MILITARY PHONE—One of the new portable telephone systems that can handle four conversations at a time over a single cable is demonstrated in action. The repeater shown here is used to amplify the conversations, which may be transmitted over a distance of a hundred miles. Another, twelve-channel system, also developed by Bell Telephone Laboratories, can handle three times as many conversations over a single cable as comparable units used in World War II and Korea.

ASTRONOMY

Solve Venus Mystery

➤ A MYSTERY of the solar system, how the planet Venus points in spinning, has been solved.

Dr. Gerard P. Kuiper, an astronomer at the University of Chicago's Yerkes Observatory at Williams Bay, Wis. and McDonald Observatory, Mount Locke, Tex., has discovered that the pole of rotation of Venus is tipped at an angle of 32 degrees to its path in the heavens, compared with the earth's 23.5 degrees.

A day on Venus, one rotation upon its axis, is not almost a year of earthly time as some textbooks estimate, but probably not more than a few weeks, Dr. Kuiper's observations indicate.

The rapid rotation is shown, he believes, by the alternating dark and light bands with which the planet is covered. Changes take place in these bands from day to day. They are sometimes quite irregular. The bands, usually three bright ones and three dark ones, are thought to be parallel to the equator of Venus.

Existence of the alternating bands indicates the planet's rapid rotation. Dr. Kuiper believes the dark bands are regions where there is much yellow dust. The bright bands show areas where there is less dust and where overlying carbon dioxide in the atmosphere scatters more of the sun's ultraviolet radiation.

This, Dr. Kuiper said, explains why the bands are visible in ultraviolet light but not at longer wavelengths, such as visible light.

Predicting weather on Venus "should be much simpler" than on earth, he stated. If there were no oceans on earth and no water vapor in the atmosphere, then our weather might be like that on Venus. That planet seems to have an ideal atmospheric circulation pattern, with three zones of ascending air currents and four zones of descending currents, including those over the polar caps.

On Venus, the ascending currents, laden with dust, photograph dark, the descending ones bright.

Dr. Kuiper made his observations of Venus with the 82-inch telescope at McDonald Observatory, operated jointly by the Universities of Texas and Chicago. Even though he could see no decided changes in the alternating bands during four-hour observing periods, when he brought 65 photographs together, he was able to detect the changes that take place from day to day.

He pinned down where Venus points in spinning by comparing drawings made from the photographs with a white globe marked with circles, moving the globe until its circles agreed best with the bands shown on the drawings.

The axis of Venus points to a position in the sky having a right ascension of three hours 32 minutes and a declination of plus 81 degrees. This is in the constellation of Cepheus.

The plane of the orbit of Venus around the sun is inclined only about three degrees to the plane of the earth's orbit, Dr. Kuiper reported in the *Astrophysical Journal* (Nov.)

Science News Letter, March 5, 1955

ELECTRONICS

12 Conversations on Military Phone System

➤ THE ARMY now has a portable telephone system that can carry 12 simultaneous conversations.

Its terminal units are about the size of large suit cases and they can be stationed up to 200 miles apart. Several such systems could be linked to span one-third the distance across the United States.

The conversations are carried on different frequencies in a cable that could be laid on the ground, buried, or strung on poles.

A second unit is also now available that could carry four conversations for 100 miles. They were developed by Bell Telephone Laboratories for the U. S. Army Corps of Engineers.

Miniaturized parts are credited with reducing the weight of the equipment. The new four-channel unit weighs only 178 pounds and occupies five and a half cubic feet. An earlier system with the same capacity weighed 475 pounds and occupied 20 cubic feet.

Both units can be used in conjunction with a radio relay system.

The equipment was designed to withstand desert heat, arctic cold and 100% humidity. It also passed vibration and shock tests.

Science News Letter, March 5, 1955

ENGINEERING

Study Fish Habits In Designing Dam

➤ ENGINEERS WHO designed the McNary Dam spanning the Columbia River had to study fish psychology to plan the fish ladders.

Finny migrants are stubborn and reluctant to retreat from a position even though conditions make it difficult for them to go on. They appear to move along the shore line or at the edge of speedy currents rather than in the main stream, Harry L. Drake, George C. Richardson, H. M. Rigler, and R. A. Schuknecht of the U. S. Corps of Engineers reported.

Taking this into consideration, fish entrances were designed on each side of the spillway and at the Oregon shore fish ladder, they told a meeting of the American Society of Civil Engineers.

Science News Letter, March 5, 1955