

# Good vibrations

When Mark Deutsch set about creating a new bass instrument complete with 29 sympathetic and 4 drone strings, he had little experience of instrument making. He tells **Tina Frost** what it took to design and build the bazantar

DOUBLE  
**Bassist**

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ONE OF THE HIGHLIGHTS OF THE 1999 INTERNATIONAL Society of Bassists (ISB) Conference in Iowa City was the introduction of Mark Deutsch's new bass instrument, the bazantar. This 1983 five-string bass by Horst Grünert fitted with 29 sympathetic strings and 4 drone strings is tuned microtonally and has enormous resonance. The delicate, slightly delayed response of the sympathetic strings creates a sense of breathing and pulsing life, while the possibility of many simultaneous voices, colours and textures within an organic whole gives it an orchestral quality, but at the core it retains the deep fundamentals and expressive richness of the bass.

Mark Deutsch, its 39-year-old inventor, has been a professional musician since the age of 12. With a degree in classical contrabass performance from the St Louis Conservatory of Music, Deutsch has a breadth of experience, encompassing classical, jazz and global folk ensembles. He plays and teaches double bass, electric bass, sitar and guitar, and has led jazz, blues and folk groups. Deutsch's interest in Indian music led him to study the underlying mathematics of untempered tuning systems, and while doing this he discovered that these nonlinear patterns are found universally in the natural world. He had no idea at this stage, however, that he would invent a new instrument.

The story of the bazantar begins in 1993 when Deutsch was playing in the Illinois Symphony Orchestra and studying the sitar with a North Indian sitar master. His teacher told him that it takes Western musicians many years to learn to hear the intervals used in Indian music. Wanting to speed up the learning process, Deutsch figured out the harmonic ratios involved and found a programmable electronic tuner that could reproduce them. He also set up recordings of Indian music to play all night while he slept, 'to get the pitches into my head'. He was especially drawn to the *sāraṅgī*, a bowed instrument with sympathetic strings.

One night, while *sāraṅgī* music was playing, Deutsch dreamt that he was playing his bass, but the bass had sympathetic strings. He promptly forgot the dream, but was haunted by the idea of a bass with sympathetic strings. 'I thought I'd read it somewhere and I kept trying to remember what magazine I'd seen it in.' When he heard the *sāraṅgī* music again, he remembered having the dream. The idea grew on him and eventually he decided to try to make such an instrument himself.

Experimenting with designs and materials gradually took over Deutsch's life until he quit all other projects. His conception of the sound he wanted grew as he worked, and by the time he had the final design, Deutsch could hear the instrument clearly in his mind: the interplay of the different types of strings creating the sense of a giant being breathing in and out, the depth and clarity of resonance, the simultaneous dark and bright colours, the strong warm vibratory quality and the shimmering overtones. The final version of the bazantar was completed in the autumn of 1997 and the design was patented in March 1999.

The greatest advantage Deutsch had in approaching the design of the bazantar was his naïveté about instrument making: 'I didn't know what couldn't be done.' The luthiers he approached told him he was crazy, so he hired craftsmen to help build his designs, working in the back room of a local guitar repair shop. In the process he learnt to work with wood, metal, bone and carbon graphite, to carve *javari* (sitar) bridges and to understand aspects of engineering mathematics.

The idea of a bass with sympathetic strings may seem simple, but the design presented serious engineering problems.

Attaching the strings directly to the bass, as on the sitar, created too much tension on the body of the instrument, limiting the size and number of strings that could be used. This approach also failed to produce the quality of resonance Deutsch was seeking. In his final design, described by Deutsch as 'energy efficient and tension reducing', the sympathetic strings are contained in a carbon graphite housing, attached to the bass at the neck-block and tailpiece. This design contains the strings' tension within the housing, while allowing their vibration to pass directly into the bass through a three-tiered bridge that sits on the face of the instrument; the normal bass bridge is modified to support four additional drone strings.

Deutsch uses Corelli strings on the bass and a variety of metal strings (sitar, harp, guitar and cello) for the sympathetic and drone strings. Strings are wound on Grover four-to-one planetary gear tuners, designed for fine tuning, with milled extensions. For his initial compositions, Deutsch tuned the bass D'-A'-D-A-d, using an E string tuned down for the low D, with G and C strings tuned up for the top A and D; the drone strings are tuned similarly (d-a-d'-a).

The 29 sympathetic strings are tuned to six to seven notes repeated in several registers over four octaves. These notes are chosen from the 66 harmonically resonant divisions of the octave, which include the pitches used in Indian music. These harmonic divisions produce notes that are in the overtone series of the tonic, so the strings vibrate with less interference than they would if tuned to tempered notes. (Tempered notes are necessarily different from the natural harmonics and therefore have a somewhat muted effect.) The result is an instrument that is highly resonant, with a richness and complexity that sounds 'like many instruments woven into one surprise,' in the words of Princeton University's Pulitzer-Prize-winning poet Yusef Komunyakaa, with whom Deutsch performed at the Chicago Humanities Festival last October.

Deutsch has developed different techniques for playing the bazantar than he uses for classical or jazz bass. His pizzicato techniques are expanded from those used on the sitar, with three and sometimes four fingers performing different functions simultaneously. Rather than striking the string, 'I feel as if I am pulling the tone out,' Deutsch says. Because the sympathetic strings respond best when related notes are played accurately, 'the instrument seems to comment on how well it is being played,' he explains.

Throughout his musical career, Deutsch has been interested in many types of music: 'I love classical music, with its panoramic scope, organic structures, colour, texture and dynamic complexity. I love the emotional purity of folk music.' He's also played a lot of jazz and likes 'to create in the moment and in relationship with other's ideas, especially in free music. What drew me to Indian music was its resonant harmonic tonal scheme, its capacity to evoke a sense of timelessness, and the ability to create spontaneously within non-cyclical harmonic structures. I conceived of the bazantar as a vehicle to create the music I wanted to hear.'

For his own compositions Deutsch uses a tonal scheme that draws from his musical and life experiences. In the Indian musical system each note has a particular character, such as joyful, melancholy, heroic, and so on. In *Fool...*, which he recorded in 1998 [see reviews, *Double Bassist* no.11, Winter 1999], Deutsch's intention was to describe a heroic journey, such as that of the soul towards enlightenment. The

composition consists of eight parts and for each of the pieces he tuned the sympathetic strings to pitches that form what he calls 'a web of relationships' that can convey the emotions, states and ideas he wanted. Deutsch calls his compositional style 'composed improvisation': the music is improvised within architectural, thematic and harmonic structures which are determined in advance.

Deutsch's interest in untempered tuning goes beyond the beauty of the sound. What he calls 'harmonically resonant' tuning has a physiologically healthy effect because the sound vibrations are lined up in a way that resonates naturally in the body. The use of these exact relationships conveys musical meaning with great clarity. Deutsch believes that the mathematics of the overtone series is deeply encoded in the structure of the universe, and human beings recognise this on an unconscious level. He adds that some people's response to his music involves intense emotions, meditation, mystical visions or deep relaxation.

The bazantar has taken Deutsch in unpredictable directions: He was recently approached by New York free jazz musicians J.D. Parran and Steve Haynes, wind and brass multi-instrumentalists who had heard his CD and wanted to play with him. They came to St Louis and did a concert with him and the poet Shirley LeFlore. Deutsch's experience surprised him: 'I thought this was not what I'd built the bazantar to do, but when I listened back to the tapes I could hear real magic.' Now he is forming a group with these musicians, a Sufi percussionist and a *sāraṅgī*/bassist/cellist, and they plan to tour the West Coast this autumn and play at the Chicago Humanities Festival next year.

Deutsch has just started to explore the range of expression possible with the bazantar, including new tuning possibilities and performance techniques. He has been trying out various pieces (*Amazing Grace* and Thelonius Monk's *Round Midnight*) and is working on Bach's Second Cello Suite. He's planning a solo composition about bigotry, 'how the ego sets up barriers through fear'. In future he hopes to play with other musicians who share his interest in vibrational relationships, to explore the therapeutic applications of the bazantar and to play in ancient spaces, such as cathedrals, that were designed with acoustic and spiritual principles in mind. Eventually he plans to manufacture bazantar attachments for both bass and cello. Deutsch also has ideas for building a sitar with greater resonance and tuning accuracy, using the techniques and principles he learnt from the bazantar.

Designing the bazantar and bringing it into being required persistence and faith beyond anything Deutsch could have imagined. It also stretched his resources to the limit; in fact, he ran out of money before completing the CD. By that time the sound engineer and producer were so committed to the project that they volunteered their time to complete it. 'I am so amazed and grateful at the level of support I have received from the people I've worked with,' Deutsch comments, 'the whole project would have faltered without them.'

'If you want to do something, if you have some idea, don't be too worried about what other people think. Everybody in their life has some really good ideas, but it takes both perseverance and faith to make it happen.' **DB**

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