

Bart Lee, A Vintage Vignette

Lee de Forest in San Francisco in 1915

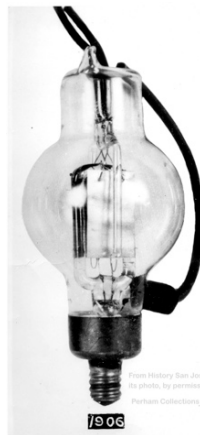
By Bart Lee, K6VK, CHRS Fellow, AWA Fellow

The sign in the DeForest company booth at the Pan Pacific International Exposition, San Francisco, a century ago in 1915, read:

“The De Forest Audion Amplifier Licensed to the American Tel. and Tel. Co as a Telephone relay made the Trans Continental Telephone Service possible.”



This 1915 telephone circuit linked the two American coasts.



An early Audion, courtesy History San Jose

The telephone company did not credit de Forest's vacuum tube for its success.



From Robert Lozier, AWA: Moving Coil Speakers and More — The History of The Magnavox Company 1911 to 1931 (YouTube)

From THE STORY OF THE EXPOSITION:

“*** ... the [telephone] company could make the statement: ‘In all the 3,400 miles of the line there is no one spot where a man may point his finger and say: “Here is the secret of the transcontinental line; here is what makes it possible to telephone from New York to San Francisco.”’ It was not merely a question of stringing wires on poles. The difficulties led into some of the refinements of physics as understood in the early part of the twentieth century, and involved all the subtleties of electrical transmission in its most delicate form. It is not possible here to discuss, even were we competent, the baffling phenomena of lagging, crowding, inductance, and other caprices of this mysterious and slippery form of energy, nor the various loading coils and relays devised by the technical men to ‘speed it up’ and make it do its work.

“There was one device exhibited in the Palace of Liberal Arts, however, and thus germane to our task, that illustrated the extreme subtlety

of technique that had been reached at this date by inventors in the electrical field. This was the audion amplifier of Lee De Forest. The De Forest Radio Telephone-Telegraph Company exhibited some notable radio apparatus, among the rest a set that had been used in wireless telephony on the Lackawanna Railroad, in 1914. It showed wireless telegraph and telephone apparatus with the audion amplifier, audion detector and ultraudion, combined detector and amplifier: devices for reënergizing the voice impulses, or others, whether they came by wire or not.

“Inasmuch as the audion amplifier was a step forward in the development of radiography, it seems worth while to record a description of it here. We quote in part the exhibiting company’s description:

“The audion amplifier consists of a small incandescent lamp bulb exhausted of air, containing in addition to the usual filament two thin plates of nickel about an eighth of an inch from the filament, on either side. Between the filament and the plates are two pieces of nickel wire bent grid shaped. The incoming current, to be repeated and amplified, is connected to the “grid” wire. The outgoing line is connected, one terminal to the plates, the other to the filament. In this circuit is found a battery. A separate battery lights the filament to incandescence. The heated gas becomes then a conductor of the local current from the battery, which can pass from the cold plates to the hot filament. The current changes produced in the outgoing, or plate, circuit are exactly similar to those current changes or electrical charges, upon the “grid” wires which produced them. But the changes in current thus produced are many times the changes in current which caused them. The one most essential and completely novel element in the whole strange device is the “grid member, interposed across the path of the traveling ions (wanderers, as their Greek name implies).”

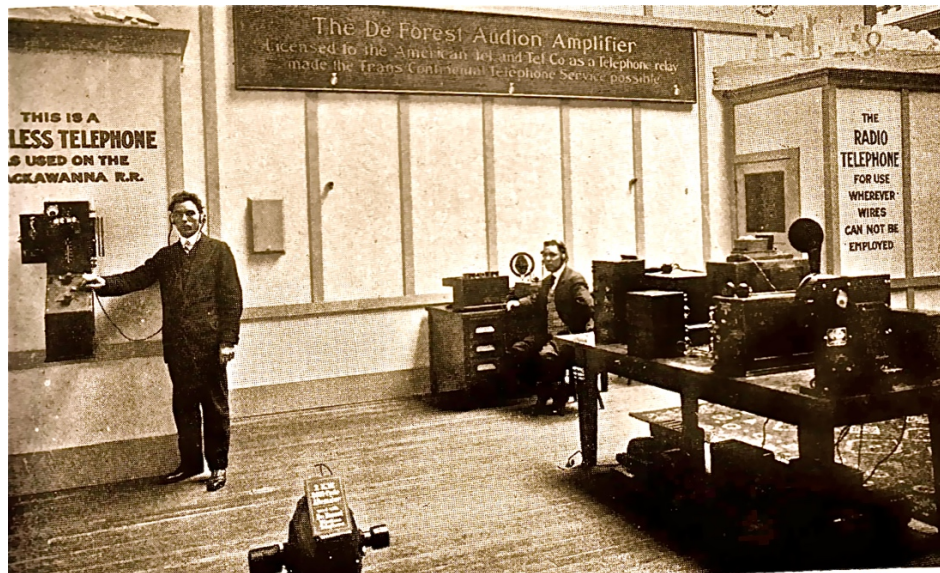
“The audion amplifier, it was said, intensified telephone and telegraph signals from ten to 1,000 times. The claim was made that it had been an essential element of transcontinental telephony but whether this was or was not the fact is not a matter for adjudication here.

“In their evolution the detector preceded the amplifier. Its use made possible the receipt of a wireless message from Nauen, Germany, at the De Forest booth in the Palace of Liberal Arts, caught on antenna hanging from the Tower of Jewels. The ultraudion detector caught wireless signals, and at times persons in the booth could hear wireless telephone

conversations from wireless phones about the bay. The instrument was not yet domesticated, and it was still, in 1915, cheaper to use the wire system.
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Lee de Forest’s plans for a radio transmitter for people to listen to through his Audion receiver fell through.



U.S. Radio Inspector Ellery Stone arranged for Doc Herold (Charles D. Herold) in San Jose to broadcast with his arc transmitter so that de Forest’s radio receivers would have something to hear. Lots of people kept looking for the wires that they thought must have been bringing the program to the radio speaker (a horn no doubt).

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Thanks to Paul Bourbin, CHRS Past President, for the text and photos from the book: THE STORY OF THE EXPOSITION -- Being The Official Story Of The International Celebration Held At San Francisco In 1915 To Commemorate The Discovery Of The Pacific Ocean And The Construction Of The Panama Canal, by Frank Morton Todd, (Putnam, 1921) Vol. IV, pps. 5-6. (de K6VK – 2015, 2020) ##