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In memoriam: Ian McKinnon and S. Jessie Bernstein.

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Other places CM stuff has been published: *Whole Earth Review*, *Signal* (Communication Tools for the Information Age, Point Foundation), *Transnational Perspectives* (Geneva), *WFMU Program Guide*.

(Submitted for presentation at the International Communication Association Popular Communication Interest Group 1988 Convention by Steve Jones, Associate Professor, Department of Journalism, University of Wisconsin at Eau Claire.)

### CASSETTES AND CREATIVITY

The Beatles' record producer George Martin once said, "Every third person I meet is either a record producer or trying to become one."<sup>1</sup> It is just as likely that now every third person is also releasing (realizing) their music on cassette tapes. Though there exist mass media which can reach more people at once, the cassette's extraordinary rise to prominence among both musicians and fans illustrates its suitability for consumer and producer uses. What follows is a brief history of the cassette and

became apparent for the first time in 1979 when cassette tapes were the medium by which the Iranian revolution spread across the country...Some of those who have achieved stardom without ever having their work officially broadcast have become more famous than artists whose work is presented on official radio and television.<sup>2</sup>

Likewise, cassettes have enabled followers of the Grateful Dead ("Deadheads") to pass among them cassette copies of concerts, a "bootleg" recording industry that thrives in the U.S. and abroad. The pirating of recordings is also a problem for record companies: illegally copied tapes of a Michael Jackson LP, neatly packaged, are available in Hong Kong for half the cost of the legitimate article. In both cases the implications for copyright are great. The "home taping" controversy has raged in one form or another (and one medium or another) for years, and is complicated by the ease of use and low cost of cassette technology. A fellow named Errol, in Negril, Jamaica, for instance, makes a living from his cassette recording studio. Errol makes cassettes of reggae music from records he buys in Kingston and New York and sells them to tourists.

# The Cassette

its use, along with some examples of music recorded and released on cassettes. But before going any further, several terms need to be defined.

The term *Cassette Underground*, as it is used in this essay, refers to a vast international network of musicians and music fans who create and consume music via cassettes. They exist largely in opposition to the traditional music industry not only by virtue of their adoption of cassettes over the vinyl recording, but also in their rejection of the musical values prevalent in mainstream music. Cassettes allow musicians to become the ultimate modern one-man band—not only because cassettes allow easy access to multi-track recording, but also because they are a mass medium that allows individual control.

Cassette technology has quickly empowered those without access to the mass media. Middle Eastern revolutionaries have long been aware of the power of cassettes for spreading propaganda. A report in *World Press Review* notes that the significance and extent of [cassettes]

On a different level, hundreds, perhaps thousands, of small "record" companies exist whose sole business is releasing cassettes—usually containing music by one of the owners of the company. To call them companies usually presumes forethought on the part of the owners. Most such cassette-only labels start with no thought whatsoever. They come into existence when a person, usually a musician, records music that (s)he wants to release to the public. By far the most convenient and inexpensive way is to make cassettes of the music and sell/give them to friends, acquaintances, record stores, etc.

But it is not simply ease of production that makes cassettes the key medium for independent (non-major-label) music. Several other reasons for the cassette's prominence must be taken into account.

### THE TAPE CARTRIDGE

Recording cartridges were developed in 1930, but it was not until RCA announced in 1958 that it had developed a tape cartridge that would hold thirty minutes of sound and retail for about a dollar more than a stereo disc that the tape cartridge gained widespread use.<sup>3</sup> RCA's cartridge was the precursor to the 8-track cartridge developed by Lear Jet and RCA. Although 8-track tapes were mass-produced in the 1960's and 1970's, they did not find acceptance among consumers. The 8-track cartridge was bulky, unreliable, and difficult to record with. A form of the 8-track cartridge became standard equipment for the radio industry, for announcements, station identifications, and advertisements.<sup>4</sup>

# Underground

The most widely accepted tape cartridge format to date, the cassette, was introduced by the Philips company in 1964. To ensure standardization of the cassette format, Philips gave up the manufacturing rights to anyone wanting to produce cassettes, provided they used Philips' specifications.<sup>(9)</sup> By 1965, several companies were making cassette recorders, and reviews were favor-

## Steve Jones

able. *High Fidelity* magazine wrote that "[a cassette recorder] achieves real portability by using a miniature self-loading cartridge rather than by merely duplicating in condensed form the basic design of larger, conventional machines...It is hard to imagine how operation could be simpler."<sup>(10)</sup>

Cassettes were relatively inexpensive compared to both LPs and reel-to-reel tape recorders (a sixty-minute tape cost approximately \$1.50 in 1968<sup>(11)</sup>), and, as shown by the wide variety of people reportedly using them, were easy to operate. Recording was no longer solely in the domain of the hi-fi enthusiast. *Business Week* called cassette decks a "music maker for the masses."<sup>(12)</sup> The sound quality was good, with most cassette decks able to reproduce frequencies from 50 to 10,000 Hz.<sup>(13)</sup> In 1969, the Dolby noise reduction system was adapted for use with cassettes, reducing tape hiss and improving dynamic range.

The rapid acceptance of cassettes prompted concern from record companies that the phonograph may be doomed. *Business Week* noticed the reason:

The teen-ager, the major market for recorded music, no longer has to thread a tape through a bulky and costly piece of equipment in his living room to make his own music. Instead, he can snap a blank cassette (cost: about \$3 versus \$6 for a prerecorded one) into his tiny portable recorder...and copy two hours of music.<sup>(14)</sup>

What *Business Week* left out of its article was that the cassette could be played in the car, which was essentially home to many teenagers. The same article quotes an executive of RCA's record division as saying, "there are indications that cassette sales have adversely affected record sales."<sup>(15)</sup> Cassette decks far outsold other tape recorders by 1970.

Records were still cheaper to mass produce than pre-recorded cassettes, and since cassettes were duplicated at high speeds, their quality was at best variable compared with records. *High Fidelity* noted in 1969 that they "doubt [records] will be displaced, except possibly by some fantastic technological breakthrough which—if it occurs—will make all present forms of recorded material obsolete."<sup>(16)</sup> That breakthrough may have occurred with the compact disc. The breakthrough that made cassettes the medium of independent music was the advent of home recording.

### HOME RECORDING

Though recording on vinyl was cumbersome, it was possible to build a small home phonograph studio, provided one could afford it. Tape recording, however, enabled home recording studios to flourish. The low price of tape coupled with its reusability made it the perfect medium for those who wanted to build small studios in their basements. More important, multi-track recording's over-

dubbing capabilities made it an ideal medium for the solo musician. Home recording equipment became to music what the single-lens reflex camera was to photography: a means for a mass audience to pursue mass production.

The home uses of tape recording had been recognized from the start. In 1955, *Musical American* extolled its benefits:

While tape's inherent qualities recommend it highly as a playing medium, the tape recorder, as its name implies, allows the musician...to...make his own recordings... You do not need to be an expert to make a fine tape recording... One versatile instrumentalist who plays fourteen different instruments used tape to make his dream of being a one-man band come true.<sup>(17)</sup>

Home recording got a boost in the 1970's when 4-track open-reel tape decks became affordable. But it got its biggest boost in the late 1970's and early 1980's, when 4-track cassette decks with built-in mixing boards were offered by Tascam and Fostex.

The 4-track open-reel deck became popular for home recording during the 1970's. According to an article in *Popular Electronics* magazine, "reasonably good 4-channel decks [sold] for around \$600 and up."<sup>(18)</sup> The article's author discovered their popularity when he noticed that electronics dealers were offering mixing boards, microphones, and noise reduction units in addition to the more conventional products such as tuners, amplifiers, and cassette decks. His conclusion was that 4-track tape decks "are forming the basis of thousands of 'home recording studios' often capable of turning out master tapes that rival some of the products made by professional studios."<sup>(19)</sup> Many 4-track tape decks became affordable when the bottom dropped out of the quadrophonic high-fidelity market.

In April, 1977, the first "Multi-Track Expo" was held in Los Angeles. Home recording had become a recognizable industry, and the home recordist an identifiable market for manufacturers. The exposition, which drew 4,500 registered participants, featured workshops like "The Musician's Home Studio," and included exhibitors that had





# TELLUS

## The Audio Cassette Magazine

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"formerly [been] regarded as 'for professionals only.'"<sup>(10)</sup>

The marketing of home recording equipment was aimed at the musician trying to achieve success in the recording industry. An advertisement typical of the marketing strategy appeared in the December, 1987 issue of *Stereo Review* magazine. Pioneer Electronics Corporation's ad for the RT-2044 4-track tape deck contains bold print stating, "For the price of a few hours in a recording studio, you can own one." The company's reasoning went as follows: since recording studio time in California costs \$165 an hour, and the RT-2044 costs \$1,650 "just once," the Pioneer deck can be had for the equivalent of ten hours in a studio. Of course, the ad does not mention that for \$165 an hour one has access to considerably more than a 4-track deck, and that a 4-track deck alone does not make a studio. Bruce Springsteen's *Nebraska* LP was recorded on a cassette multi-track machine, ostensibly because Springsteen wanted to record a "pure" album (as did the punks). His record, however, had the benefit of a professional recording engineer operating the deck, along with high-quality microphones and other equipment. The appeal is nonetheless great, because, according to the ad, "it's obvious that 'paying your dues in the studio' can be a prohibitively expensive proposition."

Pioneer's appeal is twofold, and is typical of most marketing of home recording equipment. First, manufacturers appeal to the musician's desire to learn more about "how to sound truly 'professional,'" intimating that professional recordings are the key to success. Second, and more important to the discussion at hand, they play on the traditional rock and blues notion of "paying one's dues," of working hard for little or no reward and earning one's success. But there is an obvious contradiction between having a home studio and being a struggling musician: an investment of at least \$2,000 is required to purchase enough equipment for 4-track recording. Presumably, when it comes time to pay one's dues, payment to Pioneer is the equivalent of credit. "Paying your dues," which traditionally meant sweating it out night after night in live performances at small, smoky bars or nightclubs, has suddenly become equated with sitting in the basement, bedroom, or garage with a tape recorder and other equipment.

A recent Yamaha advertisement takes this theme one step further. "Go to Your Room and Play," the headline reads. The text of the advertisement states: "Using the MT2X Multi-Track Recorder/Mixer, you can layer your recording just as you would in a real studio—one track at a time...So if you've been wondering where you're going to get your first big break in music, now you know. At home."<sup>(11)</sup>

Rock producer Tony Visconti rightly recognizes home recording as an alternative to live performance:

I'm amazed at the high quality of the tapes people are bringing me. What's more, a lot of the better material has come from home studios in England...I believe that with the reduction in the number of live venues, people are creating some of the best music around in their own homes in the form of home demos.<sup>(12)</sup>

More than anything else, home recording technology has enabled artists to capture musical ideas on the spur of the moment, in the form of demo tapes. Tascam Corporation's David Oren noted:

I worked with the Alessi Brothers in the past. They started out in 4-track, then quickly went into portastudios. Their statement to

TELLUS Audio Cassette Magazine Logo: New York, USA

me was "unless we had the portastudios we would not be able to capture the dynamics of the moment when a piece is created." Bobby said he's woken up a number of times in the morning and found his portastudio on. He had woken up in the middle of the night, had an idea, turned it on and gone for it, and gone back to sleep. I know it's a far-out example, but had it not been for something as small, compact, and easy to use as a portastudio, Bobby would not have captured the sounds that he heard in his head—and that's really what everyone wants to be able to do: capture the sound you hear in your head with the dynamics of the moment.

The boys always carried a portastudio around with them for demos, and a bag of cassette tapes, and a little book that told you on what tape at what counter number you could find a piece of music...They went into a major 24-track studio here to do an album three years ago, and after each take they'd play back their portastudio tape and see if they could get the dynamics and realism of that tape, because that's what they're shooting for. Ultimately it wound up that the portastudio tracks went on the album.<sup>(10)</sup>

Terms like "dynamics" and "realism" that were once used to set aside live performance as something special are now used as readily in the recording industry to differentiate recording methods. The pop music industry is thus still very much attuned to live performance standards, if not methods.

During the early 1980's, many records were released by rock "groups" of one or two people. Gary Numan, Soft Cell, The The, and others relied on multi-track recording to create their music. Some artists, like Peter Brown, recorded hit singles and LPs in their bedrooms. In a poignant reversal of the typical "I owe it all to my manager/wife/etc." dedication, Brown writes:

I was an art student living outside of Chicago, and I supported my musical habit by working as an art store clerk and a garbageman, among other odds and ends. Today, I've had four hit singles and a gold album (*Fantasy Love Affair*) on TK Records, and I've performed for about a quarter of a million people, not including TV audiences. And I owe it all to my bedroom in my parents' suburban ranch house.<sup>(11)</sup>

The 4-track cassette decks introduced by Tascam and Fostex in 1980 created an unprecedented interest in home recording. The decks, priced at \$1,300, were portable, built into their own small mixing console; they could bounce tracks, used inexpensive cassette tape, and needed only a microphone or cable plugged into a channel to record. The editing capabilities were limited, since cassette tape is thin and difficult to splice, but low cost and portability more than made up for that drawback. In 1985 Fostex released an 8-track open-reel tape deck that recorded on 1/4-inch tape,<sup>(12)</sup> and several months later Tascam followed with its own 8-track complete with mixing board. A host of other manufacturers have joined in making cassette and open-reel decks for home recording, including Yamaha, Akai, Ross, and Audio-Technica. An 8-track cassette deck was introduced by Tascam in March, 1988.

It must be emphasized that the availability of the 4-track and other decks for home recording was not in itself sufficient to create the tremendous demand for equipment. Several other factors were involved. First, electronic instruments such as drum

machines and synthesizers had been developed to a point where they too were both inexpensive and small enough to place in one's bedroom. Second, the integrated circuit made possible the reduction in size of most recording equipment while increasing its reliability. Third, as most recording equipment is manufactured in Japan, fluctuations in the value of the Japanese yen and the American dollar meant that at certain times equipment would be priced very favorably.

## THE CASSETTE AND HOME RECORDING

Home recording's popularity is attested to by the number of books and magazines on the subject that have been published since the late 1970's. Periodicals such as *Music Technology*, *Electronic Musician*, *Cosmo*, and many others contain useful information for the home recordist. But perhaps better testimony to its impact is the number of home recordings released in the past several years. Underground music magazines like *Sound Choice* and *Option* regularly review hundreds of records and tapes created in basements, living rooms, and bedrooms.

Jon Pareles, writing in *The New York Times*, identified a "cassette underground" brought about by "affordable music technology, especially the advent of inexpensive multi-track recorders."<sup>(13)</sup> Pareles quotes Scott Becker, *Option's* publisher, as saying "we get fifty to seventy-five cassettes every month, from all over."<sup>(14)</sup> Becker's emphasis is on cassettes (he does not mention records) and most home-recorded music that reaches the ears of the public does so by means of cassette. Though several national cassette-only distributors exist, most independent music cassettes are purchased via mail order. Independent music magazines usually publish addresses along with cassette reviews.

Several of the larger cassette labels, such as Sound of Pig, Touch, Office, and Trance Port swap artists and release compilation tapes regularly, and a network of cassette artists is well established among independent musicians. Groups with names like Big City Orchestra, F/I, Hate, The Arms of Someone New, Toxic Pussy,



and If, Bwana have cassettes regularly reviewed in independent music magazines whose readership ranges from several dozen to several thousand. The music these (and other) groups release ranges from new age to hardcore, from pure pop to pure punk. College radio stations, traditionally open to non-mainstream music, often play cassettes. Some, like Northwestern University's WNUR, have



shows specifically designed to showcase new cassette releases.

Some of the groups who began recording on cassette have achieved some prominence in popular music. Members of Romeo Void, for instance, are still actively involved in producing cassette releases. Craig O'Donnell, formerly of the Scientific Americans, swears by his Fostex X-15 4-track recorder. Many musicians use 4-track recorders as compositional aids, to "jot down" ideas.<sup>(24)</sup>

Inexpensive cassettes and cassette decks (especially double, "dubbing" cassette decks) allow for individual control of the means of production. If an order comes in, the label can dub a cassette and send it out; there is no need to keep a large inventory on hand. More importantly, since cassettes can be dubbed individually, unlike records, there is no need to spend a large amount of money manufacturing a thousand or more copies. And the small size and weight of cassettes makes them ideally suited for mailing and therefore for easy distribution.

## CASSETTES AND COPYRIGHT

The ease of cassette production is ultimately responsible for the conflicts between consumers, musicians, and a recording industry built upon exploitation of copyright. The biggest and most recent controversy over copyright concerns home taping of records and compact discs. Though beginning in the late 1970's, when the recording industry's sales slumped, it has taken on altogether new meanings with the development of digital recording.

The late 1970's found record companies no longer enjoying steady, predictable sales. Sharing the blame with a depressed economy and a stagnant musical climate was home taping of music. Concerned that home taping was cutting into record sales, the recording industry began running advertisements denouncing home taping as theft, and pursuing the U.S. Congress to amend copyright laws. Home taping, the industry reasoned, is copyright infringement.

Little came of these lobbying efforts, however. In the early 1980's, several home electronics manufacturers began marketing dubbing cassette decks, which enable cassette duplication with just one machine. The recording industry (in the form of the Recording Industry Association of America, Inc.—the RIAA) again unsuccessfully lobbied Congress, this time for a tax on dubbing decks. The reasoning was the same as with home taping, but the industry went slightly further in their demands. They originally called for a tax on both single and dubbing cassette decks, with money collected to be distributed to recording artists. The pay scale the industry suggested virtually mirrored the top record charts, since presumably those artists with the highest record sales would also have their recordings copied most.

A bill was presented before the U.S. House of Representatives in 1985<sup>(25)</sup> that proposed a tax on blank tape and tape recorders. Known as the Home Audio Recording Act, the bill included a penny-per-minute tax on blank tape, a tax of ten percent of the retail cost on tape recorders, and a tax of twenty-five percent of the retail cost on dubbing tape decks. Money collected was to be divided among record companies and distributed to copyright owners, but no mechanism of distribution was established. Although the law was to exempt individuals taping their own records, amateur musicians, and others who were purchasing tape recorders for their own musical use, there was no mention of how subsequent use would be determined at the time of purchase. The bill, though at one time tenuously connected to the Parents' Music Resource Center record-rating issue, was not passed by Congress. *The Washington Post* reported in September, 1986, that the RIAA was moving its headquarters to Washington, D.C., to better lobby Congress for taping bills and to pursue another legislative avenue, source licensing for film and television music.<sup>(26)</sup> (Source licensing is primarily concerned with residual payments for composers whose music is broadcast on television.)

It would be an understatement to say that taping is central to cassette culture. In his book *Cut 'n' Mix*, Dick Hebdige writes about reggae and hip-hop, cultures which pursue a folk/oral tradition but use cassette technology to do so:

At the center of the hip-hop culture was audio tape and raw vinyl. The radio was only important as a source of sounds to be taped... The hip-hoppers "stole" music off air and cut it up. Then

# AMERICA'S RIGHT TO TAPE: ONCE AGAIN, THEY'RE CHIPPING AWAY AT IT.

It started 20 years ago with the cassette. The big record companies didn't like it and couldn't see the need for it.

Then 11 years ago some big Hollywood studios sued to keep you from taping movies and programs off the TV. (It took the Supreme Court to prevent the studios from preventing you from taping!)

It's 1987. Do you feel that same sense of *deja vu*? At this moment the recording industry is trying to get Congress to require all new digital audio recorders (DATs) to contain an anti-taping chip. That chip will prevent you from taping most new records, tapes and discs, as well as broadcasts.

These chips respond to a code in the music that will destroy the integrity and fidelity of music—even on tape.

Many see this as the first step toward requiring anti-taping chips in all audio orders—audio and video.

And to add injury to insult, there's talk of a hefty royalty tax on audio orders and blank tapes.

Send the coupon to us at the Home Recording Rights Coalition.



We'll tell Congress you oppose any "chipping away" of your rights. Or call us toll free at 1-800-282-TAPE for more information (663-8591 in D.C.).

Send the coupon or call right away. So your rights won't be taken away.

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A coalition of consumers, retailers and manufacturers of recording products dedicated to preserving your right to use these products free of private taxes or government interference.

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the Home Recording Rights Coalition  
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Washington, D.C. 20033

Tell my representatives in Congress  
I oppose any bill banning digital audio tape  
recorders (DATs) or requiring anti-taping chips.

Name \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_  
Signature \_\_\_\_\_  
Phone \_\_\_\_\_



they broke it down into its component parts and remixed it on tape. By doing this they were breaking the law of copyright. But the cut 'n' mix attitude was that no one owns a rhythm or a sound. You just borrow it, use it, and give it back to the people in a slightly different form. To use the language of Jamaican reggae and dub, you just "version" it. And anyone can do a version. All you need is a cassette tape recorder, a cassette, a pair of hands and ears, and some imagination. The heart of hip-hop is in the cassette recorder, the drum machine, the walkman, and the... ghetto blasters. These are the machines that can be used to take the sounds out onto the streets and the vacant lots, and into the parks...By taping bits off air and recycling them, [they] were setting up a direct line to their culture heroes...And anyway, who invented music in the first place? Who ever owned sound or speech?<sup>727</sup>

The mix of technology and folk culture causes problems when viewed from within the music industry, but as Hebdige correctly asks, who owns sound, music, and rhythm?

The recording industry's next lobbying effort came in the wake of the development of digital audio tape (DAT). Regarded as the ultimate in home taping, DAT works on the same principles as the compact disc. Sound is sampled and reproduced digitally, with no distortion from copy to copy. In other words, dubbing a record or compact disc onto DAT does not produce a copy, it produces a clone, an exact replica. The threat to the recording industry is thus greater with DAT. Presumably some potential home tapers were discouraged by the noise and hiss added to each copy generation with analog tape. DAT produces no noise or hiss at all, however. And since compact discs are digitally recorded to begin with, DAT is the perfect medium for copying CDs.

The problem was one the computer software industry faced from the start—protecting a product that is simultaneously creative and unique yet by definition copyable. Ultimately, some computer software began including copy protection devices which would cause a program to self-destruct or prevent



"You can always find a house,"

copying. The recording industry is opting for a similar solution for DAT by lobbying Congress for a trade bill that would force DAT manufacturers to include anti-copying devices in their machines. The anti-copying mechanism would read information from a compact disc and respond to a message to lock a DAT deck out of record mode. Though successfully demonstrated in prototypes, the mechanism is expensive and produces a noticeable difference in sound when compared to machines without the anti-copying mechanism. DAT manufacturers are (at best) reluctant to raise the cost of an already expensive device, and feel that the record companies should take the initiative in preventing copying; after all, they are the ones providing the software. In February, 1988, a Congressional committee concluded that the anti-copying mechanism was not the solution to the copyright problem.

The dilemma faced by the recording industry is based primarily on the copying and piracy of compact discs, not records, because CDs are virtually perfect copies of the master tape. The industry was slow to switch over to compact disc, but CD sales have expanded phenomenally and record companies have now firmly established the CD market. Part of the reason for their initial sluggishness in releasing CDs lay in the large capital cost of manufacturing CDs. Now that manufacturing costs are falling, the industry is immediately faced with copying and pirating problems. Record companies are also concerned that consumers will prefer DAT over CDs since they can record on DAT.<sup>728</sup>

The outcome may involve a compromise on the part of the RIAA, its international parent organization the International Federation of Phonogram and Videogram Producers (IFPI), and the Electronics Industries Association of Japan. It is doubtful that legislation regarding a home taping tax or an anti-copy-





Hidden treasure in the floor of a haunted  
om. "Everyone knows that!"

ing mechanism will pass in the near future; in the case of the former because of the difficulty establishing the taxing and distribution process, and in the case of the latter because the current administration and Congress seem to favor a private sector compromise.

### CONCLUSION

In 1982, a friend in a rock group in Champaign, Illinois, made the offhand comment that "in a few years kids will have more portastudios and synths in their bedroom than Barbie dolls and baseball gloves."<sup>99</sup> He now lives in Denver and has a small 4-track studio in his basement. Home cassette recording has changed the economics of production. However, record companies have not directly responded to home recording. As Larry Grossberg recently mentioned, record companies no longer look for bands that have paid their dues. Instead they "go fishing" for artists.<sup>100</sup> This could be a response to the shift of the site of music production brought about by home recording. A record company executive is as likely to find the "next big thing" in a bedroom as in a concert hall.

Digital audio tape may have a significant impact on the cassette underground, provided the cost of DAT equipment is drastically reduced. As of 1989, most DAT recorders are still priced over \$1,000. Digital multi-track recorders range in price from \$80,000 to over \$250,000.

The audio quality of digital recordings is remarkable, comparable to that of compact discs (CDs). In the near future, digital audio tape recorders may prove quite amenable to home recording use, especially as stereo master tape decks. DATs provide the recording quality of compact discs, though in a cassette format, and pave the way for another revolution in recording. X

### NOTES

1. Craig Anderton, *Home Recording for Musicians* (New York: Guitar Player Books, 1978), p. 3.
2. *World Press Review*, April, 1983, p. 50.3. *Fortune*, August, 1958, p. 165.
4. Sumanta Banerjee, *Audio Cassettes: The User Medium* (Paris: United Nations Educational, Scientific, and Cultural Organization, 1977), p. 20. The author recalls that during summer, 1982, while employed at a chain-operated record store in Champaign, Illinois, an executive from the home office arrived one day in a pick-up truck and removed every 8-track car tridge from the store with the comment, "These are dead, I don't know why we've kept 'em this long."
5. *Ibid.*
6. *High Fidelity*, November, 1965, p. 46. Cassette players have become popular in automobiles. *Stereo Review* of November 26, 1966 contains an article headlined "Tape on the Turnpike" (pp. 64-67). According to *Business Week*, February 24, 1968, Detroit auto makers were installing 8-track decks as original equipment (p. 109).
7. *Popular Mechanics*, January, 1968, p. 143.
8. *Business Week*, February 24, 1968, p. 108.
9. *Ibid.*, p. 142.
10. *Business Week*, February 24, 1968, pp. 108-109.
11. *Ibid.*, p. 109. The growing division between hardware and software manufacturers is evident at this point. The article quotes an executive of Columbia Records: "[We aren't] in the hardware business, and we don't want to help [GE, Norelco, or any others] sell their equipment by telling the public they can play our music on cassettes." The recording industry called for a change in copyright laws, and hardware manufacturers marketed play-only cassette machines (which did not catch on with the public).
12. *High Fidelity*, July, 1969, p. 53.
13. *Musical America*, March, 1955, pp. 21-24.

14. *Popular Electronics*, June, 1977, p. 73.
15. *Ibid.*
16. *High Fidelity*, August, 1977, p. 109.
17. Yamaha promotional brochure, December, 1987.
18. *Home and Studio Recording*, November, 1987, p. 34.
19. Telephone interview with David Oren, June 5, 1987.
20. *High Fidelity*, January, 1979, p. 107.
21. Though the recording quality may not be as good on 1/4-inch tape, the cost of one reel of 1/4-inch tape is \$12, versus \$32 for 1/2-inch tape.
22. *The New York Times*, May 11, 1987, p. C13.
23. *Ibid.*
24. The lawsuit brought against Michael Jackson for alleged plagiarism of the song "Billie Jean" revealed that Jackson has a 4-track recorder at his bedside.
25. *Home Recording Act*, U.S. House of Representatives, H.R. 2911, June 27, 1985.
26. *The Washington Post*, September 8, 1986.
27. Dick Hebdige, *Cut 'n' Mix* (New York: Methuen, 1987), p. 141.
28. The argument that consumers will prefer DAT because they can record on it is not a very good one. Consumers would then presumably prefer cassettes to LPs also.
29. Tim Hanafey, keyboard player for Left and Memphis Phase II, in a conversation with the author at Maybel's, Champaign, IL, 1982.
30. Larry Grossberg, presentation at the International Communications Association Convention 1987, Montreal, Canada.

