



NRAO NEWSLETTER

1983 February 1

No. 10

12-Meter

12-METER TELESCOPE STATUS

The picture on page 2 shows the status as of mid-December, 1982. The new surface was undergoing adjustment at the time.

The Structure.

The surface is made from 72 aluminum panels manufactured by ESSCO of West Concord, Massachusetts. The surface panels are supported by a stiff truss structure designed by the NRAO engineering department and built by Central Fabricators, Inc. in Lynchburg, Virginia. The tower, drive system and enclosing astrodome are those used for the old 36-foot telescope.

The new telescope will permit astronomical observations between 0.7 and 10-mm wavelengths when the surface reaches its final setting accuracy. The focal length of the primary reflector is about 5.1 m, giving a focal ratio of 0.42. The usual location for the radio receivers will be behind the primary reflector.

The quadrupod supporting the secondary mirror (or the prime focus receivers when appropriate) uses tensioned rods to stabilize torsional moments. The "north" (background) leg of the quadrupod has been tack-welded with cross-bars to permit a temporary easy access to the prime focus. The "northernmost" outer panel has been removed to give access to this temporary ladder.

At the lower right in the picture is the jig and movable template used for setting the surface. The jig contains reference dowels laid out to mark the exact figure of the parabolic reflector along one radius. The template, a truss-like structure fitted with electronic depth sensors, transfers the shape of the precision reference jig up to the telescope surface. The panel adjustments are made from underneath the surface, guided by the output of the depth sensors.

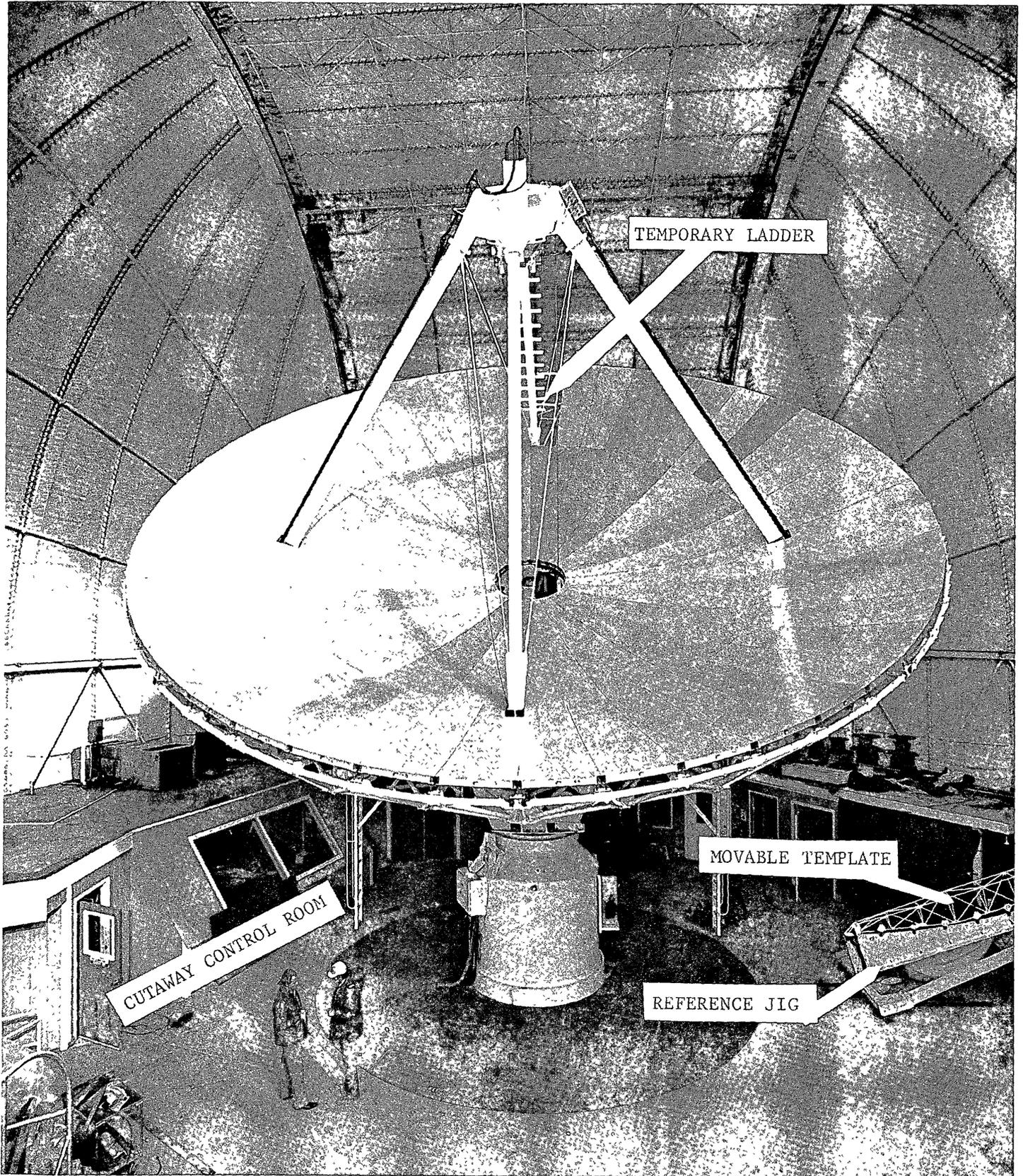
On the lower left of the picture appear the new glass windows of the old control building, which was cut away to give clearance to the larger diameter of the new telescope.

Progress on the Resurfacing.

The second surface adjustment (completed mid-January) has raised the aperture efficiency from about 25%, achieved after the first adjustment, to 40% at 3-mm wavelength. A reassessment of the jig figure was responsible for the improvement. A third adjustment is now underway, which we hope will result in a good telescope at 1-mm wavelength.

First Operation.

It is difficult to predict when the 12-meter telescope will be ready for astronomical observations. The present schedule calls for initial use at the end of February or the beginning of March. These dates can change depending upon our progress.



Mark Gordon

VLA

VLA CONFIGURATIONS FOR 1983

<u>Configuration</u>	<u>Quarters Available</u>	<u>Proposal Deadline</u>
C	Q1 1983	October 15, 1982
C+D	Q2 1983	January 15, 1983
D+A	Q3 1983	April 15, 1983
A+B	Q4 1983	July 15, 1983
B+C	Q1 1984	October 15, 1983

Mixed configurations will be available for about one week between each configuration change. These will consist of either a longer north arm or a mixture of long and short spacings depending on demand.

R. Ekers

NEW IMPLEMENTATIONS AT THE VLA

The number of baseline-channels available for observations in the spectral-line mode has been increased from 5000 to 7168. The number of antennas that can be used in this mode with the maximum number of channels (256) has thereby been increased from 6 to 8.

For ease of maintenance and operation the spectral-line and continuum modes of observing have now been included in a single version of the synchronous computer operating system. The integration which was previously handled by the array processor and CORA is now performed in the integrator hardware of the correlator.

For the first time an integration time of less than 10 seconds has been made available for continuum observations; the integration period may now be a minimum of 3.125 seconds. The only restriction is that for integration periods of less than 10 seconds the FILLER program cannot be run on this data in real-time.

G. Hunt

SUMMER SCHOOL LECTURE NOTES

The revised lecture notes from the Workshop on Synthesis Mapping held in Socorro in June 1982 are now available in the form of a report. Copies can be obtained on request from:

Berdeen O'Brien
National Radio Astronomy Observatory
P. O. Box 2
Green Bank, WV 24954

Dick Thompson

FRONT END RETROFIT FOR 2 cm AND 21 cm WAVELENGTHS

The front-end dewar assemblies are being retrofitted at 2 cm and 21 cm with GaAsFET amplifiers that were constructed and tested in Charlottesville. As of January 14, 1983, 13 systems have been completed with 21-cm system temperatures of 45 K to 50 K and 2-cm system temperatures of 95 K to 110 K, with four systems operating at about 120 K. This retrofit program will continue through June 1983.

Jack Campbell

SENIOR APPLICATIONS PROGRAMMER WANTED

We are seeking a senior applications programmer to work at the VLA near Socorro, New Mexico. The position is to work with a small group of programmers and astronomers to develop a data reduction system known as "the pipeline" primarily for spectral line observations using FPS array processors connected to PDP11s.

A broad knowledge of computer systems and languages, if possible combined with graduate experience in astronomical research, would be an advantage.

Please submit resumes to Don Swann, National Radio Astronomy Observatory, P. O. Box 0, Socorro, New Mexico 87801.

Gareth Hunt

Green Bank

L.O. FREQUENCY UPDATE FAILURE

The MODFOCUS routine for line programs at the 140-foot telescope was found to be inoperable on 8 January 1983. The Model IV autocorrelator program generates a timed interrupt at the center and end of its normal 20-second integration. This interrupt activates a task which modulates the focus but also updates the local oscillator frequency at the end of each integration period (typically 60 seconds). Investigation revealed that the cable connecting the autocorrelator and the control Modcomp computer which transmits this interrupt had been disconnected. Therefore the local oscillator frequency was set only at the start of a scan since no interrupt was received to activate the update task. The date on which the cable was disconnected has not been determined, except that it was after 28 October 1982. This failure may have a smearing effect on observations of very narrow lines with very long scans. The amount of smearing in a 10-minute scan may be as much as a few hundred hertz.

Bob Vance

GREEN BANK AIRSTRIP

The NRAO Green Bank airstrip was reopened for use in conjunction with OFFICIAL BUSINESS of the Observatory, effective 20 December 1982. PRIOR APPROVAL is required. Requests for use should be directed to NRAO, Green Bank, Business Office (304)-456-2228, or FTS 924-6228.

R. K. Moore

11 cm, 4-FEED RECEIVER IMPROVEMENT

All four notoriously unstable paramps in the 11 cm wavelength, 4-feed receiver are now replaced with ambient temperature GaAsFET amplifiers. The January 1983 observations demonstrate much improved stability with a slight increase in system noise temperature but a reduction in output noise fluctuations. The original double-sideband mixer baseband IF system is unchanged. With sufficient demand the mixer/IF system could be replaced with a single-sideband system to double the predetection bandwidth and reduce the output noise fluctuations by a factor of $\sqrt{2}$.

W. D. Brundage

In General

COMPUTER PLAN

The NRAO is in the process of developing an Observatory-wide computer plan. The development of the plan involves two groups: (1) a Planning Group made up of H. Hvatum, M. Gordon, M. Haynes, R. Ekers, K. Kellermann, B. Clark, G. Hunt, B. Stobie, and R. Burns; and (2) a Scientific Review Committee made up of a small number of NRAO staff and outside observers. The latter group has not yet been selected.

For each site the site director shall be responsible for the development of a plan that best meets the site's needs. The plan will include an estimate of the observing demands as well as the computer resources necessary to satisfy that demand. I will develop a Charlottesville plan and will work with an existing communications group to develop an inter-site communications plan. The impact based on the current VLBA proposal also will be considered (with Ken Kellermann's help).

The computer planning group will aid in the development of the various site plans and will help integrate the plans into an overall proposal. This proposal should be complete some time in March 1983.

The Scientific Review Committee will then review the integrated plan and if appropriate suggest improvements, options, etc. It is hoped a final reviewed plan can be available by late May 1983.

At this point a second planning phase will begin during which the technical particulars will be further developed. The results of this phase will probably be reviewed by the Observatory's outside Computer Advisory Committee, probably in late 1983 or early 1984. This is a standing committee of industry computer experts. Funding permitting, one or more procurements will follow.

R. Burns

SUMMER STUDENT PROGRAM

Despite some rumors to the contrary, NRAO will have a summer student program this year. The 1982 program was suspended due to cutbacks in our funding, but we are able to resume it for this summer. Interested students should be reminded that the deadline for receipt of all applications material is February 7.

J. Lockman

NEW STAFF APPOINTMENTS

The following persons have recently joined the NRAO scientific staff:

Alan Bridle takes up an appointment as Scientist in Charlottesville after having been on the faculty of Queen's University in Kingston, Ontario, Canada since 1967. Alan received his Ph.D. in Radio Astronomy at the University of Cambridge, U.K. in 1967 and spent the following year as a Postdoctoral Fellow at the Mullard Radio Astronomy Observatory. Currently his major areas of research interest are extragalactic radio astronomy, continuum radio radiation, and radio jets.

Alwyn Wootten, a new Assistant Scientist, received his Ph.D. in Astronomy from the University of Texas in 1978. Since then he has vigorously pursued his interests in millimeter astronomy in successive postdoctoral appointments at Texas, Caltech, and RPI. His current areas of research interest are the structure and chemical evolution of molecular clouds and circumstellar shells.

Timothy Cornwell has just completed two years as an NRAO Research Associate at the VLA. As an Assistant Scientist he will continue to pursue his studies of the general principles of signal and image processing and their application to radio astronomical observations. Tim received his Ph.D. in Astronomy from the University of Manchester, U.K. in 1979 and spent the following year there on a postdoctoral fellowship before coming to the NRAO in 1980.

R. J. Havlen



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