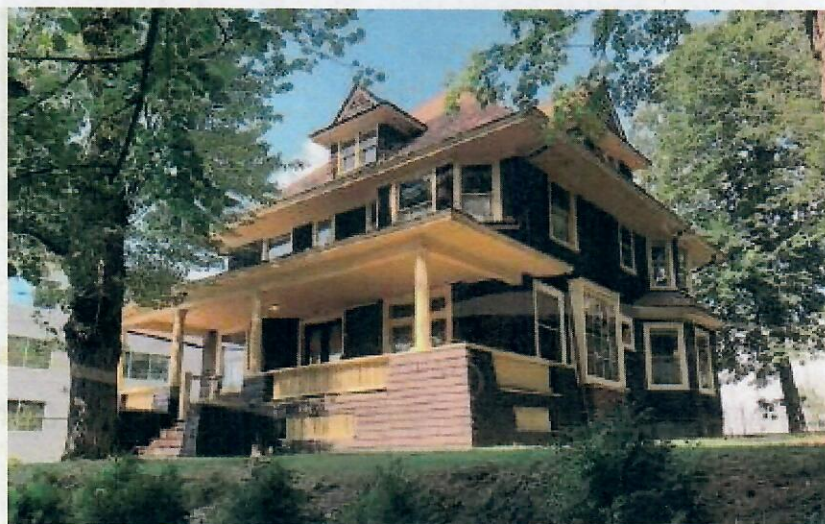


*Percy and Ella Grainger in 1951 with a reed organ Free Music machine, controlled by a perforated paper roll, 1951*

Percy and Ella Grainger in 1951 with a reed organ Free Music machine, controlled by a perforated paper roll, 1951

An old four-square house in the heart of White Plains draws musicians and historians from all over the world. They flock to the place where Percy Grainger, an Australian composer and pianist, created "Free Music," which he considered his most important accomplishment.



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*Grainger's house at 7 Cromwell Place, White Plains,  
NY*



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*Percy Grainger's bedroom with the model sailboat that  
started his ideas about Free Music*

For forty years, from 1921 until his death in 1961, Grainger occupied the house at 7 Cromwell Place, using it for his residence, his practice studio, and his laboratory for avant-garde musical compositions and experimental music machines. The home was placed on the National Registry of Historic Places in 1994, due to its exceptional importance in the history of electronic music as the site of Grainger's experiments.

### **Random and Free**

Grainger first conceived his idea of Free Music during his childhood. He observed how his toy sailboat moved along the waves on Albert Park's lake in Melbourne, Australia, the undulating movements random and free. This eventually led him to believe music should reflect those waves, with free rhythms, continuous variations in pitch, and independent melodic lines. These ideas remained with him throughout his life; he kept the childhood sailboat mounted in his direct line of sight from his bed.

Grainger's early compositions, amongst his most experimental with

traditional instruments, began to realize the idea of Free Music. His 1901 "Hill Song No. 1," for example, abounds with changing time-signatures, meandering and non-repetitive melodies and free-flowing harmonies, and is far removed from much of the post-romantic music of the time in its treatment of musical ideas. His unfinished "Train Music" of the same year similarly attempts to capture the irregular rhythms of railway locomotion in a work for large orchestra. Alongside these and other musical experiments, Grainger began imagining machines that might play his, as yet unnamed, Free Music. In a notebook of 1901, he wrote that "Probably music of the future will be performed by machines. ... Composer will make his own machine, (like an inventor) most likely his own sound-colors, (like painter his colors) will perfect composition and performance of same right by himself." In 1904, he designed a "Beatless Music Typer" that would automatically notate music played on a piano keyboard without recourse to standard musical notation.

### **Foreshadowing**

A critical aspect of his ideas was the belief that a composer's intentions should be relayed directly to the listening public, without the involvement or intervention of human performers. In this respect, Grainger foreshadowed the developments in electronic music that took place during the 1940s and 1950s, following the invention of the magnetic tape recorder. Indeed, such technology was already available in the form of player pianos and reproducing pianos—commonly known as pianolas—that were enormously popular at the beginning of the twentieth century. Grainger was very familiar with this technology, having worked on a large number of recordings for the Aeolian Company of New York between 1915 and 1932. Such systems could both capture and recreate an impression of a live performance (a technique that predates sound recording by several years.) They could also be used to manually construct a virtual performance, by punching holes directly on to a paper roll that could later be communicated by a skilled pianola player, who would control the overall speed and nuances of volume.



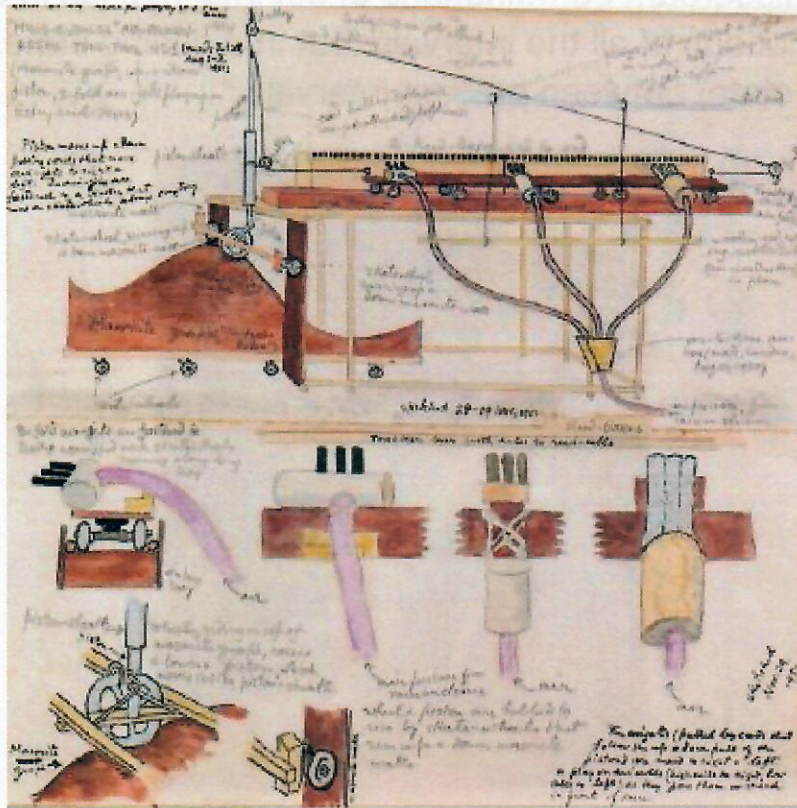
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*An Aeolian Duo-Art player piano controlled by three  
Melanettes (early keyboard synthesizers) in 1948.  
These were later replaced by Solovoxes.*

## **Time Constraints**

A combination of the lack of available technology and, for Grainger, a lack of time—the early years of the twentieth century saw him perform an astonishing number of piano concerts in America, Europe, and Australasia—meant that these ideas remained latent until the 1930s. During a series of radio lectures for the Australian Broadcasting Commission in 1935, Grainger illustrated his idea of Free Music with a new composition, “Free Music No 1,” performed by a string quartet. The following year, he rescored the piece for four theremins, the electronic musical instrument developed by the Russian inventor Léon Theremin (or Lev Termen), which was introduced to the American public in 1929 by the Radio Corporation of America (RCA). The continuously-gliding sounds produced by the theremin, which is played without touching the instrument, were ideal for Grainger’s concept of Free Music, even though they relied on highly skilled human performers. Grainger wrote two more pieces for theremin at the time—“Free Music No. 2” and

“Beatless Music”—and these, together with “Free Music No. 1,” have been recorded by Theremin’s grand-niece, Lydia Kavina, and issued by Mode Records.



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Left: Grainger’s hand-drawn and painted design for  
the “Hills and Dales” Free Music machine

Encouraged by these experiments, Grainger published his Free Music statement in 1938 for display in his newly-opened museum in Melbourne, the contents of which were “assembled with the main intention of throwing light upon the processes of musical composition ... during the period in which Australia has been prominent in music.” He further explained his concept of Free Music in a letter to critic Olin Downes in 1942: “In FREE MUSIC the various tone-strands (melodic lines) may each have their own rhythmic pulse (or not), if they like; but one tone strand is not enslaved to the other (as in current music) by rhythmic same-beatedness. In FREE MUSIC there are no scales— the melodic lines may glide from & to any

depths & heights of (practical) tonal space, just as they may hover about any 'note' without ever alighting upon it. ... In FREE MUSIC harmony will consist of free combinations (when desired) of all free intervals— not merely concordant or discordant combinations of set intervals (as in current music), but free combinations of all the intervals (but in a gliding state, not needfully in an anchored state) between present intervals.”



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*Right: Grainger with one of his  
organ pipe Free Music machines*

“In this music, a melody is as free to roam thru tonal space as a painter is free to draw & paint free lines, free curves, create free shapes. ...

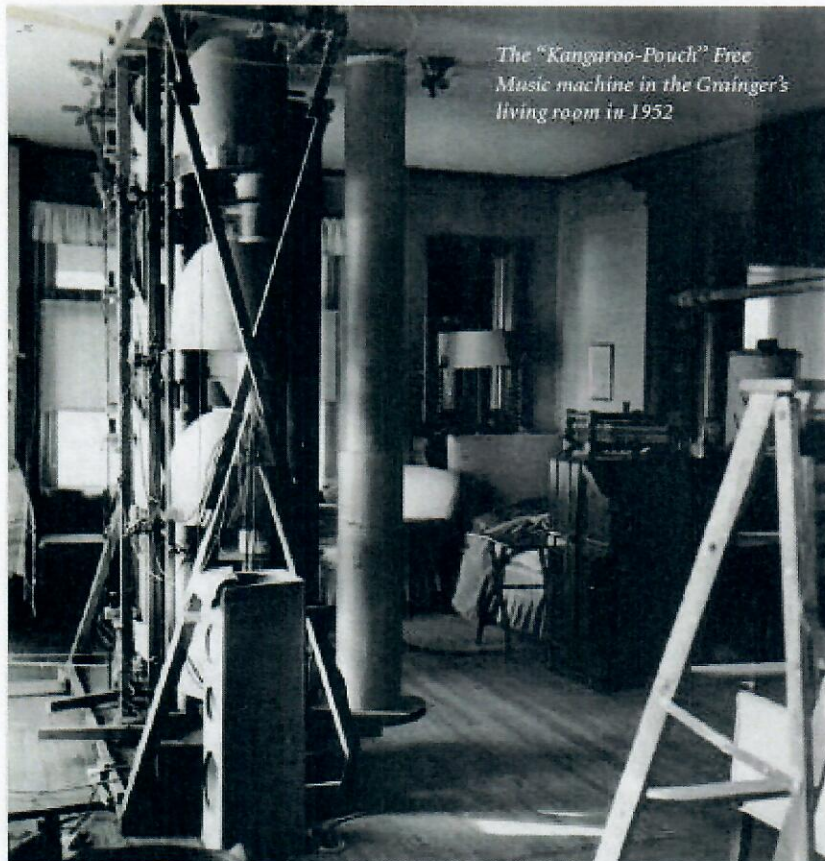
### **Dream Realized**

It was, however, the period from 1946 to the late 1950s, when his activities as a performer were on the wane, that saw Grainger's most concerted and sustained efforts to realize his dream of Free Music, efforts that were inextricably linked with his home in White Plains. In these endeavors,

Grainger was aided by his wife, Ella, and a young physicist, Burnett Cross, whom he had first met in 1944. Cross and Grainger also made several sound recordings of the outcomes of their experiments using home recording equipment, many of which still survive. From this disparate jumble of records, it is possible to trace a partial history of the development of the Free Music machines, although the definitive account of these experiments has yet to be assembled and written. In 1948, Grainger first employed electronic sound-production means in the form of early keyboard synthesizers known as Melanettes. These proved unreliable and were soon replaced by Solovoxes, commercially-available music keyboards produced by the Hammond Corporation that were designed to bolt on to the underside of pianos, providing the possibility of playing sustained melody lines (often whilst the other hand continued to play the piano keyboard). Grainger's ingenious, but rather Rube Goldberg-like contraptions employed the mechanism of the pianola to "program" the music, whilst the piano keyboard, with the aid of a complex series of strings and wires, played the synthesizer keyboard and, in turn, the synthesizer sounds. As cumbersome as this set-up seemed, it proved effective and allowed a fairly precise control of the type of multiple continuous pitch swoops that Grainger had imagined. The basic principle of this design was to re-emerge in the 1980s with the invention of the Musical Instrument Digital Interface (MIDI) protocol, which enabled the linking of electronic musical instruments with computers. Grainger also developed a number of other pioneering machines in this period.







*The "Kangaroo-Pouch" Free  
Music machine in the Grainger's  
living room in 1952*

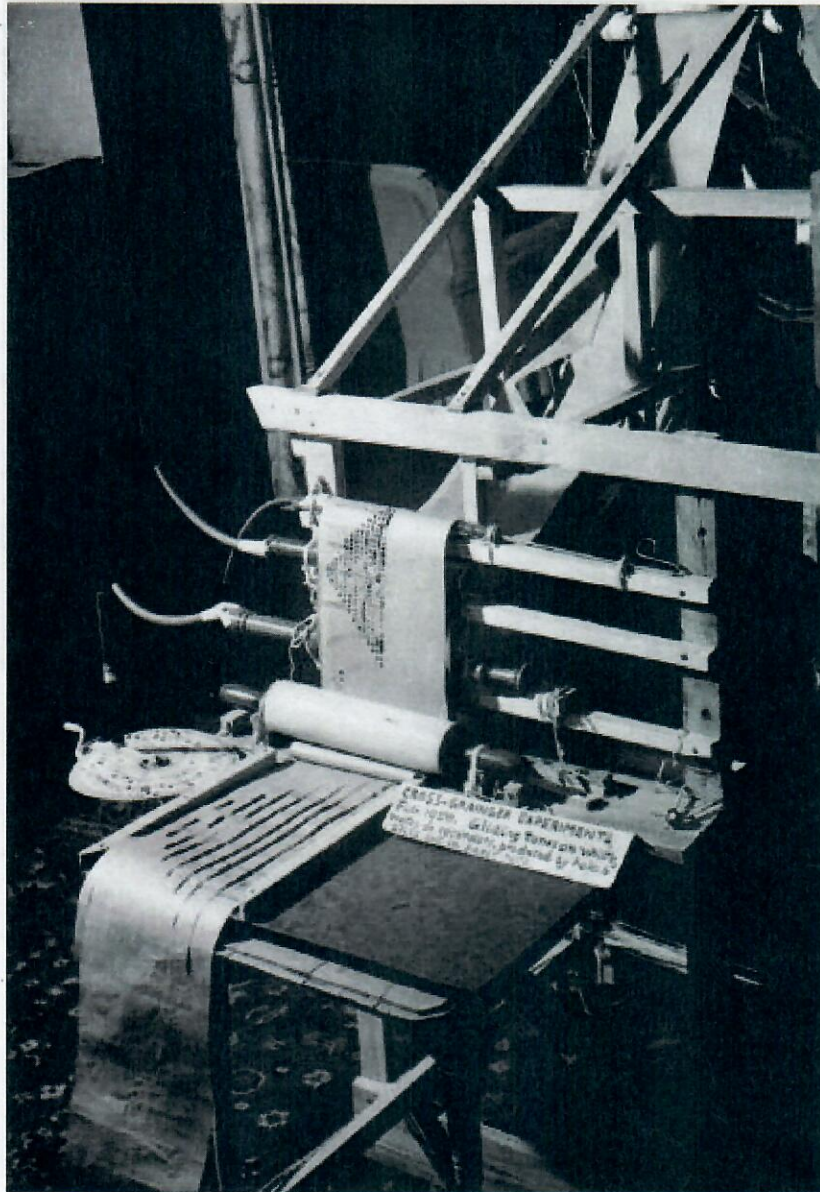
***The "Kangaroo-Pouch" Free Music machine in the  
Grainger's living room in 1952***

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The only remaining Cross-Grainger Free Music  
machine at his house in White Plains

Such was the nature of Grainger's continual work on the machines, that  
many were no sooner constructed than they were dismantled or  
reassembled. Several may have been lost or fragmented during  
transportation to his museum in the 1920s, or moved, misplaced or stolen in  
the years following his death in 1961. Burnett Cross published a description



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and drawings of the "Electric-Eye Tone-Tool" in the *Journal of the British Institute of Recorded Sound* in 1972, which has enabled versions of the machine to be reconstructed and used in live performance. The International Percy Grainger Society is now in the process of planning for the conservation of the only machine still in the Grainger house for eventual display as part of a permanent exhibition on Grainger's Free Music work. Visitors to the house will be able to see, hear and explore Grainger's ground-breaking work in the place with which it is intimately associated.

Only one operationally complete example of a Free Music machine, the "Kangaroo Pouch," is still in existence, on permanent display in the Grainger Museum in Melbourne.

Grainger's experiments with Free Music have recently been the subject of widespread academic reappraisal, and his role as a wholly original contributor to the development of electronic music is now recognized. Specifically, his experiments with the Free Music machines prefigured work by such composers as Daphne Oram at the BBC Radiophonic Workshop in the late 1950s. The Greek composer Iannis Xenakis would later perfect the use of graphic interfaces to create electronic music with his UPIC machine of 1977, a technique that is now in widespread use thanks to the development of the personal computer.