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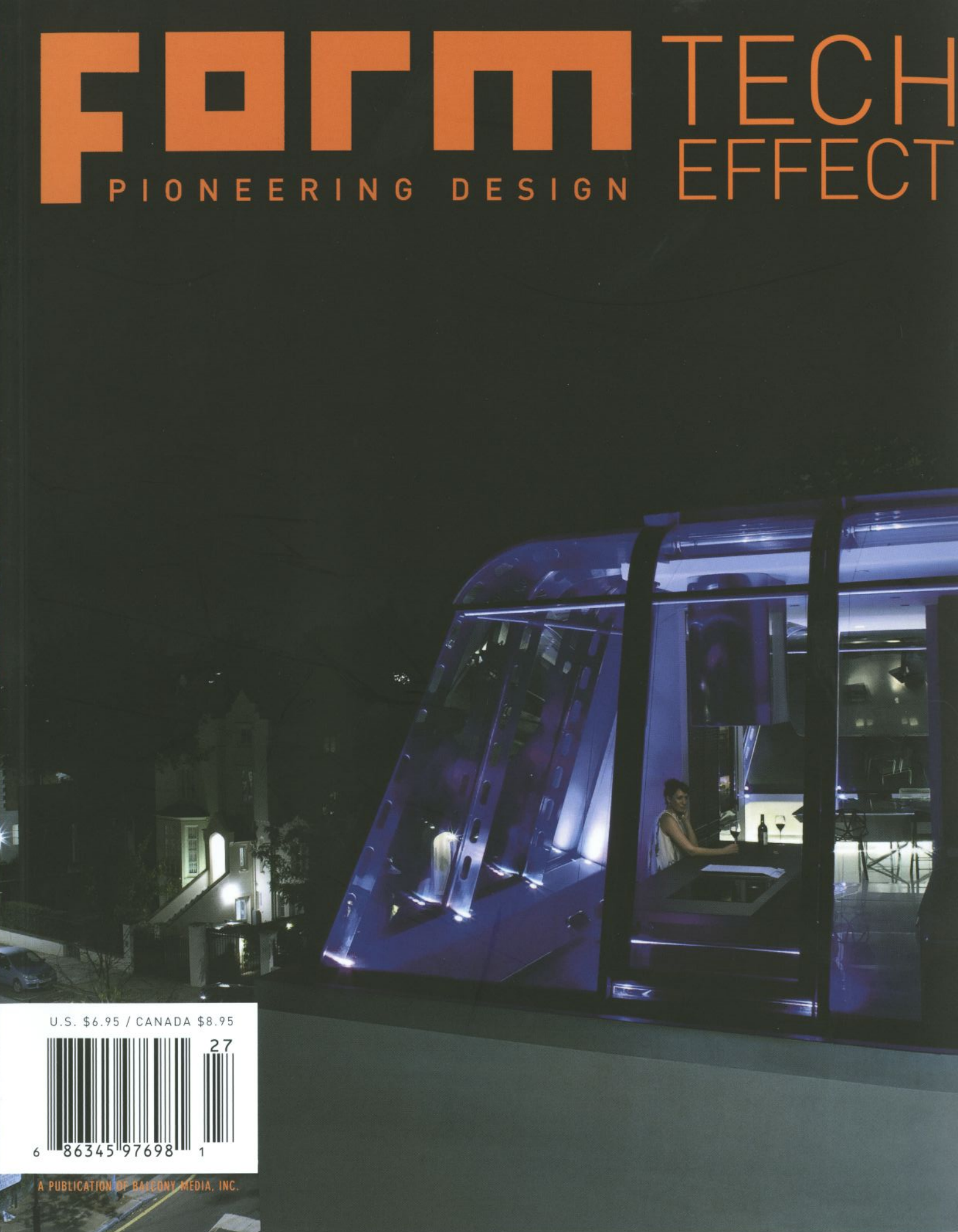

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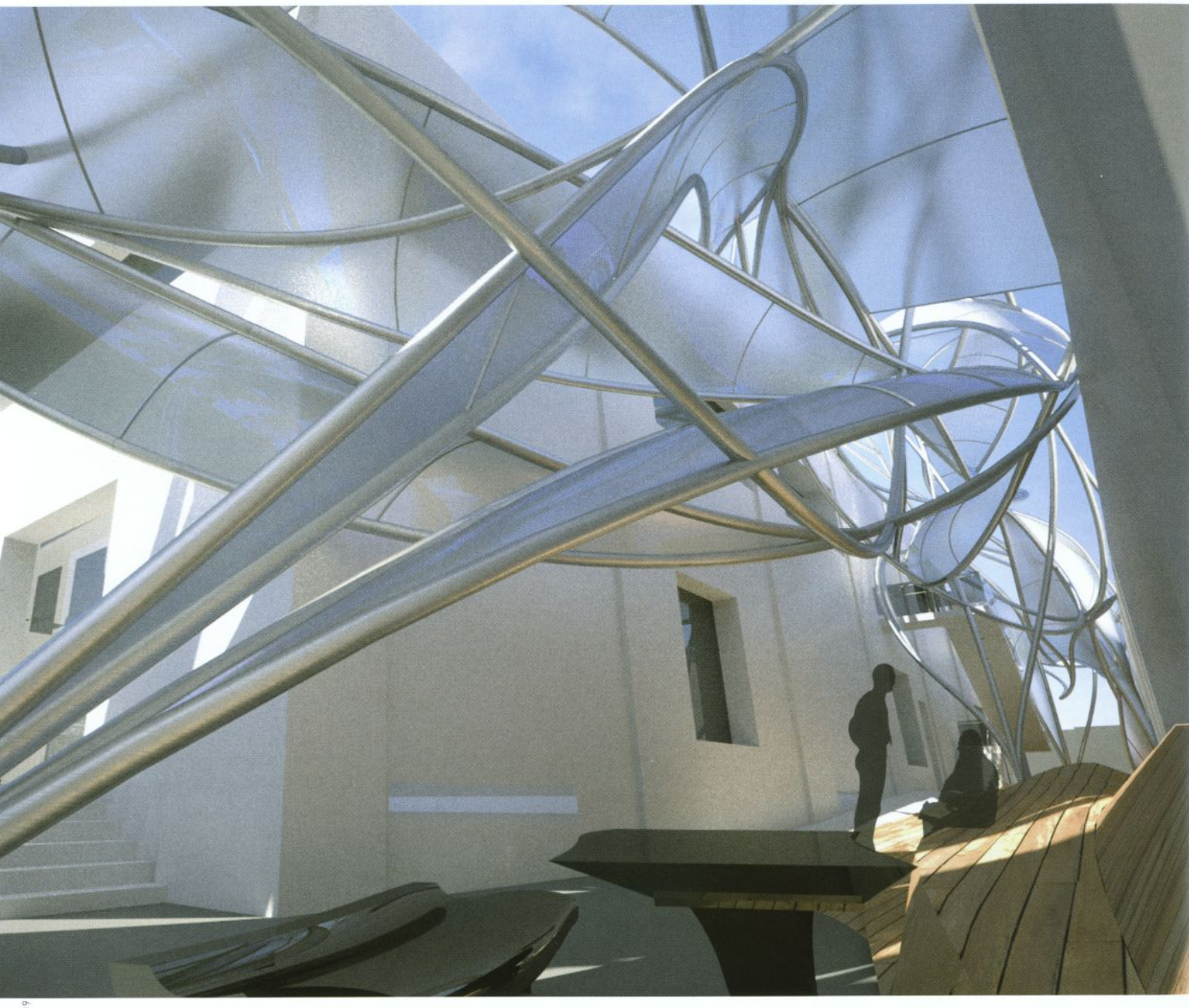
SOUNDS AND THE CITY

B + U transforms street noise into architecture

BY HERWIG BAUMGARTNER & SCOTT URIU



When composer Anestis Logothetis created STYX in 1968 he went beyond the conventional methods of noting sheet music. It was a form of notation closer to a sonogram sketch with wave patterns and directional arrows, drawn on a time line, giving specific instructions to the musicians. Similarly, composer and architect Iannis Xenakis (who worked under Le Corbusier) experimented with the mathematical and statistical application of music, establishing the CENAMu (Centre de Mathématique et Automatique Musicales) in France; and using a computer system called UPIC to directly translate graphical notations into sound resulting in compositions like Mycenae Alpha.

We began our partnership fascinated with electronic music and influenced by these ideas of notation, of transforming a drawing into sound. But being architects, we reversed this concept, starting with sound recordings of city noises in an attempt to transform them into three-dimensional structures. For this purpose we sought out Steven Pliam at MIT Media Lab to create software to diagram ambient sound throughout the given environment.

Historically, numerous digital systems have existed but most interpret and represent a two-dimensional image of the sonic material by itself. The software we developed called SoundPlot, however, incorporates a series of algorithms that generate accurate numerical data to construct a wave-terrain surface geometry. The division or separation of the sound into its constituent frequencies is a widely used algorithm; the Discrete (DTF) and Fast Fourier Transform (FFT). In short, these methods apply certain mathematics to a sound sample in order to break down the sample into its constituent harmonic partials. Once this information is derived, it can then be used to construct a surface terrain to express the energy changes of the frequencies of the whole sound over time. The other basic method used in SoundPlot divides the sound source into micro 'grains' of the whole sound at a given point in time. This approach is fundamentally different from the FTT algorithm in that there is no decomposition or 'breakdown' of the waveform. The geometric surface results in a true wave-terrain surface that represents the progression of the sonic grains.

Nevertheless, what does sound have to do with architecture and urban planning? For us, it is less about a scientific process but about developing a vehicle for our architectural ideas. SoundPlot was the first step for us because we were tired of the interpretive argumentation and use of music in architecture; on the other hand this was never about just developing a scientific mapping device but a process to create a very different set of environments, geometries and spatial constructs that ultimately could become architecture.

Our original research for "Sound City"—an urban development project for Broadway in Downtown Los Angeles—was one of our first projects exploring the use of sound as a design tool. The concept for the 12-city-block redevelopment study took shape in response to our investigation of urban sound wave patterns. The process started with sectional sound mapping at different times of the day, which resulted in a series of urban and spatial prototypes that occupy and transform the existing grid structure and envelope of the city to converge into a new skyline shaped by street noise.

Though the original approach was surface-driven its limitations were apparent. Instead of simply deploying the resultant surfaces to generate idealized "sound forms", we began to examine the vector wave patterns to generate unique building structures. For example, we created a canopy design for an urban lounge on Mateo Street in downtown Los Angeles, the comparatively unique pattern was generated from the sound associated with this particular site. Clad with video projection screen surfaces amidst an array of mini-speakers, this unique event structure attempts to reclaim and re-imagine public space in the context of a highly-urbanized and industrialized neighborhood. The structure is a network of sound vectors articulated by curved steel pipes that break the vertical and horizontal monotony of this industrial area, spilling out into the streets. Fabric cladding stretched on the steel frame is designed to serve dual purposes: to provide shade during the day and to operate as video projection surfaces at night.

Since our initial experiments with sound, we have developed our process further into proposals for structure, material and enclosure for many projects including the Performing Arts Center in Taipei or the recent Tall Emblem tower in Dubai that utilize and expand on these ideas and principals. ■

Herwig Baumgartner & Scott Uriu are the principals of the Los Angeles firm, B + U, LLP. More information available at www.bplusu.com.

OPPOSITE: The Soundcloud transforms an alleyway between two factory buildings into a public event and relaxation space. THIS PAGE: A SoundPlot wave rendering of city noise.