



## Types of Radios, 1890 to 1930

By Herb Brams

The earliest radio receivers (from the 1890's to the early 1900's) consisted of tuning circuits & a detector. Various detectors were used, such as the electrolytic detector, the magnetic detector, the coherer, and the crystal detector. The crystal detector, discovered in 1904, was particularly simple, efficient and inexpensive. Thus for many years crystal set radios were common. The vacuum tube was invented in 1906, but because of its initial high cost, low amplification, and erratic performance, tube-type radios did not immediately become common. Only with the discovery of regeneration in 1913 is the era of tube-type radios really begin. From about 1913 until the early 1920's regenerative sets were common. In this type of receiver part of the radio signal amplified by a tube was fed back to the input of the tube to reinforce the incoming signal. This greatly increased the sensitivity and selectivity of the set, but the amount of signal fed back that gave optimum reception was critical and the correct adjustment was difficult to obtain. Moreover, the feedback had to be readjusted for each station tuned in. However, regenerative sets offered good sensitivity and selectivity with a minimum of parts.

In the early and mid-1920's regenerative receivers were superseded by tuned radio frequency (TRF) sets. In these sets the incoming signal was amplified by a tube and the amplified signal was transferred to a second tube where it was amplified further. The amplified signal from the second tube was transferred to a third tube and amplified still more. In this way signal strength was built up through several stages. TRF sets were more stable than regenerative sets & easier to operate but they were more complex and so were relatively expensive. Also, amplified signals sometimes leaked back to the first stages causing erratic performance or uncontrollable squealing and howling. In some TRF sets (reflex sets) the audio (sound) signal was fed back and amplified by tubes that normally amplified radio-frequency signals so that these tubes did double duty. This reduced the number of tubes required and so made the set less expensive but the performance of reflex sets was no better than that of the usual TRF type. Also, the combination of the 2 signals often overloaded the tubes. As a result, reflex sets never became very common.

In the mid-1920's the neutrodyne set was developed. This was a TRF type in which part of the signal from the output of the tube was fed back to the input of the tube to oppose the feedback of signal that occurred within the tube itself. This internal feedback was responsible to a large extent for the squealing and howling that could occur in TRF receivers. Neutrodyne sets were good performers and were the prevalent type in the late 1920's.

In the early 1930's TRF-type sets were superseded by superhetrodyne radios. In these sets signals tuned in were converted to a single, lower frequency before amplification & detection. the superhetrodyne receiver was superior to all previous types in sensitivity, selectivity, and stability. Moreover, these characteristics were uniform across the entire tuning band. By the mid-1930's the superhetrodyne had replaced all other types of radios. It remains the standard circuit used in radio to this day.

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