

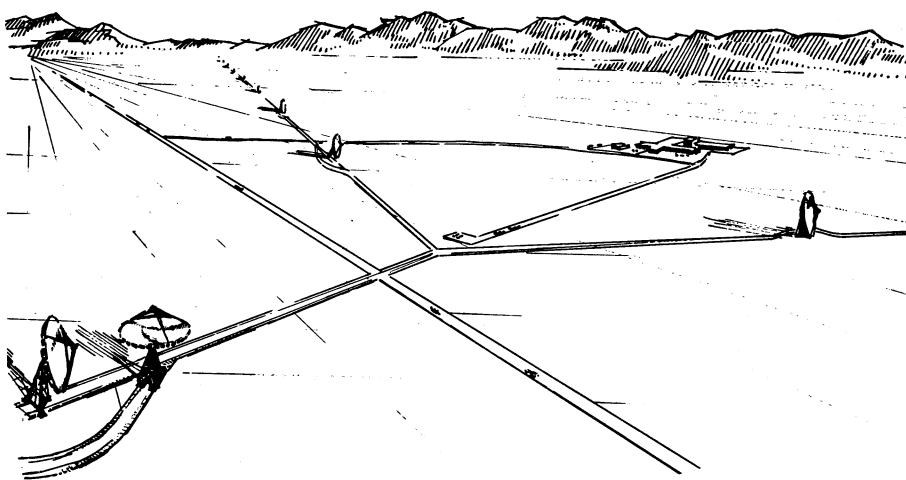
## Radio astronomy: The future is in New Mexico

Radio astronomers have a characteristic eagerness to be designing and building new observing equipment. In the history of their science the simple availability of equipment has often meant that new and unexpected discoveries have been made. Each increase in sensitivity and resolving power has added new puzzles to the list of mysteries to be solved, and the pace has been so fast that it has generated in most radio astronomers a sense of urgency about new equipment.

In the last decade the United States Government has not shared that urgency. Radio astronomy is a very basic science, and long before the present Administration came to power, basic science suffered a chilling draft in the corridors of power. In more than 10 years there has not been a start on a major new piece of radio astronomical equipment in the United States, and one that had been more or less started, a 600-foot single antenna at Sugar Grove, W. Va., was cancelled.

Other governments have been somewhat kinder, and in recent years American radio astronomers were beginning to feel like a depressed sector of the industry. Now, at last they are going to get one of the pieces of new equipment they have been agitating for for several years. The President's budget proposal in January included initial funds for what is called simply the Very Large Array (of antennas). Last week the National Science Foundation announced selection of the site.

The VLA will be built at a location 50 miles west of Socorro, N.M., in a region known as the Plains of San Augustin. Finding a place presented some serious problems. It had to be as free of manmade radio noise as possible (this is one reason for favoring remote valleys of West Virginia in the past) and yet have sufficient flat land available to assemble three strips, each 13 miles long and 600 feet wide, in the shape of a Y oriented so that the stem of the Y was no more than 10 degrees away from a north-south line. In addition it had to be as far south as practi-



cable to be able to view more of the sky and had to have a high altitude to decrease atmospheric effects. It had also to be near enough to a town so that economic, social and medical services would be available to the staff and their families.

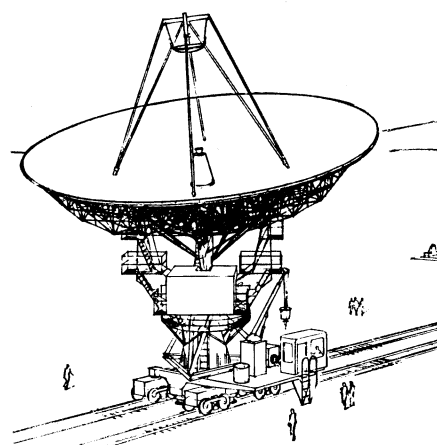
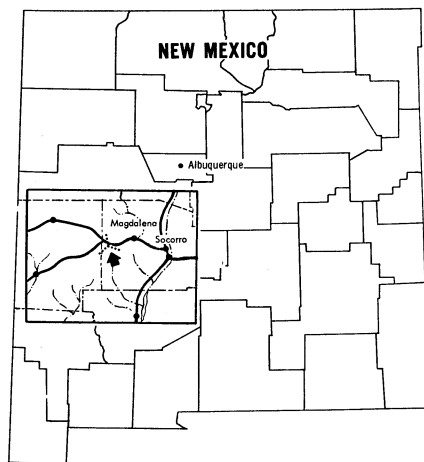
The VLA will consist of 27 dish-shaped antennas, each 82 feet in diameter. They will be mounted on railroad tracks laid in the arms of the Y so that they can be moved about to provide the order and spacing best for any given observation. Arrays of a large number of mirrors working together provide the equivalent resolution of a much larger single mirror. This one is designed to have a sensitivity and resolution 10 to 100 times that of any other existing array.

The proposed initial NSF funding for the project in fiscal year 1973 is \$3 million. Activity at the site is expected to begin within a year, and William Howard of the National Radio Astronomy Observatory says astronomers expect to begin observing with the VLA by the latter part of the 1970's. The total cost is estimated at \$76 million.

The VLA will be managed by the NRAO, which has headquarters in Charlottesville, Va., and operates telescopes at Green Bank, W. Va., and Tucson,

Ariz. Like other national scientific facilities it will be available for use by qualified persons from any U.S. institution and by foreigners as well.

The new instrument will very literally extend the horizons of radio astronomy. One of the things it is expected to do is get better radio pictures of galactic objects like quasars and radio galaxies, something that current equipment does badly or unbearably slowly since it lacks the requisite sensitivity and resolution. The VLA will also be able to make detailed investigations of the radio emanations of objects similar to ordinary stars. These include X-ray sources, eclipsing binaries, B-star binaries, novae and galactic and extragalactic supernovas. Studies of these objects are just beginning; their output is very low compared with quasars and galaxies, and greater sensitivity is needed. A third major region where improved sensitivity and resolution are sure to be a help is work on radio spectral lines, the molecular astronomy that keeps discovering new and more complicated chemical compounds in interstellar space. And then who knows? Radio astronomy is a science where serendipity is a basic principle. It remains to be seen what mysteries lurk below the present sensitivity limit. □



Y-shaped array of 27 82-foot antennas will be built west of Socorro, N.M.

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