

1

A CHANCE ENCOUNTER

The telephone companies have not offered anything at realistic rates to deaf people, so some of us had to “go at it” on our own to develop a suitable communication device using . . . cast-off teleprinters.

—Robert H. Weitbrecht, letter to Freeman Lang, September 15, 1966

On April 11, 1963, deaf physicist Robert Haig Weitbrecht turned forty-three years old. He was living in the hills west of Redwood City, California, in a new two-bedroom duplex on Woodside Road. Weitbrecht had converted a bedroom into a radio “ham shack,” and his living room was strewn with radio equipment, electrical meters, boxes of electronic parts, and books. Scattered around his bedroom were issues of *RTTY Journal*, a periodical for radioteletype users. A few months after his birthday, Weitbrecht’s chance encounter with the father of a deaf child would change deaf people’s lives forever.

Weitbrecht was an unlikely person to become a hero for the American deaf community. For much of his life, he had stayed apart from deaf people, socializing with them infrequently, perhaps because of an overprotective mother and memories of childhood teasing about his deafness. But his parents had nurtured in him a love of science, and this fascination was compelling throughout his life. It was also essential to his success in developing the telephone acoustic coupler.

As a child, Weitbrecht developed a special interest in astronomy and receiving Morse code signals by feeling vibrations. At fifteen, he was allowed to connect his own practice oscillator—complete with batteries and a headphone—to the Federal Communications Commission (FCC) code-sending machine to demonstrate that he could

receive Morse code at thirteen words per minute, the time necessary to be eligible for an amateur radio license. A month later, his mother interrupted his class and hand-delivered the license as his classmates looked on. He was officially a “ham.”

Weitbrecht’s interest in science guided both his choice of professions and his hobbies. He began his college career at Santa Ana Junior College in 1938 and then moved on to the University of California at Berkeley, where he received his bachelor’s degree in astronomy with honors in 1942. He worked as a physicist at the Radiation Laboratory at the University of California and as an electronics scientist with the Manhattan Project during the war. In 1949, he was honored with the Superior Accomplishment Award by the U.S. Naval Air Missile Test Center in Point Mugu, California.

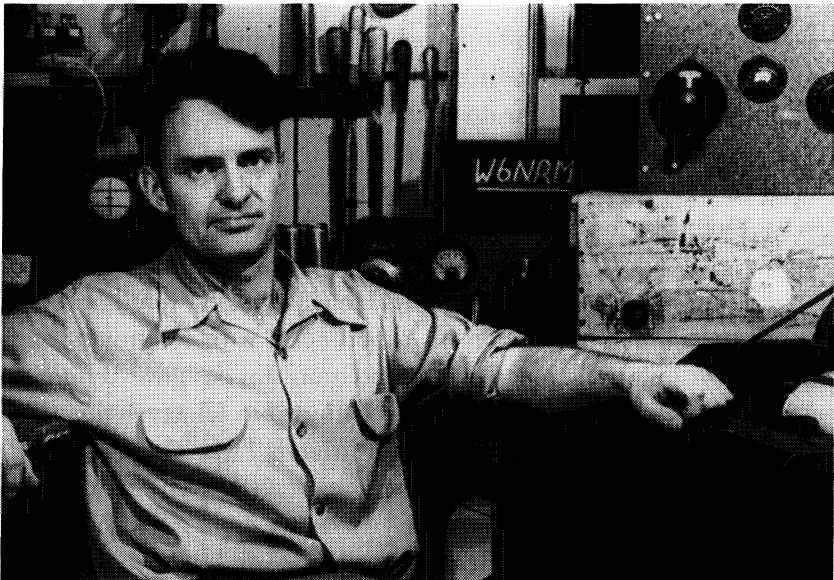
Morse code transmitted by radio waves became Weitbrecht’s particular obsession because it permitted him to communicate with other radio hams despite his deafness. In 1950, he sought to expand this long-distance contact by acquiring a used Model 12 “receive only” teletypewriter, usually called a TTY (and sometimes called a teleprinter),¹ from a Los Angeles newspaper plant. With the new machine, he could receive radioteletype communications from Japan, the Philippine Islands, Australia, South America, and many places in the United States.

Before long, though, he realized that receiving radioteletype messages was not enough to satisfy him. He also wanted to send his own. He searched for six months and finally procured a keyboard from an East Coast ham. Using a string around the gear and the shaft of an old washing machine motor, he managed to adjust the speed until the mechanical keyboard worked. He had his first “send and receive” teleprinter outfit. This was the first time Weitbrecht had full visual access to long-distance radio communications. Prophetically, he wrote “RTTY . . . is now an important and growing facet of Amateur Radio, with untold possibilities for communications purposes.”²

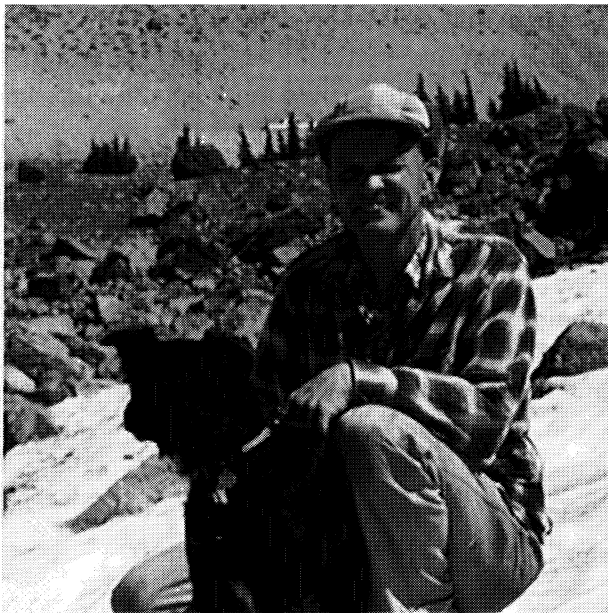
Weitbrecht’s experience with his radioteletype station, one of the first on the air since amateur radio began, taught him the value of challenging government communications regulations. In January of 1951,

he petitioned the FCC to permit radioteletype operation on a broader range of frequencies. After serious consideration, the FCC granted his request. The successful challenge opened more opportunities for RTTY communication among his amateur radio friends.

Weitbrecht left California in 1951 and moved to Yerkes Observatory at Williams Bay, Wisconsin, where he became known to other hams as “The Wisconsin Wizard.” At Yerkes he designed electronic instrumentation for use in astronomical research, earned a master’s degree in astronomy from the University of Chicago, and aided in the development of the worldwide WWV-WVH Radio Time Signal adopted by the National Bureau of Standards. He took many trips with radio users, lugging around huge pieces of equipment. During one trip in 1957 with his friend, Bruce Rowland, Weitbrecht drove 600 miles with a Model 15 TTY in his station wagon. Early one morning, he woke Bruce up to catch “Sputnik” speeding across the sky.



Robert H. Weitbrecht in his ham radio shack in his home in Redwood City, California. His FCC call sign was W6NRM. Courtesy of James C. Marsters.



Robert H. Weitbrecht on Lassen Peak in 1963. With him is his faithful companion Blackie. Courtesy of Laurence H. Laitinen, W7JYJ.

Weitbrecht's travel with bulky radio equipment and heavy teletype-writers in the 1950s probably shaped his later belief that equipment portability was essential for deaf access to telephony. Since he could not hear on the telephone, he took along his radioteletype gear to communicate with his friends. The teletypewriter, with messages transmitted via radio waves, replaced the voice telephone for his long-distance contacts. Articles in *RTTY* from this period include reminiscences of a 4,500-mile trip he took through a dozen states to visit fellow hams, as well as technical reports on his experiments with electronic transmitting distributors, bandpass filters, and transistor designs. Weitbrecht became such an ardent experimenter with various teletypewriters that he soon earned a new nickname from his friends, "Mr. Terminal Unit." The 1954 issue of *RTTY* included a photograph of Weitbrecht with a Model 26 TTY and his dog Blackie.

The radio equipment Weitbrecht carried around the country in his Chevrolet station wagon was so heavy that he began to search for ways to make things more compact. In 1958, Weitbrecht left Yerkes and re-

turned to California, this time to work at the Stanford Research Institute. In fact, he reported in *RTTY* about a trip to the San Mateo, California, Hamfest in 1959. "It is always interesting to see 'how portable' one can make his station, no matter whether high powered or low powered."³

He also sought ways to win others over to radioteletype technology. "Sure a lot of effort and work to move and set up gear, but it's all in fun and we wanted to demonstrate RTTY to the 'unwashed multitude'. . . . Maybe we'll have a few more converts, yet!"⁴ In another article, he sounded off his anger over the smashing of used TTYs by telephone companies (to assure that the machines would never be used in commercial competition). Pacific Telephone Company had recently released some machines to radio amateurs, but he noted with regret that amateur use of teleprinters would never grow with the destruction of TTYs by many other telephone companies. "We are sure AT&T Co. and its subsidiaries want us to win the next war, but a little more cooperation in making available the cast off machines would be a great help in the amateur radio self-training field."⁵ These early struggles with portability and availability of TTY equipment prepared him well for his later battles in support of the deaf community's quest for telephone access.

The story of the "telephone for the deaf" began on a summer day in 1963 when Weitbrecht was hiking on Lassen Peak with his young hearing friend Larry Laitinen. He and Laitinen shared a common interest in photography.⁶ Since early 1960, they had enjoyed excursions with their cameras at Lassen Peak, their favorite stomping grounds. Lassen Peak is one of the few active volcanoes in the United States outside of Alaska and Hawaii. Weitbrecht loved the mountains. Climbing Lassen Peak brought him closer to the stars. During his treks he also dreamed of one day flying above the clouds in his own plane.

While pausing near the top to take in the view, Weitbrecht and Laitinen met Edwin McKeown, a lawyer, and his eleven-year-old deaf son, Laddie. McKeown had heard Weitbrecht speaking to Laitinen and recognized the distinct voice quality of a person born deaf. He

introduced himself and Laddie to the physicist, explaining that his wife, Patsy, was also deaf. McKeown told Weitbrecht that Laddie was in a public school. The boy was doing all right, but he was challenged by his deafness.

This reminded Weitbrecht of his own childhood. Born deaf in 1920 in Orange, California, Weitbrecht was brought up with his younger brother George by their mother. His father, a farmer, lost the family farm during the Depression and died when Weitbrecht was young. After being tutored at home for a while, Bob entered a public school. He performed at the same level as his hearing classmates but was often teased and treated cruelly because of his hearing loss. The experience left him somewhat bitter and to his last day, he struggled with self-confidence. He hoped Laddie would not experience similar treatment. After talking a little longer with the McKeowns, Weitbrecht and Laitinen went on their way.

In February of 1964, Weitbrecht heard from McKeown again, this time in Piedmont, California. McKeown invited him to a dinner party with some deaf friends. Weitbrecht had not associated much with other deaf people. When he was four years old, a retired teacher had tutored him and another profoundly deaf child. Later, while studying astronomy in college, he had befriended a deaf student, who taught him sign language. But he never had much opportunity to use it because he preferred to read lips. This had made him rather uncomfortable about attending the McKeown dinner. At the party, however, Weitbrecht learned that the McKeowns' deaf friends were all established professionals who, like himself, could read lips well. They enjoyed his fascinating accounts of working with electronics instrumentation design. There were few deaf scientists in the workforce at this time and that made his accomplishments all the more remarkable to them.

One of the professionals at the dinner party was Arthur Simon, a deaf book editor. Within a short time, Simon contacted Dr. James C. Marsters in Pasadena to tell him about Weitbrecht. Marsters at the time was an orthodontist with his own office and a full clientele. He communicated with his hearing patients by reading their lips. When this was not possible, his dental assistant repeated their words. Like

other deaf people, Marsters found ways around most communication barriers, but he had never found an adequate solution to the problem of telephone access, despite more than two decades of searching for a way to use the common household telephone. When he learned of Weitbrecht's electronics background, he felt that destiny had brought them together.

Born in 1924 in Norwich, New York, Marsters became deaf as a result of maternal rubella. He attended elementary school in Norwich and worked with a tutor after school. He graduated from the Wright Oral School for the Deaf in New York City in 1943. During World War II, he entered an accelerated wartime educational program at Union College in Schenectady, New York. After graduating from Union College in 1947, he moved to New York City. A year later, he began applying to dental schools.

Because of his deafness, colleges of dentistry repeatedly turned him down until, after two years of persistence, New York University finally admitted him. He successfully completed the College of Dentistry program and passed the dental licensing examinations for the states of New York and California. In a sense, Marsters' struggle for admission to dental school prepared him for the long battle ahead to gain access to the telephone.

By the time Marsters heard of Weitbrecht, he had already fought and won a skirmish with the telephone company. He had sought permission to use a Listening Head, a device that allowed him to speak into the telephone as he read the lips of a hearing person who was repeating the voiced message to him. When he first connected this device directly to the telephone's main base, he was warned by the telephone company that the connection was illegal. He had to struggle for years before gaining permission to use the equipment.

Marsters had also experimented with other ways to try to gain access to the telephone. He tried a portable battery-operated amplifier, a loudspeaker, and a magnetic pick-up coil, which, when held near the earpiece of a telephone receiver, worked well enough to at least let him know that someone was saying "no," "yes-yes," or "please repeat" as he talked on the telephone. Marsters wondered if Weitbrecht



Dr. James C. Marsters with a leased Beachcraft Bonanza. Marsters and Weitbrecht shared a love of flying. Courtesy of James C. Marsters.

could help by developing a better telephone device. The fact that Weitbrecht was deaf motivated Marsters to contact him even more. At the time, Marsters and Andrew Saks, a deaf engineer, were searching for ways to inspire deaf youth to consider scientific careers. In April 1964, the deaf orthodontist wrote to Weitbrecht, hoping to recruit him for this endeavor.

Weitbrecht's ham radio hobby made Marsters curious, too. "I am much interested in getting such a system, if practical, set-up in my own home," he wrote. "I know it involves getting a radio ham license, etc., but it doesn't faze me."⁷ Marsters proposed a first meeting on Weitbrecht's birthday, April 11. He also invited Weitbrecht to go with him to Voice Systems in Campbell, California, to see a "telephone gadget" the company had developed. Marsters had made many of his own

doorbell and alarm clock signalers and was curious about what the company had to offer.

Marsters piloted an airplane from Pasadena to San Francisco to visit Weitbrecht, who welcomed him into his Redwood City home. Within a short time, Weitbrecht showed Marsters his RTTY system. Marsters was intrigued by the amateur radio set-up in Weitbrecht's cluttered two-bedroom duplex. At the same time, Weitbrecht was fascinated that Marsters had piloted a plane to visit him. The conversation jumped back and forth between radio and flying as their friendship took root.

Something else in the room caught Marsters' attention. It was a TTY connected to a private telephone line. In the early days of amateur RTTY, "on-the-air" roundtable discussions were popular. Groups of friends would gather almost nightly on a particular frequency. After making some remarks, each operator would indicate which station was going to transmit next and then turn the send-receive switch to receive. It was also customary to allow a slight pause before transmitting in case some newcomer wanted to join the discussion. Weitbrecht explained to Marsters that he was experimenting with attaching a switch to the teleprinter keyboard that would turn the transmitter on when any key was struck. This would make such conversation easier by eliminating the separate send and receive steps. The sending operator could type as much as he wished, then simply pause to allow the transmitter to automatically turn off so that someone else could send. Weitbrecht and his hearing friends within the San Francisco Bay area also conversed over TTYs connected directly to the private telephone line. He had been using both ham radio and the telephone for some time, and he showed Marsters some of the printed phone conversations.

Marsters saw in the private telephone line setup the germ of an invention that might fulfill his dream of more than twenty years. After returning home to Pasadena, he thought a great deal about it. If two people could communicate with TTYs through radio transmission or over the telephone lines in a local circuit, then why could they not do so over *any* telephone line? Regular radioteletype might be success-

ful for some, but there were too many deaf people who did not have the time, money, or interest to acquire a radio license. He wrote to Weitbrecht on April 26, 1964, and planted the idea of a national network of TTYs for deaf people—*one that would also be designed by deaf people*: “What I have in mind, Bob, is the possibility of a network of regular telephone line RTTY for deaf people who can afford one. . . . but not to lease one via the telephone company nor a special telephone line. . . . why won’t it be possible to translate over the regular line by proper modification of equipment. . . . granted that eventually there will be enough units? . . . What do you think?”⁸

Weitbrecht agreed with Marsters about the potential of extending TTY communication so that other deaf people might use the telephone on a regular basis. He responded to his new friend immediately. “About telephone setups for the deaf using teleprinters. I see no reason why not. I have such a deal setup now operating through my private line telephone. Nothing special about the telephone itself; I merely built an adapter unit that I hook up to the line; it converts teletype signals into tones that go readily through the landline; likewise incoming tones are converted into current pulses to run the teletype machine. . . . In fact I am now working on designs for such ‘phone patch teletype’ towards a simpler and more effective teleprinter system for working over regular telephones—any telephone; not just a special teleprinter line.”⁹ Weitbrecht knew that the patch units, directly connected to the telephone lines, were frowned upon by telephone companies because of their desire to restrict connections of private equipment to the phone lines. For this reason, he had used patch units cautiously, hoping that some day the companies would change their policies.

Marsters was convinced that an exciting venture was ahead. Many deaf people would view the TTY as a major breakthrough in their lives. He wrote to Weitbrecht in Redwood City, “Will be glad to be your first customer for a phone-patch teletype.”¹⁰

Marsters also introduced Andrew Saks to Weitbrecht through his first letter in April: “Andy might be much interested in your radio-ham gear and other gadgets, too, as well as you as a person.”¹¹ In May of 1964, Weitbrecht met Saks at another dinner party. Saks and Marsters



Andrew Saks in his office in Belmont, California. Courtesy of Jean M. Saks.

had been friends since the early 1950s and had shared a common interest in business investments over the years. Although he was indeed interested in the telephone access issue, Saks was very cautious about committing to making an investment. He had recently sued a stockbroker and lost the trial. Marsters had to convince Saks that the idea of supporting Weitbrecht's research and development efforts was worth further consideration.

Born in 1917, Saks was deafened by a mastoid infection when he was eight months old. The grandson of Andrew Saks, founder of the New York City Saks Fifth Avenue department store, he attended Lafayette College in Easton, Pennsylvania, and then studied electrical engineering at the University of California at Los Angeles. In 1941, while a student, Saks authored an essay titled "Deaf Difficulties," in which he wrote about the problem of not being able to use the radio or the telephone. During World War II, he held various positions for North American Aviation, the Electrical Products Division of Western Electric Company, and the Douglas Aircraft Company. After the war,

he conducted research in blood physiology for eight years at Stanford University as part of the nation's space program. Later, he managed his own investment business.

Like Marsters, Saks had tinkered with visual communication devices that would assist deaf people. He had worked on relay coils and flashing light signalers to let him and his friends know that the telephone was ringing or that someone was at the door. He also had worked on an early version of a signaler that would allow deaf parents to know a baby was crying. His drawers and closets were filled with various gadgets, and his wife, Jean, was never sure what he would bring home next. He was also experienced in the business world, which would be helpful to his new partners.

Saks, Weitbrecht, and Marsters shared an interest in mechanical devices and much more. All three were deaf professionals at a time when such accomplishment was comparatively rare, in part because of the limitations imposed by telephone inaccessibility. They also were independent and believed that deaf people could and should help themselves instead of relying on hearing people. Each was, to some extent, frustrated by the lack of easy phone access. Each man would play an important role in ending this frustration for hundreds of thousands of other deaf people.