NRAO NEWSLETTER

1985 July 1 No. 24

In General

VLBA CONSTRUCTION FUNDS RELEASED

On May 15 the funds ($9M) appropriated for VLBA construction in 1985 were released by Eric Bloch, Director of the NSF and awarded to Associated Universities, Inc., to initiate construction. The VLBA project passed a very important milestone on that date in going from the design to the construction phase. The project is proceeding well. On June 26-27 a review of the antenna design was held which resulted in approval of the antenna contractor's design and authorization to proceed with the construction of the first antenna to be installed at the Pie Town, New Mexico site.

Paul Vanden Bout

OBSERVATORY REORGANIZATION

On July 1 some organizational changes took effect at the NRAO. First, VLBA was made a free-standing project under H. Hvatum (Associate Director and Project Manager) and P. Napier (Deputy Project Manager). Second, the Technical Services Division was reorganized as follows: the Green Bank and Tucson electronics groups report to their respective site directors; the Computer Division reports to R. Brown (Associate Director for Operations); the (Mechanical) Engineering Division has been distributed to the VLBA project and Green Bank operations; and Observatory technical development is led by S. Weinreb (Assistant Director for Technical Development), with the Central Development Laboratory under M. Balister (Chief Engineer). R. Havlen has been appointed Head of Observatory Services reporting to R. Brown.

The rationale for these changes is to give the Observatory a simpler management structure, providing for good management of the VLBA project while allowing the traditional emphasis on the development of new radio astronomy instrumentation to continue.

Paul Vanden Bout

UNIQUE FOREIGN TELESCOPES

The NRAO is concerned over the high cost of full-fare airline tickets for US-based observers who observe on unique foreign telescopes. The NRAO administers the NSF-funded program and the limited funds would soon be depleted on a few expensive trips if controls were not instituted. In an effort to insure that the maximum number of observers are supported by the available funds, the NRAO will enforce the following rule:

NRAO support for US-based observers on unique foreign telescopes will be limited to an amount not to exceed the round-trip Apex fare, or its equivalent, on American flag carriers.

R. J. Havlen

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SPRING USERS MEETING: NOTEWORTHY TOPICS RAISED

The following is a summary of the most significant issues raised by the Users Committee during its meeting in Tucson, May 8.

Tucson

- Adequate staff test time for new devices and techniques is a scheduling necessity.
- Optimum scientific return from 1 mm observations depends critically on the development of a remote/absentee observing scheme geared to a scheduling flexibility that can take advantage of the times of excellent seeing.
- Improvements in data reduction programs (flexibility of editing, displaying, and observing techniques) are needed on all of the NRAO single dishes.

Green Bank

- Improved timeliness in scheduling the highest rated proposals might better be insured under a quarterly review system.
- Observatory-wide standardization of the telescope control commands is a recommended goal.
- VLBI calibration data has improved noticeably.

VLA

- Improved user access to calibrated and edited data at all sites are urgently needed. At the VLA the DEC 10 is severely limited in its ability to produce edited and calibrated data in UVFITS format.
- Until the Pipeline operates with 98% reliability, its use by visitors is not warranted.
- During the current stage of developing programs for use on supercomputers and supporting the effort to acquire a supercomputer the NRAO's interim plans for the future of the DEC 10 are not clear.
- How are NRAO's plans for a supercomputer being coordinated with the activities at NSF-funded supercomputer centers?
- Improved K-Band system performance remains a user concern.

R. J. Havlen

MILLIMETER ARRAY SCIENCE MEMORANDUM SERIES

A new memorandum series has begun. The purpose of this series will be to define and develop the scientific goals of the millimeter array. Contributions to this series should aim to address specific scientific issues and consider whether the design plan adequately confronts those issues. The scientific justification of the array will be drawn from the pool of ideas which the series will constitute. Particularly sought are contributions concerning the sensitivity requirements, the frequency range and the resolution range for the array.

We encourage the community to submit contributions to this series. Contributed memos should be sent to A. Wootten, National Radio Astronomy Observatory, Edgemont Road Charlottesville, Virginia 22903.

We invite requests for additions to our mailing list, which is identical to the mailing list for the Millimeter Array Newsletter.

So far, there have been two memos in this series:

1. Extragalactic CO with the Millimeter Array 850601.....A. Wootten
2. Resolution of Circumstellar SiO Masers Around Late-type Stars 850601..F. O. Clark

Al Wootten

NRAO IMAGE SLIDE FILE SYSTEM

The extensive file of "radio pictures" that has been maintained by the National Radio Astronomy Observatory is now being supplemented at an increasingly rapid rate by data resulting from VLA observations. These pictures, many of which are cataloged and filed at NRAO, rival or surpass the impact that optical pictures have had on professional and lay viewers alike.

In a previous Newsletter, No. 21, January 1985, the NRAO image collection was highlighted so that you might take advantage of it in the following ways:

1. Obtain copies of images of sources or telescopes for your research or educational purposes.
2. Include copies of your own images in the file so that they may be made available to a broad spectrum of educators and researchers.

All images that are (accepted for; offered to the) NRAO image archives must be accompanied by a brief written statement that the image is offered without restrictions and may be treated by NRAO as dedicated to the public domain. This statement, signed by the author(s), assures the widest possible distribution to educational, research, and nonprofit organizations in the most expeditious manner. (See sample statement below.)

Whenever NRAO fills a request for an image, the requester will be advised to acknowledge the source, i.e., "Courtesy NRAO/AUI -author et al." This requirement will be imposed on those organizations that may further distribute the images to "end users."

Your submission of an image to the NRAO file system in no way compromises your use of the same image. As principal investigator(s), you retain all rights to publish, sell, or enter into third party agreements. NRAO generally will refer requests for non-educational, commercial use directly to the author and will not enter into negotiations. Voluntary contributions and cost reimbursements made by users of NRAO images will be retained and used to enhance the Observatory's public information efforts.

Images copyrighted by the author(s) will not be entered into the NRAO image file system unless an unlimited waiver, in terms set forth above, is given. This is because we feel we cannot give adequate protection to your copyright. However, if copyrighted images are offered to NRAO with copyright restrictions, NRAO may seek permission to use it for internal use and will refer inquiries from other sources to the author(s).

The NRAO image file contains an extensive collection of 35 mm slides contributed by visitors and members of the staff. Requests from researchers, educators, and publishers are filled promptly. A catalog and price list are in preparation; their availability will be announced in a future letter. Because of our limited staff and facilities, requesters requiring multiple copies will generally be referred to one or more nonprofit organizations dealing with the distribution of scientific information if the image is or can be made available through them.

Sample permission statement:

Permission is is not granted to NRAO/AUI to use, distribute, sell, reproduce or authorize others to use, distribute, sell or reproduce without reservation or restriction the listed image(s)

immediately after the date _____

The author whose signature appears below agrees to inform all co-authors of this release.

Signed _____ / Date _____

R. J. Havlen and J. Marymor

PREPRINTS AND PAGE CHARGES (AGAIN)

The NRAO now requires the receipt of four copies of any preprint as a prerequisite for NRAO partial page charge support. Following the guidelines stated in the January 1985 Newsletter, the Charlottesville library must receive these preprints prior to the issuance of a purchase order.

Individuals and institutions which supply the NRAO with preprints in the normal library exchange process are encouraged to send four copies. The NRAO maintains four geographically distinct libraries at its Arizona, New Mexico, Virginia, and West Virginia sites, and each location gives preprints broad exposure to an avid readership of research scientists. If all four copies are sent to the Charlottesville library, the NRAO will distribute them amongst the NRAO branch libraries. If you are already sending your preprints directly to the NRAO branch libraries, please continue to do so.

Preprints based on NRAO observations (page charge supported or not) should be supplied to the NRAO as a matter of course in partial justification for the use of NRAO research facilities.

R. J. Havlen

1985 JANSKY AWARD ANNOUNCED

The NRAO takes very great pleasure in announcing the selection of Geoffrey Burbidge as the Jansky Lecturer for 1985. The Jansky Lectureship is awarded annually by the Trustees of Associated Universities, Inc., in recognition of outstanding contributions to the field of astronomy or a related subject. Dr. Burbidge is well known for his early pioneering work on stellar evolution and nucleosynthesis for which he shared the 1959 Warner Prize of the American Astronomical Society. Since then his broad range of interests have included cosmology and the study of quasars.

Dr. Burbidge has held a professorship at the University of California at San Diego since 1962, during which time he recently served a six-year term as Director of Kitt Peak National Observatory. Dr. Burbidge received his Ph.D. in theoretical physics from the University College of the University of London. His numerous international affiliations include memberships in the International Astronomical Union, the American Academy of Arts and Sciences, the Societe Royale des Sciences de Liege, and the Royal Society of London.

Dr. Burbidge's distinguished career has been characterized by his enthusiastic dedication to and support of all aspects of astrophysical research, and the NRAO looks forward to his visit. The 1985 Jansky Lecture will be given in Charlottesville on October 29. A second lecture will be given by Dr. Burbidge in Socorro on a later date to be announced.

R. J. Havlen

12-Meter

12-METER PROPOSALS

Proposal Queue

The 12-meter telescope continues to be heavily oversubscribed. The total days requested in active proposals--those received in the last quarter plus those carried over from a preceding quarter--amount to nearly 250. Requests for the 3-mm and 1-mm receivers are approximately equal. Thus, for the 1985 fall observing season (middle of September to the end of December), two and a half to three times as many observing days are presently being requested as are available. The inevitable consequence is that, unfortunately, we will be unable to accommodate many excellent proposals. In view of this circumstance, care in preparing a specific, well-defined, research proposal and/or in responding to the referees' criticisms, becomes particularly important.

New Receivers

Two new receivers are available at the 12-meter for which we now invite proposals. Beginning in the fall we plan to have permanently mounted and available on the telescope three receivers: the 3-mm and 1-mm receivers and one (or both) of the following new receivers. Receivers are selected by means of a rotatable central mirror; changeover should usually require less than half an hour.

The 345 GHz receiver is a simple, single-channel (one polarization) Schottky mixer with a tuning range of plus and minus 15 GHz about 345 GHz. The SSB receiver noise is 1400 K at band center, increasing to 2000 K as the band edges. Work at 345 GHz from Kitt Peak will be limited to those days with superb atmospheric transparency and as a result time will need to be scheduled in a discretionary manner. Note also that at 345 GHz the backend bandwith may be limiting for some projects: the widest filterbank available, 2 MHz x 256 channels, is only 450 km/s wide at 345 GHz.

The bolometer was used successfully on the telescope in April and provided a sensitivity of 2-5 Jy/s with the 1.4-mm filters. Although the bolometer sensitivity is compromised when the atmospheric transparency decreases, nevertheless under good conditions it is 2-3 times as sensitive as is the 1-mm coherent receiver. Three wavelength bands, centered at 150, 230, and 345 GHz, may be selected using a rotatable filter wheel.

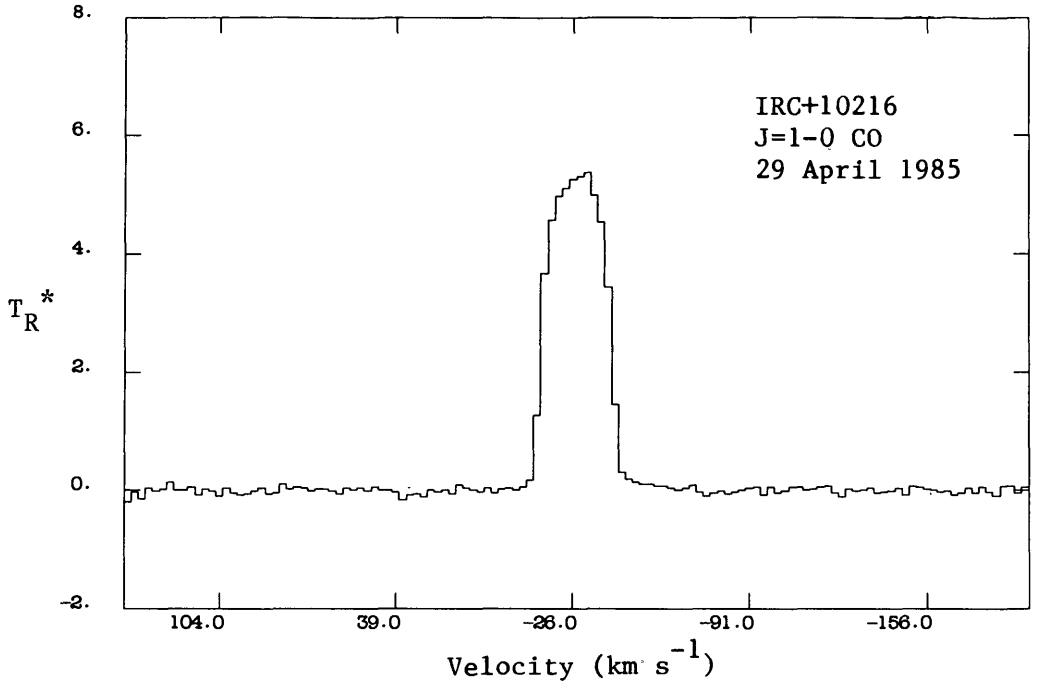
Observers wishing to propose for either the 345 GHz receiver or the bolometer may obtain further information from Phil Jewell.

R. L. Brown

TEST OBSERVATIONS WITH THE 3 MM SIS RECEIVER

The new 3 mm SIS receiver was tested on the telescope for the first time in late April by M. Balister, L. D'Addario, J. Lamb, and the undersigned. The dual-channel receiver was equipped with two different mixer designs, one by D'Addario and one by S.-K. Pan. Both mixers functioned well. The SIS cryogenic system, designed by J. Archer, held the receiver at superconducting temperatures for the 3 days of the test. A J = 1-0 CO spectrum (at 115 GHz) obtained during the test is displayed next page. After additional engineering work on the receiver this summer, the receiver will be tested again in the autumn. Noise temperatures near 100 K (SSB) are expected.

P. R. Jewell, J. M. Payne, and C. J. Salter



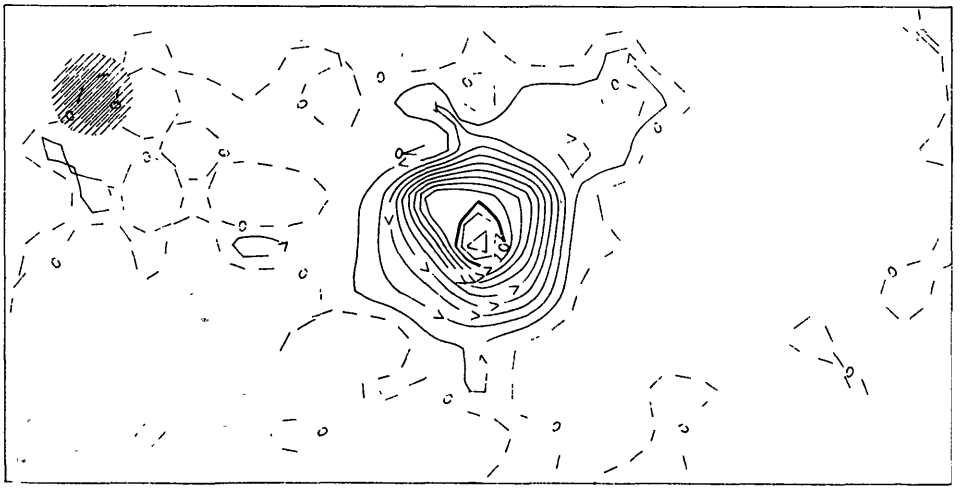
A J = 1-0 CO spectrum at 115 GHz of IRC+10216 made with the NRAO SIS receiver during a 1985 April test session.

TEST OBSERVATIONS WITH THE 345 GHz RECEIVER

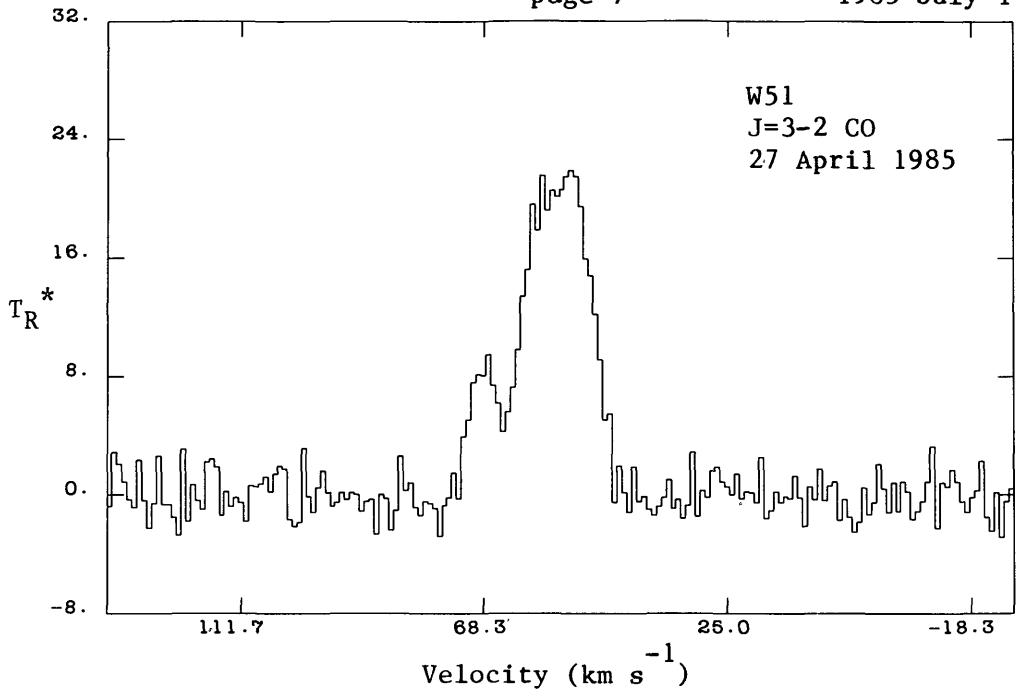
In late April, test observations with the new 345 GHz Schottky receiver were carried out. Both the receiver and the telescope performed well. An aperture efficiency of 14% was measured (as the atmospheric optical depths at the zenith were near 1 during the observations, the uncertainty in the quoted aperture efficiency is substantial). The FWHM of the beam is about 20" at 345 GHz. A map of Jupiter, whose disk diameter was 36" at the time of observation, is shown below. The lowest contour level is 13 dB down from the peak. The absence of sidelobes above this level indicates that the telescope surface is retaining its figure at this frequency and the aperture efficiency is determined largely by the rms surface accuracy. A spectral line observation of J = 3-2 CO in W51 made during this test session is displayed next page. The receiver will tune from 330 to 360 GHz; the SSB noise temperature ranges from 1400 to 2000 K over this band.

P. R. Jewell, J. M. Payne, and C. J. Salter

Jupiter at 345 GHz NRAO 12 m Telescope



A 345 GHz continuum map of Jupiter made with the 12-meter telescope. The contour levels are spaced at 8% intervals.



J = 3-2 (345 GHz) CO in W51 as observed with the 12 m telescope.

DATA HANDLING AND ARCHIVING AT THE 12-METER

As there are now several forms in which an observer may carry away his/her data from the 12-meter, and hence some cause for confusion, let me summarize the possibilities and procedures.

1. Data recorded by the PDP-11/40 computer are written as single-precision scan averages on the 11/40, 9-track, 800 bpi binary tape. Previously this was the only data export medium and it exists unchanged today.

2. In real time data are sent via a digital link from the PDP-11/40 to the analysis VAX computer. Spectral-line data are buffered as individual 30-second records and as scan averages on the VAX disk. The VAX data are double precision. One can carry away data from the VAX in three ways: As scan average export data; as individual 30-second records; and as KEEP format, processed, scan averages.

Unfortunately, it would be necessary to interrupt data-taking in order to write data from the VAX disk to tape. Since this is needlessly wasteful of telescope time, we instead copy the VAX disk to a removable disk file on maintenance day and take that disk to the NRAO offices downtown. Subsequently the data are read into the downtown VAX and the NRAO staff write them out to a 1600 bpi tape as ASCII or binary characters. The data so written are the scan average data, or the KEEP processed data, or both. The tapes requested are shipped to the observer at his/her home institution.

The scan average data copied from the VAX on the mountain are also written to an NRAO archive tape downtown. Archive records are complete for all data taken at the 12-meter since the first of November 1984. All future 12-meter observations will be similarly archived.

Finally, if an observer wishes to have access to a tape copy of individual 30-second spectral-line records, this tape must be written directly off the mountain VAX which will require the observer to (a) cease observing long enough to write the tape and (b) accept 800 bpi as the tape density since this is the only option available on the tape drive on the mountain. Moreover, the disk file containing the 30-second records is circulating and holds only about 3000 records: for long runs more than one disk-to-tape copy will be needed.

R. L. Brown

VLA

VLA CONFIGURATION SCHEDULE

I. 1985/86

Quarter	Configuration	Proposal Deadline
1985 Q3	B/C, C	March 15, 1985
1985 Q4	C/D, D	June 15, 1985
1986 Q1	D, D→A, A	September 15, 1985
1986 Q2	A, A/B, B?	December 15, 1985
1986 Q3	B, B/C?	March 15, 1986
1986 Q4	B/C, C	June 15, 1986

A/B, etc., are hybrid configurations with a long north arm. D→A is only suitable for point source observations.

II. APPROXIMATE LONG-TERM SCHEDULE

	Q1	Q2	Q3	Q4
1985	A	B	C	D
1986	D	A	B	C
1987	C	D	A*	B
1988	B	C	D	A

*We may modify the schedule from this point on to avoid A array in summer.

R. D. Ekers

VOYAGER II

NRAO has signed an agreement with the Jet Propulsion Laboratory to support the encounter of the Voyager II spacecraft with Neptune in August, 1989. All antennas of the VLA will be equipped with receivers at 8 GHz for the signals sent back to earth for Voyager II so that more images of Neptune can be sent back from the encounter. NASA will bear the cost of the new equipment.

C. Bignell

PROCESSING WITH THE DIGITAL PRODUCTIONS CRAY

NRAO has been using the NSF Super Computer Access program to develop software for processing synthesis telescope images on a Cray XMP at Digital Productions, Los Angeles. This project is proceeding on schedule, and we are close to the stage where we need to do further testing with real data. At present we have working a stand-alone version of the VM deconvolution algorithm on images up to 4k x 4k (see Cas A result reported in this Newsletter) This program can be used when the appropriate dirty map and beam are available on a FITS tape. Processing is about 100 times faster than using AIPS on a VAX -11/780 + AP. Intermediate images can be dumped at each iteration. These have been used by Rots and Cornwell to make a movie, "Perfecting the Lens," illustrating the convergence of deconvolution algorithms.

Adapting the AIPS software package to the Digital Productions Cray is proceeding on schedule, and we are now close to the stage where AIPS can be used to make images (either using UVMAP or MX) from UVITS data. Preliminary timings indicate that the gains in speed over the VAX 11/780 + AP are less substantial than those achieved for the stand-alone VM. However, the array processor emulation Q-routines have <u>not</u> been optimized for the Cray so far, but will be soon.

This initial implementation is not highly interactive and image display functions are rudimentary. Furthermore, all processing done at this stage should be considered part of our software and operations test, i.e., we do not guarantee the results. Nevertheless, we believe the processing power and software already available can be used to produce new science and we should like to extend this test phase to include a range of projects from the user community.

To be suitable, projects should satisfy the following requirements:

1. The project should be sufficiently well defined to use the batch processing environment now available. Appropriate imaging and deconvolution parameters must be known in advance.

2. Since editing of bad data is not currently practical on the Cray, data integrity should be already established.

3. Processing of spectral line and snapshot observations yielding multiple images is encouraged since at this stage the Digital Productions Cray hardware is not well optimized for large (greater than 1k) images.

4. To use the stand-alone VM program, FITS tapes with dirty maps and beams must be available.

5. Processing times should be inconveniently (or impossibly) long on NRAO's VAX system.

Astronomers with existing data satisfying the above criteria who would like to take advantage of this program should write to me giving details of their requirements. Since the availability of the supercomputer resources at this time is primarily for test purposes, allocations will be based on technical suitability. If you have technical questions about this program, contact Tim Cornwell or Bob Duquet at the VLA or Kerry Hilldrup at Charlottesville.

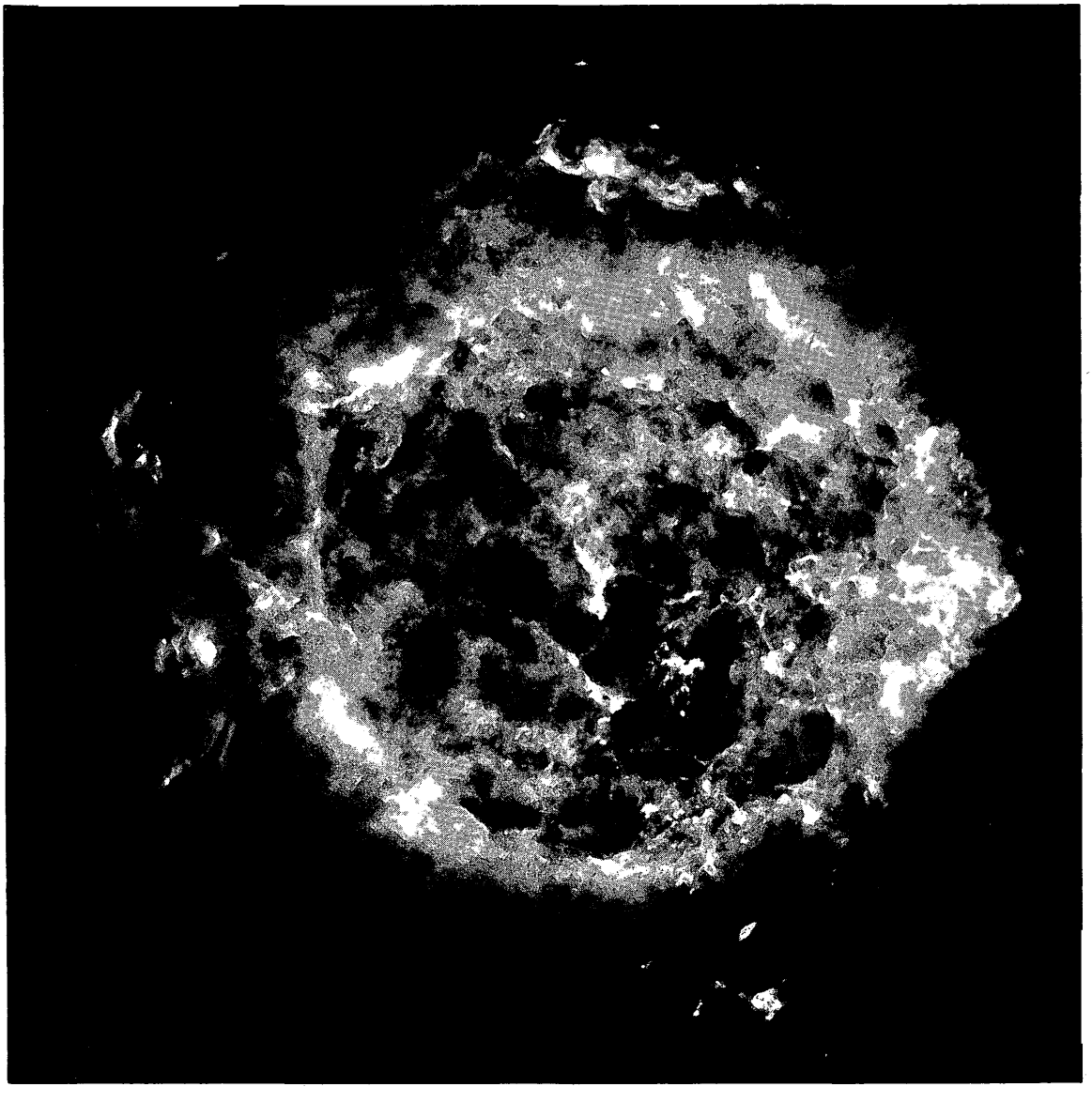
By late 1985 and during 1986 we anticipate that we will be able to provide an operational processing capability on the Digital Productions Cray using an expanded NSF Access program. Further details will follow in future Newsletters.

R. D. Ekers

DECONVOLUTION ON THE DIGITAL PRODUCTION CRAY X-MP

As part of the work on the Digital Productions CRAY X-MP, the Maximum Entropy Method (VM) program was used to deconvolve a large (4K*4K) image of the supernova remnant CASA shown below, produced from data collected by Richard J. Tuffs (MPIfR, Bonn), Rick Perley (NRAO), and co-workers. The observations were from all four configurations of the VLA at four different observing frequencies inside C-band. The deconvoluton converged in 15 iterations consuming about 20 minutes of CRAY CPU time but about 10 hours of real time waiting for and performing I/O. The deconvolved image has resolution of about 0.2 arcsec and a field of view of 6.1 arcmin. A single bad correlator in the A-array North arm has produced the fine-scale, ring-like structures emanating from the phase center. Now that these bad data have been identified and removed, the deconvolution will be performed again.

Bob Duquet and Tim Cornwell



VLA 300 MHz RECEIVER

Observations of a large number of astronomical objects would benefit from a lower observing frequency than 1.35 GHz, the lowest frequency currently supported on the VLA. Some objects radiate more strongly at lower frequencies while others are so large that a larger field of view than the 30 arcmin available at 1.35 GHz is needed.

The receiver will be designed so that observations in the range 300-350 MHz can be made with an instantaneous bandwidth of approximately 5 MHz. At this low frequency, the VLA 25-m diameter antennas can only be used in prime focus mode. It is known that radio frequency interference, both locally generated at the VLA and from external sources, will be a significant problem.

Seven antennas now have 327 MHz receivers installed, and this system is undergoing test and evaluation. The final feed configuration is expected to be determined next quarter. To reduce local RFI, modification to some modules has been undertaken.

Jack Campbell

VLA 8 GHz RECEIVERS

Feeds and front-ends covering the frequency range 8.0-8.8 GHz will be installed on the VLA primarily to allow reception of the Voyager signal from Neptune at 8415 MHz. Other scientific benefits include the provision of an additional frequency for measurements of continuous spectra and joint observations with the VLB array. There are also some molecular lines of limited interest between 8.8 and 9.2 GHz which may be covered. Finally, the 8.4 GHz front-ends would enable the VLA to be used in planetary radar experiments with the Goldstone transmitter. The NRAO Central Development Laboratory will develop this front-end. This front-end amplifier will probably be a GaAsFET amplifier or an improved HEMT (High Electron Mobility Transistor) amplifier.

A second 8.4 GHz front-end was received from the Central Development Laboratory in Charlottesville and has been installed on Antenna 21. Interferometer measurements with Antennas 20 and 21 on both Voyager I and II have been completed with the appropriate signal to noise ratio.

JPL has provided funding for this project, and antennas being overhauled will be outfitted with X-band feed towers. Installation of the next X-band system is scheduled for the second quarter in 1986.

Jack Campbell

VLA SPECTRAL LINE USERS

BASBCK, the DEC-10 program to reconstitute a baseline-based passband file from an antenna-based one, has had a serious bug in it. Basically all bandpass corrections based on pass files made by BASBCK prior to 1 June, 1985 are unreliable. For further details contact Arnold Rots.

Arnold Rots

VLA DEPUTY SITE MANAGER IN CHARGE OF ENGINEERING

Effective July 1, 1985, Dick Sramek will replace P. Napier as VLA Deputy Site Manager in charge of Engineering, and P. Napier will become Deputy VLBA Project Manager.

R. D. Ekers

VLA POSITIONS OF SOURCES FAR FROM THE FIELD CENTER

A recent article by Oort and Windhorst in Astron. & Astrophys., 145, 405 (1985) showed that positions derived from VLA observations for sources very far from the field center could be systematically in error by several arcseconds. This assertion is correct. The effect has been discussed in the following VLA documents which are available in the VLA and Charlottesville libraries:

1. VLA Scientific Memo 107, "Curvature of the Sky," by Barry Clark (June 1973).

2. "An Analysis of Aberrations of the VLA Radio Synthesis Telescope," Chapter Five--Non-Linear Phase Terms," by Jerry Hudson (Ph.D. Thesis, The American University, Washington, D. C., June 1977).

3. VLA Scientific Memo 137, "Orders of Magnitude of Some Instrumental Effects," by Barry Clark (October 1981).

4. NRAO-VLA Workshop on Synthesis Mapping, Lecture 10, "Wide Field Mapping," by Barry Clark (June 1982).

The error occurs because the VLA contains non-E/W baselines which produce a significantly non-coplanar synthesized aperture for observations longer than about 30 minutes. The sky cannot be precisely mapped by such an aperture using the standard 2-D Fourier transform. As the earth rotates, carrying the VLA, use of a 2-D transform causes a point source located far from the field center to trace out a "U"-shaped path around its correct position; the exact shape of the path depending on the declination and the range of hour angle. The size of the excursions varies with the square of the distance from the field center. At 30' from the field center the excursions can be as much as 20" over 10 hours.

When all of the data are mapped, the point source is smeared by the "U" shape (in most cases the smearing is smaller than the synthesized beam), but the centroid is also generally shifted from the true position (even for symmetric coverage around transit). This shift is the effect documented by Oort and Windhorst. It is insignificant for all but a few percent of VLA applications, affecting only wide field mapping at 1.5 GHz and, possibly, 4.9 GHz. It will however be a serious problem at 327 MHz.

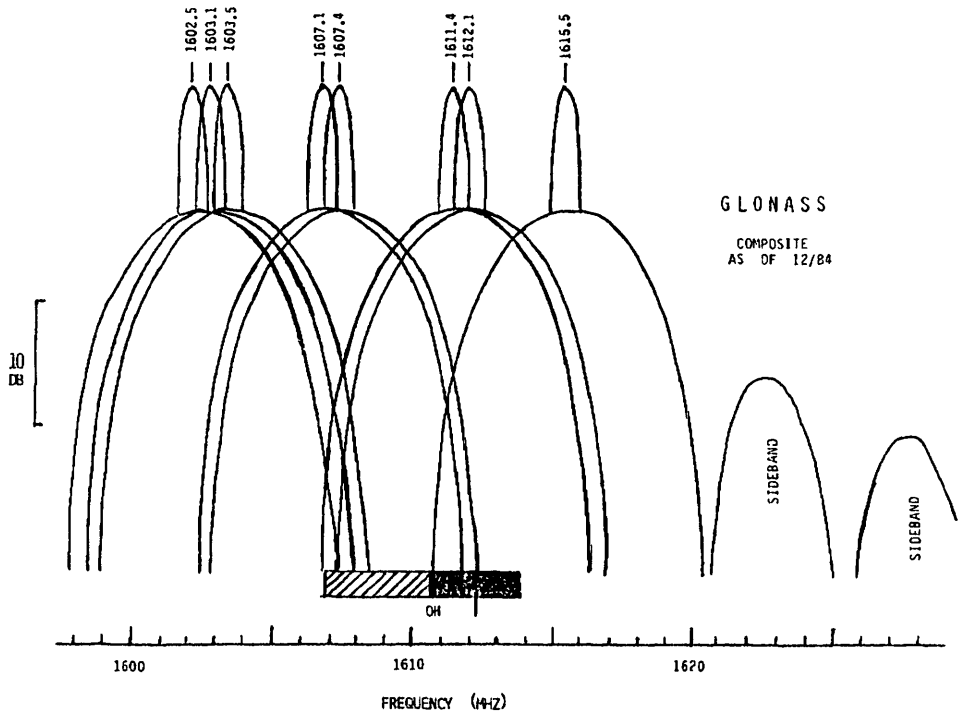
Oort and Windhorst are not correct in saying that use of the AIPS mapping/cleaning program MX avoids the problem. Both MX and UVMAP will lead to the same position offset at the edge of single large fields. The best way to avoid the offset is to use MX to mosaic the desired field of view into 16 smaller maps. There will be virtually no distortion in all of the smaller maps, even for those very far from the original field center. If there are only a few sources of interest in the field, fewer maps can be made centered on these sources.

If you are mapping large fields and you believe the source position errors will be a problem, please contact local experts at the VLA or in Charlottesville for advice.

Ed Fomalont and Alan Bridle

INTERFERENCE AT L-BAND

Vernon Pankonin, the Electromagnetic Spectrum Manager at the NSF, has identified the Soviet GLONASS radio-navigation satellite system as a significant new source of radio interference in the band 1597-1617 MHz. The GLONASS system will consist of 9-12 satellites (8 operational as of December 1984). The transmissions from each satellite consist of two $(\sin x/x)^2$ signals with separations between first nulls of about 1 and 10 MHz and the same center frequency. Each satellite has a different center frequency. An idealized composite spectrum from Vern's draft report is shown below. Unfortunately, epherimides of the satellites are difficult to obtain, so, in practice, interference will be unpredictable and intermittent.



P. C. Crane

AVOID REOBSERVATION

It still doesn't seem to be very widely known that the NRAO routinely archives the raw (uncalibrated visibility) data from all VLA observations. NRAO policy restricts general access to this data for only 18 months after the end of the associated observing program. It is thereafter available to any scientist who can show adequate justification for its use. Full catalogs of the observed sources, including all instrumental parameters, are available from the VLA and can be accessed through the VLA DEC-10 computer (see table next page). Updates of these catalogs are provided to libraries on request by Teresa McBride, (505) 772-4201 or FTS 476-4201 at the VLA.

Calibrated and procesed data remain the property of the original observer and are not automatically indexed and archived at the VLA. However, if it has been determined from the catalog that the major observational parameters (array configuration, wavelength band, etc.) are appropriate, scientists are encouraged to contact the original observers directly to determine the suitability, location, and identification of the existing digital material. In cases where the observer is willing we will provide copies of any calibrated UVFITS or image tapes that are at the VLA.

Use of existing data can save telescope, computer and your own time.

INDEX OF AVAILABLE VLA ARCHIVE CATALOGS

(as of June, 1985)

DEC-10 File Name	Description
ACCUM.SRT[13,542]	60 min or longer 09/81-12/84
1984.SRT [13,542]	All sources 1984
1983.SRT [13,542]	All sources 1983
1982.SRT [13,542]	All sources 1982
1981.SRT [13,542]	All sources 09-12/1981

R. Ekers and R. Havlen

Green Bank

S-BAND RECEIVER NOW IN USE

A dual-channel, cooled FET receiver has been used successfully for astronomical observations. Proposals will now be accepted for its use on either the 140-foot or 300-foot telescopes.

Two feeds are now available covering the nominal frequency bands 3.2-3.4 GHz and 2.9-3.1 GHz, respectively. Receiver performance is not noticeably degraded in the 3.1-3.2 GHz range. Feeds for use at other frequencies can be constructed if demand justifies, but a lead time of at least three months is required.

Performance on the 140-foot telescope is summarized below. Channels A and B have orthogonal linear polarizations. The system temperatures were measured on the telescope, so include all contributions. The efficiencies depend little on hour angle or declination. Comparable performance is expected on the 300-foot telescope.

	Channel A	Channel B
2.9-3.1 GHz		
System Temp	29 ± 1 °K	34 ± 4 °K
Efficiency	55 ± 5%	55 ± 5%
3.2-3.4 GHz		
System Temp	34 ± 4 °K	34 ± 4 °K
Efficiency	60 ± 5%	60 ± 5%

Resonances in the system cause poor performance over bands typically less than 1 MHz wide at frequencies of 2.9549, 3.0618, 3.2515, 3.2954, and 3.3710 GHz. By machining the orthomode transition these frequencies could probably be moved, but strong reasons to do so would have to be presented.

A detailed summary of the performance of the receiver is available as an Electronics Division Internal Report. It can be obtained by writing Carolyn Dunkle, NRAO, P. O. Box 2, Green Bank, WV 24944-0002.

Harry Payne and Richard Bradley

300-FOOT TELESCOPE SHUTDOWN

The 300-foot telescope will be taken out of service on Monday, August 5, 1985 for a period of approximately six weeks. During this time extensive improvements to the focal structure will be implemented. Specifically, (1) the electronics cabin will be enlarged, (2) the traveling feed mechanism will be improved, and (3) the north-south translator will be installed.

The translator will track the focal point as it moves when the telescope observes off from the zenith. It is unlikely that full computer control of this translation will be accomplished during the shutdown. It is most likely to be postponed until the control computer is installed.

George A. Seielstad

SETI WORKSHOP

From May 20 to 22, 1985, Green Bank hosted a workshop dedicated to Searches for Extraterrestrial Intelligence. The occasion was the 25th anniversary of the Project Ozma observations, made at Green Bank, which started this entire field of research.

The first searcher in this field, Dr. Frank Drake, and about a dozen others who participated in Project Ozma observations reassembled as a group for the first time in a quarter of a century. They were joined by approximately thirty other participants who discussed observations they have made or are preparing to make. Surprisingly, Frank's review of Project Ozma was the first time he has given a talk on those observations. (The gap between measurement and publication was long even in those early days of radio astronomy. But 25 years does seem excessive, Frank.)

This was also an opportunity to pay tribute to Dr. Sebastian von Hoerner and his wife Lisa for their many contributions to radio astronomy in general, to NRAO in particular, to the communities of Green Bank and Arbovale, and to the spirit of SETI. Sebastian, despite being honored guest, was asked to work by delivering a keynote address. His superb talk will be one of many to be included in a Proceedings volume in preparation.

All participants look forward to reassembling in 2010. We will either celebrate Project Ozma's 50th anniversary with the presentation of signals from other civilizations or we will observe Jupiter's Great Red Spot turn into Arthur Clarke's black hole.

George A. Seielstad

SYSTEMS SCIENTIST--140-FOOT TELESCOPE OPERATIONS

Ron Maddalena began employment on June 10, 1985, as a systems scientist with primary responsibility for the 140-foot telescope. For frequencies below 5 GHz, he will share this responsibility with Harry Payne.

Dr. Maddalena joins NRAO from Columbia University, where he has presented his thesis on "Molecular Clouds in the Direction of Orion and Monoceros." Observers desiring information about the 140-foot telescope can contact Ron at (304) 456-2207.

George A. Seielstad

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