

## Chapter IV

### Tacoma and Vancouver:

#### First Radio Laboratories

*Not so many years ago, when the Model T Fords came on the market they were hailed as the last word for that type of car. Radio is just passing out of its infancy and none of us can predict or even guess the numerous uses to which it can be placed, especially so in the Forest Service which is opening a new door in the field of radio.*

- William B. Apgar<sup>1</sup>

The 1930 field experiments did not satisfy Dwight Beatty. To him, radio communication with Morse code did not make the most of this new technology. Voice communication seemed far more practical if it could be incorporated without unduly complicating the transmitter circuitry. By extending its use to all personnel with a minimum of training, this modification would enhance the acceptance of radio in the National Forests. After the type '30 tube was introduced, Beatty saw a way to convert to a "featherweight" set using voice transmission.<sup>2</sup> He considered hiring an assistant to help him do this, because of his own commitments.

In the early 1920's, Harold K. Lawson was attending classes in engineering at Oregon State University. His interest in electronics dated back to high school when he secured amateur licenses 7UZ, 7SR, and 7FW, the latter strictly for an assignment for portable radio operation. Although he enjoyed designing and building gear, he usually lost interest in an experiment once it worked. He would then move on to some other modification or design that caught his attention. His advisor pointed out to him after his first year of college that electrical engineers often could only get jobs as trolley operators. He

urged him to transfer to forestry, a field that fit in with the Lawson family's logging business. But after 3-1/2 years of forestry study, the difficulty of supporting himself on a part-time job led Lawson to drop out. After several years of working for his father in logging near Stevenson, Wash., he went into electrical contracting with a partner down the Columbia River in Vancouver. As a member of the Vancouver Chamber of Commerce, he went to Washington, D.C., in April 1930 for the national Chamber's convention.<sup>3</sup>

For some time, Harold Lawson had thought it unusual that the Forest Service was not using portable radio communication. He had enough firefighting experience to know that radio could prove a boon to the Service. He took this opportunity to approach the agency's leaders about the possibility. He spoke to Roy Headley, who told him: "You have just left the part of the country where we are doing something about it. Go back out to Tacoma and look up a man by the name of Dwight Beatty. He's actually doing some field work."<sup>4</sup>

Lawson was too busy to follow up on the advice for several months. In early 1931 he had occasion to travel to Tacoma and over lunch he discussed employment with Beatty. A month later, he received Beatty's approval; he moved to Tacoma in March.<sup>5</sup>

The working conditions in Tacoma were far from ideal. The Radio Laboratory, located in a "little ramshackle house" at 4001 East B Street, had very few of the tools required for experimental work: one or two voltmeters, a home-made ohm meter, a hand-operated drill press, a tin snips, and some screwdrivers and pliers. "To call it a lab was something of a joke," recalled Lawson.



Figure 33. This house at Tacoma, Wash., served as the first Forest Service Radio Laboratory, from late 1929 to the summer of 1931. Note antenna poles. (Forest Service photo, History Section)

He saw little of his new supervisor during the next few months. After driving Lawson to the Laboratory, Beatty provided him instructions for designing a portable voice radio, handed him a purchase book, and told him to go to Tacoma or Seattle for the needed parts. Beatty asked Lawson to keep him posted by writing up a summary of his work every day or two and leaving it on the desk. Lawson was not expected to keep track of his time or work specific hours, but Beatty did ask him to draw the shades and throw a sheet over any experimental work each night.<sup>7</sup>

#### Lawson Designs Transmitter

By May 1931, Lawson had completed a working model semiportable code/voice transmitter--the PCL-1. The complete unit weighed about 60 pounds and was tested by Lawson along with an SP-1930 receiver.<sup>8</sup> He made contact with several amateur radio operators in the Region and received reports of excellent reception.<sup>9</sup> The set contained the type '30 and '31 tubes, which had only recently

been placed on the market, and used common amateur radio circuits at 1-1/2 watts. The PCL-1 had a tested daytime range of 11 miles; evening contacts extended to Olympia, Wash. 25 miles west.<sup>10</sup>

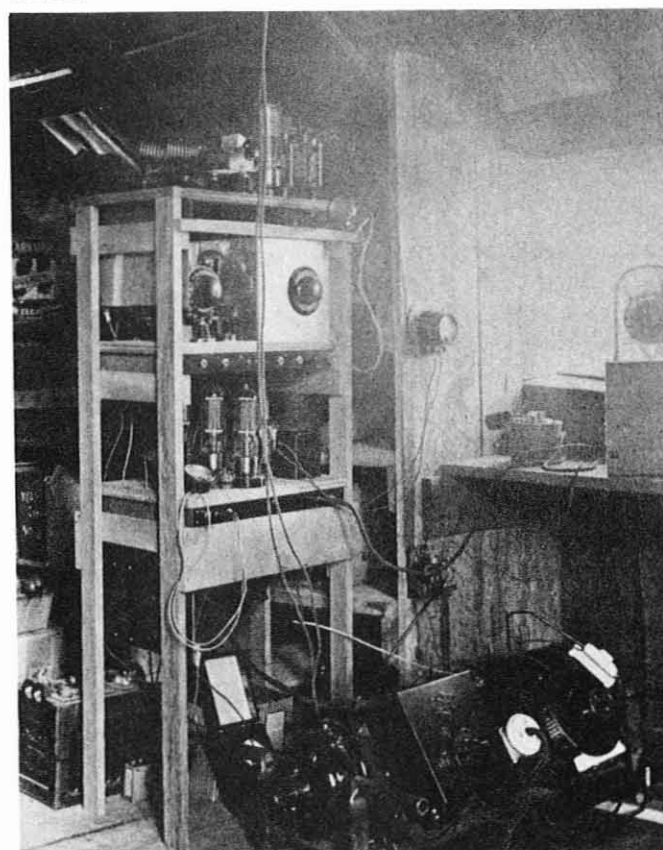


Figure 34. The 50-watt voice transmitter built by Harold Lawson to replace the borrowed Northern Electric unit first used at the Hemlock Ranger Station field test in 1930. With the same call letters (W7XAQ), Lawson's set operated from the Forest Service's new Radio Laboratory near Portland in Vancouver, Wash. It was also used for several years to communicate with Civilian Conservation Corps (CCC) camps operated in Region 6 by the Forest Service. The unit on the floor was the power source. (Forest Service photo, History Section)

By late May or early June, Harold Lawson was becoming uneasy over the lack of a working relationship with

Dwight Beatty. Beatty seldom made an appearance even if Lawson stayed at the Laboratory until 1 or 2 a.m. Yet the work summaries Lawson left on the desk were always gone by the time he returned. One morning, Lawson entered the building to find the shades still drawn and Beatty sitting at the desk with a bottle of whiskey. "Let me ask you," queried Beatty, "has anyone come here during the day, or have you seen anyone sitting outside in a car apparently observing this place?" After saying he had noticed nothing, Lawson learned that Beatty suspected Washington Office "gumshoes" of checking up on his operation.<sup>11</sup>

Shortly thereafter, when it appeared that everything was once again in order, Beatty rehired W. Foy Squibb as the chief technician for the design of a voice-operated portable. Squibb, no stranger to the program, had originally come into contact with Beatty in early 1930. He was an electrical engineering student at Washington State University. His background as a radio amateur (W7CT, W7TG, W7AUX) had proven valuable to him in securing a temporary job at Spokane Radio while the SP-1930 sets were being built. He was interested in the project, approached Beatty for a summer job, and was appointed operator of Beatty's Northern Electric base station at the Wind River Experiment Station (Hemlock Ranger Station) during the 1930 summer field tests.<sup>12</sup>

It appeared to Harold Lawson that whatever the cause of Beatty's suspicions, the radio project was about to take on a new dimension with the hiring of Foy Squibb. But near the end of June, he arrived at the Tacoma Laboratory to find a disheartening note from Dwight Beatty:

Dear Lawson: Friday  
Sure sorry you have been ill.  
See you when you get to feeling

better. Bad news for you I am afraid. I've resigned and it looks like job cracking up. I hoped and tried to arrange so you could go on, but afraid I can't make it. See you.

D L B

Am still trying for you to go on with work.<sup>13</sup>

The cause of Beatty's resignation was not directly connected with his efforts to perfect radio for use on the National Forest--few, if any, had qualms about his capability. Rather, it was a personal problem, which for some time had remained in the background. However, because Beatty could not be induced to cooperate or change his ways, the Washington Office finally exerted enough pressure so that Beatty had to resign.

It is not known when the problem first surfaced. What is known is that as early as the demonstration in Missoula, the collaborator on Beatty's radio project was Margaret Ward, a resident of the valley where the demonstration took place.<sup>14</sup> Although Beatty had a family in Missoula, Margaret Ward accompanied him to Washington. In Tacoma they lived some distance away from what eventually became the Laboratory, and remained in seclusion. Margaret Ward was seldom seen by those in the radio experiments, but she apparently had a direct role in the effort. Correspondence addressed to "Mr. M. Ward" from Spokane Radio was often received at the Laboratory.

The decision to pressure Dwight Beatty into a resignation was undoubtedly distasteful to those who had shared in his early success. For the last 4 years, he had invested considerable effort in developing radio for the fireline, and he would have been a decided asset to the program in the future. But the Washington Office could not look the

other way once the program reached the application stage. Beatty's violation of a fundamental code of conduct could have been a psychological factor in Beatty's desire to succeed, but the behavior could not be justified or ignored once the program moved into the open, certainly not in those days.

Several months after resigning, Beatty went on a well-earned fishing trip off the Oregon coast. One day a severe Pacific storm unexpectedly came up. Neither the boat nor its passengers were ever found.<sup>15</sup>

During the time Beatty was conducting tests near Tacoma and on the Columbia (now Gifford Pinchot) National Forest, he was technically out of the jurisdiction of Missoula, Region 1, but apparently still under its administrative control.<sup>16</sup> But because of Region 6's early interest, the location of the laboratory at Tacoma, and the 2-year history of the program in that Region, the Chief Forester asked Portland to "... submit recommendations as to the continuation or abandonment of the radio project."<sup>17</sup>

Region 6 sent Floyd V. (Jack) Horton, Chief of the Division of Lands and Recreation, and A. Gael Simson from the Wind River Experiment Station to confer with Lawson in Tacoma.<sup>18</sup> Both Horton and Simson investigated the project progress and the plans. Horton believed it would be a shame to drop the program because one man was leaving, and together with Simson he recommended that the program be continued.

#### Horton, Simson Put In Charge

Chief Forester Robert Y. Stuart concurred and placed the project under the Regional leadership of Horton, with Simson directly

responsible for the administration of the Radio Laboratory.<sup>19</sup> As Horton related to the author, Stewart Holbrook, the two men then proceeded in an attitude of "intelligent ignorance."<sup>20</sup>

The selection of Jack Horton was especially good for the future of the Laboratory. Although he had no radio experience, he was somewhat of a gadgeteer who saw the practical benefits that could accrue from radio. Harold Lawson remembered him as "just a believer" who had no engineering training, but a person who found the subject of radio for fire control a "natural."

"It was indeed," said Lawson, "a pleasure to work for Horton. I never had a better boss in my life. You knew precisely where you stood, knew what was expected."

"If I did something right I got a pat on the head; if I stepped out of line I got a kick in the pants."<sup>21</sup>

If Horton proved to be a worthy selection for the program, the appointment of A. Gael Simson was invaluable. During the next 16 years, "Ags," as he was known at the Laboratory, quietly provided the type of administrative leadership that carried the program through its infancy into a position of decided prominence. Few men who came in contact with Ags disputed his leadership abilities, foresight, or intellectual acumen. His interests were far-ranging, and included paleontology, writing western outdoor stories, and electronics. He was a "pretty sharp" administrator, a "good politician," operated very well in the "upper echelons," and had a comfortable demeanor that made those under his supervision fond of him.<sup>22</sup>

Many anecdotes are pleasantly remembered by Simson's contemporaries. Logan Belle-

ville recalled that Simson used to come in and "raise hell" about the appearance of the Laboratory every time dignitaries were due to arrive. To cure the usual disorganization among research groups, Simson threatened to attach the work benches to the wall with hinges and to knock the props out promptly at 5:05, sending everything left on top crashing to the floor.

Around the corner from the Laboratory at Murphy's Diner, Simson was remembered as the one who like to play the pinball machine and who consistently ordered black coffee with two ice cubes and a side order of burnt toast.<sup>23</sup> Gaylord Knight, the first Region 8 communications officer in Atlanta, remembered the numerous trips Simson made there, always with the so-called Simson's suitcase among his baggage. This device, a hefty 50-pound combination transmitter-receiver, was built at the Laboratory so that Simson could test various frequencies around the country. Upon arriving in a town, Simson would request a room that was open to the street and adjacent to a tree or other suitable fixture. While the "Chief" remained in his room with a tall, cool drink, Knight would climb the tree or pole to affix a wire antenna, which would then be strung back to the room and connected to the "suitcase."<sup>24</sup>

Unlike Horton, Gael Simson had a background in electronics. Before joining the Forest Service as a scientist, he had served in the Navy as a radio operator during World War I.<sup>25</sup> Some time before 1929, he had undertaken tests to track lightning storms at the Wind River Forest Experiment Station on the Columbia (now Gifford Pinchot) National Forest. The purpose of these tests was to determine if a way could be devised to ascertain which types of lightning started forest fires, and if a pattern

could be detected for predicting fires during such storms. Results were inconclusive. While there in 1929 and 1930, he had served as advisor to Dwight Beatty.<sup>26</sup> When it came time to select an administrator for the radio program, Simson was a logical choice.

#### Radio Laboratory Moved to Vancouver

The first decision made by the new administration was to move the Laboratory nearer to Region 6 headquarters at Portland. A house was rented across the Columbia River in Vancouver, Wash., at 3201 Drummond Avenue. Though little better than the one in Tacoma, it served its purpose as a home for the Laboratory for the next few years.

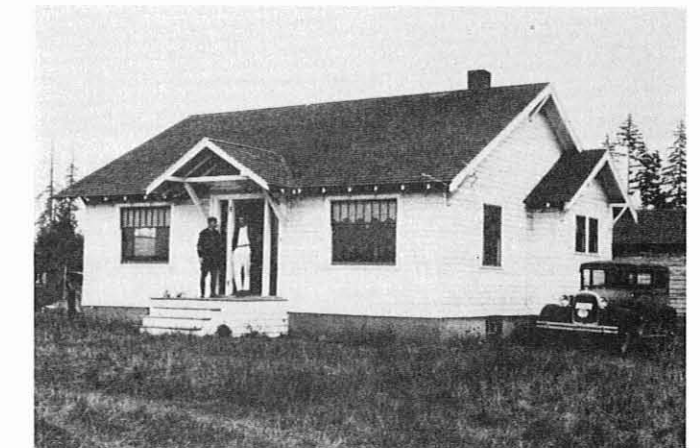


Figure 35. The Forest Service Radio Laboratory at Vancouver, Wash., established in 1931. (Forest Service photo, History Section)

Harold Lawson and Foy Squibb completed the move, and continued to work on semiportable and portable design. By July, Lawson was obtaining excellent results with the type '30 tube, and the crystal-controlled unit, now dubbed the "SP," was reported to be comparable in performance to Beatty's SP-1930.<sup>27</sup> He conducted tests at Wind River during

the summer, and the results were ready by early fall.

Optimism over the set's performance ran high. Weighing between 25 and 40 pounds, depending on battery selection, the SP, Roy Headley wrote, vindicated "Beatty's confidence that it is possible to transmit voice by such sets."<sup>28</sup> Production was scheduled for January 1, with some 50 units intended for trial use in Regions 1, 4, 5, and 6 in 1932.

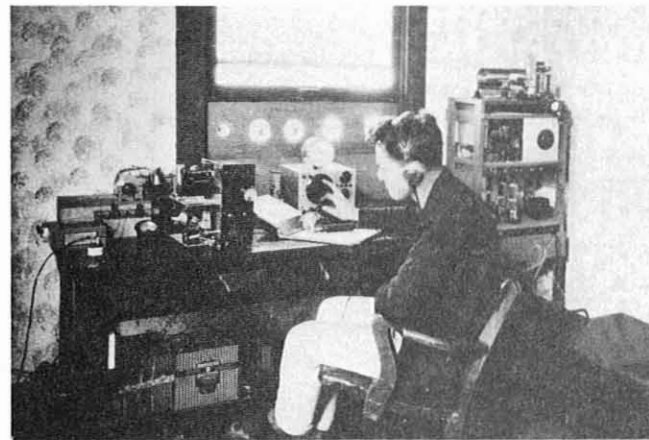


Figure 36. Harold Lawson testing a semiportable model he designed at the Radio Laboratory in Vancouver, Wash., late in 1931. In the corner is his 50-watt transmitter model; it was also used as the control station on the Columbia (now Gifford Pinchot) National Forest during the 1931 fire season.  
(NA:95G-262294)

Squibb continued work on the fully portable model. Given the designation of type P for "portable," the unit was virtually a lighter SP-1930 modified to transmit code and to receive voice and code with a minimum of electronics.<sup>29</sup> In the transmitting circuit, Squibb slightly altered the High C Hartley Circuit of the SP-1930 to eliminate the RF choke and the variable grid-leak resistance. He used an "inductively wound resistance" in its place to obtain "practically identical" results. He reported:

"One part is thus eliminated in the portable set."<sup>30</sup>



Figure 37. Gael Simson demonstrating the first type SP (semiportable) model, 1931. (NA:95G-262289)

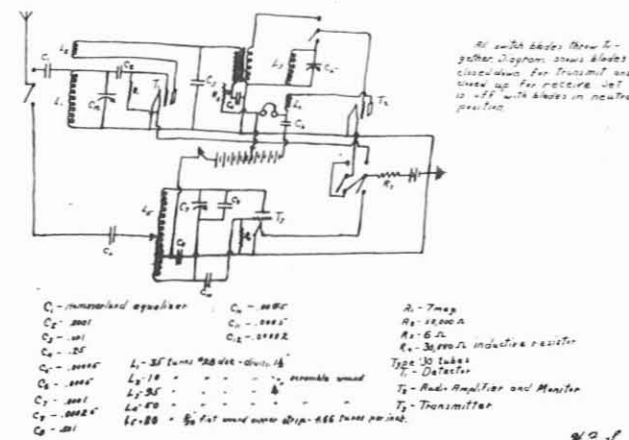


Figure 38. Foy Squibb's laboratory diagram for the first type P (portable) set, which he designed for the Forest Service in 1931-32. (Forest Service photo, History Section)

In the receiving circuit, he used a simple series feedback regenerative detector and one stage of af amplification. This arrangement eliminated the adjustable feedback condenser and the RF choke, which had provided a shunt-fed system in the SP-1930. Replacing a potentiometer with a fixed resistance for regeneration control saved even more weight. Squibb had thus ingeniously reduced the weight to 12 pounds, producing a truly portable transmitter-receiver at 1-1/4 watts. Production of 150 sets was scheduled for April 1, 1932, to complement the previous run of type SP sets.

One of the outstanding improvements in both the P and SP was a simpler single-wire antenna. All Beatty's experiments had been conducted with a high, single-wire antenna, which was parallel to a ground-wire counterpoise 3-1/2 feet high. The large clearing required for setup, the effect of wind on frequency, and excessive time required for installation were weaknesses of the counterpoise system. "It was, therefore,

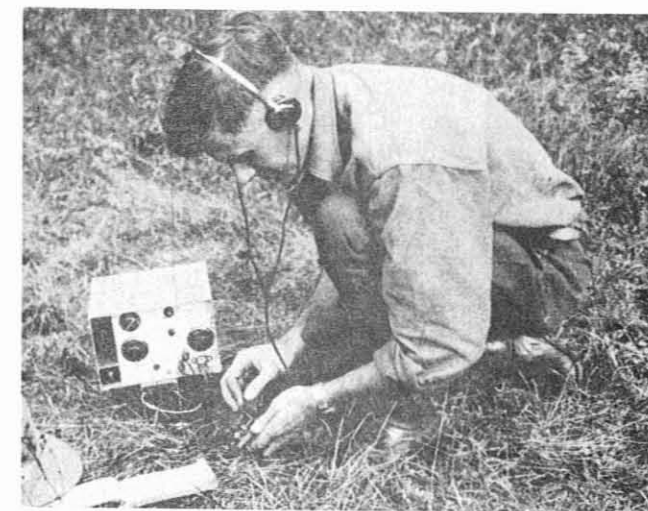


Figure 39. Gael Simson operating an early version of the type P (portable) set in 1931. (Forest Service photo, History Section)

decided to make a special effort to develop a single wire antenna and the result is a power-feed antenna of very simple design," reported the *Radio News*.<sup>31</sup>

The length of the single-wire antenna was made to correspond to the frequency of the transmitter, approximately 70 feet. Fitted with a loading coil somewhat off-center, the feeder wire was always fixed. In addition to compactness, this simplified installation. It also had the advantage of being several pounds lighter than its predecessor, "... an important contribution to the success of the project."<sup>32</sup>

To demonstrate the practicality of the P set, Region 6 selected an "average man" from a road crew. After an operating demonstration, including a setup and take-down, the operator was given 1 hour to practice. Starting on a given signal, he set up the equipment in 18 minutes and sent a coded message requesting eight men, with location and type of fire. He then waited while the receiving station copied the message,

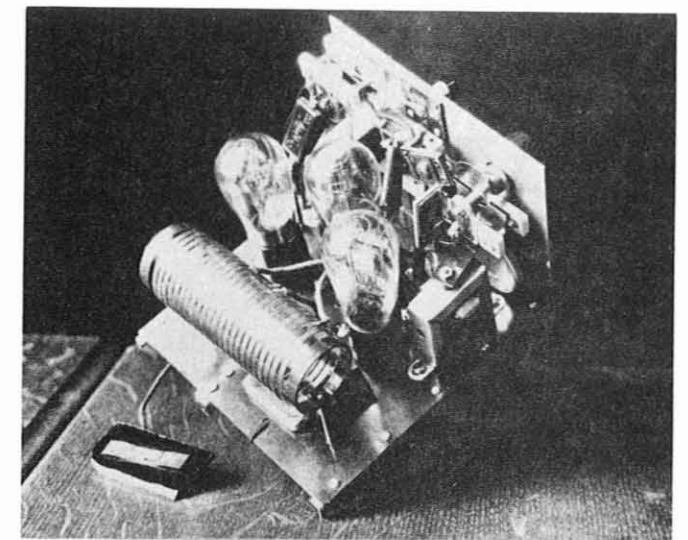


Figure 40. Interior view of the first type P (portable) set, 1931. (Forest Service photo, History Section)

phoned it to headquarters, received a reply, and retransmitted the reply to the road man, at which time he disassembled the equipment. The total elapsed time was 44 minutes.<sup>33</sup>

This demonstration conclusively established the value of radio for the National Forests. Headley's main worry, now that the units were scheduled for production and testing, was "... where is the money coming from?" Suspecting that radio could become so fashionable in the Forest Service that demand would expand out of proportion to the real need, he also cautioned all of the Regions:

As always when a new tool or device comes to the front, it is important to remember its limitations. Radio has a legitimate use in forest protection and a worthwhile contribution to make to our production objectives. Let us hope that we fit radio into its proper niche as rapidly as practicable but that in doing so we carefully refrain from going off half cocked with any cure-all or panacea type of thinking. Radio will not put out the fires, as some excited newspaper stories seem to indicate, nor will it replace telephone lines to any material extent. It does not need to do anything like this in order to make a worthwhile contribution to forest protection.<sup>34</sup>

Before the scheduled P and SP field tests, during the 1932 fire season, Lawson and Squibb completed their designs. They made minor modifications, primarily to simplify production. Lawson altered the SP front panel, adding a cabinet and putting the microphone inside the cabinet door. This allowed space to mount a meter on the front panel to facilitate tuning. Using the same small cabinet for the

P set, Squibb placed the storage compartment under the unit and rearranged the controls. Both had an advertised operating range of 15 miles on voice and 20 miles on code. The low bids of \$147.00 for the SP by the Northern Electric Co. and \$49.00 for the P, by the Spokane Radio Co., were accepted.<sup>35</sup>

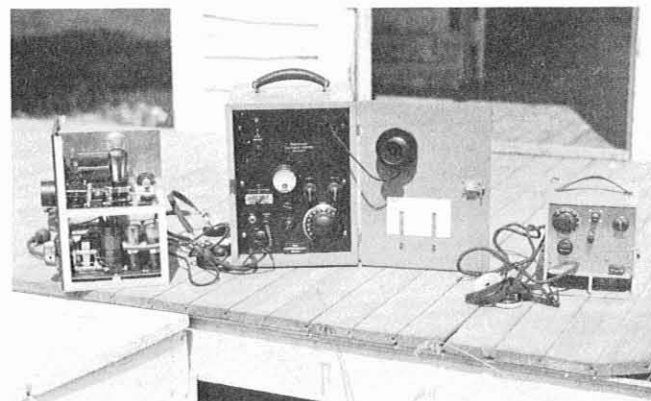


Figure 41. Left, interior view of the final SP set. Center and right, final exterior views of the SP set and of the P set, respectively. (Forest Service photo, History Section)

#### 147 Sets Field-Tested in 1932

During the summer, 43 SP and 104 P sets were installed on National Forests in Montana, Idaho, Washington, Oregon, and California. Their operation was seldom deficient. On the Umpqua National Forest in Oregon, for example, a few sets were placed on the Tiller District to assist in coping with a bad incendiary situation. "For the first time in years incendiary fires on this district have not been a problem," it was reported.<sup>36</sup>

Harold Lawson made an extensive installation of the two sets in the Calder District of the St. Joe National Forest in north Idaho. During 63 days of record, 2,663 radio calls were placed. The reliability of the 1,511 calls between SP sets was estimated to be 99 percent effective; 1,152 messages between SP and P sets rated 84 percent reliability.<sup>37</sup>

A number of fire traffic calls from northern California were also intercepted in the District, but the most extensive tests were conducted in western Montana at the Savenac Nursery near Haugen. William Apgar, the Assistant Forester at Savenac, was an amateur radio buff with license W7CRU. When the new sets became available, Lewis C. Stockdale, Chief of Operation in Region 1, ordered two of each and put Apgar in charge of testing. Because the nursery was close to St. Maries, Idaho, where Lawson was stationed, arrangements were made for daily communications at 7 and 9 a.m. and at 5 p.m.<sup>38</sup> The schedule started August 10.

The Savenac Nursery station was located in the house used by visiting Forest Service officers. It had a permanent 139-foot antenna, 40 feet in height. With this antenna, the temporary one supplied with the sets at 20 feet, and Apgar's National SW5 receiver, he was able to carry out "extremely satisfactory" tests. Except for the nursery power plant that caused considerable interference after dark, the other stations reported the Savenac signals "coming in stronger" than other SP sets.<sup>39</sup>

The period of operation lasted some 3 months and included 1,832 hours of actual operating time. Two temporary employees trained as operators kept a complete station log, and Apgar devised a full schedule of contacts to keep them busy. In addition to the St. Joe, regular schedules were maintained with the Chelan National Forest and the Radio Laboratory (W7XAQ) at Vancouver, both in Washington, far to the West, and the nearby R-1 headquarters at Missoula. But Apgar's penchant for thoroughly testing the 1-1/4-watt P sets on 3,385 and 3,445 kHz also took him out to the hills, mining dumps, and heavy timber. Covering a large area around Savenac, Apgar was able to find only one instance

"... where a [700-foot] hill masked the signals."

"It was surprising to note how well the sets were able to work thru [sic] fairly heavy static," he commented.<sup>40</sup> Even their capability to cover distances of 50 miles or more pleased Apgar.

Portable signals between Savenac and Missoula were rated as "very strong" and the ability of the sets to get through nearly 400 miles from St. Maries to Vancouver was significant, though rated "very weak" in signal strength. Apgar concluded his report on the portable set with a casual note; "These long distance tests are interesting but have little value in actual work other than to show what the sets are capable of doing."<sup>41</sup> This statement would eventually become a major lasting point of contention between the Laboratory and Missoula.

Although Bill Apgar would become decidedly disenchanted with sets of low output power in a few years, his support in 1932 for the use of radio in the National Forests probably matched that of the most optimistic radio enthusiasts. A highly outspoken individual throughout his Forest Service career, he was less inclined, with his amateur radio background, to heed the caution of Roy Headley to go slowly in adopting radio. Apgar was satisfied that the difficult tests to which he had subjected the P and SP radios proved their potential for the Forest Service. "We all admit they are not perfect," he wrote, "but they do fill a need and their usefulness will increase as time advances."<sup>42</sup>

Apgar was equally confident, though more restrained, about the future of radio versus telephone communication. By posing a series of questions, he reminded his bosses of familiar shortcomings of the telephone in the field:

Aside from the humorous arguments advanced, what would be the result if the telephone conversation on a district were rated during the field season with an audibility scale such as the radio calls are rated? Would they show over 90% satisfactory service? How many times have you had trouble getting a call thru a small local central, or been bothered with static on mountain lines, could not call the Ranger station from the lookout, could hardly understand the other party or have been annoyed at the telephone operators' favorite expression of 'just a moment, please' after you have been standing at a wall phone for over half an hour trying to get a call thru? I am afraid that a strict rating of the two systems would show that the present system of telephone communication is not as perfect as we generally consider it.<sup>43</sup>

In Vancouver, Harold Lawson was pleased with the summer's results. But the use of code in the P sets had troubled him for some time. After Squibb's return from college in 1933, the two men set out to complete the design of a voice/code portable that would equal the P set in size and performance. The result was the type PF portable phone contained in a 4- by 5- by 16-inch enclosure and weighing a scant 15 pounds, including hardware and batteries. The ultimate in lightweight, portable technology, the PF used "common ham [amateur] circuits" to transmit a nominal 1-1/2 watts.<sup>44</sup> Sometimes advertised as the "Portable Fireman," the type PF used a regenerative detector, two stages of af, and a crystal-controlled voice transmitter. At a reproduction cost between \$60 and \$75, it proved popular, and some 450 units were sold before it was replaced by an improved type.

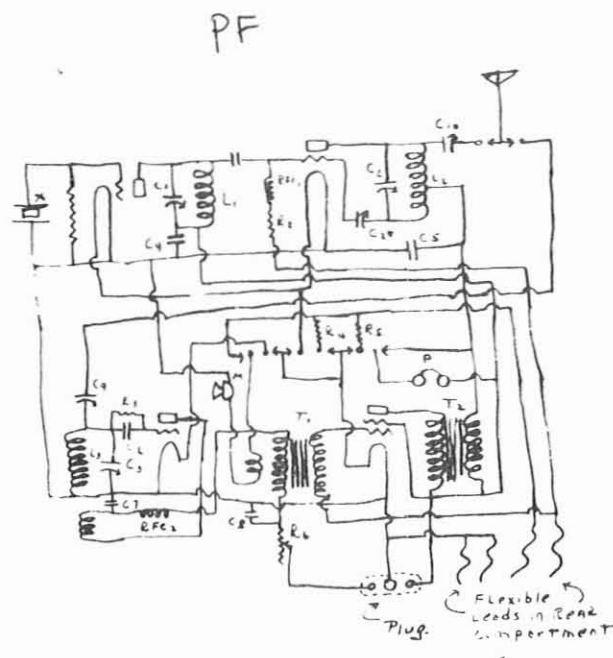


Figure 42. Working drawing for the type PF radio, by Harold Lawson. (Gaylord A. Knight Collection)



Figure 43. Demonstration of the type PF voice radio set, developed in 1933 by Squibb and Lawson at the Radio Laboratory. (NA:95G-280931)

#### Fixed-Base Transmitter Designed

One of the final tests to be completed by Lawson before the 1933 fire season was the design of an a.c.-operated, fixed-base transmitter. This unit, which would operate at more power than the smaller sets, was intended to serve as a central location. The location would theoretically be a Ranger Station surrounded by lookout structures. With 1-1/2-watt PF sets in the field, 1-watt SP sets at the lookouts or fire camps, and a larger wattage, fixed-base station at Ranger and Forest headquarters, the triad of Forest Service radios would be complete.

Because of the Depression, the design of a fixed-base transmitter had to be achieved by a circuitous route. When Simson ran out of money for a technician on the payroll, he laid off Lawson and then contracted with him to complete the design for "big money"--\$125.<sup>45</sup> With Simson supplying the material, Lawson was able to complete the type M (medium power) set before the summer.

The type M transmitter was a conventional design and was used in conjunction with a commercial radio receiver, usually a Hammarlund Comet Pro or, in a few instances, a \$17 Simplex converted to a standby receiver by the Laboratory. Rated at 20 watts nominal and 40 watts peak, the type M had the capacity to serve the intended function of a control station. Originally it consisted of a separate transmitter and receiver. With further design improvements it was also made available in a single cabinet with either Rice, Garco, or Weco gas-driven generators for field use. It had an advertised range of 50 miles and would become a mainstay in the 100-meter range of Forest Service radio equipment.

The use of the Hammarlund Comet Pro receiver indicates that the Laboratory

was receptive to commercial products when they could find products on the market that suited a particular need. The Comet Pro was considered an excellent receiver for its day. At a price of \$100 to \$150, it could not be improved upon except for minor refinements. Because it was too selective for standby service, the Laboratory devised a sweep device that allowed the tuner to scan over a narrow band of channels twice each minute.<sup>46</sup> Another refinement added at the Laboratory (its absence had irked Gael Simson) was a standby switch in the receiver B supply line. In a letter to Lewis Winner, Simson cajoled Hammarlund-Roberts into including this switch in future models in return for receiving information on Forest Service radios to be used in Winner's radio program, "The Human Side of Science."<sup>47</sup>

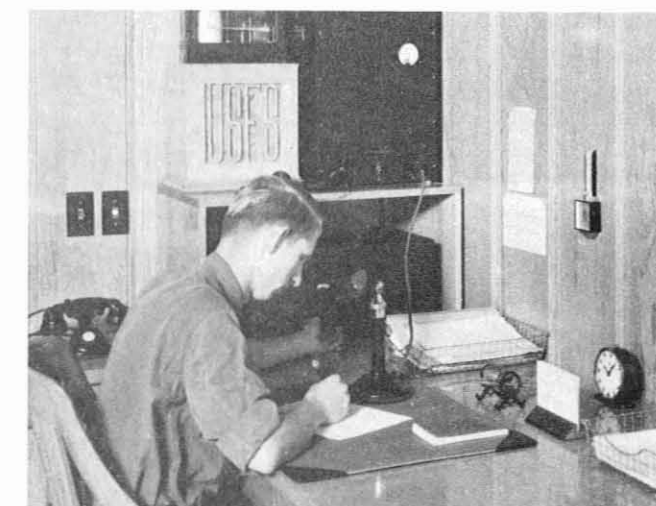


Figure 44. The type M fixed-base voice transmitter, intended for use as the control unit at Ranger Stations to reach fire lookouts. It was a high-frequency, 100-meter-band set, with a 50-mile range. Designed by Lawson in 1933, it is shown here in the "radio corner" at the Priest River Field Laboratory, Idaho, in 1936. (NA:95G-350671)

The 1933 field tests were an extension of the previous year. Regions 1, 4, 5, and 6 were most interested in developing

fire networks and purchased a number of additional radios through the Radio Laboratory. Region 1 now had 49 radios: 3 M sets, 31 SP sets, 18 PF sets and 7 P sets.<sup>48</sup> Although the P sets were then considered obsolete and placed in storage, Bill Apgar still had 50 radios to distribute for testing in a variety of situations.

The 1933 Savenac records revealed a "satisfactory" 96.2 percent completion rate for Regional calls analyzed. In addition to test calls, experimental work, and the relaying of traffic, the nursery also used radio to communicate with planting camps in the area; "This made for very efficient co-operation ..." A PF set was used to "excellent advantage" on the St. Joe Forest by a survey crew doing triangulation from peaks where there was no communication. Over on the Clearwater Forest, several sets provided communication between headquarters and road construction and CCC camps. Two M sets handled all communication that normally required long-distance phone calls between Pierce and Orofino.

Apgar established a radio network among the Clearwater, St. Joe, Lolo, and Flathead Forests, the Savenac Nursery, and the Priest River Experiment Station during the winter. "The volume of business necessitated scheduling all transmissions," he reported, "and although no record is available it seems safe to say that the sets have more than paid for their use in the decrease of long distance toll charges."<sup>49</sup>

By the 1934 fire season, some 700 sets had been distributed throughout the National Forests, primarily in Montana, Idaho, Washington, Oregon, and California. The Navy; the Interior Department's National Park Service and Indian Service; and the Bureau of Lighthouses, then in the Department of Commerce and

since 1939 under the U.S. Coast Guard, purchased sets for their own use.<sup>50</sup> Although these purchases were a significant demonstration of the acceptance of the Radio Laboratory's products, they were but a fraction of the needs of the Forest Service and other Government agencies. Considering that only 4 years had elapsed between the design of the types SP and P, 2 years for the types PF and M, and the subsequent manufacture of some 700 sets of these types, the accomplishments of Simson, Lawson, and Squibb assume added importance. In this relatively short period of time, they had formulated a plan, tested several configurations of a concept previously unknown, provided prototypes for manufacturers, had working models in the field for testing by relatively inexperienced personnel, made changes and alterations in time for orders to be placed, and kept the price at an acceptable level.

Foy Squibb and Harold Lawson continued to be very modest about their accomplishments. In later years, both emphasized the experience they gained in amateur radio, voiced their pleasure at the opportunity to turn a hobby into a vocation, and downplayed their significance in the design of lightweight, low-power, portable equipment.<sup>51</sup> In fact, Squibb would say, "Maybe *designed* isn't a good word, we *adapted* conventional circuits to weight and size limitations."<sup>52</sup> But the events during the next decade suggest that much more was involved in their initial efforts than mere "adaptation." Perhaps Gaylord Knight was correct in saying that Simson, Lawson, and Squibb constituted a "godsend."<sup>53</sup>

# Reference Notes

1. William B. Apgar, "Report on Radio Activities at Savenac Nursery--1932," 30 November 1932, typed carbon copy, p. 15, Gaylord A. Knight Collection.
2. Beatty, "Radio Communication," pp. 18, 19.
3. Harold K. Lawson, interview with the author in King City, Ore., May 1978.
4. Lawson, interview with author.
5. Lawson, interview with author.
6. Lawson, interview with author.
7. Lawson, interview with author. Lawson never learned the reasons for this security practice.
8. H. K. Lawson to W7ARZ [Wally Guthrie], Salem, Ore., 29 May, 1931, Gaylord A. Knight Collection. Attached is a draft photocopy report, H. K. Lawson, "Portable Transmitter PCL-1," 29 May 1931, Gaylord A. Knight Collection.
9. The contacts were with Bill Claypool (W7UV), Wally Guthrie (W7ARZ), and two others (W7APE in Marshfield, Ore., and W7KZ in Olympia). See Lawson, "Portable Transmitter PCL-1," p. 30. Claypool enters the picture later as an employee of the Laboratory and Wally Guthrie was employed for many years by Bill Sanders of the Oregon State Department of Forestry.
10. Lawson, "Portable Transmitter PCL-1," pp. 2, 3, and Lawson, interview with author. The antenna system was an 80-foot wire with counterpoise.
11. Lawson, "Portable Transmitter PCL-1," pp. 2, 3 and Lawson, interview with author.

12. W. Foy Squibb, interview with the author in Ramona, Calif., January 1978.

13. Original handwritten message in the possession of Harold Lawson, King City, Ore.

14. Clyde Fickes, interview with the author in Missoula, Mont., May 1978. Clyde Fickes was Beatty's supervisor at the time.

15. The details of Beatty's departure from the Forest Service were supplied to me by two sources who chose not to be identified; both believed that these details would detract from Beatty's fine work. I disagreed because I believed that Margaret Ward rightly deserved recognition. I also maintained that Beatty's accomplishments were heightened, rather than lessened, by his personal difficulties. Finally, no matter its path, historical accuracy must not be abridged in the interest of evading conflicts with perceived contemporary social values. As a final note to this portion of the history, it is interesting to note that one of the principals received a call from Margaret Ward some 4 decades after Beatty's death. She wanted to see if this individual was interested in purchasing Beatty's early prototype equipment. He was not. My attempts to locate Margaret Ward since that time have not been successful.

16. Lawson was using Region 1 stationery at Tacoma (author).

17. D. S. Nordwall, "Memorandum for the Record--Radio Laboratory Inspection," 24 March 1947, p. 1, Gaylord A. Knight Collection.

18. Lawson, interview with author. As a Division Chief, Horton was one of six Assistant Regional Foresters. He later became R-6 Chief of Operation.

19. Nordwall, "Radio Laboratory Inspection," p. 1.
20. Stewart Holbrook, "Radio for the Fire Line," *American Forests* 39, no. 2 (February 1933):59.
21. Lawson, interview with author.
22. This characterization of Simson is mine, based on my interviews with a number of individuals who knew him.
23. Logan Belleville, interview with the author in Saratoga, Calif., January 1978.
24. Gaylord Knight, interview with the author in Atlanta, Ga., November 1977, February 1978, and April 1979.
25. George A. Duthrie, "Radio Fights Forest Fires," *Radio News* 14, no. 3 (September 1932):174.
26. Headley, untitled article, *Service Bulletin* 13, no. 45 (11 November 1929):5; Holbrook, "Radio," p. 59; Lawson, interview with author; and Squibb, interview with author.
27. W. F. Squibb, "Working Plan for Portable Radio Transmitter-Receiver Study," 10 July 1931, typed, p. 5, Gaylord A. Knight Collection; and W. F. Squibb, "Progress Report on the Portable Radio Transmitter-Receiver," 3 December 1931, typed, p. 8, Gaylord A. Knight Collection.
28. Roy Headley, "Radio," *Service Bulletin* 15, no. 47 (23 November 1931):1.
29. There is some evidence that Beatty had Squibb working on the type P set during 1930. A 1932 *Radio News* article by George Duthrie, "Radio Fights Forest Fires," p. 174, mentioned that Beatty had both an 80-pound and 20-pound set in the field during 1930. Likewise, Squibb's

working diagram of the type P is dated "September 10, 1930," although its file designation is also R-6 and Vancouver, Wash. Because the working drawing is the same as that of the manufactured model, the move to Vancouver occurred in 1931, and Squibb's two progress reports on the type P were dated July and December, 1931, it is assumed that the 1930 date is incorrect and that the P set did not take shape until Squibb returned to the Forest Service in 1931.

30. Squibb, "Progress Reprot," pp. 3, 4.
31. Duthrie, "Radio Fights Forest Fires," p. 174.
32. Duthrie, "Radio Fights Forest Fires," p. 174.
33. Headley, "Radio," p. 1.
34. Headley, "Radio," p. 2.
35. Forest Service, Region 6, "Forest Service Radio," 15 November 1932, p. 3, Gaylord A. Knight Collection.
36. Forest Service, Region 6, "Forest Service Radio," pp. 3,4.
37. Forest Service, Region 6, Forest Service Radio," p. 2.
38. Frank J. Jefferson, "Memorandum for William Apgar," 6 August 1932, Gaylord A. Knight Collection.
39. Apgar, "Savenac."
40. Apgar, "Savenac," p. 2.
41. Apgar, "Savenac," p. 3.
42. Apgar, "Savenac," p. 15.
43. Apgar, "Savenac," p. 15.
44. Lawson, interview with author; Squibb, interview with author; and

W. Foy Squibb, "Application for Federal Employment, Form 8, Part 19 (b)," ca. 1940, photocopy provided to author by W. F. Squibb, Gaylord A. Knight Collection.

45. Lawson, interview with author. Lawson did not receive a Civil Service appointment until 1934. Before then he was kept on the payroll under the various titles of laborer, chief of party, technician, etc.

46. U.S. Department of Agriculture, Forest Service, "U.S. Forest Service Radio Equipment," 2 January 1935, mimeographed bulletin, Gaylord A. Knight Collection.

47. Lewis Winner to A. G. Simson, 2 July 1934, Gaylord A. Knight Collection; and A. G. Simson to Lewis Winner, 12 July 1934, Gaylord A. Knight Collection.

48. William Apgar, "Radio Report-1933," 27 February 1934, typed, p. 1, Gaylord A. Knight Collection.

49. Apgar, "Radio Report-1933," p. 1.

50. Simson and Horton, "Radio on the National Forests," typed draft of article submitted for publication to *American Forestry* per cover letter, F. H. Brundage to the Forester, 20 April 1935, Gaylord A. Knight Collection.

51. Lawson, interview with author and Squibb, interview with author.

52. Squibb, interview with author.

53. Knight, interview with author.