Broadcast for one: paging and network communication

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BROADCAST FOR ONE:
PAGING AND NETWORK COMMUNICATION

by

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Thesis Supervisor: Professor Kembrew McLeod
To my mother and father, Connie and John Morton.
This dissertation explores the history and culture of a mobile communication device and practice that has been superseded by today’s networked communication devices. The pager—known later in the 1980s and 1990s as a beeper—has a longer history than most assume. In the early 1950s the device was not a distinct technology in its own right, but a haphazard combination of existing communications technologies: telegraphy, telephony, radio broadcasting, answering services, and hearing aids. These technological origins, and the cultures that support them, are important for broadcast and telecommunications historians, as well as media history and theory in general, for three reasons.

First, research on the pager fills a gap in telecommunications history that typically begins with Bell’s wired telephone and ends with wireless mobile car-phones and, later, cellular telephones. Second, the pager’s history contributes to the limited scholarship that has emphasized radio’s many directions after the major broadcast networks left radio for larger television audiences in the late 1940s and early 1950s. Being in-between telephone and radio technology has given the pager somewhat of an identity crisis for historians. Yet this is a silver lining for communication theorists to think about the connection between a medium’s physical form (e.g., a radio is a receiving device that can’t talk back) and its communication form (e.g., a pager was once known as a radio that you would use with the telephone to talk back).

Lastly, the pager is not just a technological device, but the embodiment of a rarely discussed form of communication: paging. This project investigates the
history of paging as a cultural technique and communication practice. While early pagers utilized both broadcast and telecommunications techniques, paging as a form of communication does not fall clearly within either of those categories. Like being paged over a public intercom system, early paging systems broadcast a message (from one to many) in order to grab the attention of a single individual (one out of many). This form of communication, this project argues, is fundamental for understanding the many contemporary discussions over the publicly-private and privately-public nature of today’s social media services.
Today the mobile phone’s capabilities stretch far beyond making a phone call. The device is at once a communication center for email, texts, and various forms of social media, but also an internet browser, television, banking center, and conduit of commerce. How did we get here?

Most have answered this question by looking at inventors, technologies, advertisements, and business agendas that started cellular networks and the mobile phones to use with those networks. This dissertation answers that question in a different way by looking at the communication habits and practices that existed before the mobile phone was an object in its own right. This project focuses on the pager as an idea, technology, and form of communication that brought together three key communication habits that are now part of everyday network communication. These three habits represent the core chapters of this dissertation.

First, individuals are the targets and producers of communication as opposed to the mass group audiences of the broadcasting era who consumed messages from a limited number of producers. Second, unlike previous forms of correspondence, individual messages alert us the moment a message comes in. This may seem trivial, but it has the effect of adding a sense of urgency to each message as well as speeding up the rate at which messages are sent and received. Lastly, messages are recorded, stored, or somehow saved in an effort to make our network selves available at all times.
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This dissertation explores the history and culture of a mobile communication device and practice that many believe has been superseded by today’s networked communication devices. The pager—known later in the 1980s and 1990s as a beeper—has a longer history than most assume. In the early 1950s the device was not a distinct technology in its own right, but a haphazard combination of existing communications technologies: telegraphy, telephony, radio broadcasting, answering services, and hearing aids. These technological origins, and the cultures that support them, are important for broadcast and telecommunications historians, as well as media history and theory in general, for three reasons.

First, research on the pager fills a gap in telecommunications history that typically begins with Bell’s wired telephone and ends with wireless mobile cars-phones and, later, cellular telephones. Second, the pager’s history contributes to the limited scholarship that has emphasized radio’s many directions after the major broadcast networks left radio for larger television audiences in the late 1940s and early 1950s. Lastly, the pager is not just a technological device, but the embodiment of a rarely discussed form of communication: paging. This project investigates the history of paging as a cultural technique and communication practice. While early pagers utilized both broadcast and telecommunications techniques, paging as a form of communication does not fall clearly within either of those categories. Like being paged over a public intercom system, early paging systems broadcast a message (from one to many) in order to grab the attention of
a single individual (one out of many). This form of communication, this project argues, is fundamental for understanding the many contemporary discussions over the publicly-private and privately-public nature of today’s social network services (SNS). \(^1\)

**What’s the Problem?**

The pager has received very little historical attention within communication studies specifically, and technology studies more generally. \(^2\)

There are three reasons that the pager has evaded historical analysis. First, any talk of the pager has to overcome a popular history that has made it an emblem of 1980s and 90s pop-culture. Its appearance in popular films (e.g., *Def Jam’s How to Be a Player*, 1997), music (e.g., “Beepers” by Sir Mix-A-Lot, 1989), television programs (e.g., *Saved By the Bell*, 1989-1993), and advertisements during that period all but fixed popular knowledge of its emergence with the films, music, and TV shows in which it appeared. The texts media produce serve as the grounds on which many cultural histories are written. \(^3\) Writing has its novels, letters,

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\(^1\) A prominent example of this discussion is Zizi Papacharisi, *A Private Sphere: Democracy in a Digital Age* (Malden, MA: Polity Press, 2010).


\(^3\) A wonderful example is a study in which the late history of pagers and cell phones is read through representations within late 1980s and 90s films and hip-
documents, and newspapers. Sound recording has its music and radio programs. And photography has its photos and motion pictures. Texts have a cultural life beyond the technologies that produce them. In comparison to other media technologies, the comparatively few pieces of literature on the telephone may be evidence of this textual bias. What other forms of communication send messages but don’t record them? This is why oral histories are so important. To take this point further, the many publications on the cellular telephone within the past ten years are no doubt due to the mobile phone industry’s recently-acquired recording capabilities: calls, texts, voice mail, minutes, e-mail, and the copying capabilities of digital networks. In other words, transmission media are more likely to get a fair shake historically when there is a record of transmitted content.4


4 Even so, Gerard Goggin notes that mobile user data is more difficult to acquire when compared to internet data. “The problem is that much of the data about cell phone media traffic, application and uses lies in the hands of the various industry players—especially those who control the networks, such as carriers and service providers…” Gerard Goggin, Global Mobile Media (New York: Routledge, 2011), 1. However, it is easier to produce records of email, text messages, and other correspondence media when compared with the telephone.
The second reason the pager has gone under the radar is that the device straddles disciplinary boundaries. Early paging systems broadcast their messages over wireless radio frequencies, but the messages were intended for individuals. This is not the jurisdiction of broadcast history. Yet pagers don’t square nicely.

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5 From the album “Seminar” (Nastymix Records, 1989).

6 Of course, many historians have pointed out that Marconi’s early wireless technology did, in fact, intend to connect individuals. But let’s not stop there.
with telecommunications scholars either. It’s true that a phone call initiates a page, but there is no live conversation between sender and receiver. A page is the middle-man in this relay race. Unlike the sender or receiver, there is little glory for the pager’s relay position. The pager, to put it more simply, has an identity crisis. Is it a broadcasting or telecommunications device? Which bureau should lead the investigation? As we’ll see, the pager’s middle position between telephone and radio make it an apt device to understand the transition from broadcast to network communication.

Lastly, the pager is seen to have had a dubious significance, at best, in the history of communication. The two reasons listed above actually assume that the pager is a useful object of study. Where the pager and its history is mentioned—usually within research on the cell phone—it is largely seen as a failed or defunct communications technology. While some hospital and municipal personnel still use pagers, they have largely been supplanted by the popularity of cellular phones in the twenty-first century. The assumption in this oversight is that mobile communications are different than the old pager. The technology is shiny, new, and with more features each year mobile devices are produced. Modern

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communications have little to learn or understand from older and outmoded forms of communication. Who wants to study a loser?\textsuperscript{8}

Although the pager as a distinct communications device may have lost its popularity among users, its combination of broadcasting and telecommunications techniques links mobile communication habits of the twentieth century with those of the twenty-first. The significance of the pager, I claim, is not only in tracing the evolution of the device itself, but in understanding the verb from where the pager gets its name. Action precedes any invention, especially the invention of communications media. Media historian Jonathan Sterne defines a medium simply as “a network of repeatable actions.”\textsuperscript{9} That is, those actions, habits, and techniques of communication which mechanical and electronic media make automatic. As a network of repeatable actions and habits, a medium often precedes the physical or technological device. What is lacking in mobile communication historiography is that many studies tend to look at one particular technology rather than the underlying cultural habits that give rise to those technologies.

In the midst of a moment in which it is difficult to make sense of network communication, paging and its history shows us in slow motion those network changes that are now taken-for-granted. The history of pagers and paging is a multi-media history in the truest sense. This dissertation shows how once-distinct

\textsuperscript{8} Of course, there is a growing research field in failed or defunct communication technologies. However, I have found no studies in this area of the pager or paging.

communication technologies were brought together through networks of communications habits and techniques. These networks and their cultures change—and change with—communications technology. Pagers are one significant network in that they materialize a cultural narrative that charts the major changes in mobile, social, and networked communications. I organize these changes into three practices that are represented by the following three chapters of this dissertation: a call for a particular person (Chapter 2) alerts that person (Chapter 3) with a message to which they are expected to respond (Chapter 4). Understanding paging in this way, as a form of communication, negotiates an unsatisfactory dichotomy between mass mediated and interpersonal communication that has come to characterize twenty-first century network communication. This dissertation demonstrates how twentieth century media set the stage for today’s blurred lines between mass and interpersonal communication. “Listening in” has become the foundation of modern social media platforms like Facebook and Twitter. For example, a Facebook wall post, comments on a friend’s photo, or a Twitter debate are messages intended for one or a few but read by many.

Increasingly, research is beginning to understand communication as a concept that can’t be separated from the devices with which it is performed. In the second decade of the twenty-first century, mobile devices use less and less of their live voice capabilities, and rely more on, as I argue, the beeps, alerts, and stored messages that are the fundamental techniques of electronic paging. Studying these techniques will help communications scholars understand the
world’s most popular forms of electronic communication. In order to analyze network communication, we need to break down the key communicative functions that are largely taken for granted by using the network.

In Short

The second chapter traces the evolution of attempts to use broadcasting technology to contact individuals. While I mention paging’s indebtedness to speech (calling someone’s name), this chapter focuses on electronic paging. The narrative is one of Americans sticking to their communicative guns. Paging is the constant; new technologies and the techniques with which they are developed are the variables. The history centers on the ways in which traditional or established broadcast media forms of address (e.g., public address, radio) are transgressed in order to contact individuals at much faster rates than extant point-to-point media (e.g., mail, telegraph, telephone). This chapter’s argument is that the cultural model for mobile and network communication can be understood as broadcasting to an individual. The blessing and curse of taking part in any network is having a name for others to contact you.

I investigate three institutions in which paging played a key part in communicating between individual members of those institutions. These are police, military, and hospitals. All three use the paging technique for the purposes of urgent communication situations. Yet there are key differences between the

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10 For those who draw a line between computers and mobile devices, there are now more mobile devices in the world than internet-connected computers, even if they are increasingly connected to the same worldwide network. Gerard Goggin, *Global Mobile Media* (New York: Routledge, 2011), 1.
three institutions. Police and military saw the device as an extension of centralized authority. For police, radio communications were used to inform officers of crime or other troubles in a particular city. Similarly, military communications enabled troops to stay in contact with base headquarters. Both police and military, then, used radio communications in mixed form. Of course, there were point-to-point uses of police and military two-way radio. The police even developed “10-Code” templates into which officer’s names could be inserted for concise and urgent communication. But by and large both were used to monitor or police a certain geographic area—a communication dragnet.

Hospital communications are unique in that were developed for the expressed purpose of contacting a specific doctor, nurse, or other personnel. This is a case in which the institution bends the technology for its own needs. The specialization of medical professionals requires that particular doctors be used for particular needs: surgery, pregnancy, cardiovascular, etc. What is less known about the hospital paging context is the transition from a verb (to page) to a noun representing a device (a pager). This simple transition in grammar hides a contested noise debate inside hospitals. Patients and noise-abatement advocates complained that too many publicly-announced intercom messages were negatively impacting the mental health of patients as well as employees. “Why did everyone have to listen to messages intended for one or a few?” they wondered. It’s no stretch to see how twenty-first century networks produce similar complaints. Reply-all emails, praising one person in a public social media message, and veiled or coded public tweets (i.e. subtweets) that act like political
dog-whistling are modern examples of public messages read by all but intended for one or a few.

The third chapter investigates how communication technologies alert their users of messages. The implications of this seemingly obvious aspect of modern communications are significant. We understand what a fire alarm means even though the alarm itself never says “Fire.” The third chapter looks at those seemingly content-less codes that have made themselves part of our everyday habits of communication. Today it is more common than not to respond to multiple electronic messages daily. Each message carries with it a demand to be recognized: a ring, beep, vibration, or flash on a screen. Paging is used as a heuristic theory for calling an individual’s attention toward a communications network. Do communication scholars have an understanding for the electronic version of tapping someone on the shoulder?

The third chapter begins with alarm bells, telephone rings, and intercom announcements, or what Norbert Wiener refers to as “to-whom-it-may-concern” messages. The significance of such messages, says Wiener, is that those who are concerned with the message will be “stimulated by it.” Following Wiener, I argue that the mere possibility of receiving a message is enough to hold one’s attention. That is, if a receiver believes a message could come, even if the time of arrival is not specified, the receiver will listen at all times. This is shown through the history of mobile police communications before WWII, two-way radio communications during the war, and the always-on or “on-call” habits of mobile

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media after the war. Mobile media offer a constant flow of communication, in ways that Raymond Williams does not address in his broadcast television concept.12

The third chapter ends with beeps, vibrations, and other modern forms of message announcement. Pagers were first to link beeps with waiting messages. More significantly they were first to identify an individual with their electronic device’s number—something mobile devices and web browsers take for granted today. Using the history of pager cultures—from hospital workers to Wall Street stock brokers to drug dealers—I show how an emergency device became social. Until 1981 no news was good news: “If there’s no beep, there’s no problem,” said one stock broker. But the phantom rings and false-vibrations of the twenty-first century signal that paging has become a part of everyday communication. Today no news is suspect.

It’s about time for the fourth chapter. Today the means of communication allow people to talk live, anytime and anywhere. According to most histories of the cell phone, pagers are a communications aberration because there is a delay between when one receives a message and when it is returned. When seen this way—as a problem with the medium—the logical solution would be to add the right technology. Therefore, adding the telephone’s talking capabilities to a mobile device appears as a natural progression from the pager’s limiting functions.

Why then, this chapter asks, is so much of modern communication asynchronous and text based? In her anthropological study of cell phone use, Sherry Turkle finds that many users, young and old, prefer not to talk on the phone with one other in real time. They prefer text, e-mail, voice-mail, and other delayed messages. This form of “companionship with convenience,” according to Turkle, gives mobile users a certain control over the conversation.\(^\text{13}\)

In this chapter I argue that mobile users have chosen to widen the communication gap that cell phones made so intimate. Live conversation is said to require a connection—technologically and metaphorically. Like sending a letter, leaving a message is somewhere between broadcasting and one-on-one conversation. Publishing, argues John Durham Peters, is not much different than broadcasting. Its form of address is, following Norbert Wiener, “to-whom-it-may-concern.”\(^\text{14}\) Paging, unlike publishing, is concerned with an individual. The significance of a paged message, unlike a typical broadcast, is that a recipient is addressed directly. The message is for you.

The importance of paging systems was to add memory to a transmission medium. One of the intended uses for Thomas Edison’s original phonograph was to record telephone conversation for business records. In this new application, however, recording techniques are used to document not telephone conversation, but missed attempts at conversation. In the 1950s pagers partnered with answering services to record messages for their subscribers. Answering machines—then


called “electronic secretaries”—became part of some paging systems. Later beeper models featured a list of missed calls on the portable device itself. This chapter concludes that recordings of time away from the phone actually stimulated additional asynchronous communication. Callers call their callers.

This project concludes with the fact that 83 percent of American adults own mobile devices, and over 90 percent of those devices are equipped with text-based communication. Most mobile communication is quick and up-to-date, but rarely is that communication strictly person-to-person. Sending one message to a larger network seems much more efficient than trying to contact all of one’s friends and family. To be sure, mobile and networked devices provide opportunities for new and widespread forms of communication. But they also play on the older forms of paging discussed throughout this dissertation.

With the rise in social media almost anyone can broadcast messages to their network. Sending one message to many people seems much more efficient than trying to individually contact each friend and family member. Yet social media also introduce alternative forms of communication. For example, a Facebook wall post, comments on a friend’s photo, or a Twitter debate are messages intended for one or a few but read by many. “Listening in” to others’ messages is the foundation of social media. Like paging practices, social media record these messages and utilize various means of alerting users of those attempts.

The concluding chapter ties together the three fundamental communication elements that converged throughout the history of paging, which are analyzed in the preceding three chapters: calling an individual from the mass
(chapter 2), alerting an individual of their message (chapter 3), and leaving a message with the hope of a response (chapter 4). These three elements have implications for future communications research. They explain why recent studies of social, networked, and mobile media find that public and private messages are often undefined, attention has been dispersed, and many users complain about the burden of responding to increasing amounts of e-mail, texts, and social media messages. When we analyze these modern forms of communication in terms of their cultural practices, I argue, we find that they have in common many of the elemental functions of paging that have been part of communication practices for decades and perhaps centuries. Before I discuss the techniques of paging, I need to lay out some of the assumptions I have about what histories of communication technologies can teach us about communication more generally.
CHAPTER ONE
WHY STUDY PAGING?

Clay Shirky, a media theorist and historian, claims that “Communications tools don’t get socially interesting until they get technologically boring.” Until our tools become “normal, then ubiquitous, and finally so pervasive as to be invisible,” continues Shirky, it’s not only difficult to describe the re-organization of social life, but it’s difficult to argue that social life has been changed at all.\textsuperscript{15} We must wait until communications media become saturated in a market before we can say anything meaningful about their effect on the people who adopt them. But I can’t help but wonder: using this logic, how many communications media go in the dustbin of history because they never became boring enough to be interesting?

If we were only to study those media that became popular we would miss out on not just the technical work that created them, but the much more interesting social work that, for example, made buying a radio or telephone an obvious choice. This point has been made by many smart media historians, most notably Carolyn Marvin in 1990, at the dawn of the internet: “Electrical and other media precipitated new kinds of social encounters long before their incarnation in fixed institutional form.”\textsuperscript{16} Shirky’s analysis of media and social change doesn’t begin until the media become taken for granted or invisible; on the other hand,


Marvin argues that studying what-became-popular elides the messier timeline of media history. If Shirky claims that media don’t get socially interesting until they get technologically boring, then Marvin responds that media only become technologically boring when we experience media amnesia—the all too common assumption that the way we use media now is the way it’s always been. Well before media audiences become organized social groups, there are many different sub-groups negotiating how to use the new technologies with other existing technologies at their disposal. “New media intrude on these negotiations,” argues Marvin, “by providing new platforms on which old groups confront one another.”

This chapter lays out those media platforms that pagers and paging utilized to shape the direction of network communication in the twentieth century. I bring together key areas of research that are especially useful in analyzing how new media shake up the uses of old groups. Those key areas are radio broadcasting, mobile communication, and technology studies. Following this, I describe my assumptions for writing a history of communications technology.

**Radio is History**

Who was going to listen to sound alone when this new box brought you voice, music, and pictures, right in your own living room? Now you could

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see Burns and Allen, see the coronation of Queen Elizabeth, see the Army-McCarthy hearings, see the Dodgers at bat. No contest.\textsuperscript{18}

It is surprising that there is not a larger representation of radio scholars among research on networked media such as mobile phones. After all, mobile phones operate on radio waves, albeit at higher frequencies than AM or FM stations. Pager devices began in the early 1950s as part of the miniaturization wave in radio receiver transistor technology. The traditional narrative of U.S. radio broadcasting goes something like this: the medium achieved great popularity from the 1930s through the 1940s but seemed to fizzle out after competition from television. Families that once gathered around the loudspeaker to listen to their favorite programming segments now watched them attentively on the television. The rise of television’s popularity drew the major broadcasting networks away from radio. Radio broadcasting, this narrative assumes, lacked the allure of its visual counterpart.

Recently, however, broadcast historians have begun to dispute this declinist narrative. “By the early 1950s,” says radio historian Susan Douglas, “radio was thought to be dead, a victim, like the movies, of television.”\textsuperscript{19} Rather than retreat, however, radio refashioned its strategy. However unconsciously, radio went places television could not. A trout turned into a catfish. It had to.

Radio responded to new audiences, largely composed of individual listeners.


\textsuperscript{19}Douglas, \textit{Listening In}, 220.
Radio continued to be the major source of news for U.S. citizens, but on a new schedule. Most post-war stations broke programming down into atomized segments. Short news reports, sportscasts, and the flow of music appealed to a different type of radio listener, one who randomly tuned in for unspecified segments of time.

The changes in radio’s audience were reflected in FCC legislation, mobile radio technology, and new programming formats. While in 1948 there were 1,621 AM stations in the U.S., by 1960 that number had more than doubled to 3,458. These stations were lower in power than the previously owned network stations. Therefore, they were limited to local audiences. The rise of postwar suburban living was founded on sprawling networks of both transportation and communication. Many radio audiences did less and less of their listening inside the home. More time was spent listening on morning or evening commutes, creating a rush hour listening demographic. These new mobile listening habits reflected the changes in America’s suburban populations.

This early history of this project enters into debates about the unique and atomized uses of new radio technologies in postwar America. My research on broadcast paging services supplements the varied uses of radio communications at a time when there was a radical shift in radio station ownership, the FCC allocated thousands of new station frequencies, and miniature radios became more widely available. All of these combined to enable new forms of experimentation with station formats. As I show, one of these experiments was to link the public address paging technique to broadcast radio.

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20 Douglas, *Listening In*, 220.
Jonathan Sterne notes that there is no necessary relation between a technology and the use of that technology. It was not always obvious (or legally prescribed) that radio should be used for broadcasting messages.\textsuperscript{21} Similarly, telephones have not always been limited to point-to-point communication.\textsuperscript{22} Gabriele Balbi’s thought-provoking history of early Italian telephony shows how the telephone was used to broadcast news and other information. Balbi argues that this early twentieth century “circular telephone” system provided a model for radio broadcasting at a time when radio was mostly used for point-to-point communications.\textsuperscript{23} “There is a moment, before the material means and the conceptual modes of new media have become fixed,” notes Lisa Gitelman and Geoffrey Pingree’s \textit{New Media, 1740-1915}, “when such media are not yet accepted as natural, when their own meanings are in flux.”\textsuperscript{24} Indeed, Balbi shows how natural it seemed (the telephone broadcasting system was in place for over a decade) to use a broadcast form of address over telephone lines.

I am not totally happy with the narrative Gitelman and Pingree assign to new media. It tells nothing of what happens \textit{if} new media are accepted as natural. The authors are more interested in the fuzzy beginnings. To use the previous example, Balbi details how the meaning of early Italian telephony was in flux,

\textsuperscript{24} Lisa Gitelman and Geoffrey Pingree, \textit{New Media, 1740-1915} (Cambridge, MA: MIT Press, 2003), xii.
between a mass and point-to-point medium. He ends where most histories of radio
begin: the 1920s. What then? Postmodern scholars argue that language and
meaning are never stable. British Cultural Studies have shown that meaning is a
constant hegemonic struggle. Why shouldn’t we view the use of
communications technologies as a never-ending struggle for legitimate use?

I understand that in studying mobile communication I am trying to hit a
moving target. The uses of wireless radio frequencies will continue to evolve. Yet
they will not be radically different from their cultural and historical
development. Claims for revolutionary technological change are the domain of
product marketers. Part of this project tries to understand the historical struggle to
define network communication with mobile devices. In doing so I hope to draw a
cultural parabola of mobile communication so that future research will have better
aim at this moving target.

A Phone of Your Own

Studies of the cell phone are as varied as those in communication studies.
Cross-cultural research is well represented, demonstrating the differences between
cell phone cultures in many countries. Quantitative research regarding cell
phone use, activity, and time spent during such activities comprise a large portion

25 Lawrence Grossberg, “History, politics and postmodernism: Stuart Hall and
Cultural Studies,” in Stuart Hall: Critical Dialogues in Cultural Studies, edited by

26 In her historical study of hearing aids Mara Mills concludes that “…the present
uses of ‘new media’ are shaped by old histories.” Mara Mills, “When Mobile

27 For example, see Sadie Plant, On The Mobile: The Effects of Mobile
Telephones on Social and Individual Life (Schaumburg, IL: Motorola, 2002).
of the literature. Critical studies of cell phone use and the mobile communications industries, however, are underrepresented in cell phone research. The reason for this is similar to the rise of administrative research in 1940s and 50s America. Large media audiences (or users, in new media terms) excite media industries. They are interested in what audiences are doing. Therefore, it is no surprise that most cell phone research has been funded by the very industries under study. Most of this research comes from Europe, where cell phones were adopted at much faster rates than in America (although Americans, curiously, adopted pagers at rates unmatched anywhere else in the world).28

Most cell phone studies tend to be sociological in nature. Some of this research studies how cell phones are displayed in public. Other studies focus on the ways in which talk time and patterns of speech are adjusted on mobile phones compared to landline phones. How cell phones disrupt public and private spaces has been a research question since cell phone research began. Still others look into how cell phone users negotiate interactions with those physically present while they are taking a phone call. Early studies centered on parent-child relationships through cell phones and their effects on childhood development.29 These studies continue today.

Historical research on the cell phone is few and far between. When historical work does appear, it tends to favor the development of mobile voice

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28 European funding was/is provided by mobile corporations such as France’s Telecom, Norway’s Telenor, UK’s Telecom and Vodafone, Italy’s Telecom Italia, and Hungary’s Westel. See Nicola Green and Leslie Haddon, editors, Mobile Communications: An Introduction to New Media (New York: Berg, 2009), 10-11.

29 Green and Haddon, 11-13.
communications in a teleological sprint to the present: “For the first decade the cellular phone existed only as a car phone. It then became a bulky portable unit, and then shrank into the modern hand-set.”\textsuperscript{30} Moreover, while much cell phone research is concerned with cross-cultural comparison, I have found little research on the cultural history of mobile communication practices. That is, there is little discussion of the ideas and concepts behind mobile communication, and how these ideas and concepts have developed over time.

Two publications ask the types of critical questions I would like to address in this project: Bärbel Tischleder and Hartmut Winkler’s “Observations of Cell Phones and Bodies in Public Space” and George Myerson’s Heidegger, Habermas, and the Mobile Phone. They deal with, respectively, a critical analysis of how the cell phone is identified with the body of its user, and a hypothetical reading of how philosophers Martin Heidegger and Jürgen Habermas would evaluate the mobile phones as a major form of communication.

Tischleder and Winkler’s “Observations of Cell Phones and Bodies in Public Space” was an early push for researchers to think more critically about the significance of portable devices. Phones are only the most recent device to be taken with us at all times, the Swiss army knife of communication. What’s important, according to the authors, is that we investigate how mobile devices—including watches, notebooks, and the Walkman—developed a relationship with the body. Mobile media do not differ from standard media simply because they have no fixed location. “Is the function,” the authors ask, “only the added value of

mobility and the growth of ‘possibilities’ that make the triumphal procession of this little machine plausible?”

31 Tischleder and Winkler argue that mobile devices “enter the orbit of the body,” becoming part if its everyday habits, including communication with others who are not present.

George Myerson’s *Heidegger, Habermas, and the Mobile Phone* is one of many publications in a “Postmodern Encounters” series of books that try to link postmodern thinkers with contemporary topics. The book is part rhetorical analysis of early cell phone advertising and discourse in the UK and part abbreviated reading of Heidegger and Habermas’s philosophical understandings of communication. As Myerson sees it, “The nub of this encounter is the idea of communication itself, for, in their different ways, both the 20th-century philosophers and the 21st-century mobile persuaders claim to be redefining what it means for human beings to communicate.”

I connect both of these strands—the focus on mobile devices as both part of the “orbit of the body” and as a crucial part of what it means to communicate today—in my historical investigation of network communication techniques. While Myerson’s work is provocative for the questions it raises, his analysis

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32 Tischleder and Winkler, 98.

33 Other examples include *Baudrillard and the Millenium, Lyotard and the Inhuman, Donna Haraway and Genetically Modified Foods, Chomsky and Globalisation, Foucault and Queer Theory, Umberto Eco and Football, Derrida and the End of History.*

assumes that mobile communication was irrelevant until it had reached “market saturation” in the 1990s and 2000s. I do agree, however, that to study mobile communications is not simply to study the availability of technology. “The mobilization of the phone isn’t really a technological process—it’s cultural. The problem isn’t to invent a machine, but to get us all to adopt it, to feel we need it.” But as Tischleder and Winkler’s study of cell phones and bodies shows, machines and the people that use them aren’t separate entities. Cultures develop techniques with which to use technologies. This dissertation uses the pager as an object of study because its history most clearly foregrounds the often-unquestioned techniques of mobile and network communication.

Technology Studies

If the formative power in the media are the media themselves, that raises a host of large matters… Namely, that technological media are staples or natural resources, exactly as are coal and cotton and oil. Anybody will concede that a society whose economy is dependent upon one or two major staples like cotton, or grain, or lumber, or fish, or cattle is going to have some obvious social patterns of organization as a result.\(^{35}\)

Technology studies are as varied as any discipline, but much of the research I draw on tends to highlight the organizing influence of a particular technology. Marshall McLuhan’s critics disagree with his assumption that “the formative power in the media are the media themselves,” but many of the same

critics affirm that monopolies of knowledge, of the economy, or of communications infrastructure tend to effect social structure. My goal, like McLuhan’s, is to search out those instances in which the means of communication became so habitual as to seem like staples of interaction. Unlike McLuhan, however, I argue that the habits and practices associated with communications technology exist culturally prior to a specific invention.36

Much of McLuhan’s analysis in *Understanding Media* rests on the widespread adoption of media such as radio, television, and photography. By contrast my proposed project concedes that early practices of mobile communications were not widespread. Mobile communications were, from the 1950s through the 1960s, concentrated in a few distinct contexts: military, police, hospitals, and hospitality. While early communications devices were not so popular as to be considered a social staple, they were in their respective institutions vital to operating procedure. Mobile communications were seen as essential communications tools in these military and civilian institutions. Therefore, one of this dissertation’s goals is to bring to light the changing nature of workplaces, from the 1920s to the present. If we can uncover the basic operating principles in these early industries of urgency, then we may be able to ask new questions about the seemingly urgent nature of modern networked communication. What fundamental communication principles are shared by these past professional institutions and today’s leisurely uses?

36 To be fair, McLuhan notes that artists often sense the winds of change: “The artist picks up the message of cultural and technological challenge decades before its transforming impact occurs.” McLuhan, *Understanding Media*, 70. Although “Communication Studies” has become the dominant term for the academic major, a few colleges and universities refer to the major as “Communication Arts.”
There is considerable debate about research that focuses on a particular technology to the exclusion of social, cultural, or individual agency. Technology studies within the humanities are typically accompanied by a number of caveats. These forewarnings act as shields protecting technology researchers from the ad hominem blows of *technological determinism*. It is irresponsible, critics say, to think that technologies themselves have significant influence on human action. We should pay less attention to the technological object and more attention to how people use that object. McLuhan has been an easy target for such denouncements of technological determinism—no doubt because of his many aphorisms that seem to set people aside.

These criticisms are fair. After all, McLuhan was skeptical of arguments regarding responsible use. In one of his hotter passages, McLuhan responds to a claim by RCA’s David Sarnoff that the products of modern science are neither good nor bad, but that their value is determined in how one uses them. “Suppose we were to say,” McLuhan responds, “‘The smallpox virus is in itself neither good nor bad; it is the way it is used that determines its value.’” Or even more bluntly, “‘Firearms are in themselves neither good nor bad; it is the way they are used that determines their value.’ That is, if the slugs reach the right people firearms are good.” Of course smallpox and firearms are not exactly analogous to telephones and radio. However, their justification and invention stems from the

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37 See for example the introduction to Jonathan Sterne’s *The Audible Past* (2003).
rhetoric of fear, emergency, and warfare. Technologies, too, have emotions, reasoning, and other human qualities invested in their making.\textsuperscript{39}

McLuhan’s attention to weapons is in line with a key Toronto School research method: follow the monopolies. McLuhan continues what Harold Innis began before and what Friedrich Kittler picked up later. McLuhan shares with Kittler a theory about the emergence of communications technologies. As McLuhan sees it, “War and the fear of war have always been considered the main incentives to technological extension of our bodies.”\textsuperscript{40} Similarly, Kittler understands communications media as “an abuse of army equipment.”\textsuperscript{41} McLuhan and Kittler amend the often-cited cultural proverb, “Necessity is the mother of invention,” with “War is the mother of invention.” Indeed, it’s hard \textit{not} to find a major modern communications technology tied to warfare.\textsuperscript{42} As this study points out, two-way radios were used during wartime situations since the late nineteenth century, continued into WWI, and went mobile for paratroopers in WWII.

However, I will depart from war as the sole organizing element of mobile communications technology. To be sure, part of what follows looks at mobile communications during wartime, but I am also concerned with how people came to, following Kittler, “abuse” army equipment. Mobile communications cultures

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\item Winner, “Do Artifacts Have Politics,” 56.
\item The same can be said for food preservation technology, the original storage medium.
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can’t be separated from the historical contexts in which they live. To study mobile communications means looking at the intersections between postwar mobility, mobile technology, consumer electronics, and the cultural techniques that tie the three together.

Raymond Williams has synthesized some of these postwar influences in his concept of “mobile privatization.” The term rests on a paradoxical connection in consumer development since the early twentieth century: the ease of mobility and the self-sufficient home. Devices and services that were once provided only in the public realm (e.g., public transportation, laundering services, musical and visual entertainment) were increasingly available as private consumer products, designed to be incorporated within the home. I argue that since this period the privatization of consumer electronics has intensified. Whereas Williams claimed that consumer durables were designed for the self-sufficient home, I point out that most consumer electronics are designed for the self-sufficient individual (e.g., TVs, mobile devices, computers, etc.). Although Williams does not mention it, postwar America saw a proliferation of landline telephones in and outside of the home. The phones created a mobile network of their own, as patrons could communicate by phone from home, office, or on the street. Today the significant difference is that the receiver is identified with an individual person instead of a home.

Taking this background into account, this dissertation asks a number of questions about the cultural history of mobile communication: What are the

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cultural and technological roots of mobile communication, and in what ways are they connected? How and under what conditions did it become possible for individuals to communicate electronically without wires? Is it worthwhile to theorize grabbing one’s attention from within a larger group? What fundamental features do the many forms of this type of communication have in common? My running list includes: yelling someone’s name, telephone address (“Is Kembrew there?”), paging over intercom, paging over broadcast, two-way radio, beeps, vibrations, “You’ve Got Mail”, twitter, facebook messages. While mobile communications developed early on in the institutions of police, military, and hospitals, what sets these the three institutional practices apart regarding mobile communications techniques? Why do paging systems develop in the early 1950s? What is significant about this (American) cultural and technological context? What role do pagers play in the history of asynchronous message media (answering services, answering machines, voice-mail, text messages)? When and how did a communications device that was once shared by families in a particular address become associated with a specific individual? What significance does this have for modern network communication? How do mobile communication devices extend, facilitate, and/or trouble networked communication (i.e., e-mail, social media, and the data economy)? It is not sufficient to answer the above questions with the study of technology alone or even laying out a precise timeline of invention.

On Writing a History of Technology, Culture, and Cultural Techniques

_The Audible Past_ is a deliberately speculative history. My intent is not to establish once and for all a small set of historical facts, although clearly
facts are important to my history. Rather, this book uses history as a kind of philosophical laboratory—to learn to ask new questions about sound, technology, and culture. If all accounts of human action carry with them some concept of human nature, then we would do well to reflect on the choices that we make in describing human nature.44

Historians wince when I read them this passage. Sterne’s heavy history is an intervention into the many histories of sound recording that don’t reach further back than Edison’s phonograph. In contrast, paging and its technologies has few historical accounts with which to contend. There are no dedicated histories of the pager, descriptive or critical. Where the pager is mentioned it is done so in passing connection to the cellular telephone.45 This project will complicate this seemingly obvious connection. There is a difference, I argue, between talking on a mobile telephone and sending or receiving a message. The history of sending and receiving messages, from one individual to another, is best understood as a paging practice—using a vast network of many individuals in order to find one.

My historical narrative follows the long course of decisions and actions concerning mobile communications technology, and the cultural techniques and strategies from which they derive. Language, writing, electricity, broadcasting, computer networks—these are all creative human endeavors. To study these cultural techniques is to study what it means to communicate at specific points in

human history. Each of them make possible, but do not determine, different ways of communicating in the world. These questions come front and center in arenas as diverse as technical journals corporate magazines, newspaper editorials, FCC regulation, and the recollections of those working in the telegraph, telephone, and radio industries. Communications media are themselves the result of human values, decision-making, and user activity. At the same time, human action develops only within and through the media in which we communicate. Our actions and expressions are constrained by the media through which we interact and communicate. To study media like the pager, then, is to study power at a fundamental level.

My method assumes that new communications media are not merely used by persons of a particular community, but that communications play an integral part in the very constitution of that community. Within an institutional context, radio communication introduced new forms of policing in the late 1920s and 30s. Kathleen Battles’ intriguing account of police radio and its popular reception during this period shows that both police and public saw radio communications as a somewhat magical policing power in local communities where it operated. Police radio—a new form of institutional communication—challenged policing practices, and in addition influenced how civilians viewed the practice of policing.\textsuperscript{46} This project begins with the assumption that media have the potential to disrupt equilibriums within a given community of participants. When a medium

\textsuperscript{46} Kathleen Battles, \textit{Calling All Cars: Radio Dragnets and the Technology of Policing} (Minneapolis, MN: University of Minnesota Press, 2010).
is new, up for grabs, and undefined, there are various interpretations about what, for instance, a radio does, who can use it, and for what purposes.

I analyze the actions of inventors, corporations, and people that help define what it means to communicate anytime, anywhere. The conceptions about mobile communication are as important as the material technologies through which communication is expressed. The two work in tandem: the wires of a telephone or telegraph only become a communication problem when one thinks that it is possible to communicate without them. The key transformative power of new forms of communication is to throw into sharper relief the benefits and limitations of older forms.

The spirit of my history of paging and pagers comes from a recent—and at the same time, older—branch of German media theory known as Kulturtechniken, translated as “cultural techniques.” This method of media research descended from 1980s and 90s “historical media studies” or “media archaeology.” According to one of its key practitioners, Bernhard Siegert, this move in research style was formed in opposition to sociological approaches in German communication studies. Early on cultural techniques researchers realized that their purpose was not a history of media but, says Siegert, “a history of the soul and of the senses.”47 If this language—“a history of the soul”—smells of Michel Foucault, that is because German media historiography is indebted to the French philosopher’s method. One of Foucault’s most famous essays, “Panopticism,”

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argues that Jeremy Bentham’s design for the panopticon—a “political technology”—represents a shift in how governing powers understand the soul. Rather than *punish* the soul through bodily abuse after an infraction, the panopticon *disciplines* the soul before an infraction ever occurs. The all-seeing panoptic technology renders prisoners visible at all times, causing prisoners to monitor themselves, preventing infractions in the first place. In other words, Foucault’s analysis uses the history of technologies and techniques in order to make better sense of present attitudes toward punishment, rehabilitation, and dissident behavior. Foucault’s significance for German media theory, therefore, is to demonstrate that culture and technology are deeply embedded and inform the organization of social and physical power.

The study of cultural techniques links the sometimes-separated spheres of technology and culture. This form of analysis began its first iteration in Germany during the late 19th century. *Kulturtechnichen*, or “cultural techniques,” etymologically refers to rural engineering practices for farming. The culture within *agriculture* points to human actions upon nature: tending, cultivating, tilling, and guarding the land you tend, cultivate, and till. Culture in this sense came to be understood as the human activities that transform nature or the world yet untouched by humans. “[C]ulture is that which is ameliorated, nurtured, rendered habitable,” writes German scholar Geoffrey Winthrop-Young, “and as a consequence, structurally opposed to nature, which is seen as either actively resistant (the hoarding dragon that must be killed to release the powers of

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circulation) or indifferent (the swamp that must be drained, the plains that must be settled).” Thus irrigation, plowing, plumbing, and even making fire are activities through which people cultivate natural resources for particular uses. Culture is here understood as action upon an otherwise innocent nature. However, for twentieth-century thinkers this begged a fundamental question: is culture separate from nature?

To answer this question, nearly one century later German thinkers employed the term “cultural techniques” to understand not only agriculture but the act of communication itself. By the 1970s cultural techniques took on new meaning as scholars imported the term to analyze the ubiquity of modern media such as newspapers, film, and television. Utilizing the farming metaphor encouraged media scholars to focus on the habits, practices, and actions of those who produced, consumed, and/or participated within a particular medium. Following the radically inclusive ideas of Marshall McLuhan’s Understanding Media—which surveys not only radio, film, and television but money, clocks, and roads—cultural techniques scholars pushed modern media research back in time to uncover the contingent relationships between communications media and adjacent technologies and social practices. Plowing farmland, for instance, requires horses, mules, cows, harnesses, and the forged metal spades used to break the earth. More importantly, as a cultural technique, plowing represents a particular approach to farming that organizes not only the act of putting seeds in the ground but how that act influences the persons, animals, and communities

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involved in farming. Farmers breed draft horses for their size, strength, and endurance because farmers deem it important for farm labor like plowing and hauling. This technique enables time for other labor and may encourage farmers to produce crops beyond their family’s subsistence and in locations not amenable to previous methods. Thus, cultural techniques don’t merely inform the performance of certain tasks. Cultural techniques have shaped and continue to shape both the natural and built environment.

To cite one example, literary and cultural critic Roland Barthes claims that the Eiffel tower, that monstrous beacon of modernity and Paris’ most conspicuous landmark, is both inescapably attractive and elusively invisible. To make this large physical structure disappear, according to Barthes, “You must…get up on it and…identify yourself with it.” That is, you must use it to increase your vantage point. It gives one a perspective of the city that is otherwise impossible. So, they climb up it. And by using it one forgets that it is there, because medium and body not only identify with one another, they become mutually dependent. The Eiffel tower depends on people to build it and maintain it as much as people depend on it to provide a panoramic view of Paris. But through using it, we soon forget its significance. “Use never does anything but shelter meaning,” claims Barthes. It

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might be more accurate, however, to say that use encourages one to associate a technology with its popular use.

The Eiffel Tower, in fact, was significant for many different stakeholders. To be sure, the Eiffel Tower continues to be used as a sky-scraping structure for visitors to get a bird’s-eye view of the city. Many other cities utilize this technique, including New York’s Empire State Building and Chicago’s Sears Tower (some call it the Willis Tower). But many forget that these tourist attractions also use their height to broadcast messages and other information to cities around the world. Since the beginning of the 19th century, for instance, the radio industry (and later the television industry) has used the Eiffel Tower as a piece of broadcasting technology. For those at the Paris Observatory, working on an important 1913 broadcast to the US Naval Observatory in Washington, D.C., the meaning of the Eiffel Tower was less about gaining a better view of Paris than it was about communicating with other cities around the world.53 Today this technique can be seen in cities large and small. The cellular phone industry relies on tall structures so that mobile subscribers can send and receive signals within a particular area. As they expand their networks cellular providers like AT&T and T-Mobile pay owners of tall buildings for the ability to attach their cellular antennas. Like broadcasters who employed the Eiffel Tower, “cell phone companies are turning to a higher power,” quips one journalist, as many churches use the heights of their steeples, belfries, and crosses to make extra money.54


short, Barthes’s essay on the Eiffel Tower is an example of a larger distinction utilized by those who study cultural techniques as opposed to those who study technology more generally.

Phonographs, radios, and hearing aids are technologies. Recording sound for later reproduction, converting information into electromagnetic radio waves, and bringing the sounds of one’s environment closer to the ear canal, respectively, are techniques. Cultural techniques transcend technologies, often disappearing and reappearing in particular historical and geographic contexts. Because many techniques rely on technologies, we often tie certain cultural practices to a particular technology, but this is not always the case.

Broadcasting, like the term cultural techniques, began as a farming metaphor to describe the practice of scattering seeds over the earth. However, after radio and television popularized the technique in a communications medium it came to be associated with the technology in which it was employed. Focusing on cultural techniques, then, is key to understanding the guiding principles behind concepts that are already calcified with meaning. As a passage frequently cited by cultural techniques scholars states:

Cultural techniques—such as writing, reading, painting, counting, making music—are always older than the concepts that are generated from them. People wrote long before they conceptualized writing or alphabets; millennia passed before pictures and statues gave rise to the concept of the

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image; and until today, people sing or make music without knowing anything about tones or musical notation systems.\(^5\)

So what? What is revealing about knowing that cultures had systems of writing storage before books, played music before notation, or represented images before photography?

Without naming it as such, many media scholars focus on cultural techniques in order to uncover the historical contingencies of now widely accepted communication practices. Jonathan Sterne’s history of sound recording is a fascinating look at the cultural techniques of sound reproduction that began well before Edison’s phonograph in the late 19\(^{th}\) century. His research question was rather simple: how did people become accustomed to listening to the sounds of machines like the telegraph, telephone, phonograph, and radio? To answer this question, however, Sterne looked at the cultural techniques of mechanical hearing—the ways of thinking about sound and hearing—rather than the actual sound reproduction technologies that would dominate the twentieth century. To do so Sterne looked at the listening practices already in place before the invention of those later machines. His research on the “audile technique[s]” in the prephonograph era shows that technologies like stethoscopes and headphones provided an isolated listening environment that not only isolated listeners but also the sense of hearing from the other senses. The cultivation of this technique was fundamental, Sterne argues, to the rise in sound recording technologies decades later. “Even today, when listeners in a music library treat the surface noise of an

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LP record or the hiss of a tape as ‘exterior’ to the music on the recording, they use some of the same techniques of listening that physicians and telegraphers developed over 150 years ago.”57 As a consequence, sound reproduction technologies encouraged listening practices that were more directed and often heard in private spaces. Thus, the reasons for the commodification of communications media such as telegraphy, telephony, sound recordings, and radio broadcasts are informed by the cultural techniques of sound reproduction in addition to industrial, regulatory, and technical factors.

To study cultural techniques is to recognize that technology and culture have never been separate. People and the things they use—for communication, farming, eating, and entertainment—go hand in hand. Furthermore, for Bruno Latour, today’s societies are such that “the relations of humans and nonhumans are so intimate, the transactions so many, the mediations so convoluted, that there is no plausible sense in which artifact, corporate body, and subject can be distinguished.”58 This assertion is a confident reversal of much social construction of technology scholarship that claims that human action shapes technology rather than the other way around. Latour smartly points out, however, that neither has the lead. The idea that humans act without technology is as misleading as the notion that technologies have a predetermined control over humans. Recognizing this either/or fallacy opens up space to think about technologies as things with

human qualities and humans with technological qualities. We are proto-human as much as we are post-human, pre-modern as much as we are post-modern.

Like any cultural activity, the ways in which we use technology are learned and repetitive habits. That is to say, techniques for using technology are indebted to taken-for-granted traditions and rituals. Yet we often study technologies as if they appear fully formed out of the shadows of an inventor’s workshop. One prominent strand in this way of thinking upholds Thomas Edison, Alexander Graham Bell, Guglielmo Marconi, and Mark Zuckerberg as the geniuses who changed communication.\(^5^9\) Much research on the phonograph, telephone, wireless telegraph, and social media seeks to reverse engineer these media in order to discover how they work. The study of cultural techniques, however, is after a different prize.

Instead of asking how mobile communication works, and in addition to looking at those inventors, companies, and users of the first successful mobile communications networks, I will look to the practices, habits, and traditions that inform what mobile communication is today. My objects are the cultural techniques of mobile communication. Sociologist Norbert Elias echoes the sentiment of cultural techniques when he discusses the “underlying regularities” or “structural nexus” in his studies of cultural habits and behavior. Elias’s history of how manners developed for eating, spitting, and defecating opens a window on what he calls “the civilizing process.” The napkin, for instance, was not an obvious part of the dinner table, but came about as a bourgeois interest in keeping

one’s appearance clean at the table and to prevent guests from wiping their hands and mouths with the tablecloth. Just as it would be weird for people today to imagine that the phone was once shared by many people, it was once weird to have your own cloth to wipe food off of your face.

You can say, then, that my aim is to look at the learned manners of mobile communication rather than to focus on what would later become the mobile cellular phone. The mobile phone, like all media, is a collection of manners or habits. Again, Sterne reminds us that “[t]echnologies are repeatable social, cultural, and material processes crystalized into mechanisms.” Yet these mechanisms work precisely because social, cultural, and material processes are largely hidden once they crystalize.

This project analyzes paging not as a technology, but as a combination of cultural techniques that precede any invention. My purpose is to shed light within the pager’s technological “black box.” We often forget, reminds Bruno Latour, the values, questions, and considerations that lead to any technological invention. Technologies emerge in the world only after a process of black boxing, defined by Latour as:

the way scientific and technical work is made invisible by its own success.

When a machine runs efficiently, when a matter of fact is settled, one need focus only on its inputs and outputs and not on its internal complexity.

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Thus, paradoxically, the more science and technology succeed, the more opaque and obscure they become.62

It is precisely because of the pager’s so-called failure that we can begin to analyze the cultural techniques that made paging a possible choice in the first place. What I am suggesting is that the immaterial processes that allow media to work without seeming to work, especially the social and cultural processes, are also hidden. This is particularly true for mobile or networked devices. Imar O. de Vries begins his research on the discourse of wireless media with the assumption that “mobile communication devices become, in a sense, invisible, as they come to constitute our living environment.”63 We can go inside the black box of mobile and networked communication to see its fundamental techniques.

What cultural techniques, then, are crystalized into what we think of as networked communication today? The medium that most clearly demonstrates the processes by which mobile and networked communication became possible is the pager. The pager is one answer to the origin question of network communication. Yet the meaning of the pager does not reside within any one particular invention. It exists in the convergence of many different media that came before. Although the pager is particular device, its verb, paging, represents a cultural technique more significant than the noun. The pager is the result of a longstanding communication strategy that transcends the device itself. Paging is a practice that


seeks out individuals from within a larger audience. Thus, paging stands as an important metaphor for the transition between twentieth-century mass media and twenty-first-century networked communication between individuals. The following section gives an explanation of the historical documents I use throughout this project to describe three key cultural techniques of mobile and networked communication.

**Look Here: An Explanation of My Archive**

I draw from a diverse archive that will be used to pull out key cultural and technological moments in which the techniques that would come to be called paging were utilized to send messages to individuals. This history does deal with major dates of invention within public address, radio, and telephony, some of which have been thoroughly covered in secondary sources. Because paging is a communication practice, I focus on other communication technologies that came before and were concurrent with the standalone pager, such as the telegraph and telephone. For information on paging technology specifically, I will look at primary sources from a number of disparate areas. Patents for “Pocket Radio,” “Radio Paging System,” and other devices have already provided me with the technical information that connects early pagers to radio broadcasting, answering services, and hearing aid technology. *Popular Science, Popular Mechanics, Scientific American, Electronics*, and other popular technology periodicals have also proved helpful for outlining specific developments in public address paging and pager device systems. Moreover, they contain promotional material that is fruitful for this project in that they attempt to link mobile communications devices to popular uses of other technologies. For example, Motorola advertisements
often compared the company’s two-way radios and pagers to its more conventional portable radios. The strategy created an identity for the new device based on devices with which most users were already knowledgeable and comfortable.

One company that has lasted from the early stages of mobile communication is Motorola. The company was influential in manufacturing some of the first pager devices. Additionally, the company has been influential in the fields of military, police, and hospital communications. Motorola’s web archives contain materials that date back to the 1930s and have various items useful for my research: financial records, earnings reports, ad copy, photos of their various products, and even collections of the physical products themselves. As you will see, these archives have been extremely beneficial to tracing the material developments in radio and pager devices.

In an effort to chart the changing nature of the workplace I look at three sites: police, hospitals, and professional offices. For the history of police communications, I use a collection of newsletters published by the Associated Police Communication Officers (APCO). APCO first developed the still-popular “10-code” system for communicating over two-way police radio. This was later adopted by military personnel for their radio communications. Radio and cultural historian Kathleen Battles’s *Calling All Cars: Radio Dragnets and the Technology of Policing* is a rich secondary source for reading the changing ethos of police and policing during radio’s golden years. Through analyses of police radio dramas, Battles argues that the fictional depiction of radio policing worked together with reports of police radio used to fight crime in the popular press.
Radio was not only a technology of policing, but a key medium through which the
tool power, authority, and meaning of law enforcement was emphasized. For my
purposes Battles’s research shows how police used mobile communications to
establish a dragnet over large areas. This sort of mobile communications was
certainly used for emergencies, but, unlike hospital communications, was not
typically used to target a specific individual. Rather police radio was used to send
“news” of any crime or questionable activity from the headquarters’ broadcasting
hub to the officers’ receivers stretched over a particular part of town.

Hospital communications takes up a large part of the following pages
because this institution most closely links early mobile communications
techniques with those of the present. Motorola became the leading retailer of
hospital communications equipment with its purchase of a Minnesota hospital
communications manufacturing company in 1961, then the field’s largest
manufacturer. In addition, I investigate hospital industry journals such as
Hospital, Modern Hospital, Hospital Management, Nursing Management,
Pediatric Nursing, and The New England Journal of Medicine. Many of these
trade journals discuss how to use and coordinate hospital communications
equipment with hospital staff to better facilitate patient comfort, noise reduction,
and unnecessary interruptions. Even within an industry where urgent messaging is
most justified, doctors, nurses, and patients complained of unnecessary
communication.

Hospital communications is an area that has received scant historical
attention. At my home University, the University of Iowa Hospitals and Clinics
(UIHC) takes pride in the history of its hospital equipment. I contacted the
UIHC’s *Medical Museum* to see if they could offer me any information on the history of hospital communications equipment like intercom speakers and paging devices. My query was all but laughed at. It appears pagers do not count as what the museum calls “medical-related artifacts,” nor do they promote the museum’s primary mission: “To stimulate the desire of the public to investigate the changing role hospitals play in society.”

By the late 1970s and early 1980s pagers had branched out from strictly emergency contexts for those of business professionals. Bankers, brokers, and other companies began to purchase pagers and required their employees to wear them for quick contact. I follow these developments, and the public reactions toward them, in major U.S. Newspapers like *The New York Times, The Los Angeles Times, The Chicago Tribune, and The Atlanta Journal*. In addition, trade publications such as *Business Week* and *Wireless Week* lend insight into the persuasive strategies used for marketing, advertising, and selling mobile communication devices through the trade journals’ advertisements and editorials.

Next

Some might call this project a neglectful history, and they would be right. Any inspection has to focus on some elements at the cost of others. If a communications technology has its greatest social impact when it becomes ubiquitous and boring, then the goal of this project is to make a few communications technologies less boring by demonstrating how their innovative

uses laid the groundwork for later popular technologies. Instead of charting the development of the cell phone or internet, I will find the techniques and practices of today’s network culture by looking at past electric technologies. To do this we will need to get back to communication fundamentals such as why we have names, how we signal to others that we are talking, and how we store speech that would otherwise disappear when spoken. This project argues that these are three key techniques for understanding how we arrived at today’s network communication. In addition, this history is a tacit argument that the drawbacks of network communication are open to negotiation.

The three techniques at the heart of network communications are explained in the chapters to follow. Each mobile communication technique is represented by one of those chapters: a call for a particular person (Chapter 2) alerts that person (Chapter 3) with a message to which they are expected to respond (Chapter 4).
CHAPTER TWO
ONE FROM THE MANY:
PAGES, PAGERS, AND PAGING

Whether because of the structure of the apparatus or because of the structure of memory, it is certain that the noises of the first telephone conversations echo differently in my ear than those of today…And just as the medium obeys the voice that takes possession of him from beyond the grave, I submitted to the first proposal that came my way through the telephone.65

Mobile media (cellular telephones, text messaging, mobile e-mail, voice mail, tablet computers) seem to have taken the twenty-first century by storm. These new devices continue to make headlines, earn top profits, and connect 95 percent of US adults.66 The recent glut of research on mobile communication addresses a number of important questions: Which demographics use mobile devices? What effects do they have on social media interaction? Do they bolster political dissent? Do they benefit on-the-ground collectives? What role do they play in maintaining relationships? Mobile devices have come to represent a turning point in the way we communicate in a networked society. Just as the telegraph interrupted stock markets and news reporting, motion pictures reinvented theater entertainment, and sound recording literally changed the way


audiences listen to music, mobile communication is now a cultural metaphor for
twenty-first century communications. As many claim, we are reachable, available,
and in constant contact. Yet because of the whirlwind of recent research, the
noises of early mobile communication are muffled. Much research focuses on the
new and emergent uses of mobile communication, but we have little
understanding about where these forms of use come from.

This oversight is absent in many texts centered on mobile
communications research. The exciting newness of mobile communications often
leads many commentators to proclaim that a revolution is underway. To point to
one exemplary claim, “In a very short period of time, mobile telephony, tablets,
and other hand-held devices swept the world like crazy.”

Or, more explicitly,

“…The development and widespread use of mobile technologies constitute if not
a revolution then a sub-revolution…”

If we are going by the numbers, then the
accelerated adoption of mobile phones and other mobile media during the early
2000s is indeed staggering. However, the cultural and even technological
infrastructure for mobile and networked communication has been in development
since the first half of the twentieth-century. Today almost everyone carries their
own personal communications device.

67 James E. Katz and Mark Aakhus, eds, *Perpetual Contact: Mobile
Communication, Private Talk, Public Performance* (New York: Cambridge
University Press, 2002); Primus Mbeanoa Tazanu, *Being Available and
Reachable: New Media and Cameroonian Transnational Sociality* (Mankon,

68 Ran Wei, “Mobile Media: Coming of Age With a Big Splash,” *Mobile Media &
Communication 1*, 1 (2013), 51. 50-56.

69 Martin De Saulles and David S. Horner, “The Portable Panopticon: Morality
and Mobile Technologies,” *Journal of Information, Communication & Ethics in
Forms of Address

Although most works to date deal with recent changes in mobile communication, a few authors have covered the history of modern mobile phones. The earliest and most often cited is Jon Agar’s *Constant Touch: A Global History of the Mobile Phone*. Agar discusses wireless police radio used in automobiles, “Walkie Talkies” used by the US military, and the cellular concept developed by AT&T’s Bell Laboratories.70 Others followed Agar’s lead, tracing modern cellular equipment back through radio technology.71 Louis Galambos and Eric John Abrahamson’s *Anytime, Anywhere* is unique in that it focuses on the economic development of a mobile phone industry that, unlike US broadcasting, was composed of many small companies who localized their mobile phone efforts in various cities.72 These historical investigations give insight into the technical, industrial, and economic steps taken throughout the development of mobile communication, from the 1920s until today.

These histories provide a foundation from which to ask questions about the culture of mobile communication. What habits, practices, and values were central to its use by particular groups? Which of those habits, practices, and


values have changed as a result of new forms of communication? To study mobile communication is to pay attention not only to what is said on those devices (as much recent research has shown), but to the cultures and traditions that have informed how those devices should be used. It means understanding communication not just as content transmission, but as a ritual, as James Carey has demonstrated. The ways in which we communicate are also ways of maintaining cultures over time and, more recently, across space. Communication is therefore not merely the means of meaning making but is itself a history of indebted practices or attempts to make meaning. Seen this way, communication as ritual is a way of recording cultural practices so that they may be preserved. In short, any analysis of mobile communication would benefit from knowing the past traditions that inform modern practice.

The pager, to point to one of many past mobile devices, was a malleable idea long before it was culturally cast as a piece of hardware. It shared with many other devices the desire to communicate through the air to individual recipients who are not bound by physical location. The pager, as a physical device, riffed on an idea for human communication that had existed well before electricity. After all, the human voice has always been mobile in the sense that it communicates sounds through the air to the ears of listeners. In my neighborhood I often hear children yelling the names of their lost dogs as they search for them between yards. Groups of friends in a crowded bar or restaurant yell each others’ names to

73 James Carey, 1988; Jeremy Packer & Robertson, 2006

get their attention. But the voice alone, of course, can not travel through walls or to the opposite end of a town. So, it makes sense that most historians identify radio technology as the starting point for mobile communication.\textsuperscript{75}

From the beginning Marconi sought ways to transform and even redefine wireless communication from a medium that, like shouting, could be heard by anyone who had the receiving equipment to a medium that, like the telegraph, would be limited to one sender and one receiver. Marconi’s exclusionary dream would occupy the minds of many radio technicians for nearly two decades.\textsuperscript{76} However, for many amateurs, inventors, businessmen, the military, and others involved in the early period of wireless communication, the experience of sending messages over the air was anything but exclusive. Few viewed their wireless messages as private. Additionally, before the Radio Act of 1927 the very wireless technology used by both point-to-point and broadcast radio was nearly identical.\textsuperscript{77} Like today’s internet networks, radio technology incorporated—and continues to incorporate—different media and their forms of address within its networked infrastructure.

There is no necessary connection between a medium and its form of address. If this axiom were ever in doubt, we need only look at the early years of many popular media technologies. Take the telephone, for instance. In its first few decades the world’s most popular point-to-point medium broadcast news, music,

\textsuperscript{75} See for example Jon Agar, \textit{Constant Touch}, 17.

\textsuperscript{76} D. J. Czitrom, \textit{Media and the American Mind: From Morse to McLuhan} (Chapel Hill: University of North Carolina Press, 1982).

and entertainment as much as if not more than two-way communication. In 1890 AT&T executives spoke of the phone much like radio executives would of broadcasting technology decades later:

The scheme is to have a fine band perform the choicest music, gather up the sound waves, and distribute them to any number of subscribers. Thus, a family, club or hotel may be regaled with the choicest airs from their favorite operas while enjoying an evening meal, and the effect will be as real and enjoyable as though the performers were actually present in the apartment.78

Using the telephone for one-way distribution of news, music, and entertainment was not a phenomenon limited to the United States. Paris’ 1881 International Electrical Exhibition featured a “Théâtrophone” that used a series of telephone stations to network between the Paris Opera and several listening rooms in the exhibition. Spectators listened to the opera using twenty sets of earpieces divided between five rooms.79 One French telephone network distributed public pay phones throughout the city into which customers could drop coins to listen to music for five minutes at a time.80 In Italy telephone organizations transmitted “telephone concerts,” readings, and other public events to their subscribers.81


81 Weidenaar, Magic Music from the Telharmonium, 1.
Italy’s Araldo Telefonico included live transmissions from the stock market and horse races, religious preachers, and even language courses taught by university professors (this may have been the world’s first massive open online course, or MOOC). The programming was brought directly into the homes of subscribers through the telephone.\textsuperscript{82} Telefon Hírmondó in Budapest, Hungary was the first telephone network to offer continuous programming from morning until evening. Moreover, this Hungarian telephone service outlasted all other nation’s telephone broadcasting endeavors. In 1944, as if to recognize the service Telefon Hírmondó provided for decades, Hungary assigned the telephone company a wireless broadcasting license.\textsuperscript{83} What we understand as the telephone, in short, is not merely a technology but a constantly negotiated set of legal, technical, economic, and cultural relations. Rituals not only assign media technology their meaning for cultural groups, but rituals also make uses of media seem normal.

Although a fair amount of work has recovered the broadcast uses of the telephone—now considered a point-to-point medium—there is much less research on the continued point-to-point uses of radio—now considered a broadcast medium. One explanation for this oversight can be found in the competing definitions for what a radio, telephone, or other media are and how they should be used. New media, from before the telegraph and beyond the cell phone, rarely emerge with clear cultural instructions. “[T]he ‘content’ of any medium is always another medium,” reads one of Marshall McLuhan’s maxims, “just as the written

\textsuperscript{82} Gabrielle Balbi, “Radio Before Radio: Araldo Telephonico and the Invention of Italian Broadcasting,” \textit{Technology and Culture} 51, no. 4 (2010),793. (786-808)

\textsuperscript{83} Balbi, 790.
word is the content of print, and print the content of the telegraph.”

In a related tone, John Durham Peters notes that nearly all media merge existing media into novel formations.

Therefore, media should not be seen individually, independently, or isolated from other media. “'[M]edia specificity’ is something of a misnomer, an oxymoron, or impossibility,” reminds media historian Lisa Gitelman, author of *New Media, 1710-1915*. A medium is always already a plurality of media. That is, interpreting media, their texts, or their inherent properties is a promiscuous proposition from the start. Understanding an individual medium is impossible without examining the relations between one medium and others. Inventors, institutions, users, and others engaged in continually defining communications media become tacitly involved in what media historian Rick Altman refers to as “jurisdictional conflict.” “New representational technologies,” writes Altman, “are always characterized by multiple identities, generated by the multiplicity of models provided by existing media.” For instance, the medium that became known as “film” or “cinema”—especially the sound version—was in the aughts and teens of the twentieth century under dispute by those working in theater,

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vaudeville, live music, and other industries. Therefore the ideas for film, cinema, and other media exist well before their names calcify with meaning. Which ideas were included? Which were thrown out? Which were curiously weird? Which continue to renew themselves across different media?

Although film and other media historians often use the texts produced by media (e.g., play bills, films, television shows, scripts, song recordings) to analyze the many changes in form, historical explanation would be at a handicap if all research were to play by the same rules. What texts, for example, do telephones produce if their content disappears the moment it reaches the receiver? As Gitelman astutely observes, “media are reflexive subjects of history. Knowledge of the past rests absolutely if intuitively on a shared understanding of inscriptive media that construct and delimit the historical record, on ‘the archive’ and all of the medial conditions of ‘archive-ability.’” Media are remembered by other media. Print, sound recording, film, video, and increasingly the digital database color the past before the scholar’s work ever begins. What is written down or recorded are the data for future analysis. It is partly for this reason that transmission media like broadcast radio and television take up more shelf space than other transmission media like the telephone or point-to-point radio technologies. Without a trail of recorded texts these latter media rely on other archives to make sense of their significance. In the case of networked media like

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telephones, two-way radio, or—as I investigate—paging technologies, an effective analysis should look at the interplay between technology, culture and the ideas that bind the two.

**Paging the Word**

Media often act as metaphors for social change. The pager is a metaphor for many of the major lines of development in networked and mobile communications in the twentieth century. Paging as a communication concept has many histories and lines of influence. It is at once a form of serving, searching, seeking, and sending. In addition, paging as a communication practice later took on the roles of receiving, redeeming, reacting, and responding. The language surrounding the core noun, “page” reveals an interesting legacy of this communication technique, and it can not be separated from an understanding of the pager device.

Since the noun appeared in the thirteenth century, a page has been associated with various forms of domestic and institutional servitude. Pages were often young boys employed as a personal attendants and messengers to high ranking persons.\(^\text{91}\) Chaucer’s 1395 *Merchant’s Tale* speaks of such servants: “Ther speketh many a man of marriage That woot namoore of it than woot my page.”\(^\text{92}\) The word appears in many plays of the fifteenth and sixteenth centuries. A popular and massive collection of 42 plays, the *N-Town Play*, anachronistically

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inserts the service role of contemporary fifteenth century pages into its biblical reenactments, from creation to the last judgment. The moments that connect a page’s duties specifically with messages are particularly important: “Now weyl mote þou fare, my good page; take þou þis for þi massage.” Shakespeare, too, featured many pages in his dramatic retellings of high society. “Ay, ay, a scratch, a scratch; marry, tis enough. — Where is my page?—go, villain, fetch a surgeon.” Encyclopaedist Ephraim Chambers tried to fetch a description of pages and their roles in his “universal dictionary” of 1728: “a youth of state, retained in the family of a prince, or great personage, as an honorable servant to attend in visits of ceremony, do messages, bear up trains, robes, &c. and at the same time to have a genteel education, and learn his exercises.” Pages played important and intimate roles in the lives of those who could afford to have such servants. They were well above others on the servant hierarchy because pages often appeared before other upstanding men and women of society when delivering messages or receiving guests in the home. Again, according to Chambers, “The story of pagedom is an interesting one, and although we cannot enter fully upon it here, yet to make it evident how far removed it was from menial service…” Pages, then, have a variety of obligations: to deliver

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95 Ephraim Chambers, Cyclopaedia; or, a universal dictionary of arts and sciences, 5th ed. (London: 1743).

messages, summon medical help, assist with clothing, and otherwise wait for requests from those they attend to.

It’s no stretch, then, to call these pages media of communication. Like other servants, pages were expected to do their work without drawing attention. Their duties were to take on the otherwise everyday chores that other less fortunate members of society completed for themselves. Cooks, nannies, farmers, and other servants took on similar roles in other parts of daily life. But unlike these other servants, there were contexts in which the page came to the forefront of attention. Typically, members of a house and their guests are expected to act as if servants are not there. This introduces a conundrum for the ownership class: servants are necessary for the proper functioning of the house (food, bathing, cleaning, upkeep, delivering messages, receiving guests, etc.) but they are treated as if they are invisible. This was particularly salient when Victorian women had to relieve themselves when a guest was in their presence. In Victorian England particular pages assisted royal females in urination or defecation—a most fundamental emergency. When an important visitor came into one’s home it was polite to give the guest complete attention. Women were to be seen, often wearing elaborate dresses with wide frames that flowed from the waist downward. But women were otherwise not to draw attention to themselves. Problems arose, then, when royal women had to go. Not only did their stiff gowns make it difficult to sit on a toilet, but it would be improper for an individual to excuse their self in front of an important guest. Therefore, when nature called to Victorian women, Victorian women called to their page. A non-verbal signal was established between the two. The servant would discretely reach under the woman’s gown to
catch the urine or feces using a container similar to a bed pan or gravy boat. In her history of British servants, Lucy Lethbridge distills the position down to three words: silent, obsequious, and omnipresent. In short, pages were at once socially invisible yet necessary for the daily operations of a household.

Figure 2 — “Portrait of Alof de Wignacourt with his Page.”

98 Michelangelo Merisi da Caravaggio, “Portrait of Alof de Wignacourt with his Page,” 1607-1608. A page stands next to Alof de Wigncourt, a high-ranking Knight from 1564-1622. The Knight holds his baton of command while the page holds the Knight’s equipment and regalia.
When pages and other servants were not helping masters and their guests with bodily functions, servants listened intently for various calls to duty. Servants’ quarters were separate from the living quarters. So, when needed outside of working hours servants were called with mechanical and later electric bells installed inside their dwellings. Some houses had speaking tubes connecting downstairs to upstairs so that requests for, for instance, food, drinks, and repairs to clothing could be expedited by speaking down the tube.\textsuperscript{99}

![Figure 3 — An example of servants’ bells.\textsuperscript{100}](image)

\textsuperscript{99} Lethbridge, x.

\textsuperscript{100} These servants’ bells were recently uncovered in the former home of Victorian Robert Stayner Holford, located in England. There are more than fifty bells on this board located in the servants’ quarters, each with its own distinct pitch and each physically connected by wire to another part of the house where a servant might be called. Joseph Curtis, “The Victorian Pager: Huge board of servants' bells are discovered inside hidden wall at private school that was the former home of the designer of the Westonbirt Arboretum,” \textit{Daily Mail}, November 23, 2015, http://www.dailymail.co.uk/news/article-3330604/Servants-bells-hidden-former-home-Westonbirt-Arboretum-designer.html
But perhaps the most abundant calls were for pages or pageboys to deliver messages. These footmen, as they were often called, were treated differently than other servants because they appeared in public on behalf of a household or other employer (much like later telegraph delivery boys). Employers dressed footmen in the finest clothing, from head to toe. Nineteenth-century pageboys wore fine cloth suits fitted by expert tailors, leather boots, long raincoats, and silk top-hats. Even if they were treated indifferently by the public (pageboys were rarely called by their actual names but referred to generically as William or Henry) pageboys represented the opulence associated with direct and expedient communication between two individuals. Sending an expedient message from one person to another was luxurious, and a page was a symbol of luxury.

Language had no one word to sum up what it was that pages did for their employers. Pages were indeed servants but certainly higher in the hierarchy than other servants. After all, they greeted guests into the home, summoned guests that were outside of the home, and delivered messages on behalf of employers. Like monogrammed stationary or a colorful envelope, their employers made pages part of the message medium itself. However, paging—as a verb, action, and particular practice of communication—did not enter into vocabulary until the act was separated from the servants who performed it.

The Idea of Paging: Broadcast to You

Technically speaking, all forms of communication are mass communication. John Durham Peters borrows philosopher Charles Sanders

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101 Lethbridge, 46-47.
Peirce’s claim that all signs have a meaning beyond their immediate context. That is, language must have the potential to reach more than one person. As Peters points out, even face-to-face talk can become a broadcast message if someone else were to eavesdrop on the conversation.\footnote{John Durham Peters, “Mass media,” in Critical terms for media studies, eds. W.J.T. Mitchell and Mark B.N. Hansen (Chicago: University of Chicago Press, 2010), 266-279.} No matter how hard we try to make messages private, a coded language is by definition for more than one receiver.

In contrast, the story goes, mass media such as radio and television produce content designed to reach large groups. Although you may be the only one listening to your radio, the same message is sent to other listeners who can follow, for example, the broadcast of a sporting event. This is why the phrase “Hi Mom” is often repeated on TV and radio by excited non-professionals. They momentarily seem unfamiliar with the medium’s standard form of address. People who find themselves suddenly in front of a microphone use the special moment to address a loved one who may be listening at home. They break one of mass media’s rules of address: do not target specific persons.

So how can listeners, away from the phone, know when they are being called? For centuries cultures have solved what we might call the “individual address problem” by sending particular messages to non-particular masses. To this day some religious groups still call their members to service with a broadcast: Muslims sing or use other melodic sounds that come from a mosque’s minaret in their call to prayer five times daily; churches, too, have historically used bells to
not only mark the time of day but to remind the community of their presence.\(^{103}\) Therefore it is not surprising that industry lore about the earliest experiment with public address by electric means echoed techniques of oration like Lincoln’s Gettysburg Address: they shouted from on high. The Magnavox company (Latin for “great voice”) produced this early public address system so that orators could project their voice further than vocal chords allowed. Yet the loudspeaker public address system was an accident. Public address was an outcome of Magnavox’s engineering research into radio and wireless communication.\(^{104}\) The electric sound company, it seems, assumed that all of its technologies would use a broadcasting form of address—from one to many.

Public calls to prayer, public address systems, and even alarms and sirens—these are wireless messages that don’t use radio technology. They target people distant from the source of sound. The ability to hear messages does not require a speaker to be within sight. Recipients of these messages do not need to be at the telegram office, mailbox, or telephone. They can wander like local nomads, free to roam without wires. When it gets close to dinnertime, mothers and fathers often tell their children not to roam any further from the house than a parent’s voice or dinner bell can travel. Thus, plucking communication subjects out of a crowd has an oral history that made its way into electronic


communication. So, if we want to get at the idea behind the pager and its verb, we should look to other forms of mass communication that address individuals.

After Magnavox demonstrated the power of the magnified voice, telephone giant AT&T branched out beyond point-to-point communication to the mass audience of public address. AT&T subsidiary Western Electric installed public address systems at both large public gatherings like the presidential inauguration and smaller venues like sound film theaters. Before sound films, however, one event actually merged long-distance telephone communication with the large voice of mass-mediated public address. On Armistice Day 1921, Western Electric employed its public address system for the speeches, prayers, and performances commemorating the internment of the Unknown Soldier. Over 100,000 people gathered at Arlington National Cemetery for the event. Everyone was able to hear each speaker’s voice due to the amplification devices and speakers spread throughout the cemetery. Moreover, tens of thousands of additional listeners followed the live sounds at New York’s Madison Square Garden and San Francisco’s Civic Auditorium thanks to AT&T’s long-distance telephone lines and additional public address systems at each venue.105 The microphone was a telephone. The telephone was a loudspeaker.

Yet the function of the telephone was not lost on some institutions using these new public address systems. The most interesting—if less popular—uses of these public address systems were aimed at getting the attention of individuals

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rather than mass audiences—paging. Paging over public address is at once the most efficient and inefficient way to grab an individual’s attention. It is efficient because anyone within earshot will hear the message. Its inefficiency stems from the same reason for its efficiency: because the message is only intended for one person, you must sacrifice the ears of those for whom the message is not intended. It seems somewhat wasteful to expose all to a message for one. Yet the paging technique justifies this wasteful form of communication if used in urgent situations. Recall a time when an intercom system calls a patron that has left their car lights on, misplaced an important personal item, or momentarily loses a child. In these special circumstances, the emergency justifies the technique.

**Listen Up: Emergency Communication**

Benjamin Peters and Deborah Lubken chart the much-forgotten history of a prototypical form of emergency communication: the fire alarm. Although church bells were capable of keeping the time of day, or even calling a congregation to service, church bells had also existed as an emergency alarm for local fire systems since the 17th century. Extending successive bells to within hearing distance of the church would establish an aural relay network, connecting the initial alarm to progressively distant locations. The bells revamped the voice relay system that has been used in military situations for centuries, but bells could travel much further than the human voice (Sterling, 2008). The Fire Alarm Telegraph, first implemented in Boston in 1852, was an electric actualization of

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these prior relay systems. A circuit of signal boxes was installed at regular intervals throughout the city (much like modern fire hydrants). The set-up created a citywide emergency communications infrastructure. Although sounding the fire alarm involved a number of steps and doing so alerted the communities living near the relay, it was the quickest system for sending a message to the fire brigade. The most significant effect of the Fire Alarm Telegraph, according to Peters and Lubken, was “decreasing emergency response time and, consequently, destruction to life and property.”\textsuperscript{107} From the telegraph on, this all too obvious element—response time—would be considered a communications problem for industries such as the military, police, and hospitals.

In the early 1930s, hospitals installed public address speakers in their hallways and patient rooms so that nurses and administrators could quickly grab the attention of doctors roaming the halls. When a doctor is paged, everyone hears, but the significance of the message is intended for one. One large New York City hospital set up a message relay system very similar to the Fire Alarm Telegraph. A central microphone served as a broadcasting hub. From there, as one 1933 issue of \textit{Popular Science} reports, “Loudspeakers Page Hospital Doctors.”\textsuperscript{108}

Sound proved to be the fastest means of delivering a message. Sound, after all, is not limited by bulky materiality. Sound is accessible for everyone close enough to hear. Unlike prior forms of point-to-point communication, paging does not require one to wait by a mailbox, a telegraph office, or even a telephone. A paged message plucks its receiver from a crowd, even if that receiver is not

\textsuperscript{107} Peters and Lubken, 199.

\textsuperscript{108} “Loudspeakers Page Hospital Doctors,” \textit{Popular Science} (July 1933), 32.
expecting a message. For in the last step of the paging process, the doctor hears from the speaker that they are needed and responds back to the broadcasting hub. But what if the doctor leaves the hospital?

Radio Paging

By the 1930s the police still used signal boxes, similar to those of 1850s Boston, to send emergency messages. At this time, however, they were called call boxes: telephones, instead of telegraphs, connected each box to a central dispatch station. In her study of police communication systems of this period, Kathleen Battles notes that many officers complained how burdensome it was to use the call boxes.\(^{109}\) In the era of Bonnie & Clyde, automobiles gave criminals the same speed advantages as the police. So, police forces decided that if they could not outrun the likes of Bonnie & Clyde in their automobiles, they would focus their efforts on something much more effective: an efficient strategy to communicate criminal whereabouts.

Like earlier fire relay systems, the response time of police communication in the early 1930s was slow. Police reports claimed that call boxes typically took over 20 minutes to get an officer on the scene of the crime. Perhaps this is why Bonnie & Clyde had such an impressive streak evading the police. The solution for many police departments was found in the very same mass communications technology that officers used to listen to advertiser-supported news and entertainment. Battles claims that “Radio communication guaranteed speed in response that makers of the call boxes could barely imagine, making instant

\(^{109}\) Kathleen Battles, *Calling All Cars: Radio Dragnets and the Technology of Policing* (Minneapolis, MN: University of Minnesota Press, 2010), 158.
response to calls a key measure of police effectiveness and success." Mobile car radio communications would come to be seen as the primary modernizing tool for police authorities in the 20th century. It provided the rhetorical “dragnet” identity for law enforcement.

In 1936 the Galvin Manufacturing Corporation, an early Chicago manufacturer of mobile car radios, received some of the first police contracts for mobile radios. The Motorola “Police Cruiser” was set to a single frequency determined by each police station. As with the one-way hospital paging system above, all police officers listened to the same broadcast sounds, but no one could respond without visiting a telephone. Even so, the radio provided instant updates on criminal whereabouts. Officers spread throughout a geographical area heard if a criminal was coming their way, or if someone had called the station about suspicious activity.

Battles, 158.

Car radios were the only “mobile” radio at this time because heavy batteries and large vacuum tubes mitigated portable hand-held radios.
Police radio communications essentially created a mobile and wireless paging system. These systems cut the cords on hospital paging systems and put them into the patrol car. Both hospital and police paging systems put a certain amount of responsibility on the recipient of the message. In the hospital a paged doctor was required to call an administrator or move to a location instructed by the page. Likewise, each police officer was expected to respond to emergency calls in their vicinity. This “call and response” eased patrol anxiety, knowing that

a silent radio meant things were generally under control. What is key about these paging systems in general is that they assume ready and willing listeners. Of course, broadcasting assumes the same of its audience, but paging systems differ in that the significance of each message could be critically important. One does not know until they listen to the message.

In *The Human Use of Human Beings: Cybernetics and Society*, Norbert Wiener develops a theory for the function of alarms as messages. As a loud sound, claims Wiener, most alarms are intended for a mass audience. Yet most alarms do not appear to have a particular audience in mind. Wiener refers to alarms as “To-whom-it-may-concern” messages. “The concept of an undirected message spreading out until it finds a receiver, which is then stimulated by it, is not an unfamiliar one.” Indeed, we have seen how mosques, churches, and fire brigades use undirected messages to call those concerned with each institution’s interests. The expectation, as Wiener (1950) points out, is that those who hear (“a receiver”) these messages will be “stimulated” by them (p. 70).

Although a page is a directed message (unlike an alarm’s undirected message), it travels through the relatively undirected medium of broadcasting. Notice that here too its urgent properties also stimulate receivers. There is perhaps no more effective way to motivate a listener, to make them really pay attention, than to send messages that could be especially for them. If an individual within an audience can be convinced that a message may come, even without a specified

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113 Battles, 162.

time, then they will be prepared to listen all the time. It is not unlike waiting for one’s number to be called in a raffle. So, while Wiener’s (1950) “To-whom-it-may-concern” message assumes doesn’t have a specified receiver (like most commercial broadcasting), a paged message has a slightly different makeup due to its directness. The paging concept seems to say: be concerned and listen up, because this message could be for you. Mass communication bingo.

APCO Targets Individuals

One year after the first widespread AM radio was developed for police forces in 1936, the Associated Police Communication Officers (APCO) developed a code system for communication over radio. These codes would take into account the problems of officer identification as well as inherent problems with listening to radio transmissions with a mass audience. The “10-Code” or ten signals system was a series of numbered codes in which each code always followed the number 10. This is the reference for the oft-repeated line, “10-4,” in popular tropes of radio communication. The 10-Code system grew out of problems of listening to two-way radio systems. After working in radio for many years, Illinois State Police officer Charles Hopper became one of a number of Communications Directors for various state police divisions around Illinois. Hopper noticed that the first syllable of two-way radio communications was often cut from the transmission if speakers began talking too soon after pushing the transmit button. He encouraged the use of the 10-Code because if a listener could not hear the first part of a message, it could be assumed that it was the standard “10” spoken before each radio message.
By 1940 APCO’s “10-Codes” system included a number of codes meant to target specific officers. A “10-40” was defined as “Advise if Officer Nr……available for radio call.” The code “10-83” meant “Have officer Nr……call this station by telephone.” These and other codes used a standard broadcast template meant to reserve blanks for specific persons. The codes established a police vernacular that required each officer to listen in the event that they were called upon over the radio broadcast.

As more police stations put their faith in radio communication APCO petitioned for more radio channels reserved specifically for law enforcement. The 10-Codes were developed at a time when radio frequencies were scarce, limited by the recently formed Federal Communications Commission. In the late 1930s, APCO proposed the widespread adoption of experimental “radiophones” for police use, but this would require that the FCC reserve more channels on the radio spectrum for emergency radio services. However, in this particular instance the FCC could not justify APCO’s proposal. In a letter addressed to APCO, the FCC’s secretary, T.J. Slowie, regretfully informed the organization that the FCC would not budge on sections 10.126 and 10.153 under “Rules Governing Emergency Radio Services.” Slowie (1940) defended the FCC’s position “because it is believed such relaxation of these rules would permit point-to-point radiotelephone relays in many obviously unnecessary instances, thus interfering with the normally intended use of the frequencies involved.”

116 Letter to APCO Secretary-Treasurer Frank W. Morrow (Jan. 12, 1940), printed in The APCO Bulletin (Jan. 1940), 1.
the FCC did not want officers cluttering the airwaves with “unnecessary” communications, communications they assumed would be like casual conversation on the telephone. The term “radiotelephone” linked the wireless properties of radio with the conversation connotations of the telephone. Yet the FCC viewed these two communications technologies under different umbrellas. “[P]oint-to-point” forms of address oppose the “normally intended use” of broadcast radio.

Radio interference, of course, was the main justification for the formation of broadcast regulation less than a decade prior. Telephones and other point-to-point communications were seen as common-carrier devices by regulatory agencies. Still, APCO was diligent in its pressure toward the FCC. APCO’s monthly bulletin encouraged members to study the FCC’s current regulations regarding “Emergency Radio Services.” APCO’s 1940 National newsletter included questionnaires for local members, with the purpose of collecting “such data as will be required for proper presentation of our problems at an informal meeting of representatives of APCO, IACP [International Association of Chiefs of Police] and FCC in Washington…”117 The organization gathered all the urgent rhetoric it could muster in order to bridge the gap between point-to-point and broadcast communications.

To do this APCO forged an alliance with the Federal Bureau of Investigation. The FBI had gained nationwide fame through the public image of its “War on Crime” during most of the 1930s. Since they had authority to use any local police radio communications, the FBI championed mobile communications

as key to their success. In his address to a 1940 Kansas City, MO, APCO conference, F.B.I. representative Dwight Brantley revealed that, since “the very modern and efficient system of communications, radio and others…I am pleased to inform you that a successful bank robbery has not been effected in this end of the State of Missouri.”\textsuperscript{118} Brantley even compared the police force to a military battalion. While feeding an army was central to success in the past, says Brantley, “the value of communications in law enforcement has only recently been recognized.”\textsuperscript{119} The military—always concerned with speed, movement, and response—took notice. Once they got their hands on radio communication the development of wireless paging technology became a small matter.

**Motorola’s Walkie Talkie: A Symbol for Individual Mobility**

One can chart the history of major technological changes in 20\textsuperscript{th} century mobile communications by following a single company: Motorola. Begun in 1928 as Galvin Manufacturing Corporation, the Chicago company faced bankruptcy in its early years until it narrowed its focus to car radios. The depression did not have a drastic impact on radio or automobile sales. As we’ve seen, mobile industries thrive in crisis situations, a context in which other parts of society seem handicapped. Seeing an opportunity in mobile radio, the Galvin Corporation partnered with a radio parts company located in its same Chicago factory. The joint venture aimed to produce a mass-market automobile radio—something not very popular at the time. The name for this car radio was the Motorola. Motor-


\textsuperscript{119} “Address of Dwight Brantley,” 6.
referred to the car and -ola was in reference to the many sound technologies of the time, such as Victrola and pianola.\textsuperscript{120} These -ola technologies were also popular in their function as hidden sound devices. Manufacturers produced sound devices and radio tuners that looked much like pieces of furniture.\textsuperscript{121} Galvin combined motor- and -ola in an effort to signify mobile sound.

According to the biography of the company’s president, Paul H. Galvin, the company founder had an idea for a new radio product after vacationing in Germany with his family in 1936. Galvin saw large groups of soldiers while in Germany and noticed them using large two-way radios the size of the back-half of military vehicles. When he returned to the U.S. Galvin’s company began working on radio communication for police, eventually installing a two-way AM model by 1939. He sought to develop a smaller radio for the U.S. Military but was unable to obtain a military contract.

By 1940 U.S. military communications included a large two-way backpack radio. At the same time Motorola had been able to cram the tubes, receiver, and transmitter of the backpack into a lighter handheld AM radio device. When Galvin took his design to the U.S. Military, many officials were reportedly unimpressed. They worried that the lightweight radio would not be durable enough to handle combat situations. Things changed for Motorola, however, when at his 1940 inauguration, President Roosevelt saw his security personnel

\textsuperscript{120} This early company history comes from the company’s current website. “Where We’ve Been,” Motorola Solutions, 2011, accessed March 20, 2011, http://www.motorolasolutions.com/US-EN/About/Company+Overview/History

\textsuperscript{121} For a history of the domestic concealment of media technologies, see Lynn Spigel, \textit{Make Room for TV: Television and the Family Ideal in Postwar America} (Chicago: The University of Chicago Press, 1992), Chapter 4: The Home Theater.
using Motorola’s handheld radios. Galvin’s biographer claims that Roosevelt’s personal endorsement led to a military contract for Motorola. In a letter to military officials, Roosevelt suggested that the lightweight communications devices could be used by paratroopers who already had a limited carrying capacity.122

Motorola soon developed the SCR536 “Handie-Talkie” (or “Handy-Talky”). The device had a mouth- and earpiece design much like that of a contemporary telephone. Although it weighed around five or six pounds, the shape and design directed a user to speak into the transmitter as you held the device in your hand, thus the Handie-Talkie. It was doubly handy in the sense of being always near or within reach of its user, unlike automobile-mounted radios.123 The small device used AM radio frequencies, which were much smaller in size and range than the FM “Walkie-Talkie” (or “Walky-Talky), also manufactured by Motorola during WWII.124 By the end of the war Motorola had manufactured over 130,000 Handie-Talkies. The device gained more fame than most soldiers, and even the Galvin Manufacturing Company itself.

With the war over, Motorola capitalized on its war credibility with the public. Motorola manufactured a number of portable radio sets, and the company used certain strategies aimed at linking their more complex military technologies


123 It is interesting to note that the German word for cellular phone is *das Handy.*

124 *QST*, a magazine “devoted entirely to amateur radio,” distinguishes the portable two-way radios in this way: “Though the terms were sometimes used interchangeably, “walkie-talkies” (also known as “talkie-walkies” and even “talky-walkys”) were pack-carried radios, while “handie-talkies” (or “handy-talkys”) were true handheld units of a more limited power and range than their larger cousins.” Gil McElroy, “A Short History of the Handheld Transceiver,” *QST* (January 2005), 47-48.
with those which consumers were already familiar. As one advertisement from the 1940s explains, “When you see and hear the word ‘Electronics’…remember that the radio receivers in your home and in your car are Electronic instruments.” When portable communications devices entered civilian life, references to radio were often employed to make sense of their function. But much of the technology that made radios portable came from hearing aid manufacturers.

**Personal Portable Pagers**

Portable radio pagers, first introduced into hospitals in the early 1950s, were different from two-way military and police radios in one distinct aspect: like public address paging systems, the pager itself was a one-way listening-only device. As with commercial radios to which civilians were already accustomed, there was no button to talk back. But unlike all other radios of the time, these devices were extremely small.

A largely unacknowledged yet influential miniaturizing technology related to the development of the mobile radio—and therefore the pager—is the electric hearing aid. Since the late 1800s mechanical (i.e., non-electric) hearing aids had evolved into smaller and smaller devices and are considered one of the first wearable communications technologies.¹²⁵ The hearing aid’s early 20⁰ century electrification involved the same type of work that sound engineers had been tinkering with inside the telephone, recording equipment, radio, and other sound amplification industries. A goal shared by both hearing aids and wireless

¹²⁵ Mara Mills, “When mobile communication technologies were new,” *Endeavour* 33(4) (2009), 140.
communication are the same: bringing distant or inaudible sounds close to the listener’s ear.

Figure 5 — 1950 Patent for a “Pocket Radio.”

Early pagers linked the compact size of hearing aids with the wireless communication of radio. In his 1946 patent description for one of the earliest miniature radios (see Figure), Frank T. Hines, Jr. acknowledges that his “Pocket

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Radio” utilizes small vacuum tubes similar to “the hearing aid type.” The hearing aid tubes were important for miniaturization at this time because they were the smallest tubes on the market. The widely influential transistor would not be invented until 1948 and applied to most radios until the early 1950s. Moreover the miniature pager utilized a discrete form of listening, also taken from the hearing aid. Like the small ear buds made popular after Apple introduced its iPod in the early 2000s, Hines’ “Pocket Radio” included an earpiece described as “a type of earphone designed for hearing aid sets.” Unlike other listening headphones of the time, the single earpiece goes inside the ear, barrowing a technique from hearing aids.

Additionally, and out of necessity, hearing aids addressed technical concerns over portable power. In his history of the miniature battery, Eric Hintz calls attention to the historical importance of battery power for WWII mobile devices such as radios and mine detectors. Samuel Ruben was the independent inventor responsible for miniature batteries that allowed mobile radios like the “handy-talkie” to operate for longer periods of time than had been previously possible. In 1942 the U.S. Military called on Ruben to address problems with the current batteries used for military radio equipment. For soldiers in the South Pacific, hot and humid conditions caused the mercury cells in the batteries to leak, corrode, or even explode. Ruben developed a nonreactive “copper top” to prevent

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129 Hines, “Pocket Radio.”
corrosion and created a battery vent to prevent the explosions caused by hydrogen buildup.  

Although Ruben’s batteries were first used in wartime handie-talkies, the first post-war uses appeared in hearing aids (see Figure). By 1946 most mobile electronics devices, including portable radios, utilized zinc batteries. Even though portable radios were not prohibitively expensive, many consumers complained of the high cost of zinc batteries. Before the invention and dissemination of transistor technology, portable sound devices relied on energy-consuming tube amplification. Ruben’s mercury-cell battery addressed this power problem. The Ruben “copper-top” batteries could last much longer than their zinc counterparts. Moreover, the batteries solved another crucial shortcoming for hearing aid users. Zinc batteries caused unexpected power fluctuations and therefore errant peaks and valleys in loud and soft sounds coming to the user’s ear. Mercury-cell batteries provided both smooth and long-lasting operation of hearing aid power.  

More importantly for the history of mobile communication, the small size and long battery life of pagers encouraged users to keep the devices “in their pockets” (as some device names like “Pocket-Phone” imply) and always turned on.

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130 Hintz, 34.

Figure 6 — A 1951 “pocket radio,” with removable batteries.\textsuperscript{132}

\textbf{A Telephone Connection}

Because early pagers were receiving-only devices, they presumed callers. Pagers were part of a message economy that used missed calls as currency. Following World War II manufacturers such as the Electronic Secretary Industries of Chicago produced a successful magnetic wire recorder as a telephone add-

Due to direct-connection restrictions from telephone service providers, Electronic Secretary Industries’ early designs utilized a mechanical arm in order to literally lift the phone and place it next to the record’s microphone pickup. Although entrepreneur-inventors demonstrated the feasibility of the technology, AT&T refused to develop its own legal answering machine. But by 1950 its top engineering managers suggested that the company keep with the “march of progress.” For many answering machine users the telephone was not just a device with which to take and make calls in real time. It was now more deeply identified as a device with which to receive recorded messages.

Answering machines were not cheap. When AT&T started to produce its own models, the cost of leasing equipment was often more expensive than buying one’s own machine. Professionals who relied on timely responses to calls—doctors, pharmacists, locksmiths, and prostitutes—could also choose to subscribe to a less expensive answering service. When one was away from their phone, answering services enabled customers to reroute their calls to a call center where an operator answered and took a message. AT&T made a considerable amount of money on services such as these, leading sound recording historian David Morton to wonder if this was why the telephone giant litigated against answering machine manufacturers for so many years.


134 L. Epensheid, quoted in David Morton, Off the Record: The Technology and Culture of Sound Recording in America (Piscataway, NJ: Rutgers University Press, 2000), 125.

135 Morton, Off the Record, 123.
Mobile pager devices functioned as an alert system connected to messaging networks like answering services. The beep merely signaled that a user was trying to be reached—that a message was waiting. Messages, of course, are left for people who are away from their phone. Hospitals that had previously used intercom systems now expected their pager-carrying doctors and nurses to respond to messages when outside of the hospital. They did this with a message relay system between the caller, an answering service, and a user’s portable radio pager.

These answering services acted like secretaries who worked for many different clients. The pager, however, put the secretary in the position of being a broadcaster. Many 1950s paging services used radio broadcast frequencies to send messages to their subscribers’ portable radios. One system used an automatic “transmitting machine” (see Figure) in which a numbered audio filmstrip, representing each subscriber, was placed on a conveyor belt that paged all subscribers at repeated intervals. These pagers were similar to public address systems in that many people heard this pager system at once. Yet the pagers were also like two-way radios in that a listener was identified by a certain code or number, letting a specific listener know there is a message there. One 1953 “Pocket Phone” system from Chicago is described in this way:

A message is repeated at intervals for an hour unless canceled. So, while you watch your ball game, doctor, you take the Pocket Phone out of your pocket at least once an hour, hold it up to your ear, press a button, and listen

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to the current list of messages. You hear the message to call your hospital, and that is that.137

Figure 7 — A 1951 “transmitting machine.”138

137 “Message to a Master Sleuth: Chicago Gets Pocket Phones,” Chicago Daily Tribune (Dec. 6, 1953), B7.

138 A paging service operator places a subscriber’s “code stick” on the circuitual “transmitting machine,” which broadcasts the subscriber’s code at regular intervals, letting the subscriber know they have a message. C. Ennis, “Pocket Radio Pages Doctor Night and day. Popular Science, Jan. 1951, 104.
This automatic “transmitting machine” is a fitting name for a messaging system that does not relent until the pager user calls to have the message canceled. Device names like “Pocket Phone,” “Radio Phone,” and “Pager Phone,” among others, associated these one-way products with the two-way capabilities of the telephone (see Figure). Two-way portable telephones, however, were only a dream in the 1950s as cellular technology was not utilized until the late 1970s. Pagers did not require new technology, infrastructure, or connections to telephone lines. They utilized existing devices such as portable radios, existing infrastructure such as radio broadcast frequencies, and existing message media such as answering services. Although existing devices like the two-way radio enabled users to speak to one another in real time, these new paging systems recorded those moments when one could not be near the phone in real time. The pager essentially reminds users of something that may have seemed forgetfully obvious: others are trying to contact you when you are away from the phone. The pager, therefore, not only served as a constant reminder of one’s absence from the telephone network, but it made sure that missed calls would be returned.
Figure 8 — “Tiny Radios for Quiet Paging.” 139

When doctors and other professionals wore their absence reminders, they became easier to contact. A page sent them to the nearest telephone to return messages. The process became a human analogy to Martin Heidegger’s “standing reserve,” which the German philosopher originally defined as resources in nature “ordered to stand by, to be immediately on hand, indeed to stand there just so that it may be on call” (p. 298). Urgent-minded professionals became closer to their devices, a standing reserve for answering services, who acted as their own standing reserve for telephone callers. Like today’s answering services—voice-mails, text-messages, e-mail and others—these answering services produced responses. The standard form of these message media is, “Call me back.” Messages ask recipients to call their callers.

By the 1960s Motorola had expanded the moving sound business into a number of communications contexts. In order to strengthen its foothold in the hospital communication market, Motorola purchased a company from Minneapolis, MN, one of the largest manufacturers of hospital equipment—devices such as pagers, hospital room “televiewers,” and patient-to-nurse call units. Moreover the company’s 1961 annual report reveals eight additional specialty divisions: communications, consumer products, automotive products, semiconductor products, military electronics, solid state systems, international, and hearing aids. Motorola had broadly branded itself as not only a wireless

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communications company for professionals, but a mobile media company interested in expanding its market to consumers.

Motorola continued to target new uses for its wireless radios. The company adopted miniaturized vacuum tubes in the 1930s and 40s, transistors in the 1950s, and newer solid-state circuits, which began popping up in the 1960s. Their mobile devices not only introduced quick delivery of messages, but by 1960 the combined efforts of the company’s “transistorized ‘Handie-Talkie’ Pocket Transmitter and Pocket Receiver” gave professionals a quick way of responding to those messages.143 These “communications system[s] for the man on foot” spread to a citywide medical paging system in San Diego and a similar one for police in Washington, D.C.144 One should wonder how Motorola and other mobile manufacturers utilized their knowledge of these radio paging systems to expanded their operations into the large cellular industries of today.

Conclusion

Of course, we don’t think of cellular telephony as a broadcasting medium, but broadcasting technology makes up most of its technological DNA. The roughly 190,000 cellular towers around the United States are akin to local broadcasting hubs that pass an individual device’s signal from one tower to the next. Although popular histories of broadcast radio will have us believe that radio’s demise came after the rise of television audiences in the late 1940s and early 1950s, Susan Douglas, an influential radio historian, warns researchers not

to uncritically accept this declinist narrative. Matthew Killmeier (2005), too, argues that “radio continued to be significant, but in ways yet to be adequately interpreted or accounted for in media historiography.” It is not that audiences suddenly left radio, Killmeier claims, but they began to use it for different purposes and in different contexts. The 1950s were characterized by more Americans moving to suburban homes further away from their workplace. By 1955 seven out of ten families owned cars. The increased mobility of Americans was reflected in the changing content radio: “primetime” programming was scheduled during commuting hours and radio content went from foregrounded attention to background listening (short-length popular music, brief news reports), during which listeners could frequently enter and exit the broadcast flow. The communications technology worked in tandem with the increasingly mobile lifestyles of Americans.

After the major networks showed little interest in radio, due to the rise in TV audiences, the number of FCC radio licenses more than tripled, from 800 AM stations in 1942 to over 3,000 by 1956. Without national network funding, radio stations learned to be creative—and local—in their sources of revenue. Paging services were one such broadcasting experiment that did not require a

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147 Killmeier, 169.

148 Killmeier, 166.
revolution in radio technology, but a repurposing of its function. Most significantly, early paging devices repurposed the practice of broadcasting—from one to many—in order to target individuals—one out of the many. The combination of available technology (telephone, answering services, radio) and increasing mobility encouraged the use of radio in a range of new contexts. In short, the early history of paging can be seen as an effort to broadcast a message to one particular individual.

Direct wireless communication with individuals is now part of the 21st century human experience. Paging—as an idea and cultural technique—plays an influential role in informing the foundations and evolution in mobile and networked communications. When you assign yourself to a communication device there is a responsibility that comes with being able to respond, such as the case with early doctors, locksmiths, and others who worked in the industries of urgency.
CHAPTER THREE
BEEPS, ALERTS, & VIBRATIONS: THE PHATIC FUNCTION IN NETWORK COMMUNICATION

The rules of conduct which bind the actor and the recipient together are the bindings of society.\textsuperscript{149}

This is the end. This threatens to turn ordinary citizens into facsimiles of the punch-drunk boxers who go through life jumping at imaginary bells. Only these people will be jumping at real bells, of their own deliberate contrivance.\textsuperscript{150}

On May 13, 2005, Tonight Show host Jay Leno held a competition between two communications platforms. One was old. One was new. Months before Western Union would send its last telegraph message, in January of 2006, two telegraph operators, wearing the traditional green visor, white shirt, vest, bow tie, and sleeve garters, faced off against a text messaging teenager, Ben Cook. Cook had recently become a world champion for his ability to quickly write text messages.\textsuperscript{151} His mobile phone went up against Morse code, a nineteenth-century communications shorthand developed for the telegraph. The competition between Morse code and text message was simple. Each team was given an identical


message to send from their device to a designated receiver. The fastest team to send the message wins.

“How old is Morse code?” Leno asked as he set up the competition. “One hundred and seventy years,” responded one of the telegraph operators. Looking around at the audience, Leno repeated, “One hundred and seventy years. One hundred and seventy years.” In addition to its over one-and-a-half-century handicap, Morse code involves a number of translating steps. The sending operator first translates the written message into Morse code, and then the receiving operator translates the coded message back into the letters of the alphabet. Leno asked an audience member for her prediction on the night’s race. “Do you think text messaging will beat Morse code?” “Oh yeah,” the woman responded. The Tonight Show’s audience cheered in agreement.

As soon as Leno said, “Go!” the audience listened to the dashes of Morse code on the soundtrack as they watched Cook thumb away at his mobile phone. Both teams were furiously stationary as they pushed their buttons. In less than 21 seconds the winner was clear. The telegraph operators prevailed, surprising most in the audience and especially the text messaging team. Leno looked like he was going to console the text messagers but instead rubbed in the loss, saying, “Ben and Jason, I’m sorry. You were beaten by a one hundred and [seventy] year-old technology.”

What good are modern communications devices, surprised viewers must have wondered, if they can’t even compete with the telegraph? After all, the telegraph is the earliest form of electronic communication—the 1830s versus the 2000s. The arrangement of the competition, however, raises a number of
questions. Are telegraphy and text message comparable forms of communication? If writing speed is not the reason people value modern networked communications, what else explains its appeal?

The significance of twenty-first-century communications such as mobile, social, and networked media is that individuals can contact one another nearly instantaneously with ease. That is, network users receive messages directly, whereas telegraph messages often went through complex and circuitous transmission and delivery methods. Networked devices are personal communications centers. The significance of networked devices is not, as the *Tonight Show* competition suggests, that messages can be *written* more quickly. Networked devices *deliver* messages more quickly. The small difference is big.

To focus on delivery, one must examine how networked media have incorporated sounds, vibrations, and other means of grabbing attention so that consumers know a message has arrived. The postal system delivers letters and packages according to daytime labor schedules. Delivery is relatively unannounced, does not happen on Sundays, and is impacted by changes in the delivery environment (inclement weather, overly protective dogs, moving residences without notice, etc.). In contrast, personal electronic media emphasize a fundamental facet of communication: the phatic function, as theorized by Russian-American linguist Roman Jakobson. A crucial element of any form of communication, the phatic function establishes contact, captures attention, and repeatedly checks the connection between two or more persons. The telegraph and even the early years of the telephone, as we will see, did not typically alert operators or private users of incoming messages. Early telegraphers deciphered
printed messages and later telegraphers learned to listen to the sounds of Morse code. In either case their profession assumed that operators were already waiting by the telegraph receiver. The practices of wireless telegraphy and even the famous first phone call between Bell and Watson assume someone is already on the other end of the line, as was true with the receiving operator on the *Tonight Show*.

Modern networked media, on the other hand, don’t require steadfast attention. New personal communications devices substitute attention for the interruption of live notifications. The practices yoked around personal network devices assume users are not “tuned in,” so each incoming message alerts the user to give their attention to their communications network with a ring, vibration, or pop up on the screen. The phatic function of personal networked media is the electronic version of a tap on the shoulder. While this function is not typically separated from other functions of communication, such as the poetic function in language or the context in which a message is created, the pager is a unique technology in that it separated the notification of a message from the message itself.

**Irresistible Notifications**

In 2006, Reggie Shaw was on his way to work, driving his sport utility vehicle from Logan to Tremonton, Utah. Shaw was reading and writing text messages when he slowly crossed the double-yellow dividing line of a Utah state highway, clipping a small four door Saturn. The Saturn spun into oncoming traffic, where it collided with a large pick-up truck. Shaw came away from the crash relatively unharmed, but the two men in the Saturn, rocket scientists also on
their way to work, were killed on impact. Shaw apologized profusely for his negligence. “It was early in the morning,” he recounts in an AT&T-funded PSA. “I don’t remember what I was texting. I don’t remember what the message said. That’s how important it was.”\(^{152}\) The accident inspired one of the first texting while driving laws in the United States. It has since served as the model for other such prohibitions in other states. According to the National Highway Traffic Safety Administration, of the roughly 30,000 fatal crashes each year, ten percent involve driver distraction, and mobile devices account for 14% of reported driver distraction deaths.\(^ {153}\) Traffic researchers are hoping that nearly 1,500 deaths will be prevented by promoting the dangers of texting while driving and encouraging legislation against distracted driving. Texting while driving laws not only emphasize the dangers of divided attention, they implicate mobile communications technology and drivers’ poor communication decisions.

One hundred years earlier public officials blamed communications technology and poor communication habits in another major transportation accident. Twenty-two-year-old Harold S. Bride spent most of his time below deck on a cruise liner in the North Atlantic. An employee of the Marconi Company (not an official member of the ship’s crew), Bride’s primary responsibility was listening to and transcribing telegraph messages sent from shore to the ship’s passengers, and vice versa. On April 14, 1912, Bride sent many messages from


businessmen on his ship to telegraph operators on shore in the United States. At
the same time, however, Bride heard many other messages coming in. Some
messages were for the *Titanic*, but many were not. Amidst the sending and
receiving, Bride missed warnings from ships ahead of him that there were ice
fields in the ship’s path. Hours later Bride’s ship, the RMS *Titanic*, collided with
an iceberg. As the *Titanic* took on water, Bride broadcast distress signals for any
ships nearby. The closest ship, reportedly ten miles away, was the RMS
*Californian*, one of the vessels that had earlier tried to warn the *Titanic* of
icebergs in their path. But the *Californian*’s telegraph operator did not receive the
*Titanic*’s message because the operator was sleeping. To this day many historians
claim that the *Californian* might have rescued most of the 1,514 casualties if its
operator would have received the message.

Like today’s texting while driving accidents, the *Titanic* disaster put
communications media under scrutiny. The problem with texting, traffic
researchers and popular pundits claim, is that drivers pay *too much* attention to
their communications devices. It is hard to look away when someone is calling the
electronic version of your name. Indeed, sustained attention to one’s social
networks is one of the hallmarks of what new media researchers call “connected
presence.” In contrast, the Senate hearings that followed the *Titanic* disaster made
it clear that wireless telegraph operators were not paying *enough* attention to their
communications. The *Titanic*’s operator missed the warnings from the
*Californian*; the *Californian*’s operator missed the distress calls from the *Titanic.*
The two contexts, set in contrast, highlight the changing relationship between
electronic communication, attention, and personal connection.
There is a simple but revealing difference between the Titanic and texting: there was no way to alert the telegraph operator that a message was for the Titanic or for the Californian without listening to all the messages coming over the wireless signal. The significance of twenty-first-century communications such as mobile, social, and networked media is not merely that individuals can contact one another, nearly instantaneously, with ease. What is more significant is that messages come directly, they are for you, and they typically summon users with an alert. This fundamental difference increases the prevalence of phatic communication, or communication exchanges that serve to establish, prolong, and facilitate social ties instead of exchanging substantive information. In other words, modern networked media emphasize the many rituals of connection.

There is a handful of research on how mobile and networked technologies facilitate social ties\(^{154}\), but few have looked more fundamentally at how communication devices establish and maintain a connection between two persons and what impact that has on communication rituals. In what follows, I provide a history of phatic techniques in electric communication. How did inventors, regulators, and users adapt and adopt communication devices for the purposes of attention and connection? Additionally, how do these simple attention techniques encourage more activity and time spent on these various communications networks? Although the trend of structural analysis for communication seemed to go out of fashion by the 1970s and 80s, in their very design network media

encourage structural thinking about communication.

Phatic Communication

There are two dominant understandings of phatic communication. Both understandings emphasize the significance of seemingly trivial communication habits. The phatic term first began in the 1920s as an observation by anthropologist Bronislaw Malinowski. Trained as an economist, Malinowski imbued his social observations with functional understandings regarding why cultures behave the way they do. His understanding of language separated the ways in which “primitive, non-civilized peoples” learn to speak from the ways in which those in “civilized” societies learn language. Although many cite Malinowski as the founder of what would later be called “phatic communication,” it is surprising that few communication researchers point out that Malinowski’s understanding of communication and culture relies on what Walter Ong would later call distinctions between oral cultures and literate cultures. For the island cultures Malinowski studied, communication is not separate from the actions, behaviors, or activities of those cultures. As he writes, “language in its primitive forms ought to be regarded and studied against the background of human activities and as a mode of human behavior in practical matters. We have to realize that language, among primitive, non-civilized peoples was never used as a mere mirror of reflected thought.”


product of communicating through writing and reading. Reflective thought is thus tied to literate cultures whose individuals read books, essays, legal documents, and other messages written by people who are not otherwise there or even alive.

Unlike most economic research of the time, Malinowski’s research was interested in how community members’ social gatherings informed their economic practices. After observing island cultures in the south pacific Malinowski noticed that certain social interactions seemed more like rituals than as a means of conveying information. He called this “phatic communion,” an exchange that serves to establish, prolong, and facilitate social ties. For Malinowski, this type of behavior was distinct from social exchanges that operated more like an information transaction.¹⁵⁷

The second and more widely cited understanding of phatic communication comes from linguistics. In the late 1940s, a time when fields as diverse as mathematics, engineering, psychology, and sociology sought to break down communication into discrete abstract pieces or steps for analysis, linguist Roman Jakobson contributed a theoretical model that he claimed could be applied to almost any form of communication. Among six other factors of his communication model is a contact, which Jakobson defines as “a physical channel and psychological connection between the addresser and the addressee, enabling both of them to enter and stay in communication.”¹⁵⁸ For Jakobson communication is purpose-driven, and his model identifies six functions that

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¹⁵⁷ Malinowski, "The Problem of Meaning in Primitive Languages," 146.
correspond with the six factors. The contact factor serves a “phatic function,” a
term that Jakobson barrows from Malinowski. However, unlike Malinowski,
Jakobson claims that phatic exchanges are closely aligned with the medium or
channel in which communication takes place. “There are messages primarily
serving to establish, to prolong, or to discontinue communication,” observes
Jakobson, “to check whether the channel works (‘Hello, do you hear me?’), to
attract the attention of the interlocutor or to confirm his continued attention (‘Are
you listening?’ or in Shakespearian diction, ‘Lend me your ears!’—and on the
other end of the wire—‘Um-hum!’).”

Although Jakobson’s functional model was intended for linguistics,
communication researchers took particular interest in phatic communication as
networked technologies became widespread in the 21st century. In 2001 Andreas
Wittel, a cultural critic and internet researcher, described the emerging moment as
one of “network sociality.” This new sociality was characterized by “… the
increasing perception of social relationships as social capital…” and “…a move
from having relationships towards doing relationships and toward relationship
management.”160 Vincent Miller later claimed that much of online communication
can be considered phatic, in Jakobson’s understanding, in that it is concerned with
the process of communication. “These interactions essentially maintain and
strengthen existing relationships,” argues Miller, “in order to facilitate further

160 Andreas Wittel, “Toward a Network Sociality,” Theory, Culture & Society 18,
no. 6 (December 2001), 72.
communication.”¹⁶¹ Thus the short phone call, the text message, the brief email, and even clicking “like” on a friend’s Facebook post are ways to be present on the increasing number of social networks through which we participate. In Miller’s understanding, content takes a back seat to “keeping in touch.”

Mobile phone researchers argue that the personal technology encourages a similar logic. The device affords continuous communication, or “perpetual contact,” as one researcher puts it.¹⁶² In this logic the quantity of exchange is as important as the quality.¹⁶³ They may be mundane, but Tong and Walther show that these exchanges serve as a form of relational maintenance.¹⁶⁴ But the expectations of perpetual contact often produce an obligation to respond, to be available, and to be connected.¹⁶⁵ This is communication as culture, as ritual, in the James Carey understanding. It is part of being a responsible partner or friend in a relationship or social network when persons are not co-present.

These phatic exchanges are part of what make network cultures hum. They are integral to the metabolism of connecting with others, responding to messages, and even the data-driven advertising economy that underlies most twenty-first century communications networks. And a primary reason for this is that users


¹⁶³ Licoppe, 2008, 140.

¹⁶⁴ Tong & Walther, 2012.

hear about these messages, literally, as they happen. The seemingly trivial alerts of modern communication devices appear more significant when we consider their relationship to distant communication history. What was once a required tool for professionals is now an integral part of daily interaction. The way in which messages are announced influences expectations of attention.

A Phatic History of Telegraph Communication

The Tonight Show competition at the beginning of this chapter chose the telegraph and the text message because the two have much in common: both transcend physical space; both use written language to communicate messages; and both deliver messages instantaneously. These similarities are emphasized in the design of the competition. Competitors send their messages electrically, sitting at two tables twenty feet apart. Each team is handed an identical and previously unknown message which they must encode on their devices.

The differences between these two forms of communication, however, seem less apparent. As Leno points out, the main difference between telegraph and text message is that telegraphers use Morse code while mobile users type with the alphabet. Viewers, then, assume that the major difference between Morse code and text messaging is merely the process of transforming language into code and vice versa. This is the competition: a race concerned with writing speed more than delivery. The emphasis is significant because it distorts the social significance of the telegraph within the nineteenth and early twentieth-centuries. In setting straight the historical practices surrounding the telegraph we find the appealing differences that have led to the rise in popularity of networked communication technologies. Modern communication devices are largely identified with
individuals. Each electronic message is already connected to the address of its recipient—not true for telegraphy.

Although the telegraph has received much historical attention, there is scant research into the cultural practices of telegraphy like those on display during the Tonight Show competition.\textsuperscript{166} How was the telegraph actually used by operators? What was the telegrapher’s role in the process of sending a message from one individual to another? What cultural effects did this have on person to person communication? More practically, how did operators know when a message was coming in? To what signals or alerts did they respond?

To be sure, the process of transforming language into Morse code is a significant difference between the telegraph and modern personal forms of communication. Operators are required to memorize a coded alphabet in which each letter of the English alphabet is represented by dots, dashes, and spaces. Unlike modern text-based communications, the symbols for communicating are not written onto telegraph technology. Early mobile phones, in contrast, continued the landline telephone’s keypad system of assigning three or four letters to each number on touchtone telephones. Perhaps demonstrating the increasing popularity of text-based communications, many mobile phones incorporate QWERTY keyboard layouts, borrowed from typewriters and, later, computers.

Admittedly, text messaging on a mobile keypad or keyboard takes a certain amount of practice before a user is comfortable. However, unlike learning Morse code, the letters of the alphabet correspond directly with its push button. Text-messaging shares the same written language as other forms of written communication. This is one reason text-based messages are so widespread. Telephone communication grew in popularity for similar reasons. After only twenty years in existence, by the turn of the twentieth-century the telephone had surpassed the telegraph in total number of messages, miles of wire, money invested, and outright usage. The explanation? “[A]nyone could use a telephone,” says technology researcher James Gleick. “The only skills required were talking and listening: no writing, no codes, no keypads.” Indeed, this was first apparent during the 1896 Bryan and McKinley election. Ordinary citizens with extraordinary political participation used the telephone to relay pole numbers and voting results in real time. McKinley kept abreast of the latest developments with campaign managers in thirty-eight states with the use of a telephone in his own Ohio home. Telegraphy, in contrast, involves learning an entirely new system of signs—Morse code—that correspond to written language. Morse code is one step removed from the alphabet. In this way, it appears the text messaging team had a leg up on their Morse code counterparts. It is no wonder the audience was surprised.

167 Of course, text-message cultures have been creative with the limitations and possibilities that the medium affords. :) See Naomi S. Baron, *Always On: Language in an Online and Mobile World* (Oxford: Oxford U Press, 2008).
Transcribing and receiving telegraph messages, then, involves a certain amount of training and learning. It was not uncommon for experienced telegraphers to test younger operators’ comprehension of messages coming over the wire with a hazing ritual tailor-made for telegraphy. Thomas Edison, who in his youth worked as a telegram delivery boy\textsuperscript{170} and later as a telegraph operator and in the Boston area, was put to one such test. When he first worked as a telegraph operator senior operators asked a very fast operator in another office to send messages to Edison. The future inventor of the light bulb, sound recording, and film apparatus took the speedy messages in stride, even as the distant operator increased their rate from 25 to 30 and then 35 words per minute. Little did the senior operators know that Edison had learned Morse code as a young teenager from a railway stationmaster.\textsuperscript{171}

It is evident that a major difference between telegraph operators and those who text message is that telegraph operators are professional language interpreters within a much longer message delivery process. Their profession is seen rhetorically and historically as one that takes time, patience, and concentration. Ken Miller, the receiving telegraph operator in the Tonight Show’s competition, admits during the broadcast that he has been communicating with Morse code for over 38 years. Chip Margelli, the Morse code transmitter for the team, has used

\textsuperscript{170} Many media inventors and creative minds worked at telegraph offices in their youth. Claude Shannon, known for his information theory which led to the foundation of digital computer design, worked as a telegram delivery boy for Western Union in Gaylord, Michigan, a remote country town in the northern part of the state.

\textsuperscript{171} Tom Standage, \textit{The Victorian Internet: The Remarkable Story of the Telegraph and the Nineteenth Century’s Online Pioneers} (London: Weidenfeld and Nicolson, 1998), 133.
the coding habit for over 43 years. Each operator individually has been sending and receiving Morse code longer than the combined ages on the text messaging team.

Although it was not apparent on the night of the competition, the telegraph began as a writing instrument. The written telegraph message, like the post message before it, provided a record of communication. When Samuel Morse and Alfred Vail publicly demonstrated their telegraph apparatus and corresponding code around the United States, the printed dots and dashes received by the telegraph operator on stage were used as proof of this new instantaneous form of communication. Many early spectators doubted the telegraph because it was the first form of communication to abstract a message at one end and reconstruct it at the other. For some it seemed like a hoax. To assuage audiences Morse and Vail’s public demonstrations essentially compared written records of messages sent and messages received. “[T]he recorded (written) telegraph messages,” notes cultural historian Jonathan Sterne, “provided a kind of proof that the event happened—after the fact.”172 For early spectators at Morse and Vail’s demonstrations, seeing the telegraph write the coded message on a scroll of paper documented what might have otherwise seemed magical—instantaneous communication over large distances. The word telegraph, in fact, means “that which writes at a distance.”173 Seeing the communicative act take place—eyeing the dots and dashes on telegraph tape—was tantamount to believing in its ability to quickly transcend space.

172 Sterne, The Audible Past, 146.
The telegraph was the starting point for modern electrical engineering, argues James Carey, because the telegraph focused on the economy of a signal—comparing the signal before transmission with the signal afterward.\textsuperscript{174} Decades before Carey, Claude Shannon, the founder of the seminal “information theory” on which modern communications are based, claimed that “The fundamental problem of communication is that of reproducing at one point either exactly or approximately a message selected at another point.”\textsuperscript{175} Unlike the \textit{Tonight Show} competition between Morse code and text message, the physical record of transmission in early telegraphy was just as important as the speed of transmission. The written record not only allowed operators to compare the messages sent to those received, but it made electronic communication tangible.

More practically, the telegraph was preferred by many business professionals because writing over wires acted as a receipt for communication. Although some thought the telephone would revolutionize the speed and flow of commerce, most professionals did not see the advantages of spoken communication. Three years after the telephone enabled electronic speech, pundits were skeptical about its future, specifically in relation to the telegraph: “The advantage to be derived by the telegraphic service from the telephone is rather limited, since, as far as the speed of transmission is concerned, it is of less value than many of the telegraphic instruments now in use, and the messages

\textsuperscript{174} James Carey, \textit{Communication as Culture: Essays on Media and Society} (New York: Routledge, 2009), 156.

which it produces cannot be registered.” Speed of transmission seemed to be of highest value, just as it was in the Tonight Show competition. Telephone lines, of course, would soon undergo many changes in the coming years that would enable faster rates of transmission. But we should not forget that, for many telegraph users, the value of telegraphy was in registering or documenting communication at a distance.

As with any new medium, descriptions of the telegraph relied on existing media to make sense of how the new devices functioned. Before the telegraph, the postal system was virtually the only widespread form of distant communication. Morse and Vail’s demonstrations in the 1830s and 1840s utilized telegraph printouts not only because they were proof of communication, but because they demonstrated how much more quickly written messages could be sent over an expansive space when compared with postal mail. The telegraph was in direct competition with the postal system. In fact, spectators of the early telegraph could not comprehend this new type of delivery system. Transmission was not in their vocabulary. The term transmission, as a “conveyance or passage through a medium” would not be used to describe electrical communication until radio broadcasting came into use in the early part of the twentieth century. In the nineteenth century, transmission was a term used for the transfer of a physical

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177 Of course, France’s Chappe telegraph, optical telegraphs, and other line-of-sight telegraphs had existed previously and in other contexts. See Frank Hellemans, “Napoleon and Internet: A Historical and Anthropological View on the Culture of Punctuality and Instantaneity,” Telematics and Informatics 15 (1998), 127-133.
property through a particular medium: light transmitted through a crystal, heat transmitted through steam, or disease transmitted through germs.\(^{178}\)

It should come as no surprise, then, that early telegraph clients assumed that the electric wires over which messages were sent actually transported physical messages-on-paper at the speed of a light switch. One early publication from 1848 recounts how many members of the public made sense of electrical communication: “One wiseacre imagined that the wires were hollow, and that papers on which the communications were written were blown through them, like peas through a pea shooter.”\(^{179}\) A telegraph operator in Maine reported about many customers who did not believe their messages had been sent down the telegraph line. One man came in the telegraph office, filled out the telegraph form, and asked for his message to be sent quickly. As the man watched, the telegraph operator promptly tapped out the message, sending it up the line, and put the completed message on the “sent” hook. Seeing the message still on the hook the man asked the operator: “Aren’t you going to send that dispatch?” The operator responded that he already sent the message. “No, you haven’t,” said the man in disbelief, “there it is now on the hook.”\(^{180}\)

The confusion stems from a property inherent to all electronic communication: a message must be broken up into fragments on the sending end in order to travel. On the receiving end, the fragments are pieced together again to


reconstruct the message. All electronic communication is abstract, coded, or somehow changed in its process of transmission. The paper printouts of Morse code helped telegraph operators clearly identify these fragments as they came in over the wire.

Yet we see no paper printouts from the telegraph team during the *Tonight Show* competition. After a few decades of use telegraph operators found that Morse code could be represented by sound as well as print. By the 1860s many seasoned telegraphers chose to listen to Morse code instead of reading its print out. “Very quickly,” describes Sterne, “telegraph operators learned that they could discern messages more clearly and with greater speed by listening to the machine than by reading its output.”181 Listening enhanced not just speed, but comprehension. Indeed, this is one of the main advantages the Morse code team carried into the *Tonight Show* competition. Sound telegraphy, as it was called, transformed a written language into an oral one. Listening replaced reading. The sound of dots and dashes became, through practice, analogous to speech. While the text-message team could not receive the message until it had been fully transcribed onto the phone (i.e., *sent*), the telegraph receiving operator could hear the message, in real time, as it was being transmitted. In the abstract, listening over electric wires sounds like the telephone—a word that literally means sound from afar.182

The practice of sound telegraphy introduced a number of changes to the communications profession. Fundamentally, it assumes that operators are always

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already connected and listening in. Using only one’s hearing faculty means that
the telegraph operator stays attentively close to the telegraph, waiting for
messages to come in over the line. Unlike ringing telephones, most telegraph
instruments had no way to alert the operator of an incoming message. For
communicative forms that transpire only during certain hours of the day and only
certain days of the week, incoming message alerts seem less important. Postal
mail, for instance, is delivered between the hours of nine to five, and is not
delivered on Sundays. Telegraph services, too, typically operated during business
hours.

When telegraph offices advertised their services, they often emphasized
how fast, efficient, and attendant their operators and messengers were. A
nineteenth century London poster advertising a new electric telegraph service
educated potential customers in this way: “Messengers in constant attendance, so
that communications received by the telegraph would be forwarded, if required, to
any part of London, Windsor, Eton, & c.”183 Moreover, operators in telegraph
offices that may employ up to 30 telegraph operators learned to block out
extraneous noise and focus on their incoming telegraph messages. As Sterne
notes, “sound telegraphy required that sound be framed into foreground and
background, inside and outside: the operators at Cleveland, in a room full of
clicking instruments knew full well that each click was linked with events at a
great distance from that room, and they could focus their attention on their

183 Tom Standage, *The Victorian Internet: The Remarkable Story of the Telegraph
and the Nineteenth Century’s Online Pioneers* (London: Weidenfeld and
Nicolson, 1998), 50.
instruments.”184 This auditory anomaly would later be known as the “cocktail party phenomenon,” defined as the relative ease with which listeners are able to understand a single message even though many other messages are present at the same time.185 That is, a listener is able to isolate a single conversation amidst a number of other competing conversations. But this is not without effort. The phenomenon demonstrates just how subjective listening is. It’s not merely deciding what to listen to, but what not to listen to. Listening to a single conversation requires a number of other conversations to be filtered out.

But telegraphy is not polite. Unlike cocktail parties, telegraph operators do not make eye-contact with one another before sending a message. Some receiving operators may be inundated with messages while others sit waiting. A standing reserve of operators was required in telegraph offices because one may not know when a message would come. With reference to face-to-face communication, it might be like beginning a conversation without checking to see that your conversant is ready, engaged, or listening. The sound of the Morse code message is its own alert that a message is in process. There is no signal to check that the receiving end is ready. When the telegraph “speaks” it assumes the operator on the other end is already listening.

Bells and alerts were the foundation of electric communication, but soon disappeared from the telegraph communication model. Early inventors of electromagnetism—the technology that made it possible to communicate, over

184 Sterne, The Audible Past, 150.
wire, with others miles away—used bells to prove that a person in one location could produce action in a distant location. In the 1830s Joseph Henry was the American scientist and professor responsible for producing an electrical source powerful enough to hold an electrical signal on a wire that may be miles in length. To test this technology Henry used a large horseshoe electromagnet, a small permanent magnet, and a small office bell. Henry stood on one side of the room with a small battery and touched the copper wire. When the signal reached the horseshoe electromagnet at the other end of the room, charging the permanent magnet in-between, it swung the horseshoe to ring the small office bell.¹⁸⁶

Although Henry showed that ringing a bell was possible, Samuel Morse demonstrated that the discrete on or off action of an electrical signal—such as ringing a bell—could be used as a language for distant communication. Morse’s dot and dash system, performed by turning the electrical signal on or off, was used to reference letters of the alphabet. However, there were other designs in competition with Morse’s telegraph code system. The Englishmen William Cooke and Charles Wheatstone devised an electrical telegraph that did not use dots and dashes to communicate, but instead multiple needles that point to letters of the alphabet. When he described how his device functioned, Wheatstone pointed out that “There is another very essential part of the apparatus, the means we have of ringing a bell before the communication begins in order to call the attention of the observer.” The reason for the bell has to do with expectations of the operator’s inattention.


The Cooke and Wheatstone telegraph can not be separated from the railroads for which it was developed. When Cooke first presented the device, it was to a limited audience comprised of the directors of the major English

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189 A drawing of the 1842 two-needle telegraph that William Cooke and Charles Wheatstone sold to English railway companies. The needles on this model would point to specific rail stations along the route. The top compartment holds the bell to alert operators that a message is being received. Drawn and engraved by John Emslie, “The Electric Telegraph,” Published by John Reynolds (174 Strand, London), April 16, 1851.

railways. Cooke touted the ability of his device to provide advance notice regarding rail traffic and line conditions, thereby promoting safer rail transport.\(^{191}\) This use of railway telegraphy is depicted in fiction of the time. Charles Dickens’ “The Signal-Man” is a short story about a railway signalman who works inside a small station at the end of a train tunnel. His job is to signal by telegraph to the operator at the other end of the tunnel when the train has cleared. As the narrator in Dickens’ story recounts, the signalman’s small hut contained “a fire, and a desk for an official book. There was also a machine with a little electric bell. This was for sending telegraphs along the line. The bell interrupted the signalman several times. When it rang, he had to read off messages, and sent replies.”\(^{192}\) The telegraph bell did more than alert the signalman. Like ringing church bells, it punctuated his day, but on an undetermined schedule. “Under some conditions,” reports the narrator, “there would be less upon the line than under others, and the same held good as to certain hours of the day and night…but, being at all times liable to be called by his electric bell, and at such times listening for it with redoubled anxiety, the relief was less than I would suppose.”\(^{193}\) Even in the signalman’s quiet moments there was fear of missing a message for him. And for good reason. For the signal man, missing a message could mean death on the tracks.

Morse’s telegraph, however, prospered for purposes that did not rely on a


bell or alert. Although it would be used for rail traffic, too, the Morse telegraph commercialized the message itself and not the announcement of a message. In the US the telegraph became known as an expedient and expensive postal system. Consumers, and more often business professionals, wrote and received messages based on their postal address. As shown above, the written telegraph message, like the post message before it, provided a record of communication—a literal message receipt. The printout demonstrated how much more quickly written messages could be sent over an expansive space when compared with postal mail.

There were no bells or alerts in Morse’s system because attention was assumed of telegraph operators. After only a few decades of use telegraph operators found that Morse code could be represented by sound as well as print. By the 1860s many seasoned telegraphers chose to listen to Morse code instead of reading its print out. “Very quickly,” describes media historian Jonathan Sterne, “telegraph operators learned that they could discern messages more clearly and with greater speed by listening to the machine than by reading its output.”  

Listening enhanced not only speed, but comprehension. Sound telegraphy, as it was called, transformed a written language into an oral one. Listening replaced reading. The sound of dots and dashes became, through practice, analogous to speech.

The practice of sound telegraphy introduced a number of changes to the communications profession. Fundamentally, it assumed that operators would be listening in. Using only one’s hearing faculties, telegraph operators stayed attentively close to the device, waiting for messages to come in over the line when

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194 Sterne, The Audible Past, 147.
they were on duty. With no signal to check that the receiving end was ready, the sound of the Morse code message was its own alert. When the telegraph “speaks” it assumes the operator on the other end is ready to receive the message.

**A Titanic Telegraph With No Alert**

Wired telegraphy practices continued into wireless telegraphy, but its use at sea stretched the attention of operators. What happened to the Titanic in 1912 was not simply a tragic tale of large-scale modern transportation. The event encouraged the public to take stock of the failings and affordances of wireless communications, especially during times of emergency. A U.S. Senate Committee investigation used the tragic event as a poignant and emotional appeal for wireless reformation, inspiring the Radio Act of 1912. How could the wireless operators on nearby ships not hear the Titanic’s distress calls? Why didn’t the Titanic’s own wireless operators heed the four forewarnings of icebergs in their path? What can be done in the future to prevent miscommunication and—more importantly—missed communication?

Although most accounts of these regulations center on the ways in which the 1912 Act discouraged “interference by amateurs,” I am interested in what these suggested regulations assume to be inherent problems of communication. For instance, during the Senate Committee hearings that commenced in New York the day after the Titanic’s passengers reached land, the ships’ wireless telegraph operators became key witnesses regarding what went wrong in the middle of the Atlantic that night. Michigan Senator William Alden Smith, who chaired the hearings at the Waldorf-Astoria Hotel, was particularly interested in the hours observed by seafaring wireless operators. He asked Harold Cottam, the
wireless operator for the Carpathia, about his working hours:

Senator Smith: You were on the boat last Sunday [the day the Titanic hit the iceberg]?  
Mr. Cottam: Yes, sir.

Senator Smith: What were your hours of employment?  
Mr. Cottam: There are no stated hours. There is only one man on the boat.

Senator Smith: I understand; but what periods during the day and night are you expected to be at your instrument?  
Mr. Cottam: It all depends on where you are. If you were in the vicinity of New York or thereabouts you would be expected to be on duty all the time.

Senator Smith: Night and day?  
Mr. Cottam: Yes, sir.\textsuperscript{195}

It was the custom of many ships to employ only one wireless operator, who was usually young and received average to below average wages.\textsuperscript{196} Transatlantic ships like the Titanic sometimes employed two operators, but this rule was not strict. Operators were generally expected to stay on duty during daylight hours, the time during which most messages, including commercial messages, were sent from ship to ship and ship to shore.


\textsuperscript{196} Cottam was paid four pounds ten shillings each month. “‘Titanic’ Disaster Hearing Before a Subcommittee of the Committee on Commerce United States Senate,” 62nd Congress, 2nd Session, Part I (Washington, D.C., Government Printing Office, 1912), 97.
It became evident throughout the investigation that there were few protocols regarding what action should be taken during times of emergency. Senator Smith pressed this issue, inquiring into the communicative actions taken during distress calls aboard ships. He first asked if there were any allotted dead air times, during which all operators at sea could listen for distress messages:

Senator Smith: Have you any rules which require you to use your instrument or put it in position to be used for distress calls every hour of the day or any hour of the day?

Mr. Cottam: There is nothing in the Marconi system that would detect the signals if the operator is not present.\(^{197}\)

The dead air would separate the distress calls from the other messages competing for operator attention. Therefore a message coming over the air would by default be considered important by those listening. Moreover, the attention of all operators would be expected and devoted to possible distress signals.

The *Titanic* did not perish, however, because its distress calls went unnoticed amidst the clutter of communication competition. Rather, the *Titanic* failed to grab the attention of operators who were away from their wireless transmitter. Like a mobile phone that is turned off or left at home, the *Titanic*’s trouble was that few other ships were listening when its calls went out. Although the wireless device aboard the *Californian* was operational, its operator was away from the network, and there was no way to notify him of a message. As Cottam explained in the Senate hearings, the operator’s ears are solely responsible for

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picking up incoming messages as they come in, with no prior alert or notification:

   Senator Smith: That is, no warning or alarm?
   Mr. Cottam: No, sir.
   Senator Smith: Is that true of the more modern equipment?
   Mr. Cottam: Yes, sir.
   Senator Smith: They have an alarm?
   Mr. Cottam: No, sir.
   Senator Smith: They have none?
   Mr. Cottam: No, sir. ¹⁹⁸

In other words, wireless telegraphy, like its wired predecessor, assumes potential receivers are listening in. Without a “warning or alarm,” it is impossible to call operator attention to an incoming message when, for example, their earphones are off, they go to the bathroom, or they are asleep.

**A Telephone Without a Ring**

   It may seem surprising that the telephone did not always ring. “One aspect of the telephone that is often overlooked,” notes Michèle Martin, a telephone historian, “is the signalling [sic] system.”¹⁹⁹ We often forget the ring’s absence in the retelling of the first telephone call. In 1876, Alexander Graham Bell’s famous call in his Boston laboratory had no such system. Like the *Tonight Show* competition, a device to alert the recipient that a message was coming—or had

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¹⁹⁹ Michèle Martin, “Hello, Central?”, 19.
already come—was not important. According to Bell’s own lab notebook entry on March 10, 1876: “I then shouted into M [the mouthpiece] the following sentence: ‘Mr. Watson, come here -- I want to see you.’ To my delight he came and declared that he had heard and understood what I said.”

Most analyses stop here, however, allowing the telephone message to Thomas A. Watson, Bell’s assistant, to obscure how a telephone caller actually brought another person on the line. Bell’s description of the experiment makes no mention of a device that might call the attention of the recipient on the other end of the line. As he describes it, Watson’s ear was at attention, like a telegraph operator (or later broadcast audiences), ready to receive the message before it came: “Mr. Watson was stationed in one room with the receiving instrument. He pressed one ear closely against S [the speaker] and closed his other ear with his hand. The transmitting instrument was placed in another room and the doors of both rooms were closed.” Watson knew Bell’s message was coming because he was told to anticipate it.

Without signaling systems like bells or ringers, early telephone subscribers used other creative means of attracting the attention of telephone operators and telephone owners. One way was to shout loudly into the telephone diaphragm, hoping that the receiver would hear from the other end. Another technique was to “thump” the speaking mechanism, often with the butt of a lead pencil. This would

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201 Bell, “Notebook…”
produce a faint sound on the opposite end’s receiver, informing the user or operator to pick up the line. Watson, Bell’s assistant, thought this early technique was impractical for a few reasons. First, thumping required telephone users to create their own thumping force on the speaking transmitter. Some were more forceful than others and thumping often caused damage to the magneto speaking transmitter as well as the listening receiver on the other end. The second reason had to do with cost: “we might have to supply a pencil with every telephone and that would be expensive.” 202 After some tinkering, Watson came up with a device he called the “Watson Buzzer.” Speaking of his buzzer in 1913, Watson understands why other signal sounds became more popular: “[The buzzer] made a sound quite like the horse-radish grater automobile signal we are so familiar with now-a-days, and aroused just the same feeling of resentment that does.” 203 It was not until Watson applied the “magneto-electric call bell” to the telephone that a signaling technique became standard across all telephones, including today’s wireless telephones. 204

What is significant is that, from an inventor’s point of view, signaling mechanisms were required for a communications apparatus that would be used by a large network of dispersed non-professional individuals. Many years later, after he had time to survey the significance of his signaling mechanism, Watson


recounts the impetus for coming up with a device that would call a user’s attention to the telephone. “It began to dawn on us [Watson and Bell] that people engaged in getting their living in the ordinary walk of life couldn’t be expected to keep the telephone at their ear all the time waiting for a call, especially as it weighed about ten pounds, then, and was as big as a small packing case, so it devolved on me to get up some sort of a call signal.”

In effect, Watson expected the ring to encourage the integration of the telephone within everyday life. Not only would it be used by persons other than professionals, but people could be away from the device without fear that they might miss a call.

**Conclusion: False Alarms and Responsible Communication**

Every time he listens to the song “Calvary Cross” by Richard Thompson, Philadelphia music critic Mike Pelusi will check his mobile phone at the song’s six minutes and thirty-nine seconds mark, only to discover that his phone never rang. Allen Henderson runs AwfulCommercials.com, a blog in which he writes about low caliber commercials. One such commercial for Toyota features a man dragging a rusty car up a hill as if it were a cumbersome ball and chain. While Henderson thinks the commercial’s concept is dull, it’s not the images that bother him. Each time he watches the commercial, there is something about the audio mix on the soundtrack causes Henderson to check his phone. Pelusi and Henderson aren’t the only cases of what has come to be called “phantom

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“ringing”—an audio illusion which convinces people their phone is trying to contact them, when in reality, it is not.

In fact, a peer-reviewed study found a similar phenomenon even when sound was taken entirely out of the equation. A Massachusetts research team surveyed a number of doctors who reported having “phantom vibration syndrome,” a phenomenon related to false sensations of their phones vibrating in their pockets. The doctors described feeling their device vibrate, only to discover that it in fact never did. 68% of the doctors surveyed reported having the false vibrations, or what some called “vibranxiety.” Whether the device was in a doctor’s breast pocket or on their belt made little difference with regard to the prevalence of the phantom vibrations.207

What can explain these aural and physical hallucinations? Some technology critics claim that the phenomenon suggests an over reliance on mediated forms of communication. We are so saturated with computers and mobile devices, they say, that we imagine the sensations of technological interaction even when they aren’t there. They may be right. But it also has to do with the attention users normally give to their mobile networks. A false alarm is still an alarm. As a consequence, reports a recent Cisco study, users tend to “compulsively check their phones for updates.”208 If one is used to receiving


many messages, they question whether they may have missed the signal of an incoming message. As we learned with Dickens’ Signal-Man, this casual vigilance is a hallmark of network culture, even when alerts are not coming in.

Phantom vibrations or phantom rings demonstrate that mobile users pay as close attention to mediated communication signals as those of face-to-face. But unlike those face-to-face, mobile users who are called to attention have no sense of who a potential contact might be until they check their device. Contact, from anyone, is always possible. Most individuals with mobile devices, therefore, are encouraged to respond to stimuli that perform this phatic function.

Because alerts encourage a response, they compete for attention with other spheres of daily life. This became apparent in a recent class discussion my students had about “texting while walking.” Some were annoyed at passing their peers on the street whose heads only momentarily glance up from a screen. Others laughed. “So you are saying that I should set aside time just for texting?” responded one student. Many giggled in agreement at the remark’s sentiment, signaling the obviousness that conceals most norms of practice. On the one hand, those who are uncomfortable with the screen-focused pedestrians lament a changing civic attitude. On the other hand, those who find nothing wrong with the practice are part of that attitude change. This new attitude, my students say, is characterized by efficiency. They consider being screen-focused as a way to be a responsible member of a communications network. Keeping in touch—alerting one another—drives their relationships.

However, the students who complained about those “texting while walking” could not pinpoint why, in fact, the practice bothered them. They, like
traffic researchers, mentioned how physically dangerous it was to the user and those around them. With one’s head faced down in the screen, they said, it is difficult to navigate the sidewalk. But there are other consequences to texting while walking, or shifting attention between one’s digital network and the place through which one is travelling. Georg Simmel was early to point out the connections between street and mental life. For him the street was a place to see others, even if you didn’t know them. There you could compare yourself, learn how others talked, dressed and ate. Looking is a civic responsibility for Simmel.

These two responsibilities—to one’s social network and one’s civic life—have always been in competition. Today the ease of connection in the digital world is often used to overcome the limitations of the physical world. The increase in the phatic function in network culture is one way to temporarily remedy distance and separation. I have shown, from a historical perspective, the significant role alerts play in establishing connections for mediated message exchange. Although the phatic function may seem trivial, Erving Goffman reminds us that “The gestures which we sometimes call empty are perhaps in fact the fullest things of all.”209 If the digital tap on the shoulder explains how devices turn user attention to their networks, the next chapter explains why

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I’ve just opened my email and there’s nothing out of the ordinary there. It’s the usual daily flood of schedule, project, travel, information, and junk mail. Then I notice…I’m holding my breath.

As the email spills onto my screen, as my mind races with thoughts of what I’ll answer first, what can wait, who I should call, what should have been done two days ago; I’ve stopped the steady breathing I was doing only moments earlier in a morning meditation and now, I’m holding my breath.210

It has taken Linda Stone—a former executive at Apple, researcher for Microsoft’s Virtual World’s Group/Social Computing Group, and current advisor for the Pew Internet and American Life Project—over twenty years to conclude that the most significant impact of digital networked communications may have to do with the human respiratory system. When Stone first coined “email apnea” in 2008 the term bridged one staple of network communication and a requirement for living: email and breathing. Stone defines email apnea as “a temporary absence or suspension of breathing, or shallow breathing, while doing email.”211 Although life goes on without email, the term calls attention to the fact that most networked adults begin their day reading and responding to a number of messages.

Some were skeptical of Stone’s initial claim that the effects of digital

211 Linda Stone, “Just Breathe.”
correspondence were in fact physical. One incredulous reader wanted proof beyond the author’s experiences. “Would be nice if scientific research actually confirmed and measured the extent of the phenomenon. Your observation has yielded an interesting hypothesis, so why not continue along the path of the scientific method?” Although Stone didn’t have a scientific justification for her observation, the phenomenon drew the attention of some social science researchers. One study, “A Pace Not Dictated by Electrons: An Empirical Study of Work Without Email,” was inspired by Stone’s observations and those of Chuck Klosterman, a pop culture critic. The researchers had recently read a New York Times article by Klosterman who drew an analogy between the rise of both zombies and email in popular culture. The two are not unrelated, argues Klosterman: you can kill or delete them, but they keep coming back.

When email users logged on to America Online (AOL) in the 1990s they were greeted with an iconic “You’ve Got Mail” announcement; today email users assume as much. There is nothing new about correspondence, of course. Lovers, pen pals, bill collectors, and advertisers use the postal system to send messages. So why should it matter that networked individuals receive more electronic messages than ever before?

Recorded messages ramp up any network’s metabolism. There would be less network communication if it weren’t for recorded messages. Imagine a world without caller-ID logs, voice-mail, text messages, and social media posts—all

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212 Linda Stone, “Just Breathe.”

forms of message media that serve a memory function. Like the tree that falls in the forest, if your friend tries to call you and your message media aren’t there to connect, it’s as if your friend never called at all (for you, not your friend).

Just as the telephone did not always ring, it also did not always have a record function. This chapter details attempts to attach recorded messages to transmission media, specifically answering services and answering machines. This is a history of others answering calls intended for you. What is gained is the freedom to be away from the physically-bound phone. What is lost is the time spent reading and listening to messages, wondering if they need a response.

Like all recorded media, messages seem superhuman. Although he feared the growing popularity of writing, Socrates speaks to us today in Phaedrus because Plato wrote down Socrates’s otherwise fleeting words. The United States Congress created the Veterans History Project in 2000 so that “future generations may hear directly from veterans” about the reality of war through veterans’ audio and video-taped interviews. Recorded history projects such as these make an effort to keep alive the persons who tell the stories. Recorded messages make life immortal for their speakers. They save time.

But messages also take time, literally and figuratively, for those who receive them. An inevitable part of modern life is experiencing the world through others’ recorded time, whether it be reading a book, listening to music, watching a movie, scrolling through a social media feed, or checking your messages. Even

advertisers—who store their messages in all of these media—understand their industry as involving the implicit promise that advertisers will give consumers something (entertainment, information, or a blow-out deal) in exchange for their imposition on consumer time and attention.\textsuperscript{216} People loathe telemarketers and solicitors precisely because they don’t uphold their end of the bargain.

Popular criticisms of networked media are inextricably linked to their ability to consume time. danah boyd’s decade-long study of how teens use network media found that many of the teens’ parents complained about how much time the teens spend on their phones creating social media posts and responding to those of their friends. Yet parents admit to boyd that they use their phones because phones help save time with scheduling, responding to work emails, and keeping in touch with friends and family.\textsuperscript{217}

The story of how time got away doesn’t begin with cell phones. It’s a story that each generation tells itself in order to cope with how busy life seems. If we believe Kenneth Burke, these stories are part of our collective cleansing of guilt.\textsuperscript{218} The cell phone is the contemporary scapegoat. Like all scapegoats, cell phones are a blame magnet that indiscriminately attract criticism for wasting time in the twenty-first century. Because they are where most send and receive messages, cell phones have come to stand for all that is wrong (and praiseworthy) with communication.

\textsuperscript{216} Terry O’Reilly and Mike Tennant, \textit{The Age of Persuasion: How Marketing Ate Our Culture} (Berkeley, CA: Counterpoint, 2009), 29.


However, I would argue that what we mean when we say the word “cell phone” is the result of a number of 20th century media technologies, communication practices, and the debates that gave the device meaning. It didn’t always seem natural to be in two places at once. Since the rise of cyberspace, virtual space has received lots of attention from those concerned with online identity, online communities, and online hate speech, among others. However, much less attention is paid to virtual space’s analog—virtual time. Space, distance, and international borders, we hear, all but vanish in the information age. Yet, for all of our complaints about not having enough time, less has been made of network communication’s ability to manipulate the hours of the day. Of course, there have been many great accounts of the time-shifting abilities of writing, sound recording, and motion pictures. But there have not been many related to those recorded media sent and received between persons—asynchronous media messages that take time to write and read yet require no time for delivery. Unlike speech, much network communication is a continual back-and-forth sharing process, where each side writes alone and reads alone, yet feel connected somewhere in the middle. If the second step of the paging process (alerting an individual of an incoming message) removed time from delivery, this chapter argues that the third step (recording a message) adds time after delivery.

The Medium is the Messenger

It is tempting to compare twenty-first century social and networked media to the dominant broadcasting media of the twentieth century. But today’s networked media are more personal than those of the broadcasting era. Because of this, it would be more useful to view some network media as a form of correspondence. In his well-known essay, “Technology and Ideology: The Case of the Telegraph,” James Carey makes claim after claim about the firsts of the telegraph related to the stock market, journalism, and the creation of time zones. But perhaps the most reverberant first, claims Carey, was the literal and metaphorical separation of communication from transportation.221 Well before broadcasting technology, the telegraph was the first to encode a physical message to be sent at the speed of electricity, from person to person.

In his generalization of the telegraphic process, however, Carey overlooks one essential step: delivery. Encoding the message by one operator and decoding the message by the receiving operator is only part of the relatively longer process of sending a message. As discussed in the previous chapter, delivering a message was the final mile in this network, where messengers carried messages. Even though communication was separated from transportation during transmission, this was not the case for delivery. Telegraph messenger boys were like today’s networked devices—they brought messages from the service provider’s hub into the hands of the network’s users. The impact of the telegraph is only partly in its ability to connect distant locales instantly. The other part is in establishing a ritual

mixture of an older tradition of correspondence messages (e.g., the postal system) with a newer tradition of instantaneous connection. If sending a telegraph separated communication from transportation, delivering a telegraph brought transportation back into the equation.

Sending a message is fast. Delivering a message is slow. This is important for understanding paging systems and mobile communication in general because delivery is what mobile communication devices seek to improve. In his excellent history of *Telegraph Messenger Boys*, Gregory J. Downey makes the crucial point that “messenger work was fundamentally distinct from operator work in both space and time.” In terms of space, messengers did not occupy the electrical telegraph offices in which you might see operators, engineers, managers, and clerks. Like pizza delivery boys (and girls) today, they don’t make the product, but they deliver it with urgency. Therefore, in addition to creating large electrical networks throughout the city and country, telegraph companies also had to think about their physical transportation networks through which telegraph messengers would deliver messages.

Because delivery takes time, telegraph messengers were the most complained-about employee in the telegraph line-up. While the speed of sending a message from one part of the country to another seemed like magic to many, the comparatively slow delivery process was a source of derision. In the late nineteenth century, editorial cartoons often depicted messenger boys as apathetic, easily distracted, or both (not unlike depictions of today’s millennials). As

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Downey claims, “newspaper editors and fellow operators alike struggled with the paradox of a ‘lightning-fast’ information system that nevertheless seemed to rest on the speed of a lazy schoolboy.”

Across almost all telegraph services, messengers were young men (usually in their teens) and not adult men or women for a number of reasons. First and most practically, young men demanded less pay than adults. Indeed, this makes economic sense, but it also points to an assumption about where skilled labor was rewarded in the telegraph network. Unlike medieval pages, truck drivers, pizza delivery drivers, mailpersons, and other delivery jobs are certainly essential, but they rarely receive the high wages or esteem of others in their industries. Telegraph operators were the stars of the message industry. Unlike carrying a prepared telegraph to its recipient, telegraph operators were seen as skilled craftsmen of electronic language, especially when the industry took up listening to telegraphs instead of reading them from printed telegraph tape. Just as a skilled doctor would listen to the heartbeat, murmurs, and breathing of a patient for diagnosis, a skilled telegrapher listened to the taps of a telegraph to decipher messages more efficiently. “The telegrapher’s auditory skill drove the acceleration of telegraphic communication,” writes media historian Jonathan Sterne, “and hearing became a hallmark of its efficiency.” Compared to the speed of sound, it’s no wonder young messengers were seen as slow. “The skill involved in telegraphy,” claims Sterne, “was part of the mystique of the

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223 Downey, Telegraph Messenger Boys, 4.

profession. Being able to listen to the machine and decipher the code was an acquired skill.”

The second reason young males comprised the majority of telegraph messengers is that they were at the same time “instantly recognizable, but also unobtrusively invisible.” Some take McLuhan’s “the medium is the message” to mean that the content of a message is less important than the channel through which it is sent. The medium deserves more attention than it tends to receive. McLuhan’s later pun on the aphorism, “the medium is the massage,” might be more instructive in this interpretation. The medium goes unnoticed because it pretends as if it isn’t there. How many times will we hear about the “real,” “lifelike,” or “natural” claims related to the new HD, Super-HD, or 4k televisions? Telegraph messenger boys all but made themselves disappear from the history of sending telegraphs. But they remind us that most technologies express themselves in repeatable human labor well before they become an object.

Missed Communication: Answering Services Become Network Messengers

Just as the word “computer” comes from a human who calculates long math equations, the devices for mobile messaging have their human counterparts. Before answering machines, answering services acted like call centers for subscribers who didn’t want to miss a call. If you were going to be away from home or office, you could have your calls forwarded to an answering service

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where the caller could leave a message for you. Answering services performed the function of office secretaries for those who did not have office secretaries.

One reason for the initial growth of answering services, according to former answering service owner and operator Clayton Niles, was the across-the-board economic belt tightening of organizations during The Great Depression. Niles’s autobiography claims that “The Great Depression had precipitated a need to reduce costs, and many businesses opted for telephone answering service in lieu of an office and secretary.” The answering service would not just replace the cost of someone to answer the phone, but the office in which someone would answer a phone. Subscribers to answering services could either have their phone numbers routed to the answering services when they left their homes or offices, or they could give the number of the answering service to their clients. Although Niles assumed answering services would get most of their clients from traditional office laborers, this did not happen in practice. Typical clients included those who would travel or who were in the industries of urgency: traveling businessmen, construction managers, service companies, farmers, and others who spent much of their work day at different locations—those away from a space-bound phone address or number. Answering services gave their subscribers the feeling of mobility since they did not have to worry about missing a call. Subscribers could check their messages in any place that had a telephone.

For office dwellers a secretary acts like a communication gatekeeper. There are times when a recipient does not want to take a call. Other times the

recipient may take calls from only specific people, such as a child or spouse. For space-laborers like traveling salesmen, a telephone answering service was more indiscriminate: all messages are recorded when they come in, and the subscriber is responsible for editing out the insignificant messages. Because answering service clients shared an answering service, the operators were less personal than a secretary who is responsible for answering calls directed toward a single person or office.

One rarely discussed answering service demographic is prostitutes. As depicted in the 1960 film *Butterfield 8*, higher-paid call girls used answering services not only to keep clients at bay from their personal telephone numbers, but to evade police detection and travel more efficiently throughout the city to each appointment. Elizabeth Taylor won an academy award for her leading role as Gloria Wandrous, a Manhattan call girl who falls for one of her clients, a wealthy business executive who is married. One of the movie posters for the film advertises the story this way: “The most desirable woman in town and the easiest to find…just call BUtterfield 8.” On the hand-drawn poster Elizabeth Taylor stands against a white background, wrapped only in a bed sheet, with a red telephone in the center of the frame.

Although Gloria does not use a mobile device in any part of the film, Taylor is the “easiest to find” because of her answering service, which can be contacted by dialing 288 on the telephone (the capitalized BU in the film’s BUtterfield title corresponds to the numbers 2 and 8 on a telephone). The plot is

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largely driven by the recorded messages Gloria discovers each time she phones the answering service. Each phone call is a roll-of-the-dice that can take Gloria downtown, mid-town, the upper-east side, or nowhere—it all depends on the message.

Figure 12 — BUtterfield 8 movie poster.

This call girl experience is supported by Harold Greenwald’s controversial 1958 study, The Call Girl: A Social and Psychoanalytic Study, where he interviewed many high-priced call girls of the 1950s. Greenwald almost didn’t get the project off the ground when a few of his advisor’s in the Columbia University

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psychology program did not think the subject matter was fitting for a dissertation project. Much to their surprise, Greenwald’s dissertation became a best-selling book (with a changed title, *The Elegant Prostitute*), selling almost a million copies, and was later turned in to a movie, *Girl of the Night.*

Even in a psychological study of the mid-century call girl, the telephone answering service is a key factor, especially when it comes to organizing the time in a prostitute’s day. “First and foremost in the life of the call girl is the telephone,” asserts Greenwald. “[W]ithout it she could not practice her special form of prostitution.” That special form, of course, is sex-solicitation through the telephone as opposed to the street corner. “Call girls make almost all of their appointments by phone.”

Many call girls chose to subscribe to answering services so that they would not be tied directly to illegal acts of prostitution if they gave out their personal phone number. “This is a number which the girl gives to her clients,” writes Greenwald. Like Gloria from *Butterfield 8*, the direction of a call girl’s day is driven by her messages: “[S]he herself is never at the number but calls it several times a day and then phones the various callers who have left messages.” In this way the call girl is summoned by not only actual messages, but the mere potential of a message.

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Conversation analyst Emanuel Schegloff uses the term “summons” as a way to describe the task-oriented nature of conversational openings on the telephone. A summons describes the way in which a caller brings a receiver to the phone. Much of Schegloff’s research wanted to know what work was being done at the beginnings of conversations, and whether or not those beginnings had interactional effects on the rest of the conversation. Summons describes the way in which an intended target for conversation is initiated into that conversation.

In Telephone Conversation, one of the most prominent books on telephone discourse, Robert Hopper (a disciple of Schegloff) goes so far as to argue that the summoner has power over those who are summoned by merely taking the first turn in the conversational sequence. In his chapter on “turns,” Hopper asks simply, how do telephone speakers know when it is their turn to talk? Of course, there are pauses or gaps of silence between the two persons on the line, or the signal “go ahead” to give the floor to the other when both begin speaking. But Hopper argues that the turn-taking begins before anyone has spoken.

As in tic-tac-toe, Hopper claims the first turn does matter. Hopper argues that a phone summons initiates at least three turns of communication, which tends to favor the summoner: “The summons should be answered by a brief item like ‘Hello’ that returns the floor turn to the summoner. By implicating a three-turn sequence, summons objects propel participants into a speech situation. And since the summoner gets the third turn, s/he is in the best position to suggest the

encounter’s directions. That is, the summoner has a leg up in determining the topic of conversation. This makes sense since the caller typically has a reason for picking up the phone, and that reason is delivered after a greeting from the person who is summoned.

If there are turns for telephone conversation, there must also be turns for correspondence media such as answering services used by call girls and others in industries of urgency. Instead of the three-turn sequence of telephone conversation, correspondence media usually have two turns. The first is a summons, request, and/or question, and the second is a response and/or answer to the first. For call girls, locksmiths, doctors, and others using answering services, the first turn was often an implied request: call back the person who called. Of course, we know that correspondence media would later evolve to allow for more bandwidth in the first turn, such as answering machines, email, and text messaging. The first of these telephone additions, the answering machine, would take decades to develop into a household appliance. This was not because the technology wasn’t there, but because of the fear of legal action against anyone wanting to attach a recording device to the telephone network.

The Carterfone and the Problem of Interconnection

For much of the early to mid-twentieth-century, large-scale innovations in telephone media were stifled by AT&T, the nation’s largest network. Throughout the history of telephony, there have been a number of attempts from small-scale tinkerers to add-on various devices to adapt the way some used the telephone.

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Some early pager devices became part of answering services while others received recorded messages directly to the device. No matter the application, pagers embodied the rise of a new type of communication economy that stressed urgency. What is significant about these innovations in telephone-related communication is that they would not come from within AT&T. Many of the groundbreaking attachments to the telephone were developed by radio and telephone hobbyists. Today we might call them network hackers.

One important tinkerer was Thomas Carter, a Texas rancher in the 1950s, a time when oil fields were popping up in all corners of the expansive state. Oil field managers carried large battery-powered two-way radios with them in the fields so they could reach managers and engineers in other fields. Many times, however, managers needed to contact their offices, contractors, or homes—places that had a telephone but were too far for the two-way radio signals to travel. As a rancher who worked in remote pasture, Carter was familiar with this dilemma. His attempt to address this communications gap was not unlike many past innovations: combine the functions of existing technologies to address the gap. Carter utilized the wireless capabilities of two-way radio with the telephone’s distant network affordances, thereby expanding the two-way radio’s network to include telephone sets. In doing so, Carter would go from a rancher to a businessman to a legal pioneer.

Carter sold his first and only device, the Carterfone, beginning in 1955. His customers were large petroleum companies like Standard and Shell Oil, as well as radio and television stations, such as the Austin, TX stations owned by
Lyndon B. Johnson and his wife, Claudia Alta Taylor Johnson.\(^{236}\) The Carterfone was essentially a two-way radio that looked like the cradle of a telephone. On one end of the Carterfone was a transmitter (for speaking) and on the other end was a receiver (for listening). The transmitting end of the telephone was placed over the receiving end of the Carterfone and vice versa. The device benefitted from use in rural areas, where telephone lines were sparse. Those working in the fields used a two-way radio to call a Carterfone (also a two-way radio) located in a central office. The operator in the central office would be instructed to use the telephone network to connect the two-way radio caller with the phone number of the person to whom they wished to talk. Once connected, the operator placed the telephone on the Carterfone’s cradle. Because it is a two-way radio, the Carterfone could either transmit or receive but not transmit and receive—as the telephone could—at the same time. Therefore, the Carterfone employed a voice-operated switch that transmitted the caller’s voice over the radio when the caller was talking, and the Carterfone’s switch returned to receiving mode when the caller was listening. The operator monitored the sending and receiving volume through an external speaker.

What Thomas Carter did not know was that his small company was being monitored by AT&T, Southwestern Bell Telephone Co., and General Telephone Co. of the Southwest, the largest telephone operators in the US. The big telephone companies did not like the fact that the Carterfone, a private device, utilized their telephone networks. It wasn’t as if Carterfones were cutting into

AT&T’s subscriptions. That was not the problem. After all, the Carterfone is not operable without the telephone network. If anything, the device increased the use of the telephone system. Moreover, a mere 3,500 Carterfones were sold between 1959 and 1966. This was a paltry sum compared to the millions of telephone subscribers who were required to rent telephones and any other equipment from the major phone companies. The real gripe for the phone companies was control over which devices could be used with their network. AT&T in particular had an infamous record of bullying customers who used their telephone service in “improper” ways, especially when those users connected devices not approved by AT&T. Not surprisingly, AT&T threatened to discontinue phone service to users of the Carterfone, an unsanctioned device. The ball was in Carter’s court.


Whether Carter knew it or not, many local third-party messaging service companies were closely observing the developments of the case. In the 1950s there were a number of local answering service companies who wanted to provide mobile radio services to their customers, but they were barred by AT&T for interconnecting the phone line to the two-way radio system. “In these early years,” recounts one of these early paging system’s pioneers, “the mobile telephone service was, in part, a message relay service.”\footnote{Clayton Niles, “A Radio Common Carrier Journey,” \textit{Wireless Week}, June 4, 2001, 59.} That is, although two-

\footnote{The Carterfone, originally produced in 1959. The device connected a telephone, which was cradled by the device on the left, to a two-way radio service. Photo by Mark Richards, “Original Carterfone,” \textit{Computer History Museum}, \url{http://www.computerhistory.org/revolution/networking/19/371/2148}.}
way radio units could communicate directly (such as in police cars or on oil field sites), “it was necessary for an operator to relay messages back and forth between the mobile unit and a telephone subscriber.” As with telegraph messenger boys, transmitting messages was fast, but delivering them to their recipients was slow. Because network providers like AT&T were not interested in becoming a radio company, these early mobile messaging services were often family run operations. “In many cases, homes were mortgaged, services were dispatched from homes and wives and children served as operators.” The biggest impediment to expanding their services was the issue of interconnecting the mobile radio operation with AT&T’s telephone system. So when Carter went to court with AT&T many of these underdog providers thought he was representing their interests as well.

In 1960 Carter’s relatively small Dallas, TX manufacturer decided to take on AT&T, Southwestern Bell, and General Telephone. Although most were fearful of AT&T’s nearly monopolistic strength, Carter was strategic in his approach. Before filing a private anti-trust suit against AT&T and General Telephone Co. of the Southwest, Carter first sought information from the Federal Communications Commission (FCC) to know what the Carterfone’s legal parameters were. The FCC informed Carter that, although his device did not seem to impair the public telephone network, it did violate a tariff already in place. FCC Tariff No. 132, filed by AT&T in 1913, stated that: “No equipment, apparatus,


circuit or device not furnished by the telephone company shall be attached to or connected with the facilities furnished by the telephone company, whether physically, by induction or otherwise, except as provided in this tariff.”243

Because the telephone was considered a public service in the eyes of the FCC, and AT&T was that service’s steward, the FCC asked AT&T to write the section related to “except a provided in this tariff,” effectively regulating the use of the telephone system as outside attachments became available.244 Tariff 132 was the resulting scary provision that typically served to keep phone accessory manufacturers and their customers from tampering with telephone company property. AT&T had plenty of legal practice regarding telephone attachments prior to the Carterphone case. One of AT&T’s most significant cases as it relates to Carterfone was the Hush-a-Phone case in the 1950s.

The Hush-a-Phone was an acoustical device that mimicked the cupping of one’s hands over the end of the telephone. First developed in the late-1920s, it was described as “a voice silencer designed for confidential conversation on a telephone” (what a metaphor for the coming era of text-based communication).245 Attached to the end of a telephone’s transmitter, the Hush-a-Phone not only provided privacy for the speaker, but cut down on the extraneous sounds that came with talking on the phone in populated spaces. However, in 1948 AT&T caught wind of the Hush-a-Phone and informed the device’s distributors and

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243 FCC Tariff No. 132.


customers—as they would later do with the Carterfone—that they were in violation of tariff 132, which forbids the attachment of any equipment not provided by the telephone company. AT&T argued that the phone attachment distorted speech when used, and therefore impacted the quality of phone service for those on the receiving end. By the time of the case, more than 125,000 Hush-a-Phone devices were in use. A Hush-a-Phone user could potentially call anyone on the phone network, claimed AT&T, and the receiver of that phone call would have a poor listening experience. Hush-a-Phone disagreed, and soon filed a complaint with the FCC, arguing against tariff 132. Hush-a-Phone’s position was that, yes, the device was indeed a private telephone attachment, but it did nothing to harm the service of other telephone users. The court battle lasted for seven years, and eventually the FCC ruled against Hush-a-Phone in 1955.

Figure 14 — Advertisement for the Hush-A-Phone.246

But Hush-a-Phone did not keep quiet, appealing the decision to the US court of appeals, where it won in 1956. The reasoning behind the decision was significant for the Carterfone’s case years later. The appeals court found that tariff

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132 unreasonably restricted the ways in which telephone subscribers could use their telephones. Judge David Bazelon’s lead opinion ruled that the tariff was “unwarranted interference with the telephone subscriber’s right to reasonably use his telephone in ways which are privately beneficial without being publicly detrimental.”247 In other words, if the ways in which phone subscribers used their phones did not affect the quality of service to other subscribers on the network, even if subscribers used their own devices, those uses should not be restricted by the FCC or telephone companies. AT&T took the ruling in stride by simply adding the Hush-a-Phone to its list of approved devices under tariff 132.

Some argue that the court’s decision went far beyond a mere plastic cupping device attached to the end of a telephone. Gerald Brock, a telecommunications historian, emphasizes that the Hush-a-Phone decision “set an important precedent on the limitations of the telephone companies to restrict private use of the telephone.”248 Although the case did set a precedent, AT&T still had authority over the list of devices covered under tariff 132. New devices not approved for use with the telephone (what AT&T called “foreign attachments”), like the Carterfone, had to deal with the long and expensive process of court proceedings to justify their use. This produced a chilling effect as many manufacturers stayed out of the game for fear of illegality.

John Carter might have been cool, but he was far from chilled by AT&T. Maybe it was stubborn Texas pride or the small business owner’s keen


understanding of telecommunications policy, because he stuck it out against AT&T’s threats for six years until finally filing an antitrust suit against AT&T’s network of telephone companies in 1965. In those six years Carter carefully built his defense. He had tried for years to make his device legal, asking AT&T to put the Carterfone on its list of approved devices under tariff 132. AT&T consistently denied the request. After one year in district court Carter was told that the FCC would have jurisdiction over deciding whether or not the Carterfone was just and reasonable. The FCC took the Carterfone case in 1966 and two years later vindicated Carter and his Carterfone telephone attachment.

Kevin Wilson, a telecommunications policy researcher, claims that the wave of private antitrust actions taken against AT&T after the Carterfone decision did little to disrupt the telephone giant’s monopoly. However, even though the Carterfone case did not start a legal snowball effect, it can be seen as a small victory that signaled to others who provided adjunct telephone technologies that AT&T’s draconian interconnection laws were mortal. Although cases against AT&T prevailed, the Carterfone case did encourage confidence in private equipment manufacturers to file against AT&T’s monopoly control of telephone equipment. The cases that did come out on top were usually backed by FCC ruling.

The FCC’s opinion held powerful sway over cases brought against AT&T. The Carterfone decision was unique because, although it began as an antitrust case in the legal courts, it was ultimately resolved by the FCC. “The Carterfone was the first chink in AT&T’s monopolistic armor,” claims telephone historian Phil Lapsley.\(^{252}\) For at least five years after the Carterfone decision AT&T continued to defend—and win—antitrust suits over its requirement that no other equipment than those approved under its tariffs may be attached to the telephone network. It was not until 1974, when the government began its own antitrust suit against AT&T, that the idea of competition within telecommunications would overshadow AT&T’s government-sanctioned monopoly.\(^{253}\)

For me and others interested in the cultural history of mobile communications, it seems that the political, economic, and policy implications of the Carterfone case have overshadowed the cultural significance of the device. To put it another way, we know the legal importance of the Carterfone decision, but we don’t know why the Carterfone was produced in the first place. Why, in the words of the FCC examiner on the Carterfone decision, was there a “need and demand for a device to connect the telephone landline system with mobile radio systems?”\(^{254}\) Or better yet, in what ways was that need expressed?

\(^{252}\) Phil Lapsley, *Exploding the Phone: The Untold Story of the Teenagers and Outlaws Who Hacked Ma Bell* (New York: Grove Press, 2013), 299.


\(^{254}\) Carter v. AT&T, 13 F.C.C.2d 420 (1968); 13 Rad. Reg. 2d (P & F) 597.
To Answer for You; or, “How do you say I love you to an answering machine?”

Messaging systems are a form of mobile communication that enable us to be absent and present at the same time. Although the development of cellular technology in the 1970s and 80s tends to take precedence in the historical literature, there were many messaging systems before and after cellular technology that expressed a desire to keep in touch even when away from the telephone. As the Carterfone case shows, it was certainly possible to combine the capabilities of the radio and the telephone to connect anywhere. But until the expansion of cellular networks and low-cost devices came available in the early 2000s, most telephone users relied on recorded messages to stay in contact and prevent missed connections.

Although devices for recording the sound of a telephone had been around since the 1930s, the use of privately-owned answering machines did not surpass the use of answering services until the 1970s for many reasons. As the Carterfone case showed, AT&T was very protective about any device connecting directly to its line. To get around this, some machines involved a Rube Goldberg-level of complexity that physically picked up the phone to bring the receiver near the recording apparatus. But after the Carterfone case in the mid-1960s, manufacturers and consumers of answering machines were less timid about attaching answering machines to their telephones, even if it was illegal. In the early 1970s, consumers who bought answering machines were supposed to contact the phone company to obtain a coupler that would connect the answering machine to the phone line for charge of $2-8 per month. But most answering machines were ready to connect directly to the phone line, even without the use of
the coupler.\textsuperscript{255} AT&T simply could not enforce the hundreds of thousands of answering machines sold during this time. Another more practical reason that answering machines gained popularity was cost. The monthly lease of an answering machine was less than half the cost of an answering service.

In the early 1980s the public concern with answering machines was not the cost but what to say. What do you say to callers when you’re not there? On the other end, what do callers say when prompted to leave a message? Answering machines aimed at business owners came with specific instructions that valued clear identification of the owner of the machine as well as the caller. The Code-a-Phone answering machine instructed users to tell callers that they were listening to a recording. Indeed, all manufacturers were legally required to have a beep before they began recording a caller’s message so that caller’s knew exactly when they were being recorded.\textsuperscript{256}

Once answering machines moved into homes in the 1980s, the content of answering machine greetings was more varied. Many owners began their greeting with an apology to the caller for connecting to their machine, as if to acknowledge the burden of listening to a recording and then talking to the device.\textsuperscript{257} Some saw the new recording medium as an opportunity to produce content that could be sold to answering machine owners. Comedians in Los Angeles produced cassette recordings intended for answering machines called \textit{No Hang-Ups}. The cassettes


\textsuperscript{256} David Morton, \textit{Off the Record}, 130.

included sound effects, impersonations, and lewd messages designed to entertain callers when listening to outgoing messages.\textsuperscript{258} Relatedly, comedian Jonathan Winters used the answering machine as a space to record jokes on his friends’ machines. One of Winters’ friends, Jim B. Smith, thought so highly of Winters’ messages that he transcribed hundreds of those messages into a 1989 book, \textit{After The Beep}.\textsuperscript{259} Because privacy was a concern for many answering machine owners, many were reticent of signaling to callers that they weren’t home for fear of criminals.\textsuperscript{260} This is not unlike the privacy concerns of today’s social media users who fear sharing with their social networks the fact that they are traveling or on vacation.\textsuperscript{261}

However, by the early 1990s the answering machine would achieve the status of an “irresistible intruder,” as Marshall McLuhan had earlier claimed of the telephone.\textsuperscript{262} The privacy fears gave way to the privacy benefits of having a machine screen one’s calls. Before caller-ID, the answering machine served a gatekeeper function, allowing owners to pick up for desirable callers and let the others continue to leave their message. In this way, answering machines offered choice and hierarchy to those receiving messages. “It replaces (literally re-places)

\begin{itemize}
\item \textsuperscript{259} Jonathan Winters, \textit{After The Beep}, collected by Jim B. Smith (New York: Perigee Books, 1989).
\item \textsuperscript{260} David Morton, \textit{Off the Record}, 132.
\end{itemize}
former face-to-face conversation with a simulation of talk,” observe Aviad Raz and Rina Shapira, “where neither the semiotic maxims of proximity and synchronization—nor their derived interactional concepts of intimacy, visibility, and presence—any longer hold. However, this simulation of talk is also predesigned to reproduce an almost exact reflection of the ‘original,’ namely, face-to-face conversation.”

A phone call brings two places together at the same time. As John Durham Peters reminds us in one of his make-the-familiar-strange moves, telephone talk is essentially “Two one-sided conversations that couple only in virtual space.”

A recorded message, however, brings two times together (when the message was written and when it is read) at the same place (the machine). If you miss a call, a message is the substitute, standing in for the sender when the receiver is ready.

Theoretically, answering machines messages could have recorded any type of audio content, but the actual content of callers became fairly formulaic. According to Alvarez-Caccamo and Knoblauch’s analysis of answering machine messages in the early 1990s, that formula included (1) an opening/greeting, (2) an excuse/justification/request for calling, (3) a thank you, and (4) a closing/goodbye.

Both the (2) request and (4) closing propel a single message


toward an asynchronous conversation consisting of further messages. At a time when most recordings were intended for broadcast audiences, it must have been weird to play “phone-tag” and speak to one another through a machine. As one sound recording historian concludes, “Telephone messages are the only type of sound recording that the majority of Americans seem willing to make of their own voices.” After all, the recording process was fully automated and, like the telephone, did not involve any technical proficiency on the part of the caller (if you have ever set up an outgoing message on an answering machine or voicemailbox, you know this is not true for the owner of the machine).

But the more significant impact of the answering machine was in reorienting the patterns of conversation established by the telephone. Before the telephone, correspondence was limited to the delivery schedule of mail persons or telegraph delivery boys. The telephone made correspondence immediate and instantaneous. Curiously, the answering machine seemed to revert back to a less instant yet more “in touch” form of communication. By capturing the otherwise unknown attempts to connect with others, the answering machine “actually enhanced the immediacy of the medium for the majority of telephone users, since most could only wait by their telephones part of the time.” In doing so, the answering machine would make waiting for messages a key part of network communication for the twenty-first century.

266 David Morton, *Off the Record*, 135.
Conclusion

Technology futurists expected communication to change radically in the new millennium. Just as the telephone had reinvented the nature of talk, new affordances of digital technology would bring as many if not more changes. “The telephone,” writes Frank Hellemans in 1998, “was at its conception a telegraph that could be handled directly: by command of the human voice. And indeed, the resemblance between telephone as a speaking telegraph and internet already reveals the future evolution of computer-mediated communication: touchscreen-commands and spoken messages will soon replace the digitally decoded texts.”

In some ways futurists like Hellemans were right. Touch screens have come into popularity, replacing keyboard keys and mouse navigation on some devices. But spoken messages have not replaced digital code or text-based forms of communication. In fact, the opposite has happened.

In the early 2000s, when millions of Americans began subscribing to mobile phone services, the ubiquity of phones made the spoken voice the most popular way to communicate with others. Yet by the end of that decade, in 2009, the US Census reported that asynchronous text-based forms of communication (e.g., SMS texting, email, social media messaging) had exceeded voice-based communication (e.g., telephone calls, voice mail). This enduring shift is significant for a number of reasons. First, the mobile phone gave persons a device

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with which they could speak to others directly and at any time. It was as if
Herbert Hoover’s hopeless radio scenario from the 1920s had come true: “The use
of the radio telephone for communication between single individuals, as in the
case of the ordinary telephone, is a perfectly hopeless notion. Obviously, if ten
million subscribers are crying through the air for their mates they will never make
a junction…”\(^{270}\) By the early 2000s digital cellular technology made those
junctions possible. Second, as the network grew, as more and more individuals
signed on with their own telephone numbers, usernames, social media handles,
and other network addresses, fewer and fewer junctions were live voice
communication. Indeed, even voicemail, the answering machine’s successor, was
obsolete. Popular tech websites featured articles that derided the practice, such as
“For a Quick Response, Text Message Instead of Voice Mail,”\(^{271}\) “Voicemail
Etiquette: When Not To Leave The Dreaded VM,”\(^{272}\) and “Is There a Single Good
Reason to Leave Voicemail?”\(^{273}\) People weren’t annoyed that others were leaving
messages; they were annoyed that it took too much time to listen to voicemail

\(^{270}\) Quoted in Schwarzlose, “Technology and the Individual: The Impact of
Innovation on Communication,” in *Mass Media Between the Wars: Perceptions
of Cultural Tension, 1918-1941*, edited by C. Covert & J.D. Stevens, 87-106
(Syracuse, NY: Syracuse University Press, 1984), 100.

\(^{271}\) Elaine Chow, “For a Quick Response, Text Message Instead of Voice Mail,”
*Gizmodo*, October 24, 2008, [https://gizmodo.com/5068119/for-a-quick-response-
text-message-instead-of-voice-mail](https://gizmodo.com/5068119/for-a-quick-response-
text-message-instead-of-voice-mail).

\(^{272}\) Ramona Emerson, “Voicemail Etiquette: When Not To Leave The Dreaded VM,”
*Huffpost*, February 6, 2012, https://www.huffingtonpost.com/2012/02/05/voicemail-etiquette-cellphone-
rules_n_1255857.html.

\(^{273}\) Molly Oswaks, “Is There a Single Good Reason to Leave Voicemail?”
messages. As one critic put it, “Why listen to your friend Jane hem and haw about a good time to meet up when you could’ve spent three seconds reading ‘Im in da city. U free 2 meet?’” Information isn’t cumbersome until there is too much to handle. Listening has only one speed but turning a voice-based transmission medium into a text-based correspondence medium is a way to open up the bandwidth of sending and receiving. From telegraphs to answering services to answering machines, writing down messages is a seemingly innocuous attempt to give callers and receivers more freedom to move away from their phones and communications networks. At the same time, the very same process that enabled that freedom seems to have brought us much closer to our networks.

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CONCLUSION: RESPONSE ABILITY

…all histories embed stories about the future in their stories of the past.275

Our names are not who we are, but we agree to them so we can distinguish one from another in our communities. To call and be called is a requirement of social life, a blessing and a curse. We guard our names and their reputations while at the same time trying to shake them. In the famous balcony scene of Shakespeare’s Romeo and Juliet, the female lead yearns for Romeo, with whom she has fallen in love: “O Romeo, Romeo, wherefore art thou Romeo?”276 She speaks generally to the night in front of her, not knowing that Romeo is just below her balcony, in the darkness. Then she gets to the heart of her soliloquy: “Deny thy father and refuse thy name.”277 For most audiences, this scene is about the animosity between the Capulet and Montague families, an animosity that forbids the association of the two lovers. But it is also more fundamentally about the benefits and burdens of our names. Although his name allows Juliet to call out to Romeo (social network users call this “tagging”), Juliet realizes that “’Tis but thy name that is my enemy: / Thou art thyself, though not a Montague.”278 This is not merely a philosophical distinction. It is an expressed frustration with the very process of mediated communication.

275 Sterne, The Audible Past, 342.
277 Shakespeare, Romeo and Juliet.
278 Shakespeare, Romeo and Juliet.
In his analysis, translator Paul A. Kottman finds that what Juliet is trying to get at is “to underscore the separation between Romeo himself—the one she desires—and the name he bears; between who he is and what he is called. Indeed, her desire is made possible by—or perhaps is itself the occasion of—the separation of ‘who’ Romeo is from his name.” In the dark, Romeo can’t see Juliet and Juliet can’t see Romeo. But they know who is speaking because of the unique qualities of their voices. In this moment Juliet dreams of a world with no names, an impossible world where there are only two speakers. Whenever you enter a network of more than two, you must give yourself a name so that you can be found in the mass of people. Today we can understand the trouble of our names perhaps more than ever. We not only register our names after birth, we copy them each time we join a social network, thereby multiplying the many names separated from our voices.

The pager was not revolutionary, but it did begin to prioritize individuals and their network names. The major broadcast industries are more interested in crafting messages for broad audiences or population demographics. The pager’s technique of broadcasting-to-one allows us to untangle some fundamental questions about network communication. Is network communication a form of broadcasting or interpersonal speech? The answer, of course, is both. But that doesn’t mean that these forms of address are unimportant in a network era. Romeo didn’t have to speak up when he heard Juliet talking about him. He could have let her broadcast into the night. When you have a choice, the form of address

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is a significant part of interpreting the meaning of a message. The message “Thanks for dinner last night” sent to a friend takes on different meaning when you send the same message to the same friend using a social network that can be read by your friends and your friend’s friends. When Juliet calls out to Romeo and doesn’t know he is there, that means something different to Romeo than if she were speaking directly to him. Would a text message or email from Juliet to Romeo have sounded as sweet?

More simply, the fact that you can address any one person, by name, on this vast network should be fascinating. As we know, it was communication policy that twentieth century broadcasters address a general audience of no one in particular. Nevertheless, the broadcasting century made numerous attempts to make more intimate its generalized address. Although they are often criticized for their one-way communication techniques that don’t allow audiences to provide feedback, the radio and television industries did make efforts to tailor their communication strategies to seem more personal, despite the fact that they were speaking to no one in particular. In his edited collection on *Broadcast Talk*, Paddy Scannell argues that “while the central fact of broadcasting’s communicative context is that it speaks from one place and is heard in another, the design of talk on radio and TV recognizes this and attempts to bridge the gap by simulating co-presence with its listeners and viewers.”

Unlike addressing a classroom of students, broadcasters don’t talk loud enough for a room full of people to hear, including the person in the back of the room. They speak closely to the

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microphone, as if speaking to each individual person on the other side of the radio receiver. Horton and Wohl proposed the theory of “para-social interaction” to describe how the illusion of “intimacy at a distance” is created by broadcasting forms of address, as if an individual audience member is engaged in a reciprocal relationship with the broadcaster. More significantly, John Durham Peters argues that to sustain this illusion broadcasting audiences must not confuse the interpersonal form of address (speaking “to you”) with the mass form of distribution (available “to anyone”). We would think someone is crazy if they assumed radio or television broadcast were speaking to them as an individual. Being able to tell the difference between the interpersonal and the mass, Peters points out, is a modern litmus test for madness.

Almost every literate society complains of information overload and develops techniques to remedy the feeling of being overwhelmed. Tables of contents and indexes help readers navigate a voluminous number of pages. Files help governments keep track of an overabundance of documents. Google searches a limitless number of web pages through its algorithms. How does the networked environment of the twenty-first century deal with a flood of messages that are intended “for you?” This project has been an effort to show how twentieth-century broadcasting, telecommunications, and correspondence media laid the cultural groundwork for these twenty-first century techniques. Those techniques


283 Gleick, The Information, 373.
are represented by chapters 2-4 of this project.

First, as I have shown, the coping strategy begins by identifying each person on the network as a unique individual who can be found by other individuals (or organizations) on the network. Many industries of urgency used loudspeakers and small radio networks to broadcast messages to individuals such as police officers, service workers, hospital staff, and others. By mixing the individual-address capabilities of the telephone with the wireless capabilities of radio, these industries laid the theoretical foundation for instantaneous mobile communication. Whereas the telephone was previously space-bound and often identified with a workplace, family home, or other collective address, the consequences of direct individual address continue to reverberate. When Mother Theresa was asked how she could continue to help the poor, sick, and dying for so many years, she responded, “If I look at the mass [of people], I will never act. If I look at the one, I will.”

Personal messages are the daily calling of the networked individual.

Second, another way to deal with message overload is to notify those network individuals the moment a message comes in. In his forthcoming book, *Delayed Response: The Art of Waiting from the Ancient to the Instant World*, Jason Farman surveys the history of messages at a distance and finds that the delay from a message sent to its returned message has always been fraught with meaning. Although the pager or paging is not covered in his book, the device

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and form of address represents a turning point for networked individuals. The assumption is that one can respond to messages more efficiently with live notifications. It’s obvious but revealing to compare the frequency of messages delivered today to those of the postal service. While some homes received postal delivery up to four times each day, by the 1950s postmaster general Jesse Donaldson’s new budget called for a standardized once per day delivery. All correspondence came at one time. Although today it is possible to program your email, text messages, or other correspondence to announce itself at one time each day, the default notification setting is to ring as the messages come in. As the history of telegraphy and telephony shows, notifications such as the bell on the telegraph or the ring of a phone were developed to summon attention to their respective networks.

If broadcast media held audience attention through “flow”—how broadcasters try to hold their audiences from one uninterrupted programming segment to another—then network media tap into audience attention through personal notifications. Paging, too, is both technology and cultural form. In 2006, before they had a name for their micro-blogging service, the founders of Twitter wanted to build a device to bridge the person-to-person capabilities of the mobile phone with the information sharing capabilities of the internet. Although their “Phone-ternet” device never materialized, the idea of broadcasting text messages to one’s circle of friends became a reality. Co-founder Noah Glass

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became obsessed with choosing a name to call the new company. He sat in his apartment, flipping through a dictionary for ideas. As he looked up definitions he was interrupted again and again by the ding of text messages on his phone. Glass thought of the twitch that muscles make in response to a stimulus. As he looked up the word twitch, he saw the word twitter: “(of a bird) to give a call consisting of repeated light tremulous sounds.” Glass had finally found a verb to describe the endless flow of network messages and their accompanying alerts.

As user engagement becomes the currency of today’s network advertising revenue (as opposed to merely counting the viewers of a television program), many prominent technology critics are calling attention to the design and protocol of network notifications. Tristan Harris—a former Google product engineer and “design ethicist”—refers to his cell phone as a “a slot machine in my pocket” because you never know what the next alert or notification might be. Harris now runs an advocacy organization called Time Well Spent, which takes issue with the current state of network communication. “Facebook, Twitter, Instagram, and Google have produced amazing products that have benefited the world enormously,” acknowledges Harris’ organization. “But these companies are also caught in a zero-sum race for our finite attention...” As I’ve observed, there were plenty of notifications such as fire alarms or church bells clamoring for attention well before the twentieth century. But collective attention is different

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than being singled out individually—ask anyone who has been paged for leaving their lights on in a grocery store parking lot. Today’s network media notify users about messages as diverse as a phone call, comment on a social media post, match in an online dating app, likes on a photo, or the death of a loved one. Those alerts serve to turn attention to one’s network as much as they do to the people on one’s network.

Lastly, network communication largely did away with live conversation in order to make room for—and encourage—the number of messages flowing back and forth from person to person and person to machine. “Checking my messages” is both a habit and chore for the network individual who extends their attention and message volume with each email or social media account. As we’ve seen in the history of correspondence media, there is great benefit to one’s mobility by having a message storehouse, whether that be an answering service or the later machine version. More so than any other group, call girls taught us that the ability to record incoming calls is as much a mobile form of communication as having a phone in your pocket. Those stored messages are not only available at a later time, they often produce return messages.

Our network names and numbers are part of an effort to fulfill the perennial dream of connecting with others at a distance. Moreover, our network IDs remedy some of the main drawbacks of broadcasting: the limited bandwidth of the airwaves and the ability to talk back. But being able to contact other individuals doesn’t solve the more fundamental problems of communication: understanding others and having others understand you. What if Juliet had Romeo’s phone number? Would she have called him instead of expressing her
woes on the balcony? Her search would have been simple. By broadcasting to one, Juliet thought she was searching for Romeo. But when she found Romeo, Juliet realized that it wasn’t his network name she was looking for. After all, others in the community knew Romeo by name. Juliet was looking for the only other person she felt could understand her.

The history of paging, from servants to computer servers, is more about the value of connecting to others than it is about understanding others. It is more about creating new channels for connection than new strategies for understanding. It is more about communications than communication. Raymond Williams defines the former as “the institutions and forms in which ideas, information, and attitudes are transmitted and received.”291 John Durham Peters defines the latter as “the project of reconciling self and other.”292 Don’t get me wrong; connection is the foundation for understanding others. But as the possibility for connection multiplies—as our digital names, taps-on-the-shoulder, and messages increase—so does our realization that the time we have to devote to understanding others is limited. It is one thing to walk into a library and realize how many great ideas you won’t have the chance to comprehend; it is another to recognize that you won’t be able to answer all of the calls for your name.


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