

# Transistor Museum™ Preservation Collection

## Historic Semiconductor Fact Sheet

### The First Hybrid Transistorized Hearings Aids (1952)



Historical Examples of the First Use of Transistors in Hearing Aids in the Current Transistor Museum Collection

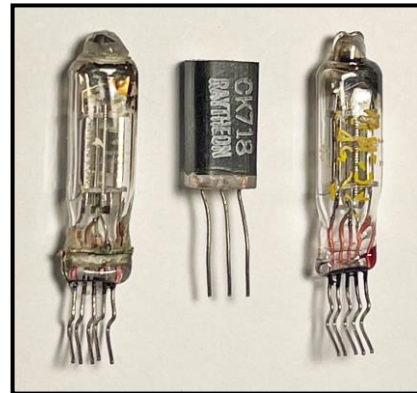
(Above left) **Sonotone Model 1010:** Introduced December 1952. Contains two subminiature vacuum tubes and a single germanium transistor. Sonotone was a major producer of hearing aids in the 1940s and moved quickly to introduce transistor technology very early. The “1010” won the First Annual Audio Engineering Award for technical excellence in design and manufacture of hearing aids. This is one of the first if not the first hearing aid with a transistor. (Reference 1). The unit shown above uses two Sonotone tubes and a Germanium Products Corp 2517 NPN grown junction transistor. The serial number for the above shown 1010 is 305766.

(Above right): **Telex Model 954:** Introduced in December 1952, this model used two Raytheon tubes and a single Raytheon CK718 germanium PNP alloy junction transistor. The 954 was larger and heavier than the Sonotone 1010 and appears to have been in limited production with very few units remaining. The serial number for the above shown 954 is 2N470.

#### References

- (1) [The Hearing Aid, Its Operation and Development by Kenneth W. Berger -Published by the National Hearing Aid Society, First Edition 1970](#) – This text is a must-have for those interested in early transistor history. Of particular relevance is the 30-page chapter “Enter the Transistor”, which provides a very comprehensive discussion on the first use of transistors in hearing aids. Also of note is the 60+ page listing of historical hearing aid companies including model numbers and transistor content for mid-century transistorized hearing aids.
- (2) [The Hearing Aid Museum](#) - The Hearing Aid Museum is the largest on-line hearing aid museum in the world, and probably the second-largest hearing aid collection in the world (the Kent State University hearing aid collection is the largest). The museum collection consists of about 1,500 hearing aids and related items.

**Historical Background:** The transistor was invented at Bell Labs in late 1947 and publicly announced by Western Electric in June 1948. Early production units by Weco and other companies were unreliable and were plagued with widely varying unit to unit performance. Late 1952 saw the introduction of transistor types that could be used in commercial products. The hearing aid market was ideally suited to take advantage of promised transistor benefits, including low battery consumption, physical reliability, and long life. Sonotone is credited with the first commercial product to use transistor technology - the model 1010 hearing aid. This product used a single transistor as the output device and retained the use of subminiature tubes as preamps. This combined use of transistors and tubes is referred to as “hybrid” technology. This “hybrid” approach was short lived. Improved transistor types were soon available and by late 1953 the trend was to eliminate tubes and use only transistors in hearing aids.



Shown above are the two Raytheon subminiature tubes and the Raytheon CK718 transistor used in the Telex model 954 hybrid hearing aid.



The [Raytheon CK718](#) was the first mass produced transistor and was the most commonly used 1950s hearing aid transistor. The type [2517](#) was an early contender (used in some Sonotone 1010 models) but the pioneering company “GPC” did not have the manufacturing and design resources of Raytheon and was soon lost to history.

# Transistor Museum™ Preservation Collection Historic Semiconductor Fact Sheet The First Hybrid Transistorized Hearings Aids (1952)



## Sonotone 1010 Hybrid Hearing Aid Facts

**History:** First commercial product using a transistor

**Date:** Late 1952

**Hybrid:** Uses transistor and tube hybrid circuit design

- [Two Sonotone subminiature vacuum tubes](#)
- [NPN grown junction transistor \(GPC\)](#)

**Physical Characteristics:**

- 3" X 2" X .5"
- Socketed tubes for ease of replacement
- Soldered transistor, best for small size and ruggedized
- Case can be dis-assembled without removing screws

**Historical Comments:** Sonotone was unique among midcentury hearing aid manufacturers because this company manufactured the tubes and the actual hearing aids. All other major hearing aid companies of the time (Zenith for example) purchased the tubes used in their hearing aid from vacuum tube suppliers such as Raytheon. Note that Sonotone did not ever enter the transistor manufacturing business and continued to manufacture hearing aids into the 1970s using purchased transistors/ICs from other companies. Sonotone transistor hearing aids from the 1950s were [technologically innovative](#).

## Telex 954 Hybrid Hearing Aid Facts

**History:** Very early commercial use of transistor technology.

**Date:** Late 1952

**Hybrid:** Uses transistor and tube hybrid circuit design

- [Raytheon CK718 Transistor](#)
- [Two Raytheon Brand Subminiature Tubes](#)

**Physical Characteristics:**

- 3.5" X 1.75" X .5"
- Socketed tubes and transistor for ease of replacement
- Larger and heavier than the Sonotone 1010
- Case must be dis-assembled by removing multiple screws

**Historical Comments:** Contains a socketed Raytheon CK718 transistor with date code 329 = 1953 week 29. See photo of the front of this transistor on page 1 above. Building on its lead as the largest manufacturer for hearing aid vacuum tubes in the 1930s/40s, Raytheon also became the largest manufacturer for hearing aid transistors, beginning with the CK718 in 1952. The two Raytheon tubes are installed on the reverse side of the circuit board. The date code for one of the tubes is 312 = 1953 week 12. See photos of these tubes on page 1 above. [Raytheon](#) was the largest manufacturer of [hearing aid tubes](#) for many years, and held important [patents](#) in this field.

