

## *The Audio Interview*

# LEN FELDMAN

## Mr. HI-FI

DAVID LANDER

**J**anuary and early February brought numbing temperatures, with a glut of snow and ice, to Len Feldman's part of the country and mine. Events in other parts of the nation included the devastating Los Angeles earthquake and were often as bleak or more so. Clearly a winter of discontent was underway for many in America.

Unfortunately, Len was among them. After battling cancer for some two years, as of late 1993 he had been experiencing gratifying results from an experimental chemotherapeutic program. Then, as if his personal weather patterns had succumbed to the forces controlling the environment, chemotherapy became ineffective. The disease began to rage anew, and Len was finally forced to

retire, a step he had resisted as long as he maintained the strength to do at least some work. On February 14, just a week before his 67th birthday, Len Feldman died.

Len's long career in audio led him along some of its most interesting avenues, and, as one of high fidelity's most staunch advocates, he returned a great deal to the industry that provided his living. A longtime contributor to *Audio* and numerous other consumer and trade magazines, much of his writing was tutorial, devoted to explaining technology to readers with widely varying levels of expertise. Along with hundreds of magazine articles, he wrote seven books.

Len was also an enthusiastic lecturer. Many attendees heard him speak at the consumer shows that were given for many years by the Institute of High Fidelity, a manufacturers' organization that



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he served as Technical Director. More recently, on several tours sponsored in part by this magazine, Len travelled to some two dozen U.S. cities and explained digital audio—including the Compact Disc, digital signal processing, and other developments—to groups of prospective home-electronics purchasers.

Several years ago, after the Institute of High Fidelity was absorbed by the Electronic Industries Association, a more broad-based trade group, Len became an EIA Technical Consultant. That led to service on the Audio-Visual Systems Technical Committee of the International Electrotechnical Commission. (An organization with representation from most industrialized countries, the IEC works to set worldwide standards for electronic and electrical products.) Len also testified before legislative committees on sev-

eral occasions when laws detrimental to the interests of hi-fi buyers were being considered.

Last summer, Len and I began discussing his experiences and recording them on cassette. For his part, he was an eager participant in this interview. For mine, as one of many younger colleagues who, in spite of Len's busy schedule, were always able to count on him for help with a project, I was honored to have the assignment.

Naturally, Len's condition, which included all-too-obvious symptoms of discomfort, was highly distressing. But he also displayed an irrepressible sense of humor, and, when reviewing the tapes for the first time, I was immediately struck by how clearly his love for his work and this industry shone through. Perhaps I should have expected that, since the high-fidelity industry has had no better friend than Leonard Feldman. D.L.



loudspeaker, which became a standard. It was a dual-concentric driver used in the Berkshire consoles, which, incidentally, marked the first of many, many live versus recorded events. It was held at Tanglewood, the music festival in the Berkshires, with a full orchestra on stage that pretended to play music actually played through speakers.

*That technique was used to promote high fidelity by a number of companies, including Fisher. You said that you went to work there in 1951. What was the company like then? And what did you do there?*

We were on Van Dam Street in Long Island City [an industrial section of Queens, just across the East River from midtown Manhattan], a tiny establishment. I don't think we had 10,000 square feet, in total—manufacturing and everything, including consoles, and consoles take up space when you're trying to put them together. I wasn't hired to do audio. My initial assignments were government subcontracts—electronics for aircraft, for radar, mostly subassemblies we were putting together according to supplied blueprints. Business in audio at that time was not that great, and the company needed cash flow. This went on for quite a while. In fact, we even did a project on



*Top to bottom: Madison Fielding multiplex decoder, FM tuner from Madison Fielding by Crosby, and Electro-Voice Stereo-4 amp.*

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color TV for Hazeltine, an experimental assembly of several prototypes. As these projects tapered off, I made my way into audio design.

*The audio business began to grow.*

The audio business did start to grow. One reason was that Fisher at that time moved into separate components as well as making consoles. And my boss, George Maerle—that's who I worked for at Fisher—was a remarkable man. George

Maerle was Chief Engineer, and had no engineering degree. He was self-taught, and he was one of the finest r.f. and audio engineers I've ever met, which to me was remarkable.

*What did he have you work on?*

I was involved in the design of some of the first power amplifiers and one of the first preamps ever to come out with levered positions for equalization. There was no standard equalization in phono; you had a dozen or more different curves. Well, we

came up with two six-position lever switches that gave you a combination of 36 possible equalization settings for different records. [Laughter.] Then I was involved in the design of several accessory products, scratch filters and rumble filters—in short, doing what was assigned to me. I didn't get too much into r.f., even though FM and r.f. were really my first loves in all of this. George basically did the designs of the tuners. He was a superb tuner designer, among other things. And Avery Fisher got into every bit of the act. He had to hear every product before it was approved, every prototype, every hand-built sample. And, of course, being a designer, he was very concerned with appearance. [Avery Fisher had been a book designer at Dodd, Mead and Company prior to launching his career in audio.] The Fisher bird, the logo still in use today, was his design.

*You've said he was a strict taskmaster. Yet I can't imagine him acting in an undignified manner, shouting at people, for example.*

He didn't, as far as I can recall, but he was critical. He very much wanted things his way, even when it came down to such things as

owner's manuals. I credit him with starting my writing career, because he would have me write some of the owner's manuals. We would go over them together.

*And he would correct your punctuation.*

Right. [Laughter.] That was typical Avery Fisher.

*Nostalgia leads some of us to think of early high-fidelity design as a search for the Holy Grail. Yet there must have been some marketing ploys involved.*

There was some gimmickry, I have to admit. In about 1954, George Maerle came up with an amplifier circuit we dubbed Z-Matic. A little knob changed voltage feedback to current feedback. In retrospect, it was a dumb thing to do, because it loused up the damping factor.

*What was the object?*

It changed the nature of the sound. You could hear a difference when you went



from one extreme to the other—in continuously varying degrees. [Laughs.] I became the lecturer on Z-Matic at the consumer hi-fi shows. I had a big pointer and diagrams, and Avery Fisher used to say, “Take it away, Professor.” I would go through this routine and demonstrate this Z-Matic, and the public was enthralled. “Hey, here’s something new. Here’s a variable we can control.” And he sold slews of these amplifiers. Z-Matic stayed in the line for several years. In fact, it was an improper treatment of an amplifier, totally improper. You wouldn’t do this today. I remember he also tried to use the Fisher-Lincoln changer, the

*I’ve heard countless exhibitors at more recent trade and consumer hi-fi shows complain about room acoustics. Did that go on when you were at Fisher?*

No, not to the degree that it does today. But I’ll tell you what did go on—at least in the case of Avery Fisher. After we thought we had the room all set up, all the signage and all the posters, he would come in, survey the room quietly, and, being a designer, say to one of us, “That sign is tilted one-eighth of an inch to the right.” He was always correct. He had an eye like nobody I know. [Laughs.] And it used to drive us crazy; we thought we had everything just so.

mandy turned around and looked askance up at me. Then the whole orchestra, at once, on cue, put down their instruments. The audience was aghast. The amazing thing was, we were dealing with mono. These speakers were all playing the same thing; it was not stereo.

*You heard some of the first stereo demonstrations on open-reel tape. What was your feeling about the medium?*

I was fascinated by it. I thought, this is the Great Coming; this has got to happen.

## ❖ The Audio



*Len Feldman  
and Willy Studer  
in the Studer-Revox  
booth at an audio show.*

one that flipped records over and sometimes tossed them across the room. [Laughter.] Listen, not everything was a success. Just as later on, there were failures in the audio industry, many of them.

*You were also involved in some live versus recorded demonstrations at Fisher. Do any stand out in your mind?*

One involved the placement of about 10 huge Jensen speakers—taller than I am—along the back of the stage at the Academy of Music in Philadelphia and the entire Philadelphia Orchestra under the direction of Eugene Ormandy. I was sitting up in the box closest to one side of the stage with a preamp—a consumer preamp with one master volume control to handle all the amplifiers and speakers that were on stage. Of course, it was again a case of the orchestra pretending to play, and, at one point, when I got the volume up a little loud, Or-

*Didn't some people feel three channels were necessary?*

I think so. But we were conditioned into thinking the left speaker was for the left ear and the right speaker was for the right ear. Of course, that's completely false. It would only be true if you were dealing with binaural, a form of multichannel that had been demonstrated, by the way, as early as 1933 by AT&T at the Chicago World's Fair. All with headphones—you had to do it with headphones.

*You left Fisher in late 1956 to form your own company, Madison Fielding, the name of which was your own—Anglicized—combined with the location—Madison Street in Brooklyn. Didn't you start that with someone you had known at Fisher?*

Steve Lipsky, an engineer, an eager beaver kid who was already fooling around with transistors—before anybody. We both left and put a small amount of money into this—because we had an angel, a company called Telematic. I was doing some work for them on the side. Steve Lipsky had a preamp small enough to hold in your hand. It was the first transistorized preamp, a microphone preamplifier that we called Mic Amp. From there we branched out and started building more conventional component products—amplifiers, preamplifiers. When they broadcast stereo with one channel on AM and one channel on FM, we built a tuner with a separate AM dial and a separate FM dial, two tuning knobs, and two outputs so that you could receive these broadcasts without a second unit. Then we did the same thing with a receiver. It had two amplifiers.



*Not long afterward, you formed an association with Murray Crosby, a talented inventor who developed a system for stereo broadcasting. Tell us about that.*

In about 1958, I heard about this fellow, Murray Crosby, who had been working to promote stereo FM. I went out to his lab, which was in Syosset, Long Island, and he told me about his system for stereo broadcasting over a single FM station. It made so much sense to me that Madison Fielding became one of his first licensees. At this

Crosby system—with a warning to the consumer that this may or may not be the system chosen by the FCC—because stations such as WBAI in New York were already experimentally broadcasting with it. *You and a number of others in the industry felt that the FCC picked an inferior system because Crosby's would have prevented FM broadcasters from piggybacking the signals of background music companies*

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time, Crosby was about to merge with a company called Teletronics and, in fact, became Crosby-Teletronics. With that, there was a stock issue. At about the same time, Telematic was going broke trying to do too much, and our assets were sold to Crosby. The idea on Crosby's part was, "If my system gets the approval of the FCC, wouldn't it be logical to have a manufacturing firm to produce multiplex adaptors under the Crosby name?" It made sense to me as well; Steve Lipsky was out of the picture by then. So we became part of the Crosby family, and at first called ourselves Madison Fielding by Crosby. Eventually it just became Crosby. We continued pretty much to make the same products we had been making—preamps, separate amps, receivers, tuners—the usual array of components, but the major effort at that time was to promote Crosby's FM system.

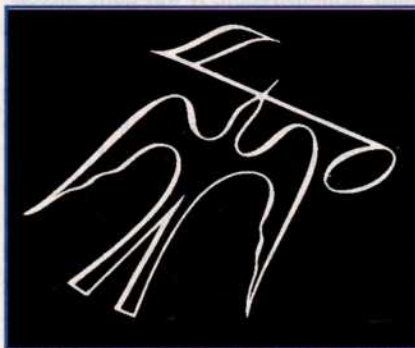
*There were, of course, other contenders for the FCC's sanction.*

By the time it got to FCC testing, there were five systems. The entire industry was convinced that the Crosby system was the best system. I say this without boasting; it was a fact. It was good stereo, it was good separation, and it was noise-free. In fact, the Crosby system would have yielded no more than a 3-dB degradation when you switched from mono to stereo under weak-signal conditions. The system we ended up with becomes horrendous if you're in a weak-signal area. There's a 23-dB loss, and you have to go back to mono. We were so sure of the outcome that, during the interim period, while the FCC was making up its mind, we actually sold adaptors for the

*on their own. That would have deprived them of revenue.*

That was never admitted, but it's my opinion. Muzak—I think they were in Kansas—had a senator. What more need I say? [Laughs.] The key was that our system required the entire spectrum out to 75 kHz, which was space assigned to those

*Avery Fisher, a talented designer as well as a demanding boss, devised the Fisher Radio logo.*



services. Our attitude was that they could go elsewhere, get themselves another piece of spectrum. Why latch on to the public FM band?

*How knowledgeable did the FCC people you encountered at the time seem? Did they care about sound quality?*

The FCC representative on hand in Uniontown, Pennsylvania, at the tests was asked, "What about multipath?" His answer, which was a classic, was, "We'll find out

The industry thought the Crosby FM stereo system was the one to beat, but the FCC decided otherwise.

about that later." We've been finding out about it ever since. To duplicate interference near the receiver, the official noise-maker used with each of the systems was this FCC representative's electric razor. The decision was a shock, a total shock to everybody. It came on April 19, 1961. That morning, my stock in Crosby Teletronics was worth \$15 a share. At 10 a.m., the announcement came that the FCC had selected what was now the Zenith-GE system—because those two contending systems were so close, they were combined into a single system. By that afternoon, my stock was  $2\frac{3}{8}$ . But the story doesn't end there, because one element of the system chosen, we felt, infringed on the Crosby patent—the very simple concept of sum and difference, L plus R being the main channel and L minus R being the stereo difference information. It's used everywhere today, but it was noted in Crosby's granted patent.

*So what did you do?*

We sued GE. That was our only hope, because the company had expended so much effort and money on promoting our system that there was little left. We won in lower court. Then they took it to appeal, and the decision was reversed. They invalidated Crosby's patent, citing prior art. That was the end of Crosby-Teletronics.

*And, I gather, the end of a happy period in your career.*

I was very happy with Crosby, because I was working with a true scientist, a great engineer who had 180 patents.



what Congress said to us was, "Go back and resolve this system in another way." The other way, of course, was the SCMS compromise, the Serial Copy Management System, which allows only one generation of digital dubs.

*In general, when you've appeared before them, what have your feelings been about legislators hearing your testimony?*

I was impressed. You know, you go in there thinking, "What are these people going to understand about such technological things?" But they ask probing questions, and they do get pretty knowledgeable by the time you're finished. Of course, they always have the assistance of technical aides. I'm favorably impressed. Now, when you get them on TV, it all falls apart, because they're all being showmen. What a difference. I hate watching what they do to themselves. They're running for office the minute they're on TV.

*Still, it sounds like the legislators have listened. Have you found that industry manufacturers have listened—to the advice they so often solicit from writers such as yourself, and to feedback from hobbyists and other interested consumers? Or are they just building their dreams?*

I think they're building their dreams—and have been. More so in the Orient than anywhere else, they have the attitude, "If there's a feature we can incorporate, let's incorporate it." Whether it's important or not. "Let's do it because we can do it." Some, of course, are more practical. On the American side, at the high end, you have another problem—pricing. I can understand some high-end pricing, because it's limited production, but most of it seems unjustified to me. In high-end audio, I

*Have you been on press junkets you felt were ill-advised?*

I'll tell you about two. One owner took a whole slew of us to an airport hotel and we spent, I believe, two days listening to "scientists"—there were at least four or five—that he supposedly brought from his facility to lecture us on how complex the product was. We never got to see his facility; the whole thing took place at the airport. It was a fiasco. More recently, we went to Europe for a one-day introduction elaborately staged at a theater. They didn't even take us to the company's headquarters. Why did they bother? They could have done this in a theater in New York or anywhere else. On the return flight, we had an engine failure—to add to our woe—but that's not the point. There have been many such press conferences where the ballyhoo was not worth the effort at all. Locally, too, and at shows. Perhaps a firm will spend a good hour lecturing you on the greatness of their new widget. They invoke the famous phrase, "Thank you for taking time out from your busy schedule," then go on and on and on, using one executive to speak after another. If there really is important information, put it in the press kit and let us go. Unless you can audibly demonstrate something.

*They're usually not bylined, but I don't think anyone would be surprised to learn that you've been one of the writers documenting the achievements of the inimitable Professor I. Lirpa, which have been known to grace the pages of this magazine around April Fools' Day. Do you have a favorite Lirpa innovation?*

*You've talked about how much you enjoyed working with Murray Crosby when you were still in manufacturing. What have you enjoyed most about the consulting facet of your career?*

I've very much enjoyed the work I've done for IEC. My first effort was in 1981 or '82, and it enabled me to visit many countries. To give you some idea, the places my wife and I visited as a result of this included Sydney, London, Paris, Frankfurt, Berlin, Prague, and Istanbul.

*Do you recall how many trips abroad you've made in connection with your work over the years?*

There have been 38 trips to Japan since 1972. I've kept track of that.

*As an audio journalist, what has given you the most gratification? And, if you want to get into it, what have you least enjoyed?*

As for what I've enjoyed least, those interminable press conferences that don't tell you anything and waste your time. But I've enjoyed the associations that I've had. I've made some good friends. And I've enjoyed what I think is the respect of the industry in general. It's always nice to hear good things about yourself, and I've had a lot of that. Some criticism, too, no question about it, but mostly it's been favorable. And for that, I've been most grateful. A

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think, there's a certain snob appeal in raising prices beyond reality.

*Apart from this, how do you feel industry manufacturers have treated the press?*

Generally, pretty good. When times were better economically, they almost did too much for the press. The trips, the junkets that are arranged periodically for journalists, are expensive. Particularly if you go to Japan, where you're treated like royalty.

Two. There was a time before digital readout of frequencies when everybody was vying for the most detailed dial. I wrote about a receiver that had a yardstick stuck out beyond the side for the dial scale. There was also a complete rack system from the Soviet Union with a remote control larger than the system itself.

Feldman influenced many components, some laws, a number of audio standards, and about 40 years' worth of readers of *Audio* and other magazines.