Home Made Crystal Detector Diodes Unique Process Experimentation

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Crystal detector radios had always fascinated me from early childhood. I built many different sets and experimented with many different designs and radio components. Since solid state diodes were not yet available, my early sets invariably used mechanical type crystal detectors. These detectors were commercially available two terminal devices. One terminal was connected to the shiny **(pyrite or galena) crystal** in a holder, and a mechanical arrangement held a spring that were connected to the other terminal. I spent many happy hours playing with the detector, always seeking to find the elusive "magic spot", the best location on the crystal surface that yields the highest volume in the headphones.

Picture 1. Pyrit Crystal

When I obtained a large ferrosilicate crystal **Picture 1**., I attempted to make my own permanently set detector, an early diode. They were crude and simple affairs. After breaking a large crystal into many smaller ones with a hammer, I selected some nice elongated pieces **Picture 2**. To these I wrapped some fine, bare copper wire at each end. Thereafter I dipped these devices into molten bee's wax to make sure the wires stay in their place. Thus my early diodes were completed. After the units cooled down and the wax solidified, measure the resistance of each device with an ohmmeter. Connect the meter leads first one direction than reverse the wire connection. Any diode that read forward to reverse resistance ratio of at least ten to one or higher, is declared a success and kept, while the rest is discarded.

Just to be sure I did not miss out on anything, I also tried some vacuum tube diodes, usually the **battery** operated radio types. I had a few 1T4T, 1S4T and 1R5T **tubes** and a few 06P2B tubes that was tried as well. A 1.5-Volt **battery cell** was required for heating the tube's filament cathode. Since dry cells were expensive (even then), depleted rather quickly, and provided only minimal (if any), detectable difference in the quality of the reception, this experimentation was hastily terminated. A while later, after they become available, I began to use factory-made point contact **cat's whisker germanium diodes** **Picture 3**. These devices were most convenient, but (to me) they never operated as well as my early crystal detectors.

Picture 2. Home Made Diode

Some of my crystal radios used a not really loud, loudspeaker, obtained from old, defunct radios. However some of my detector radio receivers indeed produced louder sounds. I discovered early that the

Picture 3. Point Contact Germanium Diode

longer the antenna, the stronger the audio signal in my receiver would be. Thereafter, I constructed an eighty five-meter, (285 feet) long-wire antenna. This length was not computed or arrived at scientifically, it was simply the length of our back yard. Because of a nearby local radio station, this antenna collected enough radiated signals to power a small six-volt light bulb. The intensity of this light varied in proportion with the broadcast modulation intensity, and it was usable as night-light. Regretfully this strong local signal also drowned out most of the other near frequency radio stations. This situation caused me to experiment with some wave traps and urged me on to ultimately became a short wave radio amateur.

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