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URN: urn:nbn:de:bsz:16-artdok-20166

URL: <http://archiv.ub.uni-heidelberg.de/artdok/volltexte/2012/2016/>.

Ebenfalls in der Gesamtpublikation: Henry Keazor, Hans W. Giessen, Thorsten Wübbena (Herausgeber), Zur ästhetischen Umsetzung von Musikvideos im Kontext von Handhelds

URN: urn:nbn:de:bsz:16-artdok-18676

URL: <http://archiv.ub.uni-heidelberg.de/artdok/volltexte/2012/1867/>

The Audiovisual Telephone: A Brief History

Mara Mills

“Let us say that in the ultimate, whenever a baby is born anywhere in the world, he is given at birth a number which will be his telephone number for life. As soon as he can talk, he is given a watchlike device with 10 little buttons on one side and a screen on the other. Thus equipped, at any time when he wishes to talk with anyone in the world, he will pull out the device and punch on the keys the number of his friend. Then turning the device over, he will hear the voice of his friend and see his face on the screen, in color and in three dimensions. If he does not see and hear him he will know that the friend is dead.”¹
—Harold Osborne, former AT&T Chief of Engineering, 1954

The history of the “handheld” or mobile phone has been well-charted from the perspective of handset miniaturization and the technical evolution of wireless communication. In *Constant Touch*, Jon Agar details the gradual merger between telephone and radio networks in the twentieth century: handsets carried in cars could be physically connected to outdoor telephone wires as early as 1910; a small number of “radio-telephones” were used for military and maritime purposes in the same period; mobile two-way radios for cars became available around 1940; handheld radios (i.e. Handie-Talkies) were built for use during World War II; the FCC approved the use of radio spectrum by commercial phones in the United States soon after the war; “cellular” systems that maximized the radio spectrum allowed an increasing number of participants in mobile telephony in the late 1970s.² In terms of hardware, subminiature vacuum tubes, developed in the late 1930s for hearing aids, transferred directly to portable radios; the “button” batteries of World War II and the transistors (and, eventually, printed circuits) of the postwar period enabled efficient portable devices with highly compact assembly; the liquid crystal display (LCD) began to appear as a feature of commercial electronics in the 1970s.³ Technological convergence has thus been a feature of mobile telephony for much of the past century.

Others have offered media archaeological explanations for the “mobile” phenomenon. Michael Brian Schiffer takes the pocket radio to be an exemplary portable device: a longstanding “cultural imperative” for mobile listening among radio enthusiasts propelled a

¹ Quoted in Robert Leslie Conly, “New Miracles of the Telephone Age,” *National Geographic* (July 1954): 87.

² By radio, here I refer to wireless technology and the radio spectrum, rather than “radio” as a commercial mass medium. Jon Agar, *Constant Touch: A Global History of the Mobile Phone* (London: Totem Books, 2004); See also Richard Ling and Jonathan Donner, *Mobile Communication* (London: Polity, 2009) and Gerard Goggin, *Cell Phone Culture: Mobile Technology in Everyday Life* (New York: Routledge, 2006).

³ Mara Mills, “Hearing Aids and the History of Electronics Miniaturization,” *IEEE Annals of the History of Computing* 33, 2 (April-June 2011): 24-45.

series of inventions in the nineteenth and twentieth centuries. Erkki Huhtamo has suggested that amateur photography arose as “the first mobile medium” in the late 1880s, tied to technical innovations in cameras and film as well as the general social value of mobility in urban modernity.⁴ Likewise, I have argued that ear trumpets and conversation tubes, sold commercially in the nineteenth century, were the first mobile communication technologies.⁵ I have also insisted that the *personalization* of technology is a phenomenon distinct from mobility; beyond being held in the hand or worn on the body, mass-produced electronic devices have come to seem “personal” to individual users.⁶ For one thing, there was a steady demand by telephone users for private and individually controlled communication in the twentieth century (private lines, answering machines, decorative phones).⁷ Second, there was an accelerating “communication imperative” in the telephone industry itself. From its earliest days, AT&T had advocated “universal communication,” but widespread telephone adoption was not a real possibility until the expansion and automation of the telephone network in the mid-twentieth century. In the 1950s, telephones began to be marketed as accessories in the United States. Handsets were sold in “decorator” colors. Consumers were encouraged to purchase multiple extensions, i.e. for bedrooms, and in this way the telephone began to be associated with the individual user, rather than the family or the business.⁸ At the same time, phones began to be designed ergonomically. AT&T hired industrial designer Henry Dreyfuss to build handsets tailored to the (average) human body. By the end of the century, “personalization” would also be defined as the capacity for digital objects to be (partially) customized by users, as in the case of ringtones.

While the “handheld” aspect of mobile phones is relatively well understood, an explanation of the telephone’s repurposing as an audiovisual medium remains to be given. Rather than proclaim the erasure of the phone with the rise of mobile multimedia, I want to make the case that audiovisual convergence was premediated by the long history of telephone engineering.⁹ By reducing speech to a signal and dialogue to message-exchange, by coming to value efficient communication over vocal immediacy, and by extending this “signal-thinking” to

⁴ “The mobility may be motivated by official needs (a messenger services) and commercial imperatives (the distributions of goods, for example), or by a developing taste for “mobility for the sake of mobility”, as exemplified by the habit of strolling the city streets and the emergence of modern tourism.” Erkki Huhtamo, “An Archaeology of Mobile Media,” http://lizard.artun.ee/~raivo/imke/texts/huhtamo_An_Archaeology_of_Mobile_Media.rtf

⁵ Mara Mills, “When Mobile Communication Technologies Were New,” *Endeavour* 33 (December 2009): 140-146.

⁶ Mara Mills, “500-Type Colour Desk Set Telephone,” *Objects of Knowledge, of Art, and of Friendship: A Small Technical Encyclopaedia for Siegfried Zielinski*, ed. David Link and Nils Röllner (Leipzig: Institut für Buchkunst, 2011), 51-52.

⁷ Michèle Martin links these demands to middle- and upper-class Victorian privacy mores. Michèle Martin, *Hello Central? Gender, Technology, and Culture in the Formation of Telephone Systems* (Montreal: McGill-Queen’s University Press, 1991), 142-143.

⁸ For mention of a similar pattern in Japan, see Tomoyuki Okada, “Youth Culture and the Shaping of Japanese Mobile Media: Personalization and the *Keitai* Internet as Multimedia,” in: *Personal, Portable, Pedestrian: Mobile Phones in Japanese Life*, ed. Mizuko Ito, Daisuke Okabe, and Misa Matsuda (Cambridge, MA: The MIT Press, 2005), 45.

⁹ On the mobile phone as emblematic of digital convergence, see Henry Jenkins, *Convergence Culture: Where Old and New Media Collide* (NYU Press, 2006). Citing Kouichi Kobayashi, Okada explains that “multimedia” exceeds the convergence of image, audio, and text capabilities in a single medium and instead encompasses “(1) having multimodes, (2) interactivity, (3) hypertext properties, (4) a tendency toward digital application, and (5) networking capabilities.” Okada, “Youth Culture,” 47.

other sensory phenomena, telephony was so successful that it erased the need for voice communication—its very foundation as a medium.

What is a telephone?

Why, in English, are the modifiers “mobile” and “smart” anchored to the phone, a technology already entirely modified through its combinations with the camera, computer, radio, music player, GPS, and game console?

In a pamphlet produced for Motorola in 2002, Sadie Plant observed that the word “phone” was diminishing in certain national contexts.¹⁰ Mobile phones had become simply “mobiles”—or portables, handys, hand machines, handhelds, movils, motos. If we consider the “phone” to be coterminous with the handset, then the employment of this word in the United States (cell phone, smartphone, mobile phone, iPhone) might seem to be little more than a tactic for marketing multipurpose luxury devices as utilities—calling on the long history of telephone advertisement as a “universal service,” a “public utility,” or a security essential.¹¹ Of course, the medium of the telephone is bigger than handsets; it includes telephone exchanges, a network of wires and—since the early 20th century when the telephone converged with radio-telegraphy—wireless.¹² “Phone” then perhaps references carriers, telecom companies such as (in the U.S.) AT&T, Sprint and Verizon that expanded their voice networks to carry other kinds of data. Or, with reference to this article’s epigraph, perhaps the phone now resides in *the phone number* and the possibility for electronic addressability.

We might also follow sociologist Robert Hopper, who defined telephony in his 1992 book *Telephone Conversation* according to phenomenology and practice, as “vocal immediacy across distances.”¹³ The electric telephone extended the capacity of earlier objects that channeled the voice, also called telephones—conversation tubes and wire transmitters of mechanical vibrations. For Hopper, the medium is less determined by a particular delivery technology than by its associated set of protocols and cultural habits. The early telephone—the “electrical speaking telephone”—provided a single sensory channel for communication, moreover the apparatus was eventually designed to privilege speech over other sounds through signal processing methods such as electrical filtering. This speech was then delivered to a single ear. On the one hand, the “immediacy” of the medium refers both to its instantaneity and transparency—the telephone’s seeming lack of mediation compared to communication technologies such as telegraphy or mail. On the other hand, as Hopper explains, telephone-speech is a very particular type of speech—dialogic and interactive, but also cut off from other communication cues, and thus often reflexive. (“Hello?” “It’s me.”

¹⁰ Sadie Plant, *On the Mobile: The Effects of Mobile Telephones on Social and Individual Life* (Motorola, 2002), <classes.dma.ucla.edu/Winter03/104/docs/splant.pdf>

¹¹ On the telephone as a “public utility” and “natural monopoly” akin to water, electric, and gas service, see John Pierce, *Signals: The Telephone and Beyond* (San Francisco: W.H. Freeman and Company, 1981), 10.

¹² On the significance of the telephone exchange, Colin Cherry has argued, “It was the exchange principle that led to the growth of endless new social organizations, because it offered *choice* of social contacts, on demand, even between strangers, without ceremony, introduction, or credentials, in ways totally new in history. The exchange principle led rapidly to the creation of *networks* covering whole countries and, since World War II, interconnecting the continents.” The telegraph system, he explains, included exchanges, but they were neither public nor widespread. Colin Cherry, “The Telephone System: Creator of Mobility and Social Change,” in: *The Social Impact of the Telephone*, ed. Ithiel de Sola Pool (Cambridge, MA: The MIT Press, 1977), 114.

¹³ Robert Hopper, *Telephone Conversation* (Indiana University Press, 1992), 29.

“Can you hear me?”) A surplus, a gymnastics of speech is nonetheless afforded by the constraints of the telephone medium.

According to Hopper’s definition, the phone might be reduced to one function—the voice function—*ever diminishing* in a converged mobile device. Yet Carolyn Marvin and other historians have shown that the phone was not initially restricted to phonemes nor to dialogue—it was not necessarily a speech technology. Before the electrical telephone achieved (temporary) stability as a medium of personal voice-transmission, it was often used to broadcast musical performances, sporting events, and news programs. Commercial telephone systems in a number of cities—Berlin, Brussels, Paris, London, Budapest, Boston—offered multiple address devices around the turn of the twentieth century. Thus “theatrophones” and “telephone pulpits” transmitted music as well as speech to dispersed, listening audiences.¹⁴ Although Alexander Graham Bell predicted that his device would someday serve for one-to-one (or “point-to-point”) social communication, he and Thomas Watson took the phone to the stage to transmit songs and organ tunes as evidence of the machine’s viability.¹⁵

From the second decade of the twentieth century, furthermore, numerous attempts were made to turn the telephone into an audiovisual medium. At American Telephone and Telegraph (AT&T), engineers began working on the problem of telephotography in 1918; by 1923 they were successfully scanning and sending “pictures by telephone.”¹⁶ In 1925—at a time when other phoneworkers were planning new transmitters to efficiently capture and streamline speech—AT&T installed wirephoto equipment in special offices in New York, Chicago, and San Francisco for the transmission of photographs down telephone lines.¹⁷

¹⁴ Carolyn Marvin, *When Old Technologies Were New: Thinking About Electric Communication in the Late Nineteenth Century* (Oxford UP, 1988), 210-214. See also Asa Briggs, “The Pleasure Telephone: A Chapter in the Prehistory of the Media,” in: *The Social Impact of the Telephone*, ed. Ithiel de Sola Pool (Cambridge, MA: The MIT Press, 1977), 40-65.

¹⁵ Sidney Aronson, “Bell’s Electrical Toy: What’s the Use? The Sociology of Early Telephone Usage,” in: *The Social Impact of the Telephone*, ed. Ithiel de Sola Pool (Cambridge, MA: The MIT Press, 1977), 15-36.

¹⁶ M. D. Fagen, ed., *A History of Engineering and Science in the Bell System: The Early Years (1875-1925)* (Bell Telephone Laboratories, 1975), 785.

¹⁷ By 1927, AT&T telephoto offices were installed in 7 U.S. cities. However, inventors had worked on the problem of image scanning beginning in the late 19th-century, and Western Union successfully sent photographs via telegraph lines as early as 1921.



Photograph by P. and A.

One of the first pictures taken after the collapse of the Pickwick Club dance hall in Boston. This photograph was rushed by train from Boston to New York and thence transmitted simultaneously over Bell System telephone wires to Chicago and San Francisco, where it was featured in the newspapers the following day

From *Some of the Commercial Uses of Telephotographs* (AT&T Pamphlet, 1927). Courtesy of AT&T Archives and History Center.

In the early 1920s, as the phone temporarily stabilized into a “dialogic” medium, AT&T took on the problem of television, which they considered to be “an adjunct to the telephone”—a means of enriching conversation through the addition of a visual “channel.”¹⁸ At this early stage in the development of the medium, “the most complete telephone service possible” began to be conceived as audiovisual.¹⁹ As William Urrichio has argued, the history of television might be read through the “lens” of telephony, rather than that of film or radio:

¹⁸ S. Millman, ed. *A History of Engineering and Science in the Bell System: Physical Sciences (1925-1980)* (Bell Telephone Laboratories, 1985), 142.

¹⁹ “It is our constant aim to furnish this country with the most complete telephone service possible. In connection with that aim, we endeavor to develop all forms of communication that might be supplemental to the

“Although one can track the idea of live moving-image transmissions back to the distant past (early claimants range from the ancient Egyptians to Saint Claire of Assisi), we can speak about the televisual in a specific sense with the coming of Bell’s telephone in 1876. The telephone sparked an anticipatory interest in visual systems that could share the instrument’s ability to link distant locations point to point in real time. This consensus took the form of verbal and graphic descriptions in both the scientific and popular press, as well as technological invention and patenting.”²⁰

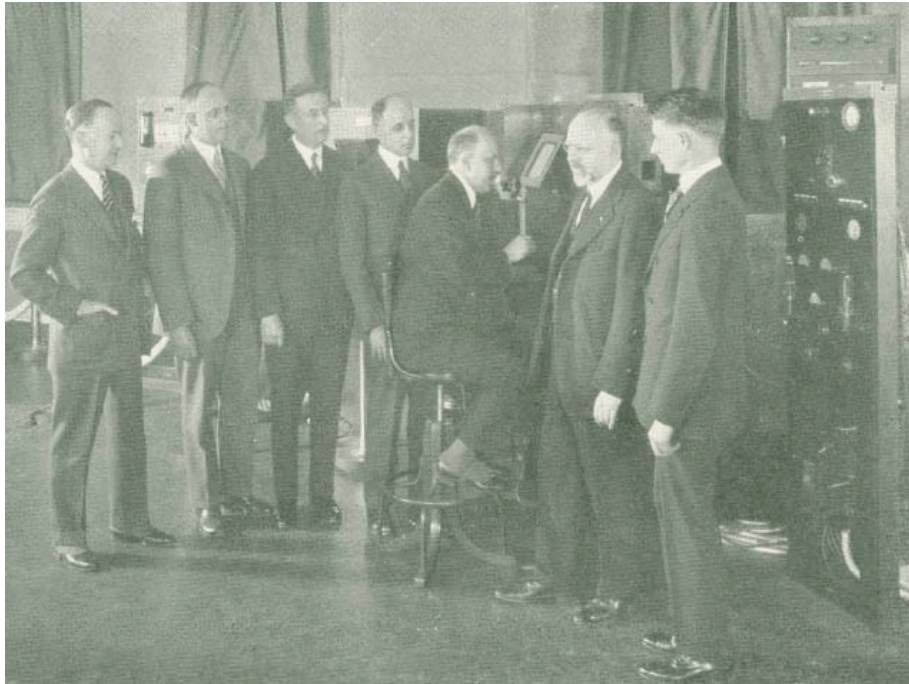
Although inventors worked on televisual transmission in many other national and industrial settings, television was successfully demonstrated to the U.S. public for the first time by AT&T. On April 7, 1927 members of Bell Labs in New York staged a conversation with Herbert Hoover in Washington in which a telephone call was accompanied by a televised image. Walter Gifford, the president of the company, explained at the start of the event that television was intrinsically linked to telephony as a phenomenon based on signal-transmission: “The principles underlying television...are related to the principles involved in electrical transmission of speech.”²¹ Rather than theorize convergence as a recent property of digital media, emblemized by the mobile phone, it is clear that electronic, sensory, and communicative combinations were “premediated” in the analog era—established through technical path-dependence and a longterm corporate imaginary.²² As opposed to an additive model of “multimedia,” this premediation suggests the hegemony of telephonic ideals in other electronic media forms.

telephone.” *Television* (pamphlet reprinted from *Bell Laboratories Record*, June 1927, copy held in the AT&T Archives and History Center, San Antonio, Texas), 1.

²⁰ William Urrichio, “Television’s First Seventy-Five Years: The Interpretive Flexibility of a Medium in Transition” *The Oxford Handbook of Film and Media Studies* (Oxford: Oxford University Press, 2008), 289. Similar to the claim I am making about the telephone as always already a multi-purpose device, Urrichio insists upon the “long-term [interpretive] flexibility” of the televisual medium.

²¹ *Television* (pamphlet reprinted from *Bell Laboratories Record*, June 1927, copy held in the AT&T Archives and History Center, San Antonio, Texas), 1. Marshall McLuhan theorized that television was an “acoustic medium” because it was immersive. However dialogism would prove to be the more salient property of speech in the era of so-called secondary orality. See “TV as an acoustic medium (1978),” *Marshall McLuhan Speaks*, <http://marshallmcluhanspeaks.com/television/1978-tv-as-an-acoustic-medium.php>.

²² According to Richard Grusin, however, premediation “is not necessarily about getting the future right as much as it is about trying to imagine or map out as many possible futures as could plausibly be imagined.” See also Richard Grusin, “Premediation,” *Criticism* 46:1 (2004): 28.



“In the auditorium of Bell Laboratories, President Walter Gifford, of the American Telephone and Telegraph Company, views Honorable Herbert Hoover, Secretary of Commerce, in Washington as the converse during the first public demonstration of television, April seventh, 1927.” – Television (pamphlet reprinted from Bell Laboratories Record, June 1927), 2. Courtesy of AT&T Archives and History Center.

With the series of AT&T videophones built between the 1930s and the 1970s—none of which was commercially successful—the image was brought further into the paradigm of dialogic immediacy. AT&T demonstrated a “two-way television phone,” the Iconophone, in 1930, the design of which sutured the audio and the visual into a single communicative space. “Seeing at a distance” was here designed to be interactive, rather than a viewing of programmed or pre-recorded moving images. R.W. Burns has detailed the parallel developments in Germany and France.²³ In Berlin, a telephone-television was demonstrated at the 1929 Radio Exhibition, and an improved device was installed at public centers in a number of cities (i.e. Berlin, Munich, Hamburg) in 1936. In France, an experimental two-way television was exhibited at a newspaper office in 1932.

²³ R.W. Burns, “Prophecy into Practice: The Early Rise of Videotelephony,” *Engineering Science and Education Journal* 4 (December 1995): S39.



Iconophone 2-Way Television Booth, 1930. Courtesy of AT&T Archives and History Center.

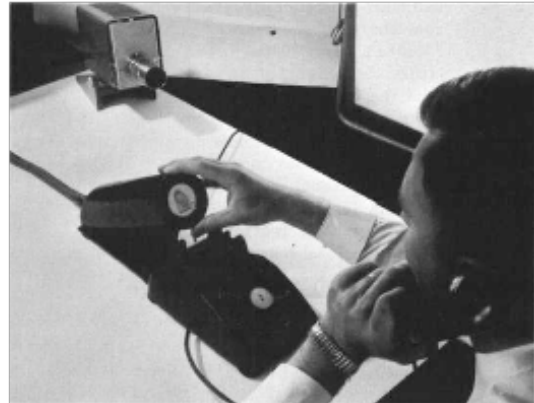
AT&T engineers subsequently built an experimental “video telephone” in 1956, followed by a “Picturephone” that was introduced to the public at the 1964 World’s Fair. As Kenneth Lipartito has demonstrated, Picturephone service became available in several U.S. cities, but the medium had failed commercially by 1978—a fact he attributes to high cost as well as a desire among consumers for the “privacy” of voice-only communications. At the same time, Lipartito argues that the Picturephone created an expectation at AT&T for massive multimedia convergence within the telephone system, which would include: data input to remote computers; movie transmission; and information display to co-present others at conferences. “A RAND study cited by Picturephone advocates at Bell Labs called for an integrated approach over a single network for multiple media—data, voice, text, graphics, and video—in both digital and analog form. It was almost an engineering road map to the media future.”²⁴ While Lipartito argues that the Picturephone was part of a “cultural imperative” for data and multimedia transmission in the 1950s, I am suggesting that this imperative can be traced to first decades of the twentieth century.

²⁴ Kenneth Lipartito, “Picturephone and the Information Age: The Social Meaning of Failure,” *Technology and Culture* 44 (January 2003): 64-5. Similarly, John Pierce has noted that “as a by-product, or product of telephone science and technology, the telephone network has provided facilities for the transmission of television and data.” Pierce, *Signals*, 9.

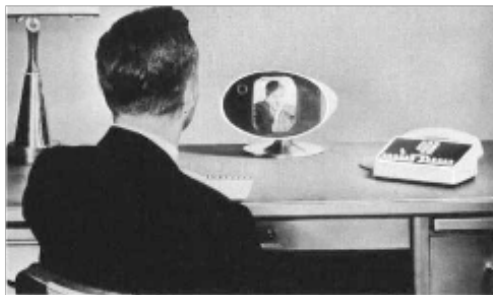
The Evolution of Picturephone Service

Some recent milestones in the development of the PICTUREPHONE® system are summarized pictorially on these pages (photos from *The Evolution of Picturephone Service*, RECORD, October 1968).

1956 *By this time, Bell Labs scientists had developed several experimental "video telephone" systems of varying size and appearance which offered commercial possibilities. The one shown here was demonstrated before the Institute of Radio Engineers on August 23. This was the first system to transmit and receive recognizable pictures over ordinary telephone wires.*



1957 *Studies and experiments continued at Bell Labs to develop an economically feasible videotelephone system. Experiments similar to the one shown here helped engineers establish such picture standards as resolution, contrast, and other features. By 1959, plans were made to develop a videotelephone system specifically for the purpose of conducting trials.*



1963 *A complete experimental Picturephone system had been developed. The station set included the camera-receiver-loudspeaker unit and the separate combination telephone set-video control unit.*



1964 *The first public exposure of Picturephone service was made at the New York World's Fair. Visitors, selected at random, tried the service for about 10 minutes each. Results of interviews conducted at the conclusion of each trial provided valuable information on early public reactions to the service.*



1964 Limited commercial Picturephone service between public locations in three cities—New York, Chicago, and Washington, D. C.—began on June 25. The service was inaugurated with a call from Mrs. Lyndon B. Johnson in Washington to Bell Laboratories scientist Dr. Elizabeth A. Wood, at the Picturephone center in Grand Central Terminal, New York. Robert F. Wagner, then mayor of New York, is seated at right.



1965 As a result of earlier trials, significant equipment and operational changes were made in the Picturephone system. The modified equipment was used in a product trial begun in July 1965, in cooperation with Union Carbide Corporation. In December of the same year an experimental trial began at AT&T headquarters in New York City. In June, 1967, the trial was expanded to include three Bell Labs locations. This trial integrated Picturephone service with normal telephone service. This "corporate network" offered an opportunity to explore additional uses for the system, such as the feasibility of using the Picturephone set as an interface between man and computer (shown here). The computer is interrogated from a Touch-Tone® dial, and results are displayed on the screen.



1968 The Bell System's Picturephone "see-while-you-talk" set has been redesigned to incorporate additional features as a result of the extensive trials. The improved "Mod II" set shown here is itself now the subject of further trials as the evolution of Picturephone service continues.

From *Bell Laboratories Record* 47 (May/June 1969): 160-1. Courtesy of AT&T Archives and History Center.

Rather than "vocal immediacy across distances," telephony should perhaps be defined more broadly, as *communicative immediacy at a distance*. Yet while the telephone has mostly been interactive and its signal transmission has mostly been instantaneous, end conversations have not always been synchronous; from the earliest days of the medium, for instance, there were

attempts to combine the telephone with the phonograph for asynchronous communication.²⁵ The “answering machine” became the answer to the problem of caller hegemony—a way for the “receiver” to reassert control over an intrusive and anonymous ring.²⁶ And, as the Picture-phone demonstrates, within a space of 40 years, the ideal of dialogic, “two-way” television was combined with asynchronous human-machine communication and even cinematic spectatorship in multiple function devices.

Is a telephone, then, *any* medium for interaction at a distance—whether synchronous or asynchronous, using wires or wireless, audio and/or visual, and only “immediate” in the sense that a user’s messages are translated automatically into electrical signals? The definition of the telephone medium briefly stabilized as live “voice communication at a distance” in the twentieth century. As the network expanded, however, telephony came to be defined by an industrial approach to speech and a universalizing theory of “communication.” AT&T authors routinely stressed the difference between mass communication and point-to-point as the provision of “content” versus technical “service.”²⁷ Premediating the networked formats of other media in the twenty-first century, telephone content was scripted by users. This content would increasingly include data and video, though it would largely remain modeled on *the conversation*.

By the middle of the twentieth century, the telephone system had become “the most complicated machine ever constructed by human beings” and telephony the “most widespread form of electric communication.”²⁸ The goal of “universal” person-to-person service necessitated a search for the fundamental principles of communication, partly to streamline speech and partly to converge speech and image transmission. Telephone engineers theorized speech to be a signal and then defined all electrical communications—fax, radio, television—in the terms of speech transmission. In a 1945 article for *The Scientific Monthly*, AT&T employee John Mills summarized the general principle of electrical communication as “generation of a current...its modulation to put in the signal, its transmission, and its demodulation to recover, to re-create, the signal.”²⁹ Mills claimed that this “universal” principle was derived from analogy to human speech and hearing. Rather than being immersive, speech and hearing were redefined as focused and directional. The apparent conflict between “dialogue” and “transmission” was resolved by defining communication as *message exchange*. If speech were a commodity, moreover, it could be industrially “processed”—coded to conserve bandwidth and to minimize the effects of noise on the transmitted signal.

²⁵ David Morton, “The Message on the Answering Machine: Recording and Interpersonal Communication,” *Off the Record: The Technology and Culture of Sound Recording in America* (New Brunswick: Rutgers University Press, 1999), Ch. 4.

²⁶ Later in the century, “annoyance call bureaus” provided early caller ID systems to victims of crank calls.

²⁷ Pierce, *Signals*, 2-3. AT&T authors, including Pierce, also routinely insisted that the telephone was “democratic” whereas mass media were “authoritarian.”

²⁸ Pierce, *Signals*, 3, 14.

²⁹ John Mills, “Electrical Communication,” *The Scientific Monthly* 61, 2 (August 1945): 139. Similarly, John Pierce argued that the “underlying” and “universal” principles of communication, first realized through telephony, are “the encoding of sound and sight into electrical signals; the nature of signals and communication channels in terms of bandwidth and noise; the theory of information, which tells us how we can quantify sources of signals and the channels that transmit them; and the practical and subtle art of modulation, through which signals can be represented appropriately and combined for transmission over one medium.” Pierce, *Signals*, 14-15.

By defining all communication in the language of signals, and by prizing efficient and individually-controlled exchanges, telephony succeeded in devaluing the social currency of the voice function—hence the prevalence of text messaging and asynchronous communication on handhelds today. As George Myerson puts it, "The old familiar telephone has become part of something else, that is the message, and in the process there has been an explosion of energy, an immense interconnection. Old slow-moving 'talk' is being rapidly pushed aside by its faster cousin 'communication'. ... [The phone is] part of a system of ideas, even a way of looking at everyday life."³⁰

Answers to the Phone: Image, Music, Text

The phone generates a call, a charge that requires an answer—this is the beginning of the communication imperative.³¹ Can we say there are telephonic ideals that structure other media, whether converged with the phone or not? Telephones have of course themselves changed through technical recombination, in particular as they have become computer-based objects which themselves communicate; users interact *with* mobiles as much as *through* them. Yet older telephonic principles have been surprisingly persistent: interactivity as efficient message exchange; individualized communication; the reduction of communicative phenomena to signals.³²

It is fairly straightforward to trace the circulation of telephone hardware into other media. Components of the telephone system were widely employed in twentieth-century electroacoustics. The domains of cinema and music were transformed by the innovations in sound wave control and sound reproduction afforded by telephone by-products such as microphones, loudspeakers, stereophonic sound, sound-on-film techniques, vocoding, and sound spectrography.³³ Other AT&T apparatus—ranging from transistors to switching systems to communications satellites—have been even more widely influential.

Telephone engineers also developed a number of “software” tools to code and compress the speech signal, tools that were later applied to music and image. In his forthcoming book on the mp3, Jonathan Sterne argues that today’s digital audio is the result of a convergence between transmission and recording technology. “Each major technical regime of sound recording,” he writes, “emerged from telephone research: the first phonographs were built in labs funded by telephone (and telegraph) research; the first electrical recording and playback technologies were borrowed from innovations in telephone systems in the 1920s; and digital

³⁰ Myerson argues that instrumentalism at the level of the signal filters up to conversation. "On the one hand, you have the supremely individualistic view, you might almost call it atomistic. There's no real gathering at all. Instead, there are isolated individuals, each locked in his or her world, making contact sporadically and for purely functional purposes. In the mobile vision people communicate because of the "Principle of Want": they satisfy their wants and accomplish goals by using their phone. The phone thus serves as an instrument to get you as much as possible, as fast as possible, as efficient as possible, with as little effort as possible." George Myerson, *Heidegger, Habermas and the Mobile Phone* (Totem Books, 1997), 19-20.

³¹ Summarizing E.M. Roger, Okada defines *new media* as characterized by “interactivity, demassification, and asynchronicity.” See Okada, “Youth Culture,” 51.

³² According to James Katz and Mark Aakhus, there’s an *apparategeist* (or “spirit of the machine”) to mobile phones that provokes certain consistent uses globally. Here I am making a claim about the logic of telephony that similarly falls between hard determinism and weak “affordances.” See their conclusion to *Perpetual Contact: Mobile Communication, Private Talk, Public Performance* (Cambridge, U.K.: Cambridge UP, 2002).

³³ On the ways the microphones and speakers assembled in the telephone system helped to disseminate the ideal of “sound wave control,” see Emily Thompson, *The Soundscape of Modernity* (MIT Press, 2003).

audio recording and playback also used concepts like the Nyquist theorem that emerged from Bell Labs beginning in the 1920s.”³⁴ While mechanical sound recording appropriated equipment from the telephone system, digital audio recording is constituted out of the signal processing and information theory that emerged from telephone transmission.

Telephone handsets and telephone sounds make certain obvious appearances in other media: the landline phone serves as a convenient tool for cutting between scenes in classic Hollywood films; ringtones have become part of the soundscape of hip hop music; and mobiles are frequent actors in music videos, signaling availability status or desirability.³⁵ The telephone has also rearranged other media at a fundamental level. James Lastra describes the reigning paradigm of film sound as “telephonic”—privileging the voice over “phonographic” or direct sound recording methods.³⁶ In the telephonic paradigm, the intelligibility of the “message” outweighs recording fidelity.

Similarly, in his book *Cell Phone Culture*, Gerard Goggin argues that “camera phones” have altered the traditional status of the photograph: not only are these images personal, ephemeral, and “found” or immediate, they are sociable and shared.³⁷ In 1997, Peter Lunenfeld insisted upon an even more pervasive telephone aesthetic in new media art: “Links between the telephone and new media forms are not as circumstantial as they might first appear. One might begin with the oft-repeated maxim that ‘cyberspace is where you are when you’re on the phone.’ It is hard to overestimate the impact of Bell Labs on the history of computing, and the net’s nodal construction is based on the model of the interstate telephone system.”³⁸ Leased telephone lines provided the infrastructure for the early Internet. Lunenfeld further theorizes that telephone art, although never widespread, preceded and facilitated the Internet’s “ability to create a dialogue between producer and audience, the first step towards the hazily grasped goal of fully interactive aesthetic practice.”

Not only can telephonic ideals be located in the domains of the digital image, video and music, they have stimulated—as I have argued—a widespread communication imperative and redefined communication as controlled messaging between individuals. Moreover components from the landline telephone were critical to the emergence of personal communications devices, and to the digital underpinnings of convergence. The telephone has been chronically understudied by media historians, perhaps as a result of its elusive content.

³⁴ Jonathan Sterne, *MP3: The Meaning of a Format* (Duke University Press, forthcoming 2012). Signals herald a mode of thinking about the “layers” of technological media.

³⁵ Ned Schantz, “Telephonic Film,” *Film Quarterly* 56, 4 (2003): 23-35; Alexander G. Weheliye, “‘Feenin’: Posthuman Voices in Contemporary Black Popular Music,” *Social Text* 20 (Summer 2002): 21-47. On the convergence of the music publishing and wireless service industries, see Sumanth Gopinath, “Ringtones, or the Auditory Logic of Globalization,” *First Monday* (December 2005)

<http://firstmonday.org/htbin/cgiwrap/bin/ojs/index.php/fm/article/view/1295/1215>

Christian Licoppe describes ringtones as another means of listener control: a mode of caller ID; a way to control the intrusion of a call into one’s sonic space; a means to further customize/personalize the phone. See Licoppe, “What Does Answering the Phone Mean? A Sociology of the Phone Ring and Musical Ringtones,” *Cultural Sociology* 5, 3 (2011): 367-384.

³⁶ James Lastra, *Sound Technology and the American Cinema* (Columbia UP, 2000), 138-141.

³⁷ Gerard Goggin, *Cell Phone Culture: Mobile Technology in Everyday Life* (Routledge, 2006). See also Lisa Gye, “Picture This: The Impact of Mobile Camera Phones on Personal Photographic Processes,” *Continuum* 21 (June 2007): 279-288.

³⁸ Peter Lunenfeld, “In Search of the Telephone Opera: From Communications to Art,” *Afterimage* 25 (August 1997): 8-10.

Nevertheless, audiovisuality—so often analyzed via sound film or computing—must also be examined from the telephonic perspective.