

## The Communications Receiver THE 1945 HAMMARLUND HQ-129X

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**A**uthor Jim Hanlon returns once more to our pages, this time to review an all-time favorite receiver of amateurs during the immediate post-WW II time frame, the Hammarlund Manufacturing Company HQ-129X. Those who have studied and used the Hammarlund receivers of the 1930s and 40s don't have to be convinced of the quality built into those products. Routine restoration work on one of these sets that is in decent shape to start will result in a pleasing working addition to any ham or SWL station. The exercise is highly recommended.--W2DGB

One of my favorite old-time receivers is the Hammarlund HQ-129X. I have two in my collection at the moment, at least one more than I really need, but they were both gifts and I wouldn't deny an old friend a good home. My first encounter with an HQ-129X was in the radio club at Saint Xavier High School in Cincinnati. Our original receiver was a Hallicrafters SX-43, not a bad performer but too much of a lightweight for the high shock and vibration environment created by a group of teenage boys. It would literally bounce off-frequency when some of the guys were horsing around in our back-of-the-physics-lab radio shack.

In the fall of 1951, our club moderator, Jesuit scholastic Tom Gideon, convinced his parents to donate a brand new HQ-129X to our club. This was a much more solid, substantial radio, and it served old W8GYH well for many years thereafter.

The HQ-129X is the second member of a family that began with the HQ-120X in 1938. Its brothers include the HQ-140X, HQ-150, HQ-160 and HQ-180. All of these radios share the same "front-end" design. They cover the 550 kHz to 30-MHz range in six bands, and they have calibrated bandspread for the 80, 40, 20 and 10-meter bands; the later production runs also included the 15-meter band.

These receivers have special, nine-section bandspread and six-section main tuning capacitors, as opposed to the three-section capacitors that are found in their



The HQ-129X. Tuning knobs are not original.

National, Hallicrafters and RME counterparts. The capacitor sections are sized and switched in to optimize the tuning span on each of the traditional 80, 40, 20 and 10 meter bands that were available when the HQ-120X was designed in the late 1930s, spreading each band over almost the full dial. (The general coverage ranges are 540 to 1320 kHz, 1.32 to 3.2 MHz, 3.2 to 5.7 MHz, 5.7 to 10 MHz, 10 to 18 MHz, and 18 to 31 MHz).

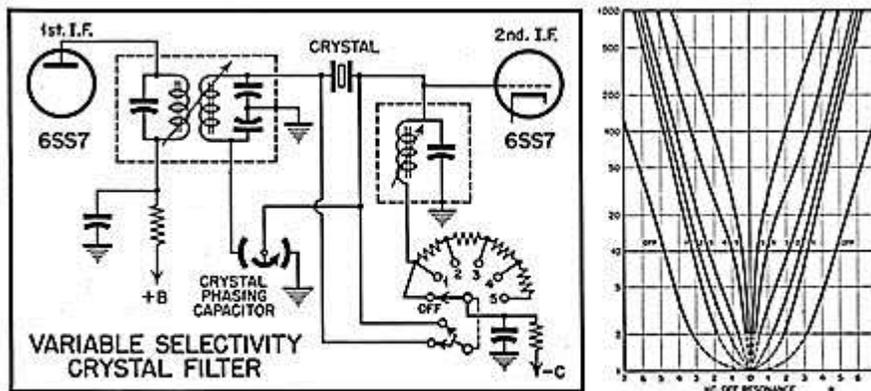
The capacitors are also designed so that the rotor plates are centered in the stator assembly, and with materials such that capacitance change due to thermal expansion is minimized. This minimizes frequency drift due to warm-up and ambient temperature changes.

An overview of the "family" shows that the HQ-120X through the HQ-150 are single-conversion superhets with one RF amplifier, three 455-kHz IF amplifiers, a crystal filter between the first and second IF stage, a noise limiter, and a modest level of audio output (three watts from a 6V6 in the HQ-129X). The original, pre-war HQ-120X was designed with "double-ended" 6S7 tubes in the RF and IF amplifiers, while the post war HQ-129X went to "single-ended" 6SS7 tubes (no plate caps; all the leads come out the base).

The HQ-140 used miniature tubes, including a higher gain 6BA6 as the RF amplifier and a lower noise 6BE6 mixer. The HQ-150 added an IF Q-multiplier to the package. The HQ-160 went to dual conversion above 10 MHz, with a 3055 kHz first IF. The HQ-180 lost the 455-kHz crystal filter but added a 60-kHz third IF with variable bandwidth and a product detector to top out the family line. Even the most recent receiver in the line, the HQ-180, is instantly recognizable as a member of the family with its two tuning knobs and dials and its six-position bandswitch.

Those three IF amplifiers in the HQ-129X deserve some special mention. Where the competition used two IF amplifiers with a total of six tuned circuits for selectivity at 455 kHz, the HQ-129 added a third stage with its additional IF transformer for a total of eight tuned circuits. As a result, the Hammarlund has noticeably better skirt selectivity. That's the good news.

The bad news is that while the IF alignment on competing receivers is accomplished just by peaking all of the transformer adjustments at a single frequency, aligning an HQ-129X properly requires using a sweep generator and an oscilloscope to adjust the passband for the best gain and skirt fall-off. Those who



Crystal filter circuit and selectivity curves of the HQ-129X, taken from the original manual. Phasing notch not shown.

want to be real HQ-129X mechanics might be interested in the simple IF sweep generator that I recently built, and which will be described in a forthcoming issue of Electric Radio magazine. In addition to

good skirt selectivity, the HQ-129X also has a top-notch crystal filter. As the selectivity curves show, with the crystal filter out the IF bandwidth is about 6.5 kHz at 6 dB down and 9.6 kHz at 20 dB down, just right for amateur AM phone in an uncrowded band but perhaps a little too narrow if you are looking for "high fidelity" reception on medium- or short-wave broadcast.

Crystal positions 1, 2 and 3 sharpen the 6-dB bandwidth to about 3.8, 2.4 and 1.5 kHz respectively, or to 6.5, 5.6 and 4.6 kHz for the 20 dB-down points. These would all have been quite useful in those days in pulling a phone signal out of increasing interference. Positions 4 and 5 yield 20 dB bandwidths of 2 and 1 kHz respectively, ideal for CW operation.

By my best estimate, using a Boonton Measurements Model 80 signal generator with a calibrated variable attenuator on its output, the crystal phasing notch rejects a signal one kHz away from the center frequency by 86 dB! So it is not surprising that the HQ-129X was a well-respected receiver in its day by both AM phone and CW operators.

The tube line-up in the HQ-129X consists of a 6SS7 RF amplifier, 6K8 converter (both mixer and local oscillator), three 6SS7 IF amplifiers, 6H6 detector, AVC, and noise limiter, 6SN7 first audio amplifier and S-meter amplifier, 6V6 audio output, 6SJ7 bfo, a 5U4 rectifier and a VR105 voltage regulator. The combination of the relatively low gain 6SS7 RF amplifier with the high noise 6K8 converter creates a situation in which the internal front-end noise in the receiver dominates antenna noise in a quiet location above about 15 MHz.

I can just barely hear a peak in antenna noise when I adjust the antenna trimmer on 10 meters at my country location in New Mexico. This didn't bother us at all at W8GYH, where the abundant noise sources in downtown Cincinnati still rode well above the front-end noise and the weak signals, all the way up to 30 MHz. But the barefoot HQ-129X is definitely not the sensitivity champion on 20, 15 and 10 meters when compared to its contemporary competitors like the National NC-173 with its 6SG7/6SA7 front end, the RME-45 with its Loktal 7B7/7J7, or the Hallicrafters SX-43 with its 6BA6/7F8.

Even with this relative disadvantage, which was often cured with the addition of an outboard RF preselector, the desirable features of the HQ-129X made it the most popular receiver in its \$180 price class in the immediate post-war era. That's why you see more HQ-129Xs in flea markets these days than all of its National, Hallicrafters and RME competitors combined. (The price in 1946 was set at \$129 as a marketing ploy. Unfortunately, Hammarlund found that they could not sustain this low price, and by 1953, at the end of production, the set sold for \$239. Ed.)

I use my HQ-129X regularly on the Classic Exchange and the AWA amateur radio events. It is stable, selective, adequately sensitive on 20 meters and below, and it is mechanically solid as a rock. It is as much fun to use today as it was back in my 1952-to-1956 stint at W8GYH, and I would thoroughly recommend an HQ-129X or any of its family members to an OTB reader as a good, highly-functional addition to your collection.