



Career of the Month

December 2010, Based on Interviews With Professionals Using Science in the Workplace

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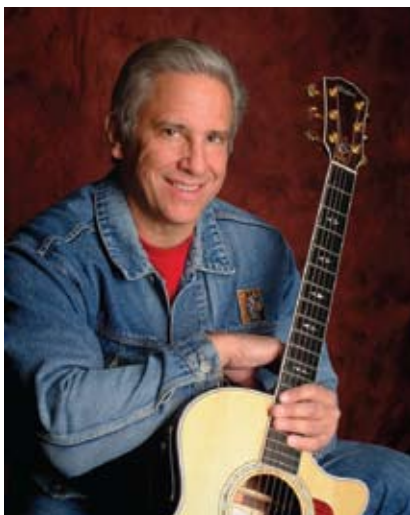
Broadcast Engineer

Broadcast engineers maintain radio stations—their job is to keep stations on the air and making money. From rewiring a station's equipment to fixing a transmitter on a mountaintop at 3:00 a.m., these engineers make sure that we, the listeners, can count on music streaming from our favorite stations. As a teenager, Glenn Leffler never dreamed that his desire to be a musician would spark a career in broadcast engineering. Now—running a business, teaching classes at local colleges, and recording his own albums—he is grateful that his passion for guitar and gift for electronics paved the way.

A knack for electronics.

My first love was music; I initially became a broadcast engineer out of necessity. When I was 17, I kept blowing up my guitar amplifier and repairs would cost over \$100 a pop. Since gigs at the time paid \$20–30 a night, money was a precious commodity. It became evident that—to not go broke—I needed to learn electronics and fix my own equipment. By word of mouth, I developed a reputation for being a good guitar player with a knack for fixing and customizing music equipment.

One day, a friend from a local radio station called and asked if I could fix the station's console—a device that is used to control the audio mix and output. I had them back on the air in a few hours. At that time, I had never considered a career in broadcast engineering, but began to study electronics and sound reinforcement for my own



Leffler's love of music sparked his career.

entertainment. A few years later, I took the Federal Communications Commission's second-class telephone operator's licensing exam; I also became a certified electronic technician. I then went on to a two-year electronics school and graduated with my associate's degree in industrial technology.

Music and engineering.

In the beginning, to make a living in broadcasting, I had to put my passion for music on the back burner. I still played guitar, but it happened after work. Then, about 10 years after receiving my associate's degree, I went back to school for my bachelor's and master's degrees in music. To record my own music, I learned about recording engineering and acoustics. I also discovered how to wire recording studios and radio stations. Through the Society of Broadcast Engineers (SBE), I became certified as an audio engineer, a senior broadcast engineer, and recently—after 20 years in the field—a professional broadcast en-

gineer. I have noticed that there are many electrical engineers, but most are not educated about the electronics of music, recording, or even radio—which gives me an advantage.

These days, I run a business called Hydra Audio and Broadcast Engineering Services. I also teach recording engineering courses at The University of Texas at El Paso and audio production and music classes at El Paso Community College. And, I have my own 24-track recording studio—I am currently finishing my second solo album.

Work overview.

Transmitter and antenna (radio frequency) engineering is the most common work of a broadcast engineer. The most persistent electrical problem in radio is due to lightning strikes, which often cause power failures. If a station is not operational once the power comes back on, I have to travel to any number of radio towers in a 300 km radius to reset the equipment. When I see a thunderstorm brewing, I know there is a 50% chance I will be working that evening. Because stations generate income by being on the air, they lose money every minute they are not broadcasting, sometimes thousands of dollars per hour. Therefore, I am on call 24 hours a day, 7 days a week.

In addition to transmitter and antenna fieldwork, I am also responsible for making sure that all of a radio station's studio equipment works properly. To maintain a listening audience, a station's signal must sound clean (i.e., no crackles, hums, or distortion). This typically requires changing cables and repairing broken equipment and, every

10 to 15 years, rewiring stations to keep up with advancing technology.

If lightning strikes.

If lightning hits a radio tower or antenna, it can destroy any equipment hooked into the electrical path. Part of the broadcasting apparatus is the transmitter, which generates and propagates radio frequency waves. Fixing broken transmitters must be done cautiously; we are talking about a voltage between 8,000 and 10,000 Volts Direct Current (VDC), which is very high. If I make contact with a voltage in this range, the chance of survival is close to zero. I may also climb a radio tower to check it for damage or burnouts, but a separate crew is brought in to fix those issues.

Station owners and managers do not want to be off the air at times when they have large audiences, so this type of work is often done between midnight and 5:00 a.m., when there are fewer listeners. Transmitter sites are usually on mountaintops and in isolated areas. Where I live in the southwest, it is not uncommon to encounter wildlife while fixing a transmitter—I was once stalked by a mountain lion and have had some close calls with rattlesnakes!

Advice for students.

Broadcast engineers' degrees range from associate's to master's and may be in electrical or computer engineering, telecommunications, or computer information systems. To be successful, you must have a knowledge of electrical, audio, computer, and radio frequency engineering; however, it is actual work experience that really creates a broadcast engineer. Because

technology is always evolving, so must your knowledge in the field: I keep up-to-date through literature and workshops provided by professional broadcast engineering organizations.

Finally, no two days are the same in this job, which keeps things interesting. There is a lot of freedom to work independently—to be your own boss, so to speak—which I consider a huge perk. According to the SBE, currently over 60% of all broadcast engineers are over 60 years old, which means we are looking for new talent. Now is a great time to enter the field.

BONUS POINTS

Leffler's education:

AAS, industrial technology; BS, MS, music

On the web:

Society of Broadcast Engineers
(www.sbe.org)

Related careers:

Audio engineer, sound engineering technician, radio operator, electronic technician

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By Megan Sullivan

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