

<u>Observer</u>	<u>Program</u>
W. Wilson (Aerospace Corp.) R. Kakar (JPL) M. Klein (JPL)	Observations of CO in Venus and other planets.
A. Wootten (Texas) N. Evans (Texas) P. Vanden Bout (Texas)	The relationship of molecular ions to galaxies with active nuclei.

### Very Large Array

During this quarter the completed portion of the array was scheduled for approximately 63% of the time; approximately 8% of the observing time was lost due to instrumental problems. A portion of the observing was assigned to instrumental development and tests, including studies of antenna pointing, amplitude and phase stability, and instrumental polarization. The following research programs were conducted with the VLA.

<u>Observer</u>	<u>Program</u>
D. Sramek D. Weedman (Vanderbilt)	Search for optically selected QSO's. (6, 21 cm)
R. Perley K. Johnston (NRL)	Structure of weak or compact halos in 3C 345, 3C 371, 3C 418, and 4C 39.25. (6 cm)
D. Gibson (NMIMT)	Time scales of variations in radio emission from Antares and Beta Lyrae. (all bands)
A. Willis (Brandeis) R. Strom (Netherlands Foundation for Radio Astronomy)	A study of the hot spot in the giant radio galaxy 3C 236.
R. Hjellming	Search for radio emission from x-ray objects. (all bands)
H. Zirin (Caltech) K. Marsh (Caltech) G. Hurford (Caltech) R. Hjellming	Observations of solar impulsive outbursts.
K. Johnston (NRL) A. Wolfe (Pittsburgh) R. L. Brown	Monitor variations of 3C 446. (all bands)

<u>Observer</u>	<u>Program</u>
R. Hjellming H. Schnopper (Center for Astrophys.)	Monitor variations of III Zw2. (all bands)
D. Gibson (NMIMT)	Search for radio emission from late-type subgiants. (6 cm)
P. Schwartz (NRL) J. Spencer (NRL) K. Johnston (NRL)	Confirmation and study of stellar radio sources detected at Arecibo. (6 and 2 cm)
R. Mushotzky (Goddard) R. Becker (Goddard) P. Serlemitsos (Goddard) R. Perley	Observations of Cen A, during x-ray observations with HEAO and OSO-8. (all bands)
D. Florkowski (Florida) S. Gottesman (Florida)	Observations of Wolf-Rayet binary HD 193793 and related objects. (20, 6 and 2 cm)
A. Dupree (Harvard) B. Burke (MIT) P. Greenfield (MIT)	Observations of active chromosphere stars. (6-2 cm)
A. Willis (Brandeis)	Structures and flux densities of 25 weak sources from a WSRT survey. (6 cm)
S. Goldstein (Virginia) K. Turner (DTM) R. Rood (Virginia)	Two deep survey fields at 21 cm.
J. Dreher	Mapping of Cyg A at 21 cm.
J. Condon L. Dressel (Virginia)	Compact nuclear sources in bright spirals. (6 cm)
J. Wardle (Brandeis) D. Altschuler (Inter-American U., Puerto Rico)	Twenty-one centimeter observations of extended structure around BL Lac objects.
H. Johnson (Lockheed) A. R. Thompson	X-ray sources near the galactic center. (6 cm)
H. Johnson (Lockheed) B. Balick (Washington)	Stellar planetary nebulae--flux densities and spectra. (6-2 cm)
R. C. Bignell	Observations of Virgo A. (6 cm)

<u>Observer</u>	<u>Program</u>
M-H. Ulrich (Texas) D. Meier (Caltech)	Compact components in Bologna radio galaxies. (6 cm)
J. Broderick (VPI & SU) R. L. Brown E. Fomalont	Hot spots in strong, extended radio sources. (6 and 2 cm)
P. Crane	Extended components around bright compact sources. (6, 2, and 1.3 cm)
R. Ekers (Kapteyn Labs, Netherlands) C. Kotanyi (Kapteyn Labs, Netherlands) T. van der Hulst	Two weak ellipticals--NGC 3665 and NGC 4472. (6 cm)
R. Hjellming N. Vandenberg (Goddard)	Observe Nova Vulpecula 1976. (21, 6, and 2 cm)
K. Johnston (NRL) E. Greisen R. L. Brown R. Walker	Positions of OH/H <sub>2</sub> O maser regions associated with HII regions. (18 cm)
K. Johnston (NRL) G. Share (NRL)	Observations of x-ray QSO 0241+622. (6 and 2 cm)
M. Kundu (Maryland) P. Bowers	Search for emission from bright stars with optical evidence of coronal activity. (6 cm)
C. Kumar (Howard) K. Turner (DTM)	Search for supernova remnants in M31--first look. (21 and 6 cm)
R. Perley J. Scott (Maryland) A. Willis (Brandeis)	Observations of radio jets. (6 cm)
J. Stocke (UCLA) P. Crane	Survey of close pairs of galaxies at 21 cm.
T. van der Hulst	Six centimeter observations of the barred spiral NGC 5383.

In addition to these programs, a period of 12<sup>h</sup> was devoted to short observations of specific objects. The observations and the first stage of data

reductions were made by the NRAO staff for the observers. Included in this period were observations of III Zw2, for R. Hjellming and H. Schnopper (SAO); of the central component of Cygnus A, for R. Hobbs, S. Maran (both of Goddard) and M. Kafatos (George Mason); of 3C 446, for K. Johnston (NRL), A. Wolfe (Pittsburgh) and R. L. Brown; of 3C 111 and Cen A, for W. Graf (Stanford); and of 3C 21.53, for W. Erickson (Maryland), J. Rickard, W. Cronyn (both Iowa) and R. Perley. Observers are encouraged to submit requests for "quick-look" programs that can be scheduled in similar periods in subsequent quarters.

## ELECTRONICS DIVISION

### Charlottesville

A week-long seminar was held to review the Model IV autocorrelator receiver for representatives from MIT and from institutions in Canada and Sweden which are copying the receiver.

Our first VLBI Mark III record terminal is currently being modified to provide full record capability and automatic control and monitor capability. The terminal will be ready for use at the 140-foot telescope in January 1979.

Work has begun on cryogenic GaAs FET amplifiers at 600 and 1400 MHz. Work is continuing on improving the performance of the 3-mm varactor down-converter. Development of Nb point-contact Josephson junctions is also continuing. The improved 1-mm subharmonically-pumped mixer has been tested and a second mixer of this configuration is being assembled. A liquid helium dewar is being adapted to permit cryogenic tests of the 1-mm mixer. A theory is being developed for comparison of fundamental and subharmonically pumped mixers at 1 mm. Specifications have been developed and a request for proposal is being prepared for a series of millimeter wavelength Carcinotrons to cover 3 to 0.75 mm range.

### Green Bank

An improved 18-26 GHz maser has been installed on a 4 K refrigerator capable of cooling a 3-watt load, and is ready for the upconverters which will cover the 5-16 GHz frequency range. The 8.2-10.8 GHz upconverter has been fully tested at room temperature and cold tests are underway. AIL is having diode problems with the 12-16 GHz upconverter and delivery is very late. AIL has recently been awarded a further contract to develop an upconverter to cover 5-8 GHz.

The 300-1000 MHz receiver development is progressing. The dewar assembly has been started; an early prototype upconverter is being tested. The material for the new travelling box track for this receiver has been ordered.

The digital standard receiver has been interfaced with the DDP 116 computer at the 300 foot and has been fully tested. This backend is available for observer use for continuum work at the 300-foot telescope.