

History of subminiature tubes

The first practical subminiature tubes were designed and developed by Raytheon in 1939. Primarily intended for hearing aid applications, they provided maximum battery life from standard dry cells. The subminiature tube was then used during W.W.II to help prevent the German 'Buzz Bombs' from reaching their target in England. Ironically a German prototype vacuum tube transmitter 'Proximity Fuze' was received by British intelligence at the end of 1939, which led to the development of the allied forces version 'Proximity Fuze' using subminiature tubes. It was basically a sensitive metal detector that could be placed in the nose of an exploding shell that was launched towards the incoming 'Buzz Bomb'. When the shell came within proximity, using the Doppler effect, it would explode, destroying the aircraft or missile or knocking it off course. When the US entered the war, the 'Proximity Fuze' was also used successfully in the pacific to knock down Japanese aircraft and Kamikaze pilots. During the war these tubes were also used in radio transmitting devices.



RAYTHEON
Excellence in Electronics

From This  Tiny Tube ...

A HARVEST OF HAND RADIOTELEPHONES

The subminiature tube, a Raytheon development, made possible this lighter, more compact hand transmitter-receiver AN PRC-6. Raytheon developed and is mass-producing this equipment . . . another Raytheon contribution to improve the effectiveness of our Armed Forces.



RAYTHEON MANUFACTURING CO.
Contractors to the Armed Services
WALTHAM 54, MASSACHUSETTS



HOW A TINY NEW TUBE HELPS SAVE LIVES

The problem was major: it concerned human life. A pocket-sized waterproof "radio station" would help rescue downed aviators. The set was designed to send out a beacon signal and provide voice contact with search planes—but it lacked the necessary power output. Needed tubes did not exist.

Using its own resources, Raytheon developed a new subminiature tube—the 6147 and its improved version the 6207. Result: greater power, reliable operation, ranges over 50 miles, longer battery life.

Here is particularly dramatic proof of the skills which have made Raytheon the world's leading manufacturer of special purpose electron tubes.



RAYTHEON
RAYTHEON MANUFACTURING COMPANY
WALTHAM 54, MASSACHUSETTS

After the war until the mid 1950s, subminiature tubes could be found in portable radios, hearing aids and early computers and missile guidance systems, representing the most reliable, durable and longest lasting vacuum tubes ever made.



By the end of the decade, they were replaced by the newest and cheaper technology known as 'transistors'. Later they were also known as 'pencil tubes' and still have military and audio use today. Production ended in 1986.

Siegmund Guitars & Amplifiers is offering subminiature tubes since 1999 in handcrafted 'Micro Tube' pedals, preamps and effects for guitar, studio and custom high-end audiophile units, revealing unique musical qualities hidden within these tubes, that may well have surprised and pleased the original designers at Raytheon.