The Clairtone “Mini HiFi” Radio

“The World’s Smallest Transistor Radio”

Gord Rabjohn, November 2020.

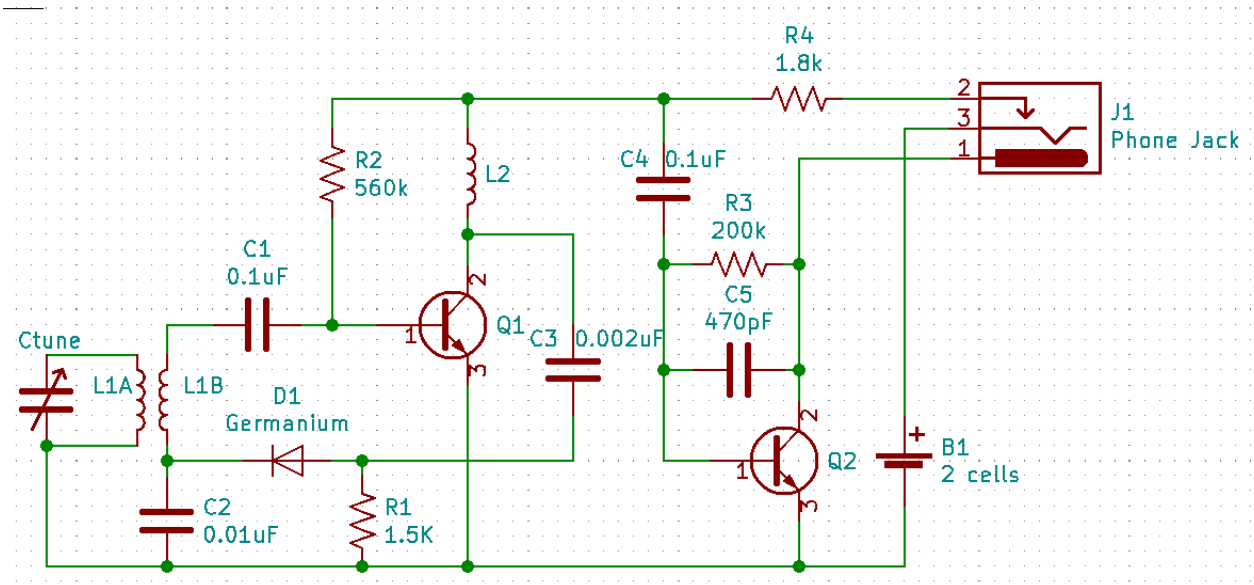
I remember in the early 1970’s, these tiny Clairtone radios were all the rage. My father had one that he took to work and apparently used to listen to the news at lunch. The father of childhood friend could get them (I believe he worked for Clairtone, but I’m not sure) and I recall that several friends had them. I believe I had one as well, but I have no idea where it ended up. 40 years passed, and one appeared, so I bought it. Mine was branded Clairtone, but many were used as promotional items and had other company logos on the front. Clairtone had a plant in Toronto and Nova Scotia, but it’s not clear exactly where these radios were made, though the plastic case says “Made in Canada”.

The Clairtone Mini Hi-fi was introduced in 1968, as the company was spiraling towards bankruptcy. Doing research on the web, I discovered that a very similar radio, called “The Micromatic” (also marketed as “the world’s smallest radio”) was sold by Sinclair Labs in the UK, and had been introduced a year earlier. They are so similar that the designs must have the same roots. The Micromatic was derived from an earlier Sinclair radio, the “Micro-6” which was intended to be worn on the wrist. Digging deeper, I found that though the radios look very similar, their designs are all slightly different. The Sinclair Micromatic used a compression trimmer to tune, so the AM band took a full 360 degree of the tuning dial. Early Sinclair Micromatics had 2 diodes and 2 transistors, and later ones had 3 transistors, but the Clairtone has 2 transistors and only 1 diode.

The Sinclair Micro-6 (web: radiomuseum) the Sinclair Micromatic (web: PlanetSinclair), and a Clairtone “Mini HiFi” (author’s collection)

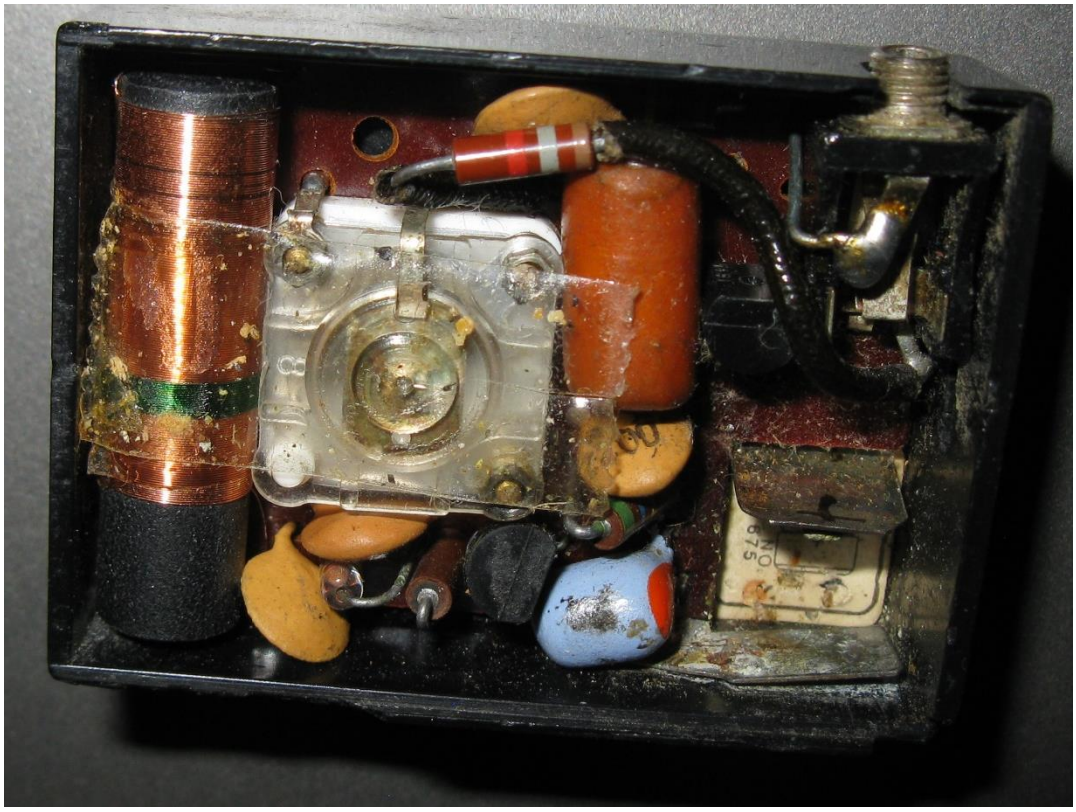
I found a schematic on the web, but I retraced my model and redrew the schematic. The radio is reminiscent of the 2 transistor “Boys Radios” from the 1950’s. There is a single tuned RF stage (using a ferrite rod, L1), followed by a detector. The audio is fed back into the same transistor again. This is known as a reflex architecture, and gets 2 stages of amplification out of 1 transistor. There is one more stage of amplification to drive the headphone. Note that there is no volume control. The user is advised to rotate the radio until the volume is appropriate, or to detune it.

The radio works with good volume and surprisingly good selectivity. However, I do remember that selectivity was inadequate in Toronto where there are powerful stations at 1010kHz and 1050kHz. Some believe that there is some regeneration happening as a result of serendipitous coupling between L1 and L2, which could improve selectivity.



Schematic of my unit.

You can see from the photo that my unit has one enormous component in it. C4, a 0.1uF capacitor, is a ceramic disc capacitor in any photo I have found on the web. In my radio, it is a huge polyester capacitor (the big brown thing) with its leads awkwardly formed to fit into the smaller footprint. I can only assume that they were running out of small disc capacitors, and were forced to substitute some other capacitor. It does not appear that this capacitor has been replaced, the solder looks untouched. Note that the antenna coil is taped in with regular cellophane tape. This radio was built down to a price. The design breaks rules that were drummed into me in school: The transistor current is determined by beta. There is no DC return path for the detector diode. There are no power supply decoupling capacitors. And, no volume control or on-off switch. All this, no doubt, to keep the price down.



Inside my unit.

Clairtone, a Canadian company, has a remarkable history. They marketed avant-garde and expensive stereos and colour TVs in the 1960's, winning awards and much media attention. They used celebrity endorsements, product placement, and cutting-edge advertising to place them at the epicentre of the "swinging 60's". The book "The Art of Clairtone" by Nina Munk and Rachel Gotlieb (Nina Munk is the daughter of one of the founders) paints a fascinating story of a company that wanted to become what Bang and Olufsen successfully became. They were unapologetically Canadian, and established factories in Toronto and Nova Scotia. Their rise to fame was largely based on their futuristic-looking stereo designs. Their fall was a mix of serious production issues, market timing, over-extending their abilities and arrogance.

Advertising copy (reference Munk and Gotlieb) for the Mini Hi-fi states:
"Wear a Radio. On your head. Around your neck. Strapped under your wrist. Under your blouse, where no one can see it.
"Wear two. One in each ear. Be your own private walking stereo. Wear it to school. To work. On a bus. Wear it wherever you want. The Mini Hi-fi comes with its own private ear speaker. No one else can hear but you.
"No toy, but a major breakthrough in microelectronic miniaturization, the Mini Hi-fi is no bigger than a book of matches. Weighs only an ounce. Yet puts out the sound fidelity of a big speaker. Clairtone guarantees it for two years.
"Get one at any Clairtone dealer or anywhere else Clairtone Mini Hi-fi's are sold.
"The $7.95 Clairtone Mini Hi-fi"

This add is full of hyperbole. A Boy's Radio is hardly a "major breakthrough". The "Ear Speaker", which is just a basic earphone, hardly sounds like a big speaker. And, calling it the size of a "Book of matches", well, a box of matches would be more accurate. But this was the Clairtone advertising style. Their branding was bold, proud, sexy and extravagant. Some would say full of exaggeration, lacking substance, arrogant, with form over function.

If you are interested in collecting Canadian stereo systems, you may be dissuaded by the prices that complete Clairtone stereo systems (especially their iconic Project G) command. They have almost a cult following. So, arguably the easiest way to start your Clairtone collection is to find yourself a Mini Hi-fi.