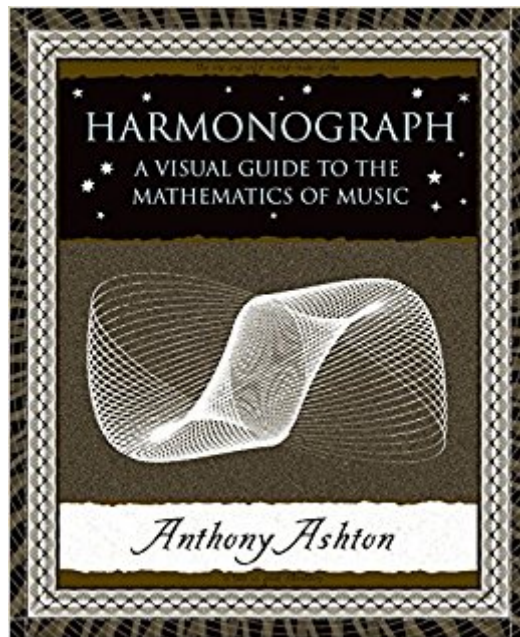




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# Harmonograph: A Visual Guide To The Mathematics Of Music (Wooden Books)



## Synopsis

During the nineteenth century, a remarkable scientific instrument known as a harmonograph revealed the beautiful patterns found in music. Harmonograph is an introduction to the evolution of simple harmonic theory, from the discoveries of Pythagoras to diatonic tuning and equal temperament. Beautiful drawings show the octave as triangle, the fifth as pentagram; diagrams show the principles of harmonics, overtones, and the monochord. Anthony Ashton examines the phenomenon of resonance in Chladni patterns, describes how to build a harmonograph of your own, and provides tables of world tuning systems. This inspiring book will appeal to musicians, mathematicians, designers, and artists alike.

## Book Information

Age Range: 8 and up

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Average Customer Review: 4.1 out of 5 stars 37 customer reviews

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## Customer Reviews

Anthony Ashton is an economist and journalist.

Gave this book as a Christmas gift to my son, and he likes it very much. Recommend this book to musicians and/or advanced music students. Fascinating!

You may read the other 4-star and 5-star reviews for the readers' love of the fascination of the Harmonograph, the beauty of the drawings it can produce, and the need for a really good computer

simulacrum of the thing. (I agree on that last point 150% and really it should be possible for an up-to-snuff programmer to emulate the device.) But for me the really valuable thing was the set of summaries concerning music theory, both in diagram form and verbally stated, in which I have found only a few errors via cross-checking (one is on page 53). Some reviewers have found those summaries extremely clear (as I have); some have found them hard to understand; one or two miss the deep connection between music and mathematics entirely, seemingly. What we have here mathematically is something one either understands or fails to understand. If you understand it, it will open worlds to you which you do not expect, even if you're already a talented and trained musician. Let me give you an example of such an opening. I am a specialist in the melodic rendition of Hebrew Scripture (I edited THE MUSIC OF THE BIBLE REVEALED by Suzanne Haik-Vantoura, also found as book and CD on ) and thanks to this book I grasped for the first time 1) how important it really is to get one's historical tunings right, 2) why the fundamental "diatonic" scale (the "just scale" as usually so defined by physicists) used in the harmonograph demonstrations, and it alone, fits Suzanne's inferences; 3) how this scale differs from the "Pythagorean scale" which, strangely, Suzanne seems to have confounded with just tuning in one of her written discussions of the tunings of antiquity. Now bear in mind, Anthony Anton says nothing about SHV's work. He does point out that the "Pythagorean scale" suits "plainchant and drone" (by "drone" he means "organum") while the allegedly later "diatonic scale" suits "polyphony and chords" But Curt Sachs pointed out a long time ago, in MUSIC IN THE ANCIENT WORLD: EAST AND WEST, that \*both kinds of tuning existed from earliest times in Mesopotamia and that the just (not the Pythagorean) tuning \*predominated. Recently discovered theory texts from that area are consistent with this: there was a basic tuning Pythagorean-style, but then this was fine-tuned to the diatonic style. I would point out to Anthony today were he still alive: this means some kinds of Ancient Near Eastern music was more like much later Western plainchant on a harmonic level and some kinds were more like even later Western music from the polyphonic era onward. That doesn't mean the melodies or heterophonies were developed the same way anciently as in the medieval and later West. But Anton and Sachs together made me realize: what I work with myself in SHV's thesis is perfectly plausible historically. Not only did people use just tuning long before Western polyphony, it goes as far back as records go - as far as the tuning Pythagoras learned when studying in Egypt and Syria. Those tunings have implications for accompaniment. Ancient musicians were \*not limited to octaves, fourths and fifths in accompaniment in all times and places, because they were \*not limited to the Pythagorean tuning in all times and places! Anyway, I digress. HARMONOGRAPH itself packs a lot into its small space, combining ethereal beauty, mathematical wonder, a light touch in writing, mechanical, historical and

human interest, simple but deep philosophical questions (a consistent feature of books by this publisher), and hidden surprises which can help anyone who is willing to follow evidence wherever it leads.

An interesting read about music theory as understood a long time ago. A harmonograph is a mechanical contraption to produce lissajous figures with pen and paper.

Very cool stuff. Kind of like a spirograph for music. If you're into both math and music you'll find this interesting. I'm really tempted to actually build a harmonograph from the designs in the back of the book.

Awesome book, arrived promptly :)

Great Product!!

Awesome resource. You must learn about the harmonograph.

Interesting, but in today's world of computer generated graphics, rather mundane.

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