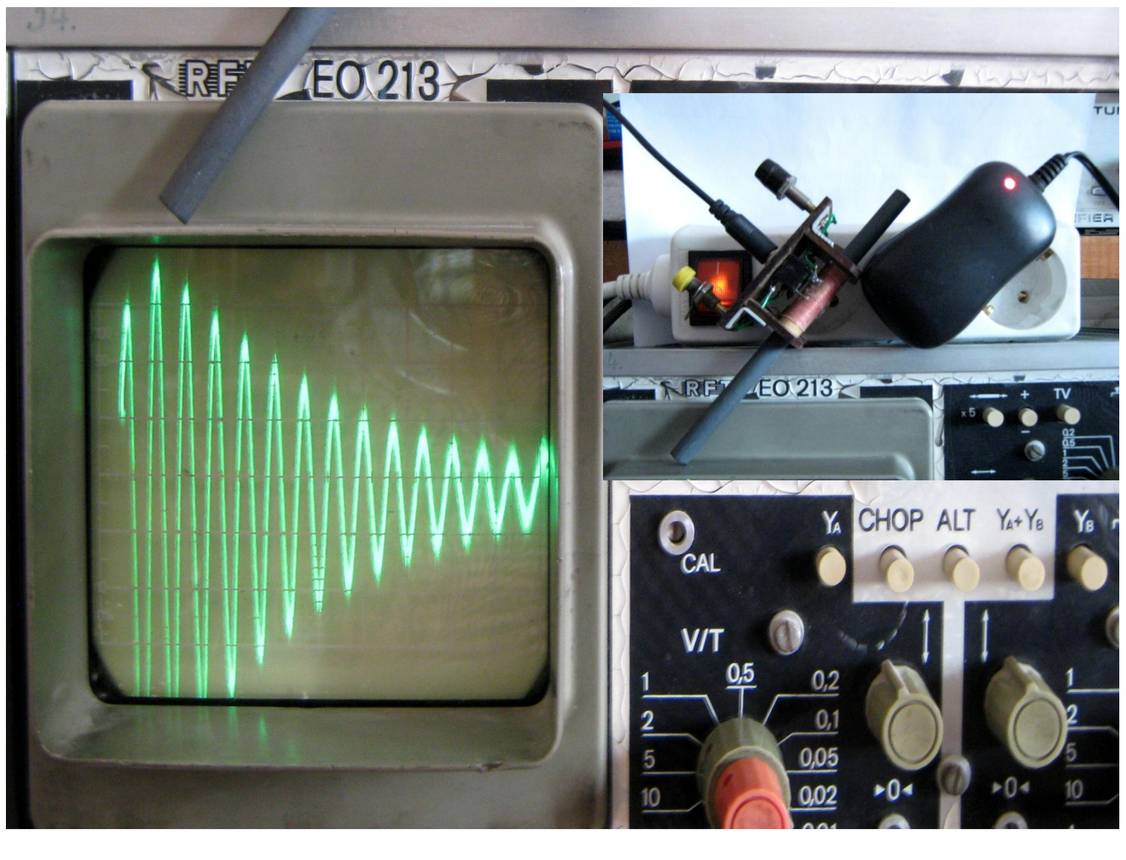
Operating principle

An iron core coil is connected to the input of the PC speaker. The changing magnetic field induces electromotive force in the coil. If the frequency of the voltage is in the audible range, after amplifying we can hear various, and often surprising, sound effects.

Applications, effects, devices

If we move the coil towards the speaker, a barking-like sound can be heard. The reason for that is the positive feedback. With our device, the sound coming from a mobile phone's loudspeaker can become louder without losing quality. It is enough to move the coil close to the mobile phone's loudspeaker.

When we place the coil of wire near a stretched string and pluck the string, we can hear the amplified sound in the loudspeaker.
The device is suitable for making microphones and loudspeakers. For this we also need an acoustic resonator (a plastic glass, a tin or a tea kettle) and a strong magnet.



100% Great!

Conclusion: Many physical electromagnetic and photometric experiments can be made more interesting and colorful by utilizing and transforming tone signals.