

The First Shirt-Pocket Radio

BY MICHAEL BRIAN SCHIFFER

The idea of a radio receiver small enough to fit in a pocket goes back to the beginning of the century, before entertainment broadcasting. The great Nikola Tesla himself envisioned "A cheap and simple device, which might be carried in one's pocket (that could) . . . record the world's news or special messages." He made that statement in 1904!

The pocket radio did not remain just an idea for long. The pages of Hugo Gernsback's radio and science magazines, especially *Modern Electrics*, *Electrical Experimenter*, and *Radio Amateur News*, contain descriptions and pictures of pocket wireless sets built as early as 1909 by amateurs and experimenters. The ingenious designs were not stellar performers, but they did advertise the cleverness of their youthful creators. Though compact, these sets, which contained crystal detectors and

By the time transistor action was first demonstrated, the first commercial shirt-pocket radio had already come and gone!

not much else, also needed external antennas and grounds. Ironically, operation of the pocket "wireless" required wires.

Technology appropriate for making truly portable pocket radios was slow in coming. Throughout the twenties and thirties larger portables with vacuum tubes were sold by many manufacturers; most resembled small suitcases. With few exceptions, there was little impetus from consumers or manufac-

turers to develop miniaturized tubes and miniaturized batteries.

Among amateurs and electronics enthusiasts, however, the idea of a pocket radio lived on. Radio magazines publicized especially compact sets that enthusiasts built in cigar boxes and camera cases. Throughout that period, Gernsback's *Radio News* and *Radio-Craft* magazines continued to urge the miniaturization of portables.

In one famous episode from 1933, Hugo Gernsback himself, using the pseudonym Mohammed Ulysses Fips, reported a new set that seemed, finally, to achieve the ideal. The set was billed as "A Revolutionary Radio Development—The Vest-Pocket 7-Tube Superhetero-Ultradyne," that was attributed to the Westinghouse company. The mini-tubes—about an inch long and $\frac{3}{8}$ -inch in diameter—were denoted "APR-1" after the month in which the article appeared. Taken-in by the April fool's spoof, some readers wrote to Westinghouse seeking to buy their pocket radio. Westinghouse officials were not amused. But Gernsback did get the last laugh: by the end of the decade, tubes as small as the fanciful APR-1 were being produced commercially.

Raytheon Takes the Field. "Subminiature" tubes were the handiwork of Norman Krim and his colleagues at Raytheon; which, in the late thirties, was only a small firm that mostly made radio tubes. After doing some sleuthing in 1938, Krim determined that hearing-aid manufacturers could become a large market for miniaturized tubes. Krim proposed a project to make hearing-aid tubes to Raytheon's President, Laurence Marshall. Marshall asked Krim if he would quit in the event that the tubes failed to pay back the development costs. Krim said yes, and the work began. After months of trial-and-error, the Raytheon team succeeded. Hearing aid companies responded with orders for subminiature tubes, and Krim kept his job.

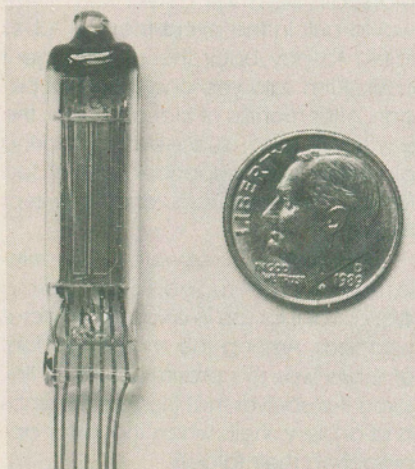
Subminiature tubes were further miniaturized and "ruggedized" during World War II for use in a variety of secret weapons. Among the most important of these was the proximity fuse, a tiny radio transceiver that triggered bombs and artillery shells when the latter approached their targets.

Excerpted with permission from *The Portable Radio in American Life* by Michael Brian Schiffer, the University of Arizona Press, 1991.

As the war drew to a close in early 1945, Raytheon executives (which now included Norman Krim) held a strategy session at Laurence Marshall's home to discuss various projects that could maintain the company's prosperity after the war. Many ambitious, high-tech projects were proposed, including microwave ovens (using Raytheon's magnetrons), televisions, and microwave-communications systems. When it was Krim's turn to propose a product, he picked something more prosaic: a shirt-pocket radio.

It is not difficult to surmise where this idea came from. Krim had been a radio amateur and, as a child during the twenties, had devoured Gernsback's radio magazines and built sundry apparatus. Perhaps he had even seen the Westinghouse portable with its subminiature-like tubes, or maybe he had responded to Gernsback's incessant editorials calling for ever-smaller portables. In any event, Laurence Marshall again gave Krim the go-ahead.

Krim assigned Niles Gowell the task of designing the world's first commercial shirt-pocket radio. It would not be a novelty or toy radio, but a superheterodyne unit. Working closely with Lemuel Temple, a battery expert, Gowell created a sophisticated 5-tube set only $\frac{5}{16}$ -inch thick and small enough to slide easily into a shirt-pocket. Hearing-aid parts were used in the audio section, but some new miniaturized components were crafted for the RF and IF stages. The radio also required production of a new family of subminiature tubes. The filaments were powered by two penlite cells, while a small 22.5-volt hearing-aid battery supplied the B+ voltage. Like many mod-



As you can see even the more complex subminiature tubes used in pocket radios were very small indeed.



The Privat-Ear pocket radio, measuring only $5\frac{15}{16} \times 2\frac{1}{16}$ -inches, could easily fit in a pocket for listening on the go.

ern shirt-pocket sets, the radio had an earphone instead of a speaker.

To Market We Go. To manufacture this shirt-pocket radio and other consumer-electronic products (among other reasons), Raytheon bought the Belmont Radio Company of Chicago in 1945. When presented with the prototype, the Belmont people were not impressed; after all, they knew radio and radio retailing. In their view, this high-tech item would have few buyers because it was a novelty item. Despite Belmont's reservations, the pocket radio entered production in late 1945.

A full-page ad in *Life* magazine, on December 3, 1945, announced the birth of the "Belmont Boulevard." A signed painting pictured the radio, actual size, nestled between a set of keys and gloves. It was a handsome radio, reminiscent of earlier "sport sets" made by hobbyists.

However, as Belmont had predicted, customers did not swarm around stores to await arrival of the first shirt-pocket portable. Total sales reached at most

5,000. Quietly, but quickly, the "proto-Walkman" died.

Although no major U.S. radio company made another shirt-pocket set with subminiature tubes, electronic hobbyists used this most appropriate technology for homebrew pocket radios. Such radios were publicized in *Popular Science*, *Popular Mechanics*, *Radio and Television News*, and other magazines. A few very tiny companies sprang up in the post-war years to exploit the possibilities of the Lilliputian radio. The sets they made were novelties and attracted little notice. The *Privat-Ear* was the most popular of this genre, enjoying sales from 1951 to about 1954.

Shirt-pocket radios, built with subminiature tubes, failed to find a mass market in the late forties and early fifties. These sets had obvious technical shortcomings, such as poor sensitivity and very short battery life, yet no company invested much effort in improving them. Radio firms judged that a pocket radio with an earphone was not apt to become a necessity for more than a

(Continued on page 83)

SHIRT-POCKET RADIO

(Continued from page 36)

few buyers, and so any further technical development would be a wasted effort.

Radios this small also had a serious image problem. In the post-war years, Americans, finally freed of the great depression and the privations of wartime rationing and shortages, were not clamoring for downsized products of any kind; "big" was in. Adding to the shirt-pocket set's difficulties was its resemblance—in appearance and ear-phone-only operation—to late-forties' hearing aids. Few trendy adults would have been eager to embrace such a product.

Luckily that interpretation did not last. In fact, during the late 1950s, transistor shirt-pocket radios were selling annually by the millions; a mass market had finally materialized. Ironically, it was American teenagers who were putting these sets in their pockets (and purses) and earphones in their ears. The shirt-pocket radio became the badge of rock-and-roll's first generation. Long championed by youthful experimenters, the shirt-pocket radio had come home to young Americans. ■