An RME Story

By Al Klase

When I wrote a piece on the National HRO-500 receiver for John Dilks' column in QST magazine, I was asked to supply a photo of myself. When I set up the shot, I made sure some of my juicier specimens were visible on the shelves.

The Navy RAL in the foreground brought a letter from a gentleman in NYC with an offer of its brother the RAK. (I haven't taken him up on that yet.) A second letter, forwarded from ARRL headquarters came from an oldtimer claiming to have helped build one of my radios in the 1930's. W9GLW wrote:

The RME-69, sitting on the shelf just beyond your left ear on page 80 of February QST, brought back memories of economic hardship as well a personal success.

As a 19-year-old technician I built the prototype of the "69" under the guidance of W9RGH (Russ Plank, RME cofounder – ed.). *The year was 1934, and times were tough.*

Production was begun with guarded expectations. Failure meant irrevocable fiscal disaster.

In production I specialized in construction of the HF tunable oscillator, mixer, and antenna amplifier as well as the associated switch. Each solder connection was wiped clean while still hot.

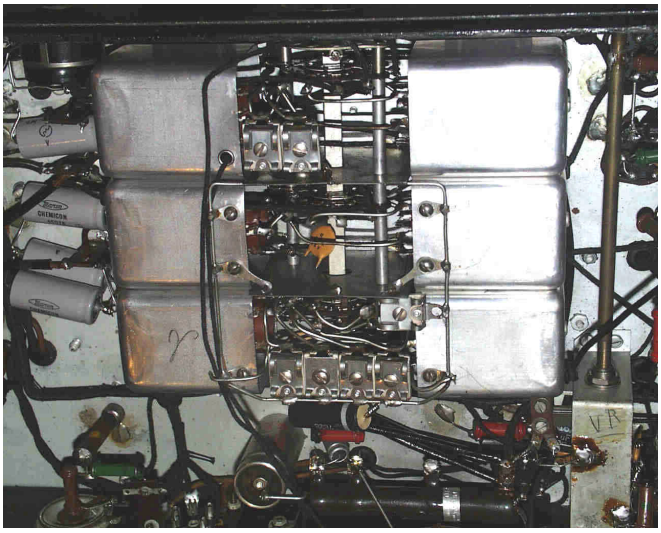
Upon completion of each assembly, one of the aluminum shield cans was initialed with a measure of pride. It is likely the radio pictured has my initials.

The RME-69 was sold world wide for commercial as well as amateur high-frequency communications.

The pay was not great, but never the less, RME was good to me. A college degree was made possible and entry into the wonderful world of electronics was assured.

73, Clint, W9GLW

I pulled the bottom cover off my radio. Sure enough, there were initials on the shield, but I couldn't relate the hieroglyph to Clint's name. Well, my radio was purchased in 1937, and he was talking about 1934. I shot some pictures, and lost the whole thing on my desk for several months.



The folder resurfaced in a recent clean up, and I wrote to Clint, and enclosed the pictures. He replied promptly. What I had been taking for a stylized "Y" or "V," was actually an upside-down "cb" for Clinton Bowman. He further informs me that the "VR" on the bracket was Vern Rogers, who wired the remainder of the set.

I am extremely gratified to have established this personal link with the distant past. Thank you Clint!

The Image Problem

The basic strategy of the super-heterodyne receiver is to convert the desired signal, by mixing it with a signal from a "local oscillator", to a, usually lower, "intermediate frequency" where filtering, amplification, and detection can be more easily accomplished. The problem is that the system responds to signals at two frequencies, LO + IF and LO – IF.

A typical broadcast-band super-heterodyne receiver, with an intermediate frequency of 455KHz, tuned to station on 1000 KHz will have the LO running at 1455 KHz. There will be an unwanted image response at 1910 KHz (signal frequency plus IF x 2). A simple LC tuned circuit at the input to the mixer can suppress the image to a high degree because the image is separated from the desired signal by 91% of the filter center frequency.

Now consider the same superhet tuned to 10,000 KHz (10 MC). The LO is now running at 10,455 KHz. The image will still be 910 KHz away, but that's only 9.1% of the input filter's center frequency. The classic solution is to add a tuned RF amplifier stage before the mixer. There will now be two cascaded tuned circuits trying to suppress the image. The problem becomes still more acute as the signal frequency increases.

More stages of preselection help, but they must be kept in alignment, consume power, and cost money. Increasing the intermediate frequency of the design will reduce the image difficulties, but the desired IF selectivity my be impossible to come by at the higher frequency and, a 0.5 to 30 MHz receiver will most likely need to tune across its own IF, with the possibility of oscillation.

The ultimate solution to the image problem does not appear in main-stream communications receivers until after WWII with the introduction of multiple-conversion superhets by Collins Radio and others.

RME's of the 1930's

By Al Klase

Radio Mfg. Engineers of Peoria Illinois was the smallest of the four best-known communications receiver builders of the 1930's. The others are National, Hammarlund, and Hallicrafters.

RME's initial receiver product was the RME-9 Single-Signal Super, a 9-tube design with a single "airplane" dial, calibrated directly in frequency, and incorporating a crystal filter for single-signal CW performance. It sported a built-in power supply, band switching as opposed to plug-in coils, one RF and two IF stages, and a BFO for code reception. BFO frequency and RF peaking controls were on the front panel. Frequency coverage was 540 KC – 22 MC in five bands. The RME-9 was first advertised in QST in December 1933. A modified RME-9 appears in the May 1934 issue. It added a second ganged tuning condenser and airplane dial, for "electrical" band spread, and an "R" meter to indicate signal strength.

Refinement of the basic design continued, and October 1934 saw the introduction of the RME-9D. This landmark radio was the first to include all the features one now expects to find in a proper communications receiver in a single instrument. The addition of switch-selected automatic volume control to the expanded RME-9 design established a receiver architecture that would endure well into the 1960's.

1935 brought an upturn in sun-spot numbers and increased amateur interest in 10-meter (30 MC) operation. To meet the 10-meter challenge, RME introduced the RME-69 six-band nine-tube receiver. This expanded frequency coverage to 32 MC. The somewhat passé airplane dials of the 9D were replaced with the large and distinctive "half moons."

The single RF stage in the RME-69 resulted in questionable image rejection on 14 MC and nowhere near enough on 28 MC. Other designs like the National HRO and the Hammarlund Super-Pro, with two RF stages, worked well enough on 14 MC, but still left a lot to be desired on 28 MC.

RME's solution was the DB-20 preselector. This self-powered external unit, with styling to match the RME-69, added two additional stages for a total of three amplifiers and five tuned circuits before the mixer. This is a level of RF preselection unrivaled by the competition.

Other RME-69 accessories included the LS-1 noise silencer, and a unusual trapezoidal metal speaker enclosure that apparently was intended to "horn load" the back of the speaker in conjunction with a nearby wall for improved bass response.

These sets were produced until 1940. Raymond S, Moore, in Communications Receivers of the Vacuum-tube Era, tells us that 6500 were produced. The RME-69 surely remains one of the classic communications receivers of the golden age.