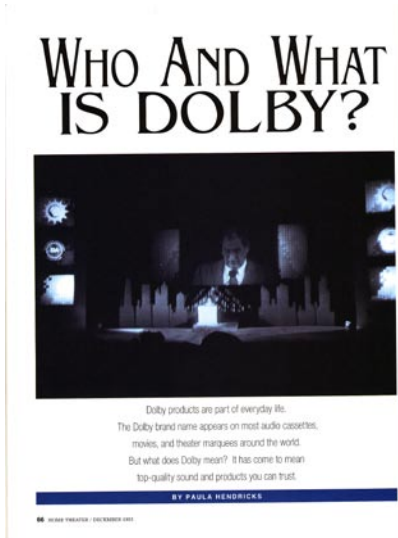


## Who And What is Dolby?



I went shopping for a home theater system, which I wrote about in this magazine, and the big deal, or one of the big deals I discovered was Dolby Pro Logic. The basic technical system whereby listening to movies at home was more like being in the theater than ever before. Briefly, it was a system that had four channels of sound—right, left, center, and surround—and for me that translated into right and left front speakers, right and left rear speakers and importantly a center front speaker. This allowed the dialog and other important sound to come from the center, essentially from the television screen, and sound like the actors were speaking—right out of the television set. The other speakers handled ambient sound, sound effects, and other less dominant “noise.” The previous systems, using surround sound, could be disconcerting because the voices would come from the sides—so the voice might be a distance away from where you were looking—or you placed your front speakers close to the television set and lost the spatial effects. Not very “lifelike.”

Anyway, the more I looked, the more the name Dolby came up. And I remembered the name from audio cassettes and movie screens.

Who, or what is Dolby? I asked. Dolby is Dolby Laboratories, founded and still owned by Ray Dolby, with headquarters in San Francisco (See Photos 1 & 2). So. Who is Ray Dolby? And how did it happen that his name seems to be on every other marquee and movie screen in the US, and virtually every audio cassette and boombox I’ve picked up? And what other things does he do that I don’t even know about?

Dolby Laboratories is a small, innovative, company, with approximately 250 employees, that grosses about \$40 million a year. It is solely owned by Ray Dolby. Ray (I will use Ray’s first name to differentiate the man from the company) holds more than 50 patents himself (his first one received at age 19) and the company holds hundreds. It is a very large company indeed in terms of its impact on the audio business. Anything that has to do with sound probably involves Dolby.

“We make things sound better,” said Joe Hull of Dolby Laboratories. “We don’t invent formats. We use signal processing and ‘twiddle’ with it to fool the ear. We fool people into thinking what they’re hearing is higher fidelity than it is.”

Their goal is to provide the illusion of being in a different atmosphere. “Acoustically speaking you are somewhere else,” said Hull. “We can do that now very convincingly.”

About 30-40 percent of their revenues come from licensing their technology to consumer companies, who make the actual products. The balance comes from their professional division.

These consumer products are not manufactured by Dolby, but by their licensees. They have very close relationships with these other companies. Hull describes it as trust. Because their brand name is very important to them, they set standards that must be met by these products before the Dolby brand name can be attached. They test either prototypes or early run products. And then later they buy these products off the shelf, just like I do, and test them again. If there are problems, they address them.

*Dolby products are part of everyday life.  
The Dolby brand name appears on most audio cassettes,  
movies, and theater marquees around the world.  
But what does Dolby mean? It has come to mean  
top-quality sound and products you can trust.*

What this means to me is if the Dolby name is on the product, I can assume the technology meets certain standards and makes my choice of equipment easier. I can choose the look of the piece, the one with red knobs, or a dealer I like, or a better warranty, knowing the basic performance of the machine will meet certain, high, standards.

Dolby products are in our everyday lives. The Dolby brand name is on virtually every audio cassette released, every movie, and every other marquee in the free world. The numbers here are enormous, and it is hard to imagine how pervasive their influence truly is. If you watch TV, use a VCR, go to the movies, use audio tapes (or just listen to someone else's)—you are bound to hear the result of Dolby inventions.

- -More than 264 licensees in 43 countries have produced more than 395 million consumer products incorporating Dolby technologies.
- -About 68 million headphone portable cassette machines with Dolby noise reduction have been manufactured in the past ten years.
- -About 17 million car products with Dolby noise reduction are produced each year.
- -More than 90 percent of music cassettes being made in the US and 75 percent of those being made worldwide are made using Dolby HX Pro.
- -More than 7 million consumer Dolby Surround decoders, and more than 2.5 million Dolby Pro Logic surround decoders have been produced worldwide.
- -More than 2 million consumer Dolby surround decoders are incorporated into television sets.

But, Dolby is not just a licensing company for consumer products. They develop, manufacture, and market all their own professional equipment. These products, of necessity, are more complex, more sophisticated, and more expensive than consumer products. Their clients include recording studios, broadcast companies, and the film industry. And, again, their presence is tremendous:

- -More than 90 percent of the major films produced in the US are recorded in Dolby Stereo.
- -More than 3700 Dolby stereo films have been released worldwide since 1975 and more than 240 Dolby SR films have been released since 1988.
- -Dolby stereo films are dubbed in film studios in more than 28 countries.
- -More than 140,000 professional recording tracks worldwide are equipped with Dolby A-type noise reduction.
- -More than 65,000 tracks of Dolby SR have been sold to users in more than 55 countries.

So, where did all this start? Ray Dolby went to India in 1963, after earning a Ph.D. in Physics from Cambridge University. He lugged around his Ampex reel-to-reel tape recorder, which he helped invent in the



'50s (see photo #3), taping sitar music in ashrams. He was disturbed by the lack of purity in the recordings, the presence of "hiss." He returned to England and founded Dolby Laboratories in May, 1965 with a staff of four. Early on Dolby labs began to focus on audio. While Ray has done work with X-ray (developed a long-wave X-ray analyzer) technology, since the early days, Dolby has been "audio."

Their first noise reduction system, for professional music recordings, Dolby A-type, was demonstrated for Decca Records in November 1965. Decca ordered the first nine units in January 1966 and Dolby was on its way.

The first commercial recording session using a Dolby A-type noise reduction system was with Vladimir Ashkenazy playing Mozart piano concertos in May 1966.

During 1967, a consumer company, KLH, showed interest in the technology, and in 1968, the first consumer product was released in the US.

Well, what was this technology and why is it so important? LP, vinyl, records have had technology in the system for a long time to reduce the noise caused by the needle scratching against the record, but this wasn't true of tape. The Dolby process comes into play essentially during the quiet moments—after all, when the music is loud you won't hear "hiss."

Ray has always been fascinated with how things work—he did a complete valve job on his father's '32 Plymouth when he was 11. He played the piano and then switched to horns, clarinets. He loved music, was curious about how it worked—why things sounded the way they did, how the organs worked and how the reeds vibrated to produce the sounds they did. He became obsessed with how to make things work better—sound better.

In the late '60s, Dolby expanded with a sales office in New York, and in the mid '70s transferred corporate headquarters to San Francisco, California. Ray is reputed to have said to his top staff: "Dagmar and I are going back to California, San Francisco, and you're coming with me."

Ray and his wife, Dagmar, met at Cambridge, and were in India together. During the early days of the company, Dagmar was very involved. She actually delivered the first noise reduction units to Decca in 1966, helped on the production lines, and went on licensing trips with Ray in the early '70s. Once she had children, she became less involved in the company, even though she is still a presence there. Their two sons are college and high school age now (the first one was born at the time of the move to California).

During the '70s Dolby became involved with the movies. Ray has said "When I started my company, in 1965, one of the major things I had in mind to do was to improve the quality of sound in motion pictures. At first we were happy enough just to think about enhancing the lowly 35 mm mono optical sound track. It was economical and therefore widely used—mono was the standard I could not believe that only a few audio freaks like me cared about the sound. So I kept pushing my people into doing something and in the early 1970s we introduced the high fidelity mono optical sound track."

Stanley Kubrick, the director, became interested and in 1971 *A Clockwork Orange* became the first film to use Dolby noise reduction on all pre-mixes and masters, released with an optical sound track.

From "*A Clockwork Orange*" they went on to develop Dolby stereo optical sound tracks—"Lisztomania" was the first feature film for commercial release employing this technology in 1975. "*A Star is Born*" in 1976 was the first film with surround effects encoded on a 35 mm Dolby stereo optical sound track.

But in 1977 they hit it big with "*Star Wars*" and "*Close Encounters of the Third Kind*." The public became aware of Dolby stereo and more theaters jumped on the bandwagon. "*Star Wars*" became the first in a



continuing series of movies using Dolby technology to win the Academy Award for Best Achievement in Sound.

*Academy Awards for Best Achievement in Sound  
16 Movies in a Row*

1978:	Star Wars
1979:	The Deerhunter
1980:	Apocalypse Now
1981*:	The Empire Strikes Back
1982:	Raiders of the Lost Ark
1983:	ET: The Extraterrestrial
1984:	The Right Stuff
1985:	Amadeus
1986:	Out of Africa
1987:	Platoon
1988*:	The Last Emperor
1989:	Bird
1990*:	Glory
1991*:	Dances with Wolves
1992*:	Terminator 2: Judgment Day
1993*:	The Last of the Mohicans

\* All nominees released in Dolby Stereo

In 1979 Apocalypse Now was the first film released utilizing Dolby Stereo 70mm with two separate surround channels on the film. Another Dolby invention.

The 1980s became a decade of acknowledgment as well as pushing into significantly different realms. New applications were developed for satellite transmission. With the advent of MTV and later VH-1, uses for full time cable services recorded in stereo and incorporating Dolby B-type noise reduction, and satellite transmission using Dolby soundlink delta modulation technology (AC-1) were evident.

All this technology, the language, the code numbers, makes my eyes swim. AC-1, SR, optical vs. digital, gives me a headache. But, I also know it's necessary—I don't need or want what professional recording studios or dubbing theaters need, and someone has to keep all these different items straight. So bear with me as I attempt to keep them straight myself.

In 1986 Ray Dolby was awarded the British title of Officer of the Most Excellent Order of the British Empire (OBE) for his outstanding work in the audio field.

Ray and Loan Allen received an Oscar in 1989 for "their continuing contributions to motion picture sound through the research and development programs of Dolby Labs." In the same year, Ray Dolby received



an Emmy for outstanding achievement in engineering development for audio noise reduction systems for professional television tape recorders.

The '80s were also a time spent in the lab. Ray and Dolby have never stopped inventing, from innovating, from making things sound better. Some compare it to the picture in the movies. People are always trying to make the picture better. You blow up the picture from this tiny little negative and you want better color, more sharpness, less grain. The same is true for sound, and Dolby is the premier company in this area. They have moved from audio to movies, to video. From Dolby stereo to surround and in the '90s to stereo digital, which translates to Dolby surround digital for home use.

"During the 1980s we designed better encoders and decoders including the Pro Logic system " said Ray Dolby.

So what about now? About the 90s? What's going on that's new?

From a professional stand point, the code numbers are back: AC-1, as I mentioned earlier, was a satellite soundlink system. Now, there is AC-2, which allows simultaneous master recording of different elements from different locales. Recently, Gloria Estafan recorded a song from her studio in Miami, the horn section was in Chicago, and the backup singers were in LA. That's AC-2. AC-3 is the newest development that will allow six channels of audio in consumer products. Current in-home state-of-the-art is four channels. Zoran Corporation is now working with Dolby to produce a low-cost integrated circuit to do just that.

From my stand point, however, the most interesting news is optical digital and what that means for compatibility of every format. The implications of this are much bigger than just movies. Television shows are beginning to be recorded in digital stereo and it will end up in home theaters and media rooms. The first film in Dolby Stereo SR-D 35 mm format was *Batman Returns* in 1992.

As of 9/17/93 twenty-eight movies have been released with SR-D, including *What's Love Got to Do with it* and *Malcolm X*. More are due for release, including Tim Burton's *The Nightmare Before Christmas*. More than 130 theaters in the US and almost 300 theaters worldwide are now equipped to show this new format.

One of the great things about this technology is that it does not eliminate the analog soundtrack from the film, which means that movie producers do not have to release two sets of prints—some theaters have the digital decoders and some do not.

The other magical thing about this is where they coded the signals. There really isn't much room left on a piece of film after the visual image and the analog soundtrack are in place. So they squeezed this data into the film between the sprocket holes (see photo #4). Very clever.

AC-3 is the coding that makes it possible to fit the six-channel digital track into the space between the sprocket holes on the film today and to provide multi-channel Dolby surround digital sound in consumer video and audio formats tomorrow. These six channels are left, center, right, two surround, and a sub-woofer (photo option "X"). The other great thing about AC-3 is that it evolved from a study the movie industry conducted to determine what they wanted, what would be ideal. Instead of being driven by technology, its limitations or its pie-in-the-sky enthusiasms, the six channels represent the blend of desired result and innovative technology to accomplish it. And importantly, it involved the future of other media, like HDTV, as well.

And with this available on 35 mm, television producers expect this to be available to them, so everything becomes totally compatible. If you have a mono system, you hear that, all the way up to digital with sub





woofers.

One reason this is so exciting, is that limited channels had long been the norm in movies. Even LP records could only hold two tracks, which meant that the sound all of us were hearing at home was actually worse than what we heard in movie theaters. In 1941 *Fantasia* was released with four channels of sound. A big breakthrough. The first commercial films with 4-7 channels were released in the '50s. We've come a long way since then.

At the Consumer Electronics Show in 1992, Ray said, "As you know, there are now many wonderful home theater systems available, with more all the time. We finally have to admit that multi-channel sound in the home does seem to be viable. It took the motion picture, the VCR, and laser discs to create the critical mass necessary to make it all happen." Ray is a man who knows about timing, about what's viable. He recognizes what's possible and then makes it a reality.

Today, Dolby is still as active as ever, always innovating and doing things better. They opened a new headquarters in Wootton Bassett England last spring (see photo #5), with, obviously, the latest technology. The office in the UK contributes about half the company's income. Dolby labs now have two manufacturing plants, one in San Francisco at their headquarters on Potrero Street and one in England. These two main labs contribute about the same gross income to the bottom line, which means they have a significant presence in Europe as well as the US. There are consulting offices in New York and Los Angeles to service the movie industry, as there is always a Dolby employee on hand during film mixes.

So, what's next? Well, even though Ray and his family moved recently, he still has a home lab where he works on his own projects. He likes to think of himself as an inventor, even though he is also an entrepreneur, an engineer, and an astute businessman.

Ray turned 60 this year, and it raises all kinds of questions about retirement and the future of the company. It is an interesting problem for a solely owned, hugely successful company. While he had a heart attack a couple of years ago, it does not seem to have slowed him down. He has a new passion—flying. He has just recently learned to fly. His first plane was a Cessna, but he has recently bought a new, high-performance (of course) European plane.

Okay, what about the future? Even though laser discs are available and considered to be very high quality, they aren't mass market yet. The technology is available to put movies on computer chips, so the laser disc would not have to be "read," a mechanical process. But, all this is still blue sky.

Ray Dolby. A low-key, thorough, very hard-working, linear thinking man. A man whose imagination can make the leap that says people want to hear airplanes zooming around their own home theater rooms. A self-defined "audio freak" who makes my pleasure at the movies increase 100-fold. He once told a reporter, "Anxiety is the key to my success." He was always trying to do the impossible, and was never sure it would work. But, he kept trying.

When the German planes are strafing Indiana Jones and the noise is mind-boggling, and you can hear him whisper under his breath while he's being dragged by a car and you're there, sweating with him that's a Dolby innovation.

A friend said "He's brought to home theater what he brought to the movies—reality."

But I think it's more. It's better than reality.

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