



**SIGN, STORAGE, TRANSMISSION**

*A series edited by Jonathan Sterne and Lisa Gitelman*

**THE MEANING OF A FORMAT**

**Jonathan Sterne**

DUKE UNIVERSITY PRESS DURHAM AND LONDON 2012

**MP3**

© 2012 Duke University Press

All rights reserved.

Printed in the United States of

America on acid-free paper

Designed by Amy Ruth Buchanan

Typeset in Minion by Tseng

Information Systems, Inc.

Library of Congress Cataloging-in-

Publication Data appear on the last

printed page of this book.

FOR CARRIE

## 6. IS MUSIC A THING?

If we look back over the past quarter century, it would appear that the commodity form of music has undergone a massive transformation. Twenty-five years ago, it was dominated by recordings on physical media: compact discs, tapes, and (though in decline) LP records. Sheet music made up a portion of the market as well, as did mechanical rights, reproduction rights, and payment for live performance. Today, the world's largest music store sells digital files. Sales of recordings on CD have plummeted precipitously, and though vinyl is enjoying a resurgence, it is not going to pick up the financial slack. Before the financial crisis in 2008 and resulting recession, the industry had already lost about a sixth of its mass, a shrinkage of over

\$6 billion. Labels and artists alike have sought out new business models, and it is generally acknowledged that the recording industry is in crisis. The blame, more often than not, is laid at the foot of the phenomenon of mass file-sharing.<sup>1</sup>

We should not be too quick to accept this simple explanation. The record industry is prone to crisis. In the late 1970s, sagging profits were blamed on the failed promise of disco and on lost profits from home taping. Between roughly 1990 and 2000, record-industry profits were artificially elevated by format changes and resale and repackaging of back catalogues. Once LP collections were replaced by CDs this market dried up and, with it, a substantial portion of industry profits. Some have argued that the failure to agree on a high-definition audio standard to supersede the compact disc must also be considered a part of the crisis. Experimental high-definition formats like HDCD and DVD-A found no commercial success, so no new avenue exists for the back-catalogue business that propped up sales figures in the 1990s.<sup>2</sup> Digital files or not, a sizable dimension of the market for physical recordings has dried up.

However we read the current conjuncture, it is true that worldwide, more recordings now circulate through channels that do not carry the official sanction of recording industries or states. The iTunes store may be the world's largest music retailer, but an extended web of Gnutella and BitTorrent sites and the users who frequent them make up an even larger, transnational swap meet for recordings. For the industry, this state of affairs poses the important economic question of what is to be done. Perhaps the music industry will undergo yet another of the massive reorganizations that have characterized the last five hundred years. But we should not view the current crisis as purely a practical question for those who make money from recorded music, or a matter of whether or not industries should be preserved in their present form. The debate over the explosion of file-sharing and the MP3's role therein also opens out into a long-standing argument about the nature of music in contemporary culture—as process, as practice, as thing.

The nature of music is worth revisiting for reasons pointed out by Walter Pater, of all people. Pater is famous for his overused dictum that “all art constantly aspires to the condition of music,” but let us consider why. In the very next sentence, Pater wrote “while in all other works of art it is possible to distinguish the matter from the form, and the understanding can always make this distinction, yet it is the constant effort of art to obliterate it.”<sup>3</sup> In some ways, Pater's aesthetic proposition was quite forward-thinking. Form

and matter were inseparable for him in music, and other arts did indeed strive toward the same condition. Consider what happened to all the arts in the modernist moment that emerged some years after the publication of Pater's book in 1873 and in the avant-garde practices that continue down to the present day. In much of this work, its form is part of its expression. Certainly, Pater offers a hierarchy of the arts common to nineteenth-century thought and unfashionable for that of the twenty-first. And certainly he idealizes musical performance and listening as, in Alan Durant's words, a "condition without conditions, a condition at all times and in all places identical, even as surrounding conditions shift and vary."<sup>4</sup> But in the intervening years, both artists and scholars of art and music have expanded their concept of form from a formal concern to one of cultural, economic, or physical form. In that sense, the form and matter of music remain closely bound today, especially if we consider the ways in which recordings move across formats and milieus.

As Bill Brown writes, "If the topic of things has attained a new urgency . . . , this may have been a response to the digitization of our world."<sup>5</sup> Journalists and humanists have worried as much about the purported dematerialization of tangible musical objects as have label executives and policy-makers, and not for entirely dissimilar reasons. Depending on whom you ask, analog and early digital recording media either led us to hold music in our hands or to think that we did. A similar dichotomy exists now. Either music has dematerialized, or its materiality now exists on a different scale. When ads can talk of effortlessly holding 25,000 songs in your hand, recorded music moves more freely and into more places than ever before.

Is music a thing? If it was, is it still? The MP3 format's widespread success demands that we reconsider these basic questions. This chapter begins by tracing the contours of a long-standing debate among scholars and critics as to what music is, framed against the changing status of recordings over the last twenty-five years. Having set out the range of positions on music's thingness, it offers an account of how the MP3 format became the most common form of recording audio in the world. For most of this book, I have been concerned with the conditions of possibility for creating perceptually coded audio. But the establishment of the MPEG standard in no way guaranteed that its third layer of audio would become commercially successful. Thus, I consider both the traditional market strategies used by Fraunhofer—the owners of important MP3 patents—alongside piracy as forces in the format's promotion. First, the software to make and play back

MP3 files was itself cracked and distributed through unauthorized channels, then promoted through large-scale unauthorized music sharing online and the repackaging and resale of music on city streets around the world.

The term *piracy* implies the unauthorized distribution of copyrighted material but is more complicated than it initially appears. As a figure of speech, the term accomplishes a ridiculous conflation. Piracy collapses people who make mix CDs for their friends with kidnappers who operate off the coast of Somalia, among other places. It suggests lawlessness and seems to authorize military or police vigilance against its spread. As Patricia Loughlan points out, the term stretches beyond a legalistic definition to "instances where, despite the action of the 'pirate' not being against the law, it is contrary to what the writer thinks ought to be the law, or contrary to the writer's view of what the 'natural rights' of the intellectual property owner in question are."<sup>6</sup> Adrian Johns mentions file-sharing and the digital copying of music just a few times in a six-hundred-odd page book on piracy, arguing that those who reduce piracy to intellectual property evacuate the term of its history, which predates the invention of intellectual property as a concept. "What is piracy? It is not entirely clear that we agree on the answer. An official study for the European Union once defined it rather impishly as whatever the knowledge industries said they needed protection from. . . . In the end it may even be the most adequate definition we can get; but it will scarcely do as a starting point." Johns goes on to discuss examples of piracy that appear to have nothing to do with intellectual property, such as British "pirate buses" in the 1850s, arguing that piracy ought to be considered those activities characterized by contemporaries as "piratical" while acknowledging that "we cannot simply take such characterizations at face value. Those who were called pirates . . . repudiated the label as inaccurate and unjust. The point is that when they did so, they often triggered debates that threw light on major structural issues and had major consequences as a result."<sup>7</sup>

Even within the realm of copyrighted digital audio files, piracy conceals the diversity of practices it names, ranging from copying practices that recording industries simply don't like, to unauthorized file-sharing online, to the unauthorized sale of MP3 CDs on city streets, to unauthorized webcasting, and on and on. For the purposes of this chapter, I will refer to a specific activity such as peer-to-peer file-sharing when there is one, and use *piracy* to denote a range of unauthorized copying and distribution practices considered collectively (rather than issuing a long, drawn-out



list each time). The key attribute here is *unauthorized*—the activity may be legal, moral, or appropriate to its context or it may not, but that is a separate matter. Even here, there is an ambiguity. The recording industry may treat file-sharing as unauthorized, but as we will see, the consumer electronics and broadband industries clearly profit from it and de facto authorize it. Piracy may not itself always be an economic activity, but it enables all kinds of other market activities.

Viewed from the litigious wing of the recording industry, piracy is a dangerous, antimarket force. But as I will argue, the mass piracy of music was actually quite productive as an economic force. Record companies may view mass copying as a threat to capitalism, but copying generates all sorts of value for other industries like consumer electronics, broadband, and even other kinds of intellectual property, like the patents on MP3s. Piracy also reveals and calls into question the social organization of music. “In many parts of the world, media piracy is not a pathology of the circulation of media forms but its prerequisite,” writes Brian Larkin in his study of film in Nigeria.

Piracy and the wider infrastructure of reproduction it has generated reveals to us the organization of contemporary Nigerian society. They show how the parallel economy has migrated onto center stage, overlapping and interpenetrating with the official economy, mixing legal and illegal regimes, uniting social actors, and organizing common networks. This full flowering media, and the infrastructure it relies on, presents a stark contrast to the state sponsorship of media in the colonial and early postcolonial era. Now political control exercised through the governmental, pastoral care of developmental media has been replaced by an economy shorn of its political objectives.<sup>8</sup>

Larkin’s point about Nigeria could be generalized to the global record industry with just a little substitution: international intellectual property regimes and trade agreements in place of a developmental media, and a corporate regime that stood outside that transnational regulatory sphere. The worldwide proliferation of MP3 files announces the end of the artificial scarcity of recorded music, but it does not guarantee a more just or democratic organization of music. It simply reopens the organization of music—and the infrastructure that supports it—as a social question. The traffic in MP3s thus brought to elite economies a set of questions that had been more commonly asked in the developing world.

## Some Different Kinds of Musical Things

The argument over whether music is a thing and what that might mean has a long history in the scholarly study of music, though it is often found at the margins of what we now call *music studies*. The debate most often wells up in response to industrial and technological transformations. One tradition considers music as a social practice and process that may produce artifacts but is not itself something that can be objectified as a thing, except as a kind of reduction. Meanwhile, writers who refer to music as a thing may refer to its technologized forms, its status as a commodity, or its essence as a work independent of any particular performance. Against these definitions, I consider music as a bundle of affordances, thus borrowing some of the process language and some of the thing language. To clarify my argument here, let’s consider some of the other, better-known positions on whether music is a thing.

### TECHNOLOGY

Unsurprisingly, writers who focus on music’s technologization tend to tell their story as a series of landmarks, indicated by—for instance—the invention of notation in the ninth century, the invention of movable type for musical printing in the sixteenth century, the invention of sound recording and radio in the nineteenth century, and the digitization of music at the end of the twentieth. In such a scheme, the “condition of music” is a technological condition. Technological change remains an important historical signpost for marking major shifts in the form and matter of music, even if it doesn’t simply cause historical change in music. Scholars often use each stage of music’s thingness as shorthand for different social relations of and around music. Chironomic notation—the diacritical marks one finds, for example, in Hebraic chants—and the notation that arises in the ninth century clearly embody and enable different orientations toward music-making. The former is a mnemonic device, the latter is not. The changes to Western music that we associate with these kinds of transformations were not immediate or causal—they happened over time. The modern sheet music industry did not appear out of thin air the moment it became possible to print sheet music on presses using movable type at the beginning of the sixteenth century. It slowly formed over the next three centuries alongside a new kind of domestic amateurism and new forms of patronage and profitability for composers.<sup>9</sup>

Recording also follows this pattern. In the chapter of *The Recording Angel* from which I have borrowed my chapter title, Evan Eisenberg argues that music became a thing not with the invention of sound recording but with the development of the recording industry and prestige records like Victor's Red Seal line in the early twentieth century. "Whereas dances, recitals and soirées remained slippery ground for the bourgeois, records brought music to his home turf, which was acquisition."<sup>10</sup> For Eisenberg, music is a thing because it is a commodity; the technological fact of sound recording is necessary but in itself insufficient to objectify music. Later in the chapter he writes, "When I buy a record, the musician is eclipsed by the disk. And I am eclipsed by my money—not only from the musician's view but from my own. When a ten-dollar bill leaves my right hand and a bagged record enters my left, it is the climax. The shudder and ring of the register is the true music; later I will play the record, but that will be redundant. My money has already heard it." Ten years ago Eisenberg's \$10 for a record would be charmingly dated. As I write, many albums (if not records) are again available for \$10, which speaks to a host of changing economic and cultural formations. But Eisenberg's point remains salient. Relations that once existed between musicians and audiences were transformed into relations among cash and records. In other words, relations among people became relations among things.<sup>11</sup> The current recording economy breaks music into units that can be owned, sold, or loaned.

There are many possible implications of commodification. Some writers of a certain anthropological (or at least ethnographic) bent may understand and lament music as a process that is compromised in its objectified, recorded form. For instance, Charlie Keil writes, "I have nurtured a deep ambivalence, at times masking outright hostility, toward all media for many years. I treat records badly; they aren't real music." Although Keil treated media with more care and sophistication in his scholarship than in his record and tape collection, the question of what to do with recordings has been an ongoing source of anxiety since the first vexed encounters between sound recording and the study of music.<sup>12</sup> Keil's problem with notation, recording, and industrialization is quite simply the containment, fixing, and instrumentalization of this process. Writers like Keil and Christopher Small have argued that we are so deep into this system of objects and objectification that we have forgotten how to think about music as a vital force in life, one driven by involvement and participation, and this forgetting has

limited the possibilities for ourselves and for a more just and egalitarian world.<sup>13</sup>

## PROPERTY

Keil and Small's argument can be extended to a critique of copyright as such. While property talk has suffused most discussions of the products and processes of creativity, intellectual property isn't really property. Simon Frith writes, "In the music industry itself, a song—the basic musical property—represents 'a bundle of rights'; income from the song comes from the exploitation of those rights," and the relevant rights in the bundle can change over time. There are the rights to sell the music, but also secondary rights like licensing fees from other users, for instance, when a song is used in a film soundtrack.<sup>14</sup> These rights, which are really rights of circulation, are the basis of the value of the commodity. A copyright, patent, or trademark may appear to refer to a concrete thing, but this analogy quickly disintegrates. As Majid Yar argues, intellectual property talk enacts a "myth of equivalence between tangibles and intangibles." It is more accurate to describe intellectual property as a temporary trade monopoly guaranteed by a state. Copyright is not outright ownership to begin with—it expires. The notion of the song as intellectual property converts a trade relationship—the temporary but exclusive right to copy—into a quality of the thing, where no such quality (and possibly no such thing) exists. From this perspective, mass file-sharing threatens not just specific properties, but the very legitimacy of the recording industry's monopoly of distribution. In a way, the property argument is a ruse, since supporters of the existing intellectual property regime often seek to extend the domain of property rights, to make this equivalent to "a natural, unquestionable right to control, use and decide upon the dispersion of property." In the world of tangible property, a vendor cannot assert any control over my use of a product once I purchase it. Mattresses sold with tags that say "it is illegal to remove this tag" are the subject of countless bad comedy skits, and most customers would balk at chairs that came with user agreements regarding where they could be sat upon, or musical instruments that came with a list of allowable genres and venues for the musicians to use them in. When it comes to digital files, the name intellectual property conceals a wide number of strategies for restricting use and circulation through contracts or trade monopolies. To use Siva Vaidhyanathan's terms, we would be better off talking about intellectual "policy" than intellectual "property."<sup>15</sup>



Some industries have attempted to convert their desire for control over circulation from an ideological project to an engineering project. Digital rights management (DRM) schemes neatly illustrate how intellectual property is really an attempt to enforce a trade monopoly. Digital rights management most often takes the form of encryption, so that a digital file won't operate in a given hardware or software system unless it meets certain criteria, for instance, that the system is officially sanctioned, or that a user code has been entered to show that the owner paid for the file. It may also work as an attempt to prevent copying, for example, by scrambling the output of an audio or audiovisual device when hooked up to a recorder. Although the term *DRM* is new, the practice is old. When the global cassette industry was threatened by mass unlicensed duplication, it attempted to create media that only sanctioned dubbing houses could write onto (basically re-creating the artificial scarcity that existed with LPs). Digital rights management is about asserting control over an economy by force when law and custom are not enough. But *DRM has been both a technological and a cultural failure*. Its technologies are routinely circumvented, and *DRM undermines legitimate rights that users may have since it cannot, for instance, distinguish between fair use and other kinds of uses.*<sup>16</sup> It is therefore not properly understood as a conservative or status quo technology, but a *reactionary one, since it erodes users' legitimate rights* in the service of extending effective trade monopolies.

#### IDEALIZED WORK

The "it's not really a thing" line of reasoning is not the only ground for the critique of music's technological or juridical objectification. Adorno also had a profound ambivalence toward media in the form of recording, radio, and scores, but he believed that music existed as a different kind of thing. In his unfinished manuscript, the *Theory of Musical Reproduction*, Adorno considered notation to be "the notation of something objective, a notation that is necessarily fragmentary." Musical reproduction presupposed "the existence of works that are fixed through writing and print, and thus independent precisely from empirical music-making. The end of improvisational practice, the work's attainment of independence and its separation from interpretation at once instigate its self-sufficiency. *The work can only be rendered once it is estranged.* Interpretation, as an autonomous form, is necessarily confronted with its contradiction, the autonomous musical construction."<sup>17</sup> This quote is notable precisely because the tone

is so strikingly different from Adorno's more famous laments about radio and recorded popular music. *Here, he takes for granted that there is something like a work of music that exists independently of its performance.* It might be tempting to view him as the product of a particular industrial-technological regime: symphonic music, concert performance, sheet music, and patronage of composers by states or elites. But we should keep in mind that the main ingredients of Adorno's notion of music were already present in Pythagoras, Plato, and Aristoxenus. In this tradition, music may have an existence independent of its notation, capture, and storage in a physical object, or its insertion into a money economy.

#### BUNDLE OF AFFORDANCES

Although Adorno would find awkward company in the figure of Martin Heidegger (as do I), there is an affinity between them around the status of things. Heidegger argued in his essay on "the thing" that *things are things because they offer people affordances by virtue of their presence.*<sup>18</sup> A thing lets you do something that you could not otherwise. Heidegger's key example is a jug. A jug can hold liquid, which can then be poured out at the user's will, so long as the jug is ready-to-hand. In this arrangement, a picture of a jug on television won't do if you've got a garden to water.<sup>19</sup> On the other hand, a digital recording will do just fine in many cases when you've got music to hear.

Considered outside the realm of technologization and commodity exchange, the thingness of music has also been framed in terms of its affordances, which are largely about the well-being of subjects and societies. Plato wrote that "a change to a new type of music is something to beware of as a hazard of all our fortunes. For the modes of music are never disturbed without unsettling of the modern fundamental political and social conventions." The medieval church's prohibition of certain modes and Martin Luther's adage that "music is a fair and glorious gift of God" are opposite inflections of the same proposition that *music is a divine gift meant for worship. Adorno's derision of the hit song was based on his belief that the massive symphonic work presented its listening subject with an opportunity to apprehend the totality that lay behind the fragments that capitalism presented to the senses.*<sup>20</sup> We need not accept Platonic, Christian, Heideggerian, or Marxist moral precepts to grasp their great insight into music. *If music is a thing, then it is for something,* and that affordance is both the substance and the object of critique.



Digital data have a materiality even though they are not available to unaided senses. A digital song takes up space on the platter of a hard drive or in the channel of a DSL connection. In a review of Traktor, a software DJ program, Philip Sherburne pauses to note that digital audio formats and their manipulation on computers reflect "the ongoing dematerialization of music (or perhaps a better term would be 'micromaterialization' since even MP3s live in silicon, invisible as they may seem)."<sup>21</sup> So MP3s remain things but in a special way. In his jug example, Heidegger notes that the jug does its holding through the void created by its walls and base: "the empty space, this nothing of the jug, is what the jug is as holding vessel."<sup>22</sup> Like the jug, the MP3 is defined by the interior space that it creates. The MP3 is a container technology.<sup>23</sup> All communication technologies can be considered as container technologies, but the MP3 is a special kind. For most of this book, I have considered the space inside the MP3 as an attempt to fabricate a medium adequate to the spaces left by the gaps in the hearing subject. In its conception, the MP3 holds only the sound that can be heard; it discards the rest and attempts to hide its own excesses. But the MP3 is also a container for recordings—records, CDs, and so forth. It is a container for containers for sound, and it codes the space within itself. To borrow a phrase from Lisa Gitelman, new machinery is constantly interposed into recording.<sup>24</sup>

Lewis Mumford first wrote in 1966 that technology scholars' emphasis on tools over containers overlooked containers' equally vital role.<sup>25</sup> He postulated that one reason why container technologies are often neglected in the history and philosophy of technology is that they are usually coded as feminine. While the gender coding may be a bit dated, Mumford did have a point about activity and passivity. More recently, the feminist scholar Zoe Sofia has picked up Mumford's thread. She qualifies Mumford's argument, positing that even though the container category may be considered feminine in some cases, container technologies may in fact be as connected with men as with women.<sup>26</sup> Sofia argues that the misogyny story is only part of the explanation for the neglect of container technologies: "to keep utensils, apparatus, and utilities in mind is difficult because these kinds of technological objects are designed to be unobtrusive and . . . make their presence felt, but not noticed."<sup>27</sup> An MP3 is useful but does not call attention to itself in practice. It takes up less space than other kinds of digital recordings, and when it is listened to, it is experienced as audio and not as a file format. Mumford and Sofia both use the term "apparatus" to describe

a container that transforms as it holds.<sup>28</sup> The MP3 clearly belongs to this category, but it differs because it holds other containers. Like an oven that holds a casserole and transforms its contents, the MP3 is a holder for sound recordings. It is a media technology designed to make use of other media technologies.

When an encoder makes an MP3, two things happen. It shapes the audio in the file in relation to a model of experience based on the history and culture of sound recording, as we have already seen. But it also places the audio in a definite economy, both within the file and in relation to other MP3 files. Like the jug, the space inside the encoder makes the audio ready-to-hand for users. Less like the jug, it manages the conditions under which that readiness-to-hand occurs and requires an ensemble of other technologies. At a formal level, this is totally unremarkable. The MP3 is yet another in a long line of storage formats that, with the aid of other equipment, allow recordings to be managed and played back. The difference is that the MP3 allows for audio to circulate in ways that it otherwise couldn't. It takes the temporalities of recording and subjects them to a new set of possible paths of circulation.

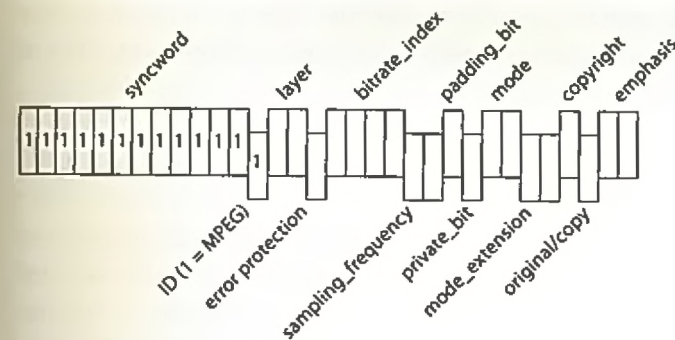
For all this, we would be wrong to see this as a quality inherent in the technology alone. Users can only experience music's readiness-to-hand in use, and they may only become conscious of it when it breaks down. Only when MP3s actually store music, circulate, accumulate on hard (or flash) drives, or play back through headphones or speakers do they make music ready-to-hand.<sup>29</sup> Only when the playback technology is not up to its task do users take note of its contours, and MP3s fail a lot less often and in many fewer contexts than records, CDs, or tapes. The MP3 player may run out of batteries, but the format itself is much more robust in everyday use than its larger cousins. In use, whether on computer networks or in some portable form, the format much more effectively makes music more ready-to-hand than even the relatively durable and portable cassette. As Michael Bull writes, "The carrying of large slices of one's musical library in a small piece of portable technology liberates users from the contingency of mood, place and time, making redundant the contingencies of future moods and circumstances."<sup>30</sup> Again, it is not the technology but the act of carrying that "liberates."

Even though this aspect of MP3 use belongs more to the realm of practical reason than formal reason, we can understand a bit of its contours by considering how the MPEG protocol presupposes certain kinds of relation-



ships, and allows for others, as well as the ways in which the actual historical development of the MP3 as a technology of circulation superseded this code. The code carried in MP3s and the historical trajectory they have followed appear to have increased the number of things that “go with” music—and this is one of the key nonsonic aspects of the MP3’s thingness.<sup>31</sup> Now the music lives in its recorded container, which is enfolded into another container. Every MP3 is divided into frames, and every frame conforms to an arrangement of bits specified in the MPEG standard. Each frame is divided into a *body* that contains information correlated to the sound waves the playback software and hardware will reproduce. The audio data in each frame represents 8 ms of audio (at a 48 kHz sampling rate). Each frame also contains a *header* that is information about the information in the body. Although one might assume the intent behind such basic coding is purely technical, it was clearly ideological in its attempts to represent existing and hoped-for delivery formats and industrial structures in every frame of every MPEG audio file. Just as we can analyze a film or song for the world-views it contains, so too can we analyze a header. As Wendy Chun puts it, “In our so-called postideological society, software sustains and depoliticizes notions of ideology and ideology critique. People may deny ideology, but they don’t deny software—and they attribute to software, metaphorically, greater powers than have been attributed to ideology.” The code just is. It speaks to the machine in ways we can’t and in ways to which we do not attend.<sup>32</sup>

In figure 28, each block represents one of 32 bits that make up the header. The first eleven are used for syncing the frame with all the other frames in the stream. Since one of the original purposes of the MPEG standard was to render audio suitable for digital broadcast, it required that a receiver could at any point tune into the data stream and “find” its place in the playback. The header also identifies which version of the MPEG standard the file conforms with; the bitrate of the file; the sampling rate at which the audio should be played back; whether the audio is coded according to layer 1, layer 2, or layer 3 (MPEG-1 only); and so forth. But three of the bits in the header provide clues as to the world for which the MPEG format family was designed: the private bit, copyright, and original/copy. The private bit was reserved for third-party applications, for instance, if the frame in the file would trigger some kind of event. The copyright bit does not hold any copyright information but simply indicates whether it is permissible to copy the



28. MPEG header syntax. Source: Pan, “A Tutorial on MPEG/Audio Compression,” 68.

file, according to the people who created the file: set to zero, the audio is copyrighted; set to one, the audio is not. The original/copy bit set to zero means “copy of original media” and set to one means “original media.”<sup>33</sup>

The existing and hoped-for technological forms of music in 1991 became the model for the MPEG standard.<sup>34</sup> The commodity forms of music—as recordings for sale, as something provided by a central broadcaster—were written into the code. As Karlheinz Brandenburg explained: “You will find two bits in the header which duplicate the interior copy management scheme introduced for DAT (digital audio tape) and CD recording. Two bits saying whether it is copy protected or not, and if it is whether it’s the original or the first copy. The idea is that then equipment wouldn’t allow an additional copy to be made of something that had already been copied.” But no software ever looks at these bits, and even if it did, the scheme would be easy for users to circumvent.<sup>35</sup> There was no internet in 1991 as we currently understand it. The MPEG audio standard was conceived in terms of emerging delivery systems of the time, which were all freestanding hardware devices or devices that were part of a closed network like the relays between remote reporters, a central radio studio, and a broadcast tower. If an MPEG audio player was going to be like a radio receiver or a CD player or a digital audio tape player but with a hard drive, then it would be possible for such simple measures to be effective deterrents against users making copies that copyright owners did not want to be made. In fact, it would have been more difficult to copy MPEG audio than it was to make a tape of a radio program or a CD, for instance. Like Heidegger’s jug, the inside of an MPEG file is an affording space. In coding and tasking the divisions within its void, the

MP3 file shapes both the sound of the material within it and the form that material takes. It recognizes the music's status as a commodity and tries to preserve it, however daintily.

#### How MP3s Became Ubiquitous

As the header story illustrates, MPEG may have intended to preserve and promote one kind of media system, but its formats succeeded in very different ones. The MP3's rise to global preeminence was a product of contingency, accident, and opportunity. Its affordances harmonized with other, broader cultural, technological, and political forces in the 1990s. The MP3 would proliferate thanks to file-sharing, thanks to a motivated computer and consumer electronics industry, and thanks to a series of happy accidents that put the format in the right place at the right time. The standard had to be set, then sold, then used. **It was not the copyright bit that determined the MP3's historical significance, but its amenity to being copied and shared.** MPEG initially split its audio into layers to broker an industrial compromise among competing interests. Layer 2 was backed by major companies like Philips and Panasonic. Layer 3 was the result of collaboration among Fraunhofer, Thomson, and AT&T. Once the MPEG standard was set, competition that had been somewhat mediated by the organization spilled entirely outside it. Given the much greater power and influence of layer 2's backers, we might have expected layer 2 to win the day in the marketplace. By some measures, it was a wonder that layer 3 became a successful commercial format at all, much less a household name.

Shortly after the establishment of the MPEG standard, layer 2's backers scored two quick victories. The format was chosen as the specification for the two key emerging applications of digital audio that were known at the time: audio on video compact discs and stereo digital audio broadcast, which included satellite radio, terrestrial digital radio, and satellite TV. From these two adoptions alone, there are hundreds of millions of layer-2 systems in use to this day. Each early adoption of the layer-2 standard made it increasingly difficult for layer 3 to get into the business. The Fraunhofer engineers grew progressively more worried. Here's Karlheinz Brandenburg: "In 1992–1994, the main focus was to find companies who would really use this MPEG audio layer 3 and with the exception of some professional applications in the first year, layer 3 was out of luck. Everybody else decided to go with layer 2." Harald Popp added: "We were very afraid that it would wind

up a paper tiger. In the video market there were much better video systems and in the end they did not succeed and VHS made it, so we very often heard . . . 'you did a great academic job with a highly complex algorithm—yes, it works well in the labs but in real-world applications it's not really useful.'"<sup>36</sup>

A phenomenon called *path dependency* helps to explain the importance of early victories in the development of media formats and standards. Once manufacturers and users adopt a system built around a certain standard, the standard becomes a self-reinforcing phenomenon. Both manufacturers and users have interests in the persistence of the standard (or "path"), since a change in standard means a transformation in manufacturing equipment and sometimes major purchases for users. **So the potential advantages of a new standard have to outweigh the cost for either manufacturers or users.** If manufacturers decide to eliminate an old standard, like the floppy drives on computers or vinyl records, they can push a large swath of users into line over time. As we will see, users can exercise a similar power over manufacturers in some cases.<sup>37</sup>

Path dependency can also define the limits of a technological system. If companies build a successful radio network or millions of video compact disc players that all work according to the layer-2 standard, it is quite likely that the standard will persist for the life of the format and that devices conforming to the standard will be more appealing to users, even if a "better" technology comes along. In fact, this is exactly what happened with digital audio broadcasting. Layer 2 was initially adopted in 1993. In 1995, when major players in European Digital Audio Broadcasting met to reevaluate their decision, they decided to stay with layer 2, mainly because they had already been working with it for three years. **Arguments about efficiency and similar sound quality at lower bitrates were less relevant than the hassle of retooling entire technological systems.** Harald Popp called it "one of those battles we lost at the time."<sup>38</sup>

While Philips was securing the markets for traditional broadcast and audiovisual applications, Fraunhofer sought out other opportunities to commercialize layer 3. Popp and Brandenburg developed a slide presentation that they took on tour to electronics shows, to corporate boardrooms, and to meetings of organizations interested in the development and promotion of digital audio. Layer 3 did manage some sales. Fraunhofer built a few ASPEC-branded coder boxes to help sell the concept (see figure 29). The self-proclaimed first commercial application for MPEG audio was by Telos Systems in 1993, a Cleveland company that manufactured a box called the





29. The ASPEC audio codec. This version was built after the MPEG standard was set as an early attempt by Fraunhofer to market MPEG layer-3 audio. Image copyright © Fraunhofer IIS. Used with permission.

Zephyr. The Zephyr realized one of the original goals for MPEG audio: it digitally transmitted voices in real time over ISDN lines. The Zephyr and its descendants are used for remote telephonic connections in radio broadcasting—for instance, for call-in shows or shows from temporary remote locations. Telos also teamed up with Macromedia to develop an alternative to RealAudio for streaming web audio.<sup>39</sup>

Layer 3-technology was also used for a short-lived music-on-demand-via-ISDN service by Deutsche Telekom and a slightly longer-lived one in Britain. Cerberus Sound and Vision, the British service, first appeared in the news in 1994, and in some ways prefigures more modern online schemes for selling music. It consisted of proprietary coding and decoding software, complete with a copy protection scheme. Customers would dial in to a server through their modems and download songs that they could play back on their computers. Although originally scheduled for launch in 1994, Cerberus could not come to an agreement with major labels, and the service finally went live in 1995 with a catalogue of entirely independent-label music. By 1997 the service had signed deals with EMI and the Harry Fox Agency, which handles music licensing in the United States. That same

year, they began a “virtual pressing plant” initiative, through which labels could transmit music digitally to kiosks in record stores, where people could audition music and have it burned onto a CD on demand.

Fraunhofer had other success as well. It signed a contract with a German jukebox company, NSM Music. WinPlay3, a Windows application that could play MP3 files, made it easier for home users to try out the technology on their own PCs. In 1995 Fraunhofer reached an agreement with Microsoft to include the MP3 specification in applications that came bundled with its operating system; in 1996 it first appeared in “Netshow,” a predecessor of Windows Media Player. In 1997 Fraunhofer signed a deal with Worldspace, a satellite-broadcasting initiative. Apple’s QuickTime had MP3 compatibility by 1999. But apart from the software deals (and then only a few years down the road), none of these deals were of an industry-changing nature. They were business plans that operated within the parameters of existing schemes for making money from sound technology such as broadcast, software playback, auditioning in record stores, jukeboxes, and the direct purchase of recordings. Had layer 3 remained in these niches, it would simply have continued to tread water in the crowded pool of digital audio formats. It would have had little industrial or broader cultural importance.<sup>40</sup>

During this period, Fraunhofer devoted a lot of effort to marketing. Harald Popp, who had come to Fraunhofer as an engineer, switched over to marketing and authored a FAQ on MPEG layer 3. The version of the FAQ from December 1996 is mostly concerned with describing possible applications. It lists music links via ISDN, digital satellite broadcasting, audio-on-demand, audio-on-the-internet, recording studio equipment, sound on CD-ROMs, and sound on solid-state memory (like RAM) that could then be put in portable players. Where it did not have commercial takers or enough resources on its own, Fraunhofer engaged in proof-of-concept applications. It built a solid-state MP3 player that could play back one minute of audio. Although one minute isn’t useful for much, Fraunhofer assumed that increasing computing power and storage capacity would eventually allow such a player to be bigger and more powerful. Another proof of concept was a pair of command-line programs called L3Enc and L3Dec, released in July 1994 and priced at \$250 (this was before WinPlay3 became available). Fraunhofer also released a shareware (initially free) version of the programs that would allow users to encode and decode twenty seconds of stereo audio, as a sort of test-drive for the more expensive version. An Australian hacker acquired L3Enc using a stolen credit card. The hacker then reverse-engineered the

software, wrote a new user interface, and redistributed it for free, naming it "thank you Fraunhofer."<sup>41</sup>

But in 1994, there was no such thing as an MP3, and there were only small communities online dedicated to file-sharing. The Internet Underground Music Archive, founded in 1993, was dedicated to allowing unsigned bands to post their music and download other bands' music. Today, IUMA is hailed as the first major player in online music distribution. It was later purchased by eMusic, a company in California that was one of the first online stores that successfully sold MP3s via download. The IUMA started out using the layer-2 specification, but switched to layer 3 after "thank you Fraunhofer" and WinPlay3 became available in 1995.<sup>42</sup> For the subculture of hacking and file-sharing developing in the 1990s, layer 3 had one significant advantage over layer 2 because it provided higher quality at lower bitrates and lower file sizes. In 1994 most internet users were still using dial-up connections, and variations of even a few kilobytes made a big difference in terms of how long it took to upload or download a file. In 1993 and 1994, it would probably have taken about a half hour to download a single song encoded as a layer-2 file, while a DSL, cable, or 3G connection allows the same download to occur in seconds today. (Given computers' storage capacities at the time, file size was also a major concern for early users.) With the "thank you Fraunhofer" hack, layer 3 was also free to use, which meant that users who had some technical facility could simply acquire the software and start converting their digital audio files into layer-3 recordings that they could then upload to sites set up for the exchange of files.

There was also the matter of the name. "MPEG-1 audio layer 3" does not roll off the tongue, and as Fraunhofer got more involved in marketing its scheme to users as well as to companies, it realized that it needed a different name for its file format. After considering generic names like ".bit" and ".son," a vote among people at the institute resulted in the adaptation of "MP3" as the name for the file format. An e-mail from Jürgen Zeller to the rest of the organization on 14 July 1995 announced the result and urged "for WWW pages, shareware, demos, and so on, the .bit extension is not to be used anymore. There is a reason for that, believe me."<sup>43</sup> The name served several functions at once. It promoted Fraunhofer's technology; it made uses and applications easier to track; and it concretized the format in the minds of users. An MP3 was a thing, like a .doc or a .pdf. Naming the format helped demystify and make banal digital audio for users: your word proces-

sor documents are .docs, your spreadsheets are .xlss, and your music files are MP3s.

The relative absence of innovation in the mainstream recording industry is crucial to the MP3 story. Most labels ignored the potential of online distribution, and as late as 1998 many companies did not have any staff assigned to monitor the internet. The retired police officers who made up the RIAA's antipiracy enforcers were more likely to troll flea markets for cassettes than websites or newsgroups for files. Apart from a few scattered and tentative forays into online marketing, it appears that the Recording Industry Association of America's first major engagement with online music distribution was a lawsuit in 1997 against illegal FTP sites. A year later the RIAA and complainants filed suit against Diamond Multimedia, whose Rio device was one of the first commercially viable portable MP3 players. The RIAA won the FTP case (which was in many ways a dry run for the more famous Napster case a few years later) but lost the suit against Diamond.<sup>44</sup> In other words, its first action regarding the online distribution and digital copying of music was to try to make it stop. The recording industry's inaction until 1997 is a key part of the story because it allowed other industries to develop and organize the online music environment according to their needs. The recording industry may or may not have been able to shape online distribution to its liking in the 1990s. But while it did experiment with online sales and distribution, the lack of a coherent strategy and its litigious attitude toward file-sharing guaranteed that other industries would shape the environment.

MP3 music is thus a classic case of transectorial innovation, a process whereby "new technologies are no longer confined to a single application, to a single sector; they are disseminating and interpenetrating the whole economy." Technical innovations in one industry may have massive effects in another because of the vast interconnections among technologies and standards. The phrase *transectorial innovation* comes from economics and social studies of technology, to provide a language for discussing the ways in which innovations in one area may cut across another. In studies of sound technologies, the phenomenon was first noted by Paul Théberge, because digitization led to the subordination of the music instrument industry to the computer industry, a phenomenon that perseveres today. Théberge was interested in synthesizers, but the phenomenon he noted has now suffused almost every kind of music-making or editing technology (apart from high-



end markets in several fields that specifically distinguish themselves as “analog,” “boutique,” or “hand-wired”), especially if we include their manufacture in our considerations.<sup>45</sup>

In its formative years, online music was not the province of the recording industry, which had hitherto done a fairly good job of controlling its distribution channels. Online music—which was at its core a mode of distribution, a relation to infrastructure—was instead the province of companies like Fraunhofer and Philips, Microsoft and RealNetworks. It was dominated by manufacturers of computers and consumer electronics, providers of broadband internet, software companies, and startups dedicated to some aspect of online distribution.<sup>46</sup> As the internet grew in size and scope, this posed more of an economic and social problem for the recording industry. The industry had already lost control over distribution in some parts of the developing world during the heyday of cassette recordings, but now the multinationals were losing ground on their home turf. For generations who grew up after prestige records became the norm in the first decades of the twentieth century, there were relatively few channels of musical distribution: labels, record stores, radio, television, the mail, hand-to-hand. With the exception of the mail and hand-to-hand, users had little chance to distribute music themselves and benefit from that distribution. Because it presented an alternative, especially in these early years, file-sharing betrayed the social character of musical exchange to its users, putting the recording industry’s privileged position directly into question. The internet was a space of circulation where the record industry did not assert its dominance, and in that moment, file-sharing served synecdochically to call into question the industry’s dominance tout court. If Eisenberg’s exchange of money for records hid the social relations of music from him, the absence of that particular economic relationship, the opportunity to acquire recordings in some other fashion, could illuminate music’s social character.

The term MP3 entered into wide journalistic use in reference to sound recordings for the first time in 1997 and really took off in 1998. Before that, a few scattered articles mentioned other computer software and hardware schemes that used the name MP3, a multipurpose plow that hitches to horses, and a United States Air Force space and missile systems center which had an “MP3”—a “Manufacturing Problem Prevention Program” (let us hope this last one was effective).<sup>47</sup> The MP3’s popularity as a new topic roughly coincided with a sea change in online file-sharing between 1995 and 1997. The MP3 became a popular format for putting music on hard drives

and sharing on the internet thanks to the crack of L3Enc and its later inclusion into applications that came bundled with PC and Apple operating systems. College campuses in the wealthier parts of the world (especially the United States and Canada) began to wire their dormitories for high-speed internet connections, bringing many more students online, and cable and telephone companies started to offer high-speed broadband internet as part of their consumer services in some communities. Broadband became increasingly common at large institutions like universities (which were hubs for file-sharing in the late 1990s) and eventually began to expand in the consumer market, though it did not really take off as a product for home users until the 2000s.<sup>48</sup> CD burners also began to drop precipitously in price (from initially over \$10,000 to under \$1,000), and by 1997 were an option on consumer-grade computers. It was possible for anyone with a few hundred dollars to purchase a CD burner, and by converting CD files to MP3s, a user could place over one hundred songs on a single compact disc. Unauthorized CDs containing MP3s started to appear for sale on the streets of major cities around the world. But the rate of estimated music piracy in the United States actually decreased between 1993 and 1997, despite the availability of new digital tools. This was likely because most internet users did not yet view it as a medium for the distribution of music. At the time, a 2-megabyte MP3 was still considered a relatively large file, both in terms of the hard-drive space it took up and the bandwidth it required (and therefore the time it took to upload and download on a slow dial-up connection).<sup>49</sup>

When I interviewed Brandenburg, he cited 1997 as the turning point at which MP3 became a mass phenomenon online:

In 1997 the elements were forming. We already heard earlier that in the USA students at colleges and universities played around with MP3 and put their music on the university servers using MP3; we had the licensing contract with Microsoft in place who wanted to put it into the Media Player attached to the operating system; we had the first consumer electronics application in view with the WorldSpace application.

In mid-1997 there was the first legal action of the RIAA against illegal FTP sites at universities and there was an article about that in *USA Today*—think that was clearly a moment when everybody knew about it and everybody wants to use it and this can’t be undone. It was the same year that we tried to get into closer contact with the music industry to

make them aware of the format saying, “Look—you have to be careful what you do next because there is something rolling that is running in the way people want it.”<sup>50</sup>

At the same time as these developments, a number of commercial and unauthorized ventures combined to help promote the MP3 format. In November 1997, a Hungarian fan with a prerelease promotional tape made clips from U2’s *Pop* album available online prior to its release. By January 1998, music by Van Halen, Metallica, Eric Clapton, and Madonna appeared on the internet before its official release. The site MP3.com was launched in October 1997. It began as a clearinghouse for information on MP3 and internet music and quickly morphed into a massive distribution service for artists who signed a nonexclusive agreement with the site, meaning that they retained many more rights than artists who signed recording and distribution contracts with major labels. The site’s revenue was generated from banner ads and sales of consumer data to clearinghouses like DoubleClick. Until a lawsuit stopped them, MP3.com also provided an online streaming service for its users’ collections. Users would deposit MP3s in online “lockers” and then be able to access their music anywhere they were online. The service did not actually allow for downloads, and users had to “prove” they owned the music by inserting the relevant CD in the CD-drive of their home computers. Meanwhile, eMusic (formerly “Goodnoise Corporation”) experimented with a subscription-based service where users would pay a monthly fee to download tracks in MP3 format from the eMusic.com site. As 1998 opened, MP3 was the second most popular search term on the internet, second only to pornography. By 1999 MP3 was the most popular search term on the internet. August of that year saw the public launch of the file-sharing service Napster.<sup>51</sup>

By the time Napster appeared on the scene, online file-sharing was well established. Its main innovation was the interface, which made it easier and faster to share more music with more people. Napster was a single, massive, synthetic database of recordings that could be searched by keyword. Users who downloaded the client software and logged in would make the music on their hard drives available to other users through the database. They could also search the database and potentially download music from the millions of other users logged in at the same time. Napster claimed that over 28 million people downloaded its software, though other estimates place the number of users closer to 7 million. Either way, the company be-

came incredibly valuable as a property despite its lack of revenue generation. Napster didn’t sell anything: not ads, not user information, not subscriptions. Its value was generated by its user base, upon which investors assumed they could cash in at a later date. The RIAA saw Napster as a threat and sued to shut it down in April 2000. After a string of cases and appeals, along with a dwindling user base (and with it dwindling investor interest), the company filed for bankruptcy in 2002. Other less traceable software protocols emerged in the wake of the Napster shutdown. The people who built Aimster, Gnutella, and BitTorrent all learned from Napster’s mistake and skipped the centralized database part of the program, thereby creating a massive swarm of users who shared files directly and anonymously with one another. Individual IPs could be traced, but the whole system was difficult to shut down. Today, sanctioned search engines like Google are almost as effective for finding pirated material as specialized torrent sites like the Pirate Bay.<sup>52</sup>

Although there exists a long-standing debate regarding the actual cost of file-sharing to the recording industry, it is clear that the massive boom in file-sharing between 1998 and 2001 is the moment when MP3 became the dominant sound format online and for pirated music. This feeds into the usual story that is told about the format’s dominance: the MP3 was destined to come to dominance; it only needed the right helping technologies in place—broadband internet, CD burning, sound cards, and portable audio players. In an interview, Fraunhofer’s Harald Popp characterized it as almost epiphenomenal, as though MP3 was swept up in an unstoppable technological revolution:

[Piracy] made MP3 the breakthrough format on the internet. There’s no question about it. Sometimes I think people in the music industry had some nasty thoughts about MP3 but we were never approached by the industry with criticisms about killing the music industry—those were headlines from the press but not the music industry itself. The real challenge is not MP3 but the internet—and it still is the internet. This is the thing that traditional businesses, media businesses, music businesses and video/movies as well have to think about—the availability of the internet and computers in every household. This is the challenge and the opportunity. It’s not MP3—that was always our clear answer: “MP3 was just a catalyst. If it was an ISO standard it could [just as easily] have been a proprietary scheme.” The technology is out there and you cannot



avoid some audio compression—we were very happy that the appearance of MP3, when it took off, that people took MP3 to code their music and use it. Of course, in such [cases] you are sometimes violating the law, and that's not good, but that is just an aspect of a technical revolution.<sup>53</sup>

The Fraunhofer patents now bring in over 100 million euros a year in revenue—the MP3 patents are the company's main revenue stream. Their value derives from the MP3 format's ubiquity. But this ubiquity is the result of a confluence of sanctioned and unsanctioned markets. Even though the MP3's growing proliferation depended on the emerging infrastructural preeminence of the internet, the growth of broadband was necessary but not sufficient for MP3 to become the most common format for recorded audio. Fraunhofer did what it could to establish the possibility of path dependency in computer operating systems and consumer electronics.

#### Fissures between Industries: The Political Economy of Piracy

Piracy was also a central catalyst in the MP3's rise to preeminence and the growing value of MP3 patents in this period. As we saw, the format was first widely disseminated through the “thank you Fraunhofer” hack and later through its inclusion in Microsoft and Apple software that was free to users. And while there were concerted efforts to sell MP3 music online from 1994 on, the vast majority of music that circulated online did so through unauthorized channels—FTP, IRC, and file-sharing services. Although the pirates paid for their computers and their internet connections, they experienced the recordings as something they acquired for free (even though strictly speaking, they were still operating inside a money economy).

Nowhere is this clearer than in the behavior of a conglomerate like Sony, which held both record labels and consumer electronics interests. When Sony Electronics introduced a CD player that would play MP3s burned onto a CD in 2001, Sony Music was enraged, but the electronics division felt it had no choice: it had an opportunity to cash in on the explosion of file-sharing.<sup>54</sup> Multisectorial innovation and path dependency worked together to produce the value of the MP3 format at precisely the moment that recordings could be obtained for free. While Sony Music sought to stop the growing swarm of MP3s, Sony Electronics either had to capitalize on it or be left out of the market. The conflict inside Sony encapsulated the conflict across industries. Pirated music was very good for some people's business even if

it was bad for that of others. In subsequent years, this has continued to be the case. A study published in 2006 estimated that 70 percent of all internet traffic was peer-to-peer file-sharing, most of it pirated movies, TV shows, games, software, pornography, and music.<sup>55</sup> That statistic suggests that ISPs built a large portion of their business on unauthorized traffic.

As already intimated, the MP3 was not the recording industry's first crisis. Two other tales of piracy set the current declarations of emergency in relief: Britain's pirate-radio adventure in the 1960s and the international wave of cassette piracy in the 1980s. Although various forms of unlicensed radio broadcasting had existed in Britain since the government began to regulate broadcasting, pirate radio was central to British popular culture of the 1960s. At the time, the British Broadcasting Corporation was limited by law to playing only a few hours of recorded music per week, and much of that time was devoted to classical music. Into this void stepped a group of pirate broadcasters. If radio audiences wanted to hear the latest recorded pop hits, they needed to tune in to a pirate station. Unlike the BBC, which received its income from license fees charged to listeners, pirate stations sold time to advertisers (as in the model of broadcasting in the United States), providing them with a steady source of income. When violence and scandal in the pirate industry eventually led to its shutdown, the British government recognized that it needed to provide an alternative where audiences could hear the latest popular records. Born in October 1967, BBC Radio One filled this void.<sup>56</sup>

The pirates' challenge to British broadcasting was not only institutional and commercial but also resolutely ideological. Coincident with the rise of the pirate stations of the 1960s was the emergence of the Institute for Economic Affairs (IEA), which published tracts like *TV: From Monopoly to Competition* (1962), *Competition in Radio* (1965), and *Copyright and the Creative Artist* (1967). The IEA was part of a tradition of antimonopoly writing in England, which had previously found its strongest statement in Ronald Coase's *British Broadcasting: A Study in Monopoly*. Coase attacked the idea that the BBC's monopoly was natural or desirable and called into question its value as a source of cultural uplift. The IEA tracts “tried to teach a lesson about the social role of so-called ‘pirates’ in general.” The radio book argued, “Pirate broadcasters had a pivotal role to play in the development of a new politics of communication and public culture. Pirate broadcasters were examples of a broader type. They represented a form of commercial life that recurred frequently, but that the state and existing institutions always re-

garded as *immoral*." In contrast, the IEA argued that piracy was a "business force" and that resistance to it was "a reflex reaction by established interests to unwelcome and adventurous competition." Yet the IEA arguments offer a very different genealogy for today's anticorporate and anticopyright crusaders. The IEA and its allies lost the battle in the 1960s with the ban on pirate stations and the opening of BBC Radio One, but they would win the war as free market ideology and deregulation would come to dominance in British telecommunications policy in the 1970s and 1980s, and eventually around the world. Anticopyright politics can be libertarian or pro-corporate just as easily as they can be anticapitalist.<sup>57</sup>

The British case is also instructive in its terminology. *Legitimate* broadcasting was broadcasting that had official state sanction, alongside the section of the broadcasting industry that was sanctioned by the state. *Pirate* operations were not anticapitalist or anticommercial. They simply operated outside of the bounds of legitimacy as defined by the state and state-sanctioned industry. As the pirate industry gained influence and purchase, it facilitated the transformation of the state's policies and industries, breaking old oligopolies but leading to the establishment of new ones in the process. Thus, piracy was a business force not only in terms of breaking open markets that were previously closed, but also in creating the next generation of institutions that would themselves come to dominance in a market. Despite the degree to which terms like *legitimate* and *pirate* carry normative weight, they are strictly relative terms and exert a certain ironic force in their invocation (or at least they should), since their application always begs the question of who legitimizes and under what conditions transgression occurs. The government treated the BBC as if it spoke for the British listening public, even as audiences of the 1960s wandered away to find the music they sought elsewhere. Radio pirates made it their major ideological mission to undermine the BBC's legitimacy as well as that of the government as cultural arbiter.<sup>58</sup>

Similar stories can be told about cassette piracy. Two decades after Britain's pirate-radio crisis, the worldwide recording industry was in an uproar around the mass piracy of music through cassette duplication. The most famous effort during the 1970s and 1980s was the British phonographic industry's PR campaign slogan "home taping is killing music." But home taping was dwarfed by massive pirate cassette-duplication operations, which sometimes even used the logos of legitimate labels (or crude imitations thereof). These cassettes sold for a fraction of the cost of their autho-

rized counterparts and weren't even treated as illegal in many countries, because in the 1980s many national copyright codes hadn't been updated since the early twentieth century.

Piracy thus generated huge profits for two kinds of enterprise: locally and nationally based cassette-duplication operations and multinationals that manufactured blank tape, such as BASF (a subsidiary of Siemens) and Philips, which went on to be a major player in MPEG. Both the duplication houses and blank-tape manufacturers benefited from low overhead and huge profit margins on the sale of their products. But the political valences of their interventions are somewhat different. As with the example of Sony's record label and consumer electronics divisions working against each other, many conglomerates owned both record labels and tape manufacturers (for instance, Siemens owned half of PolyGram, as well as BASF). So it is possible to see the issue as at once a conflict between the interests of two different industries and, at the same time, large-scale multinationals essentially maintaining diversified portfolios to hedge their bets. Meanwhile, the duplication houses in developing countries were often the first institutions to dislodge the hegemony of foreign multinational conglomerates that had previously dominated national and regional recording industries.<sup>59</sup>

Consider the example of T-Series, an Indian company. Today, T-Series is a major and diversified music conglomerate at the center of the legitimate music industry in India. But in its early days, T-Series functioned as a label and distributor for new music, as well as a pirate duplication house that churned out copies of EMI releases, whose market dominance and near-monopoly were leftovers from British colonialism. T-Series employees tell stories of HMV artists (HMV was an EMI label) coming to them begging for pirate releases, as HMV could not keep up with demand. These are not apocryphal stories. In several cases during the 1980s, legitimate labels turned to pirate duplication houses to meet consumer demand for recordings. T-Series thus offered an Indian-owned alternative to a multinational that had dominated India's recording market for decades, an opportunity for artists to reach larger audiences than they might otherwise, and a new outlet to release music that would compete with a previously locked-down national record industry. One important implication of this arrangement is that the pirate cassette business predated the legitimate cassette business in India.<sup>60</sup>

The current uproar around file-sharing follows a similar pattern to the



cases of British radio and the transnational cassette industry, although it clearly operates on a different scale. The distinction between home taping and mass duplication in factories has morphed into the difference between the so-called sneakernet ripping of CDs and exchange of hard drives and the massive online swap meets of Gnutella and BitTorrent. A legitimate online record industry appeared via a wave of independents, followed by the iTunes Music Store and now competitors like Amazon. And yet a sense of crisis persists, largely because of the sheer scale and apparent impossibility of stopping the file-sharing tide. So while it shares some important structural features with the earlier examples, it may also be the case that the MP3-enabled file-sharing breaks some of the conceptual machinery of both classical and Marxist explanations of capitalist markets. To use the language of the former, a vast body of recorded music has become demonetized. To use the language of the latter, that body of recorded music has lost its exchange value while retaining its use value.

This phenomenon is normally explained through variations on a story about the internet as a gift economy and its radical potential for changing the way we think about exchange. Examples drawn from the free-software movement support this proposition. Yochai Benkler's *The Wealth of Networks* also argues that the free exchange of labor and goods online can generate economic value in new ways. The argument is that sharing online can lead to new, more humane modes of economic exchange and social collaboration, and may pose a threat to existing economic hierarchies.<sup>61</sup> Yet there are at least two problems with this formulation. If we return to Marcel Mauss's classic work on the gift, he is quite clear that a gift logic already obtains in large industrial societies and that it is part of the capitalist economy. Contemplating various forms of social insurance produced by states, corporations, and unions, ranging from socialized medicine to employers' family benefits to union-organized unemployment insurance in France and Britain, he calls these forms of collective gifts not "an upheaval, but a return to law." These techniques attach people to their employers and impose social obligations on them, just as the gifts in smaller societies impose reciprocity and escalation. In a footnote clarifying his position, Mauss writes that "of course we do not imply any destruction; the legal principles of the market, of buying and selling, which are the indispensable condition for the formation of capital, can and must exist beside other new and old principles."<sup>62</sup>

There are also some key ways in which "gift" model doesn't quite work for online file-sharing of music. Gift economies are normally distinguished from commodity economies in at least three ways. Gifts come with obligations bestowed upon the receiver that may themselves be coercive. To receive a gift is to receive an obligation; to give a gift is to create one. Gifts are inalienable because to transfer the gift to a third party would undermine the relationship between giver and receiver — gifts "carry traces of the gift giver." Commodities are by design alienable. It matters that my friend painted the painting he gave me, it matters not whose hands touched the movie poster on its way to the store display where I purchase it. In traditional gift economies gift exchange is also characterized by a time delay. As Andrew Leyshon points out, most forms of online exchange of recordings do not follow these patterns. In file-sharing networks, MP3s are alienable; it does not matter who made them or ripped them. They carry no mark of the individual who passed them on, and although some groups enforce norms of reciprocity (like a 1:1 download-upload ratio on a BitTorrent site), only some specialized networks actually enforce this reciprocity, which in any event is considerably more abstract. The temporality of file-sharing is not serialized as in a traditional gift economy.<sup>63</sup> File-sharing also differs from the open-source movement in that the former is not, strictly speaking, any kind of self-conscious movement. Some elements, like Fraunhofer and Napster, quite explicitly sought profits for their work. Others, like the Australian hacker who cracked L3Enc or the millions of students who started sending files back and forth on networks in 1997 and 1998, had other, more idiosyncratic motivations and may or may not have seen themselves as part of a massive collective enterprise.

The idea of online collaboration and sharing as a gift economy has already been debunked in the scholarship of open source. For instance, Steven Weber argues that the logic of the gift is wholly insufficient for understanding free software, and that network externalities better explain why people contribute to a nonrivalrous, nonexcludable resource like open-source software. The larger the scale of a technological form, the easier it is to use, access, and make available.<sup>64</sup> Chris Kelty goes further to argue that

coordination is important because it collapses and resolves the distinction between technical and social forms into a meaningful whole for participants. . . . Such coordination would be unexceptional, essentially mimicking long-familiar corporate practices of engineering, except for

one key fact: it has no goals. Coordination in Free Software privileges adaptability over planning. . . . Geeks not only give expressive form to some set of concerns (e.g., that software should be free or that intellectual property rights are too expansive) but also give concrete infrastructural form to the means of expression itself.<sup>65</sup>

The collectives that move music online are neither as self-conscious nor as coordinated as the recursive publics of the free-software culture. Certainly protocols exist, and something like BitTorrent can be read as an infrastructural politics that is a direct response to the RIAA's shutdown of Napster. But there is no MP3 community, no self-defined or self-conscious public of file-sharing. There is a much more atomized, clustered, rhizomatic series of collectives, some of which share interests and empathy, and many of which don't. If anything, browsing a single search engine, like TorrentBox or Pirate Bay, gives an illusion of a cohesive public where there is considerably less collective consciousness to be found beneath its well-designed interface.

The MP3 that travels over a file-sharing network partakes of both commodity and something else. If Evan Eisenberg's money listened for him in the cash exchange at the record store, it may seem as if file-sharing obliterates this relationship, since file-sharers do not directly pay for the files they download. And yet there is a sense in which the concept of the collection persists, along with the bourgeois sense of ownership that subtends it. Users may be able to handle MP3s quite differently than the recordings they possess in larger physical forms like records or CDs, but they still talk about MP3s as things—things that are owned, and which offer affordances to their users. Consider this review of the iPod and iTunes Music Store: "You'll even find that you listen to music in new ways. Recently the Talking Heads' sublime 'Heaven' popped up on my jukebox in random play mode; I'd owned the CD for years but hadn't played it much and never noticed this amazing song. That kind of discovery happens all the time now that my music collection has been liberated from shiny plastic disks."<sup>66</sup> Listeners may refer to the dematerialization of music in discussing their practices of use, but they insist on treating the music as a thing when they discuss it in terms of possession. Music micromaterialized is still recorded music. "For a collector," wrote Walter Benjamin, "ownership is the most intimate relationship that one can have to objects."<sup>67</sup> This appears to be the case even when people do not pay for the objects they collect.

For both the classical and the Marxist economist, ownership without payment presents something of a contradiction. MP3s appear to walk and talk like the regular products of capitalism. They act as if they had been received in exchange for money—even the modes of exchange follow the model of the money economy more closely than that of the gift economy—and yet in most cases, they were not in any direct sense acquired for a price. By definition, a thing is only a commodity when "its exchangeability (past, present, or future) for some other thing is its socially relevant feature."<sup>68</sup> Sure, there were markets. There were markets for hardware, software, and bandwidth. There were markets for software licenses and blank media (and what is a portable MP3 player if not a very sophisticated blank medium?). But because of the recording industry's absence in the formative stages of the online music economy, music itself was demonetized, to use the term in current business parlance. Along with videos, websites, news, e-mail, social networking, and pornography, it helped to sell the internet and all of the commodities that went with it. It was not itself sold. Thus, we need to think differently about markets and capitalism. A pair of feminist scholars who write under the pseudonym J. K. Gibson-Graham offer an interesting way out by applying the insights of poststructuralist feminism to the theory of capitalist markets. Gibson-Graham reasoned that if it was the case that a range of configurations of gender and power could flourish "on the ground" in a society characterized by a prevailing condition of patriarchy—an argument routinely advanced by feminists in other fields—a similar dynamic might be at work under prevailing conditions of capitalism and market economies. "The market, which has existed across time and over vast geographies, can hardly be invoked in any but the most general economic characterization. If we pull back this blanket term, it would not be surprising to see a variety of things wriggling beneath it. The question then becomes not whether 'the market' obscures differences but how we want to characterize the differences under the blanket."<sup>69</sup> Beneath the veneer of capitalism and the market, we might come to see "feudalisms, primitive communisms, socialisms, independent commodity production, slaveries, and of course capitalisms, as well as hitherto unspecified forms of exploitation."<sup>70</sup>

The music market may be capitalist in a general sense, but not in its totality. Even in the most fully monetized situation, commodities can move in and out of market exchange over the course of their lifetimes. If relations between people can become relations between things, changing rela-



tions among people may lead to changing relations among things.<sup>71</sup> In this sense, the music contained inside an MP3 partakes of a well-established pattern. Although the vast majority of MP3s in the world today were not purchased, they are copies of recordings that were produced in the money economy. The most popular MP3s in circulation at any given moment are all popular commercial recordings, most of which were released by major labels through the usual industry channels, then pirated and recirculated. Although the correspondence is not exact between the most popular MP3s and the biggest hits (country music, for instance, remains quite underrepresented in file-sharing networks), the phenomenon is striking.

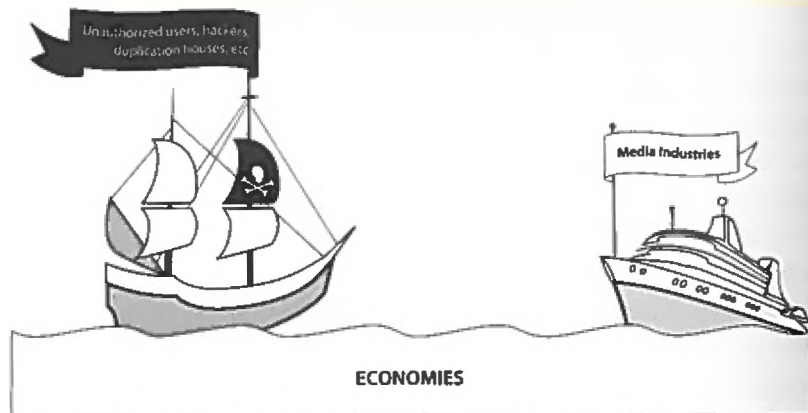
In MP3 form, recorded music's behavior is deeply related to its commodity status even though buying and selling represents only a minority of the occasions upon which an MP3 circulates. Although Gibson-Graham's work focuses on self-conscious, progressive alternative economies, the case of the MP3 extends their argument in another direction. Alternative, non-market economies within capitalism may not themselves be anticapitalist. It may appear that file-sharing and sampling challenge particular market economies, but that does not necessarily mean that they challenge the broader capitalist condition of music. There remain music-related markets for software licensing, blank media, and infrastructure (and access to bandwidth), not to mention vast economies of licensing for other media (such as film and video games). This may also be true for music, musicians, and audiences.

DJ Danger Mouse's career is an instructive example of how piracy can generate value, even for artists. In 2004 Danger Mouse released the *Grey Album*, which was a mashup that combined material from the Beatles' *White Album* with Jay-Z's *Black Album (Acapella)*. As a mashup, the sampling rights were impossible to obtain. Danger Mouse released his recording in a limited-pressing vinyl edition and on the internet for free, for which he received a cease-and-desist letter. Scholars published articles celebrating Danger Mouse's challenge to the corporate hegemony of the record industry, analyzing the political dimensions of mashup culture through the recording techniques it used, or using the Danger Mouse case as another example of the need for alternatives to copyright law that effectively render sample-based music illegal. These were all valid and important arguments. But Danger Mouse himself moved on to a successful career as a producer for bands like Gorillaz, the Rapture, and Sparklehorse, and eventually wound up as

half of the very successful duo Gnarls Barkley. Danger Mouse's career thus shows a possible connection between piracy and the promotional culture of the official record industry. His unauthorized copying leveraged future market-based activity—his successful production and recording career. In many ways, Danger Mouse's move was a classic piece of independent musician entrepreneurship: the internet equivalent of the local DJ or band that plasters posters all over a city in the hope of attracting an audience.<sup>72</sup>

Both the industry lawyers who decry file-sharing and the culture critics who celebrate it mix up their forests and their trees (see figures 30 and 31). To threaten an industry's incumbents is not to threaten the economy itself, despite incumbents' protestations to the contrary and their critics' glee at the prospect.<sup>73</sup> Tiziana Terranova sums up the challenge: "The question is not so much whether to love or hate technology, but an attempt to understand whether the internet embodies a continuation of capital or a break with it. . . . It does neither. It is rather a mutation that is totally immanent to late capitalism, not so much a break as an intensification, and therefore a mutation, of a widespread cultural and economic logic."<sup>74</sup> File-sharing is not automatically or necessarily more progressive or egalitarian than the economy it challenges. It could just as easily go the way of British radio or the Indian cassette industry.

Politically, this leaves us with an ambiguous situation. Most positions in the file-sharing debate are unable to articulate a strong ethical position beyond self-interest. The interests in the recording industry speak for themselves as copyright holders, and not for the musicians they claim to represent or for music itself. But the same must be said of the people who enable or participate in file-sharing. Often enough, they too have themselves in mind, either as industries who affect music transectorially and find profit as recordings slip out from inside the money economy, or as users who simply get something for free because they do not want to pay for it and do not have to (though they pay for the tools and network access that enables file-sharing). There are many mechanisms for supporting music-making and listening in societies, and there is no divine decree or moral precept that a hundred-year-old recording industry must be preserved in perpetuity. The continued existence of music schools and community-funded bands and orchestras suggests that many cultures are already comfortable with alternatives to market-driven music-making and listening. In countries with culture ministries, the ethos extends to rock and hip-hop as well as

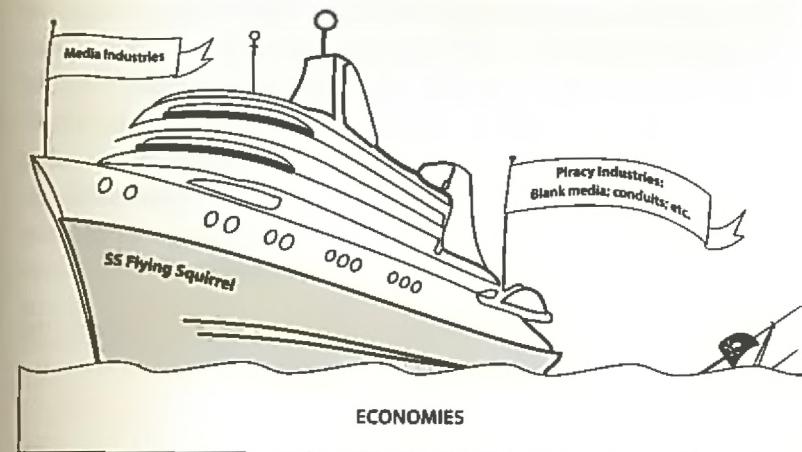


30. Piracy: how it's usually represented. Content owners represent piracy as a force external to the legitimate media industries. Image by Liz Springate.

art music. A real social critique of music markets must extend beyond the *usually named* music industries, to broadband, consumer electronics, computers and software, and a range of other related fields.

#### The Right to Music, and Other Things

The ambiguous economic status of the file-shared MP3—not quite a gift, but not entirely a commodity—marks a historical conjuncture full of possibility. It does not fully conceal social relations in the way that Evan Eisenberg's trade of cash for records might. But a file-shared MP3 also lacks the revelation of social relationships that would occur with a gift. To borrow a term from Marx, MP3s are part of "social intercourse," but of what kind? Commentators, even those sympathetic to the file-sharing phenomenon, routinely refer to mass file-sharing as "promiscuous," and the normative overtones of the sexual analogy are instructive.<sup>75</sup> In a classic gift economy, the gift requires a certain level of intimacy between two definite individuals, a relationship of obligation. Because it is largely aggregated, file-sharing has none of that structuring obligation written into it—but neither is it promiscuous in a strict sense. The normative implication behind the epithet *promiscuity* is that more regulated transactions—transactions that more closely follow the gift model or the commodity model—are somehow



31. Piracy: more like how it is. A subset of media industries have an economic interest in piracy. The piracy industries are media industries that sell blank media, conduits, and connectivity. Image by Liz Springate.

less deviant. But from what norm do they deviate? As we have already seen, the unsanctioned economy of file-sharing has been immensely valuable and value-generating for several legitimate software and hardware industries. British pirate radio extended the reach of the for-profit radio industry and a sector of the recording industry. Pirate activities always occur in particular historical and political conjunctures, which themselves change over time. The end of recordings' artificial scarcity has no inherent moral or political valence written into it, but it does have potentials.

One potential is clearly greater industry control. When there are fewer shiny plastic discs, some sectors of the industry imagine moving from a product to a utility model. Patrick Burkart and Tom McCourt refer to this model as the "celestial jukebox," where content providers could charge users for each time they listen to music or use it in some other way. In other words, when people legally purchase MP3s, they are not purchasing commodities (as was the case with records or CDs) but instead buying a license, as is the case with software. The license can restrict, curtail, or order use, and it provides the vendor with an opportunity to maintain a relationship with the buyer that would have concluded at the moment of purchase in the old commodity regime. Accessibility and universality, the "anytime, anywhere" advantages of networked digital culture, may entice users. According to Burkart and McCourt,



The Jukebox may promise more innovative music, more communities of interest for consumers, and lower prices for music; in fact, however, it gives us less (music in partial or damaged or disappearing files) and takes from us more (our privacy and our fair-use rights) than the old system. . . . Rather than a garden of abundance, the Celestial Jukebox offers a metered rationing of access to tiered levels of information, knowledge and culture, based on the ability to pay repeatedly for goods that formerly could be purchased outright or copied for free.<sup>76</sup>

In other words, mass piracy provided training for users to abandon the commodity model of music, but that does not mean they will leave the money economy forever. They may reenter on other terms. As Andrew Leyshon writes, the “hi-tech gift economy . . . is seen by some of its influential participants as a precursor to a more distributed, more efficient market economy, with a strong libertarian edge.”<sup>77</sup> Or to put it another way, the short-term loss of compact discs as property can be overcome by industry players who seek ownership and control of the means of distribution as the main model for profit generation. In this way, music companies would become more like phone, electrical, cable, or satellite companies. The service, not the recording, becomes the commodity form. Inasmuch as users already pay for their broadband connections or their electricity, they are already accustomed to this order of things.

In the MP3, there is a potentially explosive commingling of property and thing. Clearly, the MP3 has the potential, as do all recordings, to exist as property in the conventional sense. Forget for a minute about the “intellectual property” epithet and consider an MP3 as a very, very small miniature that is analogous to a compact disc or LP record. Its power comes from its holders’ abilities to acquire it by expending their own energies, and from its holders’ abilities to put it to work. It represents a stockpile of accumulated and alienated labor which the user or listener can put to work. But the corollary to these kinds of property rights, if an MP3 is a commodity to be bought and sold, are the rights to “buy, sell, produce, and trade, without monopoly, arbitrary regulation, or arbitrary taxation.”<sup>78</sup> When recordings move from a good purchased to something subject to licenses and contracts, DRM schemes, or monthly service agreements that impose artificial economies of scarcity on recordings, those corollary property rights become easier to abridge. In fact, a radical reading of the noncircumvention clauses popping up around the world in telecommunications and intellectual property

law—which make it illegal for end-users to circumvent whatever copy protection vendors wish to put in their hardware and software, no matter how heinous—suggests that politicians, lawyers, and industry lobbyists have done more to erode the status of music as a form of property than all the pirates in the world.

But music is not only a thing because it is a commodity. In MP3 form it is ready-to-hand because it affords greater storage, greater portability, more opportunities for playback, for sound, for pleasure. In this way, the MP3 is part of a long history of transmission and proliferation that has spanned centuries. And in this way, the condition of digital reproduction is not that different from mechanical reproduction as described by Walter Benjamin. It offers large numbers of people an opportunity to bring the arts nearer to them. The distance between art and everyday life was only ever a social distance. It may be a necessary distance inasmuch as a division of labor is a constitutive feature of complex societies, but the social character of the distance between music and its listener is now an open question for the first time since prestige records began to erode elite and popular disdain for recorded music.

Peter Szendy has put forward the provocative notion of the *right to music*, which for him includes the rights of appropriation, the rights of listeners as well as authors (and authors as listeners, as in the case of the arranger, the DJ, the person who shares a recording). “Who has the right to music? This question can also be reformulated thus: What can I make of music? What can I do with it? But also: what can I do to it, what can I do to music? What do I have the right to make of, do with or to music?” Szendy locates this problem at the historical intersection of copyright, artistic, and technological reproduction (first the arrangement of musical works based on their scores, then sound recording), and changing listening practices. If listening changes over time, if it is plastic, then “we must think of the conditions and limits of the *right of the listener*.”<sup>79</sup> To Szendy’s liberal language of rights, we might also add a republican language of responsibilities: the responsibility to music, and the responsibility to listen, as well as the limits of those rights and responsibilities.

To fully understand the circulation of MP3s, we need to look beyond market economies as our models of circulation to other confluences of infrastructure and circulation. File-sharing has a deliberate and considered dimension to it, but it is not only exchange. It also depends on seriality and networked sociability with people one doesn’t know. For decades, one



strand of social theory approached this aspect of modern life as the basis of alienation and destabilization—a position most famously stated in Georg Simmel's work. Simmel argued that the money economy, combined with the intensely varied experience of urban life at the turn of the last century, produced a "blasé attitude" whereby people cut off their inner emotional lives simply to get by in city cultures characterized by large and impersonal institutions, the division of labor, and bureaucracies. Simmel's people compensated for this by turning inward and sensation-seeking in other ways, most notably by searching out "disposable" emotional experiences, a point that has been picked up more recently as an explanation for the increasing saturation of contemporary life by media in all their different forms.<sup>80</sup> Certainly one can think of many examples where this holds true in bureaucratic and economic interactions, where both parties basically move through scripts in the transaction in order to negotiate the fact that they do not otherwise know one another. But while this way of life struck Simmel as new and different, a century later there is no necessary reason why we need to maintain his particular classification of what is authentic or alienated. A simple ride on any major city's metro system demonstrates the folly of attempting to have a full, meaningful intersubjective interaction with everyone we encounter on a daily basis. If modern transit requires alienation, a nonalienated condition would be psychologically unbearable. In fact, we could just as easily look to transport to tell a very different story about circulation in the current moment.

Modern life is full of spaces like the metro where we interact with strangers peacefully and cooperatively—or at least there is a tendency to order even if order is never fully achieved. These interactions are not necessarily economic. Just as often, they are about simply moving through life, and some tacit cooperation is necessary in order for the system to work. The same could be said of a vast file-sharing network. We normally think of "non-places" as spaces of physical transition—the inside of a rail car or airplane, a waiting room, a freeway, a line outside a ticket booth, the hallway of an enclosed mall—but the file-sharing network operates in a similar way. A non-place refers to "two complementary but completely distinct realities: spaces formed in relation to certain ends (transport, transit, commerce, leisure), and the relations that individuals have with these spaces."<sup>81</sup> It is, strictly speaking, impossible to do an ethnography of a non-place because the subjects are not consciously relating to one another. "Try to imagine a Durkheimian analysis of a transit lounge at Roissy!" jokes Marc Augé.<sup>82</sup> The

same is true of a file-sharing protocol like BitTorrent, because it is precisely not a community. There are, of course, file-sharing communities, and even customs and norms for using the protocol built into software interfaces, but those self-formed and identified communities are exceptions. In these social non-places, one can imagine the overall shape of interactions is perceivable—at least in its outlines—even if it would be impossible to do a traditional ethnography of a BitTorrent swarm.

File-sharing is guided by a whole range of protocols that actually leave users relatively little freedom (the genius of the BitTorrent protocol is that it effectively forces users to share content they acquire through the network). To borrow Augé's language if not exactly his point, we could say that even if every MP3 has its life to live in circulation, that life is not lived in total freedom, not simply because no freedom could ever be lived in society at large, but more precisely because there is an ordered and coded character to traffic.<sup>83</sup> Against the backdrop of these larger flows, the individual acrobatics of users or files disappear—deliberately—into the massive traffic of bits, discs, and sounds in the world. The rules governing their movement do not exactly conform to an economic theory of gifts or commodities, but they do follow the injunctions and affordances of pull-down menus in interfaces, as well as protocols and specifications for passage through the infrastructure. Those protocols in turn govern what is recognizable as a coherent entity—establishing the insides and outsides of files by applying rules for assembly and disassembly. Interfaces' constructions confront users with instructions and indications: "30523 seeders," "60991 leechers," "ratio: 1.95," the available space or "number of songs" in a library, or the gradations of color on the bottom of a CD-R that indicate whether it has been written upon. All of these apparently banal characteristics underscore the collective and ruled character of the traffic in MP3s. Again, the metaphorical extensions of piracy mislead. File-sharing is intensely governed, not lawless.

Inasmuch as intellectual habit has sedimented into tradition, the argument about MP3s and the future of music breaks down into a few familiar positions. There are those who believe that we are moving toward an even more restrictive moment in the history of cultural industries, with Celestial Jukeboxes and the creation of massive, for-profit archives of the world's knowledge by Google and its competitors. There are those who believe that the MP3 signals an age where the conduit industries rule the content industries and not the other way around. There are those who believe that through its sonic characteristics and its peculiar mode of exchange,



the MP3 format has helped to take the sheen off the products of the culture industry for its users, who will hereafter no longer treat its products as exalted. But all of these positions begin from the assumption that the rules of economy—gift, commodity, or others—govern the circulation of MP3s. Certainly they play a role, but they are clearly not the entire story. The circulation of MP3s is also very much a conditioned interaction among people through heavily regulated protocols. It is a kind of social circulation.

The MP3 story could well herald the future of all media, and not simply because sound files take up less bandwidth than video files. Although less tangible than recordings on LP or CD, MP3s continued to act like commodities even when they weren't exchanged like them. If there is a distinctive "thingness" to the MP3—and to music in its current digital form—it is that it occupies an ambiguous position that is both inside and outside market economies. As was the case with records, the MP3's particular thingness did not emerge *sui generis* along with the initial publication of the standard. It was only with the emergence of vast online networks and the creation of powerful path dependency through a confluence of licensing agreements, software cracks, and user networks dedicated to music piracy that the present form came into existence over the period of a decade.


Music remains a thing in all the senses I have outlined in this chapter. It retains many of the trappings of the commodity form, but it also retains a purpose beyond commodity exchange so long as it is ready-to-hand. Music also exceeds any definition of a thing as it always has—it contains irreducible dimensions of social practice. If anything, the so-called MP3 revolution has made more music more ready-to-hand for more people than at any other time in human history. If copyright law has served to create an economy of artificial scarcity for recorded music, file-sharing has announced an age of musical abundance.<sup>84</sup>

The age of artificial scarcity privileged a commodity form for music that resided in liberal notions of property, alienable labor, and ownership. It is easy to rail against the ways in which the industry exploited artists and audiences through that system—and we should not diminish the ways in which those forms of exploitation followed existing patterns of power across race, class, gender, and nation. But it is also easy to forget that aspects of that system also gave form and meaning to the rights of users and artists that are now once again under contest. The end of the artificial scarcity of recording is a moment of great potential. Its political outcome is still very much in question, but its political meaning should not be.


Anahid Kassabian has recently described a new type of musical subjectivity, "ubiquitous listening," which has emerged from the extensive availability of music in daily life in many parts of the world: "Those of us living in industrialized settings have developed, from the omnipresence of music in our daily lives, a mode of listening dissociated from specific generic characteristics of the music. In this mode we listen 'alongside' or simultaneously with other activities. It is one vigorous example of the non-linearity of contemporary life."<sup>85</sup> As a phenomenon, ubiquitous MP3s are symbiotic with ubiquitous listening and ubiquitous media. The global circulation of MP3s resonates with ubiquitous listening in its present form, although clearly ubiquitous listening (and the desire for ubiquitous media with which Kassabian connects it) predates MP3s by decades, maybe centuries depending on how it is periodized. The wide availability of MP3s is a testament to an enduring collective passion for recorded music, but Kassabian's thesis suggests that it may be a particular kind of passion. The desire to have music present and ready-to-hand—available for listening but not requiring engagement—lies just behind the gigabytes of music files that accumulate on hard drives and the "complete collections" that reside on CD-Rs sold in city streets.

MP3s are particularly striking because they are so small but circulate on such a massive scale. Whatever the fate of existing recording industries, we need not worry about the future of music as a vital component of human cultures around the world. If the MP3 story demonstrates anything, it is that the desire for music and to be with music is greater than anything the recording industry has been able to imagine or provide. This is the main point for those who seek out music in one form or another. The politics of the MP3 mixes issues we normally keep separate through artificial, analytical divisions between culture and technology, the economy, and everything else. Under the umbrella of culture, we ask after how music should and does enter into people's lives. Under the umbrella of technology, we ask after the means of moving recordings. But the means incorporate their own answers to the questions of how music should and will enter into people's lives. This is readily apparent in existing copyright law, which is why debates about intellectual property are so close at the mention of the word MP3. It is readily apparent to activists interested in net neutrality or free public broadband, though these are still often wrongly dismissed as more specialized or technical issues. We cannot assume that a new system of circulation, even one that was to totally destroy the music property system

as we know it, is an automatically progressive development for musicians and audiences. The questions we now face go far beyond intellectual property or even the will to cooperate or collaborate among individual users. We now face an age where the very technological basis for culture is available for discussion, for the first time in well over a generation. However slight it may be, there is an opportunity to build a cultural infrastructure based on values other than buying and selling, even if they have some connection with commerce.<sup>86</sup> If we do not begin our discussions of the future of music by considering what music is for—and by extension, what culture is for—the answers will be decided for us.



### THE END OF MP3



Measured by the pace of internet fashion and the product cycles of consumer electronics, the MP3 is already old technology. So long as it brings in revenue, its developers look after it. But ask them and they will freely recommend successor standards, like Advanced Audio Coding (AAC, represented in file names like .m4a or .mp4).<sup>1</sup> Formats like AAC give higher definition at lower bitrates and have fewer audible traces. Other alternatives, like .ogg are nonproprietary, open standards. Yet MP3s remain the most common form in