RADIO ASTRONOMY

Bounce Radio Off Sun

New radio astronomy observatory planned to study atmospheres of Mars and sun by radio waves from earth. British 250-foot dish almost completed for sun attack.

➤ THE UNITED States could bounce radio waves off the sun, Mars and other planets if it set up a large radio astronomy observatory.

Plans for such an observatory are now being discussed. Decisions as to where it would be built, how it would be financed, what it could accomplish are expected within a year. Scientists are now excitedly arguing about what equipment would be best to expand man's knowledge of the solar system and the universe by radio astronomy.

Sensitive receivers here on earth can pick up noises in the radio wave range continuously being broadcast from the heavens. The sun is the nearest source of such cosmic noise, but far-away galaxies also are sending out radio waves, as is the neutral hydrogen sparsely scattered through space.

Different kinds of equipment are needed to catch the various kinds of radio waves.

British astronomers, for instance, are planning to use their 250-foot dish, now being completed at Manchester, England, to bounce radio waves off the sun. They hope to learn much more about its atmosphere. To get the sharpest focus, they want to use the shortest possible wavelengths, but interference from the edges of the dish impose a lower limit.

Dr. Lloyd V. Berkner, president of Associated Universities, Inc., which operates Brookhaven National Laboratories, Upton, N. Y., told SCIENCE SERVICE that he and Dr. R. M. Emberson are calculating what kind of equipment would be needed to bounce radio waves off Mars and the other planets.

Scientists have succeeded in sending radio waves to the moon, then catching the signals reflected from the moon's surface. They have even speculated about the possibility of using the lunar surface to communicate between points on earth when the ionosphere is disturbed by magnetic storms.

Radio waves bounced off the planets would give much more information than now available about their distances and the composition of their atmospheres.

In addition to picking up radio waves beamed to the sun and reflected back, astronomers can also tune in on the noise the sun itself is making. They are particularly interested in the mysterious "M" regions that seem to be tied in with the magnetic storms that disturb shortwave communications on earth.

No scientist has yet found anything visible on the sun's surface to correspond to these M regions. By looking directly at the sun through the radio wave "window" they hope to pinpoint some particular spot as the source. Doing so might then lead to much more accurate prediction of the ionospheric storms that seriously interfere with the use of short wave radio for long-distance communications.

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TECHNOLOGY

Big Camera Photographs Objects 26 Miles Away

See Front Cover

➤ A 100-INCH lens camera that can take photographs having good detail from scenes as far as 26 miles away has been developed by the U. S. Army Signal Corps Engineering Laboratories at Fort Monmouth, N. J.

Built with a special telephoto lens, the camera can take battlefront pictures impossible either with smaller cameras or when aerial photo flights are grounded or too dangerous.

It has an *f*12.5 infrared lens.

Test pictures taken from the bluffs at Atlantic Highlands, N. J., with the one-eyed giant clearly detail Sandy Hook, Coney Island, Wall Street and mid-town Manhattan land-marks, as shown on the cover of this week's SCIENCE NEWS LETTER.

In tactical military use, the camera has many advantages. At six miles, it can pick out in detail a jeep or weapons carrier, or any other comparable tactical target in the third of a mile the camera photographs.

The closest distance it can operate is about 500 yards from the camera, which gives a coverage about 105 feet wide. At 20,000 yards, or 11 and a half miles, it takes in a 3,000-foot front.

A second 100-inch telephoto lens that takes pictures with ordinary "visible" light is also being tested by the Signal Corps laboratories for still and 35 mm. motion picture use.

In the latter field, a possible later step might be to use this lens with a television camera, the video pictures to be monitored in more advantageous locations.

For civilian use, this combination could prove the answer to constant surveillance of large wooded tracts—to detect and help fight forest fires.

The camera takes five by seven inch still pictures with cut film or plates. It also has a roll film adapter that takes a 30-exposure roll.

Two camera boxes with different optical systems are now being tested with the 100-inch lens. One type uses a beam bending or folding system to bounce the light in a "Z," the other is a "bazooka" type.

Science News Letter, July 31, 1954

LONG-DISTANCE CAMERA—To record battlefront objectives impossible with smaller cameras, the Signal Corps Engineering Laboratories at Fort Monmouth, N. J., developed this photographic giant with a special 100-inch f12.5 infrared telephoto lens. Its closest working distance is 500 yards. Two men are needed to operate it, one sighting and the other working the shutter.