

# AMBISONANCE

Instruments and Music by Cris Forster



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Acoustic music continues to evolve in the workshop, study, and studio of Cris Forster: builder, acoustician, composer, and musician. Kindred spirit to history's finest musical craftsmen (Stradivari, Cristofori, Sax), Forster created his ensemble of ten extraordinary acoustic instruments to facilitate the intimate exploration of sound. His work revitalizes the quest for new resonant sources, essential to human music making.

This anthology of compositions represents the bloom of Forster's lifelong devotion to his art. The eleven compositions chosen for this album are excerpted from two larger works and played by members of the Chrysalis Ensemble on

*Chrysalis I, Harmonic/Melodic Canon, Bass Canon,  
Diamond Marimba II, Bass Marimba, Just Keys,  
and Glassdance.*



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From *Song of Myself: Intoned Poems of Walt Whitman*

1. *A child said, What is the grass?* (6:45)

From *Ellis Island/Angel Island: A Vision of the American Immigrants*

2. *Blue Nights* (5:05)

3. *Dream Time* (5:59)

From *Song of Myself: Intoned Poems of Walt Whitman*

4. *The past and present wilt—I have fill'd them, emptied them* (3:04)

5. *The spotted hawk swoops by and accuses me* (3:43)

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7. *Farewell* (4:05)

8. *Far Away* (7:47)

9. *Lullaby* (3:58)

10. *Wild Flower* (13:22)

11. *The Harbor* (2:46)







# Ambisonance

Instruments and Music by Cris Forster

From Cris Forster's book *Musical Mathematics: On the Art and Science of Acoustic Instruments* (2010)—

More than thirty years ago, I coined the term *ambisonance*. From the Greek *amphi* as in amphibian, and the Latin *ambi* as in ambidextrous, these two prefixes literally mean on both sides. For me, figuratively, they mean *partaking of two worlds*. Ambisonance describes hearing a musical interval for the first time with the sudden realization that such an interval produces neither a consonance nor a dissonance. Experiences of ambisonance inspire new ways to hear, and then new ways to tune and to compose.

Ambisonance is a term for an auditory realm that exists between the two opposite poles of consonance and dissonance, a space that can only be appreciated by suspending judgment and listening with an open mind. This intriguing word is characteristic of its originator, a man who has honed the ability to move fluidly between disciplines—in other words, to *partake of many worlds*.

I have made the effort to understand music as an art and as a science. The instruments I have built and the music I compose for them are a direct acknowledgment of this two-fold nature of music. It is the fertile space between art and science that gives music an endless richness and variety.

By incorporating multiple fields of knowledge into his vision, Cris Forster has discovered fertile spaces for acoustic innovation. When he realized that the tunings and timbres he heard in his imagination could never be found on store shelves, he resolved to build his own instruments. This required mastering advanced woodworking and metalworking skills, then implementing them with a workshop full of sophisticated tools and machinery. It also demanded a comprehensive understanding of the physics and acoustics of vibrating systems. And so, through time, with scientific artistry, Forster has created an ensemble of ten incomparable musical instruments.

Experiencing new tunings is the principal reason why I build musical instruments. Scales and tunings cannot be intelligently discussed without numbers. So, without mathematics there will never be advancements on the subject of tuning, no matter how noble the aspirations to evoke change.

Throughout his lifelong study of music, Cris has focused on the dynamic experience of hearing and creating new tunings. There is a picture of him as a young man holding his first instrument, the Little Canon, his face radiating happiness. He tuned his initial just intoned intervals and scales on this humble instrument, which motivated his quest to develop an instrument capable of accurately measuring sound. After many incarnations, his Harmonic/Melodic Canon fulfills this goal. Finally, Forster has solved the centuries-old enigma of making a true canon that produces mathematically predictable length ratios on both sides of the bridges. And because this canon also functions as a fully resonant performance instrument, Forster has once again found fertile space, this time through the synthesis of acoustics, mathematics, and music.

Although ultimately concerned with tuning and building scales, Cris has never imposed tuning theories on others:

As a composer, I categorically reject the formulation, presentation, and documentation of theoretical scales as a means to establish legitimacy in the tenuous worlds of "microtonality" and "just intonation." As a student of art, I have always understood the frequency ratios by which acoustic instruments are tuned in the context of paint on a painter's palette. None of the artists important to me ever predetermined a painting based on a set of colors they would use or not use. I know of no color theorists among the painters I admire. As a composer, scale theory, or what ratios to tune and not tune over the span of an entire instrument, is the most intimate of all subjects, and as such, is my personal choice.

All of his ideas and motivations are impartial and meant for exploration.

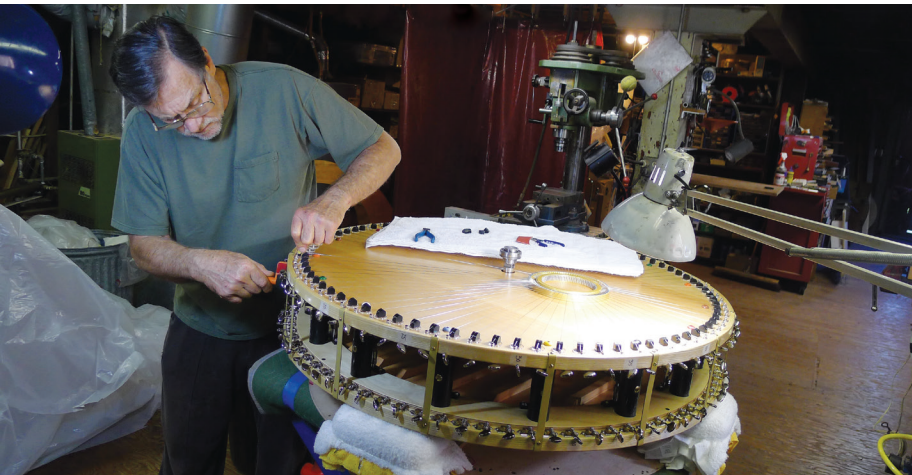
As I am free, I have left all free.

## Building New Instruments

In his workshop, Forster transforms wood, steel, and glass—among countless other materials—into unique musical instruments. On the pages that follow are photos and descriptions of ten instruments he has built to date. The recordings capture the sounds of all but three: Diamond Marimba I, Chrysalis II, and Simple Flutes.

Acoustic music is the most difficult music. Building musical instruments from the ground up is an expression of freedom and, therefore, an expression of imagination. (*Musical Mathematics.*)

Welcome to Forster's world: a place of serious freedom where imagination reigns, invention is the order of the day, and commitment to acoustic musical progress is the standard.





















## About Cris Forster

Cris Forster is a musical instrument builder, composer, musician, and scholar. Born in Rio de Janeiro (1948), he immigrated to Berlin (1954), then New York (1958), and later California (1961). Against the backdrop of this expansive worldview, he found the freedom to develop his prodigious imagination.

Growing up, Cris played the accordion; later, trumpet and piano. Although he was strongly drawn to music, he chose to earn a degree in history from UC Santa Cruz. But music's call was undeniable, so Cris pursued another degree in piano performance from Lone Mountain College, immersing himself in intensive practice. Supporting himself as a piano tuner and technician, he continued his studies, but soon began to chafe at the life of an interpretive artist. A deep restlessness led him to the works of Harry Partch and others who were building their own acoustic instruments to explore unconventional tuning systems. In a decisive burst of clarity, the young man turned down a full scholarship to graduate school, sold his grand piano, bought a band saw, and ventured out on his life's true path. His metamorphosis from historian to classical pianist to acoustic trailblazer was complete.

After building *Little Canon* (1975) and *Chrysalis I* (1975–1976) in San Francisco, Cris moved to San Diego where he worked as curator for the Harry Partch Foundation, a position he held from 1976–1980. During this time, he tuned, repaired, and rebuilt virtually all of Partch's instruments and performed as percussionist and string player with the ensemble. His own work continued with construction of the *Harmonic/Melodic Canon* (1976) and *Diamond Marimba I* (1978).

In 1982, Forster established the Chrysalis Foundation, a nonprofit organization structured to support his continued efforts to develop the field of acoustic music. The young man used his nonprofit status in an unusual way. Rather than asking for monetary donations, Cris went directly to industrial manufacturers to solicit parts, tools, and materials for the construction of his instruments. He met with resounding success. And so, throughout the eighties, Forster's orchestra continued to grow.

In a remarkable burst of inspired energy, he built the Glassdance (1982–1983); started (1983), then completed the Bass Marimba (1985–1986); and created the String Winder (1988), Bass Canon (1989), Diamond Marimba II (1989), and Just Keys (1990). In addition, he composed, trained musicians, exhibited the instruments, and staged public performances of his works.

Although he had contemplated the idea for years, Cris finally resolved to write a book. Little did he know when he began in 1990 that he would be at his desk for twelve years in service to the work: ten years to write the text (1990–2000), and two more to typeset, index, and copyedit the contents (2008–2010). *Musical Mathematics: On the Art and Science of Acoustic Instruments* was published by Chronicle Books in 2010.

During the interval between writing and typesetting *Musical Mathematics*, Forster focused his attention on finding a studio to house the instruments. In 2002, a group of Chrysalis Foundation patrons joined with him to lease an old warehouse in San Francisco and convert it into a rehearsal/performance space. In June 2003, the instruments were moved into their permanent home, the Chrysalis New Music Studio.





Almost fifty years since his pivotal decision, this renaissance man is still on his chosen course. At the studio, he composes, practices, trains musicians, and presents performances of his music. In the workshop, he builds (Simple Flutes, 1995; Chrysalis II, 2013–2015), restores (Chrysalis I, 2015), rebuilds (Diamond Marimba I, 2019), and improves all the other instruments. His carefully curated Instrument Construction Archive, filled with comprehensive manuals and boxes of tools and parts, will insure the longevity of these instruments. All of Forster's achievements are the result of a disciplined and uncompromised life. He aspires only to be a faithful servant of music and to share what he has learned with his fellow musicians. Through his words and his music, he invites us all to a deeper exploration of what it means to participate in the fine art of making music.

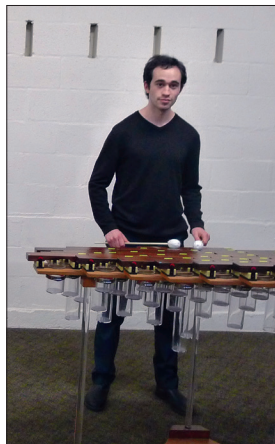


## Internship Programs

A studio full of unique acoustic instruments is missing one essential ingredient—musicians to play them! So, in 2005, Forster initiated the Chrysalis Foundation internship programs to recruit, audition, and train musicians. Individuals chosen for paid internships have the rare opportunity to study one-on-one with Cris, practice solo at the Chrysalis New Music Studio, rehearse with the ensemble, then play for live performances and recordings. All the interns featured on this recording participated in the 2012 program, which culminated with performances in December 2012 and a videotaping/recording session in March 2013.



*Isabelle Jotterand*



*Jacob Richards*

## Musicians

Two mallet percussionists, a violin player, and a pianist were selected from a group of auditioning musicians to become 2012 Chrysalis Interns. Already skilled players, they were all imbued with the desire to hear new tunings, learn new techniques, and adventure outside the bounds of their previous conventional musical experiences. After six months of intensive training with Cris and many hours of rigorous practice, these young musicians played their instruments with passion and precision.



*David Boyden and Benjamin Koscielak*

## Descriptions of Two Larger Works

### *Song of Myself: Intoned Poems of Walt Whitman*

*Song of Myself* is the title given by Walt Whitman (1819–1892) to the third book of his *Leaves of Grass*. This book contains fifty-two poems, from which Forster chose eleven for his 1976 composition. In his original score (first edition privately published in 1980, second edition in 2000), Forster describes his work:

*Song of Myself: Intoned Poems of Walt Whitman* represents a departure from the usual practice of combining instrumental music with the language of poetry. At the heart of this composition and its performance is the oral tradition of the storyteller who, since the beginning of poetry and music, has relied on a limited stage set and a small number of props in the fulfillment of his art. He lives today as then to inspire and ignite the imagination of his audience. He rejoices in the conviction of his performance because it is founded on clarity of speech, so that anyone may understand and sense the meaning of the few precious words of the poet as they are combined with the sounds of the instruments.

Standard musical terms (plainsong, chant, inflected speech, etc.) left me discontent in describing or directing the motivating forces of this musical setting of Whitman's poems. I finally chose the verb to *intone* because I sense within it a quality of restraint. Musicians approaching a set of great poems should always be restrained; the poetry won't get any better with their music. Intoning means having and developing a sensitivity for pitch. The inflections of the human voice are an indication of emotions, reflections, and ideas, not only on stage but everywhere. Intimately connected to and inseparable from pitch is the rhythm, the speed, timing, and accentuation of the poetic line. Only after many months of reflecting and having thoroughly memorized all the poems did I approach the question of sound and music because I wanted to preserve as best I could Whitman's internal voice.

Forster's performance of all eleven poems will be forthcoming on a second Micro-Fest Records release.

### *Ellis Island /Angel Island: A Vision of the American Immigrants*

Cris was born in Rio de Janeiro, immigrated to Berlin, and then to New York. Having endured two intercontinental immigrations by the age of ten, *Ellis Island/Angel Island* is a work based on his personal experiences, and on his research of historical texts, letters, and journals.

This work in progress is scored for the entire ensemble of instruments and a small company of dancers. All musicians and dancers will be present on stage throughout the entire performance. The interplay and synchronicity between them is crucial because *Ellis Island/Angel Island* is a narrative dance composition that tells the story of immigration from the perspective of those who came to America, and of those left behind. This intense and passionate work reflects—in music and dance—both personal and universal themes of cultural dislocation and assimilation.

Forster has written complete musical scores for all the compositions that comprise these two larger works. The score for *Song of Myself* includes detailed just intonation tuning charts for Chrysalis I and the Harmonic/Melodic Canon. His novel system of tablature notation indicates not only pitch and rhythm, but illustrates for the performer such practices as arpeggios, glissandi, Chrysalis wheel rotations, and string bending. The composer gives instructions for the voice to intone, recite, or speak. He often uses polyrhythm "...to counteract the 'natural' tendencies that could lead to a singing style..." but also concedes that sometimes "...the musician, mortal that he is, cannot help himself and sings a melody; the words must stay intact."

All the scores for *Ellis Island/Angel Island* may be viewed at the Chrysalis Foundation website, accompanied by the scenario for each piece. Forster's Just Keys scores use nonlinear key signatures which indicate that, although they look exactly like conventional scores, they are actually tablature scores. As such, trained musicians cannot survey the notated music and hear the harmonies and melodies in their inner ears without knowledge of the underlying Just Keys tuning. Similarly, all other compositions from *Ellis Island/Angel Island* are notated as tablature scores. However, because Forster uses familiar Western music notation, skilled musicians have minimal difficulties learning how to read these scores.

# Music by Cris Forster

Featuring members of the Chrysalis Ensemble

From *Song of Myself: Intoned Poems of Walt Whitman*

1. *A child said, What is the grass?* (6:45)

Cris Forster  
Chrysalis I and Voice

From *Ellis Island/Angel Island: A Vision of the American Immigrants*

2. *Blue Nights* (5:05)

David Boyden, Heidi Forster, Isabelle Jotterand, Benjamin Koscielak  
Bass Canon, Glassdance, Just Keys, Bass Marimba

3. *Dream Time* (5:59)

Jacob Richards  
Diamond Marimba II

From *Song of Myself: Intoned Poems of Walt Whitman*

4. *The past and present wilt—I have fill'd them, emptied them* (3:04)

5. *The spotted hawk swoops by and accuses me* (3:43)

David Boyden  
Harmonic/Melodic Canon and Voice



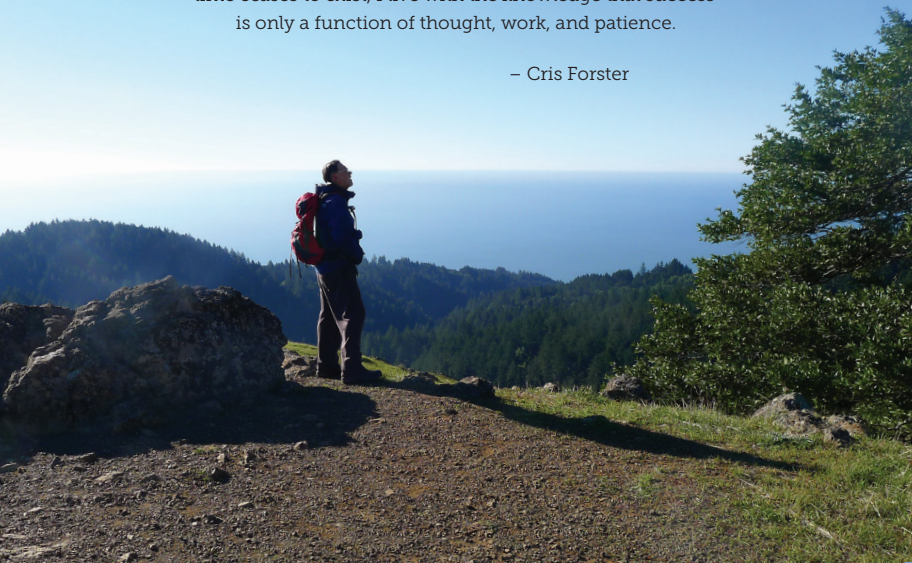
From *Ellis Island/Angel Island: A Vision of the American Immigrants*

- |     |   |         |
|-----|---|---------|
| 6.  | <i>Good-Bye</i>   | (4:16)  |
| 7.  | <i>Farewell</i>   | (4:05)  |
|     | Isabelle Jotterand<br>Just Keys   |         |
| 8.  | <i>Far Away</i>   | (7:47)  |
|     | Cris Forster<br>Just Keys   |         |
| 9.  | <i>Lullaby</i>  | (3:58)  |
|     | Heidi Forster<br>Glassdance   |         |
| 10. | <i>Wild Flower</i>  | (13:22) |
|     | Cris Forster and Benjamin Koscielak<br>Diamond Marimba II and Bass Marimba                        |         |
| 11. | <i>The Harbor</i>   | (2:46)  |
|     | Heidi Forster, Benjamin Koscielak, Jacob Richards<br>Glassdance, Bass Marimba, Diamond Marimba II |         |

I build because the tunings and timbres I want to hear  
do not exist on store shelves. Robinson Crusoe built because  
he had no choice. And yet, his creations also had no critics,  
and so his imagination became his life.

Often when I hike through forests or climb mountains, I am  
reminded that only man knows what time it is. When I enter  
Crusoe's world, or when in building an instrument  
time ceases to exist, I live with the knowledge that success  
is only a function of thought, work, and patience.

– Cris Forster



# Credits

**Producers:** John Schneider and Heidi Forster

**Recording Engineer:** Cris Forster

**Recording Editing and Mastering:** Scott Fraser, *Architecture*

**Liner Notes:** Heidi Forster

**Liner Notes Contributions:** Cris Forster

**Album Design:** Juliana Gallin

**Photographs:** Norman Seeff, Front Cover (1981)

Will Gullette, pp. 6, 10, 12, 14–16, 20, 22, 24, 26–28

Cris Forster, pp. 8, 18, 23

Heidi Forster, pp. 2, 5, 31, 32, 36, 38, Back Cover, Inside Cover

Eli Noyes, Booklet Cover, p. 13

**Recordings:** Track 1, September 1980, San Diego, CA

All other tracks, Chrysalis New Music Studio, San Francisco, CA

Tracks 2–7, 10–11, March 2013

Tracks 8–9, December 2005

All royalties go directly to **The Chrysalis Foundation**.

[www.chrysalis-foundation.org](http://www.chrysalis-foundation.org)

[www.youtube.com/user/CrisForster/videos](https://www.youtube.com/user/CrisForster/videos)



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