

“I always sang, ever since I was a teenager,” explains Ellen Fullman as she prepares her fingers by dipping them in rosin that has been dissolved in isopropyl alcohol. “I’ve kept at it even as I developed the Long String Instrument. And I have always had a fascination with really simple pop music, just certain kinds. It has to be very clear ... almost austere.”

Growing up in Memphis, Tennessee, Ellen Fullman took every opportunity to hear the regional forms of rock and Delta blues. At the tender age of one, she was even blessed with a kiss from one of Memphis’s most famous residents, the King of Rock and Roll himself, Elvis Presley. So it seems perfectly natural that she would come full circle with *Ort* (Choose Records), a record of straightforward rock and folk songs that combines the passions of her youth with a mature expression of her life’s work on the Long String Instrument (LSI).

Ort (the German word for place) is a collaborative effort between Fullman and Jörg Hiller, a Berlin-based musician who goes by the name of Konrad Sprenger. Hiller played the LSI for the first time during a visit to Fullman’s studio, and she knew immediately that this would be a winning partnership. “Jörg has a wonderful feel for tuning and craftsmanship,” she says. “He’s an incredibly developed all-around artist. He loves working in the acoustic realm, and his sensibility really matches mine.”

Fullman, who entered the world of new music by way of the visual arts, is best known for her intricate explorations of drones using the LSI. An important ingredient in her work is just intonation, a tuning system derived from the naturally occurring harmonic series. Just intonation offers intervals with a greater purity than the commonly used equal temperament system, which provides 12 equidistant notes per octave. It also provides a wide array of intervals that sit between the notes on the piano, with endless degrees of consonance and dissonance foreign to most Western ears. Yet such tuning systems have been used by musicians for thousands of years, and a number of twentieth-century composers — including Harry Partch, Lou Harrison, Terry Riley, Wendy Carlos, Pauline Oliveros, and LaMonte Young — have been seduced by the sonic beauty and mathematical integrity of pure intervals.

Whole-number ratios — such as 3/2 for a perfect fifth and 5/4 for a major third — are commonly used to describe harmonically derived notes and intervals, and Fullman’s descriptions of the LSI are peppered with these terms. “It’s a chromatic scale,” she explains, pointing to the array of strings streaming past her. “The 1/1 is on that side, and this is the 2/1, the octave. I organized it in a chromatic sequence using the positive seven limit. See where that blue tab says 7/5, and it picks up again at 3/2? I put the subharmonic sevens closer in, because if I inserted them into the chromatic scale, I couldn’t reach chords.”

The just intervals are reinforced by the harmonics coaxed from each string as Fullman plays. In performance, she walks between the wires with a regulated pace, her hands stretched out at waist level beside her so that her fingers gently touch the strings. The speed of her steps and the pressure of her fingertips on the wires are important to the quality of the sound produced, and she times her movement between nodal points on each string so that harmonics speak at exactly the right moment. She has the ability to play 10 strings at a time, phrasing differently with each digit, using downward and sideways pressure to increase intensity, and skimming lightly over the strings to get ethereal wisps of sound. Breathing, focus, and pacing are important as she navigates her way through this complex web of harmonics.

“The potential of choreographing location is so interesting to me. I mean really choreographing it,” she says. “There is so much detail I would like to go into. The whole point has to do with the physics of sound and what happens in space with pitch combinations and textures.”

The unique sound of the LSI comes from its design and how it is played. The strings, which are attached perpendicular to the wooden resonators and run parallel to the floor, vibrate as Fullman runs her rosined fingers along the top. She notes that the strings on other acoustic instruments — for example, the guitar, koto, violin, and piano — run parallel to their resonators.

The resulting timbral characteristics of the LSI’s longitudinal mode of vibration are unique: each whole-number partial above the fundamental is nearly equal in volume. This gives the LSI a harmonically rich sound and allows Fullman to easily accentuate the partials as her fingers pass over the many nodal points along the wires.

“That’s what I use compositionally,” she says, continuing to rosin her fingers in her sunny loft in Berkeley, California. “That’s what I’m doing with this instrument. It’s a matrix, and there are these events happening along the way. And not just on one string: when you’re playing a chord, those events happen on different locations on each string. My job is to internalize a map of those points and bring them out as much as possible by how I’m touching the strings.” Her fingers thoroughly coated, she begins playing, and the studio fills with sound as the room becomes a massive resonator.

It’s no surprise that taking the LSI on the road presents a number of challenges. Fullman is at the mercy of each performance space, because it determines the dimensions of the instrument, and she must adapt the length and tension of the strings, as well as the tessitura in which she’ll work.

“I don’t just tune it to the length of the room,” she explains. “I’m always in the key of A. The room either gives me more range, or, if a room is too short to

continue down to the fundamental of an octave, I bounce it up to the octave above. Because all of the overtones are present, voicing doesn’t have that much bearing on the composition. So if I bumped a frequency up an octave, it doesn’t really change it that much, because you still have all this same information in the upper harmonics repeating itself.”

Her Berkeley studio is only long enough to give her the upper cello range. “This installation is 42 feet,” Fullman says. “To get a bass range, I need 100 feet or so. Eventually, I will need to get a bigger space, because, in order to work out a big piece, I have to have multiple installations.”

This interview took place as she was preparing for a multimedia performance in Seattle, which would allow her to set up more than one LSI, including a full-length version. “This is 31 meters, which is about 100 feet,” she says, pointing to a diagram of the Seattle venue. “And then there’s this smaller installation: that’s only nine meters. I’m going to have some helpers play the pedal-tone stuff, because the bass frequencies are more forgiving. I haven’t been teaching anyone, lately, how to play the LSI, because I haven’t been set up for it. It’s a big deal to me to get the sound that I want. And it’s difficult, it requires practice.”

Until the release of *Ort*, the majority of Fullman’s compositions used expansive time frames that were subdivided into sections based on distance, timing, or both. A good demonstration of this is Fullman’s other new release for 2004, *Staggered Stasis* (Anomalous Records), which documents recordings from the mid- to late-’80s, when she was based in Austin, Texas.

The closest thing to song-length pieces in her discography are the etude-like compositions on her New Albion release *Change of Direction* (1988). Although the CD’s title alludes to the method of playing the LSI, where the performer walks back and forth, Fullman notes that the release was literally a change in direction of her work — a distillation of ideas into a concise collection of pieces. In retrospect, *Change of Direction* is like an attractive rest stop on the longer journey that led to *Ort*. Not only have the decades Fullman has spent developing a language for the LSI finally begun to pay off, but getting her songs — two of which have haunted her for nearly 20 years — recorded proved to be a cathartic experience.

“From time to time artists have told me ‘Your songs are so cool. You should do something with them,’” Fullman explains. “I just never knew what to do, other than little performance-art pieces here and there. When I met Jörg, something clicked. I thought ‘Okay, now’s the time to really get this done,’ because it always hung over my head that I’d never finished it. My songs always had potential, but they were never produced in such a way that they would come across.”



WITH STRINGS ATTACHED

Ellen Fullman

designed the Long String Instrument to explore her interests in drones, harmonics and just intonation. Now she's released a CD that puts the spotlight on her songwriting skills. Gino Robair and photographer Elise Ryerson met with Fullman at her Berkeley studio.

Around the same time, Fullman settled into a style of vocal delivery that suited her abilities and musical interests. "There were certain songs — especially 'In the Mist' — where I could never get the sound I had in my mind into the vocal part," she says, "But it was something about being over 45." To demonstrate, she does what sounds like an impression of Tom Waits, then laughs. "It was like 'Okay, I'm haggard now, I can do the haggard voice and really do it, you know?'" Fullman's way of mixing spoken word passages, open-mouthed whispers, and sung parts, combined with her soft, southern accent, gives *Ort* a fresh, down-home quality.

She likes to point that she has no formal training in music, but that's not strictly accurate. Fullman studied classical Indian singing with Anita Slawek in the mid-'90s, which improved her vocal technique and deepened her awareness of the subtleties of pitch. The concept of getting the most out of a single sung note resonated with her and, ultimately, seeped into her work with the LSI. Subsequently, she decided to lower the tuning of the LSI's fundamental pitch from C to A, which she notes is the basic tonal center for female vocalists in Indian music.

It was a rapid-fire chain of events that finally led to the realization of her songs. "The truth is that I needed surgery when I was in Germany, and that was scary: I didn't know what I was going to do. Arnold Dreyblatt called — I feel like he was calling me to cheer me up — and said 'Hey, let's do this songs project.' It was to do the Woody Guthrie song 'I Ain't Got No Home,' which was something he had wanted to do with his group for 20 years or so, and he ended up not having time to play on it." However, Dreyblatt introduced Fullman to Hiller, knowing that both artists shared a keen interest in the American folk-music tradition as well as acoustic-instrument exploration.

"Arnold told me that Ellen had been writing songs for the last 20 years, but had never released them," Hiller explains. "At that time, my focus was on early American folk music and I had just started my label, Choose Records. So we began talking about doing a record together. We met in her atelier and recorded Woody Guthrie's 'I Ain't Got No Home' in one afternoon."

"I Ain't Got No Home" proved to be an auspicious beginning for the project. "When I played the LSI for the first time," Hiller says, "I was amazed by the variety of sounds I could achieve by just moving my fingers. From then on it was clear that we would definitely do a record."

"No Home" begins with pulsed chords on the LSI, followed by Hiller on claves, timpani, and bass. The melody is sung simply, but with a slight edge in Fullman's voice. The stark orchestration creates a subtle, driving rhythm evocative of a mid-summer hitchhike down a lonesome Southern highway.

"I did some of the songs in Berlin, because I had the Long String Instrument set up," Fullman explains, "I laid down those tracks myself, as well as some vocal tracks. Then Jörg added the layers of percussion and guitars."

Another example of Hiller's studio wizardry is the disc's opening cut, "Glittering Glass," which combines the stripped-down intensity of the Velvet Underground with Fullman's sing-songy delivery. Fullman wrote the lyrics when she moved to New York City in 1980, capturing the glass-half-full optimism of someone experiencing life in the city for the first time. "Those are real observations of different places where I was living in Brooklyn. Like looking at so much broken glass on the street, that it looks like jewels; a building falling down that was being painted in the style of an Italian landscape; looking at the skyline of Manhattan through the dirty glass of my living room window."

Around 1990, she performed "Glittering Glass" over a loop from the end of the Velvet Underground's "I'm Waiting for My Man," which Fullman describes as an "archetypal riff — just two chords." For *Ort*, Fullman and Hiller decided to use the loop as a template only, to avoid any copyright issues.

"I wanted it to be a little slower, otherwise it would be way too fast for the words," adds Fullman. "I multitracked the voice in Seattle, then we built up the texture in Berlin. Jörg has this funky old piano that he totally restrung — just one string per note — and we tuned it in just intonation to get these simple chords with a lot of fifths. He also played violin and soprano saxophone, just screeching partials throughout the whole thing. Then he added the distorted guitar and bass parts, which definitely give it the rock sound."

When asked which track is her favorite, Fullman thinks about it for a few moments before cheerfully describing what she likes about *every* piece. "I really like 'Empty Building,' especially these funny 11-limit chords, but the fact that they're strummed with this rhythm makes it more accessible. And I used the Autoharp, tuned to these super-extended intervals, to just [sings falling cascade of notes], but it's almost random. I love it that it has all this mathematical background and it sounds so right, and yet it also sounds random. It just sounds casual, you know?"

Throughout the CD, Fullman has made the LSI sound uncannily like a giant blues harp. In fact, *Ort*'s only instrumental track, "Train," is subtitled "Harmonica Song." "Just the fact I could get the sound of a harmonica is exciting to me. I have tried, literally, for 10 years to do that, then all the sudden it came together with these tools." At this point, Fullman displays her box bows, hollow wooden cubes attached to what appears to be a wide ski. The box bows are lightweight and the ski is heavily rosined to pull a sharp, horn-like attack from the strings.

"When I first started, I was trying to just get a clear, steady sound," says Fullman of her early LSI playing technique. "It's not until the past five years or so that I've been working on this other thing. I've always wanted to articulate it in different ways and think of the LSI as an orchestra in one instrument."

To that end, Fullman has spent her first year in the San Francisco Bay Area exploring its various artistic resources, looking for new ways to approach her work. One new direction that shows promise is the addition of stainless steel wire to complement the bronze wire she is currently using on the LSI. "I first tried stainless wire during my residency at the [San Francisco] Exploratorium, but we didn't make any observations on the timbre at the time," she explains. "I was intrigued with the delicacy achievable by using very thin wire. Since it is stainless, it is strong enough to use an extremely thin gauge."

"I had a session with Bart Hopkin [instrument builder and editor of *Experimental Musical Instruments*] a few weeks ago to play my instrument live for him for the first time. He had observed that stainless steel dampened the upper partials: I had assumed that they would be really pronounced, really hard. So we did this experiment." Fullman plays two notes on her steel strings, which are C-clamped much closer to the resonators than the bronze strings. "If I'm close to the resonator," she notes, "it has a good sound. If I play bronze strings that short, the sound is thicker and tends to break up more. The steel ones are more delicate, more musical, at this length."

"I love to practice with the trains around here," she continues. "They're so good, and they're all different. It's incredible." Having lived within earshot of the railroad for most of her life, it's not surprising that Fullman has incorporated its sound into her music. But the smaller, more complex intervals Fullman's exploring with stainless steel wire in her Berkeley studio make the LSI sound more train-like than ever.

"I've always struggled with the LSI's timbre, because it has a very raw sound. It's overtone city," she says. "I feel like I've been tempering it to make it more round, and more musical with the techniques I've been developing."

"I can play one chord for a half an hour, and do variations on that chord just by where I'm standing when I'm walking," she adds before returning to work on her upcoming performance. "I came to the realization recently that it could be just one or two chords. That's basically how it's interpreted on this instrument, and in the whole matrix of what overtones are coming out."

"Just listening — that's what I'm doing. I'm just listening."

Gino Robair is the editor of Electronic Musician and a creative improviser based in the California Bay Area. This is his first feature for Signal to Noise.

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