OPENING

The Very Long Baseline Array

National Radio Astronomy Observatory

Array Operations Center
Socorro, New Mexico
August 20, 1993

The National Radio Astronomy Observatory is operated by Associated Universities, Inc., under cooperative agreement with the National Science Foundation.

Agenda

10:00 - 11:00 a.m.

Registration at Macey Center
Lower Lobby

11:00 - 11:45 a.m.

VLBA Opening Ceremony
Macey Auditorium

Introduction:

Paul Vanden Bout
Director, NRAO

Remarks:

Robert Hughes
President, Associated Universities, Inc.

Hugh Van Horn
Director for Astronomical Sciences
National Science Foundation

Daniel Lopez
President, New Mexico Tech

Joe Skeen
U.S. Representative

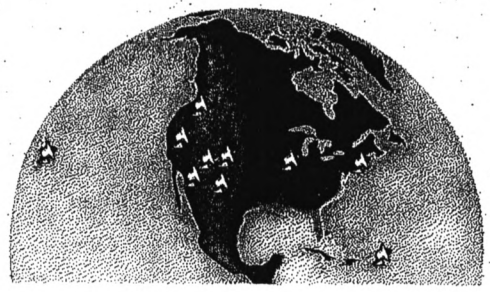
Pete Domenici
U.S. Senator

12:00 - 1:30 p.m.

Barbeque
South side of Macey Center

1:30 - 3:30 p.m.

Tours
Array Operations Center



The AOC Tour

The guided tour of the Array Operations Center (AOC) will show you some of the VLBA's equipment in approximately the order that equipment would be encountered by a cosmic radio wave entering one of the VLBA antennas. You will follow the path such a signal would take in order to produce an image of the astronomical object from which the radio wave was emitted. At each stop on the tour, an expert will give a brief explanation of the equipment at that stop.

Radio Receivers

Our radio receivers are among the most sensitive in the world. They are cooled to within a few degrees of absolute zero to help receive extremely faint signals from space.

Formatters, Recorders, Computer

The signals from the receivers are amplified, digitized, organized into a standard format, then recorded on ultrafast tape recorders. Each VLBA station has a main computer that keeps all the station equipment working together.

Atomic Clock (Hydrogen Maser)

This device uses a natural resonance of hydrogen atoms for timekeeping accurate within one second in a million years. It also allows our radio receivers to be tuned with extreme precision.

Weather Station

The VLBA is controlled by operators in Socorro, and operates 24 hours a day. Since the technicians at each site are not present continuously, each site has an automated weather station to alert the operators in Socorro to conditions that may affect the quality of data obtained or the safety of the equipment.

VLBA Array Control Position

This is where the entire, far-flung Array is controlled. Operators here can aim all the antennas, select the frequency bands for observation, start and stop the recorders at each site, and monitor the "health" of the equipment at each site.

VLBA Correlator Control Position

This is the control point for the Correlator -- the VLBA's special-purpose, high-performance computer that assembles the data from all the stations to produce the high-resolution information from which images can be made. Operators here control the Correlator and the tape playback drives that send recorded data from the stations to the Correlator.

Correlator

This superfast computer is where the complex mathematical operations are performed that allow the ten antennas of the VLBA (plus 10 others anywhere in the world) to work together as a single instrument to produce the most detailed images of any telescope on earth or in space. This computer, designed and built by NRAO, is capable of performing 750 billion multiplications per second.

Scientific Workstation I

The tapes that are produced as the output of the Correlator are used to transport data to scientific workstations, where scientists analyze and process the data to produce the images they desire. Our visiting observers can use the workstations here at the AOC, or they may take a tape to a workstation at their home institution.

Scientific Workstation II

At both workstation stops in your tour, you will see actual astronomical images produced from observations made with the VLBA, illustrating the power of our new radio telescope system and its promise for helping scientists solve some of the outstanding mysteries about our universe and how it works.

Don't forget to pick up your commemorative poster when you leave the AOC.