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Big Brother, Little Brother

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WESTINGHOUSE MICROPHONES OF THE 20S

In 1920, when the first Westinghouse radio station KDKA went on the air, the only microphones that were available were telephone transmitters. The type telephone in use at that time was the Western Electric "Candlestick" which used the #323 transmitter; a single button carbon unit. (See fig. 1.)

Figure 1

This telephone was used as it came from the manufacturer. The transmitter was wired through the receiver hang up assembly to the radio microphone circuit. By removing the receiver from the hanger and placing it on the desk, the microphone was "on;" and by placing it back into the hanger, the microphone was "off." This was convenient at the time. Later, the receiver and hanger were removed, and the on-off switch was on a remote control unit, or in some cases, replaced by a press to talk lever. In some instances, the hard rubber mouthpiece was replaced by a short (6") brass megaphone for better "distance" pickup.

The next step was to dispense with the telephone stand and use only the transmitter assembly. One of the first mics used at WJZ was a #323 Western Electric transmitter with the 6" brass megaphone, encased in a felt lined cylinder that had eye hooks, so that it could be suspended from an improvised stand. (See fig. 2.)

Figure 2

An approach to improved quality was to take two #323 transmitters and mount them back to back in a short brass cylinder to create a type of push-pull microphone. (See fig. 3.) The main problem with telephone transmitters was the heavy metal diaphragm producing large peaks in the frquency response. This was unacceptable for music so the Westinghouse engineers came up with a higher quality push-pull transmitter element. (Double button carbon microphone.) This consisted of a heavy paper diaphragm with a strip of gold leaf running across the center of each side. This paper diaphragm was held tightly around its perimeter by two

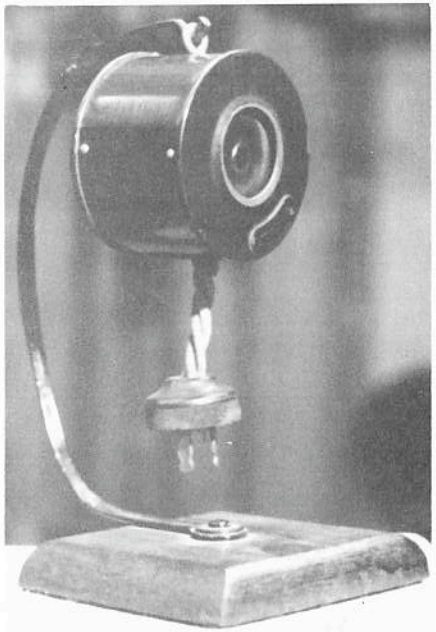

Figure 3

Bakelite rings bolted together. Across these rings on both sides were fastened brass bridges that held brass, carbon holding cups, that rested against the gold leaf on the diaphragms. This double button carbon microphone element was installed in a felt-lined brass cylinder that had a solid Bakelite back and a screened front. The cylinder also had an angle bracket with holes on top to facilitate suspending it from a stand or boom. The microphone wiring was terminated in three binding posts mounted across the bottom of the cylinder. (See fig. 4.) The same microphone was made to mount on a wood base with the binding posts mounted on the face of the wood base for desk use. (See fig. 5.) Due to the general appearance of these microphones and others to be described, the Westinghouse microphones in general were given the name "tomato cans."

The one major problem with carbon microphones was the constant hiss in the background. This was due to the current flowing through the loose carbon granules and could not be elimi-

Figure 4

nated. To get around this, the Westinghouse engineers were experimenting with dynamic and condenser microphones. They developed a microphone that later was to be referred to as the "dishpan" microphone. It was made by modifying a Phonetron loudspeaker. (An early cone type with a voice coil arrangement.) The speaker base was removed, a loop of wire was fastened under two of the upper screws to form a loop to suspend it from a bird cage

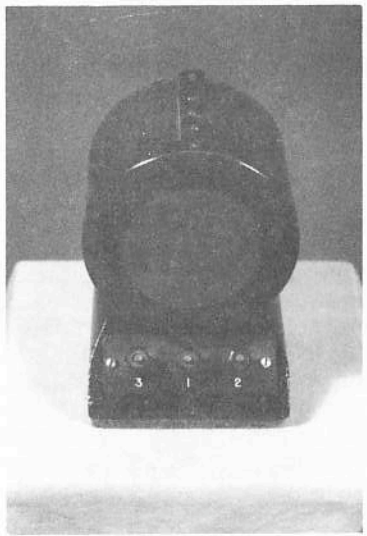

Figure 5

stand and a matching transformer was connected to match it to the equipment. (See fig. 6.) This microphone had good low and medium frequency response but fell off sharply on the high end. However, it did away with the hiss that you got with the carbons and that was a step in the right direction.

Figure 6

Westinghouse also developed and patented a dynamic microphone but it was too large and inefficient to be practical so they let it lie and put more effort into the condenser microphone. Their first condenser element was very similar to the early Western Electric element. It too was mounted in a short cylinder shaped housing similar to the double button carbon microphones. However, it required a power supply and a preamplifier so it was connected through a large diameter, high impedance cable to what was called the "coffin." The coffin was a low style cabinet that held the power supply and preamplifier. (See fig. 7.) Later, the preamplifier and microphone were built into a much smaller case that could be suspended or stand-mounted. This microphone required a five conductor shielded cable to carry the "A" and "B" power to it and the audio out to the control room. This in turn, facilitated the removal of the coffin from the studio. (See fig. 8.)

Figure 7

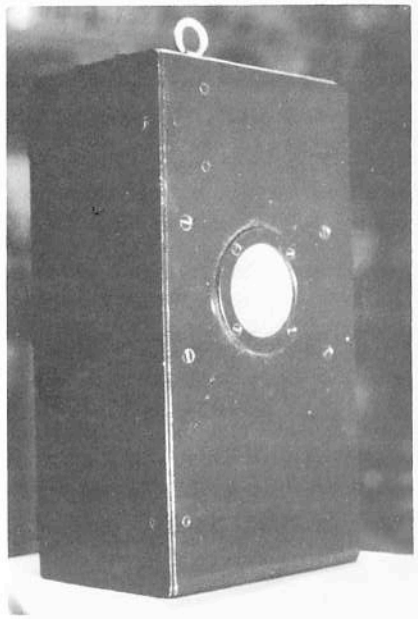

Figure 8

Another interesting microphone was the "Hushaphone." This was the same double button carbon microphone but in a sort of noise eliminating housing. (See fig. 9.)

This came about because of more people working in the studio when there were announcements to be made and unwanted noise in the background.

Westinghouse had also developed a

Figure 9

diaphragmless microphone known as the "Glo Discharge" microphone. This microphone looked very similar to the condenser microphone housing but much thinner. (See fig. 10.) It required a 3000V power supply and a preamplifier and consequently used a large cabinet to house the equipment and take up room in the studio. During 1923 this microphone received many glowing write ups in radio periodicals as the microphone of the future. It seemed to eliminate all the problems that were common to the diaphragm. But then it had many problems of its own and in a short time very little was heard of it and it seemed to fade away.

In 1926 Westinghouse had redesigned their double button carbon microphone and it looked more like the Western Electric type double button carbons in weight and size, but was made of brass rather than steel. (See fig. 11.) The microphone stand base for the newer double button carbon microphone and the Hushaphone microphone were the same bases used for a line of small fans Westinghouse manufactured for home use. Since Westinghouse was handmaking these microphones for their own little network of radio stations and not supplying them to others, they found it to be more practical to buy microphones from Western Electric and later from other suppliers. By the late twenties they were pretty much out of the microphone business.

Figure 10

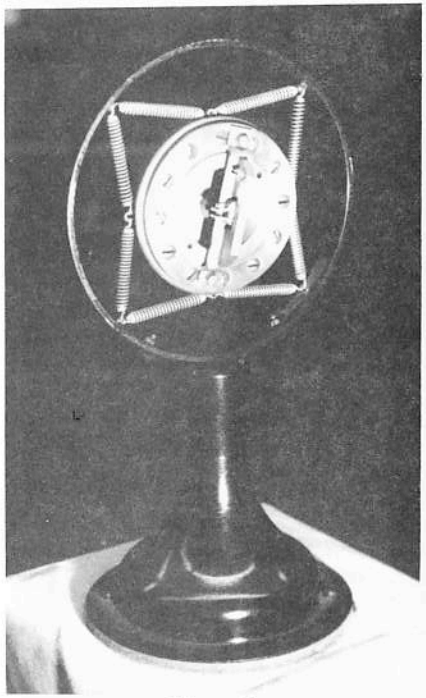

Figure 11

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