

**I Walk the Waterfront**  
**or,**  
**Crystal Detector Patents of the Early Era**  
**by Henry W. Dickow**

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I walked the San Francisco waterfront from Pier 1 to Pier 30 almost daily, carrying with me a bottle of distilled water, a huge metal ring containing dozens of keys to open the doors of the wireless cabins on ships, a hydrometer, and a test meter. The distilled water was for replenishing the liquid in thirsty storage batteries used for the emergency transmitters on shipboard. The keys not only unlocked the doors of radio rooms, but also the holders which secured the crystals used in the detectors of the receiving sets. The hydrometer and meter were for battery-testing.

In the early days of wireless at sea, it was unlawful to infringe on the several patents which covered the detector and various components. Amateur operators were permitted to use any kind of detector or crystal without royalty payment to the inventor, but for commercial services the facts were otherwise. The price of a commercial detector ranged from \$40 to \$75,<sup>1</sup> of which \$35 to \$65 went to the patent holder and \$5 to the manufacturer for the cost of the device itself. To make certain that the patented detectors were not tampered with by the operators, the Marconi interests put them under lock and key. Replacements, when needed, could be made only by the shore inspector, who carried with him the keys to open the particular locks in question. These detectors utilized a crystal known as cerussite.<sup>2</sup> Ship operators were strictly forbidden, under threat of dismissal, to use any detector or crystal other than the one originally supplied by the Marconi Company. Nevertheless, all of the operators took with them to sea an assorted lot of super-sensitive crystals of their own, and which they

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<sup>1</sup> Perhaps 1000 - 1900 2018 dollars.

<sup>2</sup> Lead carbonate, a fairly arcane reference to a mineral largely unknown today as a radio frequency detector.

would substitute for the less sensitive Marconi product as soon as a ship cleared the dock. In later years, these self-same operators took with them the newer and vastly-improved deForest vacuum tube as a replacement for the greatly inferior crystal detector. (All detectors were dubbed "a piece of coal.")<sup>3</sup>

Warnings issued by Marconi fell on deaf ears. Operators not only took their own detectors to sea, but other components as well... sometimes a complete receiver. The headphones supplied by Marconi were heavy and uncomfortable to wear. They were commonly known as cans, and remained on the hook in the wireless room while the operators wore headphones of their own. Among the better-known varieties was a headset known as Brandes, which had aluminum cases and were lightweight and had a comfortable headband. Above all, they were extremely sensitive, unlike the Marconi counterpart.<sup>4</sup> Price ranged from \$7 to \$10.<sup>5</sup> We bought these 'cans' from Ford King, Pacific Coast agent for the Brandes Company. His name was legion among the pioneers. The same applied to Val Leach and his "Leach Relay."<sup>6</sup>

My duties as Marconi Inspector included a search of the wireless room for "bootleg apparatus." I was instructed to report my findings, if any, to Superintendent Stevens. A seasoned offender myself while at sea, I consistently overlooked any infraction of unenforceable rules. Furthermore, the operators generally took their private equipment ashore with them upon arrival in port, and did not put it back into service until after the ship had sailed.

Each morning after reporting for duty I scanned the list of ship arrivals and departures from the pages of The Guide, a daily newspaper devoted exclusively to maritime news. My boss then handed me a nickel, which would pay my streetcar fare to the shop after completing my inspection of the ships in port. I was a familiar figure to the security guards at the piers; they

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<sup>3</sup> "A piece of coal" usually referred to a carborundum detector. See Lee, "How Dunwoody's Chunk of 'Coal' Saved both de Forest and Marconi," 22 AWA Review, 2009, p. 1ff. Available at <http://www.californiahistoricalradio.com/CHRSPix/10LeeDunwoodyCoal2009.pdf> (checked 11Sep2019).

<sup>4</sup> Brandes headphones used a mica diaphragm and were remarkably sensitive.

<sup>5</sup> About \$180 - \$250 today; nearly the price of a good pair of Sennheisers!

<sup>6</sup> A break-in relay that simplified switching between transmission and reception. Leach® relays, much advanced, are still made and used for a variety of applications including aircraft and satellite communications.

recognized me by my jug of water and brass ring with its many keys. One of the guards greeted me regularly with a "Hello, Saint Peter."<sup>7</sup>

My inspection of a ship's wireless equipment included a call to the Marconi station KPH for a quick check of the strength and quality of the test signals. I would call KPH and identify myself by signing the letters RI for Radio Inspector, and followed by the letters HW, or "How?" KPH would reply FB, for "Fine Business" if the signals were excellent, or NG, "No Good" if not. I would then adjust the transmitter and ask for further reports. A U.S. Government Radio Inspector from the Custom House likewise checked the ship in port to make sure that the wireless transmitter was tuned to the prescribed wavelength. He would arrive aboard ship just prior to its scheduled hour of departure, thereby enabling him to meet the operators in person and examine their licenses to make sure that they were in order.

I was once called upon to board a ship and remove the wireless operator who allegedly held a fraudulent license. His name will remain anonymous because he subsequently became a personal friend. The unsavory task took me to Meigg's Wharf where a small lumber schooner was making ready to sail at the moment of my arrival. I jumped to the deck and rushed to the bridge, where the captain regarded me with scorn. I asked him to wait until I first had time to check the wireless set. In the wireless room I saw a young fellow overcome with fear, shaking like a leaf. I asked to see his license. It was issued at the Mare Island Navy Yard, near San Francisco. In the early days an applicant for a license could present himself for examination either at the Custom House in San Francisco or at Mare Island. Failing to pass the examination in S.F., he could proceed to Mare Island and try again. The technical questions asked at both places were the same. Once the nature of these questions was known, it would be relatively easy to pass a second test. And this is what happened in the case of the operator whom I was ordered to remove from the ship. The law required that a person who failed to pass the examination may not again be allowed to undergo the test until thirty days had elapsed. In this particular instance, the operator waited only a few days and his license was therefore fraudulent.

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<sup>7</sup> A reference to St. Peter, the first Pope in Rome, with the "Keys to the Kingdom [of Heaven]."

He readily admitted his guilt. He pleaded with me to let him make just one trip on the ship so that he could earn a few dollars. He was in desperate financial straits. He assured me of his ability as a telegrapher, although his technical knowledge was scant. I knew that he would lose his license and his job after his ship returned to San Francisco, so I told him to remain aboard. And it was mutually agreed that it was impossible for me to remove him because his ship had sailed before I reached the dock. On my return to the shop I reported to Stevens. "Got there too late," I said, "the ship had already sailed." Stevens then asked me to call the Custom House and report the facts to the Federal Radio Inspector.

The operator with the fraudulent license was severely reprimanded by (Lawrence) Malarin when the ship returned to San Francisco. He was duly fired, and told that he could never again seek employment with Marconi. By a strange quirk of fate, it was not necessary for him to ever again earn his living as a wireless operator. He became a secret agent for the Intelligence arm of the U.S. Government by reason of his comprehensive knowledge of several foreign languages. I met him in Honolulu more than a year later while he was en route to a wartime assignment. "I owe my success to you," he told me, "and someday I will repay you."

My job as a Marconi Wireless Inspector was exciting if only for the reason that I was able for the first time to meet many operators I had known previously only through contacts over the air. Somehow, I managed nicely on my \$60 monthly pay.<sup>8</sup> A modest lunch could be had a few doors from the Marconi shop for 20 cents. Pleasant days to remember...

*Note: Henry W. Dickow, 3-SGP, the Grand Old Man of West Coast wireless, became a silent key on April 17, 1971 in San Francisco. His book, Tales of the Wireless Pioneers remained unfinished at his death, but a number of chapters such as this one, either completed or in draft form, have been found in the Society of Wireless Pioneers archives. We are making these available via the SoWP website.*

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<sup>8</sup> About 1500 2018 dollars.