



"BIG JIM" RADIO STATION—Looped in giant strands across Jim Creek Valley, Arlington, Wash., 150,000 feet of steel copperweld cable form the largest radio antenna ever constructed. This is a bird's-eye view through the steel framework of a 200-foot summit ridge tower showing the transmitter building in the valley between 3,000-foot mountains. Special precautions have been taken to protect personnel from the invisible but dangerous energy at the most powerful radio station known to the Western world.

ELECTRONICS

Teeth Can "Tune In"

Antenna stretching across a mountain valley is used to send low frequency messages to U. S. Navy units around the world with power to punch through magnetic storms.

► THE NAVY'S "Big Jim", radio station is so powerful that its operators may be able to "tune it in" on their tooth fillings.

Situated on a 6,000-acre tract about 55 miles northeast of Seattle, Wash., the million-watt station began flinging its official messages around the world to ships on and under the seas on Nov. 18.

Although the Navy has received no reports that anyone so far has "heard" dits and dahs in their mouths during try-out tests, the station's signal strength is so great that this is a distinct possibility.

However, Americans need not fear that the cryptic chatter of a telegraph key in their tooth fillings will keep them awake at night. The Federal Communications Commission states that this unusual type of reception is generally restricted to within a mile of powerful stations.

C. B. Plummer, chief of the FCC's broadcast bureau, explains it this way: When two

unlike materials touch each other, current induced in them sometimes flows more easily in one direction than in another at the point of contact. This sets up small electric currents that can be heard as music or voice without a radio receiver. Early cat-whisker radio sets used the phenomenon.

Thus an amalgam filling touching tooth enamel can produce the tiny currents if the conditions at the point of contact are just right.

The radio commission that antedated the FCC once received a report from an elderly woman who claimed she could pick up a strong station on her frying pan. A scientist at the National Bureau of Standards remembers a woman who said she heard music in her head all of the time. He could not recall, however, whether she could pick up commercials too.

Many persons who "hear" strange things actually have hallucinations.

Engineers at Cincinnati's WLW once told the FCC about a boy who climbed out of his swimming hole to report he could hear WLW underwater. Station engineers took a quick dip to test the boy's veracity. They heard the program also. The phenomenon was traced to two submerged rocks lightly touching each other. At that time the station was broadcasting 500,000 watts of power. It is a 50,000-watt station today.

A guy wire on the antenna of an eastern FM station was found so "hot" that an electric arc jumped between it and a piece of metal held in the hand half an inch away, and the station's program was heard in the electric flame.

Plenty of invisible, dangerous radio power surrounds the Navy's new Big Jim station. To make things safe, engineers installed a ground mat extending 2,700 feet in all directions from the radio transmitter. Providing a good electrical connection with the ground, the mat required 280 miles of copper wire.

A special grounding system has been provided for station operators who drive their cars to work. A metal bar projects into each parking space. The driver eases his car into the space until the bumper touches the ground bar. If he fails to do this, the motorist may receive a severe burn from radio waves as he alights from his car.

The new Navy station is operating in the very low frequency radio range, and should not interfere with commercial broadcasting. Its maximum power, about 22 times more than any licensed broadcast station in the U. S., is great enough to override magnetic storms and interference that normally slash the range of less powerful stations.

Science News Letter, November 28, 1953

PHYSICS

Human Eye Keener Than Film or Other Detectors

► THE HUMAN eye is more than a hundred times keener than photographic film or devices that detect heat and light, experiments by Dr. R. Clark Jones of the Polaroid Corporation, Cambridge, Mass., have demonstrated.

By combining experimental results from other measures of the human eye's functioning, Dr. Jones has determined that a measure of the ability to detect light is 35,000 for the human eye compared with about one for the best thermocouples, which are heat-detecting devices. For photographic film of high speed (Super-XX) it is about 200, and for a good lead sulfide photoconductive cell it is about 350 on the same scale.

A short light pulse gives the best performance of the human eye with respect to other detectors. The angular size that gives the best performance of the eye relative to other detectors is a size anywhere from the angular diameter of the moon to ten times that of the moon.

Science News Letter, November 28, 1953