

# BUREAU FOR OPEN CULTURE

## ***Infrastructure Drone Music and the Chord of Columbus***

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“I think that the un-pitched whir of distant busy night highways is one of the most beautiful sounds, and there’s no one way to pinpoint one “individual” source. It’s an accidental collaboration. How often when you are riding on a highway do you think about how the sound you are making is blending with the other vehicles? And how often do we consider that someone might be listening at a distance and HEAR those sounds that you are all making as one composite whole?”—  
Ryan Jewell

The sonic environment in any large city is a chaotic mesh of unmusical sounds, some coming from pinpointable sources, such as power transformers, air conditioners or electric lights, and some less easy to pinpoint, such as the wash of white noise coming from highways audible from almost anywhere in a major city. Most people naturally tune out this melee of environmental sounds. Our brains can only process so much stimuli at a time, and if a sound has few conventional musical qualities (rhythm, melody, harmony), we are likely to stop hearing it. Yet these sounds are important windows into flows of energy, information and commerce, and have musical value. They are a side effect of the processes that keep our society afloat—the generation of the electricity that powers our way of life, the ventilation systems that circulate the air we breathe, or the machinery that constructs and sustains our buildings and infrastructure. These are processes that most of us will not often think about during their daily lives, yet directly affect us. Likewise, listening closely to these sounds is something that most of us (if we can help it) will not do. They don’t fit in with our illusions of the way the world should be, and compete with our internal processes and communication. However, conscious perception of these sounds can increase awareness of the systems that sustain us and our relentless consumption of energy, and lead to a new appreciation of the possibilities of sound and music. *The Chord of Columbus*, a collaborative project between myself, Sarah Cowles and the Learning Site *Audible Dwelling*, with help from Bureau for Open Culture, attempts to harvest and extract the meaning from these infrastructural and environmental sounds.

Almost exactly between A sharp and B, and two octaves

below middle C, the mains hum is a tone heard by most people living in major US cities every day, often continuously, without notice. The mains hum, also known as 60-cycle hum, is caused by an electrical phenomenon known as magnetostriction. Magnetic material changes shape slightly when exposed to a magnetic field, and transformers consist of conductive material wrapped around a magnetic core. These micro changes in shape manifest in this 60 cycle per second vibration and subsequent hum. The primary tone audible in the United States is around 60 Hz, depending on local electric utility configuration. However, its visible spectrum of harmonics ranges from 1 to higher than 10,000 Hz, meaning thousands of individual tones lie underneath and above the immediately audible 60 Hz. The tone lurks in the infrastructure of our cities, and surrounds us as we venture forth in our lives. Emanating from sewers, power transformers, electric lights, and home appliances like refrigerators, it is a seemingly static tone; a relentless, uncompromising drone. The mains hum could have been the world’s first electronic music performance, being performed live all over the world since the advent of electricity. No doubt, it can be seen as a worldwide minimalist drone sound installation.

Drone music has roots in many ancient traditions, such as Indian classical music (which usually makes use of the Tambura, a four stringed instrument used solely for droning), Australian aboriginal didgeridoo music, Mongolian throat singers and Scottish bagpipe music. Drone has also emerged in many 20th century composer’s work, such as La Monte Young, Terry Riley and Brian Eno, German kraut-rock bands from the sixties and seventies such as Tangerine Dream, Popul Vuh and Neu!, as well as many contemporary underground experimental musicians such as Emeralds, Nautical Almanac and James Ferraro. La Monte Young, widely regarded as the first minimalist composer, claims to have been fascinated by the sound of step down power transformers and telephone poles as a child in Idaho, as evident in many of his later compositions. In 1962, he wrote *The Second Dream of the High-Tension Line Stepdown Transformer*. The piece consists entirely of four tones, or frequency ratios, played by eight muted trumpets for long periods of time, continuously overlapping with each other. Over the course of the piece, the listener becomes aware of frequencies and tones not previously noticed, and enters a kind of meditative trance, less aware of other external stimuli.

“Facets of sound become apparent that are usually only peripheral to conscious perception. The tones diffract (via Harmon mutes) to form a brilliant corona

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of partials that soon flares to dazzling intensity. In a dream, events of little apparent significance may be evocative of fathomless resonances. As *The Second Dream* develops, the four pitches virtually turn inside out to reveal astonishing depths of sonic phantasmagoria” —Sandy McCroskey.

Not all sounds in the city are a static drone. There are many sounds we tend to ignore that can have implications on our built and psychological environments. Air conditioners, ventilation units and fans produce a huge whir of sound. Sometimes strange high pitched frequencies emanate in addition to the sounds of motors and moving air. Inside any major building, such as a library, hospital or office, the hum of the central air conditioning or heating unit is easily noticeable once perceived. Building and neighborhood designers take these sounds into consideration, and sound researchers have developed equations calculating the amount and nature of the sound produced by fan filtration units. Gas meters send out the oscillating whoosh of natural gas flowing through. The sounds of highways are taken into consideration in urban planning. Huge sound barriers have been designed and installed along many major highways in an attempt to block the sound, which is actually a quite often calming wash of white noise. Inside a city bus, a malfunctioning ventilation unit producing a high pitched or overly loud frequency can create an irritable or soothing environment, depending on the sound and how it is perceived. Many televisions, radios and electronics produce an extremely high frequency, around 20 khz, when turned on. This is often caused by the flyback transformer, which converts low voltages to high voltages, and can be irritable and confusing. The sounds of daily human life, such a vacuum cleaner in the apartment above you, a chainsaw or jackhammer at a distant construction site or even a motorcycle or car engine a few blocks away, all produce sounds what we attempt to tune out.

Becoming aware of these sounds can take some concentration. They are not always easy to notice. Pauline Oliveros developed a theory of “Sonic Awareness” in *Sonic Meditations*. It is described as “the ability to consciously focus attention upon environmental and musical sound, requiring continual alertness and an inclination towards always listening” (Heidi Von Gunden). Using a sensitive microphone and a pair of nice headphones can help as well. Once one truly begins to focus on the audible landscape, one begins to notice just how thick the sonic environment of a city, even an empty one, really is.

*The Chord of Columbus* is an investigation of these sounds. It gathers, analyzes, condenses and amplifies them, creating a sonic map of the city—in this case Columbus, Ohio. The chord, a composition consisting of all the tones collected, is projected through Learning Site’s *Audible Dwelling*, a combination loud speaker and dwelling located in a parking lot in downtown Columbus. The tones are analyzed to determine frequency and intensity and projected visually onto the exteriors and interiors of *Audible Dwelling*. The projected sound waves combine with the sounds as well as a map of all recording sites to create a visual and aural cross section of the urban experience, drawing to the surface the subtle urban soundscapes that continually and often unknowingly affect our everyday life. Visitors are encouraged to walk around and inside *Audible Dwelling* to find different listening points, and are welcome to lay down and assume a state of relaxation during the performance. *The Chord of Columbus* is the first of what could be an ongoing project to analyze infrastructural and environmental soundscapes in cities, industrial landscapes, urban environments and communities around the country and world, presenting the idea that they can be given musical value and serve as windows into these pulses of energy, commerce, and transportation.