

It's been 45 years since I joined KFI, Los Angeles, as an engineer and I must admit that when I took the job, I didn't think it would last.

Radio in those days was worlds apart from radio today. Looking back to 1925, I had already been involved in radio, having been enthusiastic ever since my cousin built a ham outfit back in 1914, which was about the time I graduated from grammar school. I built my own amateur receiver about that time and at the age of 14, I was given first prize on my school's "Public's Day." I later became an amateur operator, then went to sea as a radio operator, and even when going to college in St. Louis I continued to be fascinated by radio.

From there I went to the Western Electric office in New York, and became a telephone engineering estimator. When they wanted to transfer me to Philadelphia, I quit and came to Los Angeles.

It was at that time, January 1, 1925, that KFI's founder and president Earl C. Anthony was looking for a man with some radio-telephone engineering background. I just walked into the job and stayed ever since.

Before the KFI job opened however, I was working with the Los Angeles phone company adjusting relays for broadcasting. They had a telephone link set up between Long Beach and Beverly Beach, Catalina Island. The Phone company had asked me at the time if I knew anything at all about radio-telephone and of course, I lied a little bit and said I knew all about it. Nobody knew that much at the time anyway, so I got away with it.

I worked at Beverly Beach until a cable went in. Not long after that, they dismantled the station out there, and I went into the phone company's transmission engineering department.

Now, Earl C. Anthony was an electrical engineer, a graduate of the University of California at Berkeley, but was earning his

living as a Packard distributor in L.A. His station was only a hobby. He chose the call letters KFI simply because they sounded clear enough for anyone to say — and remember. Mr. Anthony was quite inventive; he had built himself an automobile at one time and then with a local engineer named MacDonald, he built his first radio-telephone outfit, only about four tubes on a breadboard. With this unit he went on the air in 1921, but because he had a 50 watt tube in his set, he was probably radiating only five watts. He then got a Western Electric transmitter, 1 kw, around 1922. At the time that he put the 1 kw on the air, Mr. Anthony began to realize the value of radio advertising, since his first sponsor was his own Packard dealership and he did quite a bit of business from those spots on the station.

There weren't too many radio receivers around in 1925 and even Mr. Anthony was becoming discouraged by that fact. There was a time however, when to find out how large an audience KFI had, he got on the air and offered anyone listening in who was 125 miles or more from KFI's transmitter, writing him reporting on their reception, a crate of oranges. Believe it or not, he got 5,000 requests! He was so amazed, he went down to a local orange packer and sent 5,000 little three-orange crates to those listeners.

In the beginning, we were only on the air from 10 a.m. — 12 noon. then signed off until 4 p.m. to dinner time and then ended up broadcasting until around 2 a.m.

In the 1 kw, we were using a Western Electric unit, assembled by us. The console package didn't arrive until around 1930. It didn't look too much different from what we use now. From the outside it looked pretty much the same, but it had more switches and more gadgets than are needed today. The tubes then were not very stable, not at all dependable, and you had to boost them up from time to time to keep them working. You had a lot of things to use to keep them under control. You had to worry about the frequencies because the electrical

parameters would change with heat; for this you twisted a little coil. There was also another switch to change capacity and then the ordinary turn on/turn off power switches, and even lightning switches for the antenna.

Around 1925, Mr. Anthony bought his first 5 kw outfit from Western Electric, which we had broadcasting from an antenna in downtown Los Angeles; we stuck with that until 1930. In 1930, things really began to improve, the tubes got better and it was then that we put up our 50 kw RCA transmitter. The tubes developed in 1930 had a longer life and they were also quieter. The early tubes were very noisy, had a considerable hum and you had to adjust a lot of circuitry to take that noise out. The electrical primers on the old tubes would continually change with age and you always had to be on top of the circuit.

It was all live broadcasting in those days. Recordings came much later. Handling those live programs really was a chore. We were always striving for excellence in sound, but the microphones were just not well developed, nor were they built uniformly. One microphone, the same model, would be different from the other. You'd listen to the live presentation and you'd know that the frequency characteristic of the whole system was not as good as it could be because certain parts of the system were better than others. The loudspeakers were not at all good. It's like comparing the old phonograph records with the new ones. I thought I had a pretty good ear then, but at one time we were broadcasting a series of programs with Al Jolson (*ed. note: possibly the "Shell Chalet"*) and we were doing the pickup for NBC. Jolson would listen to the music and his stand-in singing and claim that the quality we were broadcasting was not as good as he had been used to in New York. Now, in those days, New York was very many miles away and the west coast engineers didn't confer with the east coast engineers about sound and the means to improve sound; we worked independently. Jolson was a perfectionist and his ear was acute enough to tell the difference. We knew that certain frequencies were not being transmitted then. The acoustic problem was another problem we faced. Not much was known then about acoustics — just a little more is known today. We had to improvise all along the line, experimenting with one thing or another, using different studios, different acoustical material.

Nobody could agree on what kind of treatment would be good on the walls. We first sprayed asbestos fiber on the surface of the walls and that took out all of the high frequencies and made the sound worse. Bell Laboratories told us to put curtains on the walls, so we experimented with big curtains, six inches away from the wall and that muffled everything. Nobody knew, East Coast or West Coast. They were experimenting, too. They had more money to play with in the East, however, and were, I believe, just a little ahead of us all the time.

We had already established the first network, long before NBC came out here, from KFO in San Francisco to KFI in Los Angeles and they transmitted over the telephone line. The sound wasn't very good. You could tell the difference between a San Francisco originated show and a Los Angeles show. There was a lot of distortion.

The phone company could offer better transmission, but they charged more for those circuits and KFI was just not able to afford it. In 1930, with the crash affecting the buying public, radio offered a most inexpensive way for people to advertise and the radio business was affected far less than any other business. There were a little better than 11 million radio receivers in the nation then, but during the Depression more and more radio sets were being purchased, it being the cheapest

form of entertainment. It was then that we were able to buy better equipment.

In the early days, it was quite a job to keep the transmitters in town from interfering with one another. We'd tune the things very well, but the tubes being unstable, the harmonics, nobody knew how to find them, the frequencies became very unstable. We were set on numbers then and by and large we kept to them but our frequencies often did interfere with other frequencies and those others with ours.

RCA and the Bell Labs were continually at work to improve broadcasting. Both of the companies were spending their time and money on different aspects. In general however, RCA equipment was lighter and not so rugged as Bell's. Bell's equipment was made to last for years, lasting longer than the technology.

When you look back at the developments, bringing it up to the age of the transistor, the most significant change was development of the three element tube and even today on our transmitters we use the same principle of that vacuum tube.

There were a great many refinements along the way, however, including the development of playback equipment in 1930, which was a copy of what they were using in the movie studios when sound pictures came in. The first recording outfits were recorded on 16" acetate discs. That made a big difference in radio. You could record programs in advance and then edit them by rerecording. Around that time, radio stations began playing phonograph records over the air.

From 1925 until 1950 there was a constant improvement in microphones, tubes, speakers, you name it. Every year there was some improvement. Engineering became easier. In 1925 we couldn't even see the performers; we had to run our controls blind. Then, we had a man on microphone control whose job it was to signal the engineers. We did it all blind. We used to go on remotes and monitor blind.

We worked with one microphone in the early live broadcasts because when we tried to work with more than one, we didn't know how to phase them properly and got muddy results. With the emergence of dance band remotes, we put mikes near special instruments and we learned a lot from that, too. We once had a microphone in front of every instrument in a 14 piece orchestra. We backed off from that because even if you could balance the orchestra the sound was not as clean. Today, we effect a compromise by using two or three mikes or as many as five to pick up a Lawrence Welk orchestra or something like that.

I recall the problems which were developed with the Round Robin. The network had an idea that if you sent a program out from New York on one circuit, you could send it back on another so they could monitor the broadcasts while checking on the quality. They had one complete circuit going to the coast and another going back to New York, and along the way it would drop off the sound in various cities. It made it fairly easy for local stations to drop on and drop off without going into new circuits everytime a station took a program or didn't take it. The wires were strung to all of the telephone companies' toll offices, wired together making this big loop and with a bridging amplifier, you could get a program. This had to be done by the station at the toll office.

Things were handled on cues, then on a fixed time schedule. Keeping all the various components working 24 hours a day was a major job in those days. The engineers of today have it easy. With transistorized equipment, the thing is either going to work or not work at the start. If it works, you've got little to worry about. ■

*Headlee Blatterman is Vice President, Engineering, KFI, Los Angeles.*