Reflecting on the earliest organizing he had done around LPFM, a Prometheus organizer cited Mbanna Kantako. Kantako was an early hero of the micro-broadcasting movement who had broadcasted without a license from a public housing project in Springfield, Illinois, in the 1980s. He devoted his broadcasts to social justice topics including police brutality, racism, and poverty. Kantako understood his transmissions as electronic civil disobedience and "a potent means of regaining power and a voice within an oppressive local system."[1] The activist said that this story was one that filled him with passion, and that although he wanted to capitalize on this story to provoke an enthusiastic reaction in others, he did not wish to exploit Kantako. He recalled, "I told his story over and over, like 200 times, in the most respectful way I knew how."[2] In the main, he felt he had struck the right chord: the early lawless origins of LPFM made it "a hell of a story, it captured people's imaginations."[3] In the mid-2000s, Prometheus was poised to expand from radio into community wi-fi. But this was not a seamless transition. The same activist said that his main problem with the group's work on wi-fi was that unlike radio, which he considered to be an issue people were willing "to go to jail over," he didn't know how Prometheus could convince anyone to "fall on a bayonet" for wireless.[4] He said, "we need to take [wireless] into people's hearts [and make them see that] it's not about getting a cheaper cable bill [from an Internet service provider] … we need to seek danger."

This chapter follows the interplay between radio activists' assessments of FM radio and emerging Internet-based technologies, primarily wi-fi networks. It highlights their role as mediators of technology, engaged in a quest for "appropriate" technical options at the community level. They promoted these options to would-be users and to regulators as well as other groups with the power to influence policy or shape technology. How did the considered negotiation of new technology play out? What were the

benefits to holding a focus on radio in order to understand Internet-based technologies? In practice, the activists largely rejected some proposed technical alternatives (such as webcasting), yet they cautiously embraced others (such as community wi-fi networks).

As the activists assessed Internet-based technologies, they worked to translate the perceived assets of LPFM into the domain of emerging technologies.[5] They sought to retain the vision, flavor, and organizing strategies from their LPFM campaigns while circumspectly negotiating the expansion of the organization's efforts to include community wi-fi networks. This process highlights a nuanced interplay between "new" and "old" media.[6] (We might miss this complexity if we listen only to new technology.) Radio is an entrenched and well-understood artifact. Such already-developed technologies provide insight into how new technologies are interpreted and taken up. This book holds that the significance of new and emerging communication technologies can be grasped most effectively when emerging technologies are considered in a dynamic field that includes older technologies.

The activists puzzled over how to gauge which technological options were best suited to particular purposes and how to shape interpretations of technologies. They also confronted their own role as mediators. Differences in position and privilege meant that some would-be users did not understand technologies in the same terms that the activists did. When this happened, the activists' technological mediation was further complicated. Attempts to incorporate other technologies once again led the activists into collision with historical patterns of inclusion and exclusion, including race and paternalism.

Activists aimed to assess changing technological options in light of both present and future needs. They also exhibited a strong awareness of the past. One policy advocate said, "I think we are at a good point in telecommunications policy and technology.... It hasn't been this way since the 1920s[; now] we have an opportunity to secure spectrum for people beyond businesses. The window will close again within two to three years and be closed for at least another 70 years."[7] Prometheus organizer Ellen claimed, "There is a sense of urgency because of the new technologies. The Telecommunications Act is being rewritten."[8] Scholars have argued that the policies implemented in the 1920s and 1930s profoundly affected the media landscape for many decades.[9] The activists were largely conversant with these arguments, and cultivated a deliberate historical awareness. They believed that their technical and political choices about media technologies were important because of their implications going forward in time. As one activist stated, "The idea of spectrum scarcity is changing fast, and it's up to

us to understand technologies.... The ideological struggle is whether Verizon will own the spectrum and sell it to people, or whether the spectrum will be unlicensed and available."[10]

The activists realized that the demand for LPFM radio stations (or even other terrestrial radio[11]) was not endless. Technical and political changes of various sorts would inevitably reshape the media landscape. Prometheus believed that the ability to add more FM stations to the dial was limited. One of Prometheus's board members said in a 2005 meeting, "LPFM is finite, in five years all the stations [the FCC will license] will already be on the air or won't be able to get on the air."[12] With the passage of the Local Community Radio Act of 2010, LPFM was further expanded. But the general principle remained that access[13] to the FM spectrum was circumscribed. As a consequence, the ongoing feasibility of their focus on FM was brought into question. In thinking about the future, one activist indicated that FM radio would possibly be less relevant to the organization:

Prometheus is working for social movements we believe in and to democratize technologies. Wherever there's a communications technology that needs to be democratized is where we should be.... It's not the boxes that deliver [media content] that [are] important [for our mission], but the idea of community media. [14]

In his identification of the group's priorities, he indicated that the particular technologies favored by the group were subject to negotiation. As one activist stated, "I love radio, but it's not going to be the same in ten years."[15] The activists' concerns were navigated in the midst of a shifting technopolitical media landscape; his affection for radio itself was not necessarily sufficient to support organizing around it over the long term.

Interpreting the Internet: Practices and Policies

The Telecommunications Act of 1996 ushered in a massive wave of consolidation amongst media companies. A primary rationale for consolidation had to do with the supposed availability of new media, mainly the Internet. Some regulators and broadcasters believed that traditional media would be subject to greater economic threats by new media, which necessitated the merging of the old guards. According to media historian and Free Press founder Robert McChesney, new media were seen as heralds of a more democratic media landscape. Many claimed that "the Internet ends the problem of broadcast scarcity (that is, more people want to broadcast than there is space on the airwaves) and means that everyone communicates on a relatively equal playing field."[16] With new media such as the Internet held

up as harbingers of democracy, regulations to protect the public interest with regard to traditional media were valued less.

Due to the 1996 act's chilling effect on radio ownership in particular (see chapter 1), many people concerned about consolidation stepped up advocacy for legal access to LPFM radio stations during this period. At the same time, a multitude of unlicensed micro-broadcasters defied the FCC. As many as one thousand of these unlicensed broadcasters were on the air in 1997.[17] During this period, microradio advocates considered the possibility of using the Internet for "webcasting," but many did not view it as an equivalent alternative to FM. Jasper routinely argued, "If Clear Channel [a large corporate owner of radio stations] wanted to trade me my website for their 1,200 radio stations, I'd do it tomorrow.... A lot of people think we're crazy for focusing on this dinosaur technology, that some new pie-in-the-sky technology will come along and eclipse everything ... but people didn't expect radio to last after 1950."[18]

Activists had numerous objections to webcasting. Webcasting was an undesirable alternative to FM because it was less accessible. Internet connectivity and computer literacy were required to produce or receive webcasts. Speaking in 2003, one Philadelphia activist compared some available media choices, including low- and full-power FM, television, and webcasting:

Radio is the most universally accessible ... you can reach more people. [Radio isn't expensive], you set it up, you talk into it, people tune in, on their car radios or whatever. The cost of entry of tv is just too high....

We're looking at broadcasting to people who are within a mile or two of our studio; it is mostly our friends and neighbors. And that's probably one difference between a small community radio station and a big commercial FM station that covers multiple cities or at least a whole city.... So we're trying to come up with something that will be meaningful for that [nearby] group of people. With webcasting, you're trying to come up with something that is somehow unique or different, so you can somehow differentiate yourself from the other thousands of websites that are out there, something that will be meaningful to a group of people that are geographically distributed all over the world.[19]

Although the activists more routinely compared radio to Internet-based technologies, it is worth noting that this person also considered (and rejected) television. Activists also held that using computers to transmit or receive "broadcasts" was far more expensive than FM. And webcasting lacked the crucial element of "localism" that advocates saw as a main advantage of FM broadcasting. Another activist said, "Everybody has a radio, not everybody has a computer. You don't need any skill at all to be able to turn on the radio. Webcasting, anybody can get it, you can be

in Oslo and listen to West Philadelphia radio. In a way, that's cool, if I'm a West Philadelphian in Oslo, that's great, [but] it makes it less somehow cohesive for the community…. If you webcast, it doesn't seem like a community resource anymore."[20] For her, accessibility and community orientation made FM radio more desirable than webcasting. Another radio activist said that FM possessed immediacy and even serendipity that webcasting lacked. "There's a sense of urgency about every minute. You're on-air, you know, it's happening … [With the web], it's not broadcasting. There is some sense about [radio] being broadcast, you can turn on anything that's there, [in a] specific location, you can run into it by accident, but to go to a website, you have to know where to go."[21] Activists consistently raised concerns regarding "localism" or "community," accessibility, and use patterns that differed between FM and webcasting. They clearly favored FM.

However, this did not mean that people who preferred FM radio ignored the Internet entirely. Prometheus organizer Brian said in 2006, "We use 'radio' narrowly to mean FM broadcast radio, but it's more. You can have the Internet [connection] and a mesh network and tie them into the radio station…. [Y]ou could utilize the mesh network for production and uploading … you could produce PSAs [public service announcements] at home and never have to go into the studio."[22] He also described how a wi-fi link could be used in the setup of an FM radio station to establish the studio-transmitter link. In this configuration, a wireless Internet connection would be used to send audio from the production site to the transmitter and antenna (an arrangement that Prometheus used in some LPFM stations) (see figure 7.1).

Using the Internet to share audio content for broadcasting was also a common practice within radical media. Jesse Walker wrote in 2001, "The A-Infos Project, a collective of online anarchists, has set up a website through which [unlicensed] micro stations, legal community radio stations, and independent producers can upload and download news reports, full-length documentaries, and other shows in MP3 form [digital audio format]."[23] There were other similar examples. Prometheus actually recommended that LPFM stations web-stream their FM broadcasts if they had the technical and economic[24] capacity to do so. But one activist said in 2005 that "not as many LPFMs are webcasting as you might think."[25] The radio activists did not entirely reject the use of the Internet for community media. Rather, they were critical of the suggestion that webcasting might be an analogous or comparable substitution for FM broadcasting. They were open to using the Internet to extend the practices of producing "traditional" FM radio.

Wi-fi networks and software-defined radio (or "smart radio") also present opportunities to examine the radio activists' attitudes toward the Internet's
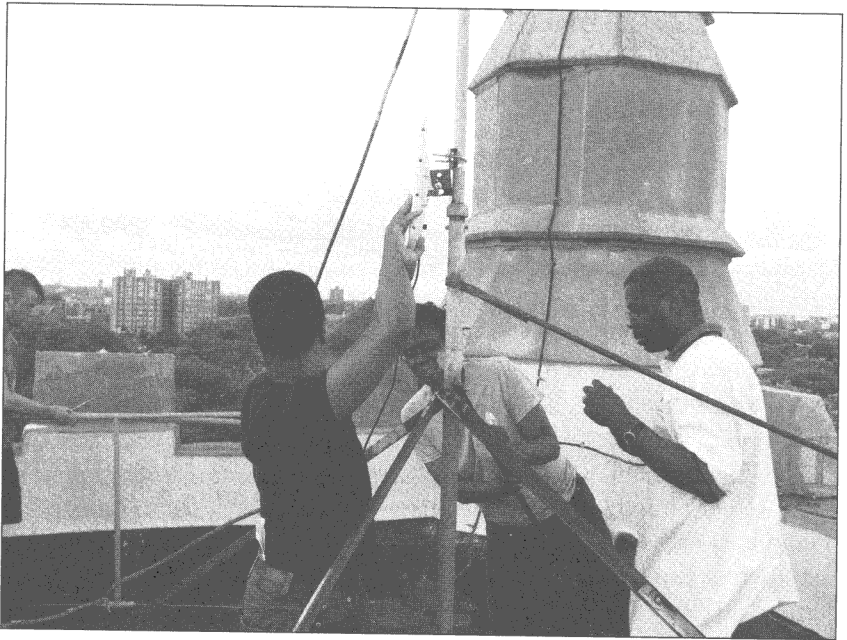
Figure 7.1
Volunteers mount a wi-fi dish for a studio-transmitter link atop a church, Philadel-phia (2008). Volunteer photo.

role in broadcasting and community media. Short-range transmission between wireless devices in portions of spectrum designated for unlicensed use is permitted by the FCC. These devices are commonly referred to as "part 15 devices," after the section of FCC statute governing them.[26] Part 15 devices include everything from extremely low-power FM radio transmitters (250 μV/m at a distance of three meters from the antenna, often understood as using a transmitter powered by around 1/25 watt) to wi-fi cards and baby monitors.[27] Wi-fi (or wireless broadband Internet connectivity[28]) is a later technical innovation that, similar to garage-door openers, cordless phones, and baby monitors, uses RF to allow devices to communicate across short distances.[29] Smart radio refers to the use of this spectrum by devices configured with software to change between dynamic frequencies to transmit and receive. This capacity to change between available frequencies has the potential to enable many more channels of communication in the same amount of spectrum. Devices only need to know with which other device they are communicating and select together the frequency to use. This potentially obviates the need for clear channels. One way to

explain this is the metaphor of many people communicating in a crowded room; if two people sitting next to each other can agree to pay attention to one another, they can hear each other. Multiple whispered conversations can simultaneously occur in the same room. By contrast, a clear channel model is likened to one person speaking loudly in a room to an audience, permitting only one "conversation" at a time. Smart radio technology can be used to run wi-fi networks that dynamically change frequencies to rout around obstacles and communicate bi-directionally (transmit and receive) in order to network between computer users and share Internet service. This is the application that most excited the activists.

Wi-fi networks may be configured in a number of different ways. They range from open, nonproprietary, dynamic meshed networks to static, closed, proprietary hub-and-spoke networks (with other models in between). They are not inherently open to other users or devices not speci-fied by the network.[30] The term *community wireless network* indicates "open, freely accessible, nonproprietary systems ... built using the buying power and economies of scale within neighborhoods, towns, and cities."[31] A "municipal" wireless network has a slightly different valence than a "com-munity" wireless network. It indicates that the service is being provided or hosted by a municipality, as opposed to a corporate provider. But it does not necessarily connote the openness of a community network, and it may not embrace the use of the network as a platform for community media. Instead, these networks often provide users with connectivity that is largely similar to connectivity that would be provided by a corporation (these dis-tinctions are discussed more fully below). It is also worth noting that not all community or municipal broadband efforts are also wireless—some are cable-based, though increasingly the model is to incorporate wi-fi.

During the period from 2000–2011, LPFMs were virtually impossible to license in cities (due to the requirements for spacing between stations that Congress placed on LPFMs in 2000). During LPFM's first decade, such sta-tions were almost completely out of reach in urban areas. Activists also acknowledged that even if the FCC and Congress were to reauthorize the FCC's initial recommendations for LPFM (as finally occurred in 2011), LPFM licenses would still remain elusive for many in urban areas because of spec-trum crowding. Partly due to the unavailability of LPFM as an option, the Prometheus activists considered the expediency of municipal and com-munity wi-fi networks in cities. Their interest was partly symbolic. Wi-fi could allow Prometheus to stake a claim in cities that would complement their work building radio stations in rural areas. One activist stated, "We care about radio, but we believe in appropriate technology.[32] If wireless is

the best way to support community and social justice needs, we need to get them that. If people can't get radio, they need this now instead."[33]

The idea that the airwaves belong to the people was first articulated about radio broadcasting. But it gradually enabled the radio activists to claim community wi-fi as relevant as well. They were aware that the technical and political terrain on which their LPFM work occurred was constantly shifting, and they assumed that their focus might not be solely on LPFM as time went on. Their understandings of technology, political organizing, and policy work led them to actively imagine other ways in which their mission to promote a democratic media environment could be expanded from their more narrow focus on radio. One Prometheus volunteer looked back on the struggle for LPFM and said, "I was so stupid [then]. I thought that when [then-FCC chairman] Kennard said he was going to start giving out licenses, I thought this meant we had won."[34] She described researching telecommunications technology and policy issues in order to more fully understand the wider realm in which the group's work was situated. (As a single mother who had dropped out of college, she vividly recalled "reading Harvard economists' reports" while her toddler "peed in her lap.") This led her to the issues of media ownership and spectrum management, including open spectrum and wi-fi. She began to formulate ideas about how to expand Prometheus's scope, which included the idea of what the "spectrum" is in the first place. She said that for her, "Spectrum isn't a thing—the first step is you need to make it a thing."[35] Here she underscored that the notion that private property (as opposed to its technical aspects) dictated how spectrum is treated in the realm of policy: "Policy, more than science, informs our understanding."[36] She reiterated this in a presentation about spectrum management: "Building our own communications infrastructure today is technically possibly and economically feasible. It's not a pie-in-the-sky situation, the only obstacles are political.... Neighbors helping neighbors works better than the big companies."[37] The activists thus asserted that it was possible and desirable for communities to build wireless networks, expanding a position they had long maintained about radio to include other technologies.[38]

In 2004, Prometheus worked with other advocacy groups on a state legislative campaign in Pennsylvania. They mobilized to oppose a bill that would give Verizon, a massive telecommunications corporation, the right of first refusal before municipalities could set up their own broadband networks. The bill ultimately passed in late November 2004. It contained a clause that denied Verizon's right to challenge the city of Philadelphia's plan to build a wi-fi network, which the city government and other groups,

including media activists, were already planning. Philadelphia's planned network was grandfathered in, but the ban was put in place for the rest of Pennsylvania.

By mid-2007, fifteen states had passed similar legislation banning municipal broadband initiatives unless local telecommunications corporations approved them.[39] Controversy over municipal wi-fi resulted in large corporate entities opposing each other. Providers of broadband service and content such as Comcast and Verizon opposed municipal broadband efforts. But makers of computer and networking hardware generally favored municipal broadband under the assumption that there would be greater demand for their products no matter who provided connectivity. A pilot wi-fi program in Philadelphia relied on donations from Cisco. Another program in Chicago received funding and hardware from Dell.[40] Prometheus was interested in municipal wireless for a number of reasons, including the strategic importance of organizing in solidarity with other media advocates and consumer protection groups.

Prometheus members had also developed an interest in wi-fi as it related to their own mission. The activists emphasized material links between wi-fi and FM radio. The notion of the spectrum was crucial—symbolically, politically, and materially. Similar to FM radio, wi-fi also uses RF as the technical means by which data signals are transmitted. This material continuity between wi-fi and radio was often used to explain what wi-fi is and how it works. Representations of wi-fi often drew on radio as a familiar technology to indicate how the newer technology should be understood. Many illustrations of wi-fi "hotspots" showed RF radiating from what looked like radio towers.

One of the activists' intents in challenging dominant media institutions was to provide a platform for the creation of alternative discourses. They favored media "content" produced by ordinary citizens that could stand in contrast to the content provided by commercial media outlets. Esmé reflected in an interview:

All kinds of technology, and I think especially communications technology, creates leverage and power. Often, the thing [our society] understands best to do with [technology] is to oppress people.... People that need communication the most have the least access to it. You can almost define oppression by lack of ability to communicate, to express yourself, to be heard, to be able to bear witness to your life, to be able to network with other people, to be able to create agency [for] change, to be able to celebrate your culture.[41]

Critically, activists held that media technology could empower people along two interrelated lines. It could enable them to "tell their own stories"

and express themselves. It could also give them the means to challenge elitist and technocratic decision making.

A main strategy that Prometheus employed was to teach people to build and use technical artifacts. As explored in previous chapters, activists hoped to teach people to be unafraid of technology and to challenge expertise. They felt that if people attained technical competence, they would extend this sense of agency to nontechnical matters and become critical of expert-based, technocratic decision making. The propagation of technologies was an important part of Prometheus's vision. Ellen commented that she found the material and symbolic value of wi-fi to be complementary to her radio activism agenda. She discussed the organizing strategy of holding workshops in which coffee cans were used to build directional antennas for use in wi-fi networks ("cantennas"):

The cantennas [are] an organizing tactic. It's an easy piece of technology to build. It's a useful piece of technology. In the ten or twenty minutes it takes someone to learn to use a cantenna, you learn RF, you learn DIY sharing of a public resource, like public airwaves stuff, you handle a drill, you handle a soldering iron, you have them handle a component, you learn about cabling, it's a fucking barnraising in a ten-minute package; it's the best tool for that.[42]

She made reference to the material linkage to radio when she said that a cantenna workshop teaches people "about RF." The connection to radio is also apparent in teaching people to use soldering irons and become familiar with cabling while building cantennas. But the main significance of the cantenna workshop for her was that it was "like a barnraising" in that it combined Prometheus's technical and political missions, raising awareness about citizen use and ownership of the spectrum. The activist also hailed the cantenna workshop as an effective organizing tool because it was more portable and less involved than a barnraising. As a result, it could be shared with more people (see figure 7.2).

Incorporating wi-fi into their organizing mission proved troublesome for Prometheus. The activists' understanding of radio as ideally suited to demystification of technical expertise did not necessarily translate to other artifacts. One Prometheus organizer stated, "With radio, it's easier to have a real 'Eureka!' moment, like when you realizing you're broadcasting from a [radio transmitter mounted inside a lunchbox]. This is harder with computers."[43] A Prometheus intern echoed this: "The barrier [of] access to radio is so much lower. You have to know relatively little [technically] to produce or use radio creatively, but with computers it's much higher."[44] In previous chapters, I described how soldering a transmitter board was a
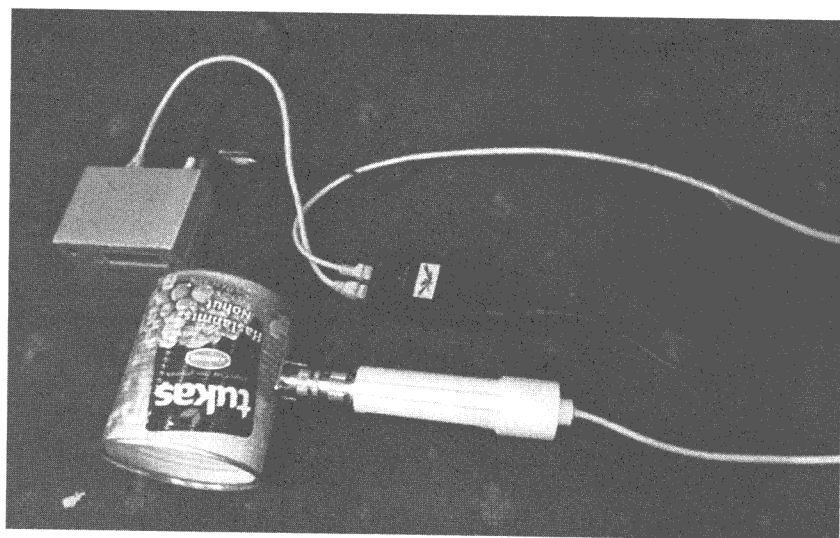
Figure 7.2
A finished cantenna to be used in a studio-transmitter link or on its own in a wi-fi network. Volunteer photo.

good opportunity for novice participation. It is relatively simple to solder together the various components, as long as the instructions and schematic are closely followed. It takes several hours of work and is a social activity. Each small board can accommodate a couple of people soldering and at least a few more observing or guiding. When the board is complete, it is easy to hook it up and demonstrate its use to broadcast an audio signal. By contrast, a cantenna has a less obvious function when it is complete. It is an artifact that can be integrated into a network of other technologies in order to produce a wi-fi signal and link computers. But the computers themselves are still complex and essentially black-boxed. The cantenna is arguably a more abstruse end product than a voice or music sample being heard over speakers.[45] This is not because of any inherent properties of these artifacts. It is because the stabilization of the use and meaning of radio as an artifact enables a transmitter's function to be readily grasped by novices.

Radio's common understanding as a medium of sound transmission may also make it more easily understood as having democratizing implications. With radio, the idea of a "voice" is salient. It is not only an aural phenomenon. It also resonates with the ideas of "having a voice" or "being heard" within discourse surrounding democratic participation.[46] To illustrate this

point, one activist stated that barnraisings were part of an "international movement for people to own their own voices";[47] *voice* is about power.

Activists were stymied in their efforts to make wi-fi seem as transparent, utilitarian, and democratic as radio. Although they largely understood it in these terms themselves, they had difficulty convincing the public that their robust vision for community wi-fi was about more than Internet connectivity. Activists wished to promote wi-fi for the circulation of locally produced media, but other uses of the Internet had already stabilized. The dominant understandings of connectivity inhibited the activists' efforts to symbolically forge a link between wirelessly networked computers and the ideas that had crystallized around radio. Radio is not inherently a more democratic technology than wi-fi. But the radio activists were swimming upstream in their attempts to promote an interpretation of community wi-fi that diverged from how Internet connectivity was commonly understood. This illustrates the wider point that technological meaning has to be constructed. The political valence of a given artifact is a result of interpretive work.

Technological Mediation and Its Discontents

In promoting their preferred meaning for wi-fi, the radio activists faced dilemmas in multiple directions. Would-be users did not always value wi-fi in the terms they did. Nor did policy makers or other geeks. The radio activists also struggled with issues of position. When grassroots demand for technology in underprivileged communities was at odds with their own understanding of technology, they exhibited discomfort about paternalism. These dynamics can be observed by attending closely to the use and meaning of wi-fi networks as promoted by different groups.

Municipalities and nonprofit groups often cited reasons for building wi-fi networks that did not identically match the activists' interest in wi-fi. In early 2005, a Prometheus organizer met with a representative from a nonprofit group in Philadelphia called HousingSpace (a pseudonym). The organization was a former homeless shelter that provided other services such as computer access and job training. It had built a wi-fi network in the neighborhood in which it was located. In the meeting, the Housing-Space staff member stressed the use of the wi-fi network for services such as downloading forms from city social services agencies. In many areas, including the one in which HousingSpace was located, new wi-fi networks also required the provision of personal computers and training to use them. Many families and individuals receiving wi-fi access had never

before owned computers. So-called digital inclusion was a complex process, confronting historical exclusion that exceeded "the digital."[48]

This emphasis on basic computer literacy and the use of connectivity to primarily *download* material (or to eventually use connectivity for purposes such as commerce or running one's own business website) represented a paucity of vision as far as the activists were concerned. It was also paternalistic: lawmakers and some nonprofit organizations tended to represent the "users" as wards of the state. During a 2006 city council session, one Philadelphia City Council member said that the benefits of a municipal wireless network would be to provide "high speed Internet to all citizens and businesses, to take advantage of the new digital society. [We can] bridge the digital divide in 12-18 months, provide access and opportunity for all, prepare children for the future, empower low-income families by providing access to information and social services at home, [and] level the playing field for small businesses."[49] By constrast, Prometheus activists and others who favored community wi-fi saw the potential use of these networks as extending beyond the provision of Internet service. Instead; their interest flowed from their vision of wi-fi networks as *platforms for community media.* Significantly, they emphasized *uploading* content and multidirectional transmission as opposed to downloading news, entertainment, or forms related to services. One document distributed by Prometheus stated,

People just like you have been using inexpensive wireless transmitters to shoot high-speed internet from home to home and neighborhood to neighborhood.... They've expanded wireless networking from a way to get the tangles of cables out of your home office to a way for communities to get the connectivity they need for cheap or free. In some cases—like right here in [this town]—they are *redefining the internet altogether!*[50]

To the radio activists, community wi-fi was appealing due to its potential for unrestricted and multidirectional transmission of citizen-created content. One e-mail sent by a Prometheus organizer expressed her concerns about the city of Philadelphia's plan, which had not yet been fully outlined: "will the important community content—like the videos produced at [a community] video center, the content hosted at the IMC [Independent Media Center], and the community newspapers and websites scattered across the city—be marginalized or promoted to users of the network[?]"[51] Advocates touted community wi-fi as "cheaper, more reliable and flexible, and offer[ing] end users access to more bandwidth, services, and applications" than profit-driven corporate models.[52] They added that participants in a community wireless network could decide to create such resources as

streaming media servers. This possibility represented a major difference from a model in which users of broadband were assumed to be primarily or exclusively "consumers." A document prepared by a Chicago nonprofit with whom Prometheus consulted echoed this interpretation of wi-fi: "It's important to understand that a connection to the Internet is just one of the many services a [wireless community network (WCN)] provides. Because a WCN creates a very high-speed network local to your neighborhood, you'll be able to receive interesting content that your community produces while sharing content that you produce ... The WCN achieves speeds higher or comparable to DSL or cable modem. Additionally, a WCN is community-based and delivers content and applications that are community-created and community-specific."[53] In a document prepared by Philadelphia activists with whom Prometheus often collaborated, this sentiment was expressed even more strongly: "Communities across Philadelphia are *fighting to tell their own stories.* The city's wireless plan could give thousands of us a new way to do just that, but we need to let the city know that, when it comes to technology, the public interest is the criteria [*sic*] for success."[54] A Prometheus organizer stated, "It's time to take back unlicensed airwaves—wireless community networks are not to just receive content but to create and transmit it."[55] The act of *transmission* was crucial.

Due to their interest in community wi-fi and their belief that it was an "appropriate" option in cities, Prometheus consulted on a project with a Chicago-based nonprofit organization, Neighbors for Access to Technology (NAT) (a pseudonym). NAT had built a small wireless network consisting of a few nodes, which were used by a neighborhood community center and a few homes. NAT was planning to expand this into a larger community wireless network in the economically disadvantaged, largely African American Chicago neighborhood of Larch Park. Their staff were interested in collaborating with Prometheus on this project, especially hoping to draw on Prometheus's expertise in leading hands-on workshops in the mode of barnraisings. But after arriving in Chicago for meetings, the Prometheus activists began to feel uneasy. Prometheus tried to get a feel for the reaction of Larch Park residents to the proposed wi-fi network. Some were enthusiastic. A person who worked closely with the community members said that "this is a chance [for the residents of Larch Park] to not just keep up with society, but to advance beyond it; people want to use this to start businesses and for education."[56] In this comment, he alluded to the historic exclusion of African Americans from technological decision making and "progress."[57]

However, the Prometheus organizers were concerned that this goal on the part of the residents stopped short of their own agenda, which included

social change and local citizen–created media, not only connectivity.[58] They also had reservations about collaborating with NAT, an organization they felt differed from Prometheus in significant ways. One Prometheus activist later characterized another organizer's reaction, saying, "[H]e didn't like the [NAT] people ... he didn't trust them, he didn't like the money that was there."[59] A Prometheus intern privately referred to the situation with NAT's attempt to bring Prometheus onto the community wi-fi project as "a liberal clusterfuck." He felt that NAT had good intentions, but the project was not well managed. He worried that NAT exhibited an attitude that could be construed as heavy-handed or patronizing toward Larch Park's residents—an attitude from which Prometheus members wished to distance themselves.[60]

This project involved money and technology coming in from outside the community. The neighborhood residents had a (legitimate) concern that this sort of investment in improving the neighborhood might not solely be in the interest of the current residents. A historically poor neighborhood in a desirable location with well-developed communications infrastructure might be a target for gentrification, for example. There are historical reasons why African Americans in some cases may have an adversarial relationship to technology, particularly that introduced by whites.[61] Some residents raised concern over attempts by a group of (largely white) people from elsewhere (NAT was not based Larch Park, and Prometheus was not even from Chicago) to "improve" the neighborhood. A NAT staff member said, "There will never be a time when it will be okay for hundreds of people who don't live in [Larch Park] to come volunteer there."[62] This made Larch Park a troublesome site for a wireless barnraising. Organizers concluded that Larch Park was not an appropriate site to promote Prometheus's wi-fi and general open-spectrum interests. Ultimately, Prometheus participated in a smaller project to build network nodes in the neighborhood. In order to support their community media agenda, they worked with a community member to get a grant for equipment to start a community Internet radio station for the neighborhood (over their wi-fi network as opposed to FM). They did not conduct a wi-fi barnraising in Larch Park, nor did they conduct a stand-alone wireless barnraising elsewhere.

Prometheus organizers were concerned about Larch Park because they did not want to project an image as (white) paternalists. For the activists, providing nonwealthy citizens and community groups with radio stations was another means of leveling power and promoting egalitarianism and pluralism. The activists' vision promoted the inclusion of as many groups as possible, including (or especially) those lacking some forms of social or

economic capital. Nonetheless, this was a difficult area for the Prometheus organizers. Though they were critical of white privilege and paternalism, their organization and volunteers were made up of an educated, white[63] segment of the population. The activists were therefore extremely careful to frame their activities as self-consciously antiracist, promoting cultural exchange. They did not want to be seen as a group of (mostly) white activists providing a commodity or service to a less-privileged "other." In an interview, one Prometheus organizer commented about their international workbuilding radio stations in Nepal, Tanzania, Kenya, and Guatemala:

Historically the US has been seen as a patronizing force, NGOs come in.... But we're learning from [community groups] in other countries—we're resource-rich materially, but how are they organizing? We want to find winning strategies and learn from them and use that knowledge here [in the United States or Global North;] they are doing community organizing under [circumstances that are unbelievable]. We're not "giving" to them, because in the US, the organizing strategies and ability is in its infancy.[64]

He also stated that "privilege allows us to not realize that [media] is a life and death issue for other people. As a white[65] activist group, we're in solidarity—they can use the radio station to do it themselves."[66] This is not to suggest that the activists succeeded in evading charges of paternalism in their organizing activities. It is only to highlight that they expended significant effort reflecting on these issues.

Another organizer commented on the potential tensions for Prometheus in choosing groups to hold barnraisings with: "It's easy for us to work in rural communities where we're a big deal when we come in, where they want us to be there. To be honest, it's easy to work with other nonprofits. It's easy for us to work with other white groups.... We can work well with hippies. We've done a great job of it in the past."[67] In noting that that Prometheus worked well with "hippies" and nonprofits, this activist was remarkably candid about the ease in collaborating with groups positioned similarly to themselves in terms of race and class. Prometheus's identification with hippies (and vice versa) was a legacy of their countercultural heritage and communalist ideals, as discussed in previous chapters.

She added, "I'm impressed that we've been able to work with farmworker groups. I think that that shows a lot of growth...,"[68] indicating that the group strove to break out of their comfort zone when selecting collaborators (see figure 7.3). The activists' attention to "difference" and its potential to stir up tensions occurred in their work with LPFM and in their work with wi-fi in Larch Park. Another activist said that privately, the group struggled

with how much to foreground issues of race and class in their work. He said that occasional experiences forced the group to reflect on these topics and spurred internal dialogue within the organization. He felt this was positive, even when the conversations were hard or forced them to confront ways in which the organization needed to improve.[69]

The Prometheus organizers' experience with the Larch Park case was complicated. But critically, their status as a white group providing services to a group with whom there was a perception of social difference was not the only concern. Although this was a potentially vexing issue on its own, it was one with which Prometheus routinely grappled in their work building radio stations domestically and internationally. (I have outlined above the resources on which Prometheus members drew to legitimate and explain their encounters with groups who were "different" from them.) In Larch Park, race and class differences were significantly compounded by the fact that the grassroots demand for community wi-fi *as it was understood and*

Figure 7.3
A barnraising workspace inside a farmworkers' union, Oregon (2006). The mural reads: "*¡Respecto y sueldo justo para los campesinos!* [Respect and fair wages for farm-workers!]." Author photo.

promoted by Prometheus was absent. Larch Park residents desired *connectivity*, but did not flesh out uses for a wi-fi network beyond "education, business, and keeping up with society."

Prometheus members believed themselves to have a strong grass-roots mandate. They constructed an organizational identity around this belief. The discomfort Private registered about NAT could be read as attempts to embody a "different" kind of nonprofit organization (as explored in chapter 5). In their board meeting, the radio activists reflected on these issues. Even though they felt that they had compelling reasons to enfold a spectrum management agenda into their mission (based on their own understanding of the technical and political issues at stake), they did not see how they could do so without perceiving a grassroots mandate to support this work. They felt obliged to listen to "the voices of the people." They did not want to "carpetbag organize." (Again, I am not suggesting we take these claims at face value, only that they were important in the activists' ideations about their positions and their organization.) One of the activists captured their dilemma, saying, "No one goes around with signs that say 'Free the Spectrum!'"—and another chimed in, "Except us!"[70]

Activists worried that wi-fi was a bloodless issue: no one was ready to "fall on a bayonet" or go to jail for wireless. Prometheus held passionate opinions about wi-fi and spectrum management, but activists could not assume that members of the public shared their sentiments. Without outreach and education efforts, the grassroots demand for community wi-fi was less easily identifiable than the appreciable demand for radio stations. Prometheus hoped to differentiate itself from "wonk," "Beltway," or paternalistic organizations, so the lack of grassroots demand was troubling. Even when grassroots demand for wi-fi was apparent, it could not be assumed to be for wi-fi as the activists understood it (as opposed to a general demand for Internet connectivity). As one activist said, "we can't push [our agenda] on anyone. We're patient because we have to be; we can't do things before groups are ready."[71]

The "wonkiness" of wi-fi troubled the activists. They were often critical of other groups whose purposive engagement with technology did not, in their opinion, lead to a more egalitarian distribution of expertise. The radio activists were critical of computer hackers and free and open source software (FOSS) developers. They felt that these people tended to not be politicized enough. Their knowledge was too elite (as described in chapter 2). When advising an LPFM station about software, a Prometheus activist recommended they avoid an open source platform unless many people at the station were already familiar with it. He said, "The problem with using

open source is that it puts [the radio station's operating system] more into the hands of the cadre of nerds—it's not a platform that as many people know, which, practically, is a problem, even though politically it's great."[72] Another activist who was involved in radio activism and open source reflected about the radio activists' engagement with, and sometimes opposition to, hackers and FOSS developers:[73]

The open source community has potential to be activated in a political way [but it isn't always]. Open source software is free in a number of different senses, it's free in that anyone can use it freely, it's open, it's free for anyone to go through and change, it's free in the freedom sense, in that some of it, you can use it and change it, but whatever you put into it has to remain open and free. So it contributes to a general culture of people contributing to a general pot of common tools and common infrastructure, and they do it for free....

[There's] a general sense that ... these technological tools are powerful and should be used for a common good and not be developed for profit when profit is at the cost of human need, [which] is exciting and has a good intersection with a lot of the values of progressive and social justice movements....

So open source projects that also have a political focus are really exciting.... [F]ocusing that energy on more socially useful open source software, I think would be great.[74]

This radio activist had thoughtfully considered the ways in which the FOSS community could be brought into line with more overtly political goals, building technological tools for an explicit social change agenda. But he drew a distinction between FOSS as a general project and FOSS projects with a deliberate political focus, suggesting that FOSS participation in general was not consonant with the radio activists' rather more robust politics. He believed hackers were related to the radio activist mission but distinct from it. He imagined that things would remain that way until or unless hackers took a more sensitive political stance regarding their technical engagement:

The other one that's kind of interesting is the hacker community, which is kind of related to microradio stuff.... [W]e kind of want to court hackers.... People get involved in [technical projects] for a lot of reasons, [such as] they're bored, they're disillusioned, they have technical interests and they're isolated and there's something about their interest that is not being satisfied ... [but] there's often a lack of a goal....

We try to maybe draw them out in such a way that they have to figure out what their values and goals are, and then maybe involve them in more political work, on something that's a little more focused on the community beyond the technical community. That seems pretty exciting, and pretty possible.[75]

The radio activists were keen to reflect on ways in which they felt that their work and goals resembled (as well as differed from) the work and goals of

members of related technical communities such as hackers and FOSS developers. They tended to view their own work as more well-developed politically because it included an overt challenge to elitism in technical practice. They wished to further politicize members of hacker and FOSS communities and inspire them to work toward more fully articulated activist goals. Radio activists viewed the FOSS community as overly concerned with building technical artifacts at the expense of awareness of the potential problems created by elite technical knowledge. This was especially a concern with issues related to the inclusion or exclusion of novice participants. (Chapter 4 addresses the potential gap between "participatory culture" and the radio activists' desire to promote egalitarian technical participation.) (These critiques did not preclude the radio activists seeking FOSS developers' or hackers' help when they needed assistance in projects requiring software development and other technical matters.)

The FOSS community was also mediating wi-fi technology, developing material artifacts and resources for interpreting these artifacts. Users of open platforms such as Linux have been involved in "user-driven innovation" in the development of wi-fi networks,[76] not unlike the creators of the ARPANET (the progenitor of the Internet).[77] A document distributed by Prometheus activists stated, "Wireless networking by the community of geeks and experimenters who have been innovating networks on the cheap for years, [this website is] much more focused on cheap, free software-based and open-source solutions for connecting homes to each other wirelessly."[78] By 2004, all major wi-fi card manufacturers released had drivers for Linux, which illustrates the relevance of FOSS communities in developing wi-fi (and especially the card manufacturers' interest in courting this market).[79]

Material and social links between the FOSS community and those building wi-fi networks were strong. The radio activists' deepening interest in wi-fi brought them (by necessity) into even closer contact with people involved in FOSS projects. Radio activists' interest in wi-fi was generated in part by the involvement of people they knew. Indeed, it is inaccurate to treat these as wholly discrete social groups. Some members of each group were involved in telecommunications policy, programming, and technical work. Members of both groups attended such events as HOPE (Hackers on Planet Earth) conferences and barnraisings. Radio activists possessed some degree of overlap with FOSS developers in terms of interest and skill in FOSS, programming, or computer hardware; they also expressed some major points of contention, as previously noted. The FOSS community's approach to building and promoting wi-fi gave the radio activists resources for understanding wi-fi. It also created difficulty when the radio activists'

notions about how to build and promote wi-fi clashed with those of FOSS developers. Prometheus continually cited difficulty with wi-fi promoters, claiming that they were "too wonky." They also claimed they were inattentive to the grassroots and to wider issues of social justice.[80] Collaboration was further hampered by the fact that other geeks did not share the radio activists' vision of radically egalitarian technical participation.[81]

Pondering Prometheus's foray into wi-fi, one organizer stated that "the radio stuff is very tangible. People learn and then they are passionate. Our organization is the whole package for radio, but for wireless [we have had less success]."[82] This comment reflects some of the difficulties the group had in finding the right way to promote wireless as an accessible and desirable technology. It also underscores the observation that working with other groups on media democracy and spectrum management issues was a challenge. One regular feature of their organizing work was to consider groups with whom they could ally. They often exchanged support on wireless issues as an in-kind trade with groups who could make an impact on LPFM-related campaigns. In this respect, wi-fi was also a means to an end in terms of promoting LPFM. The radio activists felt that relationships formed with other advocacy groups or legislators could be leveraged in a variety of ways.[83] But they were sometimes left with the lingering feeling that other organizations would potentially be better equipped to combine the technical work and the "message" needed for a successful campaign around wi-fi. Prometheus's formula for success with FM was not easily ported to community wireless. Despite this, groups who valued the work Prometheus did with FM were interested in tapping into Prometheus's ease with hand-on demonstrations concerning the material and political aspects of communications technology into wireless. This was why they had been asked to join the effort in Larch Park in the first place.

Conclusion: The Interplay of Old and Emerging Technologies

In distancing themselves from groups that more unabashedly embraced digital technologies and the Internet, the radio activists provide a unique site for analyzing new media adoption and resistance. They are not dismissible as mere Luddites or nostalgic radio hobbyists. In fact, their high profile in the media democracy movement indicates that they were taken seriously by advocacy peers. The radio activists' attitudes toward web-streaming and community wi-fi demonstrate that the negotiation of new technology can have subtle contours; adoption and resistance of technology occur along a continuum. Over time Prometheus cautiously expanded

its definition of "appropriate technology" in order to include community wi-fi networks. But what radio activists valued in the newer technology was heavily informed by what they elevated in LPFM—in particular, the ability to locally "broadcast" citizen-created content. In this, they preserved the notion of user agency they imported directly from their understanding of FM radio.

The truism that new technologies necessarily "disrupt" and overthrow past practices is a distortion. It is not an accurate depiction of the more gradual and evolutionary events that occur on the ground with the introduction of new technologies. New technologies' salient and "unique" qualities usually begin with borrowing from social practices that surround existing technologies.[84] In this case, the activists did not advocate the acceptance of new technologies until they could locate and articulate continuities between radio and community wireless networks. By pointing this out, it is not my intent to characterize the radio activists as especially savvy or prescient. But these dynamics do tell us something about the trajectory of new technologies. They also accentuate the importance of leaving "old" technologies in the mix as we assess new ones. We do not need to know how these artifacts or wider issues about community media will "settle" in order to derive meaningful insights from this case. Listening to the uncertain early stages of these negotiations can help us understand the trajectory of technological change without succumbing to the hype of sudden, marked, revolutionary change (which is usually technologically deterministic).

In their capacity as mediators, radio activists had the potential to shape how users understood or interacted with certain technologies. Through advocacy work, they also had the ability to influence whether citizens would have legal access to certain technologies, including FM radio and community-municipal wireless.[85] This mediating role was at times uncomfortable, especially as they organized around community wi-fi. This was because of the perception that users and other social groups did not understand wi-fi in the same terms as the activists. Promoting community wi-fi networks as platforms for community media rather than Internet connectivity illustrated this dilemma. (By contrast, the grassroots demand for radio stations was largely consonant with the activists' vision for LPFM.) The notion of *broadcasting* was an enduring one, and this interpretation of community wi-fi provided a material and symbolic link between FM radio and community wi-fi. A document produced by Prometheus about wi-fi and smart radio (*not* FM) contained the statement, "Using a combination of the techniques outlined [here], it is possible to imagine a world in which anyone can be a broadcaster."[86]

At the same time, the radio activists were not restricted to advocacy. Their role as propagators meant that they labored to bring the same politics and values they had identified in radio to wi-fi through hands-on technical engagement. Computers are in some ways more opaque artifacts than radios. Their dominant meanings proved challenging for the radio activists to contest. Nonetheless, the activists tried hard to link their rhetorical interpretive work to technical practice. They promoted political and technical aspects together to users through cantenna workshops.

The radio activists' mediating role became additionally complex as it intersected with issues of race and paternalism. Ron Eglash et al. have explored the appropriation of technology by marginalized groups.[87] Here, the end users did not necessarily understand why they need a given technology in the same terms as the activists did. The activists had difficulty reconciling their belief that user groups "needed" technologies with their stated belief opposing (white) paternalism. Wi-fi proved vexing because even when groups presented a grassroots demand for it, this demand potentially "limited" to a desire for connectivity. It was problematic for the activists to creatively reclaim wi-fi on behalf of marginalized groups.

The radio activists' disconnect with users was mirrored by their disagreement with other mediators in certain ways. They were skeptical of municipal and NGO interventions that configured users as dependent. And they also disagreed with FOSS activists about how much of a premium to place on "the technical" versus "the political." One activist said, "There is a tendency among nerds to find technology to solve social problems. I would say it's just the opposite, you have to use the society to govern the technology."[88] Ironically, though, the radio activists did themselves elevate the technical when they promoted skill sharing in minibarnraisings and cantenna workshops. This may have unintentionally distanced them from would-be users, some of whom wanted "access" to communication technology without necessarily embracing the full suite of hands-on skill sharing the activists prized. Barnraising tactics could have hindered activists organizing with groups such as the Larch Park community group. The historical exclusion of African Americans from engineering culture and infrastructural development meant there were excellent reasons for neighborhood residents to be skeptical of white activists bearing technology coming from outside their community.[89]

Nonetheless, the activists found other ways to justify their interest in the Internet. They called wi-fi an "appropriate technology," in a rhetorical effort to bring it into alignment with other small- or community-scale technologies they favored. A board member voiced support for Prometheus's

move into wireless, stating that "the Internet didn't drop down from the sky—it was created by the military and we need to take it back."[90] This interest in reclamation or seizure of technology indicates the influence of anarchist and Marxist traditions on the activists. On more than one occasion, the activists invoked the ideal of "seizing the means of production lest they be used against you."[91]

The radio activists sought to provide technical and symbolic links between their deep, loving, and playful engagement with radio technology and wi-fi technology. This aided them in their goal of teaching ordinary people relevant technical skills. Their hands-on work with technical artifacts like cantennas also provided them with an opportunity to create continuity between their identification with radio technology and their perhaps burgeoning identification with other technologies. But their rejection of digital utopianism made it difficult for them to develop the same unambiguous, affective relationships and strong identifications with computers that they had successfully cultivated with radio.[92] Although the activists could muster a strong enthusiasm for a portable transmitter screwed into a lunchbox, for a tool-belt, or for knitting, they would not extend this affection to a portable digital wireless communication device such as a smart phone. Of course, these meanings of technologies do not reside "inside" the technologies themselves—they require construction, maintenance, repair, and translation.

As media historian Carolyn Marvin writes, "New media, broadly understood to include the use of new communications technology for old or new purposes, new ways of using old technologies, and, in principle, all other possibilities of the exchange of social meaning, are always introduced into a pattern of tension created by the coexistence of old and new, which is far richer than any single medium that becomes a focus of interest because it is novel."[93] This episode in early-twenty-first-century radio activism exposes complex negotiations surrounding differing technological options (radio versus wi-fi). It also exposes negotiations to identify the best interpretations of a single technological option (wi-fi alone), some of which drew from interpretations of radio. This interplay demonstrates the continuing viability of an old communications technology (radio) and its centrality in understanding emerging technological options. Wi-fi's material connection to radio may have been partially responsible for the activists' interest in it. Most intriguingly, the radio activists only expanded their purview to include wi-fi when they could make an argument that it could be used in the same hands-on, empowering, and community-building ways that were possible with radio.