

This Month's Stiff: Lev Sergeyevich Termen

Entered Mortal Coil: 15 August 1896

Assumed Room Temperature: 3 November 1994



A Young Termen and his Invention, The Theremin

Okay kiddies, here we are scraping the literal bottom of the barrel and rapidly running out of bodies as suitable cannon-fodder for these little essays of mine. And to the ill-tempered ingrates who will inevitably whine like spoiled cry-babies, **"But what does this have to do with radio?"** (say in squeaky, shrill voice).....Nothing. Absolutely nothing. I have waxed eloquent (and sometimes not-so-eloquently) over the past two years about the great founders of our electronic world. So today, I'm writing about Mr. Theremin as I have an interest in one of his inventions at this particular point in my life. Narcissistic? You betcha! So let's get about the business of telling you fine folks about Lev Sergeyevich Termen, also known by the westernized version of his name, Leon Theremin.

Dearly departed Leon was from St. Petersburg (later known alternately as Leningrad, Petrograd, and then again as St. Petersburg), and therefore, of Russian birth. In his early 20's, Termen serendipitously noted squeals while experimenting with radio receiver circuits. An idea germinated as he wondered if the squeals could be put to some useful purpose, perhaps as a musical instrument. He built suitable apparatus and refined the device to the point where it could be unveiled to the world.

The year was 1919: Russia was in the midst of a civil war betwixt the Bolsheviks and the imperial government. The imperials eventually lost, and a new government, based upon the precepts of Karl Marx, was formed. Vladimir Ilyich Lenin was the first premier of the new Soviet Union. Word of Lev's invention reached the new leader, who requested a demonstration of the electronic device. It is said that Lenin was musically inclined, and undertook some instruction from Termen. Ilyich was impressed; so much so that Lev was persuaded to tour Europe and demonstrate his device as an example of Soviet ingenuity. At this point, the inventor hit the big time, performing to stunned audiences with his musical invention. He traveled to the United States and performed to stunned audiences here as well. RCA bought the rights to his patents and began manufacturing vacuum tube theremins. Only a few were ever made. Even badly damaged examples today can fetch upwards of \$5000.

So what was so special about the new musical instrument, which was dubbed the “Theremin” after its inventor? Musical notes were formed by merely moving one's hands through the air near the device, which had two antennas jutting from its chassis. A horizontal loop antenna controlled volume: as the left hand was brought near the antenna, the volume would decrease. Another vertical whip antenna controlled pitch: as the right hand was brought near, the pitch would increase. Vibrato and other musical subtleties were induced by gently oscillating the fingers back and forth. The show-stopping performances were a hit because the performer would never touch the instrument: such magic had not been witnessed before by audiences. To hear the ethereal music of a theremin being played by perhaps the greatest virtuosa of all time, the gifted Clara Rockmore, click on the following internet link:

<http://home.comcast.net/~ka4koe/rockmore.mp3>

Note that I used the word “gifted” in the preceding sentence. The confounding nature of the instrument results from the fact that the performer has no tactile references for producing correct notes. Theremin technique relies heavily on having a sense of “perfect pitch” and good muscle memory. Anyone can make “music” on a theremin. However, making good music requires a tremendous amount of skill and practice. The instrument is as difficult to play as a violin; perhaps more so.

The theory of operation of the theremin is actually quite easy to understand. In the simplest of terms, it is comprised of two oscillators that work in tandem. One oscillator is fixed in frequency. The second oscillator is a “VFO” so to speak, and is connected to the pitch sense antenna. Under an initial condition of no input from the artist, both oscillators are in a state of what CW operators would term “zero beat”. When the performer brings his right hand near the pitch antenna, he is capacitively coupled to the second oscillator circuit, and its resonant frequency changes as a result. The two signal sources are no longer in zero beat, and you will hear the difference frequency being produced by the loudspeaker.

Clara and Lev were friends and contemporaries. Lev proposed marriage on four separate occasions but was rebuffed every time. Unfortunately for Lev, Clara eventually married someone else. On the rebound, heartbroken Lev married a gifted black dancer. This act scandalized polite society of that era, and the inventor lost many of his friends. It is perhaps fortunate that Clara refused to marry the young, dashing inventor, as things got really weird at that point shortly after in 1938: Lev disappeared and went missing. One rumor was that he was kidnapped by the NKVD (later known as the KGB), so that he might be induced to work on war electronics projects for Mother Russia. Another version is that Lev left willingly, as his personal and professional life were in a shambles as a result of his impulsive marriage. His finances were also in a similar sad state of affairs. Perhaps the inventor had had enough heartbreak and decided to go home of his own accord. I highly recommend you rent or purchase the movie *“Theremin: An Electronic Odyssey”* (available on Amazon.com), which relates the first version of this story. Nevertheless, Lev spent approximately seven years in the gulag, and later worked for the Soviet government 25 years after he was released from prison. During his tenure as a working scientist, Termen invented the world's first electronic listening device, or “bug”. Stalin was very pleased. Many years later, Lev and Clara were reunited and see each other one last time in 1991. They reminisced about their lost youth and had tea together. Both died a few short years later.

Clara Rockmore sincerely hoped that the theremin would be considered a serious musical instrument, and refused all offers to make “spooky” sound effects for Hollywood. However, others had no trouble using the instrument for this purpose. Listen to this famous clip from the movie “The Day the Earth Stood Still” by Bernard Hermann:

<http://home.comcast.net/~ka4koe/day.mp3>

The damage was done. It would be many years before the theremin would undergo a resurgence of interest. Late electronic music genius Bob Moog dedicated his life to keeping interest in the instrument alive. Modern versions of the theremin are still available from Moog Music; the URL is <http://www.moogmusic.com> .

So there you have it, ladies and gentlemen; the story of perhaps the first successful electronic instrument, the theremin. Any google search will turn up oodles and oodles of useful information on this fascinating device. I have included some good links, however, to make your task easier should you wish to look for additional information. Wish me luck as I venture forth and determine if I can learn to play one of these devilishly difficult instruments of ethereal music making.

Till next time, Space Cadets. Gort, Klaatu, Barada, Neckto.

Recommended Theremin Links:

Theremin World, <http://www.thereminworld.com>

Theremin Vox, <http://www.thereminvox.com>

Theremin Info, <http://www.theremininfo.com>

LevNet - Friends of the Theremin, <http://www.discoveret.org/mailman/listinfo/levnet>

Theremin Hispano (en español), <http://www.thereminhispano.com>

Contemporary Theremin Artists:

Peter Pringle, <http://www.peterpringle.com>

Charles Lester, <http://www.137.com/theremin/>

Lydia Kavina (great niece of Lev, and his last student), <http://www.lydiakavina.com>

Pamelia Kurstin, <http://www.pameliakurstin.com>

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