

Chapter IX

Radio in the Regions:

Reasons for Wide Variations in Use

While the Forest Service, as seen by the Chief or by the casual outside observer, assumes the form of a traditional administrative pyramid, it appears to the individual Ranger as an inverse pyramid with himself at the apex.

- Herbert Kaufman¹

The grouping of the National Forests into first 6 and later 10 Regions, together with the loosening of centralized control from Washington, was intended to and did benefit their administration.² It was expected by Gifford Pinchot that stationing Regional Foresters permanently in the field and making them responsible for all activities within their respective territories would result in more effective management. In general it has worked out that way. In 1982 there were 154 National Forests encompassing a net area of 292,700 square miles, managed by 123 forest supervisors and grouped into 9 Regions.

One problem has been that regional divisions cannot be made entirely along lines corresponding to forest type, geography, or climate. For practical reasons, a regional boundary generally follows rather closely the boundaries of its outer States; it may encompass forests of diverse climate, terrain, elevation, vegetation and, therefore, fire conditions. In Region 6, for example, Oregon and Washington, the Regional Forester deals with the dense rain forests of the Pacific Coast as well as the drier and more open forests east of the Cascade Range. In the Pacific Southwest Region (R-5), which coincides with California, great differences are

apparent between the redwoods of the northern coast and the scrub pines and dry brush of the southern interior forests.

Demographic patterns are similarly diverse. The Region 8 Forester at Atlanta must deal with communities affected by decisions that apply to areas surrounding the Sam Houston National Forest near Houston, Texas, the Francis Marion National Forest along the coast of South Carolina, and the Cherokee National Forest in the southern Appalachian mountains of Tennessee. Even in Region 1, which since early 1909 has included Montana, northern Idaho, North Dakota, and a corner of South Dakota, the Forests are not all similar.

Rarely are a Ranger's duties the same throughout a Region. Often the most urgent needs of a particular forest as seen by the Forest Supervisor, are entirely different from those of a Supervisor in another corner of the same Region. This potential for conflict is reflected in the national policy determined by the Washington Office and the interpretations made in the Regions.

James B. Bruce, for example, a Montpelier District Ranger in Region 4's Caribou National Forest, Idaho, and Thomas V. Pearson, Assistant Operation Chief in Region 4, suggested to Washington in 1935 that a firefighting crew of paratroopers might prove invaluable as an immediate strike force against fires. Major Evan Kelley, Regional Forester in Region 1, did not like the idea. Writing to Earl Loveridge, he noted the high risk to the men, and said Region 1 would have little need for their services. More to the point, he questioned the wisdom of relying on men who would jump from airplanes. "I am willing to take a chance on most

any kind of a proposition that promises better action on fires," he wrote to Loveridge, "but I hesitate very much to go into the kind of thing that Bruce proposes. In the first place, the best information I can get from experienced fliers is that all parachute jumpers are more or less crazy--just a little bit unbalanced, otherwise they wouldn't be engaged in such a hazardous undertaking; accordingly, I discount materially ³ the practicability of Bruce's idea."

Despite Kelley, the Forest Service smokejumper school and headquarters was established only a few years later, nearly in view of Kelley's Regional office in Missoula. Sane or not, smokejumping is a vital and colorful mainstay in the firefighting arsenal of the National Forest System.)

Accordingly, many factors may affect the advent and acceptance of a new idea and device in the National Forest System. The lumber industries and the dominant political, business, and social attitudes may have a significant impact at the community level. On the District Ranger and Forest Supervisor levels, the budget and relative needs for various improvements may be important considerations. At the Regional level, such considerations multiply in importance, become more complex in scope, and mix with considerations based on current professional opinions, technology, and management criteria. In Washington, special interest groups, Congressional leaders and committees, and Presidents may significantly influence or alter existing policy. Even so, the individual Forest Supervisor and his Rangers play a major role in when and how new developments are accepted, integrated, and ultimately utilized throughout the National Forest System.⁴

Electronic communication did not escape this maze of complex forces. Some Regions, for example, placed radio under the supervision of the Division of Operation, others put it under the Division of Fire Control, and some under the Division of Engineering. The varied geography, climate, population, and communication facilities compounded the lack of uniformity, making radio a "must" in some cases and not necessary in others.

The cost of installing and maintaining radios, for example, in the terrain of rugged mountains and intemperate climate lying between the Kaniksu National Forest in the tip of Idaho and the Regional office in Missoula would be less than for telephone, while in Region 8 a short telephone trunk line out of the Sam Houston National Forest in Texas could cost-effectively tie that area to Atlanta through some 750 miles of A. T. & T. telephone lines. In western Oregon National Forests, population was dense enough quite early to encourage commercial telephone line development. On the Big Horn National Forest in north-central Wyoming, however, telephone lines were installed by the Forest Service in its early years because of a scarcity of both population and commercial telephones.

Strong Geographic, Demographic Influences

The cost of installation and maintenance notwithstanding, predominant geographic and demographic conditions also strongly influenced the communication plans of each Region. Region 1, for example, would opt for low-frequency band, 3-MHz (100-meter) sets because it did not have the prominent high peaks visible from many lower points, as was typical in Region 6 and northern Region 5. And Region 1, a relatively rugged, unpopulated

territory, would insist on more power to "force" its radio messages through. On the other hand, Region 8 would subsequently favor the 30- to 40-MHz vhf (10-meter) sets for use over the gentle terrain of the Southeast. Even though Regions 1 and 8 differed on the type of equipment they needed, they agreed on the use of intraregional radio networks. Region 6, however, had little use for this application because of its well-developed network of commercial telephone lines.

The issue of output power as it related to National Forest conditions further complicated the position of the Radio Laboratory. Region 1, of course, championed a high-power policy, and National Forests in other Regions found particular merit in this approach, with the Angeles National Forest in southern California a close second to Missoula. Fire crews on the Angeles were often stretched out over long distances because of the unique chaparral vegetation, as well as the high velocity and extreme heat and dryness of the infamous Santa Ana winds in the area. Because of the numerous population centers near the Angeles, the Forest Service radio operators also preferred increased power to overcome the QRM, or interference, from other private operators, the Army, the Navy, and commercial air flights.

Given these diverse communication needs, there was some value in the Washington Office's hesitancy to dictate radio use. The staff lacked the necessary technical background to prescribe programs that could incorporate all Regional needs. They also may have been hesitant to take action that went against established decentralized Forest Service policies. Radio was still in

its infancy, and such issues as output power, battery life, unit size, comparative circuit, and adaptation of particular components did not lend themselves to Servicewide directives. The technology had yet to be improved, the tool better understood, and conditions of use determined through trial and error. Washington believed that until then, decisions affecting radio design were best left to the discretion of the Radio Laboratory and decisions regarding application left to the field. Consequently, no Servicewide policy on comprehensive radio development or procurement evolved during the early years of the program.

Until World War II, the Regions centered in Missoula, San Francisco, and Portland (R-1, R-5, and R-6) provided the main thrust for radio use. Denver, Albuquerque, Ogden, Washington, D.C. (later Philadelphia), Atlanta, Milwaukee, and Juneau (R-2, R-3, R-4, R-7, R-8, R-9 and R-10) did little innovation. Surprisingly, Region 2 with many of the forests and 14,000-foot peaks in central Colorado, believed it had little to gain from immediately adopting radio. Indeed, the Region, which some considered a "grazing outfit," was never visited by Harold Lawson in over 20 years of travels.⁵ Radio was used in Colorado, but its acceptance was limited because communication needs were met by existing telephone systems. Radio also lacked financial support, was resisted by individuals with opposing views, and was superseded by other needs.

The Eastern Region

The Eastern Region (R-7), which originally encompassed Kentucky, West Virginia, and the eastern States from Virginia to Maine, also had no need for extensive

new communication facilities. After the design of the type T set, Foy Squibb was temporarily assigned to the Region to provide radio instruction and install S and T sets on the Cumberland (now Daniel Boone) National Forest in central Kentucky. The lack of funds at the Radio Laboratory kept him in Region 7 for 4 years.

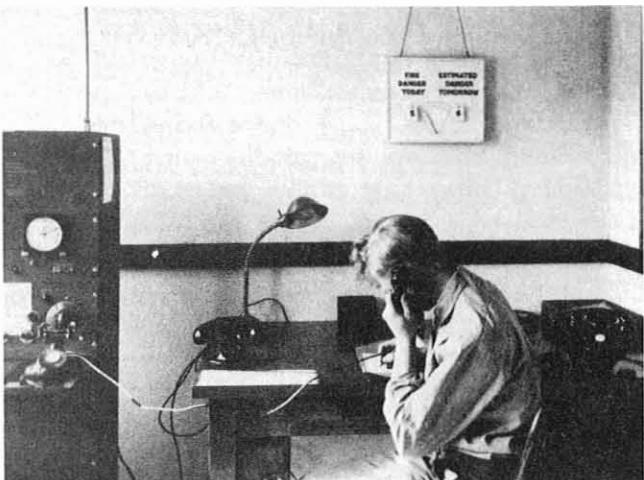


Figure 90. Operator Bradford talking over set U-9 at Baldwin Ranger Station, Manistee National Forest, Mich., 1937. (NA:95G-367687)

Squibb's initial duty in June 1935, "...was considered an experimental field installation for the testing and developing of equipment and methods for use by the Eastern National Forests." During the second year he was detailed to other forests "...to determine performance and applicability of radio communication on several National Forests and several installations each consisting of a few stations." By 1938, when Squibb was appointed Regional communication engineer, Region 7 had made little headway in radio development. By the time he resigned a year later, he had only completed studies of communication needs and the "installation on several National

Forests of radio systems similar to but less elaborate than the system installed on the Cumberland Forest."⁶

This is not to say that Region 7 lacked communication facilities. The population density provided an adequate base for commercial telephone systems that could be tapped by feeder or trunk lines from lookouts to the nearest towns. In addition, with the limited elevations in the Northeast, vhf sets had a particular advantage over line-of-sight distances; the fewer obstructions meant that less 10-meter equipment was required for installation in 45- and 100-foot towers.

A great deal of Squibb's time in Region 7 was required to install these vhf sets. The isolation of the backwoods and its people was both an advantage and a disadvantage. On the positive side were the "cooperators" who, through a Forest Service telephone hookup, could serve as a valuable unpaid volunteer staff. In the remote backwoods areas of Kentucky, however, Squibb had to learn never to approach a cabin door at night without first announcing his presence at the gate. With "moonshiners and revenoos" in abundance, a load of unexpected buckshot was liable to greet a stranger.⁷ Also on the negative side were a number of practices, including the burning of underbrush, that had gone on for generations before the Forest Service was established.

Rural Tennessee on the Cherokee National Forest had an unusually high incidence of small forest fires. When the alarm sounded, the entire town would show up and "work their butts off" to put out the fire. The Forest Service studied every possible cause for the rash of fires. In desperation, Region 8 sent in W. R. Murphy, a

psychologist from Texas. After several months, he managed to get to know the townspeople and become friends with the local minister.

One Sunday, after blessing the town from the Forest Service lookout tower, the pastor revealed the source of the problem to Murphy. The Forest Service policy allowed residents to collect only "dead and down timber" for firewood, and the residents had taken it upon themselves to insure a continual supply of this necessary resource. After starting a small fire, they would turn out in numbers to chop down trees for a firebreak, and then return some weeks later to collect the burnt and cut timber. After the ruse was discovered, the Forest Service started identifying trees that could be harvested. "Like shutting off a switch, the fires stopped."⁸

Aside from his single-handed effort to bring radio to Region 7, Foy Squibb also made a concerted attempt to upgrade the performance of the vhf sets. In addition to improving the set itself, (his changes were not always agreeable to his former colleagues in Portland), he studied and experimented with various antenna configurations that would enhance vhf transmission and reception. He improved on a type J antenna then in amateur use by experimenting with quarter- and half-wave vertical, aluminum configurations. Utilizing galvanized iron water pipe for the mast, he also devised a supporting member to give the equipment structural integrity. Precariously perched on a plank protruding from the window of the 100-foot lookout towers, Squibb installed many of the units with C. Otis Jett, the Regional telephone engineer.⁹



Figure 91. Operator Howes with type S set on Jefferson National Forest, Va., 1937. (NA:95G-355028)

Radio also found limited application in the Southwestern Region (R-3) and the Southern Region (R-8). Their histories of mild, brief fires associated with certain species of pine limited the extension of radio. Gael Simson noted, "...fires are short-lived, and a first crew ordinarily is sufficient."¹⁰ Region 3, therefore, was far behind the others in adapting radio for the fireline; Foresters there were just gathering to witness radio communication demonstrations in late 1937. But in Region 8, one of the many factors that could unexpectedly extend radio into the National Forests appeared in the person of Gaylord A. Knight.

The Southern Region

In August 1934, Harold Lawson made one of his many trips to install radio equipment. In Athens, Tenn., he set about hooking up an M set in the supervisor's office of the Cherokee National Forest. With the main installation complete, Lawson planned to run the antenna diagonally across the street to a church steeple. He approached a church elder for approval,

and in conversation learned that the elder, who owned a hardware store, had a son who knew radio and might be able to help with the installation.¹¹



Figure 92. District rangers at a meeting in Coronado National Forest, Ariz., waiting for test call from Tucson, March 1937. (NA:95G-344490)

The young man was Knight, a tall, good-natured individual whose humor and pleasing demeanor added a new dimension to the title of communications technician. He was an amateur radio buff (5AQR and 4AB) who had grown up with radio. After his father bought the second home radio in town, the younger Knight built the third set. This knowledge, experience, and interest led him to open a radio repair shop while still in grammar school, and later to take a 3-year college course in math, chemistry, and the physical sciences.¹²

When Lawson completed the installation on the Cherokee, he saw the need for someone to service and repair the system. He suggested Gaylord to the Forest Supervisor, and Knight was later employed as the technician for radio and telephone.

Gaylord Knight remained in Athens for 2 years. In 1936, he moved with the Forest Supervisor's office to Cleveland, Tenn., and took on additional, if unrecognized, communication duties as radio technician at-large for Region 8. By July 1941, the Regional Forester had come to recognize the importance of radio communication and offered Knight the official title of Regional Communications Officer. This entailed moving to Regional headquarters in Atlanta.¹⁴ Although it meant a decrease in salary from \$2,000 to \$1,800 per year, he accepted the joint radio and telephone assignment with high expectations. He was disheartened, however, by spending 4 months in the new job behind a desk with no work to do. He finally demanded to be put to work, but by that time World War II abruptly halted his yet-undefined job.¹⁵



Figure 93. Gaylord Knight, right, Southern Region radio specialist, on assignment with personnel from Arkansas Department of Forestry. (Forest Service photo, History Section)

During his first 7 years, 1934 to 1941, in Region 8, Knight's personal

convictions about radio's value significantly affected the coming of radio on the fireline. He had always felt that radio would replace the telephone. When he came to the Region, there were 7,000 miles of telephone line and 15 radios. When he retired nearly 40 years later, Region 8 had 4,000 radios and no telephone lines.¹⁶



Figure 94. Radio communication in Southern Region (R-8). Assistant Ranger R. M. Stratton, later a technician, receiving a message on the type S set, 1937. (NA:95G-367378)

In Region 10 (southeastern Alaska), the varied climate, geography, terrain, vegetation, and population made the need for radio communications and fire control considerably different from the needs of the lower nine Regions. Stretching along the ruggedly mountainous southeastern islands and coastline are its vast Chugach and Tongass National Forests where rainfall often exceeds 100 inches per year. Population between Ketchikan, Juneau, and Anchorage was sparse and roads and trails were few, and expanses of water vast--inlets, bays, fjords, and

channels. The Rangers took to boats to patrol the endless miles of mountainous islands and coastline.

The telephone system was inadequate. Late in 1933, Gael Simson and Foy Squibb sailed to the Tongass to install type M sets in the Ranger stations and on the patrol boats. They proved unsatisfactory and led to the subsequent design and installation of the type B2 by Bill Claypool in 1934.¹⁷ Region 10 had little other need for radio until the post-World War II period.

The Intermountain Region

The Intermountain Region (R-4), directed from Ogden, Utah, is a good example of how personal attitudes affected adoption of radio. Lack of adequate finances, a condition not unique to Region 4, meant that the opinions of the Rangers had considerable influence; very few could find a reason to replace the proven telephone lines with a new, unfamiliar device.

The task of administering the Region 4 telephone and radio communication program was assigned to Francis Woods. For 10 years since 1922, Woods had served on a Regional mapping crew. In that time, he developed the interest in radio and acquired the amateur radio license (W6NRN) that undoubtedly led to his appointment as communications officer. Until 1950, Woods would be the only radio technician for the National Forests in all Utah, Nevada, western Wyoming, and southern Idaho. "All you could do was get a piece of equipment going and run to another forest," Woods recalled.¹⁸ Yet when Woods retired in 1958, conditions were

not much improved. Even with four more technicians for five forests, he had 16 forests under his charge.

The popularity of over 5,000 miles of telephone line in Region 4 was the main reason for resistance to radio. With up to 12 lines serving some supervisors' offices, and a good rapport between the Region and the Mountain Bell Telephone System,¹⁹ there was a solid nucleus for Regionwide telephone networks. It was folly for Woods to argue the advantages of a forest radio network based on a single frequency allocation. As Woods pointed out, "The supervisors had a legitimate gripe," and their insistence that radio parallel existing telephone lines was understandable.²⁰ Until radio proved it could outperform the telephone, many Rangers used the new tool only where the tried and proven alternative ran alongside it.

For Woods to build up a Regional radio inventory and demonstrate the application of radio, he needed freedom to pursue this goal single-handedly. He seldom had the time. One reason was his responsibility to improve the telephone. This included design of a 2-watt amplifier to boost transmissions over lines up to 100 miles long with 30 to 40 people "hanging" on the line, as well as an unsuccessful attempt to develop a mechanical device to break up speech so that several voices could be transmitted simultaneously over the same line. Even more time-consuming was a Regional campaign to lower all ground-return lines to a resistance of 40 ohms or less. It required considerable effort and much ingenuity to devise and locate ground rods where a value of resistance would provide the required impedance. In one instance when all else failed, Woods had the crew drive rods into the pit under an

outhouse. He then rang the supervisor for a very successful test call. On hearing how the call was accomplished, the supervisor simply replied, "I've heard a lot of that on the line, but this is the first time I've talked to it."²¹

Another problem limiting the extension of radio in Region 4 was the inordinate amount of talk that became routine on the single-channel forest frequency. In an attempt to limit these conversations, Woods first went to the "Q" amateur designations, then devised a separate code when this did not solve the problem. But codes were not enough to stop those who had learned that talking into a microphone could command the time and attention of distant listeners. Resorting to a tape recorder, Woods monitored transmissions for playback as examples to violators of what not to do.²²

Time went on, and a concerted effort was made to overcome the objections of Rangers to replace some high-maintenance telephone lines with radio. But opposition continued. Woods conceded that radio was never intended to replace telephone in Region 4, but Regional attitudes were not favorable to even a limited change. By the time commercial sets became available a few years after the end of World War II, the Intermountain Region had experimented with only two Laboratory-designed vhf-type T sets. When Woods retired in 1958, the Region was still using PF, SP, and SPF sets from 1935. Woods' observation that "in those days ...Region 4 didn't give very much money for communication,"²³ indicated that the Regional administrators didn't expect much from the radio development program. Their priorities on

a limited budget were for programs with proven benefits.

Any gains for radio made in Region 4 during the first two decades of its existence were due to the patience of Francis Woods, as well as the time he sacrificed to teach a communications class at Utah State University. Many part-time summer employees and graduate foresters received a thorough introduction to the uses, operation, and advantages of radio on the fireline as part of their requirements for a forestry degree. As they returned to or went into the Forest Service, their familiarity with radio grew into support for the device. After World War II, when radio development entered its second phase, this attitude, along with the radio experience of many war veterans and a 1948 operating manual by Woods entitled *Radio Training Plan*,²⁴ would bring a decided shift in Region 4 attitudes towards the acceptance of radio. In the meantime, however, its communications continued to be based on the telephone.

The California Region

Region 5 took an early, positive view of radio. The San Francisco office authorized a number of higher powered commercial purchases for the high fire-risk Angeles National Forest. In late 1933, the Angeles established a 500-watt control station in Pasadena and several 100-watt portables and mobile stations elsewhere. This action, of course, worried Jack Horton in Portland, because he feared the practice would spread and create a demand for separate frequencies for every National Forest in the country. As he pointed out to Roy Headley, "There ain't that many frequencies available."²⁵ The Angeles continued the experiments, much to the

consternation of Harold Lawson who picked up their transmissions during the 1932 St. Joe installation in Idaho.²⁶



Figure 95. A 100-watt mobile set on the Angeles National Forest, Calif., August 1933. (NA:95G-282674)

The assignment of Region 5 radio supervision to the Fire Equipment Section tended to defuse the impact of the Angeles experiments. Fred Funke, head of the section, took steps to support the Radio Laboratory philosophy of low-power outputs. Although not technically versed in radio electronics fundamentals, Funke saw merit in this approach to fireline communication. He also attended all of the Portland communication conferences, where he often played the role of arbiter on the issue of output.²⁷

As Lawson recalled, the Radio Laboratory had a "soft spot in its heart for Fred" because he

would push to get orders through the San Francisco Regional office; he had reasoned that the Radio Laboratory with its limited facilities couldn't perfect hardware unless radios were purchased, thereby giving the Laboratory an opportunity to improve on its product. Lawson considered Fred Funke as "...our savior in R-5 because he would go down there and sell effectively a bill of goods sometimes."²⁸



Figure 96. Making signal strength measurements in the field. Fred Funke, head of the fire equipment section in the California Region (R-5), (now the Pacific Southwest Region). (Forest Service photo, History Section)

Complete records of Regional radio purchases no longer exist.²⁹ However, Funke's support of the Laboratory was significant in 1936, when Fred Haynie, supply officer in Oakland, tabulated the spring purchases. Of the 272 sets scheduled for preliminary purchase, a very high proportion (110), 40 percent, were for Region 5.³⁰ If each Region had had a "savior," the total purchase would undoubtedly have been two or three times higher.

Funke also made a concerted effort to publicize the successful use of radio for the fireline. In a letter to the Regional Forester, he extolled the virtues of the radio network in the Plumas-Nelson Creek fire of August 17, 1934.

A combination of 10-meter and 100-meter sets had allowed Funke to try various installations and tests on the Plumas fire. The resulting fire network effectively demonstrated the manner in which all three classes of sets--portables, semiportables, and fixed-base--could be deployed. The final paragraph of Funke's memorandum is a classic example of the early use of radio as it evolved in most Regions under actual fireline conditions:

Arriving at the Nelson Creek Fire early Monday morning with George James to assist in getting the outfits in use, we found that Mr. Curry had sent his crew in a few days earlier and that they had given the 'T' type sets an opportunity to demonstrate their usefulness to advantage. Arrangements [were] made to put in a net of PF and SP sets to connect the headquarters camp at Sloat with the various camps on the sectors, using an 'M' type set at Sloat. Coldwater, Jackson Place, Cottonwood Creek and Nelson Pt. were thus connected to Sloat and later

a PF set was placed on the line in Jamison Creek. As a supplement to this net a 'T' type set was placed on the slope of Jackson Pk. at a point where a large part of the fire area was visible, this type set, operating on about 9 1/2 meters requiring practical intervisibility between points being contacted, the frequency being used being on the order of an optical frequency. Using this 'T' set as an outlet for the fire line work to a 'T' set installed at Sloat headquarters camp, operators were sent out with the sector bosses with 'S' sets to instruct the men in charge of the sectors in the use of the equipment and to make necessary contacts with camp. Excellent results were secured in making rapid contacts with headquarters and report[ing] conditions as well as receiv[ing]/instruction without the necessity of making long tedious trips to the nearest telephone. At one time seven 'S' type sets were in use on the line and I believe that Ranger Delaney can testify to the usefulness of the equipment, particularly on an inspection trip he made over the great part of the west line during which he was able to keep in touch with conditions on other parts of the fire throughout the greater part of the day. Breaks in the line were reported immediately and accurate locations given which expedited the work of control to a degree which has not been possible on past fires. 'T' sets were used at various lookout points on the fire area and changing conditions reported immediately.³¹

Earl Loveridge disseminated this example throughout the Forest Service because it "...presented the first

extensive use of radio equipment on an R-5 [on-7 going fire and since radio made a real contribution to the control operation on this fire, it seems worth while to record some of the facts governing its use]."³²

The 110 sets purchased by Funke in 1936 were intended for crews that would be used as "first attack suppression crews."³³ This concept was approved by Roy Headley, and the authorization for purchase was made in June, some 2 months after Funke placed the order.³⁴ The sets greatly expanded California's nucleus of 11 SP sets, 10 PF sets, 27 S sets, and 60 T sets, indicating that Funke's support of radio went beyond personal considerations for the Radio Laboratory. Experience on the fireline had reinforced his favorable attitude.

In Regions 4, 7, and 8, only one technician or communications officer was initially hired to oversee each Regional radio and telephone program. In Region 5, however, Fred Funke started early to obtain technical personnel for communications planning and maintenance on each National Forest. Ray Richards on the Los Padres was the first, followed in 1936 by Guy V. Wood on the Sequoia.

Wood's appointment represented his return to his primary interest. Wood had gotten a ham license (W6ANS) a year before high school graduation and attended Pacific Radio School for 3 years. He then opened a radio manufacturing business in Porterville, where he manufactured broadcast and police radios until the Depression brought an end to the business. Wood was employed as a Porterville bank clerk when offered the Forest Service position.³⁵

Guy Wood remembers that, in spite of Funke's efforts, Region 5 "had very

little equipment in 1936." The equipment on the Sequoia consisted of some SP sets, a few S and TH-TL sets, and one type M. When Wood was appointed the first full-time Region 5 communications officer in 1945, his recollections indicate that the attitude towards radio was still negative. "We had to do a selling job," he recalled, and he met much the same resistance as Francis Woods in Region 4. With money short ("Boy it was hard to come by dollars"), and resistance high ("The oldtime Rangers were not too receptive"), much of Wood's time both in the field and Regional office was directed towards promoting radio. "Every job I went out on," he reported, "I had to demonstrate and convince."³⁶ Woods work was cut out for him.

Region 5 relations with the telephone company in California were good. Pacific Telephone and Telegraph Co. did not approve of the Region's use of the 100-meter band for point-to-point communication, but did not press the issue because the Region lacked clear channels in the 3-MHz range. In addition, the Navy shared frequencies in that spectrum, so interference was too much for 24-hour use. Then, too, the Region lacked enough sets for routine point-to-point communication. Networks were set up on an "as-needed basis," using a nucleus of sets installed at locations strategic to existing telephone lines.³⁷

Much of the knowledge needed to effectively deploy radio communications on large fires in Region 5 had to be acquired through trial and error. Guy Wood had been on the Sequoia only a week when he was told to join a crew traveling to a fire. Expecting nothing unusual, he threw some radios in the back of the truck. At the fireline, he distributed radios to the fire bosses and rushed

back to camp to install a base station. Much to his embarrassment, he learned that this was not the way to set up communications. Without establishment of an operating base station, there was no way to check out the field sets for proper operation or location. The fire bosses, preoccupied with the safety of their men and containment of the fire along their sections of the fireline, were loath to waste time making contacts with an unestablished base camp.

Wood had to make several trips between the base camp and the fast-moving fire bosses to insure that the network was operating properly. He learned that communications personnel should expect the very worst of conditions. Without anyone to forewarn him and expecting to be gone only a day or so, he had left Porterville without a thought to his own personal needs. He had not packed a change of clothing or his personal effects. Three weeks later he returned from the fireline a tired and disheveled but wiser man.³⁸



Figure 97. Message center at night on the Barley Flats fire, Angeles National Forest, southern California, December 1936. Shown is the TH/TL set with separate circuits on the 10-meter band for reception and transmission, described in chapter 7. See figure 72. (NA:95G-341687)



Figure 98. One of several mobile radio units used for fire control in the Angeles National Forest, Calif., October 1938. (NA:95G-374663)

The Pacific Northwest Region

The North Pacific (now Pacific Northwest) Region had a noticeable advantage over the other Regions because of its decided radio interest, due primarily to Jack Horton, and its proximity to the Radio Laboratory. The Laboratory tested new designs and modifications on Region 6 forests, and staffers were readily available for consultation on the Region's specific communication problems. They could also be borrowed for special tasks and influenced in the choice of Laboratory projects. Nevertheless, the early use of radio in Region 6 was not spectacular. According to Bill Claypool, this was because Oregon and Washington "had a helluva lot of telephone lines."³⁹

Since the settlement of the Willamette Valley in the mid-1800's, population had grown enough to justify private telephone service between many towns and cities. The Regional budget, as usual, was tight. Many Rangers favored the telephone. Thus, the telephone remained the mainstay of Region 6 communications into the 1950's.⁴⁰

Almost immediately after the Radio Laboratory moved to Portland, Foy Squibb was detailed to install sets and instruct personnel in Region 6. During the summer of 1932, he traveled between the Radio Laboratory and the Chelan, Umpqua, and Siskiyou National Forests on training assignments that included the repair and maintenance of sets.⁴¹ Between June 1933 and June 1935, he prepared communication plans and supervised the installation of Region 6 radio equipment on several National Forests, including the Olympic and Siskiyou.⁴²

Early radio correspondence indicates that Region's acceptance of radio was accompanied with high expectations and considerable planning. "As money becomes available," R. H. Brundage wrote to the Chief in 1934, "radio will be extended, starting with those Forests having considerable areas of rough inaccessible country where the fire problem is acute."⁴³ Brundage believed this application was appropriate in view of both Squibb's success in training men in the proper use of radio and successful use of radio on the Tillamook burn of 1933. Squibb had made the installation there and supervised six or seven fire camps that helped the fire crews suppress the blaze. As a result, Brundage concluded, "...the general consensus in R-6 is that radio is paying its way."⁴⁴

Bill Claypool was appointed communications officer in Region 6 after his trip to Puerto Rico and a brief stint with the Bonneville Power Administration. He took up where Squibb left off.⁴⁵ In the remaining few years before World War II, Claypool worked "very close" with the Radio Laboratory in an attempt to overcome technical problems, the opinions of Rangers who preferred telephone, and inadequate

funding. "We did not have radio networks," Claypool remembered. "We used radio strictly for fire control with occasional use of uhf [vhf] for point-to-point communication."⁴⁶ It might also be worthwhile to note that this "occasional use" extended to other applications. As table 2 shows, R-6 had 375 radios in 1939, and hf sets outnumbered vhf sets in Region 6 by four to one.

Table 2.--Forest radio inventory, Region 6, September 23, 1939⁴⁷

National Forest	Type									
	h f				v h f			Totals		
M	I	SPF	PF	SP	SV	T	S	hf	vhf	
Chelan	2	1	20	12	15	-	-	-	50	-
Columbia	-	1	10	9	-	-	-	-	20	-
Colville	1	-	3	2	-	1	6	-	6	7
Deschutes	-	-	-	2	-	-	-	-	2	-
Fremont	-	-	4	1	-	-	-	-	5	-
Malheur	-	-	-	-	-	3	6	10	-	19
Mt. Hood	1	-	2	1	1	2	-	2	5	4
Mt. Baker	-	-	11	8	-	-	-	-	19	-
Ochoco	-	-	5	-	-	3	2	8	5	13
Olympic	2	-	-	35	4	-	-	-	41	-
Rogue River	-	-	1	2	1	2	-	-	4	2
Siuslaw	1	-	8	-	-	-	-	-	9	-
Siskiyou	3	-	14	23	1	3	1	9	41	13
Snoqualmie	2	-	7	-	5	2	4	-	14	6
Umpqua	1	1	15	9	2	-	-	2	28	2
Umatilla	-	1	5	11	1	-	1	-	18	1
Wallowa	-	-	3	3	-	3	-	-	6	3
Willamette	-	-	3	6	-	-	-	-	9	-
Whitman	-	-	2	-	-	2	1	1	2	4
Wenatchee	1	-	15	-	1	-	-	-	17	-
Totals	14	4	128	124	31	21	21	32	301	74

The table shows the impact of Forest Supervisors and Forest Rangers on radio use in their areas.



Figure 99. Sending weather report to base camp. Type SPF set in use on the Spud Hill fire, Columbia (now Gifford Pinchot) National Forest, Wash., August 1937. (NA:95G-350530)

In southwestern Oregon, the crews in the coastal mountains of the Siskiyou bordering on Region 5 had 54 radios. The Deschutes, in central Oregon on the eastern slope of the Cascade Range, had only 2.

In eastern Oregon, the Umatilla had 18 hf sets and 1 vhf set, while its neighbor, the Malheur had the opposite condition, no hf and 19 vhf.

The Colville in northeastern Washington had 7 fixed-base units compared to 3 semiportables and 3 portables. This suggests a forest administrative network similar to adjoining Region 1. Indeed, the Colville was part of Region 1 from 1943 to 1974. By contrast, the Mt. Baker in northwestern Washington had no fixed-base units, 11 semiportables, and 8 portables. This suggests a fire control network.

The diversity of National Forest radio systems in Region 6 may be partly attributable to how well other systems met communication needs; a well-developed telephone network out of Bend, Ore., for example, may explain why the Deschutes had only two radios. It could also be argued, although less convincingly, that Mt. Baker had no fixed-base units because of the telephone. The data, however, suggest other reasons for the variations. A total lack of hf radios (Malheur), virtually no fire network (Colville), an emphasis on hf (Umatilla) or vhf (Malheur), and the differences in inventory (Siskiyou, Deschutes)--all tend to support the thesis offered by the Laboratory that personal opinion, not technology, was responsible. This state of affairs was exacerbated by the decentralization policy of the



Figure 100. Fire scout George Clisby with portable radio on the Willard fire, Columbia (now Gifford Pinchot) National Forest, Wash., August 1939. (NA:95G-391287)

National Forest System. In the absence of a Servicewide policy from Washington, each Region allowed its Supervisors and Rangers to determine what, if any, use would be made of this new tool. The Radio Laboratory continually pressed the Washington Office for a Servicewide policy that would, at least, allow them to evaluate their own accomplishments and goals. Washington's hesitation continually frustrated the Laboratory.

Sent to inspect the Northern Region communication system in 1940, Harold Lawson pointed out the folly of an inspection based upon the absence of standards. Except for implied regulations and limitations, there was no authority for passing judgment on any system. After completing the inspection, and finding a number of radio communication practices in contradiction to the recommendations of the Laboratory and the experience of Region 6, the futility of the exercise, and a decade of frustration, made its way into Lawson's final report. "They can't all be right," he observed in disgust.⁴⁸ The decisions for the most part reflected the varied opinions of the men in the field and were based on everything from economics to personal prejudice. This decentralized approach carried the potential for conflict should the ideas and plans of an enterprising Region come into conflict with those of the Radio Laboratory, IRAC regulations, or the A. T. & T. lease agreement. In Region 1 out of Missoula, this possibility became a reality almost immediately.

Reference Notes

1. Herbert Kaufman, *The Forest Ranger: A Study in Administrative Behavior* (Baltimore: Johns Hopkins University Press, 1960), p. 67.

2. Region 7 has since (1966) been divided between Regions 8 and 9. Until 1930 Regions were called Districts, rather than Regions.
3. Evan W. Kelley to Earl W. Loveridge, 19 July 1935, Gaylord A. Knight Collection.
4. Kaufman, *Forest Ranger*, pp. 62-65.
5. Harold K. Lawson, interview with the author in King City, Ore., May 1978.
6. W. Foy Squibb, "Application for Federal Employment, Fort 8, Part 16(c)," ca. 1940, photocopy provided to author by W. F. Squibb, Gaylord A. Knight Collection.
7. W. Foy Squibb, interview with the author in Ramona, Calif., January 1978.
8. Knight, interview with the author in Atlanta, Ga., November 1977, February 1978, and April 1979.
9. W. F. Squibb, "Memorandum for Forest Supervisor--Antenna Test," 6 August 1935; W. F. Squibb, "Memorandum for Regional Forester--Design of a High Frequency Antenna for Permanent Installation on Lookout Towers," 3 September 1936, and Squibb, "Field Diary," 1935, all Gaylord A. Knight Collection; and Squibb, interview with author. C. Otis Jett of Region 7 Engineering completed the mechanical design for Squibb; see Squibb, interview with author.
10. A. G. Simson, "Role of Radio in National Forest Communication," 11 April 1936, typed, Gaylord A. Knight Collection.
11. Lawson, interview with author.
12. Knight, interview with author. Knight attempted without success to locate a university which offered radio engineering, note 29, chapter 5.
13. Lawson, interview with author.
14. P. M. Prater to Forest Supervisor, District Supervisor, Station Director and Division Chief, Region 8, 11 July 1941, Gaylord A. Knight Collection.
15. Knight, interview with author.
16. Knight, interview with author, and Donald Sanders, interview with the author in Beltsville, Md., April 1979.
17. Squibb, "Diary," 6 November 1933-4 December 1933 and Wilbur Claypool, interview with the author in San Antonio, Tex., July 1978.
18. Francis Woods, interview with the author in Ogden, Utah, January 1978.
19. Region 4 telephone systems were based upon the transposition schemes of Western Union, rather than A. T. & T. Woods believed that the Regional Office often hired Mountain Bell employees to install particular systems and to wire up a number of Regionally designed telephone switchboards. Woods, interview with author.
20. Woods, interview with author.
21. Woods, interview with author.
22. Woods, interview with author.
23. Woods, interview with author.
24. Francis W. Woods, *Radio Training Plan: Installation and Operation* (Ogden, Utah: U.S. Department of Agriculture, Forest Service, Region 4, 1948). The pamphlet was written for the SPF model.
25. F. V. Horton to Roy Headley, 26 January 1934, Gaylord A. Knight Collection.
26. Lawson, interview with author.
27. Guy V. Wood, interview with the author in Porterville, Calif., January 1978.
28. Lawson, interview with author. Guy Wood also pointed out that Robert Deering of the Division of Operation in the Regional Office also took an active interest in the funding of radio. Wood, interview with author.
29. When the Laboratory was moved in 1952, many of the records were destroyed. The few which remained were either copies which had been distributed or a few significant ones rescued from destruction.
30. Frank Haynie to Regional Forester, Portland, 6 April 1936, Gaylord A. Knight Collection. The final count of 1936 purchases was tabulated at 466 units for a total of 1,123 units in the Regions. See C. J. Buck to Chief Forester, 15 September 1936, Gaylord A. Knight Collection.
31. E. W. Loveridge, "Memorandum for Regional Foresters--All Regions," 16 October 1934, p. 2, Gaylord A. Knight Collection.
32. Loveridge, "Memorandum."
33. C. B. Morse to the Chief Forester, 15 May 1936, Gaylord A. Knight Collection.
34. Morse to Chief. Approval was written in the margins and initialed. Headley's comment was "sound and important."
35. Wood, interview with author. Date of employment was May 18, 1936.
36. Wood, interview with author.
37. Wood, interview with author.

Chapter X
A Dissenting Opinion:
Communication Plans and Practices in Region I

38. Wood, interview with author.
39. Wilbur Claypool, interview with author in San Antonio, Tex., July 1978.
40. Claypool, interview with author.
41. Squibb, "Application for Federal Employment," and Squibb, "Diary" 23 June to 29 September 1933, Gaylord A. Knight Collection. McCabe says the cost on the Chelan was \$5,000 and that the Olympic planned to invest \$8,000. See Francis R. McCabe, "The Use of Radio in Forestry," (Senior thesis, School of Forestry, Oregon State Agricultural College, 25 April 1934), p. 29.
42. Squibb, "Application for Federal Employment."
43. F. H. Brundage to the Forester, 26 January 1934, Gaylord A. Knight Collection.
44. Brundage to the Forester.
45. Civil Service appointments to electronics positions in the Forest Service were at a premium during the Depression. Claypool had gone to Bonneville as a means of getting Civil Service status. When this was accomplished he transferred back to the Forest Service. Claypool, interview with author.
46. Claypool, interview with author.
47. Condensed from W. S. Claypool, "Memorandum for Mr. Mays," 23 September 1939, Gaylord A. Knight Collection.
48. See chapter 11, citations 44 to 47, for further discussion on this inspection.

In a brand new thing like that we were bound to have divergent opinions.

- William B. Apgar¹

On July 2, 1932, Frank Jefferson, the Northern Region's (R-1) Forest Fire Control Chief, wrote William "Bill" Apgar at Savenac Nursery in Haugen, Mont., to confirm an earlier discussion. Jefferson outlined a plan whereby Apgar and a man of his choice would be made available by Assistant Regional Forester Elers Koch for up to 5 days of firefighting. With each carrying two of the first type P and SP sets, they were to serve as a communication strike force for any fire in the Region. "The experiment that I have in mind," Jefferson wrote, "is that of using radio for the sole means of communication on fires remote from telephone and the general plan which I have in mind is that on call, you, with an assistant, will immediately proceed to the designated fire, install one radio set at the nearest telephone communication point, take the second set into the fire and establish communication between the two sets."²

This early selection of Bill Apgar to head the experiment indicates that the Missoula office was giving serious thought to the application of radio. Apgar was a 14-year veteran of the Service serving as the Assistant Forester at Savenac. He had earned a master's degree from the Yale School of Forestry where he wrote his thesis on grazing, then became interested in radio, and got amateur license W7CRU. He had become aware of a need for more effective communications after an early experience in R-1 with the heliograph when he was a fire guard at the Castle Butte lookout station on the Lochsa Ranger District,

Clearwater National Forest, northern Idaho.³

Described as a "nice guy" by his superiors and coworkers, Apgar had a penchant for perfection, and he pursued his new assignment with alacrity and force.⁴ He was never one to shun responsibilities or yield to adversity. He adopted a demeanor that reflected this attitude as well as his belief that Region 1 was a tough place to work and it took tough men to meet the challenge. He always went into the field with a Colt revolver strapped to his hip, although he was never forced to use it. During his 20-year tenure as the Regional Communications Officer he said he never thought of himself as a "communication man," but as "a Ranger who used electronic communication to get a job done."⁵



Figure 101. Loading radio supplies aboard Ford trimotor airplane of Johnson Flying Service, longtime contractor for the Forest Service, at Missoula, Mont., in the 1930's. William Apgar, Region 1 radio chief, stands near plane. (Forest Service photo, History Section)

Apgar's efforts during the 1932 radio experiments were hampered because the semiportable SP sets were not yet completed by the manufacturer.