DIAL
TONES

TELESYMPHONY

DIALTONES
(A TELESYMPHONY)
FINAL REPORT

Dialtones *is a concert performed entirely through the ringing of the audience's own mobile phones. It premiered Sunday, 2 September 2001 at the Brucknerhaus Auditorium in Linz, Austria as a co-production of Golan Levin and TAKEOVER: the 2001 Ars Electronica Festival.*

CONTRIBUTORS
Dialtones was created by:

Golan Levin *[USA, concept / direction / performance software], with*
Scott Gibbons *[USA, composition / studio mastering]*
Gregory Shakar *[USA, composition / interaction design]*
Yasmin Sohrawardy *[USA, telephony middleware engineering]*
Joris Gruber *[AT, database software]*
Jörg Lehner *[AT, staging / production]*
Gunther Schmidl *[AT, ringtone messaging]*
Erich Semlak *[AT, database software]*

DOCUMENTATION
Online documentation of *Dialtones,* including audio and video, is available at:
http://www.telesymphony.com
http://www.flong.com/telesymphony

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OVERVIEW

Dialtones is a large-scale concert performance whose sounds are wholly produced through the carefully choreographed dialing and ringing of the audience's own mobile phones. Because the exact location and tone of each participant's mobile phone can be known in advance, *Dialtones* affords a diverse range of unprecedented sonic phenomena and musically interesting structures. Moreover, by directing our attention to the unexplored musical potential of a ubiquitous modern appliance, *Dialtones* inverts our understandings of private sound, public space, electromagnetic etiquette, and the fabric of the communications network which connects us.

Dialtones premiered in two consecutive concerts in September, 2001, as a co-production of Golan Levin and *TAKEOVER*: The 2001 Ars Electronica Festival. It was subsequently presented in seventeen performances in May/June 2002 at the Swiss National Exposition.

Dialtones begins with a brief preparation phase prior to its performance, during which the members of the audience register their wireless telephone numbers at a cluster of secure Web kiosks. In exchange for this information, the participants receive seating assignment tickets for the concert venue, and new "ringtones" are then automatically downloaded to their handsets. During the concert itself, the audience's mobile phones are brought to life by a small group of musicians, who perform the phones *en masse* by dialing them up with a specially designed, visual-musical software instrument. Because the audience's positions and sounds are known to the *Dialtones* computer system, the performers can create spatially-distributed melodies and chords, as well as novel textural phenomena like waves of polyphony which cascade across the crowd; these musical structures, moreover, are visualized by a large projection system connected to the performers' interfaces. Towards the end of its half-hour composition, *Dialtones* builds to a remarkable crescendo in which nearly two hundred mobile phones peal simultaneously. It is hoped that the experience of *Dialtones* can permanently alter the way in which its participants think about the cellular space we inhabit.

ARTISTS' STATEMENT

Wireless telephony has quickly become an indispensable aspect of modern life. Today, one out of ten people on the planet possesses a mobile phone; over the next three years, according to the industrial analysis firm The Gartner Group, this market is expected to increase by almost a billion new users. Ironically, the astonishing eagerness with which we have adopted mobile phones is matched by our almost equal repulsion on the occasion of a cell phone's ringing. Mobile phones now infuse our theaters and public spaces with the least welcome details of our neighbors' intimacies, and perforate our private lives with the sonic machinery of electronic commerce. Our emotional reactions to these interjections can even outstrip the veneer of our professional identities: when ringing mobile phones interrupted keynote speakers at a recent telecommunications conference in Finland, the conference manager became enraged and threatened to get a radio-frequency scrambler to silence the din. Caught between adoration and irritation, we have come to regard our intimate communications apparel with a deep ambivalence.

In the hype, hate and hypnosis surrounding the mobile phone, its potential as an ingredient of art has been largely overlooked. As with the proverbial fish who would never discover water, we take for granted that we are immersed in cellular space, our imaginations dulled by the extraordinary ubiquity of our wireless devices. Announcers at every modern-day concert command us to turn off our cell phones, but what Cagean aesthetic possibilities might we discover in leaving them on? What deranged beauty might we find, or what might we learn about our interconnected selves, in their high, pure tones? The mobile phone's speakers and ringers make it a performance instrument. The buttons make it a keyboard and remote control. Its programmable rings make it a portable synthesizer. Yet, although no sacred space has remained unsullied by the interruptions of mobile phone ringtones, there is no sacred space, either, which has been specifically devoted to their free expression. In the context of this lack, and in the context of our society's contradictory attitudes towards wireless communication technologies, *Dialtones* is proposed.

If our global communications network can be thought of as a single communal organism, then the goal of *Dialtones* is to indelibly transform the way we hear and understand the twittering of this monumental, multicellular being. One of *Dialtones's* strategies for doing so is the musical reification of this organism's sprawling and enveloping omnipresence. By placing every participant at the center of a massive cluster of distributed speakers, *Dialtones* makes the ether of cellular space viscerally perceptible. In a rejoinder to the eminent electronic composer Iannis Xennakis—who once complained that all electronic music sounded alike, because it would inevitably emanate from the same pair of speakers—*Dialtones's* radical surround-sound is at once musically and phenomenologically unique.

In an appropriate acoustic environment, the sporadic triggering of calls to mobile phones can evoke the placid chirps and trills of crickets, cicadas, frogs and birds. If hundreds or even thousands of mobile phones were to ring simultaneously, by contrast, the result would be an unimaginably seething, engulfing cacophony. Between these two textural extremes lies an enormous terrain of more musically familiar possibilities: gently shifting diatonic chord progressions, distributed and aggregate melodies, roving clouds of spatialized sound-clusters, and pointillistic hyper-polyphonies. Over the course of its half-hour duration, *Dialtones* explores sequences and combinations of each of these possibilities, scaffolded throughout by a set of recurring harmonic themes and slowly-evolving melodic phrases. Ultimately, the exact composition of *Dialtones* is a function of both the scored and improvised performance produced by the project's staff, and the specific settings of the phones brought by the concert's attendees.

In *Dialtones*, the phones, and not their owners, speak to one another. By summoning a communication between communications technologies in which there is no interlocutor, *Dialtones* invites its participants to perceive an order in what is otherwise disorganized public noise, and ratify it as a chorus of organized social sound. Thus the overdetermination of the world of Work is countered with an equally determined Play, as the ringing of mobile phones—ordinarily, the noise of business, of untimely interruptions, of humans enslaved to technology—is transformed into a sound of deliberate expression, startling whimsy, and unconventional beauty.

THE *DIALTONES* COMPOSITION

The *Dialtones* composition consists of three major subsections, or "movements", each approximately ten minutes long. The first section is produced entirely through the ringing of the mobile phones of the 200-person audience; these phones were completely unamplified by any means. The second section, a "solo" movement, is performed by *Dialtones* staff member Scott Gibbons on ten amplified (but otherwise unmodified) mobile phones. In the third section, the soloist plays together with the ensemble.

The goal of *Dialtones* three-part structure is to introduce the contrasting aesthetic possibilities of virtuosic real-time cellphone performance ("mobile phone jockeying") on the one hand, with coordinated-ensemble handheld-music on the other. In addition to yielding a variety of sonic contrasts, this structure also allows for the exploration of a broad range of musical interaction-models: from the deeply practiced (e.g. Gibbons' solo performance), to the entirely visual (e.g. the graphical interface controls used by Levin and Shakar to interactively perform the audience phones), to a lightweight model of consumer participation (e.g. through one's selection/purchase of a phone model, negotiation of its ringtone, and manner of displaying it during the performance).

Within each of the three movements, the composition is structured as a sequence of sound-textures. These texture-segments are realized as interestingly distinct combinations of ringtones; while the sound of one texture resembles a forest full of twittering birds, another consists of pure drones, and recalls the sound of a pipe organ. There are about fifteen sound-textures in all, each approximately two minutes long. Although the order and duration of these sound-textures is explicitly scored, the moment-to-moment details within each texture are left to the improvisation of the *Dialtones* performers.

The final movement of the *Dialtones* concert concludes with a climactic crescendo involving both orchestra and soloist. During the course of this section, the *Dialtones* soloist Scott Gibbons initiates the "ringing" of a phone's vibrator, transduced by a flat piezoelectric microphone and amplified by a subwoofer. At the same time, increasingly greater numbers of phones are introduced until the maximum possible number of simultaneous rings (60) is achieved. At this point, louder phones are swapped with quieter ones, and the selection of rings shifted around the orchestra until, within the space of a few seconds, all 200 of the audience phones have been triggered.

TECHNICAL REALIZATION

Dialtones' technical realization is broadly divided into three distinct software sub-systems: (A) the means by which the audience's mobile phones were registered (prior to the performance) into a networked database; (B) the means by which the audience's cell phones were computationally dialed (and thereby performed) during the concert itself; and (C) the telephony middleware which communicated the dialing requests from the performance system to the infrastructure of the local Mobile Switching Center. In addition, two special optical subsystems added visual and diagrammatic dimensions to the performance: (D) a vertical video projection system, in which spots of light were cast from above onto actively ringing audience members; and (E) an assembly of autonomous miniature lights which visually augmented the audience's highly-localized cellular activities. In this section, each of these mechanisms is treated in turn.

A. Prior to the *Dialtones* concert, audience participants register their mobile phone numbers (and model numbers) at special Web-based terminals located outside the performance venue. ASP-based CGI scripts are used to store this information in a SQL database. At the same time, the scripts also use a ticketing algorithm to issue the audience member an assigned seat in the concert auditorium. Depending on the make and model of the participant's phone, it can be possible to program-matically modify its ringtone at this time; if so, a specially-composed ringtone is encoded in the RTTTL (Ring Tone Text Transmission Language) data format and transmitted to the user's phone as an SMS message. The *Dialtones* staff composed more than 100 customized ringtones for the concert, created special software to convert these ringtones from MIDI sequences into RTTTL, and created a special CGI system to transmit the tones automatically to the audience phones. In the Linz performances, a small number of preconfigured phones were also available as temporary loans for phoneless participants.

B. After the participants' phone numbers and models have been collected and stored in a database, *Dialtones* itself is performed live on a custom software instru-ment which makes use of this database. This performance system consists of an interactive graphical software interface, which represents each mobile phone in the audience as a spatialized cell in a visual grid. During the performance, the per-formers place "animated paint" into specific cells in the visual grid; these actions trigger the ringing of the corresponding mobile phones in the audience. It is important to emphasise that no part of the dialing-performance is pre-sequenced or automatically triggered—all of the phone dialings are executed "by hand", that is, set into motion by the direct action of a human performer. The performance instrument is implemented as an OpenGL-based Windows application, using a standard mouse and keyboard as its interface system.

C. The Windows-based performance software transmits dialing requests over a TCP/IP LAN to a nearby Linux-based telephony server. This machine uses an Aculab telephony card in order to convert these requests into actual phone calls. The phone calls are then sent out over two dedicated E1 lines (primary-rate 2Mbit ISDN connections), and transmitted directly into the Mobile Switching Center (MSC) of the local mobile service provider (in the case of the Linz performances, Mobilkom Austria). The Base Transceiver Station (BTS, or cell antenna) in the location of the concert venue was specially modified by Mobilkom in order to allow at least 60 simultaneous signalling channels.

The audience-orchestras at the two Linz performances each consisted of 200 participants, who were arranged in a 20x10 seating grid. Of these 200 participants—whose phones hailed from 13 different countries—as many as sixty could be dialed at any one instant. Each performance lasted approximately 26-30 minutes, and entailed the placement of more than 4000 phone calls.

D. Two optical subsystems were deployed to add additional, visual layers to the *Dialtones* performances. The first of these was a vertically-suspended video graphics projection system (implemented with a wide-angle 12000-Lumen Barco ELM R12), which beamed individualized spots of light onto audience members to coincide with the ringing of their phones. Specifically, the performers' own grid-based graphical user interface was simultaneously projected onto the audience from above, and carefully registered with their seats. As a result, each participant was lit up by a personal spot of light whenever their handset was rung. Audience members were able to witness the play of these spotlights by observing their reflections in a large (12x6m) reflective-foil mirror, diagonally suspended above the stage.

E. The last visual subsystem consisted of a set of two hundred small keychain lights, which were distributed to the audience-participants at the time of their pre-concert registration. These inexpensive and autonomous devices, which are sensitive to energy in the 800-1900 mHz radio band, illuminate a small red LED when they are within one meter of a ringing mobile phone. Despite their small size, the darkness of the concert hall made it possible to observe the flashing of these lights, which were also reflected in the large suspended mirror. Generally speaking, these keychain lights would flash about two seconds prior to the ringing of a nearby mobile phone, while the overhead video projection system would typi-cally enable its corresponding spotlight about half a second after the phone had begun to ring. These minute differences in timing had the effect of diffusing events over time, creating micro-anticipations and multilayered syncopations between the light and sound of the performance.

The combined effect of the telephone rings and their synchronized visual phenomena was to render each individual person as an audio-visual pixel, a twinkling particle in an organic, audiovisual substance—and the participants, as a group, could at once be audience, orchestra and (active) score.

It is important to state that the technical realization of *Dialtones* would not have been possible without the extensive technical collaboration of A1 Mobilkom Austria and Telekom Austria, the leading telephony service providers for Upper Austria. The fact is that, while placing a single phone call from one's computer is relatively simple (such as dialing a number with one's modem), placing many phone calls at the same time requires technological means and access *at an infrastructural level*—a level typically available only to governments and large corporations. Three instances illustrate this quite well. The dialing of many phones at the same time, for example, required extremely high-bandwidth connectivity—in our case, two primary-rate (2Mbit) ISDN E1 lines, provided by Telekom Austria, which could carry 30 phone calls each. Secondly, these lines were connected *directly* into the Mobile Switching Center (MSC) of Mobilkom Austria, allowing the artists an unusual degree of access to the mobile telephony infrastructure, and permitting the minimum theoretical dialing delays. Finally, a typical mobile-phone antenna (called a BTS, or Base Tranceiver Station) usually allows up to 10 or 15 simultaneous phone connections. Because this would be too few for the purposes of our concert, Mobilkom made special modifications to the antenna in the Brucknerhaus concert hall, increasing its signalling capacity from 15 to 72 connections.
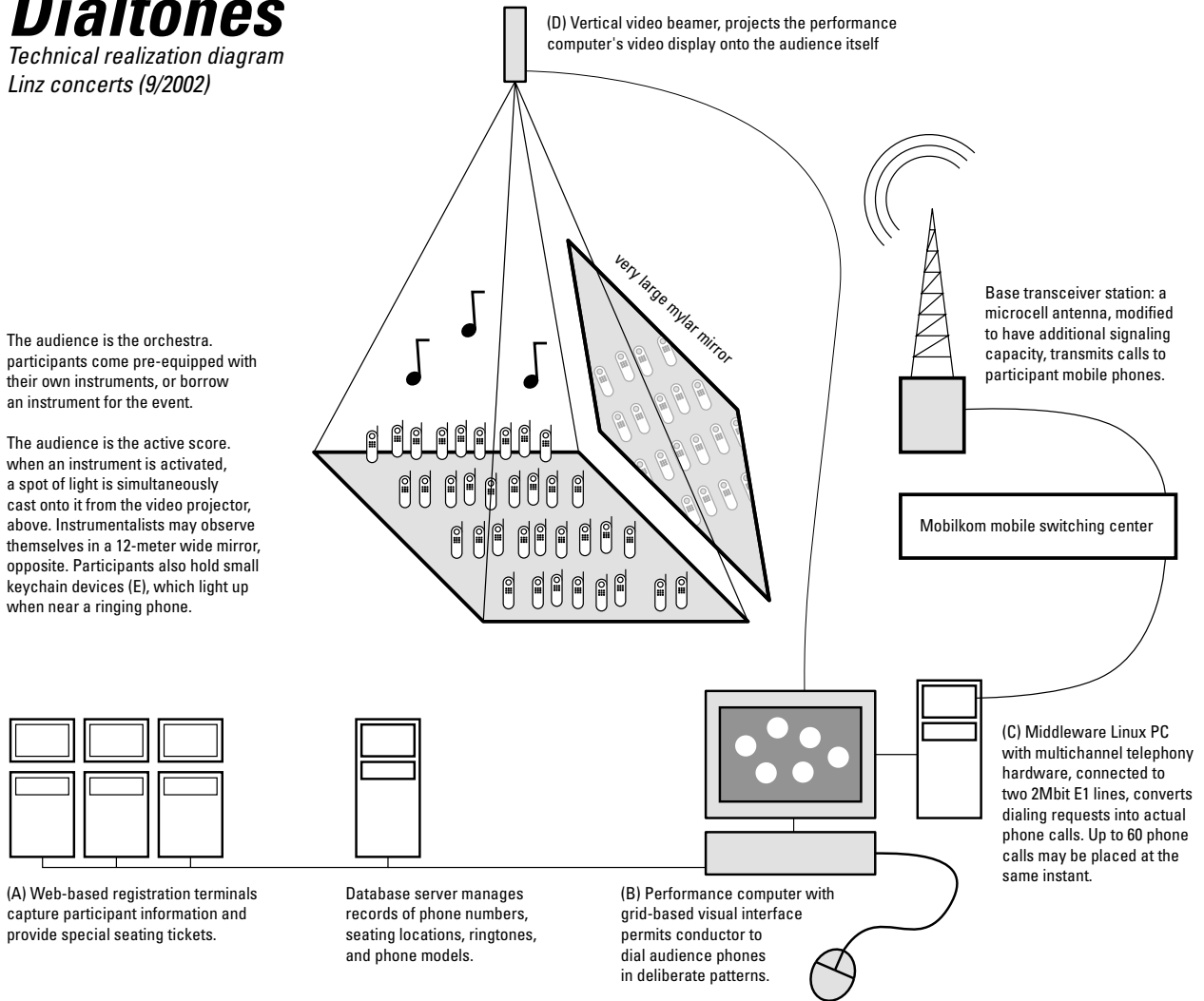
The technical realization of *Dialtones* in Switzerland in May and June of 2002 had a few important differences. Seventeen performances were commissioned by the Swiss National Exposition, with the specification that the concerts take place on the *Arteplage Mobile de Jura*—a small boat in the middle of a lake. Because of the remote location of the concert venue, an entire mobile sub-system needed to be installed on the boat, including a Base Transceiver Station (BTS), Base Station Controller (BSC), and 8 megabits of connectivity snaking on and off the boat. Owing to space limitations, the audience/orchestras on the boat were restricted to 99 people (11x9), with no secondary (observing) audience. Likewise, there was no overhead projector or large mirror; the graphical usier interface illustrating the active phone calls were instead displayed on two plasma screens suspended above the stage. Greg Shakar was not available for the Swiss concerts, and so the Swiss events were performed by Golan Levin (conductor) and Scott Gibbons (soloist). The Swiss concerts were made possible through the technical collaboration of Swisscom Mobile.

Dialtones

Technical realization diagram
Linz concerts (9/2002)

(D) Vertical video beamer, projects the performance computer's video display onto the audience itself

very large mylar mirror

Base transceiver station: a microcell antenna, modified to have additional signaling capacity, transmits calls to participant mobile phones.

Mobilkom mobile switching center

The audience is the orchestra. participants come pre-equipped with their own instruments, or borrow an instrument for the event.

The audience is the active score. when an instrument is activated, a spot of light is simultaneously cast onto it from the video projector, above. Instrumentalists may observe themselves in a 12-meter wide mirror, opposite. Participants also hold small keychain devices (E), which light up when near a ringing phone.

(C) Middleware Linux PC with multichannel telephony hardware, connected to two 2Mbit E1 lines, converts dialing requests into actual phone calls. Up to 60 phone calls may be placed at the same instant.

(A) Web-based registration terminals capture participant information and provide special seating tickets.

Database server manages records of phone numbers, seating locations, ringtones, and phone models.

(B) Performance computer with grid-based visual interface permits conductor to dial audience phones in deliberate patterns.

PRESS BIBLIOGRAPHY

Dialtones was awarded an Honorable Mention in Interactive Art in the 2002 Prix Ars Electronica competition. The project has generated a variety of press since August 2001; the bibliography below is current as of January 2003.

Adams, Noah. "All Things Considered" Interview. *National Public Radio* (8/27/2001). Available from NPR in RealAudio. *http://www.npr.org/ramfiles/atc/20010827.atc.09.ram*

Batista, Elisa. "Did This Musician 'Cell' Out?" *Wired News* (8/2001). *http://www.flong.com/telesymphony/press/wired/*

Bédat, Thierry. "Première de «Telesymphony»: le chant de 99 téléphones portables peut être mélodieux." *La Liberté.* (6/1/2002). *http://www.flong.com/telesymphony/press/laliberte/*

Bezreh, Tanya, "Telephone Man." *Artbyte* (9/2001). *http://www.flong.com/telesymphony/press/artbyte/*

Bhesania, Edward. "Mobile phones make symphonic debut." *BBC Music Magazine* (9/2001). *http://www.flong.com/telesymphony/press/bbcarticle/*

Bröhm, Alexandra. "Ich wollte mich selbst verblüffen." *Sonntags Zeitung.* (6/2/2002). *http://www.flong.com/telesymphony/press/sonntagszeitung/*

"Cellphone Symphony!" *Connection Points (Aculab Quarterly)*, 13, Fall 2002.

Dayen, David and Joanna Lux, "Cellphone Symphony: In composer's hands, annoying ringtones have musical potential." *TechTV.* (11/15/2001). *http://www.flong.com/telesymphony/press/techtv/*

diSanto, Richard. "Dialtones: A Telesymphony." *Incursion Music Review*, 60, 10/14/2002. *http://www.flong.com/telesymphony/reviews/incursion/*

Goldman, Jeff. "The Art of the Mobile Phone." *The Feature.* (1/3/2002). *http://www.flong.com/telesymphony/press/thefeature/*

Goldsmith, Kenneth. "Dialtones: A Telesymphony." *New York Press,* Vol 15, Issue 49, 12/5/2002. *http://www.flong.com/telesymphony/reviews/newyorkpress/*

Herzog, Bernhard. "Symphony für 100 Handys." *Technica* (7/2002). *http://www.flong.com/telesymphony/press/technica/technica.pdf*

Jesdanun, Anick. "Digital Art Gaining Acceptance." *Associated Press.* (12/10/2001). *http://www.flong.com/telesymphony/press/ap/*

Kornberger, Ruth. "Ein Konzert für 200 Handys." *Geolino.de*, Germany. (12/2002). *http://www.flong.com/telesymphony/press/geolino/*

Levin, Golan. "Dialtones: A Telesymphony." In *Takeover: Who's Doing the Art of Tomorrow? Catalog of Ars Electronica 2001*, p.55. Springer:Wien. (9/2001).

"Making art as well as noise." *St. Petersburg Times* (8/27/01).
http://www.flong.com/telesymphony/press/stpetersburg/

Melin, Jan. "Första mobilsymphonin: Störande ringsignaler förvandlas till musik vid bejublad konsert." *NyTeknik,* Sweden (10/16/2002). *http://www.nyteknik.se/pub/ipsart.asp?art_id=23966*

Mirapaul, Matthew. "Composer Plans to Strike Up the Cell Phones." *The New York Times* (8/16/2001). *http://www.flong.com/telesymphony/press/times/*

"Morat: symphonie de natels sur l'AMJ." *SDA* [Swiss Press Agency]. (5/28/2002).
http://www.flong.com/telesymphony/press/sda/

"Music To His Ears." *Bangkok Post* (8/21/2001).
http://www.flong.com/telesymphony/press/bangkok/

"Musica Maestro! Golan Levin Dirige un'orchestra di 200 Telefonini." *TgCom* (8/21/2001).
http://www.flong.com/telesymphony/press/tgcom/

"Orchestre de cent portables." *24Heures.* (5/29/2002).
http://www.flong.com/telesymphony/press/24heures/

Punjabi, Mala. "Getting in tune with your mobile phone." *AsiaWeek* (8/31/2001).
http://www.flong.com/telesymphony/press/asiaweek/

Sawatzki, Frank. "Dialtones (A Telesymphony): Interview with Scott Gibbons and Golan Levin."
Receiver, October 2002. *http://www.receiver.vodafone.com/06/articles/index03.html*

Schreier, Paul G. "An Orchestra of Ring Tones." *ChipCenter* (7/2/2002).
http://www.flong.com/telesymphony/press/chipcenter/

Sheridan, Molly. "Composer Calling: Cell Phone Symphony Premieres." *New Music Box*, October 2001. *http://www.flong.com/telesymphony/press/newmusicbox/*

"Il primo concerto con le suonerie dei telefonini." *Corriere Della Sera.* (8/21/2001).
http://www.flong.com/telesymphony/press/corriere/

Swanson, Sandra. "Celling Out: Serious Musicians are Using Cell Phones as Instruments." *Information Week.* (4/24/2002). *http://www.flong.com/telesymphony/press/informationweek/*

"Une symphonie en natels majeurs." *L'Express*, p.3. (5/29/2002).
http://www.flong.com/telesymphony/press/lexpress/

Urselli-Schärer, Marc. "Dialtones: A Telesymphony." *ChainDLK*, 11/7/2002.
http://www.flong.com/telesymphony/reviews/chaindlk/

CONTRIBUTOR BIOGRAPHIES

Golan Levin [*concept / direction / performanceware*] is an artist and composer interested in developing artifacts and experiences which explore supple new modes of audiovisual expression. His work has focused on the design of systems for the creation and performance of simultaneous image and sound, as part of a more general examination of communications protocols in cybernetic systems.

Scott Gibbons [*composition / soloist*] began composing electronic music in 1984. Under the stage name of Lilith he began a two-fold exploration into the possibilities of natural acoustic sound on the one hand, and those of information technology on the other. Many of his compositions defy normal frequencies and come close to silence. His CDs include *Stone* in 1992, *Orgazio* and *Redwing* in 1994, *Field Notes* in 1998, and *Imagined Compositions for Water* in 2002. Scott records on the Sub Rosa and Hushhush labels and is currently developing a new music opera with Socìetas Raffaello Sanzio in Italy.

Gregory Shakar [*composition / interaction design*] is exploring various paths toward the goal of creating emotive and expressive active art. In the course of this effort he taps his experience as an artist, musician, and composer with the intention of teasing out the fundamentals of human attention and fascination. While participating with his recent reactive sound sculptures, viewers have controlled thunderous 30-meter long wires, expressive 3-meter tall metronomes, dozens of dangling tentacles, sociable spiny metal spheres and musical bolts of lightning. Shakar is currently a Research Fellow at the Interactive Telecommunications Program at New York University.

Yasmin Sohrawardy [*telephony middleware engineering*] is a software engineer specializing in the telephony and financial sectors, and was the lead telephony software engineer for the *Dialtones* project.

Joris Gruber [*database software*] is a software engineer specializing in databases. Gruber developed the system which performed automatic ticketing, programme generation, and seating assignments for the *Dialtones* project.

Jörg Lehner [*staging / production, Austria*] was the technical director for *TAKEOVER:* the 2001 Ars Electronica Festival, and coordinated the lighting, networking, recording and staging needs for *Dialtones*.

Gunther Schmidl [*CGI SMS messaging*] is a software engineer specializing in databases and web-based programming. Schmidl developed the automatic SMS transmission component of the *Dialtones* user registration system.

Erich Semlak [*database software*] is a software engineer specializing in databases, and directs the database technology support for the Ars Electronica Festival. Semlak developed the phone registration database for *Dialtones*.

Jonathan Feinberg [*system administration, Switzerland*] is a drummer and software engineer based in New York City. His particular expertise is UNIX programming, databases, server-side programming and scripting, which he has applied to the creation of a number of projects in both the commercial and art domains.

Shelly Wynecoop [*project management, Switzerland*] is an independent artist and writer. She is formerly Associate Curator of Digital Media at the American Museum of the Moving Image, NYC.

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PROJECT SPONSORS

Dialtones: A Telesymphony was a co-production of Golan Levin and the 2001 Ars Electronica Festival, and was realized and made possible through the extensive technical collaboration of A1 Mobilkom Austria.
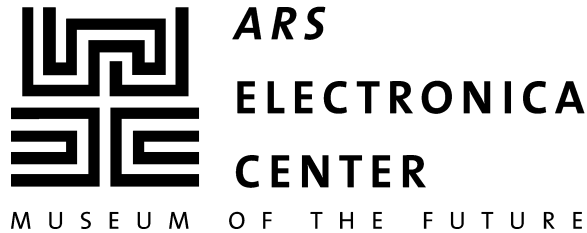
We further express our gratitude to the following organizations for their generous support for the Dialtones project: Aculab; Cellphoneart.net; Design Machine NYC; Ericsson; The Greenwall Foundation; Hartlauer Inc.; Telekom Austria; The Daniel Langlois Foundation for Art, Science, and Technology; The New York State Council on the Arts; Nokia Austria; Siemens; and Thundergulch, a division of the Lower Manhattan Cultural Council.

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NOKIA SIEMENS

## THUNDERGULCH

Dialtones is a commissioned artwork of Ars Electronica and premiered at *Take-over*, the 2001 Ars Electronica Festival. The Ars Electronica Festival is organized by the Ars Electronica Center and the ORF Radio Oberösterreich, in cooperation with the Linz Brucknerhaus and the OK Centrum für Gegenwartskunst.

ARS ELECTRONICA CENTER
MUSEUM OF THE FUTURE

ORF
radio oberösterreich

BRUCKNER HAUS

OK
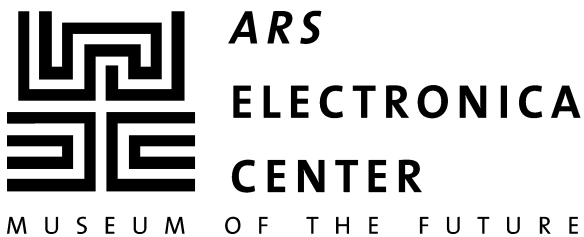
Centrum für Gegenwartskunst
Oberösterreich

A series of seventeen *Dialtones* concerts was commissioned by the Swiss National Exposition (Expo'02) for the *Arteplage Mobile de Jura*, and was presented at Murten-Morat and Biel-Bienne Switzerland from 28 May to 6 June, 2002. These concerts were made possible through the generous financial and technical support of Swisscom Mobile, Aculab Germany, and the New York State Council on the Arts (NYSCA). We'd like to add that Aculab makes *terrific* telephony products.

EXPO.02   **swisscom** **mobile**

aculab   State of the Arts / **NYSCA**

The *Dialtones* CD recording was a production of the Ars Electronica Festival and was made possible by generous support from Sony DADC. Released on and distributed by the Dutch/German Staalplaat label, the disc includes interview video footage generously provided by TechTV. The packaging of the disc was generously designed by Design Machine, NYC.
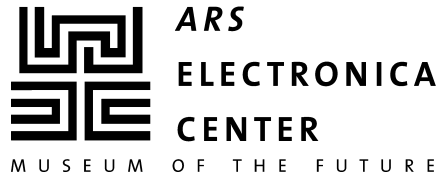
APPENDIX: The *Dialtones* Ringtones

More than 100 ringtones were composed by Scott Gibbons and Gregory Shakar for the *Dialtones* project. The ringtones were composed as monophonic MIDI patterns using conventional music sequencing tools, encoded into RTTTL (Ring Tone Text Transmission Language) text strings using custom software by Golan Levin, and then transmitted to the audiences' mobile phones through a Novelsoft SMS gateway using Gunther Schmidl's custom CGI software.

The ringtone melodies were collected into approximately twenty thematic and textural groupings, with colorful nicknames like "drones", "bugs", "twinkly", etc. Reproduced below are the tones composed for the concert.

APPENDIX: The *Dialtones* Score

Dialtones was structured in three movements: the first, was performed by Golan Levin and Greg Shakar on the audience's mobile phones; the second, was performed on six unmodified but amplified phones by soloist Scott Gibbons; and the third, was a combination of the audience's and soloist's phones. The score below was used by Levin and Shakar for the first and third movements, and illustrates how these sections were composed as progressions of differing textures.
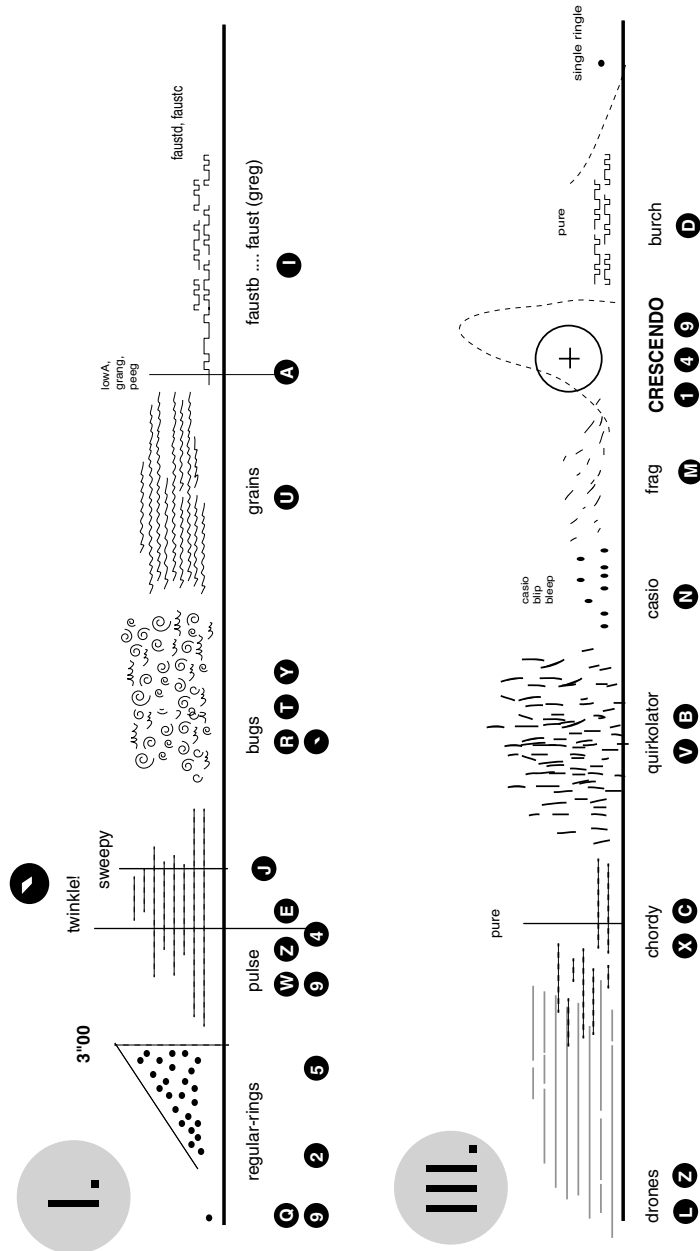
APPENDIX: The *Dialtones* CD

In October of 2002, an enhanced CD (CD-Extra) of the *Dialtones* concert was released on the Dutch/German *Staalplaat* recording label. This CD recording is a production of the Ars Electronica Festival and was made possible by generous support from Sony DADC. The disc includes a special documentary video in a Macintosh/Windows CD-ROM partition; this video was kindly provided by TechTV, San Francisco.

Dialtones (A Telesymphony)
Golan Levin / Scott Gibbons / Gregory Shakar
Staalplaat STCD160

Production credits:
Golan Levin	concept, direction, software engineering
Scott Gibbons	composition, soloist, mixdown engineering
Gregory Shakar	composition, interaction design
Yasmin Sohrawardy	telephony middleware engineering
Jörg Lehner	staging, recording, production
Joris Gruber	database software
Erich Semlak	database software
Gunther Schmidl	ringtone messaging
Rashad Becker	audio mastering
Dafna Naftali	audio transfer
Nina Wenhart	video editing

The packaging for this disc was designed by Dave Heasty and Alexander Gelman of Design Machine, NYC.

Staalplaat Press Release [October 2002]:
What is the sound of 200 mobile phones ringing? When it's choreographed by computer whiz Golan Levin, 'Lilith' frontman Scott Gibbons, and sound artist Gregory Shakar, the answer is: suprisingly sublime. 'Dialtones' is a large-scale concert performance whose sounds were wholly produced through the carefully triggered dialing and ringing of the audiences' own mobile phones. In "Dialtones", waves of polyphony cascade across the crowd, rendering unprecedented sonic phenomena like spatially-distributed melodies and chords. The magic is accomplished with a custom software system, developed by the artists, which allowed them to arrange the audience members' locations and ringtones before the concert, and then perform their mobiles in real time with a specially-designed dialing instrument. The composition is sometimes delicate and twinkly, sometimes cacophonous, and sometimes purifyingly haunting. More than just a simple composition, however, 'Dialtones' is a performance artwork which redirects our attention to the unexplored musical potential of a ubiquitous modern appliance, and inverts our understandings of private sound, public space, electromagnetic etiquette, and the fabric of the communications network which connects us. This disc contains a complete live recording of the 26-minute concert, as well as a special CD-ROM component with Quicktime video excerpts, interviews with the artists, and other information about the concert.

APPENDIX: The *Dialtones* Project Plan (June 2001)

This plan was prepared by project engineer Yasmin Sohrawardy at the beginning of our technical development period, in June of 2001. All work was completed by 2 September 2001.

1	**Publicity**	
2	Program Notes	Golan, Jutta, Ursula
3	**Composition**	
4	Ringtones composition	Greg, Scott, Golan
5	Sequence composition & testing	Greg, Scott
6	Overall composition scoring	Golan, Greg, Scott
7	**Registration**	
8	Web page design	Golan, Joris
9	Web page text, including translation	Golan, Joris, Iris
10	Web page allowing registration	Joris, Erich
11	Web server config	Joris, Erich
12	DB config	Joris, Erich
13	Technology for ticket printing	Joris
14	Admin tool to terminate registration	Joris, Erich
15	Registration uploading mechanism	Yasmin
16	Configure kiosk machines for registration	Pascal, Joerg, Joris
17	Acquire info trainers to do registration	Iris, Jutta
18	Get list of Mobilkom prefixes	Golan,Joerg,Mobilkom
19	Attendee phone configuration	
20	Create test SIM cards	Mobilkom
21	Get list of SIM properties	Golan, Joerg, Mobilkom
22	Train helpers on SIM card swapping	Joris
23	Ringtone transmission	
24	What % of Mobilkom phones are Nokia?	Yasmin, Joerg, Mobilkom
25	Get cables/ringtone software for phones	Golan, Mobilkom
26	CGI utility for SMS ringtone xmission	Joris, Gunther
27	**Projection System - Physical Setup**	
28	big mirror	Joerg,Greg,Golan,Norbert
29	little keychain ringtone sensors	Iris, Golan
30	stands for soloist & performance furniture	Joerg
31	pitch shifters / contact mikes for soloists	Greg, Joerg, Scott
32	small (4x3 meter) side screen projections	Joerg
33	projector hanging / suspension	Joerg
34	Orchestra seating arrangement	Golan, Joerg
35	**Performance Software**	
36	Performance front-end software	Golan
37	Dialing request component to access middleware	Yasmin
38	**Dialing Middleware**	
39	Obtain telephony cards	Golan, Mobilkom, Joerg
40	Acquire Linux PC & Install telephony cards	Joerg
41	Increase channels in Brucknerhaus microcell	Mobilkom
42	**Middleware Server**	
43	Messaging component	Yasmin
44	Determine phone states and status messages	Yasmin, Golan
45	Call placing component & Call manager	Yasmin
46	Thread pool	Yasmin
47	**Testing**	
48	Acquire Nokia test phones	Ursula, Iris
49	Phone bank recharging nursery	Scott, Greg
50	Install 2E1 lines, network access	Joerg
51	Set up & test all networking	Joerg, Team, Mobilkom

APPENDIX: The *Dialtones* Programme

Customised, automatically-generated concert programmes were distributed to the members of the *Dialtones* audience. These programmes, which also functioned as tickets to the event, detailed the precise seating location of their bearers, as well as the name and musical notation of the ringtone sent to their mobile phone.

Participant information:

Show Time	**21:00**
Phone Number	0664XXX1234
Phone Manufacturer	Nokia 6210
Phone Owner	Dialtones / Guest
Seat Location	Row 5, Seat 4

Your location:
Row 5, Seat 4

Your ringtone:
18 (bigSqueal)

Dialtones: A Telesymphony
by Golan Levin, with:

Collaborating artists:	*Collaborating engineers:*
Scott Gibbons	Joris Gruber
Greg Shakar	Jörg Lehner
	Erich Semlak
	Gunther Schmidl
	Yasmin Sohrawardy

Programme Notes

Dialtones is a concert performance whose sounds are wholly produced through the choreographed ringing of the audience's mobile phones. Because the location and ringtone of the participants' handies are prepared in advance, *Dialtones* presents a diverse range of musically interesting sonic phenomena. By directing our attention to the unexplored musical potential of a ubiquitous modern appliance, moreover, *Dialtones* aims to invert our understandings of private sound, public space, electromagnetic etiquette, and the fabric of the communications network which connects us.

Dialtones begins with a brief preparation phase just prior to its performance, during which the members of the audience register their wireless telephone numbers at a cluster of secure Web kiosks. In exchange for this information, the participants receive their seating assignments in the concert venue, and (if possible) new ringtones are automatically downloaded to their handsets. During the concert itself, the audience's mobile phones are brought to life by a small group of musicians, who perform the phones *en masse* by dialing them up with a specially designed, visual-musical software instrument. Because the audience's positions and sounds are known to the *Dialtones* computer system, the performers can create spatially-distributed melodies and chords, as well as novel textural phenomena like waves of polyphony which cascade across the crowd.

The performers' grid-based graphical interface is projected onto the audience from above, and registered with their seats. Whenever a participant's handset is dialed, their seat is lit up by a personal spot of light. In this way each individual becomes an audiovisual pixel, a twinkling particle in an audiovisual substance—and the participants, as a group, are at once audience, orchestra and (active) score.

Suggestions for the performance

Due to technical constraints, the set of active phone-participants is limited to the 200 individuals who have registered for assigned locations in the central seating area. All others are invited to enjoy the performance from the surrounding general-admissions area.

Dialtones is a quiet concert, performed without any amplification of the audience's handies. We kindly ask you, therefore, to keep other noises to a minimum. Though your phone may ring, we ask that you please not answer it, and please not use it to place any calls.

APPENDIX: The *Dialtones* Stage Plan

The stage plan for the Linz *Dialtones* concerts called for a large Mylar mirror to be erected at an angle to the audience, so that they would be able to observe themselves ringing during the performance. Below is a section diagram of the Linz Brucknerhaus theater, showing the relationship between the hall, mirror, and audience seating area.
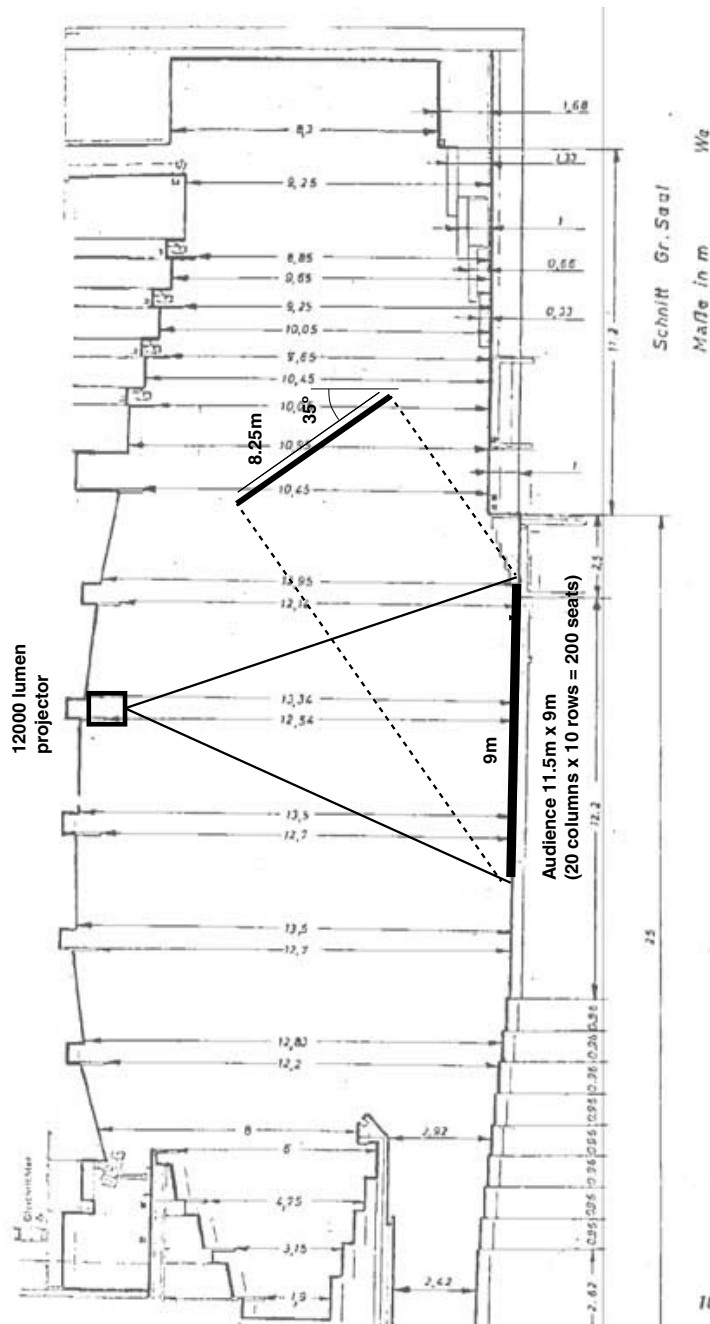
APPENDIX: Announcement Transcript

The following text is a transcript of the announcement made by Golan Levin immediately prior to the premiere performance of Dialtones *on September 2, 2001.*

"Good evening ladies and gentlemen! Thank you so much for your interest in this event. I'd like to thank all of you for coming, and to our many friends for their support. I'd also to thank all of our sponsors, especially the Ars Electronica Residence Program for allowing us to develop the work here, and to A1 Mobilkom Austria for their extensive technical collaboration.

"I'd like to make a few brief statements that might help explain what you're about to see and hear. I also have a few requests which I hope you'll consider.

"First of all let me say that all of the sounds you're hearing are entirely produced by ordinary mobile phones. In some cases these are your own phones, and in some cases we've loaned you some of ours, but none of the phones have had their circuitry modified in any way. Of course, one thing we have done is reprogrammed their ringtones with our own melodies.

"Almost all of the phones you're hearing are completely unamplified. There's no big sound system that your phones are going into, and the microphones overhead are just for recording. This means that Dialtones is a relatively quiet concert. We would therefore be extremely grateful if you could therefore keep unrelated noises to a minimum. Since our concert is also a relatively dark concert, we would also like to ask you please not to use flash photography.

"I said that 'almost' all of the phones are unamplified, but there's a small exception. Up here by the front you can see that we have a few phones that Scott will be performing a solo on. The sound of these phones has been amplified to these speakers you see up here. We've had to do this in order to pick up some sounds that would otherwise be too quiet to hear, such as the touchtones. Another example is the really big bass sound you might hear, which is actually a phone's vibrator amplified by a microphone. That sort of thing. But let me emphasize again, none of our phones have been electronically modified in any way.

"Something that bears a little explanation is why there are two audiences—the people up here in the seating-grid, and then the rest of you at the sides and rear. The fact is that there are some technical constraints on how large of an image we could project, and also how many phones we could ring at the same time. In the end we decided that we'd have the best results if we limited the number of active phones to 200. So that is why we have the audience seating, and then the orchestra seating.

"If you're in the orchestra and you've brought your OWN phone, I'd like to ask a special favor: could you please turn off your phone, and then turn it on again. This will help it lock in to our antenna. If you're from out of town, please make sure that your phone is set to A1 as the service provider.

"Finally, a little bit of etiquette that we kindly ask of you. Phones always seem to have some etiquette attached, no matter the context. So: your phone may ring, but we kindly ask that you please not ANSWER it. Especially because this is such a quiet concert. And along the same line, we ask you please not to MAKE any phone calls. But, to make up for this, we do ask you to please leave your mobile phones ON."

APPENDIX: *Dialtones* Facts and Figures

Each 26-minute concert entailed the placement of more than 4000 phone calls. During the premiere concerts on 2 September 2001, calls were placed to the following thirteen countries:

0031   Holland
0033   France
0036   Hungary
0037   Latvia/Lithuania
00386 Slovenia
0039   Italy

0041   Switzerland
00420 Czech Republic
0043   Austria
0044   England
0047   Norway
0049   Germany
00972 Israel

The Linz mobile-orchestra pits were designed to seat 200 participants in a 20x10 grid. The first concert had 198 participants, while the second had 193. On average, we were able to modify the ringtones on approximately two-thirds of each orchestra's mobile phones. This meant that in each concert, roughly sixty to seventy phones performed sounds that were essentially left to the choice or chance of the audience members, while approximately 120 performed sounds of our own design.

The composition team created 106 different ringtones for the concert. These were sent in various proportions to the audience members whose phones were capable of receiving them. In some cases, such as certain simple drones, more than one person had the same ringtone.

The time required to connect a cellular call on the Austrian Mobilkom network averaged 4.74 seconds, with a standard deviation of approximately one second. Connection times on the Swiss network were similar, with a slightly smaller deviation. The length and unpredictability of these connection times effectively ruled out the composition of precisely-timed rhythms and melodies, and compelled us to pursue a more ambient or textural compositional strategy.

The maximum number of simultaneous rings possible in the *Dialtones* concerts was 60. This limit was due to the number of 30-channel E1 lines we had available.

The total cost of supporting the Linz concerts was estimated by Mobilkom Austria at $100,000. The total cost of the Swiss concerts, by contrast, was estimated by Swisscom Mobile at between $200,000-350,000. The difference is partially explained by the duration of the Swiss events (17 concerts in two locations over the course of 3 weeks), and also by the fact that the Swiss concerts were performed on a boat in the middle of a lake.