



INART 55

History of Electroacoustic Music

The Trautonium



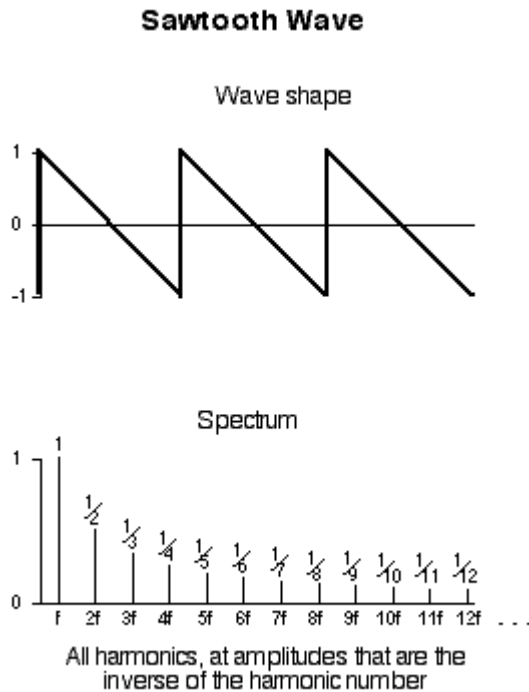
In 1928, acoustician **Friedrich Adolf Trautwein (1888-1956)** was employed at the radio experimental center of the Berlin State Music Academy. He formed an alliance with the Academy's Professor of Composition, **Paul Hindemith (1895-1963)**, the most important German composer of the first half of the twentieth century.

Hindemith was a rebellious, innovative, and scholarly composer. No doubt, he had read [Busoni](#), which had been translated from Italian in 1919 and played an important role in the formation of Italian and German musical politics. Hindemith was to write important books in music theory that based the nature of harmony in acoustic principles. His interest in acoustics was evidenced by his alliance with Trautwein. At Hindemith's urging, Trautwein created the **Trautonium**. This instrument was new in concept



Paul Hindemith

as it produced a [sawtooth wave](#) and featured special [filters](#) to control timbre.



Thus it was not based on creating timbres out of sine waves ([additive synthesis](#), as was employed by the **Telharmonium**). Rather than build complex timbres from sine tones, the Trautonium started with a complex wave and filtered it -- a methodology now known as **subtractive synthesis**. The filters were called *tone-formers*, based conceptually on the [formants](#) that characterize acoustic instruments. The performer could establish formants in different key regions, creating a tone color that varied with *tessitura* (pitch range). A wire was pressed at some point along its length to create a pitch. A floor pedal controlled volume. Like

the [theremin](#) and the [ondes martenot](#), the instrument was **monophonic** -- meaning it could only produce one pitch at a time.

The instrument was popular in the 1930s. It was able to change pitch continuously, like a string instrument. The ability to change tone color with pitch range was also a fascination. Among the composers who wrote for it were Hindemith, Richard Strauss, and Paul Dessau. The instrument was marketed by Telefunken in 1932, making it the first mass-produced electronic instrument in Europe. It was not a commercial success, and was discontinued in 1935. The instrument may have been just a momentary fad had it not been for the efforts of Hindemith's student, **Oskar Skala (1910-2002)**, who adopted it as his main instrument and continued to work with it, developing improved versions of it over the years.

