

Keiko Abe's Quest

Developing the Five-Octave Marimba

BY REBECCA KITE

HAVE HAD MANY DISCUSSIONS with Keiko Abe about marimba sound, design and construction, but I had never before heard the full history of her work with Yamaha in designing the five-octave, YM 6000 marimba. This article is a compilation of information from an interview I conducted with Abe in December 1996 during a visit to Japan, from various unpublished articles written by Abe, and from an article by Yamaha Corporation published in a record album booklet.

Keiko Abe was born in Tokyo to a family of distinguished doctors and businessmen. Her grandfather was one of several people who first brought grand pianos into Japan during the Meiji period (1868–1912). As a child Keiko studied piano, composition, xylophone (in 1947 the xylophone was designated as a musical instrument to be used in elementary-school music programs in Japan) and many percussion instruments. At the age of twelve she heard a performance by the Lecours Mission group (from the U.S.) that included music on the marimba—the first marimba ever brought to Japan. From that moment, the marimba became her instrument of choice for her personal musical expression.



After graduation from music school, Abe organized the Xebec Trio, a marimba trio with two other young women, which was quite successful commercially, playing light classics and popular music. In addition to performances, they recorded albums of popular songs.

Increasingly, Abe felt limited by this music. She disbanded the trio and turned to the music that she found most sympathetic to her own musical spirit, contemporary “serious” composition. Her visionary quest began in earnest. In 1962 she joined the Tokyo Marimba Group. Because of the limited repertoire for the marimba, Abe requested original marimba music from various composers. That year saw the first performance of “Conversation” by Akira Miyoshi.

The period from 1962 through 1968 was one of increasing activity. Abe performed regularly with the Nippon Hoso Kyokai (Japan Broadcasting Corporation) symphony as a mallet specialist. She became quite active as a recording artist (thirteen albums in five years), had her own NHK television program (in the school programs division) for instructing the xylophone, and was heard each morning on Radio Kanto on the program *Good Morning Marimba*.

In 1963, the Yamaha Corporation decided to begin the research involved in designing and manufacturing marimbas. Shigeo Suzuki, Yamaha’s engineer for marimba research, began this project by interviewing professional marimbists in Japan to find out their ideas about marimba design. After these meetings and many discussions, Yamaha decided that Abe’s concept of marimba sound was the clearest and most useful. It was also the most original. They chose Keiko Abe as their marimba design consultant.

Abe had very specific musical requirements for the marimba. She wanted an instrument with impeccable intonation, capable of a wide dynamic range, with excellent projection, and a clean brilliant sound in the high range and a rich mellow sound in the bass. She foresaw a future where the marimbist would play in ensembles equally with other instru-

ments, so the marimba must have a clear, focused sound with pure intonation and timbre—not the sound of ethnic and folk instruments. She advised Yamaha not to copy the existing instruments, but to build a completely new instrument with these musical goals in mind.

In 1968, Abe gave her first full solo marimba recital of contemporary music, performing on a Musser four-octave marimba. This concert was also the first where she used two-tone mallets for “Time” and “Torse III” (mvts. 1, 2, 4). Abe had worked with Hidehiko Saito (percussionist with the Japan Philharmonic) to come up with a mallet design that worked.

Meanwhile, Yamaha was working on its design. Abe spent many hours meeting with Suzuki, trying out different bars shapes and harmonic tunings. In 1971, Yamaha finished the YM 4500 four-octave marimba, which Abe began using for concerts. (Today, the model number for Yamaha’s four-octave instrument is YM 4000.)

Through the 1970s, Yamaha’s development of marimbas with larger and larger ranges was the direct result of Abe’s musical ideas. She believed the middle and high range of the marimba is supported better by having a rich bass. She requested that the resonators be individually adjustable to get the best sound in different concert halls. As her musical ideas developed, she knew she needed a low-F instrument. This instrument was completed in 1973, and became Abe’s standard performance marimba.

This was the marimba Abe brought to the United States in 1977 for her first U.S. tour, which was organized for her by Michael Rosen. Abe was able to bring Japanese marimba music to thirteen different universities and to PASIC ’77 in Knoxville. The marimba she used was a prototype labeled YM 5000, which was the precursor to the five-octave YM 6000 in frame design and bar size. (It was not the same design as the current YM 4900 four-and-a-half octave marimba.)

Some of the processes involved in designing the YM 5000 marimba for Keiko



Abe were described by Yamaha in a short article that was included in a double-LP album titled *Keiko Abe Reveals the Essence of the Marimba* (Denon GL-7001/2, 1976). Following are excerpts from that article:

[T]he Marimba for Keiko Abe was designed to incorporate the following features:

1. Deep, full-bodied resonance in the lower registers.
2. Clear, bright, penetrating tones in the middle and high registers.
3. Volume and carrying power sufficient to fill the largest auditorium.
4. Appearance befitting the concept of grand marimba music, unique, impressive dignity.

It is not easy to design such an ideal instrument. In the first place the various elements such as resonance, tonal quality, volume, and appearance may not each be considered separately, for the design approach must simultaneously comprehend both the physical and psychic aspects attendant upon the developing of a great new instrument.

In drawing up the specifications for Keiko Abe's Marimba, some parts were relatively easy to decide upon, while

others took much time. It was necessary to find common meeting ground, acceptable compromises, for certain parts which mutually limited each other's freedom of design. For example, in designing the tone bar of a low register tone, to make it ideally large from the standpoint of acoustics would make it too unwieldy functionally. To make the tone bar thick for sound power would necessitate a deeper tuning hollow, which could make the effective thickness of the block so thin as to invite splitting under a forceful mallet blow. In designing a tone bar, still other factors, such as sound emitting efficiency and resonator response must also be considered.

A simplified technical explanation of the process involved in designing and making a tone bar may be interesting:

1. The tone bars have been lengthened, their mid sections thickened. Within the limits of leaving leeway for second harmonic tuning, the thickness of the bars over the entire tone range was decided intuitively, using a "sixth sense" gained from years of past experience.

2. Each bar was suspended by a string attached exactly at a node of the bar, and all sources of impediment to

free vibration were removed.

3. Throughout the entire tonal range, the cross-section area was increased, and the attainment of sound volume as well as full-bodied mellowness was aimed for.

4. In consideration of the listening characteristics of the human ear, the pitch of the low register tones was slightly lowered, while those of the high register were tuned, in graduated degrees, slightly higher.

In the final tuning of the tone blocks, infinite care was taken to adjust for clean first and second harmonics in relation to the fundamental frequency. This step is especially necessary to obtain improved sound carrying power.

As Abe performed on the four-and-a-half-octave instrument, it became clear to her that she needed additional low-range pitches for her music. The design demands of a five-octave instrument meant wider bars and a new approach to mallets and performance. Abe was not completely sure that the five-octave instrument would be practical, but in 1980 she asked Yamaha to make an extension to the existing four-and-a-half-octave instrument to test the idea.

DON'T HEAR HALF THE STORY

SUBSCRIBE TODAY AND GET RHYTHMUSIC MAGAZINE AND RHYTHM ON DISK CDS EVERY MONTH!

SUBSCRIBE NOW **11** ISSUES AND **11** CDS

A WHOLE YEAR OF RHYTHMUSIC MAGAZINE AND CDS FOR ONLY \$49.95
Only RhythmMusic Magazine comes to you each month with an exclusive CD of the world's hottest sounds. Each limited-edition collector's CD, Rhythm On Disc, delivers the RhythmMusic experience to your ears. From the latest Afro-pop to timeless Indian ragas, fiery salsa to cool Celtic balladry, righteous reggae to the healing music of Native American. Let RhythmMusic Magazine be your guide to global culture with the world's artists, music news, record reviews, food, film and travel.



RHYTHM ON DISC IS AN EXCLUSIVE PRODUCTION OF RHYTHMUSIC MAGAZINE AVAILABLE TO OUR SUBSCRIBERS. EACH FULL LENGTH CD IS BRIMMING WITH TRADITIONAL AND CONTEMPORARY WORLD MUSIC, SELECTED AND SEQUENCED BY THE PUBLISHER OF RHYTHMUSIC MAGAZINE. HEAR TOMORROW'S GLOBAL SMASHES TODAY WITH RHYTHM ON DISC.

- ONE YEAR SUBSCRIPTION WITH CDS: \$49.95
- ONE YEAR SUBSCRIPTION WITHOUT CDS: \$29.95
- TWO YEAR SUBSCRIPTION WITH CDS: \$94.95
- TWO YEAR SUBSCRIPTION WITHOUT CDS: \$54.95
- OVERSEAS/FOREIGN SUBSCRIPTION: \$79.95 (CD AND MAGAZINE FOR ONE YEAR)
- CANADA/MEXICO SUBSCRIPTION: \$59.95 (CD AND MAGAZINE FOR ONE YEAR)

Please send me RHYTHM ON DISC compilations beginning with the next issue. I have enclosed payment.

Check or money order payable to:

RhythmMusic
928 Broadway, Suite 1206,
New York, New York, 10010.

RhythmMusic is published monthly and combines January and February into a special double issue. Rates subject to change.

TO PLACE A CREDIT CARD ORDER CALL:

1-800-464-2767

OVERSEAS ORDERS: 212.253.6271

Having a five-octave range gave Abe the energy and inspiration to write her own compositions, such as "Variations on Japanese Children's Songs," "Wind in the Bamboo Grove" and others. Abe toured the United States in 1981 using the four-and-a-half-octave marimba with the extension, performing at colleges and universities, Carnegie Hall and PASIC '81 in Indianapolis.

The experiment with the extended range was a success. Abe asked Yamaha to build a five-octave instrument. She also wanted a slightly richer, warmer sound in the new marimba. Working again with the engineers, Abe asked for the bars in the lower end of the marimba to be longer and wider than those of the YM 5000. The low F bar on the YM 5000 was 55 cm long, 6.0 cm wide; on the new YM 6000, the length became 57 cm and width 7.5 cm.

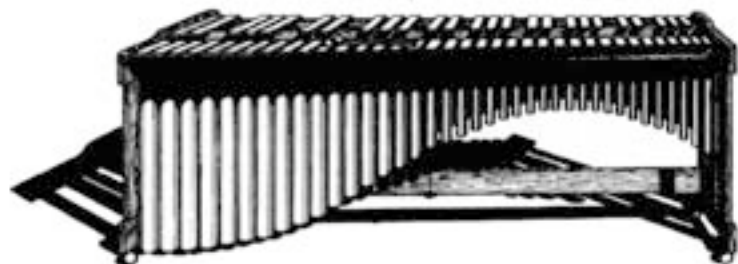
Yamaha finished the design of the YM 6000 in 1984. Abe used this new instrument in her 1984 tour of the U.S., where she performed at PASIC '84 in Ann Arbor. Since that time, the YM 6000 has been her standard performance instrument.

The five-octave marimba has become a standard that is used by many composers and marimbists today. After the YM 6000 marimba became available from Yamaha, a number of other manufacturers developed high-quality five-octave marimbas. Today, marimbists not only have a wide variety of music for an instrument with a five-octave range, but may select from instruments made by such companies as Adams, DeMorrow, Mallettech, Marimba One and Kori.

Abe says: "This day, I believe that if marimbists want to have serious concert activity, they must use a five-octave marimba. For a range lower than five octaves, very special bass mallets are necessary. For a higher range, a xylophone is already available. I believe for the near future that five octaves will be the standard marimba range."

Rebecca Kite lives in St. Paul, Minnesota where she performs as a marimba soloist and as a freelance percussionist. She teaches marimba and percussion at the University of St. Thomas and Hamline University. She first met Keiko Abe in 1981 and since then has studied and performed with her. Most recently, Abe invited Kite to appear as a marimba clinician at Toho Conservatory. PN

marimba one®



Nancy Zeltsman: "I've never felt 'at home' on any marimba the way I do on a *marimba one*. Their particular timbre, the evenness of resonance across the keyboard, the range of articulation and colors I can draw from them, and the depth of the fundamental tone are all unparalleled. The shape and spacing of the bars is narrow and sleek enough to accommodate wide interval reaches within one hand which are impossible on some other makes. The five-octave model which I recommend may be enormous but still feels embraceable."

"The workmanship is absolutely extraordinary. Besides being a musical instrument, *marimba one* marimbas are wood and metal sculptures to behold! The frame design is unique to *marimba one*: absolutely sturdy, with the simplest assembly imaginable. There is no more courteous or honestly-run business than theirs. I see no other choice than *marimba one*!"

A partial list of institutions which own a *marimba one*:

Eastman School of Music	Los Angeles Philharmonic
The Juilliard School	University of Miami
The Boston Conservatory	University of Akron
Berklee College of Music	University of Illinois - Urbana
University of Michigan - Ann Arbor	Southern Methodist University
University of Missouri at St. Louis	University of Chicago
Concordia College	Old Dominion University
Bowling Green University	University of Houston
San Diego State University	San Jacinto College Central
Oklahoma City University	Towson State University
Radford University	University of Colorado - Boulder
University of South Carolina	College of St. Rose
Lawrence University Conservatory	University of Nevada - Las Vegas
Susquehanna University	Harvard University
University of Massachusetts	Valley City State University
Glenville State College	Texas Tech University
San Francisco Symphony	Baldwin-Wallace College Conservatory
Friends University	Stanislaus State University
Eastern Michigan University	Juniata College
University of Arkansas	University of Oklahoma
James Madison University	Rowan College of New Jersey
University of Tennessee	U.S. Coast Guard Band
Virginia Commonwealth University	Geneseo State University
University of Dayton	University of Missouri Conservatory of Music
Queens College	Truman State University
University of Montana	Rice University - Shepard School of Music
University of British Columbia	Indiana University of Pennsylvania
De Paul University	University of Southern Mississippi
Interlochen Center for the Arts	San Francisco Conservatory of Music

RON SAMUELS
P.O. BOX 786 • ARCATA, CA 95518
PHONE (888) 990-6663 FAX (707) 822-6256
EMAIL percussion@marimba1.com
<http://www.marimba1.com>