

Deconstructing a Vintage Garage Door Opener

Gord Rabjohn, June 2025

For no good reason other than curiosity, I purchased a "Multi-Elmac" model C-2BC-R27 tube garage door opener receiver at a recent OVRC auction. This is a Canadian-made (Windsor, Ontario) 5-tube receiver that works in the "CB" band. It had a 5-pin (like a '24 or '27 tube) plug-in module (coil) marked 4kc, and a crystal marked 25.5MHz.



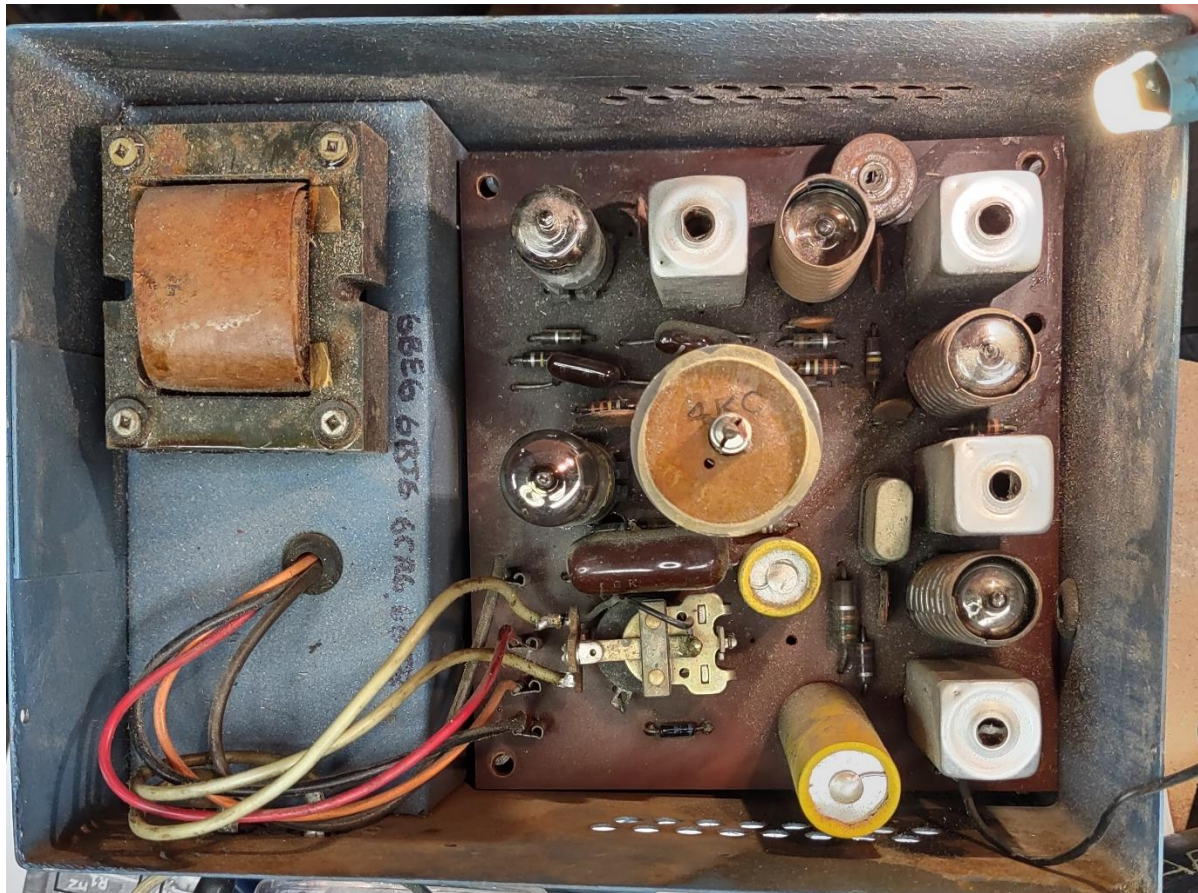
The Multi-Elmac company made ham, CB and commercial radio equipment starting in 1947 in Michigan. (<https://mcrn3885.com/>) The garage door opener business was a logical extension of this. Their garage door opener business was sold to Stanley in 1967. I was unable to find very much on the internet that describes the early garage door opener line, so I dove in to see if I could make it work.

I traced the circuit as best I could. It has an RF amplifier using a 6BJ6 pentode. There is a short wire antenna that feeds this stage. The RF amplifier feeds a 6BE6 converter tube that runs with the 25.5MHz crystal. This feeds a 6BJ6 IF amplifier. The detector is a diode in a 6CR6 tube, and the pentode part of the 6CR6 is an audio amplifier. This goes through the "4kc" filter, and feeds detectors in the last tube, a 6BJ8. A triode in the 6BJ8 drives the coil of a relay when enough 4kHz energy gets through the filter. The contacts of the relay go to a terminal strip that would usually connect to the motor mechanism. As you can see, the radio is constructed on a circuit board. The receiver had seen some service in the past. The original selenium rectifier had been replaced with a diode.

My theory was that the receiver would respond to a signal somewhere in the CB band that was AM (or maybe FM) modulated with a 4kHz tone. I wasn't sure what RF frequency was required; the 25.5MHz crystal gave me a ball-park, but I had no idea of the IF frequency. I powered it up, measured a few voltages (there was 150V plate voltage everywhere), then swept a signal generator (AM modulated with 4kHz) from 27 to 28MHz, but there was no action at the relay.

So, I dug deeper. The output of the 6CR6 diode detector, therefore the AVC voltage, was pretty easy to find (this part of the radio looked a lot like a standard AM tube radio). I swept the RF generator's frequency, and discovered that the AVC voltage increased markedly at about 27.25MHz. (Closest CB channel is channel 25 at 27.245MHz or channel 23 at 27.255MHz. Yup, CB channels are not in order!) So, there was life! I concluded that the IF frequency was about 1.75MHz. I fixed the generator RF frequency

to 27.25MHz and swept the audio input from 1 to 5kHz, but there was still no relay action. I looked at the voltage across the relay coil, and it definitely peaked at 4kHz, but not enough to actuate the relay. I tested the 6BJ8 tube that drives the relay, and found that the triode was weak (it was an original tube with the Multi-Elmac name on it). I replaced the tube and voila, the radio works. The relay closes when the receiver receives a 27.25MHz signal modulated with 4kHz. You would differentiate your receiver from your neighbours' by the RF frequency and the selection of the 4kHz filter.



It is not a sophisticated receiver, as it does not employ any form of a digital key. The relay contacts close when it receives a signal, that's all. Any other functionality (selecting whether to open or close the door, safety features, etc) was done elsewhere. Its nameplate states that it takes 26VA (about 26W), which would be consumed 24-7. Quite a significant waste of electricity! While not sophisticated, I was surprised at the amount of gain this receiver has. This is a proper superheterodyne receiver with an RF amplifier, and much audio gain. Perhaps the radio transmitter was relatively small? The Henry Ford Museum has this model and lists it as being marketed in 1957-1960.

I wonder what that transmitter was like? I guess that it was equipped with tubes (maybe subminiature tubes?) as transistors capable of operation at 27MHz were very exotic and expensive in 1960.

The “garage door geek” (facebook) shows a red remote of about the correct vintage, but does not show what is inside. Another remote (a different brand but similar vintage) used subminiature tubes. If you have a remote like this I’d love to see inside it!



Caption: Maybe a remote for my receiver? From “Garage Door Geek” facebook page.

Someday, I’ll make a transmitter for this, maybe using some subminiature tubes. Then, I’ll need to find a use for it. With a reasonable transmitter power, I expect it should have a range of many blocks, maybe even several km.