VLA UTILIZATION DECEMBER 1988

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
AA-95	Alexander, P. Pooley, G. Sopp, H.	MRAO MRAO MRAO	Circum-nuclear star formation in ultra-luminous galaxies.	2,6,20 and 90	10	10
AB-414	Becker, R. White, R.	Calif, Davis STScI	Monitoring the radio flux of HD193793 and P Cygni.	2 and 6	2	2
AB-456	Burke, B. Hewitt, J. Roberts, D.	MIT Haystack Obs. Brandeis	Time variation of 0957+561.	6	21	2.5
AB-492	Bloeman, J. Duric, N.	Leiden New Mexico	Study of 4 edge-on galaxies.	90	7	18.0
AB-512	Barthel, P. Coleman, P.	Kapteyn Lab. Kapteyn Lab.	Radio morphology of the BAL quasar PG1700+518.	2 and 6	15	8
AB-521	Bowers, P. Johnston, K. de Vegt, C.	NRL NRL Hamburg	Absolute positions and structure of circumstellar water masers.	1.3 cm line	12	24
AC-234	Chambers, K. Miley, G. van Breugel, W.	STScI Leiden Calif, Berkeley	Study of radio galaxies with z>2.	6 and 20	3	24
AC-242	Claussen, M. Bowers, P. Johnston, K. Gaume, R.	NRL NRL NRL NRL	Interferometric stokes polarimetry of the OH maser emission from late-type stars.	18 cm line	16	24
AC-243	Condon, J.	NRAO-CV	Compact components in nearby radio galaxies.	20	30	18
AD-188	Drake, S. Simon, T. Florkowski, D. Stencel, R. Bookbinder, J. Linsky, J.	SASC Hawaii USNO Colorado Colorado Colorado	Variability of emission in M Supergiant Alpha Ori.	2 and 6	21	2
AD-205	de Pater, I.	Calif, Berkeley	Jupiter at 327 MHz.	90	19,20	14
AD-222	de Pater, I. Gulkis, S. Romani, P. Atreya, S.	Calif, Berkeley JPL NASA/Goddard Michigan	Uranus.	6 and 20	26	8
AE-55	Ekers, R. Cowan, J. Sramek, R. Goss, W. Roberts, D.	Australia Telescope CFA Australia Telescope NRAO-VLA Oklahoma	Young SNR G25.52+0.22.	6,20 and 90	22	6
AF-151	Frail, D. Cordes, J. Hankins, T. Weisburg, J. Seaquist, E.	Toronto Cornell NMIMT/NRAO-VLA Carleton Toronto	Neutral hydrogen absorption measurements of distant pulsars in the inner galaxy.	20 cm line	9	8
AF-163	Feretti,L. Giovannini, G.	Bologna Bologna	Cluster radio galaxies of small size.	20	2	12
AF-168	Fruchter, A. Stinebring, D. Taylor, J. Goss, W.	Princeton Princeton Princeton NRAO-VLA	Eclipsing millisecond pulsar.	20 and 90	2,27	5
AG-255	Gwinn, C. Birkinshaw, M. Fiedler, R. Dennison, B. Simon, R.	CFA Harvard NRL NRL NRL	Search for host structures of extreme scattering events.	6 and 90	20	12
AH-293	Hanisch, R. Miley, G.	STScI Leiden	The rich x-ray cluster Abell 2256.	90	24	9
AH-295	Habing, H. Goss, W. Winnberg, A. van Langevelde, H.	Leiden NRAO-VLA Onsala Leiden	Monitoring galactic center OH/IR stars.	18 cm line	27	2
AH-329	Hughes, V. MacLeod, G.	Queens Univ. Queens Univ.	Star formation in very dense regions.	2,6 and 20	9	1.6
AH-335	Hewitt, J. Burke, B. Turner, E.	Haystack Obs. MIT Princeton	Variability in Einstein ring MG1131+0456.	2,3.5 and 6	15	5
AK-213	Kwok, S. Aaquist, O.	Calgary Calgary	Compact planetary nebulae.	2 and 6	17,18	20

VLA UTILIZATION DECEMBER 1988 (Cont.)

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
AM-227	Maccacaro, T. Gioia, I. Wolter, A. Stocke, J. Morris, S.	CFA CFA CFA Colorado Mt. Wilson	Extragalactic component of the extended medium sensitivity survey: an extension to the south.	6 cm	7	1.1
AM-250	Mangum, J. Wooten, A.	Virginia NRAO-CV	OH and H_2O masers in the pre-stellar condensations of DR21 (OH).	1.3 and 20 cm line	19	4
AM-252	Mollenhoff, C. Bender, R. Hummel, E.	Heidelberg Heidelberg NRAL	Dust-lane ellipticals.	20	28	5
AM-254	Mirabel, I. Sanders, D. Dickey, J. Kazes, I.	Caltech Caltech Minnesota Meudon	HI and OH in ultraluminous infrared galaxies.	18 and 20 cm line	10	48
AM-255	Mirabel, I. Sanders, D. Dickey, J. Kazes, I.	Caltech Caltech Minnesota Meudon	HI absorption and OH emission in the ultraluminous infrared radio galaxy PKS 1345+125.	18 and 20 cm line	2	6
AM-256	Migenes, V. Johnston, K. Wilson, T.	Pennsylvania NRL MPIR, Bonn	The kinematics of Orion-OMC-1.	1.3 cm line	1	6
AM-261	Moran, J. Rodriguez, L. Scalise, E.	CFA CFA CRAAM	Very luminous H_2O maser associated with GGD25.	1.3 cm line	2	2
AN-47	Neff, S. Hutchings, J. Gower, A.	NASA/Goddard Dominion Astro Obs Victoria	Radio evolution of high redshift radio quasars.	6 and 20	1	12.1
AN-48	Neff, S. Hutchings, J.	NASA/Goddard Dominion Astro Obs	Multiple nucleus active galaxies.	1.3,2,3.5 and 6	19,15	6
AO-84	O'Dea, C. Baum, S.	NFRA NFRA	Radio properties of giant galaxies in cooling flows.	90	29	17
AP-168	Pedlar, A. Anantharamaiah, K. Goss, W. van Gorkom, J. Ekers, R.	NRAL NRAO-VLA NRAO-VLA Columbia/NRAO-VLA Australia Telescope	Galactic center.	90	3	8
AR-190	Rafanelli, P. Marziani, P. Gregorini, L. Padrielli, L.	Padova Trieste Bologna Bologna	Nuclear environment of Seyfert galaxies.	6 and 20	26	4.9
AR-192	Rodriguez, L. Bastian, T.	CFA NRAO-VLA	Radio recombination line radiation from MWC 349.	3.6 cm line	31	12
AR-200	Reynolds, S.	North Carolina State	Small-scale structure in young supernova remnants.	90	29	8
AR-201	Rodriguez, L. Ho, P. Curiel, S. Torrelles, J. Canto, J.	CFA CFA UNAM IAA UNAM	Central source of the HH1-2 system.	20	18	10
AS-333	Sramek, R. Weiler, K. van der Hulst, J. Panagia, N.	CSIRO/NRAO-VLA NRL Westerbork STScI	Statistical properties of radio supernovae.	2,6 and 20	22,27, 29	9.9
AS-352	Smith, H. Fischer, J. Schwartz, P. Mozurkewich, D.	NRL NRL NRL NRL	Outflows from CO/IR selected IRAS sources.	6 and 20	5	10
AS-355	Sumi, D. Burns, J. Zhao, J.	Illinois New Mexico New Mexico	3C317, the central galaxy in the cooling flow cluster Abell 2052.	6,20 and 90	1	8
AT-94	Taylor, A. Seaquist, E. Kenyon, S.	Calgary Toronto CFA	Monitoring of the symbiotic stars Z And. and CH Cyg.	1.3,2,6 and 20	9	2
AV-153	van Breugel, W. McCarty, P. Spinrad, H.	Calif, Berkeley Calif, Berkeley Calif, Berkeley	High redshift radio galaxies with extended optical line emission.	6 and 20	4,22	21
AV-157	van Breugel, W. McCarthy, P. Lilly, S. Spinrad, H.	Calif, Berkeley Calif, Berkeley Hawaii Calif, Berkeley	Multifrequency observations of B2 "Jansky" radio sources.	3.5,6 and 20	16,26	16
AV-161	Velusamy, T.	TIFR	Jet, filaments and outer structure of the Crab nebula.	90	15	4 w/Move/Op

VLA UTILIZATION DECEMBER 1988 (Cont.)

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
AV-162	van Breugel, W.	Calif, Berkeley	Radio loud far-infrared galaxies.	20	8	13
	Shields, J.	Calif, Berkeley				
AW-193	White, S.	Maryland	Narrow-band flaring on red dwarf stars.	6 and 20	6,7	1.4
	Kundu, M.	Maryland				
	Jackson, P.	Maryland				
AW-230	Wrobel, J.	NMIMT	International monitoring of the Seyfert NGC 5548.	3.5	27	1
	Unger, S.	RGO				
AZ-39	Zhao, J.	New Mexico	Monitoring long-term flux-variations of Sgr A* at multi-wavelenghts.	1.3,2,3.5, 6,18,20	27	1
	Ekers, R.	Australia Telescope				
	Goss, W.	NRAO-VLA				
	Price, R.	New Mexico				
	Lo, K.	Illinois				
VH-43	Hough, D.	JPL	Survey of weak nuclei in double lobed quasars.	3.8 cm phased array VLB	17	13
	Zensus, A.	NRAO-VLA				
	Porcas, R.	MPIR, Bonn				
	Readhead, A.	Caltech				
		JPL Staff	Tests		9	2.9
		NRAO Staff	Electronics			49.5
			Operation			45.8
			Standard Field Observation			12.0
			Software			41.6
			Move/Op			0.2
			Holiday/Shutdown			36.9
			General Tests			49.7

The average downtime for the month of December 1988 was approximately 4.1 percent.

$$\text{Average downtime of operational antennas} = \frac{\text{Total number of antenna-hours of operational antennas lost due to hardware and software failures during scheduled observing}}{\text{Total number of antenna-hours of operational antennas scheduled}} \times 100$$

Where "antenna hours" definition is: An array consisting of N antennas operating for Y hours is defined to have YN antenna hours operation.

The array was scheduled 95.0 percent (709.1 hours) of the time: 65.2 percent (486.5 hours) to astronomical programs, 17.6 percent (131.6 hours) to scheduled test/calibration, and the remaining 12.2 percent (91.1 hours) went to scheduled maintenance.

The array was in the A configuration the entire month of December.

The total number of programs run for the month of December, 1988 was 49.

The following independent proposals shared simultaneous observing time (0.2 hours total simultaneous observing):

AV161/Move/Op 0.2

890104PDH/sm

VLA UTILIZATION NOVEMBER 1988

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
AA-73	Akujor, C.	Nigeria	PKS 0114 + 074.	6,20, and 90	23	4
AA-93	Alexander, P. Sopp, H. Pooley, G.	MRAO MRAO MRAO	Active nuclei in star-forming galaxies.	20	12	7
AA-96	Anantharamiah, K. Cornwell, T. Narayan, R.	NRAO/VLA NRAO/VLA Steward Obs.	Synthesis imaging of sources scatter-broadened through the solar wind.	2,3.5, 6 and 20	2,3,4, 5,6,11	12.0
AB-414	Becker, R. White, R.	Calif, Davis STScI	Monitoring the radio flux of HD193793 and P Cygni.	2 and 6	19	1.5
AB-440	Brown, R.	NRAO/CV	The extended structure of 0235+164.	18 and 20	5	2
AB-456	Burke, B. Hewitt, J. Roberts, D.	MIT Princeton Brandeis	Time variation of 0957+561.	6	18	2 w/VM101
AB-457	Brown, A. Bookbinder, J.	Colorado Colorado	Distance to the Taurus-Auriga star formation region.	6	11,14	12.7 w/VM101
AB-511	Baum, S. Chambers, K. Miley, G.	NFRA Johns Hopkins Leiden	A search for HI absorption in a radio galaxy at z=3.395.	90 cm line	10	12
AB-516	Brown, R.	NRAO/CV	Ionized gas in the z=0.473 absorption region toward 3C196.	3.5 and 6	2	12.5
AB-518	Baudry, A. Diamond, P.	Obs. Bordeaux NRAO/CV	Mapping the OH masers near the starburst nucleus of M82.	18 cm line	19	10 w/VU18
AB-537	Baudry, A. Brouillet, N. Henkel, C. Jacq, T.	Bordeaux Bordeaux MPIR, Bonn MPIR, Bonn	H_2O maser in M82.	1.3	12	1.5 w/VM101
AC-209	Cohen, R. Chapman, J. Saikia, D.	NRAL NRAL NRAL	Circumstellar masers.	1.3 and 18 cm line	22,25	9 w/VL54,VH46
AC-230	Cummins, N. Owen, F.	Maine NRAO/VLA	3C442.	90	15	8 w/VM100
AC-238	Cotton, W. Bridle, A. Perley, R. Carilli, C. Laing, R. Walker, C.	NRAO/CV NRAO/CV NRAO/VLA NRAO/VLA RGO NRAO/VLA	Hotspot complexes at 0"1 resolution.	3.6 cm 3 antenna VLB	25	24.0 w/VAH40
AC-239	Crane, P. Bash, F. Kaufman, M.	NRAO/VLA Texas Ohio State	Structure in the nucleus of M81.	20	9	12
AC-241	Campbell, B. Stocke, J.	New Mexico Colorado	Inner disk and jet structure in L1551 IRS 5.	1.3,2, 6 and 20	16	10
AD-188	Drake, S. Simon, T. Florkowski, D. Stencel, R. Bookbinder, J. Linsky, J.	SASC Hawaii USNO Colorado Colorado Colorado	Variability of emission in M Supergiant Alpha Ori.	2 and 6	22	4.5 w/VH46
AD-225	Diamond, P. Goss, W.	NRAO/CV NRAO/VLA	Magnetic field structure in the envelopes of supergiant stars.	18 cm line	21	4.1 w/VM100
AD-226	Durio, N. Gregory, P.	New Mexico British Columbia	Core-variable radio sources.	6 and 20	4	12
AF-166	Foster, R. Backer, D. Wolszczan, A.	Calif, Berkeley Calif, Berkeley Arecibo Obs.	Pulsar PSR 1951+32 in SNR CTB 80.	20	8	1.6
AF-168	Fruchter, A. Stinebring, D. Taylor, J. Goss, W.	Princeton Princeton Princeton NRAO/VLA	Eclipsing millisecond pulsar.	20 and 90	10,19 28	7
AG-276	Greenhill, L. Moran, J. Reid, M.	Harvard CFA CFA	HII regions with H_2O masers in M33.	1.3,2,3.6, 6 and 20	7	12
AH-295	Habing, H. Goss, W. Winnberg, A. van Langevelde, H.	Leiden NRAO/VLA Onsala Leiden	Monitoring galactic center OH/IR stars.	18 cm line	22	2 w/VL54
AH-328	Heflin, M. Lehar, J. Burke, B. Langston, G.	MIT MIT MIT NRL	Third image near 2016+112C.	1.3	28	4
AH-330	Hughes, V.	Queen's Univ.	Variability of HII regions in Cepheus A.	2,6, and 20	2	6
AH-334	Hewitt, J. Perley, R. Turner, E.	Haystack Obs. NRAO/VLA Princeton	The twin galaxies of the 0249-186 field.	20	29	4

VLA UTILIZATION NOVEMBER 1988 (Cont.)

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
AH-335	Hewitt, J. Burke, B. Turner, E.	Haystack Obs. MIT Princeton	Variability in MG1131+0456.	2,3.5, and 6	2	5
AH-337	Hankins, T. Horton, E.	NMIMT/NRAO-VLA Dartmouth	Measurements of the Crab pulsars average profile.	6 and 18	8	2.5
AJ-168	Jones, D. Gwinn, C. Linfield, R. Dewey, R. Davis, M.	JPL CFA JPL JPL Arecibo Obs.	VLBI astrometry of PSR 1937+214.	18 cm phased array VLB	13	9.8
AK-200	Keto, E. Carral, P. Welch, W. Reid, M. Ho, P.	Lawrence Livermore Calif, Berkeley Calif, Berkeley CFA Harvard	Structure of recombination line emission in ultracompact HII regions.	3.6 cm line	1	8.5
AK-211	Kapahi, V. Hough, D.	JPL JPL	Jets in misaligned quasars.	2 and 6	3	8
AL-150	Lestrade, J. Preston, R.	JPL JPL	Statistical properties of RSCVn stars.	6	12	0.6 w/VM101
AL-188	Langston, G. Heflin, M. Lehar, J. Burke, B. Lawrence, C.	NRL MIT MIT MIT Caltech	Variation of 2016+112, probable lens source.	2 and 6	13	2.6
AL-198	Lestrade, J. Preston, R.	JPL JPL	Astrometry of UX Ari, Sigma CrB.	6 single antenna VLB	26	13.5 w/AM241, AM249
AM-235	Masson, C. Keene, J.	Caltech Caltech	Search for dense gas around young stars.	1.3 cm line	20	2.8
AM-241	Miley, G. Chambers, K.	Leiden Johns Hopkins	A survey of ultra-steep spectrum Texas sources.	20	26-28 w/AM249,AL198,VAH40	48
AM-249	Miley, G. Chambers, K. Rottgering, H.	Leiden Johns Hopkins Leiden	A survey of ultra-steep spectrum parkes sources.	20	26-28 with AM241, AL198,VAH40	48
AM-256	Migenes, V. Johnston, K. Wilson, T.	Pennsylvania NRL MPIR, Bonn	The kinematice of Orion-OMC-1.	1.3 cm line	30	4.1
AM-260	Menten, K. Reid, M.	CFA CFA	Methanol masers in the NGC6334-F region.	1.3 cm line	10	4 w/Tests
AP-166	Pottasch, S. Zijlstra, A. Ratag, M. Bignell, R.	Kapteyn Lab. Kapteyn Lab. Kapteyn Lab. NRAO/VLA	Very young planetary nebulae.	2 and 6	6	3
AR-168	Rusk, R.	Toronto	Radio polarimetry of 1807+698 (3C371).	1.3,2, 6 and 18	25	4
AR-189	Rudy, D. Berge, G. Muhleman, D.	Calif, Los Angeles Caltech Caltech	Latitudinally varying brightness temperature on Mars.	6 and 20	5,6	22
AR-190	Rafanelli, P. Marziani, P. Gregorini, L. Padrielli, L.	Padova ISAS Bologna Bologna	Nuclear enviroment of Seyfert galaxies.	6 and 20	8,19	8.5 w/VU18
AR-191	Riley, J. Warner, P.	MRAO MRAO	The radio core of the largest-known quasar 4C74.26.	2,3.5, 6,20 and 90	16	2.5
AS-319	Simon, R. Fiedler, R. Dennison, B. Johnston, K. Spencer, J.	NRL NRL NRL NRL NRL	Extreme scattering events in the interstellar medium.	21 cm line	3,14, 17	4.5 w/VM100
AS-333	Sramek, R. Weiler, K. van der Hulst, J. Panagia, N.	CSIRO/NRAO-VLA NRL NFRA STScI	Statistical properties of radio supernovae.	2,6, and 20	18	2.3
AS-339	Sramek, R. Goss, W. Cowan, J.	CSIRO/NRAO-VLA NRAO/VLA Oklahoma	A search for radio emission from supernovae 1909A and 1970G in M101.	20	22	12 w/VL54
AS-355	Sumi, D. Burns, J. Zhao, J.	Illinois New Mexico New Mexico	3C317, the central galaxy in the cooling flow cluster Abell 2052.	6,20 and 90	30	8
AT-95	Terzian, Y. Bignell, R. van Gorkom, J. Phillips, T.	Cornell NRAO/VLA Columbia/NRAO-VLA Cornell	Angular expansion of planetary nebulae-Epoch II.	6	10	4
AT-98	Turner, J. Ho, P.	Calif, Los Angeles Harvard	Supernova remnants and supernovae in normal spiral galaxies.	6 cm line	18,19	7.5 w/VM101

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
AW-223	Wehrle, A. Crane, P.	Caltech NRAO/VLA	Bubbles in NGC 2992.	3.5 and 6	4,5 6	24
AW-228	Wrobel, J. Briggs, D. Bridle, A. Leahy, J. Walker, R. Laing, R.	NMIMT/NRAO-VLA NMIMT NRAO/CV NRAO/VLA NRAO/VLA RGO	Proper motions of a knot in the side-on jets of M84.	6	23	10 w/VH46
AW-230	Wrobel, J. Unger, S.	NMIMT RGO	Monitoring of the Seyfert NGC5548.	3.5	29	1
AY-22	Yun, M. Ho, P. Lo, K.	Harvard Harvard Illinois	HI synthesis mapping of M82.	21 cm line	7	8.5 w/tests
AZ-39	Zhao, J. Ekers, R. Goss, W. Price, R. Lo, K.	New Mexico CSIRO NRAO/VLA New Mexico Illinois	Monitoring long-term flux-variations of Sgr A at multi-wavelengths.	1.3,2,3.5, 6,18 and 20	7	1
AZ-40	Zlobeck, P. Messerotti, M. Dulk, G. Bastian, T. Bookbinder, J.	Trieste Obs. Trieste Obs. Colorado NRAO/VLA Colorado	High resolution studies of the Sun and Type I bursts.	90	8,12, 14	13.1 w/VM101,VP85
AZ-41	Zell, P. Fix, J.	Iowa Iowa	Polarization maps of two OH masers.	18 cm line	5	3
VA-19	Andre, P. Lestrade, J. Montmerle, T. Phillips, R. Mutel, R.	IRAM, Granada JPL CEN, Saclay Haystack Iowa	Magnetic B star near Rho Ophiuchi.	6 cm phased array MK III VLB	12	1.6 w/VM101
VAH-40	Kus, A. Porcas, R.	Copernicus Univ MPIR, Bonn	3C309.1	3.6 cm phased array VLB	26	9.0 w/AC238, AP241,AP249
VB-81	Bartel, N. Rogers, A. Shapiro, I.	CFA Haystack CFA	Expansion of SN1979C.	6 cm phased array MK III VLB	13	8
VC-51	Clegg, A. Cordes, J. Spangler, S.	Cornell Cornell Iowa	Angular brodening of extragalactic sources behind the supernova remnant CTA 1.	6 and 18 cm phased array MK III VLB	12,20	11.7 w/VM101
VF-18	Fanti, C. Spencer, R. Venturi, T. Schilizzi, R. Nan Rendong, W.	Bologna NRAL Bologna Dwingeloo	3C343, a source with an ambiguous structure.	18 cm phased array MK II VLB	21	21.3
VH-46	Hummel, C. Krichbaum, T. Quirreubach, A. Schalinski, C. Witzel, a.	NRAL MPIR, Bonn MPIR, Bonn MPIR, Bonn	S5-quasar 0836+71.	18 cm single dish VLB	22	14 w/AC209, AD188,AW228
VJ-49	Jones, D. Preston, R. Wehrle, A.	JPL JPL Caltech	Long-term evolution of NGC 6251.	18 cm phased array MK II VLB	19	18.3
VL-49	Lestrade, J. Boloh, L. Mutel, R. Niell, A. Preston, R.	JPL JPL Iowa Haystack JPL	15 RS CVn binaries - mapping and and astrometry.	6 cm phased array MK III VLB	16	10.6 w/VM100
VL-54	Langston, G. Porcas, R. Simon, R. Johnston, K. Browne, I.	NRL MPIR, Bonn NRL NRL NRAL	The curved luminous jet blazar 3C446.	18 cm single dish VLB	22	10 w/AS339, AH295,AC209
VM-100	Marscher, A. Rickett, B. Padrielli, L. Romney, J. Bartel, N.	Boston Calif, San Diego Bologna NRAO/CV CFA	VLBI observations of NRAO 140.	6 and 18 cm single dish VLB	15,17, 21	19.7 w/AC230, Tests,VL49, Startup, AS319,AD225
VM-101	McHardy, I. Marscher, A. Gear, W.	Oxford Boston Royal Obs.	Extremely variable quasar 1156+295.	6 and 18 cm single dish VLB	12,18	17.8 w/AB457, AB537,Tests, VS79,AT98,AZ40, AL150,VA19,AB456

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hs
VP-85	Pearson, T. Riley, J.	Caltech MRAO	The largest radio source associated with a quasar: 4C74.26.	6 cm MK II VLB w/AZ40	14 phased array single dish	4.4 3.1
VR-46	Roberts, D. Wardle, J. Cawthorne, T. Brown, L. Gabuzda, D. Holdaway, M. Kollgaard, R.	Brandeis Brandeis Brandeis Brandeis Brandeis Brandeis Brandeis	Linear polarization structures of the Pearson-Readhead sample.	6 cm phased array MK III VLB	15	12
VS-79	Spangler, S. Mutel, R. Fey, A. Cordes, J.	Iowa Iowa Iowa Cornell	Interstellar scattering in a region in Cygnus.	6 and 18 cm phased array MK III VLB	11,18	22.0 w/VM101
VU-18	Unwin, S. Davis, R.	Caltech NRAL	3C273 jet to a radius of 120 pc.	18 cm single dish VLB	19	13.2 w/AB518,AR190
		JPL Staff	Tests		30	5
			Voyager Tests		30	3.5
		NRAO Staff	Electronics			43.2
			Startup/Baseline/Pointing			27.4
			Software			32.2
			Calibrator Observations			0.0
			Holiday/Shutdown			26.1
			General Tests			52.1

The average downtime for the month of November 1988 was approximately 5.3 percent.

$$\text{Average downtime of operational antennas} = \frac{\text{Total number of antenna-hours of operational antennas lost due to hardware and software failures during scheduled observing}}{\text{Total number of antenna-hours of operational antennas scheduled}} \times 100$$

Where "antenna hours" definition is: An array consisting of N antennas operating for Y hours is defined to have YN antenna hours operation.

The array was scheduled 96.4 percent (695.9 hours) of the time: 75.6 percent (546.2 hours) to astronomical programs, 10.3 percent (74.3 hours) to scheduled test/calibration, and the remaining 10.4 percent (75.4 hours) went to scheduled maintenance.

The array was in the A configuration the entire month of November.

The total number of programs run for the month of November, 1988 was 72.

The following independent proposals shared simultaneous observing time (150.7 hours total simultaneous observing):

AL198/AM241/AM249	13.5	VM101/AL150	0.6
AM249/AM241	48.0	VM101/AT98	3.0
AM260/TESTS	0.9	VM101/AZ40	3.5
AY22/TESTS	1.3	VM101/TESTS	3.8
VAH40/AC238	3.3	VM101/VA19	0.2
VAH40/AM241/AM249	5.7	VM101/VS79	0.2
VH46/AC209	2.0	VP85/AZ40	3.1
VH46/AD188	4.5	VU18/AB518	9.4
VH46/AW228	7.5	VU18/AR190	3.8
VL54/AC209	4.0		
VL54/AH295	2.0		
VL54/AS339	4.0		
VM100/AD230	6.5		
VM100/AD225	4.0		
VM100/AS319	1.0		
VM100/STARTUP	2.1		
VM100/TESTS	5.7		
VM100/VL49	0.5		
VM101/AB456	2.0		
VM101/AB457	3.0		
VM101/AB537	0.6		

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VLA UTILIZATION OCTOBER 1988

Program	Observer	Affiliation	Program title	Bands cm	Obsv date	Sched hrs
AB-456	Burke, B. Hewitt, J. Roberts, D.	MIT Princeton Brandeis	Monitoring 0957+561.	6	27	2.5
AB-473	Burns, J. Gisler, G. Borovsky, J. Baker, D. Zeilik, M.	New Mexico Los Alamos Los Alamos NASA/Goddard New Mexico	VLA observations of the planet Mercury.	2 and 6	18	9
AB-489	Barvainis, R. Antonucci, R.	Haystack STScI	A new continuum component in radio quiet quasars.	1.3,2,6, and 20	9	12.5 w/AC238
AB-501	Benz, A. Catala, C. Praderie, F.	Inst Ast ETH Meudon Obs Meudon Obs	Search for radio emission in three Ae/Be Herbig stars.	3.6 and 6	7,27	9 w/Move/Op
AB-513	Becker, R. White, R. Helfand, D. Zoonematkermani, S.	Calif, Davis STScI Columbia Columbia	A search for stellar wind sources and ultracompact HII regions.	6 and 20	10	7.4 w/AB515
AB-515	Becker, R. Helfand, D. Zoonematkermani, S. White, R.	Calif, Davis Columbia Columbia STScI	Weak extended galactic sources.	6 and 20	10	7.4 w/AB513
AC-187	Campbell, B. Simon, M.	New Mexico SUNY	Outflow young stellar objects.	2 and 6	23	5
AC-224	Caillault, J. Patterson, J. Skillman, D.	Georgia Columbia NASA/Goddard	The radio light curve of V471 Tauri.	6 and 20	24	10
AC-233	Chlebowski, T. Churchwell, E.	Warsaw MPIR/Wisconsin	A search for radio continuum emission from massive, X-ray luminous O-Stars.	6	9	11 w/AC238
AC-236	Cordova, F. Hjellming, R.	Los Alamos NRAO-VLA	A coordinated, multi-wavelength campaign on Cygnus X-2 from X-ray to radio wavelengths.	2,3.6, 6 and 20	5,6, 7,8	21 w/Move/Op
AC-238	Cotton, W. Bridle, A. Perley, R. Carilli, C. Laing, R. Walker, C.	NRAO-CV NRAO-CV NRAO-VLA NRAO-VLA RGO NRAO-VLA	Hotspot complexes at 0"1 resolution.	3.6 cm 3 antenna VLB	9,16,22 23 tests,AC187,AC233; software,Move/Op, AD224,AG273;AF168, AM248,AM178,AT94, AW220,AW209,AW227	70.8 w/AB489;
AD-217	Drake, S. Caillault, J.	SASC Tech Georgia	Radio emission in the spotted BY Draconis stars.	6	8,12,17	23 w/Move/Op
AD-224	Drake, S. Bastian, T. Linsky, J.	SASC Tech NRAO-VLA Colorado	Helium-weak magnetic stars in Sco-Cen.	2,3.5, and 6	23,28	16 w/AC238
AE-59	Elvis, M. Bechtold, J.	CFA Arizona	Limits on Galaxy disk sizes at Z->0.5.	6 and 20	30	8
AF-168	Fruchter, A. Stinebring, D. Taylor, J. Goss, W.	Princeton Princeton Princeton NRAO-VLA	Observation of the eclipsing millisecond pulsar.	20 and 90	23,25, 27	7.5 w/AC238
AG-273	Ge, J. Owen, F.	NMIMT NRAO-VLA	Rotation measure in A1795.	3.6 w/AC238	8,10,11, 14,15,22	44
AH-295	Habing, H. Goss, W. Winnberg, A. van Langevelde, H.	Leiden Obs NRAO-VLA Onsala Leiden Obs	Monitoring galactic center OH/IR stars.	18 cm line	17	2.3
AH-301	Hjellming, R. Gehrz, R. Taylor, A. Seaquist, E.	NRAO-VLA Minnesota Calgary Toronto	Systemic observations of two new radio novae.	1.3,2, 3.6,6,and 20	24	6.5
AH-329	Hughes, V. MacLeod, G.	Queens Univ Queens Univ	Star formation in very dense regions.	2,6, and 20	29	10
AH-337	Hankins, T. Horton, E.	NMIMT Dartmouth	Measurements of the Crab pulsars average profile.	6 and 18	4,12, 18	16.9 w/Move/Op
AH-339	Haschick, A. Ho, P. Rodriguez, L.	Haystack CFA CFA	A new position determination for the H_2O Maser Associated with HH1-2.	1.3 cm line	30	4
AK-210	Kulkarni, S. Wolszczan, A. Middleditch, J. Backer, D. Fruchter, A.	Caltech Arecibo Los Alamos Calif, Berkeley Princeton	Astrometry of the pulsar in the Globular cluster M15.	20	11	7.5 w/Move/Op
AK-211	Kapahi, V. Hough, D.	JPL JPL	Jets in misaligned quasars.	2 and 6	30	2

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
AK-212	Kirkpatrick, H. Wilson, A. Heckman, T.	Maryland Maryland Maryland	Star formation and nuclear activity in Seyfert galaxies.	6 and 20	27	4
AL-146	Leahy, J. Perley, R.	NRAO-VLA NRAO-VLA	Bridges in nearby 3C sources.	20	7	1.5
AL-185	te Lintel Hekkert, P. Likkel, L. Zijlstra, A. Pottasch, S. Caswell, J. Habing, H.	Leiden Calif, Los Angeles Kapteyn Lab Kapteyn Lab CSIRO Leiden	OH and H_2O line observations of irregular OH/IR stars and young planetary nebulae.	1.3 and 18 cm line	30,31	9
AM-178	Mutel, R. Gopal-Krishna	Iowa TIFR	Compact double sources.	20 cm line	13,16 w/Move/Op	12 AC238
AM-238	Muhleman, D. Grossman, A. Thompson, T. Goldstein, R.	Caltech Caltech JPL JPL	Radar imaging of Mars.	3.5	21	10
AM-248	Menten, K. Walmsley, C. Schilke, P. Henkel, C. Wilson, T. Gaume, R. Johnston, K.	CFA MPIR, Bonn MPIR, Bonn MPIR, Bonn MPIR, Bonn NRL NRL	Methanol Masers.	1.3 cm line	22,26	10 w/AC238
AM-257	Mutel, R. Morris, D.	Iowa Iowa	RS CVn Stars: frequency dependence of polarization.	2,3.6,6 18 and 20 cm line	6,8, 14,20	27
AP-138	Pedlar, A. Anantharamaiah, K. van Gorkom, J. Ekers, R.	NRAL NRAO-VLA Columbia/NRAO-VLA CSIRO	Continuum and recombination lines towards the galactic center.	90 cm line	1	4.5
AR-182	Rodriguez, L. Hartmann, L.	CFA CFA	Radio continuum from FU Ori stars.	6	18,21	10.7
AR-193	Rodriguez, L. Mirabel, F. Roth, M.	CFA Caltech Chile	Positions of the H_2O and OH Masers possible associated with a peculiar triple source in Serpens.	1.3,20 cm line	21	2
AS-319	Simon, R. Fiedler, R. Dennison, B. Johnston, K. Spencer, J.	NRL NRL NRL/VPI NRL NRL	Extreme scattering events in the interstellar medium.	6,20 and 90	3,8,14 19,27	10
AS-331	Sahai, R. Claussen, M.	Chalmers NRL	The enigmatic radio source in IRC+10216.	1.3,2, 3.5	7	5
AS-348	Skinner, S. Bookbinder, J. Fleming, T. Linsky, J. Stocke, J.	Colorado CFA Arizona Colorado Colorado	The stellar component of the Einstein medium sensitivity survey: the lower main sequence.	6	17	10
AS-360	Schwartz, P. Johnston, K. deVegt, C.	NRL NRL Hamburger Sternwarte	Precise radio positions and flux densities of T Tau N and S.	2,6, and 20	6,29	12
AS-364	Singh, K. Westergaard, N.	TIFR DSRI	Simultaneous monitoring of radio and X-ray emission from Markarian 509.	6 and 20	7,14	6
AT-94	Taylor, A. Seaquist, E. Kenyon, S.	Calgary Toronto CFA	Continued monitoring of the Symbiotic stars Z and CH Cyg.	1.3,2, 6 and 20	16	8 w/AC238
AV-157	van Breugel, W. McCarthy, P. Lilly, S. Spinrad, H.	Calif, Berkeley Calif, Berkeley Hawaii Calif, Berkeley	Multifrequency observations of B2 "Jansky" radio sources.	3.5,6, and 20	29	8
AW-209	White, S. Kundu, M.	Maryland Maryland	Flare stars.	20 and 90	23,24	14.5 w/AC238
AW-220	Willson, R. Lang, K.	Tufts Tufts	Dynamic spectra bursts from active stars.	20 and 90 cm line	15	10 w/AC238
AW-227	White, S. Kundu, M. Agrawal, P.	Maryland Maryland TIFR	X-ray emitting dM stars.	6 and 20	22,23, 25	9.0 w/AC238
AW-229	Wilson, T. Henkel, C. Johnston, K.	MPIR, Bonn MPIR, Bonn NRL	Precise position and distribution of the NH_3 maser associated with W3(OH).	1.3 cm line	26	6
AY-27	Yusef-Zadeh, F.	NASA/Goddard	Orientation of the magnetic field near the galactic center.	3.5 and 6	2	7.5
VA-21	Alef, W. Preuss, E. Kellerman, K.	MPIR, Bonn MPIR, Bonn NRAO-CV	The core of 3C147.	3.6 cm phased array VLB	2	15.7

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
VAH-40	Kus, A. Porcas, R.	Copernicus Univ MPIR, Bonn	3C309.1	3.6 cm phased array VLB	1	11
VH-44	Hewitt, J. Bookbinder, J. Cappallo, R. Corey, B. Hinteregger, H. Lestrade, J. Lonsdale, C. Niell, A. Phillips, R. Preston, R.	Haystack CFA Haystack Haystack Haystack Paris Haystack JPL Haystack JPL	dMe Stars.	3.6 cm phased array MK III VLB	1	7
VP-86	Porcas, R.	MPIR, Bonn	3C179.	3.6 cm phased array VLB	1	16.5
		JPL	Tests		18,20	10.1
		NRAO Staff	Baselines/Startup/Pointing			41.4
			Electronics, etc.			56.5
			Move/Operations			88.7
			Software			43.5
			General Tests			60.8

The average downtime for the month of October 1988 was approximately 5.7 percent.

$$\text{Average downtime of operational antennas} = \frac{\text{Total number of antenna-hours of operational antennas lost due to hardware and software failures during scheduled observing}}{\text{Total number of antenna-hours of operational antennas scheduled}} \times 100$$

Where "antenna hours" definition is: An array consisting of N antennas operating for Y hours is defined to have YN antenna hours operation.

The array was scheduled 100 percent (747.1 hours) of the time: 63.4 percent (473.3 hours) to astronomical programs, 23.3 percent (173.8 hours) to scheduled test/calibration, and the remaining 13.4 percent (99.9 hours) went to scheduled maintenance.

The array was in the D configuration October 1-3.
A/D configuration October 3-12.
A configuration October 12 - October 31.

The total number of programs run for the month of October, 1988 was 49.

The following independent proposals shared simultaneous observing time (104.0 hours total simultaneous observing):

AB489/AC238	5.9
AB501/Move/Op	4.0
AB513/AB515	7.4
AC187/AC238	2.0
AC233/AC238	11.0
AC236/Move/Op	3.4
AD217/Move/Op	13.0
AD224/AC238	7.0
AF168/AC238	2.5
AG273/AC238	3.5
AH337/Move/Op	4.1
AK210/Move/Op	0.6
AM178/AC238	8.0
AM178/Move/Op	0.7
AM248/AC238	4.5
AT94/AC238	5.2
AW209/AC238	5.0
AW220/AC238	4.0
AW227/AC238	1.0
AW227/AC238	2.5
Move/Op/AC238	5.0
Software/AC238	0.1
Tests/AC238	3.5

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VLA UTILIZATION SEPTEMBER 1988

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
AA-87	Appleton, P. van Gorkom, J. Ghigo, F. Struck-Marcell, C.	Lancashire Polytechnic NRAO-VLA Minnesota Iowa State	A giant intergalactic HI bubble near Arp 143.	20 cm line	24,25	25.2 w/VL55
AA-88	Anantharamaiah, K.	NRAO-VLA	Anamolous motions of HI clouds.	20 cm line	7,17	12
AB-414	Becker, R. White, R.	Calif, Davis STScI	Monitoring the radio flux of the radio stars HD193793 and P cygni.	2 and 6 cm	27	2.5
AB-485	Brosch, N. Gondhalekar, P.	Wise Obs. Ruth.Appleton	Late-type dwarf galaxies in the Virgo cluster.	6 and 20 cm line	10	12
AB-491	Beck, R. Hummel, E. Loiseau, N. Berkhuijsen, E.	MPIR, Bonn NRAL MPIR, Bonn MPIR, Bonn	The magnetic field in M31.	20	7	12
AB-495	Bastian, T. Cornwell, T. Dulk, G.	NRAO-VLA NRAO-VLA Colorado	Temporal evolution of solar active regions.	6 and 20	3	11
AB-524	Bregman, J. McNamara, B. van Gorkom, J. O'Connell, R.	NRAO-CV Virginia NRAO-VLA Virginia	HI in cooling flow cluster A2151.	20 cm line	21,22	9.5 w/VL55, VM93
AC-207	Cornwell, T. Yusef-Zadeh, F.	NRAO-VLA NASA/Goddard	A unique HH object.	2, 6 and 20	9	10 w/Move/Op
AC-225	Churchwell, E. Wood, D.	Wisconsin Wisconsin	Systemic velocities and physical properties of ultracompact HII regions.	2 cm line	4	8
AD-188	Drake, S. Simon, T. Florkowski, D. Stencel, R. Bookbinder, J. Linsky, J.	SASC Tech Hawaii USNO Colorado CFA Colorado	Variability of emission in M supergiant Alpha Ori.	2 and 6	20	3.1
AD-217	Drake, S. Caillault, J.	SASC Tech Georgia	Radio emission in the spotted BY Draconis stars.	6	8	9
AD-223	Dickel, H. Goss, W. Wilson, T.	Illinois NRAO-VLA MPIR, Bonn	H66 recombination line emission from NGC 7538N.	1.3 cm line	1	7
AD-228	dePater, I. Palmer, P. Snyder, L.	Calif, Berkeley Columbia Illinois	Comet Machholz.	18	15,16 20	12.4
AE-53	Evans, N. Zhou, S. Mundy, L. Kutner, M.	Texas Texas Caltech RPI	NH3 observations of S140.	1.3 cm line	5	12
AG-145	Geldzahler, B. Swartz, P. Gear, W. Ade, P. Robson, E. Nolt, I. Smith, M.	NRL NRL Royal Obs. Queen Mary Coll Lancashire Poly Oregon Royal Obs.	Simultaneous multifrequency observations of blazars.	1.3,2,6, 20 and 90	5	1.5
AG-266	Garcia-Barreto, J.	UNAM	Search for radio continuum emission from NGC1022 and NGC1326.	2, 6 and 20 cm	19	6.5
AG-268	Garay, G. Mendez, R. Rodriguez, L. Murphy, D.	Chile Chile CFA/UNAM ESO	Hot ammonia toward IRAS compact HII regions.	1.3 cm line	18,19 20	17.5
AG-269	Ge, J. Owen, F.	NMIMT/NRAO-VLA NRAO-VLA	High faraday rotation in cooling flow clusters: 3C338.	3.6,6 and 20	12	4 w/Move/Op
AG-271	Gary, D. Zirin, H.	Caltech Caltech	High-resolution studies of the quiet sun.	3.5, 6	7,8	17
AH-293	Hanisch, R. Miley, G.	STScI STScI	The rich x-ray cluster Abell 2256.	20 and 90	2	8.5
AH-299	Helfand, D. Becker, R.	Columbia Calif, Davis	A 327 MHz survey of the galactic plane.	90	23,24	20 w/VM45,VL55
AH-309	Henning, P. Kerr, F.	Maryland Maryland	A study of a 21-cm selected sample of galaxies.	20 cm line	1	3.5
AH-310	Hogan, C. Partridge, B.	Arizona Haverford	Search for cosmic background fluctuations at 23 GHz.	1.3	11,13	25.6

VLA UTILIZATION SEPTEMBER 1988 (Cont.)

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
AH-324	Habbal, S. Gonzalez, R. Harvey, K.	CFA NRAO-VLA Solar Phys Res	Multiwavelength observations of solar activity.	6, 20 and 90	1,2,4	20.5
AJ-166	Johnston, K. Gaume, R. Wilson, T. Walmsley, C. Henkel, C. Schilke, R.	NRL NRL MPI MPI MPI MPI	Protostars in Orion: Formaldehyde emission.	2 cm line	11	10
AK-182	Kundu, M. Schmahl, E. White, S. Nitta, N.	Maryland Maryland Maryland Maryland	Coronal magnetic structures using VLA microwave observations.	2,8,6 and 20	13	6.5
AK-201	Krause, M. Beck, R. Hummel, E.	MPIR, Bonn MPIR, Bonn MPIR, Bonn	Polarization observations of IC 342 and M81.	6 and 20	21,22 23	39.2 w/VM93, VM45
AK-206	Kundu, M. White, S. Gopalswamy, N. Pick, M.	Maryland Maryland Maryland Paris	Simultaneous microwave and decimeter observations of solar activity.	20 and 90	12,17	17.0
AL-183	Linsky, J. Bookbinder, J. Doyle, J. Neff, J. Skinner, S.	Colorado Colorado Armagh Obs NASA/Goddard Colorado	Coordinated multiwavelength observations of the RS CVn system EI Eridani.	2,6 and 20	16,17, 18,19	13.5
AM-235	Masson, C. Keene, J.	Caltech Caltech	Search for dense gas around young stars.	1.3 cm line	4	7
AM-238	Muhleman, D. Grossman, A. Thompson, T. Goldstein, R.	Caltech Caltech JPL JPL	Radar imaging of Mars.	3.5	12	10.5
AM-240	Mangum, J. Wootten, H. Mundy, L.	Virginia NRAO-CV Caltech	A study of the Pre-stellar condensations in DR21(OH)	1.3 cm line	9	10
AM-245	Menten, K. Reid, M. Batrla, W.	CFA CFA Illinois	Methanol in the NGC 6334F region.	1.3 cm line	25,26	8.9 w/VC48
AR-185	Roelfsema, P. Goss, W.	NRAO-VLA NRAO-VLA	H, He and C 92 Alpha observations of W3.	3.5 cm line	6	8
AR-188	Roelfsema, P. Bastian, T. Anantharamaiah, K.	NRAO-VLA NRAO-VLA NRAO-VLA	Recombination lines from supernova Remnants.	20 cm line	1	6
AS-319	Simon, R. Fiedler, R. Dennison, B. Johnston, K. Spencer, J.	NRL NRL NRL/VPI NRL NRL	VLA observations of extreme scattering events in the interstellar medium.	1.3,2, 6 and 20 cm line	1,3,6, 11,17, 22,25, 29	14.6 w/VM93, VL55
AS-333	Sramek, R. Weiler, K. van der Hulst, J. Panagia, N.	CSIRO/NRAO-VLA NRL NFRA STScI	Statistical properties of radio supernovae.	2,6 and 20	15,16	7.9
AS-347	Schmelz, J. Gonzalez, R. Saba, J. Strong, K.	NASA/Goddard NRAO-VLA NASA/Goddard NASA/Goddard	Stereoscopic coronal structures observing campaign (SCoStOC).	6,20 and 90	26,28 29,30	19.1 w/VC48
AT-90	Taylor, A. Waters, L. Bjorkman, K. Persi, P.	Calgary LSR, Utrecht Colorado IAS	Radio survey of IRAS selected Be stars.	2	28,29	7
AU-34	Uson, J. Bagri, D.	Calif, Berkeley NRAO-VLA	Search for redshifted "21-cm" emission from Zel'dovich pancakes.	90 cm line	14,27	20.5
AV-134	Vanden Bout, P.	NRAO-CV	Compact HII regions in S88B.	6	5	2
AV-158	Viallefond, F. Zheng, X. Boulanger, F.	Meudon Obs CFA Caltech	Radio Continuum survey of M33 at 327 MHz.	90 cm	18	4
AW-217	White, S. Kundu, M. Schmahl, E. Nitta, N.	Maryland Maryland Maryland Maryland	Solar coronal bright points.	3.5,6 and 20	11	6.0
AY-24	Yusef-Zadeh, F. Palmer, P.	NASA/Goddard NRAO-VLA/Chicago	The Orion nebula.	2 and 6	5	10
AY-25	Yin, Q. Heeschen, D. Saslaw, W.	Peking NRAO-CV Virginia	Optically selected starburst galaxies.	1.3,2, 6 and 20	16,18	18.5

VLA UTILIZATION SEPTEMBER 1988 (Cont.)

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
AZ-37	Zhou, S. Evans, N. Mundy, L.	Texas Texas Caltech	Probing the collimating disk of NGC 2071 IRS.	1.3 and 6 cm line	2	10
VB-91	Bartel, N. Rupen, M. Shapiro, I. Strom, R. Foley, T. Preston, R.	CFA CFA CFA CFA CFA JPL	SN 1986J in NGC891.	3.6 cm phased array MK III VLB	28	13.7
VC-48	Claussen, M. Wilking, B. Wooten, H. Myers, P. Temeby, S. Vogel, S.	NRL Missouri NRAO-CV CFA Caltech Rensselaer Poly Inst	Water masers near 16293-2422.	1.3 cm single antenna VLB	26	4.2 w/AS347, AM245
VG-59	Greenhill, L. Moran, J. Reid, M. Gwinn, C. Hirabayashi, H. Downes, D. Genzel, R.	CFA CFA CFA CFA Tokyo Ast Obs IRAM MPIR, Bonn	Paralaxes to water masers in M31.	1.3 phased array MK III VLB	25,26	26.3 w/VL55
VH-44	Hewitt, J. Bookbinder, J. Cappallo, R. Corey, B. Hinteregger, H. Lestrade, J. Lonsdale, C. Niell, A. Phillips, R. Preston, R.	Haystack CFA Haystack Haystack Haystack Paris Haystack JPL Haystack JPL	dMe Stars.	3.6 cm phased array MK III VLB	30	7
VL-55	Lawrence, C. Readhead, A. Jones, D. Linfield, L. Preston, R. Schilizzi, R. Booth, R. Burke, B.	Caltech Caltech JPL JPL JPL Dwingeloo Onsala MIT	Strong source survey.	1.3 cm single antenna VLB	21,24, w/AB524,VN15, Tests, AA87, AH299, AS319, AM245, VC59	47.5
VM-93	Marr, J. Backer, D.	Calif, Berkeley Calif, Berkeley	NGC 1275.	1.3 cm single antenna VLB	22 w/Software, AS319,AB524, AK201	18.3
VN-15	Neff, S. Antonucci, R. Ulvestad, J.	NASA/Goddard NASA/Goddard JPL	NGC 1068.	1.3 cm phased array MK III VLB	21,22	2.3 w/VL55
VN-17	Niell, A. Lestrade, J. Lonsdale, C.	JPL Paris Haystack	AE Aquarii.	3.6 cm phased array MK III VLB	28	2.4
VP-87	Porcas, R.	MPIR, Bonn	Flat spectrum radiogalaxy 0831+557.	3.6 cm phased array MK III VLB	29	12.4
VW-45	Witzel, A. Schalinski, C. Johnston, K.	MPIR, Bonn MPIR, Bonn NRL	Monitoring superluminal 1928+738.	1.3 cm single antenna VLB	23 w/AK201, AH299,Tests	12.2
	JPL	Tests			15	7.6
	NRAO Staff		Baselines/Startup/Pointing Electronics/etc. Software General Tests Move/Operations			30.7 19.3 37.3 31.9 1.0

The average downtime for the month of September 1988 was approximately 4.6 percent.

$$\text{Average downtime of operational antennas} = \frac{\text{Total number of antenna-hours of operational antennas lost due to hardware and software failures during scheduled observing}}{\text{Total number of antenna-hours of operational antennas scheduled}} \times 100$$

Where "antenna hours" definition is: An array consisting of N antennas operating for Y hours is defined to have YN antenna hours operation.

The array was scheduled 100 percent (722.0 hours) of the time: 84.2 percent (607.7 hours) to astronomical programs, 8.0 percent (57.8 hours) to scheduled test/calibration, and the remaining 7.8 percent (56.5 hours) went to scheduled maintenance.

The array was in the D configuration the entire month of September.

The total number of programs run for the month of September, 1988 was 58.

The following independent proposals shared simultaneous observing time (87.4 hours total simultaneous observing):

AA87/VL55	25.2
AB524/VL55	4.8
AB524/VM93	4.0
AC207/Move	1.0
AG269/Move/Op	3.7
AH299/VL55	10.0
AH299/VW45	10.0
AK201/VM93	13.0
AK201/VW45	1.7
AM245/VC48	0.7
AM245/VL55	0.7
AS319/VL55	1.5
AS319/VM93	1.1
AS347/VC48	3.5
VL55/Tests	5.3
VM93/Software	0.2
VN15/VL55	0.4
VN15/VL55	0.2
VW45/Tests	0.5

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VLA UTILIZATION AUGUST 1988

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
AA-85	Alexander, P. Pooley, G. Sopp, H. Wynn-Williams, C. Green, D.	MRAO MRAO MRAO Hawaii DRAO	Dynamics of atomic and molecular gas in interacting galaxies.	20 cm line	26	5
AA-89	Anantharamaiah, K. Bagri, D.	NRAO-VLA NRAO-VLA	OD at 8 GHz.	3 cm line	3,25	4
AA-90	Anglada, G. Lopez, R. Estalella, R. Rodriguez, L.	Barcelona Barcelona Barcelona CFA	Variable radio sources associated with IRAS 16293-2422.	2	9,20	4
AA-91	Appleton, P. Joseph, R.	Iowa State Imperial College	HI in infrared active/inactive pairs.	20 cm line	5	8
AA-92	Appleton, P. Schombert, J. Hughes, D.	Iowa State Caltech Lancashire Polytech	HI plume associated with NGC 3628 in the Leo triplet of galaxies.	20 cm line	6	8
AA-94	Allen, R. Sukumar, S.	Illinois Illinois	Linearly polarized radio emission from NGC 891.	6	28	13
AB-414	Becker, R. White, R.	Calif, Davis STScI	Monitoring radio flux of the radio stars HD 193793 and P Cygni.	2 and 6	24	2
AB-470	Bosma, A. Athanassoula, E.	Obs Marseille Obs Marseille	A survey of warped and flaring HI disks.	20 cm line	12,14	15.8
AB-505	Beck. R. Klein, U.	MPIR, Bonn MPIR, Bonn	The magnetic field in M51.	18 and 20	27	12
AC-213	Curiel, S. Rodriguez, L. Canto, J.	UNAM CFA UNAM	Central source of double Herbig-Haro objects.	6	26	10
AC-225	Churchwell, E. Wood, D.	Wisconsin CFA	Systemic velocities and physical properties of ultracompact HII regions.	2 cm line	1,4	11.2
AC-227	Casertano, S. van Gorkom, J.	Groningen NRAO-VLA/Columbia	Late-type disk galaxies with extended HI envelopes.	20 cm line	1,7, 15,20	25.6
AD-188	Drake, S. Simon, T. Florkowski, D. Stencel, R. Bookbinder, J. Linsky, J.	SASC Tech Hawaii USNO Colorado CFA Colorado	Variability of emission in M supergiants: Alpha Ori, Alpha Sco A, and Alpha Her.	2 and 6	26	2.5
AD-215	de Jong, T. van den Broek, A. van Driel, W.	Amsterdam Amsterdam Amsterdam	Extreme IRAS galaxies.	6	8	3.5
AD-223	Dickel, H. Goss, W. Wilson, T.	Illinois NRAO/VLA MPIR, Bonn	H66 alpha recombination line emisssion from NGC 7538N.	1.3 cm line	29	7
AG-247	Garrington, S. Laing, R. Leahy, J. Conway, R.	NRAL RGO NRAO-VLA NRAL	Origin of depolarization asymmetry.	6	17	6 w/AZ31
AG-265	Goodman, A. Myers, P. Benson, P. Fuller, G.	CFA CFA Wellesley Calif, Berkeley	Ammonia observations of dense gas in low-mass cores.	1.3 cm line	13	16
AG-269	Ge, J. Owen, F.	NMIMT/NRAO-VLA NRAO-VLA	High faraday rotation in cooling flow clusters.	3.6,6 and 20	3	2.5
AG-270	Ge, J. Owen, F.	NMIMT/NRAO-VLA NRAO-VLA	3C84.	6	21	8
AH-284	Hollis, J. Michalitsianos, A. Kafatos, M.	NASA/Goddard NASA/Goddard George Mason	Survey for large-scale structure associated with symbolic star systems already showing small-scale radio structure.	6	15,19, 22	26
AH-306	Higgs, L. Landecker, T. Wendker, H.	DRAO DRAO Hamburg	Sources in Cygnus-X.	6,20 and 90	21	7
AH-309	Henning, P. Kerr, F.	Maryland Maryland	A HI selected sample of galaxies.	20 cm line	27,29 31	16.5
AH-319	Ho, P. Szczepanski, J.	Harvard MIT	Condensations in the G10.6-0.4 complex.	1.3 cm line	11	8
AH-320	Heaton, B. Macdonald, G.	Kent Kent	Compact ammonia cores in the bipolar outflow sources L 379 and IRS20188 + 3928.	1.3 cm line	23	6
AH-327	Ho, P. Jackson, J. Szczepanski, J. Armstrong, J.	Harvard Calif, Berkeley MIT Cologne	Warm ammonia toward the galactic center.	1.3 cm line	14	8

VLA UTILIZATION AUGUST 1988 (Cont.)

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
AI-35	Inoue, M. Perley, R. Carilli, C. Kato, T. Tabara, H. Aizu, K.	Nobeyama NRAO-VLA NRAO-VLA Utsunomiya Utsunomiya Rikkyo	High quality mapping of large faraday rotation source Hyd A.	2 and 6	14	8
AJ-162	Johnston, K. Pauls, T. Wilson, T.	NRL NRL MPIR, Bonn	Formaldehyde absorption toward Sgr A.	6 cm line	18	6
AK-197	Kim, D. van Gorkom, J. Knapp, G. Guhathakurta, P Walsh, D. Katz, N.	Calif, Los Angeles NRAO-VLA Princeton Princeton Princeton Princeton	Search for HI in six elliptical galaxies.	20 cm line	15,16	12
AK-209	Keto, E. Klein, R.	Livermore Lab Livermore Lab	The temperature structure of the star forming region W33.	1.3 cm line	5,6	13
AL-181	LaViolette, P.	Starburst	The compact feature near the southwestern tip of CTB 80.	2 and 6	25	5
AL-182	Little, L. Heaton, B.	Kent Kent	Ammonia distribution in GGD12-15.	1.3 cm line	22	5.5
AM-235	Masson, C. Keene, J.	Caltech Caltech	Search for dense gas around young stars.	1.3 cm line	9	7.2
AM-239	Mirabel, I. Ruiz, A. Rodriguez, L. Canto, J.	Puerto Rico Puerto Rico CFA UNAM	High velocity OH absorption toward selected outflow sources.	18 cm line	23,25	22
AM-244	Mundy, L. Blake, G.	Caltech Caltech	Ammonia in the Orion molecular ridge.	1.3 cm line	16,18	22
AM-245	Menten, K. Reid, M. Batrla, W.	CFA CFA Illinois	Methanol in the NGC 6334F region.	1.3 cm line	25	4
AM-246	Mauersberger, R. Wilson, T. Johnston, K. Pauls, T. Henkel, C. Walmsley, C. Schilke, R.	IRAM MPIR, Bonn NRL NRL MPIR, Bonn MPIR, Bonn MPIR, Bonn	Ammonia masers in W51.	1.3 cm line	20	5.5
AM-247	Menten, K. Walmsley, C. Schilke, P. Henkel, C. Wilson, T. Johnston, K. Pauls, T.	Smithsonian MPIR, Bonn MPIR, Bonn MPIR, Bonn MPIR, Bonn NRL NRL	Hot thermal methanol in orion.	1.3 cm line	20	9
AP-157	Pauls, T. Johnston, K. Wilson, T. Gaume, R.	NRL NRL MPIR, Bonn NRL	High density molecular clouds in the pre-collapse phase.	1.3 cm line	19	9
AP-163	Pottasch, S. Payne, H. Zijlstra, A. Bignell, C.	Kapteyn Lab NRAO/GB Kapteyn Lab NRAO-VLA	OH emission from very young planetary nebulae.	18 cm line	7	6
AP-164	Palmer, P. Yusef-Zadeh, F. Goss, W. Lasenby, A. Lasenby, J.	NRAO-VLA/Chicago NASA/Goddard NRAO-VLA Cambridge Cambridge	Continuum observations of SgrB1/SgrB2 complex of HII regions.	2,6 and 20	2	8
AR-167	Roeser, H. Perley, R. Hiltner, P. Meisenheimer, K.	MPIA, Heidelberg NRAO-VLA MPIA, Heidelberg MPIA, Heidelberg	Optically identified hotspots in classical double radio sources.	2,6 and 20	15	4
AR-173	Richards, P. Heaton, B.	Ruth.Appleton Kent	Ionized gas in IRAS compact molecular clouds.	2	22,24	3
AR-184	Roelfsema, P. Seaquist, E.	NRAO-VLA Toronto	Recombination lines in M82.	3.5 and 6 cm line	21	10
AS-319	Simon, A. Fiedler, R. Dennison, B. Johnston, K. Spencer, J.	NRL NRL NRL NRL NRL	Extreme scattering events.	2,4,6, 20 and 90 cm line	3,7,10, 15,19,22, 26	8

VLA UTILIZATION AUGUST 1988 (Cont.)

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
AS-325	Sukumar, S. Allen, R.	Illinois Illinois	NGC 5236 (M83).	20	29	6
AS-326	Sukumar, S. Allen, R.	Illinois Illinois	Edge on galaxy NGC 4565.	20	28	12.5
AS-333	Sramek, R. Weiler, K. van der Hulst, J. Panagia, N.	CSIRO/NRAO-VLA NRL NFRA STScI	Statistical properties of radio supernovae.	2,6 and 20	22	3
AS-334	Siemieniec, G. Urbanik, M. Beck, R. Hummel, E.	MPIR, Bonn Krakow MPIR, Bonn NRAL	The radio disk of NGC 3628.	20	13	9
AS-336	Simkin, S. van Gorkom, J.	Michigan State NRAO-VLA/Columbia	A search for very extended HI envelopes.	20 cm line	5,7,9	18.5
AS-341	Snell, R. Schloerb, F.	Massachusetts Massachusetts	Continuum emission from nearby giant molecular clouds.	6	2	7 w/Move/Op
AS-345	Shaw, M. Wilkinson, A.	Manchester Manchester	The radio properties of box/peanut galactic bulges.	20	22,24	6.1
AS-348	Skinner, S. Bookbinder, J. Fleming, T. Linsky, J. Stocke, J.	Colorado Colorado Arizona Colorado Colorado	The stellar component of the Einstein medium sensitivity survey: the lower main sequence.	6	1,5	9 w/Move/Op
AT-96	Turner, J. Ho, P.	Calif, Los Angeles Harvard	Star formation in the spiral arms of IC342.	2	26	12
AU-34	Uson, J. Bagri, D.	NRAO-VLA NRAO-VLA	Search for redshifted "21-cm" emission from Zel'dovich pancakes.	90 cm line	4,6,8, 10,12	47.9
AU-35	Ulvestad, J.	JPL	Thermal emission from Markarian 231.	2	8,9	5.1
AW-173	Wilking, B. Mundy, L. Howe, J.	Missouri Caltech Texas	A survey of cold IRAS sources.	2	3	1
AZ-31	Zhao, J. Burns, J. Owen, F.	New Mexico New Mexico NRAO-VLA	Extensive observations of turbulent radio jets in cluster galaxies.	6 and 20	17,19	11 w/AG247
		JPL	Tests		16,30	7.1
	NRAO Staff		Baselines/Startup/Pointing			45.4
			Electronics/etc.			57.4
			Software			48.6
			General Tests			30.3
			ModComp Maint			19.5
			Move/Operations			13.6

The average downtime for the month of August 1988 was approximately 7.26 percent.

$$\text{Average downtime of operational antennas} = \frac{\text{Total number of antenna-hours of operational antennas lost due to hardware and software failures during scheduled observing}}{\text{Total number of antenna-hours of operational antennas scheduled}} \times 100$$

Where "antenna hours" definition is: An array consisting of N antennas operating for Y hours is defined to have YN antenna hours operation.

The array was scheduled 100 percent (746.1 hours) of the time: 72.1 percent (538.1 hours) to astronomical programs, 11.1 percent (82.5 hours) to scheduled test/calibration, and the remaining 16.8 percent (125.5 hours) went to scheduled maintenance.

The array was in the D configuration the entire month of August.

The total number of programs run for the month of August, 1988 was 57.

The following independent proposals shared simultaneous observing time (19.6 hours total simultaneous observing):

AG247/AZ31	6.0
AS341/Move/Op	6.8
AS348/Move/Op	6.8

880902PDH/ap

VLA UTILIZATION JULY 1988

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
AA-88	Anantharamaiah, K.	NRAO-VLA	Anamolous motions of HI clouds.	20 cm line	14,27	5
AA-89	Anantharamaiah, K. Bagri, D.	NRAO-VLA NRAO-VLA	OD at 8 GHz.	3 cm line	7,29	4
AA-90	Anglada, G. Lopez, R. Estalella, R. Rodriguez, L.	Barcelona Barcelona Barcelona CFA	Variable radio source associated with IRAS 16293-2422.	2	16	2
AA-91	Appleton, P. Joseph, R.	Iowa State Imperial Coll.	Testing the triggering mechanism of starburst galaxies: mapping the HI in infrared active/inactive pairs.	20 cm line	31	8.5
AA-93	Alexander, P. Sopp, H. Pooley, G.	MRAO MRAO MRAO	Systematic study of active nuclei in star forming galaxies.	6 and 20	22	6
AB-414	Becker, R. White, R.	Calif, Davis STScI	Monitoring radio flux of HD 193793 and P Cygni.	2 and 6	6,29	3.5
AB-493	Bregman, J. van Gorkom, J.	NRAO-CV NRAO-VLA	HI imaging of the cooling flow elliptical NGC 4406.	21 cm line	16,17	16
AB-498	Braun, R. Hester, J. Cox, D. Raymond, J.	NRAO-VLA Caltech Wisconsin CFA	Direct measurement of magnetic field strength and relativistic ion fractions in SNR's.	4	24	8
AB-499	Bothun, G. van Gorkom, J. Bagri, D. Impey, C.	Michigan NRAO-VLA NRAO-VLA Steward Obs	HI imaging of the low surface brightness galaxy Malin 1.	20 cm line	11,18	16.1
AB-502	Baum, S. Bridle, A. Heckman, T. Miley, G. van Breugel, W.	NFRA NRAO-CV Maryland STScI Calif, Berkeley	Large scale structure of 3C98.	6	22	2
AB-503	Briggs, F. Garwood, R.	Pittsburgh Pittsburgh	The disturbed HI of NGC 772.	20 cm line	7	6
AB-506	Bally, J. Thronson, H.	Bell Labs Wyoming	Survey of IRAS selected SO galaxies.	3.5 and 6	11,12	5
AB-507	Balkowski, C. Cayatte, V. Chamaraux, P.	Meudon Meudon Meudon	A large HI cloud surrounding NGC 399.	20 cm line	30,31	12
AB-508	Bastian, T. Anantharamaiah, K. Roelfsema, P. van Gorkom, J.	NRAO-VLA NRAO-VLA NRAO-VLA NRAO-VLA	Search for recombination line radiation from the symbiotic binary H1-36.	2 and 3.6 cm line	20	5
AC-223	Cordova, F. Hjellming, R. Mason, K. Middleditch, J.	Los Alamos NRAO-VLA Mullard Space Sci Lab Los Alamos	A potential "Ghost" SNR and filaments associated with PSR 0656+14 and the Gem-Mon SN remnant.	6 and 21 cm line	12	9 w/Software
AC-225	Churchwell, E. Wood, D.	Wisconsin Wisconsin	Systemic velocities and physical properties of ultracompact HII regions.	2 cm line	31	5
AC-226	Carilli, C. van Gorkom, J. Stocke, J.	NRAO-VLA NRAO-VLA Colorado	HI imaging of quasar galaxy pairs: 3C232.	20 cm line	1	5
AC-230	Comins, N. Owen, F.	Maine NRAO-VLA	3C442.	90	28	2
AC-231	Claussen, M. Gaume, R. Johnston, K. Wilson, T.	NRL NRL NRL MPIR, Bonn	The W3 (Continuum) star forming region.	1.3,2 and 6 cm line	16,21	17
AD-188	Drake, S. Simon, T. Florkowski, D. Stencel, R. Bookbinder, J. Linsky, J.	SASC Tech Hawaii USNO Colorado Colorado Colorado	Variability of emission in M Supergiant Alpha Ori.	2 and 6	21	3
AD-201	de Muizon, M. Braun, R. Oort, M. Roland, J.	Leiden NRAO-VLA Leiden Leiden	SNR G70.7+1.2.	2, 6 and 20	27	1.5
AD-204	Duric, N. Dittmar, M. Crane, P.	New Mexico New Mexico NRAO-VLA	Multi-frequency, scaled array study of 4 normal spiral galaxies.	2	10	15
AF-156	Fich, M. Taylor, A.	Waterloo Calgary	Survey of discrete sources in the outer Galactic Plane.	6	20	2.5

VLA UTILIZATION JULY 1988 (Cont.)

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
AG-145	Geldzahler, B.	NRL	Simultaneous multifrequency observations of blazars.	1.3,2,6, 20 and 90	20	1
	Schwartz, P.	NRL				
	Gear, W.	Royal Obs				
	Ade, P.	Queen Mary Coll				
	Robson, E.	Lancashire Poly				
	Nolt, I.	Oregon				
	Smith, M.	Royal Obs				
AG-256	Green, D.	DRAO	Radio filaments in the Cygnus Loop and G84.2-0.8.	6	29	5
AG-259	Goss, W.	NRAO-VLA	Recombination lines from the external galaxy NGC 253.	6 and 20 cm line	1	8
	Anantharamaiah, K.	NRAO-VLA				
AG-264	Gavazzi, G.	IFC/CNR	Disruption of spiral disks in the cluster A1367.	20 cm line	25	4
	Dickey, J.	Minnesota				
AG-269	Ge, J.	NMIMT/NRAO-VLA	High Faraday rotation in cooling flow clusters.	3.6,6 and 20	3	10
	Owen, F.	NRAO-VLA				
AH-307	Harnett, J.	MPIR, Bonn	The magnetic field in NGC 6946.	18 and 20	25	12
	Beck, R.	MPIR, Bonn				
	Buczilowski, U.	MPIR, Bonn				
AH-314	Hummel, E.	NRAL	The magnetic field structure in NGC 877, 2076, 6907 and NGC 7331.	6	5,9	24.5
	Harnett, J.	MPIR, Bonn				
	Beck, R.	MPIR, Bonn				
AH-322	Hummel, E.	NRAL	Radio emission from edge-on spiral galaxies.	6	8,9, 13	17.5
	Beck, R.	MPIR, Bonn				
	Krause, M.	MPIR, Bonn				
AH-326	Ho, P.	Harvard	Extragalactic ammonia emission.	1.3 cm line	18,19	20.5
	Martin, R.	Steward Obs				
	Turner, J.	Calif, Los Angeles				
	Jackson, J.	Calif, Berkeley				
AI-34	Irwin, J.	Toronto	Radio continuum observations of NGC 4388 and NGC 5775.	6	15	12
	Seaquist, E.	Toronto				
AJ-165	Jackson, J.	Calif, Berkeley	Ammonia in the circumstellar disk around NGC 6334 I.	1.3 cm line	28,30	8
	Ho, P.	Harvard				
AK-198	Knapp, G.	Princeton	HI distribution in the circumstellar envelope of Mira (o Ceti).	20 cm line	28,29	16
	van Dishoeck, E.	Princeton				
	Bowers, P.	NRL				
AK-199	Kassim, N.	NRL	SNR candidates from the Clark Lake Galactic Plane Survey.	20 and 90	23	10
	Erickson, W.	Maryland				
	Weiler, K.	NRL				
AK-205	Kirkpatrick, H.	Maryland	Comparison of star forming rates in Seyfert and normal galaxies.	20	2,4,5,7	23.5
	Wilson, A.	Maryland				
	Heckman, T.	Maryland				
AL-180	Lizano, S.	Calif, Berkeley	The high velocity neutral stellar wind in HH7-11.	20 cm line	8,15	13
	Shu, F.	Calif, Berkeley				
	Rodriguez, L.	CFA				
	Mirabel, I.	Puerto Rico				
AM-242	Meaburn, J.	Manchester	Interlocking giant shells in the local group dwarf galaxy IC 1613.	6	12	4.5
	Pedlar, A.	NRAL				
	Hummel, E.	NRAL				
	Clayton, C.	Inst Ast, Cambridge				
AM-243	Morris, M.	Calif, Los Angeles	Recombination line observations of the radio streamers near Sgr A.	6 cm line	5,7	15.5
	Yusef-Zadeh, F.	NASA/Goddard				
AP-155	Paczynski, B.	Princeton	Search for CO emission from the quasars at z = 4.	1.3 cm line	11,17	13.5
	van Gorkom, J.	NRAO-VLA				
	Bally, J.	Bell Labs				
AR-168	Rusk, R.	Toronto	Radio polarimetry of 1807+698 (3C371).	6 and 18	15	2
AR-180	Rudnick, L.	Minnesota	Large-scale shock structures driven by the jets of SS433.	20	22	10
	Anderson, M.	Minnesota				
AR-181	Riley, J.	MRAO	Radio structure of 4C 74.26 - the largest-known quasar.	20 and 90	31	4.5
	Warner, P.	MRAO				
AR-186	Rodriguez, L.	CFA	The bipolar HII region NGC 6334(A).	6 and 20 cm line	6,8	8
	Moran, J.	CFA				
	Canto, J.	UNAM				
AR-187	Reipurth, B.	ESO-Chile	Radio continuum from the luminous Herbig-Haro objects 80 and 81.	6	17	3
	Rodriguez, L.	CFA				
AS-319	Simon, A.	NRL	Extreme scattering events.	2,4,6, 20 and 90 cm line	26	1
	Fiedler, R.	NRL				
	Dennison, B.	NRL				
	Johnston, K.	NRL				
	Spencer, J.	NRL				
AS-328	Singh, K.	TIFR	Survey of a compact group of galaxies: 2A0335+096.	20	23	2
	Patnaik, A.	TIFR				
AS-329	Subrahmanyan, R.	TIFR	Continuum observations of Orion A and Orion B.	90	14	8
	Gopal-Krishna	TIFR				
	Swarup, G.	TIFR				

VLA UTILIZATION JULY 1988 (Cont.)

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
AS-333	Sramek, R. Weiler, K. van der Hulst, J. Panagia, N.	NRAO-VLA NRL SRZM STScI	Statistical properties of radio supernovae.	2,6 and 20	23	3
AS-342	Schneider, S. Young, J.	Massachusetts Massachusetts	An HI study of IC 356.	20 cm line	25	5.5
AS-343	Schneider, S. Hacking, P.	Massachusetts IPAC	A high-galactic latitude cirrus cloud.	20	28	1
AT-90	Taylor, A. Waters, L. Bjorkman, K. Persi, P.	Calgary LSR, Utrecht Colorado IAS	Radio survey of IRAS selected Be stars.	2 and 3.5	2	8
AT-92	Torrelles, J. Ho, P. Szczepanski, J. Rodriguez, L. Canto, J.	Inst Ast Andalucia Harvard MIT CFA UNAM	MONR2: A shell-like high density structure produced by the pressure of the supersonic outflow.	1.3 cm line	3	10
AU-34	Uson, J. Bagri, D.	NRAO-VLA NRAO-VLA	Search for redshifted 21 cm emission from Zel'dovich pancakes.	90 cm line	4,22,24, 29,30	57.5
AV-159	van Gorkom, J. Hibbard, J.	NRAO-VLA NRAO-VLA	The riddle of NGC 4438.	20 cm line	2	8
AW-211	Williams, B. van Gorkom, J.	Delaware NRAO-VLA	HI synthesis of three compact groups of galaxies: HCG 44.	20 cm line	23	8.5
AY-26	Yun, M. Ho, P. Lo, K.	Harvard Harvard Illinois	HI synthesis mapping of M82.	21 cm line	17	4.5
AY-27	Yusef-Zadeh, F.	NASA/Goddard	Orientation of the magnetic field near the galactic center.	3.5 and 6	5	8
AY-28	Yusef-Zadeh, F. Morris, M. van Gorkom, J.	NASA/Goddard Calif, Los Angeles NRAO-VLA	Recombination line emission from G0.15-0.05.	2	13	6.5
	Students		Summer school student exercise.		16	4
		JPL	Voyager telemetry	4 cm	12,14,19,21	30.9
			Standard Field Observation		9	12
	NRAO Staff		Baselines/Startup/Pointing			49.1
			Electronics/etc.			49.4
			Software			47.1
			General Tests			74.8
			Move/Operations			0.1

The average downtime for the month of July 1988 was approximately 10.49 percent.

$$\text{Average downtime of operational antennas} = \frac{\text{Total number of antenna-hours of operational antennas lost due to hardware and software failures during scheduled observing}}{\text{Total number of antenna-hours of operational antennas scheduled}} \times 100$$

Where "antenna hours" definition is: An array consisting of N antennas operating for Y hours is defined to have YN antenna hours operation.

The array was scheduled 100 percent (746.0 hours) of the time: 70.7 percent (527.1 hours) to astronomical programs, 16.6 percent (123.9 hours) to scheduled test/calibration, and the remaining 12.7 percent (95 hours) went to scheduled maintenance.

The array was in the D configuration the entire month of July.

The total number of programs run for the month of July, 1988 was 60.

The following independent proposals shared simultaneous observing time (3.0 hours total simultaneous observing):

AC223/Software 3.0

880817PDH/ap

VLA UTILIZATION JUNE 1988

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
AA-86	Arnal, E. Dubner, G. Braun, R. Goss, W.	Ins. Argentino Radio IAFE, Argentina NRAO-VLA NRAO-VLA	HI observations of the SNR Puppis A.	20 cm line	10,12, 13,14	19.6 w/VM98, VW42,VS75
AB-414	Becker, R. White, R.	Calif, Davis STScI	Monitoring radio flux of HD 193793 and P Cygni.	2 and 6	19	2
AB-462	Bandiera, R. Brinks, E.	Arcetri RGO	The optical knots in Kepler's SNR.	2	5	1
AB-482	Bookbinder, J. Linsky, J.	Colorado Colorado	Search for radio emission from K dwarfs.	6	1,3,27	9
AB-486	Bertola, F. Huchtmeier, W. Zeilinger, W.	Padova, Italy MPIR, Bonn Wien, Austria	HI mapping of AM 2209-251.	20 cm line	5,7,8	13.1 w/VC50
AB-497	Bastien, T. Bookbinder, J. Linsky, J. Merryfield, W.	NRAO-VLA Colorado Colorado Colorado	Radio and ultraviolet observations of AE Aquarii.	1.3,2, 3.6 and 6	1,2	17.1
AC-220	Crampton, D. Gower, A. Cowley, A.	DAO Victoria Arizona	Survey of an optical cluster of quasars.	20	23	1
AC-221	Carignan, C. Puche, D.	Montreal Montreal	HI studies of the Sculptor group galaxies NGC 55 and NGC 300.	20 cm line	4,5,10, 14,16,20	36.5 w/VM98
AC-227	Casertano, S. van Gorkom, J.	Groningen Princeton/NRAO-VLA	Study of late-type disk galaxies with extended HI envelopes.	20 cm line	25,26	17
AC-232	Cordova, F. Hjellming, R.	LANL NRAO-VLA	Coordinated, multi-wavelength campaign on Cygnus X-2 from X-ray to radio.	2,3.6, 6 and 20	10,11, 12,13	16.2 w/VW42, VH42,VC50,VS75
AD-188	Drake, S. Simon, T. Florkowski, D. Stencel, R. Bookbinder, J. Linsky, J.	SASC Tech Hawaii USNO Colorado Colorado Colorado	Variability of emission in M Supergiant Alpha Ori.	2 and 6	10	2.5 w/VM98
AD-215	de Jong, T. van den Broek, A. van Driel, W.	Amsterdam Amsterdam Amsterdam	Southern extreme IRAS galaxies.	6	4,5,8, 13,26	12.4
AD-216	Dickel, H. Goss, W.	Illinois NRAO-VLA	Mapping of H2CO absorption and H76-alpha emission towards component A in NGC 6334.	2 cm line	15,23	14
AD-218	Dahlem, M. Klein, U. Mebold, U. Wielebinski, R. Dettmar, R.	Univ, Bonn Univ, Bonn Univ, Bonn MPIR, Bonn Univ, Bonn	Linear polarization and HI observations of peculiar filaments in NGC 1808.	20 cm line	4,5,8	11 w/VC50
AD-220	Dubner, G. Arnal, E. Winkler, F. Goss, W.	IAFE, Argentina Inst. Argentino Radio Middlebury Coll. NRAO-VLA	The SNR Puppis A.	20	5,8	8.1 w/VA18, VC50
AG-145	Geldzahler, B. Schwartz, P. Gear, W. Ade, P. Robson, E. Nolt, I. Smith, M.	NRL NRL Royal Obs Queen Mary Coll Lancashire Poly Oregon Royal Obs	Simultaneous multifrequency observations of blazars.	1.3,2,6, 20 and 90	6,10,12	4.9 w/VM98,VW42
AG-260	Guhathakurta, P. Kim, D. Jura, M. van Gorkom, J. Knapp, G.	Princeton Calif, Los Angeles Calif, Los Angeles Princeton/NRAO-VLA Princeton	HI in the interacting elliptical galaxy NGC 5018.	20 cm line	4,14,21, 25,26	26
AH-292	Hughes, V. MacLeod, G.	Queen's Univ Queen's Univ	Star formation in very dense regions.	6 and 20	25	2
AH-299	Helfand, D. Becker, R.	Columbia Calif, Davis	Survey of the Galactic Plane.	90	20,22,24	24.5
AH-301	Hjellming, R. Gehrz, R. Taylor, A. Seaquist, E.	NRAO-VLA Minnesota Calgary Toronto	Systematic observations of two new radio novae.	1.3,2,3.6, 6 and 20	24	3.5
AH-305	Ho, P. Szczepanski, J. Pyne, E. Jackson, J. Armstrong, J.	Harvard MIT Harvard Calif, Berkeley Cologne	NH3 condensations in the neutral ring around the galactic center.	1.3 cm line	14,16,17	27
AH-316	Hjellming, R. Han, X. Johnston, K.	NRAO-VLA NRAO-VLA NRL	Phase dependence of radio spectra of X-ray binaries.	1.3,2,3.6, 6,18 and 20	4,24	4.5

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
AH-318	Higdon, J.	Texas	Neutral hydrogen observations of the Cartwheel Ring galaxy.	20 cm line	17,18	9
AL-156	Lind, K. van Breugel, W.	NRAO-CV Calif, Berkeley	Further observations of an edge-brightened jet in PKS 0623-206.	6	17	8
AL-171	Lang, K. Willson, R. Trottet, G.	Meudon/Tufts Tufts Meudon	Simultaneous VLA-Nancay radioheliograph observations of the sun.	90	3,8,12, 19,24	18.5 w/VC50, VW42
AL-176	Langston, G.	MPIR, Bonn	Ring source at 30 degrees galactic latitude.	2,6 and 20	2	1.4
AL-177	Langston, G. Burke, B. Conners, S. Heflin, M. Lehar, J.	MPIR, Bonn MIT MIT MIT MIT	Highly variable radio sources detected in the MG 5 GHz survey.	6	2	4.5
AM-233	Muhleman, D. Grossman, A. Goldstein, R.	Caltech Caltech JPL	Radar echos from Saturn's rings.	3.5 cm line	19,25	14.5
AO-81	Odenwald, S.	NRL	Unusual filaments in FIR-21: a galactic center HII region?	1.3,2 and 6	26	2
AR-164	Rodriguez, L. Gomez, Y. Garcia-Barreto, J. Garay, G. Moran, J.	UNAM UNAM UNAM Chile CFA	Density distance of NGC 6302.	6 cm line	9	4.6
AR-166	Roeser, H.-J. Perley, R. Meisenheimer, K.	MPIA, Heidelberg NRAO-VLA MPIA, Heidelberg	Hotspots, jet and lobes of Pictor A.	90	24	3.5
AR-179	Richter, O. van Gorkom, J. Ferguson, H.	STScI Princeton/NRAO-VLA Johns Hopkins	HI survey of the Hydra I cluster of galaxies.	20 cm line	18,19, 20,24	28
AS-327	Stewart, R. Slee, O. Dulk, G. McKean, M. Bastian, T. Large, M. Robinson, R.	CSIRO CSIRO Colorado Colorado NRAO-VLA Sydney Anglo-Aust. Obs	Spectra of active southern stars.	2,6,18, 20 and 90	30	10.5
AS-333	Sramek, R. Weiler, K. van der Hulst, J. Panagia, N.	NRAO-VLA NRL SRZM STScI	Statistical properties of radio supernovae.	2,6 and 20	11,14	6.5
AW-213	Wootten, H. Mangum, J.	NRAO-CV Virginia	Study of the pre-stellar condensations in Rho Ophiuchi.	1.3 cm line	8,10,11 w/VA18,VM98,VC50	21
AW-214	Wootten, H. Butner, H. Loren, R.	NRAO-CV Texas Texas	Structure of a dense star-forming core.	2 cm line	5	7
AW-215	Wootten, H. Mundy, L. Wilking, B.	NRAO-CV Caltech Missouri	The star-forming center of a proto-stellar disk.	1.3 cm line	6	7
AW-218	Walter, F. Brown, A. Gibson, D. Stern, R.	Colorado Colorado MIT-Lincoln Labs Lockheed	Simultaneous VLA-GINGA-IUE monitoring of the corona of Sigma2 CrB.	2,3.5, 6 and 20	27	12.5 w/Move/Op
AY-23	Yusef-Zadeh, F. Bally, J.	NASA-Goddard Bell Labs	G359.54+0.18 and Sgr C.	2,6 and 20	18	7.5
VA-18	Akujor, C. Wilkinson, P.	Nigeria NRAL	Monitoring 3C380.	6 cm single dish VLB	8	11 w/AD220, AD215,AW213
VA-19	Andre, P. Lestrade, J. Montmerle, T. Phillips, R. Mutel, R.	IRAM, Granada JPL CEN, Saclay Haystack Iowa	Magnetic B star near Rho Ophiuchi.	6 cm phased array MK III VLB	13	3.5 w/VS75
VB-79	de Bruyn, A. Brouw, W. Schilizzi, R. Brouwer, F.	NFRA NFRA NFRA Delft	Astrometry of M81 and SS 433.	6 cm phased array MK III VLB	9	18.4

VLA UTILIZATION JUNE 1988 (Cont.)

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
VC-50	Cohen, M.	Caltech	High redshift strong sources.	6 cm single dish VLB	8,10,11 w/AB486, AS333,AD220, AC232,AW213, AD218,AL171,VO2	26.2
	Barthel, P.	Caltech				
	Unwin, S.	Caltech				
	Wehrle, A.	Caltech				
	Zensus, A.	Caltech				
	Aller, H.	Michigan				
	Aller, M.	Michigan				
	Baath, L.	Onsala				
	Nicholson, G.	Hartebeesthoek				
VH-42	Hooimeyer, J.	Leiden	Extended quasars 1222+216, 1830+285.	6 cm phased array VLB	12	11.3
	Barthel, P.	Caltech				
	Schilizzi, R.	NFRA				
	Miley, G.	STScI				
VM-98	Marscher, A.	Boston Univ	4C39.25.	6 cm single dish VLB	10 w/AA86, AC221,AW213 AG145,AD188	13
	Shaffer, D.	Interferometrics				
	Marcaide, J.	Andalucia				
VO-2	O'Dea, C.	NFRA	Two sided jet NGC 1265.	6 cm phased array MK III VLB	11	10.5 w/VO2
	Biretta, J.	CFA				
VR-45	Roberts, D.	Brandeis	Polarization monitoring of superluminals.	6 cm phased array MK III VLB	7	12.4
	Wardle, J.	Brandeis				
	Cawthorne, T.	Brandeis				
	Brown, L.	Brandeis				
	Gabuzda, D.	Brandeis				
	Holdaway, M.	Brandeis				
	Kollgaard, R.	Brandeis				
VS-75	Simon, R.	NRL	Extreme scattering events.	6 cm single dish VLB	13 w/AA86, AD215,AC232, VA19	7
	Feidler, R.	NRL				
	Johnston, K.	NRL				
	Spencer, J.	NRL				
	Dennison, B.	VPI&SU				
	Phillips, R.	Haystack				
	Nicholson, G.	Hartebeesthoek				
	de Bruyn, A.	NFRA				
	Mutel, R.	Iowa				
	Booth, R.	Onsala				
	van Breugel, W.	Calif, Berkeley				
	Crane, P.	NRAO-VLA				
	Montovani, F.	Bologna				
	Spencer, R.	NRAL				
	Porcas, R.	MPIR, Bonn				
VW-42	Walker, R.	NRAO-VLA	Monitoring 3C120.	6 cm single dish VLB	12 w/AA86,AC232, AL171,AG145	10.6
	Unwin, S.	Caltech				
	Cohen, M.	Caltech				
	Students		Summer school student exercise.		18	4.5
		JPL	Voyager telemetry	4 cm	29	6.6
		JPL	Tests	4 cm	27	5.4
	NRAO Staff		Move/Operations			12.5
			Baselines/Startup/Pointing			69.7
			Electronics/etc.			53.8
			Software			49.9
			General Tests			52.0

The average downtime for the month of June 1988 was approximately 16.52 percent.

$$\text{Average downtime of operational antennas} = \frac{\text{Total number of antenna-hours of operational antennas lost due to hardware and software failures during scheduled observing}}{\text{Total number of antenna-hours of operational antennas scheduled}} \times 100$$

Where "antenna hours" definition is: An array consisting of N antennas operating for Y hours is defined to have YN antenna hours operation.

The array was scheduled 100 percent (722.0 hours) of the time: 67.6 percent (487.8 hours) to astronomical programs, 18.1 percent (130.5 hours) to scheduled test/calibration, and the remaining 14.3 percent (103.8 hours) went to scheduled maintenance.

The array was in the CD hybrid configuration June 1 to June 29.
The array was in the D configuration on June 30.

The total number of programs run for the month of June, 1988 was 48.

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs

The following independent proposals shared simultaneous observing time (75.4 hours total simultaneous observing):

AA86/VM98	4.6
AA86/VS75	1.7
AA86/VW42	3.2
AB486/VC50	4.0
AC221/VM98	1.4
AC232/VC50	2.0
AC232/VC50	0.2
AC232/VS75	2.5
AC232/VW42	0.8
AC232/VW42	2.5
AD188/VM98	2.5
AD215/VA18	2.5
AD215/VS75	2.5
AD218/VC50	3.5
AD220/VA18	1.5
AD220/VC50	2.5
AG145/VM98	2.4
AG145/VW42	1.0
AL171/VC50	4.0
AL171/VW42	3.0
AW213/VA18	7.0
AW213/VC50	4.9
AW213/VC50	5.0
AW213/VM98	2.1
AW218/Move/Op	7.6
VA19/VS75	0.3
VO2/VC50	0.2

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VLA UTILIZATION MAY 1988

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
AA-85	Alexander, P. Pooley, G. Sopp, H. Wynn-Williams, G. Green, D.	MRAO MRAO MRAO Hawaii DRAO	The Dynamics of atomic and molecular gas in interacting galaxies.	20 cm line	01	2.1
AB-408	Bookbinder, J. Caillault, J. Gary, D. Giampapa, M. Golub, L. Linsky, J. Gibson, D.	Colorado Georgia Caltech NOAO SAO Colorado MIT-Lincoln Labs	A first epoch, volume-limited survey of M dwarf stars.	1.3,2, 6 and 20	8	12
AB-414	Becker, R. White, R.	Calif, Davis STScI	Monitoring radio flux of HD 193793 and P Cygni.	2 and 6	14	2
AB-456	Burke, B. Hewitt, J. Roberts, D.	MIT Haystack Brandeis	Time variation of 0957+561 A,B.	6	7	2
AB-469	Brown, A. Reimers, D.	Colorado InsTheoPhyStern	Simultaneous radio and ultraviolet variability study of the 4 Draconis system.	6	6,13	11
AB-482	Bookbinder, J. Linsky, J.	Colorado Colorado	Search for radio emission from K dwarfs.	6	23	17 w/Move/Op
AB-483	Bookbinder, J. Brown, A. Walter, F.	Colorado Colorado Colorado	Study of main sequence evolution via mass loss.	6	26	24 w/VS77
AB-488	Brissenden, R. Bicknell, G. Tuohy, I. Remillard, R.	Mt Stromlo Mt Stromlo Mt Stromlo MIT	X-ray selected AGN.	6 and 20	3,7	12
AB-494	Bastian, T. Drake, S. Bookbinder, J.	NRAO-VLA SASC Tech Colorado	Synoptic observations of FF Aquarii.	2,3.6, 6 and 20	1,3,5,6	4
AB-496	Bastian, T. Cornwell, T. Dulk, G.	NRAO-VLA NRAO-VLA Colorado	High resolution imaging of the Sun: an application of mosaicing.	20	7	12
AB-500	Bajaja, E. Hummel, E.	MIPR, Bonn NRAL	The large- and small-scale HI structure in NGC 4321.	20 cm line	17	12
AC-220	Crampton, D. Gower, A. Cowley, A.	DAO Victoria Arizona	Survey of an optical cluster of quasars.	20	2	12
AC-224	Caillault, J. Patterson, J. Skillman, D.	Georgia Columbia NASA-Goddard	Radio light curve of V471 Tauri.	6 and 20	26	11 w/VB90
AE-28	Escalante, V. Ho, P. Haschick, A. Rodriguez, L.	Harvard Harvard Haystack CFA	Accurate positions of H2O masers associated with young objects.	1.3 cm line	17	1
AE-55	Ekers, R. Cowan, J. Sramek, R. Goss, W. Roberts, D.	AT CFA NRAO-VLA NRAO-VLA Oklahoma	Observations of the young SNR G25.52+0.22.	2	10	2.5
AG-259	Goss, W. Anantharamaiah, K.	NRAO-VLA NRAO-VLA	Recombination lines from the external galaxy NGC 253.	6 and 20 cm line	8,12, 14,23	27
AG-261	Green, D.	DRAO	IR selected candidate new galactic SNRs.	6	6	6.5
AH-265	Hollis, J. Yusef-Zadeh, F.	NASA-Goddard NASA-Goddard	Imaging of M20 and M8.	6 and 20	5	8 w/Move/Op
AH-276	Hanisch, R. Batuski, D. Burns, J.	STScI STScI New Mexico	Head-tail radio sources in poor clusters of galaxies.	6 and 20	19,20	12
AH-292	Hughes, V. MacLeod, G.	Queen's Univ Queen's Univ	Star formation in very dense regions.	6 and 20	19	3
AH-295	Habing, H. Goss, W. Winnberg, A. van Langevelde, H.	Leiden NRAO-VLA Onsala Leiden	Monitoring galactic center OH/IR stars.	18 cm line	22	1.5
AH-299	Helfand, D. Becker, R.	Columbia Calif, Davis	Survey of the Galactic Plane.	90	2	9.7
AH-300	Helfand, D. Hamilton, T.	Columbia SAO	In search of the origin of the X-ray background.	6	3	12
AH-301	Hjellming, R. Gehrz, R. Taylor, A. Seaquist, E.	NRAO-VLA Minnesota Calgary Toronto	Systematic observations of two new radio novae.	1.3,2,3.6, 6 and 20	26	6 w/VB90

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
AH-306	Higgs, L. Landecker, T. Wendker, H.	DRAO DRAO Hamburger Sternwarte	Sources in Cygnus-X.	20	17	6.5
AH-316	Hjellming, R. Han, X. Johnston, K.	NRAO-VLA NRAO-VLA NRL	Phase dependence of radio spectra of X-ray binaries.	1.3,2,3.6, 6,18and20	1,2, 3,6	9.5
AI-34	Irwin, J. Seaquist, E.	Toronto Toronto	NGC 4388 and NGC 5775.	20	6	12
AI-35	Inoue, M. Perley, R. Carilli, C. Kato, T. Tabara, H. Aizu, K.	Nobeyama NRAO-VLA NRAO-VLA Utsunomiya Univ Utsunomiya Univ Rikkyo Univ	Large Faraday rotation source Hyd A.	2 and 6	8	8
AK-200	Keto, E. Carral, P. Welch, W. Reid, M. Ho, P.	LLNL Calif, Berkeley Calif, Berkeley CFA Harvard	Structure of recombination line emission in ultracompact HII regions.	1.3 cm line	22	8
AK-201	Krause, M. Beck, R. Hummel, E.	MPIR, Bonn MPIR, Bonn NRAL	ASS and BSS magnetic field structures of IC 342 and M81.	20	9	12 w/Move/Op
AL-166	Loushin, R. Crutcher, R. Troland, T.	Illinois Illinois Kentucky	OH observations toward S106.	18 cm line	20	12.5
AL-169	Liszt, H. Greisen, E. Braun, R.	NRAO-CV NRAO-CV NRAO-VLA	HI absorption toward W43.	20 cm line	16	8
AL-171	Lang, K. Willson, R. Trottet, G.	Meudon/Tufts Tufts Meudon	Simultaneous VLA-Nancay radioheliograph observations of the sun.	90	15,22, 28	9.3
AL-174	Lawrence, C. Davies, R. Lasenby, A. Myers, S. Readhead, A.	Caltech Manchester Cambridge Caltech Caltech	Observations of MWB fields.	6 and 20	1,14,15	21.5 w/Move/Op
AO-82	O'Dea, C. Ge, J. Owen, F.	NFRA NRAO-VLA/NMIMT NRAO-VLA	Distance class 4 Abell clusters.	20	5,16	8
AP-158	Pooley, G. Riley, J. Liu, R.	MRAO MRAO MRAO	Spectral ages of luminous radio sources.	2 and 6	19	3.5
AP-160	Pedlar, A. Yates, G. Saikia, D. Unger, S. Axon, D.	NRAL NRAL NRAL RGO NRAL	Neutral hydrogen in NGC 3227 and NGC 3226.	20 cm line	16	12 w/Tst-Walker
AR-173	Richards, P. Heaton, B.	Appleton Lab Univ Kent	Ionized gas in compact molecular clouds.	6	18	1
AR-177	Rengarajan, T. Iyengar, K.	TIFR TIFR	Search for continuum emission from unassociated IRAS sources with HII region like colors.	6 and 20	15	6
AR-181	Riley, J. Warner, P.	MRAO MRAO	Radio structure of 4C 74.26 - the largest known quasar.	20 and 90	22	4
AR-184	Roelfsema, P. Seaquist, E.	NRAO-VLA Toronto	Recombination line observations of M82.	3.5 and 6 cm line	12	9.2
AS-211	Sramek, R. Weiler, K. van der Hulst, J. Panagia, N.	NRAO-VLA NRL NFRA STScI	Statistical properties of radio supernovae.	2,6 and 20	22,28	3.5
AS-331	Sahai, R. Claussen, M.	Chalmers NRL	The enigmatic source in IRC+10216: spectrum and variations.	1.3,2 and 3.5	23	5
AS-333	Sramek, R. Weiler, K. van der Hulst, J. Panagia, N.	NRAO-VLA NRL SRZM STScI	Statistical properties of radio supernovae.	2,6 and 20	15	2
AS-335	Stanford, A. Wood, D. Code, A.	Wisconsin Wisconsin Wisconsin	Spatial and kinematic distribution of HI in colliding galaxies.	20 cm line	21	14
AT-94	Taylor, A. Seaquist, E. Kenyon, S.	Calgary Toronto CFA	The symbiotic stars Z And. and CH Cyg.	6 and 20	29	8 w/VB85
AU-34	Uson, J. Bagri, D.	NRAO-VLA NRAO-VLA	Search for redshifted emission from Zel'dovich pancakes.	90 cm line	1,15	14

VLA UTILIZATION MAY 1988 (Cont.)

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
AW-196	Wicklind, T. Henkel, C.	Onsala MPIR, Bonn	HI in the early type galaxy NGC 404.	20	20	10
AW-211	Williams, B. van Gorkom, J.	Delaware Columbia/NRAO-VLA	HI synthesis of three compact groups of galaxies.	20 cm line	19,22	16
AW-216	Westpfahl, D.	DAO	HI observations of the regular spiral NGC 5364.	20 cm line	13	8
AZ-35	Zheng, X. Reid, M. Birkinshaw, M. Ho, P.	Nanjing Obs CFA Harvard Harvard	Low frequency characteristics of NGC 6251.	90 cm line	11	8
AZ-36	Zijlstra, A. Pottasch, S. Bignell, R.	Kapteyn Lab Kapteyn Lab NRAO-VLA	A rapidly cooling proto planetary nebula.	1.3,2,18 and 20 cm line	1	6
VB-83	Biretta, J. Reid, M. Junor, W. Spencer, R. Muxlow, T.	CFA CFA NRAL NRAL NRAL	Structure and evolution of M87 jet.	18 cm phased array VLB	29	13.1
VB-85	Baath, L. Wehrle, A. Cohen, M. Jones, D.	Onsala Caltech Caltech JPL	Confirmation of superluminal motion in CTA 102.	18 cm single dish VLB	29	9.5 w/AT94, Move/Op
VB-88	Biretta, J. Zensus, A.	CFA Caltech	Low frequency structure and spectra of 3C345.	18 cm phased array VLB	30	17.7
VB-90	Briggs, F. Garwood, R.	Pittsburgh Pittsburgh	Radio sources behind high redshift galaxies.	18 cm single dish VLB	26	15.2 w/Move/Op, AH301,AC224
VF-16	Fey, A. Spangler, S. Mutel, R.	Iowa Iowa Iowa	2021+317: a source affected by interstellar scattering.	18 cm phased array VLB	27	8.7 w/VS77
VL-53	Lonsdale, C. Phillips, R. Barthel, P.	Haystack Haystack Caltech	Survey of double hotspots in 5 powerful double sources.	18 cm phased array MK III VLB	28,30	16.9
VS-77	Simon, R. Fiedler, R. Johnston, K. Spencer, J. Waltman, E. Dennsion, B. Phillips, R.	NRL NRL NRL NRL NRL NRL Haystack	Possible scattering by the ISM in 0954+658, 1502+106 and 1749+096.	18 cm single dish VLB	26	25.1 w/Move/Op, VB483
		JPL	Tests	4 cm	11,13,24	13.4
	NRAO Staff		Move/Operations			43.9
			Baselines/Startup/Pointing			44.0
			Electronics/etc.			58.8
			Software			48.9
			General Tests			49.9

The average downtime for the month of May 1988 was approximately 9.26 percent.

$$\text{Average downtime of operational antennas} = \frac{\text{Total number of antenna-hours of operational antennas lost due to hardware and software failures during scheduled observing}}{\text{Total number of antenna-hours of operational antennas scheduled}} \times 100$$

Where "antenna hours" definition is: An array consisting of N antennas operating for Y hours is defined to have YN antenna hours operation.

The array was scheduled 100 percent (746.1 hours) of the time: 69.1 percent (515.8 hours) to astronomical programs, 16.4 percent (122.6 hours) to scheduled test/calibration, and the remaining 14.4 percent (107.7 hours) went to scheduled maintenance.

The array was in the CD hybrid configuration the entire month of May.

The total number of programs run for the month of May, 1988 was 59.

The following independent proposals shared simultaneous observing time (73.2 hours total simultaneous observing):

AB482/Move/Op	6.0
AB482/VS77	24.0
AC224/VB90	11.0
AH265/Move/Op	5.5
AH301/VB90	0.6
AK201/Move/Op	5.0
AL174/Move/Op	5.2
AP160/Test-Walker	1.7
AT94/VB85	7.2
VB85/Move/Op	2.3
VB90/Move/Op	3.7
VF16/VS77	0.2
VS77/Move/Op	0.9

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VLA UTILIZATION APRIL 1988

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
AA-82	Allen, R. Sukumar, S.	Illinois Illinois	The thin and thick radio continuum disks of NGC 891.	90	28	3
AA-85	Alexander, P. Pooley, G. Sopp, H. Wynn-Williams, G. Green, D.	MRAO MRAO MRAO Hawaii DRAO	The Dynamics of atomic and molecular gas in interacting galaxies.	20 cm line	30	5.9
AB-414	Becker, R. White, R.	Calif, Davis STScI	Monitoring radio flux of HD 193793 and P Cygni.	2 and 6	9	1.5
AB-458	Branduardi-Raymont, G. Mason, K.	Univ Coll London Mullard Sp Sci Lab	Radio flux measurements of soft-X-ray-selected active galactic nuclei in the field of the Coma cluster.	6	18	4.5
AB-468	Bookbinder, J. Bastian, T. Holman, G. Gary, D.	Colorado NRAO-VLA NASA/Goddard Caltech	Spectral mapping of solar active region loops.	6	24,26	18
AB-471	Bagchi, J. Kapahi, V. Joshi, M.	TIFR NRAO-VLA/TIFR TIFR	Survey of a complete sample of distant Abell clusters of BM I classification.	20	4	12
AB-472	Barsony, M.	Caltech	HI imaging of molecular outflow sources.	21 cm line	9	12
AB-476	Birkinshaw, M. Davies, R.	Harvard NOAO	Study of the morphologies of bright elliptical galaxies.	6	10,13	8.5
AB-485	Brosch, N. Gondhalekar, P.	Wise Obs Rutherford Lab	Late-type dwarf galaxies in the Virgo cluster.	20 cm line	11,15	24
AB-492	Bloemen, J. Duric, N.	Leiden New Mexico	Spectral index study of 4 edge-on galaxies.	6	10	18
AB-494	Bastian, T. Drake, S. Bookbinder, J.	NRAO-VLA SASC Tech Colorado	Synoptic observations of FF Aquarii.	2,3.6, 6 and 20	23,24,25, 26,28,30	6
AB-498	Braun, R. Hester, J. Cox, D. Raymond, J.	NRAO-VLA Caltech Wisconsin CFA	Direct measurement of magnetic field strength and relativistic ion fractions in SNRs.	4	19	12
AC-207	Cornwell, T. Yusef-Zadeh, F.	NRAO-VLA NASA/Goddard	A unique HH object.	2 and 6	8	10.5
AC-216	Campbell, B. Asbell, J.	New Mexico New Mexico	Search for radio emission from new young stellar objects.	6	2,3	8
AC-222	Caillault, J. Drake, S.	Georgia SASC Tech	Full-phase coverage of BY Dra.	6	2-9,11,14, 21,23-26, 28,30	21
AC-223	Cordova, F. Hjellming, R. Mason, K. Middleditch, J.	LANL NRAO-VLA Mullard Sp Sci Lab LANL	A possible "Ghost" SNR and filiments associated with PSR 0656+14 and the Gem-Mon SN remnant.	6 and 21 cm line	5	12
AC-226	Carilli, C. van Gorkom, J. Stocke, J.	NRAO-VLA Columbia/NRAO-VLA Colorado	HI imaging of quasar galaxy pairs.	20 cm line	19,21	24.5
AC-227	Casertano, S. van Gorkom, J.	Groningen Columbia/NRAO-VLA	Late-type disk galaxies with extended HI envelopes.	20 cm line	16,29, 30	24
AD-188	Drake, S. Simon, T. Florkowski, D. Stencel, R. Bookbinder, J. Linsky, J.	SASC Tech Hawaii USNO Colorado Colorado Colorado	Variability of emission in supergiants: Alpha Ori.	2 and 6	7	3
AD-219	Dewdney, P. McCutcheon, W. Purton, C.	DRAO British Columbia DRAO	Early stages of star formation (cool IR/strong CO sources).	6	15	14
Ad hoc	Goss, W.	NRAO-VLA			13	2
AE-55	Ekers, R. Cowan, J. Sramek, R. Goss, W. Roberts, D.	AT CFA NRAO-VLA NRAO-VLA Oklahoma	Observations of the young SNR G25.52+0.22.	2	16	2
AG-145	Geldzahler, B. Schwartz, P. Gear, W. Ade, P. Robson, E. Nolt, I. Smith, M.	NRL NRL Royal Obs Queen Mary Coll Lancashire Polytech Oregon Royal Obs	Simultaneous multifrequency observations of blazars.	1.3,2,6, 20 and 90	21,23, 24	4
AG-259	Goss, W. Anantharamaiah, K.	NRAO-VLA NRAO-VLA	Recombination lines from the external galaxy NGC 253.	6 and 20 cm line	23	8

VLA UTILIZATION APRIL 1988 (Cont.)

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
AG-262	Ge, J. Owen, F.	NMIMT/NRAO-VLA NRAO-VLA	High Faraday rotation in cooling flow clusters.	3.6	14	4
AG-264	Gavazzi, G. Dickey, J.	IFC Minnesota	Disruption of spiral disks in the cluster A1367.	20 cm line	1	12
AH-269	Hester, J. Braun, R. Cox, D. Raymond, J.	Caltech NRAO-VLA Wisconsin CFA	Relativistically supported recombination regions in the Cygnus Loop.	6	14	12
AH-295	Habing, H. Goss, W. Winnberg, A. van Langevelde, H.	Leiden NRAO-VLA Onsala Leiden	Monitoring galactic center OH/IR stars.	18 cm line	7	2
AH-312	Hogg, D.	NRAO-CV	The HI distribution in Wolf-Rayet galaxy He2-10.	20 cm line	25	5
AH-313	Hummel, E. van der Hulst, J.	NRAL SRZM	The B-field structure in the interacting systems NGC 2207/IC2163 and NGC 4038/39.	20	17	12
AH-316	Hjellming, R. Han, X. Johnston, K.	NRAO-VLA NRAO-VLA NRL	Phase dependence of radio spectra of X-ray binaries.	1.3,2,3.6, 6,18and20	11,16,23, 24,26,28, 30	21
AJ-160	Joshi, M. Bagchi, J. Kapahi, V.	TIFR TIFR NRAO-VLA/TIFR	Spectral index mapping of very steep spectrum sources in clusters.	20	6,7	8.5
AK-172	Kristian, J. Windhorst, R. Fomalont, E. Kellermann, K.	Mt Wilson Mt Wilson NRAO-CV NRAO-CV	Deep survey in a Space Telescope/WFPC ultradeep survey area.	6	2,7,20, 24,26	50 w/Move/Op
AK-193	Kim, K. Kronberg, P.	Toronto Toronto	Polarization observation of S 147 background sources.	6,18,20, 21 and 22	22	10.5
AL-172	Lasenby, A. Howarth, N.	Cambridge Cambridge	Nine edge-on spiral galaxies.	90	16	6
AL-178	LaViolette, P.	Starburst	Radio investigation of the compact feature near SW tip of CTB 80.	6 and 20	30	1
AM-236	MacKenty, J. Burg, R. Griffiths, R.	STScI STScI STScI	Starburst and extragalactic HII region galaxies.	6	23,24	9
AM-237	Montmerle, T. Feigelson, E. Andre, P.	CEN Saclay Penn State IRAM, Granada	Embedded infrared sources in the Rho Ophiuchi cloud core.	6	9	14
AP-159	Penninx, W. Lewin, W. Mitsuda, K. van Paradijs, J. Zijlstra, A.	MIT MIT ISAS, Tokyo Amsterdam Groningen	Simultaneous radio and X-ray observations of the low-mass X-ray binary GX 17+2.	6 and 20	1,4,5	16.5
AR-167	Roeser, H. Perley, R. Hiltner, P. Meisenheimer, K.	MPIA-Heidelberg NRAO-VLA MPIA-Heidelberg MPIA-Heidelberg	Hotspots in classical double radio sources.	2,6 and 20	2	9
AR-180	Rudnick, L. Anderson, M.	Minnesota Minnesota	Large scale shock structures driven by the jets of SS 433.	20 and 90	17,18	16
AR-185	Roelfsema, P. Goss, W.	NRAO-VLA NRAO-VLA	H, He and C 92 alpha observatios of W3.	3.5 cm line	1	7
AS-211	Sramek, R. Weiler, K. van der Hulst, J. Panagia, N.	NRAO-VLA NRL NFRA STScI	Statistical properties of radio supernovae.	2,6 and 20	2,11	2
AS-324	Schmahl, E. Kundu, M. Nitta, N.	Maryland Maryland Maryland	Quiet sun fine structure variability.	2,6 and 20	3	9.5
AS-326	Sukumar, S. Allen, R.	Illinois Illinois	NGC 4565.	20 and 90	29	12
AS-327	Stewart, R. Slee, O. Dulk, G. McKean, M. Bastian, T. Large, M. Robinson, R.	CSIRO CSIRO Colorado Colorado NRAO-VLA Sydney Anglo-Aust Obs	Spectra of active southern stars.	2,6,18, 20 and 90	28	12
AS-329	Subrahmanyan, R. Gopal-Krishna Swarup, G.	TIFR TIFR TIFR	Orion A and Orion B.	90	18	8
AS-333	Sramek, R. Weiler, K. van der Hulst, J. Panagia, N.	NRAO-VLA NRL SRZM STScI	Statistical properties of radio supernovae.	2,6 and 20	10	2

VLA UTILIZATION APRIL 1988 (Cont.)

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
AV-153	van Breugel, W. McCarthy, P. Spinrad, H.	Calif, Berkeley Calif, Berkeley Calif, Berkeley	High redshift radio galaxies with extended optical line emission.	2 and 6	21	5.5
AV-156	Vader, J. Frogel, J.	Yale NOAO	Dust-embedded AGN in unusually warm IRAS galaxies.	6 and 20	14,17	6
AW-216	Westpfahl, D.	DAO	HI observations of NGC 5364.	20 cm line	25,27	16
AZ-31	Zhao, J. Burns, J. Owen, F.	New Mexico New Mexico NRAO-VLA	Turbulent radio jets in cluster galaxies.	6 and 20	8	4
		JPL	Tests	4 cm	21,25	7
	NRAO Staff		Standard Field Observation		1	6
	NRAO Staff		Baselines/Startup/Pointing			46.4
			Electronics/etc.			49.6
			Software			41.2
			General Tests			26.1

The average downtime for the month of April 1988 was approximately 7.44 percent.

$$\text{Average downtime of operational antennas} = \frac{\text{Total number of antenna-hours of operational antennas lost due to hardware and software failures during scheduled observing}}{\text{Total number of antenna-hours of operational antennas scheduled}} \times 100$$

Where "antenna hours" definition is: An array consisting of N antennas operating for Y hours is defined to have YN antenna hours operation.

The array was scheduled 100 percent (721.0 hours) of the time: 76.0 percent (547.8 hours) to astronomical programs, 11.4 percent (82.4 hours) to scheduled test/calibration, and the remaining 12.6 percent (90.8 hours) went to scheduled maintenance.

The array was in the CD hybrid configuration the entire month of April.

The total number of programs run for the month of April, 1988 was 52.

The following independent proposals shared simultaneous observing time (6.2 hours total simultaneous observing):

AK172/Move/Op 6.2

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VLA UTILIZATION MARCH 1988

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
AA-80	Anantharamaiah, K. Radhakrishnan, V. Shukre, C.	NRAO-VLA Raman Res Inst Raman Res Inst	Positronium towards the galactic center.	6 cm line	13	8
AA-81	Anantharamaiah, K. Radhakrishnan, V.	NRAO-VLA Raman Res Inst	Positronium towards extragalactic objects.	20 cm line	26	3.5
AA-82	Allen, R. Sukumar, S.	Illinois Illinois	The thin and thick radio continuum disks of NGC 891.	90	12	6.5
AB-414	Becker, R. White, R.	Calif, Davis STScI	Monitoring radio flux of HD 193793 and P Cygni.	2 and 6	8	1.5
AB-434	Braun, R. Perley, R. Gull, S. Rudnick, L.	NRAO-VLA NRAO-VLA Cambridge Minnesota	Physical processes in Cassiopeia A.	2, 6 and 20	11,26	16.8 w/VS77,VW42
AB-456	Burke, B. Hewitt, J. Roberts, D.	MIT Haystack Brandeis	Time variation of 0957+561 A,B.	6	16	2
AB-481	Bietenholz, M. Kronberg, P.	Toronto Toronto	High resolution studies of the Crab nebula.	6 and 20	14	6
AB-484	Brown, A. Linsky, J. Butler, J. Bromage, G.	Colorado Colorado Armagh Obs Ruth. Apple. Lab	The flare star eclipsing binary YY Gem, in support of a coordinated multi-spectral-region observing campaign.	6 and 20	4,5	19 w/VZ17
AC-187	Campbell, B. Simon, M.	New Mexico SUNY-Stony Brook	High resolution studies of outflow young stellar objects.	2	10	6 w/VZ17
AC-205	Condon, J. Helou, G. Sanders, D. Soifer, B.	NRAO-CV IPAC Caltech Caltech	IRAS bright galaxy sample.	20	13,22	18
AC-218	Crampton, D. Cowley, A.	DAO Arizona State	A close pair of quasars.	1.3,2,6, 20 or 90	24	2
AD-188	Drake, S. Simon, T. Florkowski, D. Stencel, R. Bookbinder, J. Linsky, J.	SASC Tech Hawaii USNO Colorado Colorado Colorado	Variability of emission in supergiants: Alpha Ori.	2 and 6	13	3
AD-195/ 201	De Muizon, M. Oort, M. Roland, J. Braun, R.	Leiden Obs Leiden Obs Leiden Obs NRAO-VLA	SNR G70.+10.2.	2, 6 and 20	6	2.5 w/VZ17
AD-204	Duric, N. Dittmar, M. Crane, P.	New Mexico New Mexico NRAO-VLA	Multi-frequency scaled array study of four normal spiral galaxies.	6	12	5
AD-213	Dulk, G. McKean, M, Rottman, G. Bastian, T. Orrall, F. Large, M.	Colorado Colorado Colorado NRAO-VLA Hawaii Sydney	Solar transition region and corona: state of the sun near the Phillipine eclipse of March 17.	20 and 90	17,18	21.9
AD-221	de Pater, I. Palmer, P. Snyder, L.	Calif, Berkeley Chicago Illinois	Comet Liller.	18 cm line	22,23	23
AF-151	Frail, D. Cordes, J. Hankins, T. Weisberg, J. Seaquist, E.	Toronto Cornell Dartmouth Carleton Toronto	Neutral hydrogen absorption measurements of distant pulsars in the inner galaxy.	20 cm line	27,29	14
AG-145	Geldzahler, B. Schwartz, P. Gear, W. Ade, P. Robson, E. Nolt, I. Smith, M.	NRL NRL Royal Obs Queen Mary Coll Lancashire Polytech Oregon Royal Obs	Simultaneous multifrequency observations of blazars.	1.3,2,6, 20 and 90	3,4,8	4.3
AG-247	Garrington, S. Laing, R. Leahy, J. Conway, R.	NRAL RGO NRAO-VLA/NRAL NRAL	Origin of depolarization asymmetry.	2, 6, 18 and 20	24,29	10 w/Move/Op
AG-252	Goss, W. Viallefond, F. Boulanger, F. Peimbert, M.	NRAO-VLA Meudon IPAC/Caltech UNAM	Radio continuum survey of the spiral M101.	90	28	4

VLA UTILIZATION MARCH 1988 (Cont.)

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
AG-255	Gwinn, C. Birkinshaw, M. Fiedler, R. Dennison, B. Simon, R.	SAO Harvard NRL NRL NRL	Search for host structures of extreme scattering events.	6	31	4.5
AG-258	Garay, G. Rodriguez, L.	Chile UNAM	The exciting stars of IRAS compact HII regions.	2,6 and 20	27	10
AH-293	Hanisch, R. Miley, G.	STScI STScI	The rich x-ray cluster Abell 2256.	20 and 90	14	16.3
AH-299	Helfand, D. Becker, R.	Columbia Calif, Davis	A 327 MHz survey of the galactic plane.	90	24,25,26	20
AH-301	Hjellming, R. Gehrz, R. Taylor, A. Seaquist, E.	NRAO-VLA Minnesota Calgary Toronto	Systematic observations of two new radio novae.	1.3,2,3.6, 6 and 20	12	6
AH-304	Higdon, J.	Texas	Neutral hydrogen observations of ring galaxies: Arp 141.	20 cm line	21,28	18.5
AK-184	Kazes, I. Mirabel, I. F. Dickey, J.	Meudon IAPE, Argentina Minnesota	Continuum observations of two megamaser galaxies.	2,6 and 20	27	3
AL-146	Leahy, J. Perley, R.	NRAO-VLA/NRAL NRAO-VLA	Bridges in nearby 3C sources.	20	10,13	13 w/VS77
AL-167	Lewis, B. Schmelz, J. Terzian, Y.	Arecibo NASA/Goddard Cornell	Accurate positions for new 1612 MHz OH maser sources.	18 cm line	3	12
AL-173	Linfield, R.	JPL	Radio sources for planetary occultations.	3.7	29,31	6.5
AM-230	Mundy, L. Kutner, M.	Caltech RPI	Study of a possible circumstellar disk in GL 490.	2 cm line	25	10
AP-135	Perley, R.	NRAO-VLA	Rotation measure of 3C295.	2	16,26	11.5
AP-153	Pooley, G. Alexander, P.	MRAO MRAO	Circum-nuclear star formation in ultra-luminous galaxies.	2,6 and 20	11	8 w/VW42
AP-159	Penninx, W. Lewin, W. Mitsuda, K. van Paradijs, J. Zijlstra, A.	MIT MIT ISAS Amsterdam Groningen	Simultaneous radio and X-ray observations of the low-mass X-ray binary GX 17+2.	6 and 20	28,29, 31	9.5
AR-168	Rusk, R.	Toronto	Radio polarimetry of 1807+698 (3C371).	6 and 18	6	2 w/VZ17
AR-173	Richards, P. Heaton, B.	Ruth. Apple. Lab Kent	Ionized gas associated with compact molecular clouds detected by IRAS.	6	5,30	3
AS-80	Sramek, R. van der Hulst, J. Weiler, K.	NRAO-VLA NFRA NRL	Supernovae SN1980 in NGC 6946 and SN1979c in M100.	2,6 and 20	17,30	4
AS-211	Sramek, R. Weiler, K. van der Hulst, J. Panagia, N.	NRAO-VLA NRL NFRA STScI	Statistical properties of radio supernovae.	2,6 and 20	23,31	4.5
AS-300	Siemieniec, G. Urbanik, M. Beck, R. Hummel, E.	MPIR, Bonn Krakow MPIR, Bonn NRAL	The radio disks of NGC 891 and NGC 3628.	20	24,27	12
AS-309	Sumi, D. Norman, M. Smarr, L.	Caltech Illinois Illinois	Survey of the radio structure of cooling inflow galaxies.	2,6 and 20	16	4
AS-325	Sukumar, S. Allen, R.	Illinois Illinois	NGC 5236 (M83).	20 and 90	10	7.5 w/VS77
AV-96	van der Hulst, J. Sramek, R. Weiler, K.	NFRA NRAO-VLA NRL	Radio supernova in NGC 4258.	6 and 20	30	2
AV-153	van Breugel, W. McCarthy, P. Spinrad, H.	Calif, Berkeley Calif, Berkeley Calif, Berkeley	High redshift radio galaxies with extended optical line emission.	2 and 6	18	11.1
AV-154	Viallefond, F. Zheng, X.	Meudon CFA	Low frequency survey of the sources in the spiral M33 and large scale disk emission.	90 cm line	6	6 w/VZ17
AW-198	Willson, R. Lang, K.	Tufts Tufts	Dynamic spectra of microwave bursts from active stars.	20 cm line	4	4.1
AW-199	Willson, R. Lang, K.	Tufts Tufts	Survey of active cool stars.	6	1,4	8.4
AW-200	Willson, R. Lang, K.	Tufts Tufts	Spectra of active cool stars.	2, 6 and 20	1	5
AY-22	Yun, M. Ho, P. Lo, K.	Harvard Harvard Illinois	HI synthesis mapping of M82.	21 cm line	17	8

VLA UTILIZATION MARCH 1988 (Cont.)

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
AZ-31	Zhao, J. Burns, J. Owen, F.	New Mexico New Mexico NRAO-VLA	Turbulent radio jets in cluster galaxies.	6 and 20	23	4
VAH-35	Phillips, R.	Haystack	Non-thermal radiation from Ap and Bp stars.	6 cm phased array MK III VLB	8	3.5
VAH-36	Niell, A. Cappallo, R. Hewitt, J. Lonsdale, C. Phillips, R.	Haystack Haystack Haystack Haystack Haystack	AE Aquarii.	6 cm phased array MK III VLB	8	2
VB-82	Barthel, P. Pearson, T. Readhead, A.	Caltech Caltech Caltech	Two new superluminals: 3C216, 1642+690.	6 cm phased array MK III VLB	8	11
VB-83	Biretta, J. Reid, M. Junor, W. Spencer, R. Muxlow, T.	Caltech CFA NRAL NRAL NRAL	M87.	6 cm phased array MK III VLB	6	10.5
VH-42	Hooimeyer, J. Barthel, P. Schilizzi, R. Miley, G.	Leiden Caltech NFRA STScI	Cores of extended quasars.	6 cm phased array VLB	7	10.9 w/Move/Op
VK-20	Kaufmann, P. Schaal, R. Bakor, Y. Abraham, Z. Scalise, E. Zensus, A. Unwin, S. Cohen, M. Nicolson, G.	INPE, Brazil INPE, Brazil INPE, Brazil INPE, Brazil INPE, Brazil Caltech Caltech Caltech Hartebeesthoek	Monitoring 3C273 and 3C279.	6 cm single antenna VLB	9	11.3 w/startup, pointing, baselines
VL-44	Lestrade, J. Preston, R. Mutel, R. Niell, A.	JPL JPL Iowa Haystack	Phase referenced Cyg X1.	6 cm phased array MK III VLB	7,8,9, 10	8.4
VL-49	Lestrade, J. Boloh, L. Mutel, R. Niell, A. Preston, R.	JPL JPL Iowa Haystack JPL	Phase referenced RS CVn stars.	6 cm phased array MK III VLB	7	12.1
VR-42	Roberts, D. Wardle, J. Cawthorne, T. Brown, L. Gabuzda, D.	Brandeis Brandeis Brandeis Brandeis Brandeis	Polarization of superluminals.	6 cm phased array MK III VLB	5	15.5
VS-77	Simon, R. Fiedler, R. Johnston, K. Spencer, J. Waltman, W. Dennison, B. Phillips, R.	NRL NRL NRL NRL NRL NRL Haystack	Scattering of sources which have had extreme scattering events.	6 cm single antenna VLB	10	20.1 w/AL146, AC187,AS325, AB434
VW-42	Walker, R. Benson, J. Unwin, S.	NRAO-VLA NRAO-CV Caltech	3C120.	6 cm phased array and single dish VLB	11	12.7 phased & single w/AB434,AP153
VZ-17	Zensus, A. Cohen, M. Unwin, S. Wehrle, A.	Caltech Caltech Caltech Caltech	Monitoring 3C345.	6 cm single antenna VLB	5	14.1 w/AB484,move, AR168,AD195, AD201,AV154
		JPL	Tests	4 cm	12,14	7
	NRAO Staff		Standard Field Observation		31	6
	NRAO Staff		Planned Power Outage/Shutdown			19.2
			Cryo Cool			16.6
			Move/Operations			12.6
			Baselines/Startup/Pointing			66.2
			Electronics/etc.			40.3
			Software			58.4
			General Tests			38.0

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs

The average downtime for the month of March 1988 was approximately 9.83 percent.

$$\text{Average downtime of operational antennas} = \frac{\text{Total number of antenna-hours of operational antennas lost due to hardware and software failures during scheduled observing}}{\text{Total number of antenna-hours of operational antennas scheduled}} \times 100$$

Where "antenna hours" definition is: An array consisting of N antennas operating for Y hours is defined to have YN antenna hours operation.

The array was scheduled 100 percent (746.1 hours) of the time: 67.6 percent (504.7 hours) to astronomical programs, 14.3 percent (106.8 hours) to scheduled test/calibration, and the remaining 18.0 percent (134.6 hours) went to scheduled maintenance.

The array was in the BCD hybrid configuration from March 01 through March 02.
The array was in the CD hybrid configuration from March 02 through March 31.

The total number of programs run for the month of March, 1988 was 62.

The following independent proposals shared simultaneous observing time (60.8 hours total simultaneous observing):

VZ17/Move	3.5
AB434/VS77	3.6
AB434/VW42	7.0
AB484/VZ17	5.7
AC187/VS77	6.0
AD195/AD201/VZ17	2.5
AG247/Move/Op	3.4
AL146/VS77	3.0
AP153/VW42	3.2
AR168/VZ17	2.0
AS325/VS77	7.5
AV154/VZ17	0.3
VH42/Move	1.7
VK20/Baseline	5.0
VK20/Pointing	5.0
VK20/Startup	1.3

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VLA UTILIZATION FEBRUARY 1988

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
AA-79	Apparao, K. Tarafdar, S. Rengarajan, T.	TIFR TIFR TIFR	Radio observations of Be stars.	2	7	18
AA-81	Anantharamaiah, K. Radhakrishnan, V.	NRAO-VLA Raman Res Inst	Positronium towards extragalactic objects.	20 cm line	26	6 w/AP152,VZ17
AB-408	Bookbinder, J. Caillault, J. Gary, D. Giampapa, M. Golub, L. Linsky, J. Gibson, D.	Colorado Colorado Caltech NSO SAO Colorado MIT, Lincoln Labs	First epoch, volume-limited, multi-frequency survey of M dwarf stars.	1.3,2, 6 and 20	1,2	16
AB-414	Becker, R. White, R.	Calif, Davis STScI	Monitoring radio flux of HD 193793 and P Cygni.	2 and 6	22	2
AB-462	Bandiera, R. Brinks, E.	Arcetri RGO	The optical knot in Kepler's SNR.	6	22	5
AB-463	Brinks, E. Pagel, B. Terlevich, R.	RGO RGO RGO	High resolution HI observations of NGC 5253 and NGC 5408.	20 cm line	29	4
AB-464	Bally, J. Yusef-Zadeh, F.	Bell Labs NASA-Goddard	Cometary source G359.2-0.8.	2, 6 and 20	25	8
AB-473	Burns, J. Gisler, G. Borovsky, J. Baker, D. Zeilik, M.	New Mexico LANL LANL NASA-Goddard New Mexico	Mercury.	2 and 6	2,23	12
AB-479	Bastian, T. Bookbinder, J. Dulk, G. McKean, M. Taylor, A. Wade, R.	NRAO-VLA Colorado Colorado Colorado Calgary Arizona	Stellar candidates in a 1.4 GHz survey field.	2, 3 and 6	6,12	26
AC-208	Caganoff, S. Bicknell, G. Ekers, R.	Mt Stromlo Mt Stromlo NRAO-VLA	Southern radio galaxies.	6	14,19	6
AC-216	Campbell, B. Asbell, J.	New Mexico New Mexico	Search for radio emission from new young stellar objects.	6	26,27	5.3 w/AP152,VZ17
AC-217	Carilli, C. van Gorkom, G. Stocke, J.	NRAO-VLA NRAO-VLA Colorado	Search for HI absorption in intervening galaxies towards PKS 0440-209 and 1327-206.	20 cm line	13,23	14.6
AD-188	Drake, S. Simon, T. Florkowski, D. Stencel, R. Bookbinder, J. Linsky, J.	SASC Tech Hawaii USNO Colorado Colorado Colorado	Variability of emission in supergiants: Alpha Ori.	2 and 6	20	3
AD-209	Dickel, H. Goss, W.	Illinois NRAO-VLA	H2CO abosrption and H76-alpha recombination line study of NGC 6334.	2 cm line	20,21	14
AH-254	Hjellming, R. Gehrz, R. Taylor, A. Seaquist, E.	NRAO-VLA Minnesota Calgary Toronto	Radio observations of 3 pre-1987 and bright 1987 novae to complement extensive infrared observations.	1.3,2, 6 and 20	11	9
AH-295	Habing, H. Goss, W. Winnberg, A. van Langevelde, H.	Leiden NRAO-VLA Onsala Leiden	Monitoring galactic center OH/IR stars.	18 cm line	29	2
AH-297	Harvey, P. Forveille, T.	Texas Grenoble	The compact HII region W28A2.	1.3,2 and 6	15	2
AH-298	te Lintel Hekkert, P. Zijlstra, A. Pottasch, S. Caswell, J. Habing, H.	Leiden Leiden Kapteyn Lab CSIRO Leiden	OH in very young planetaries and irregular OH/IR stars.	18 cm line	1,2,17	10.2
AH-303/ AH-304	Higdon, J.	Texas	Continuum and neutral hydrogen observations of ring galaxies: the cartwheel.	6 and 20 cm line	19,20, 21,27	24.5 w/AH304, VZ17,VW46
AH-305	Ho, P. Szczepanski, J. Pyne, E. Jackson, J. Armstrong, J.	Harvard MIT Harvard Calif, Berkeley Cologne	NH3 condensations in the neutral ring around the galactic center.	1.3 cm line	14,16, 18	26.5
AJ-160	Joshi, M. Bagchi, J. Kapahi, V.	TIFR TIFR NRAO-VLA/TIFR	Spectral index mapping of very steep spectrum sources in clusters.	90	13	3

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
AK-195	Kutner, M. Mundy, L.	RPI Caltech	Dynamics of G10.6-0.4: testing a model of massive star formation.	2 cm line	13	8
AL-150	Lestrade, J. Preston, R.	JPL JPL	Statistical properties of RSCVn stars.	6	26,28	4 w/VU17
AL-156	Lind, K. van Breugel, W.	NRAO-CV Calif, Berkeley	Further observations of edge-brightened jet in PKS 0623-206.	6	16,18, 19	16
AM-217	Morris, D. Mutel, R.	Iowa Iowa	Investigation of radio emission in RS CVn binaries and comparable single stars.	6	4	16.5 w/Move/Op
AM-226	Muhleman, D. Berge, G. Hofstadter, M.	Caltech Caltech Caltech	Uranus.	2, 6 and 18	4	8
AM-227	Maccacaro, T. Gioia, I. Wolter, A. Stocke, J. Morris, S.	CFA CFA CFA Colorado Mt Wilson	Radio observations of the extragalactic component of the Einstein medium sensitivity survey: an extension to the south.	6	11,15	13
AO-76	O'Dea, C. Gregorini, L. Feretti, L. Giovannini, G.	NFRA Bologna Bologna Bologna	Complex radio emission in Abell 568.	6	3	0.8
AO-80	Owen, F. Perley, R.	NRAO-VLA NRAO-VLA	Observations of B3 classical doubles.	6	3	4
AP-152	Preston, R. Purcell, G. Ulvestad, J. Jones, D. Linfield, R.	JPL JPL JPL JPL JPL	Phobos lander VLBI reference sources.	6	26	3.6 w/AC216
AR-166	Roser, H. Perley, R. Meisenheimer, K.	MPIA, Heidelberg NRAO-VLA MPIA-Heidelberg	Hotspots, jet and lobes of Pictor A.	90	21	4
AR-170	Rodriguez, L. Roth, M. Tapia, M. Persi, P. Ferrari-Toniolo, M.	UNAM UNAM UNAM IAS IAS	Spectral index of Cyg OB2 No. 5.	1.3,2, 6 and 20	5	2
AR-172	Reich, W. Handa, T. Furst, E. Sofue, Y. Reich, P.	MPIR, Bonn NRO MPIR, Bonn Univ Tokyo MPIR, Bonn	Search for plerionic or combined-type supernova remnants.	6 and 20	15	4
AR-173	Richards, P. Heaton, B.	Rutherford Appleton Lab Kent	Ionized gas associated with compact molecular clouds detected by IRAS.	20	2	2
AR-175	Richter, O. van Gorkom, J. Ferguson, J.	STScI NRAO-VLA Johns Hopkins	The HI content of NGC 3312.	20 cm line	14,15,17, 18,19,20, 21	42
AS-211	Sramek, R. Weiler, K. van der Hulst, J. Panagia, N.	NRAO-VLA NRL NFRA STScI	Statistical properties of radio supernovae.	2,6 and 20	1,4,25	4.5
AS-314	Saikia, D. Yates, G. Pedlar, A. Axon, D. Unger, S.	NRAL NRAL NRAL NRAL RGO	Sersic-Pastoriza galaxies: a link between Seyfert and starburst galaxies?	6	1	7.4
AV-155	Venugopal, V. Bhatt, H.	TIFR TIFR	1912+172 PO9 - Planetary nebula?	1.3,2, 6 and 20	2	1.5
AW-169	Winglee, R. Dulk, G. McKean, M.	Colorado Colorado Colorado	Substellar and planet-like companions of nearby stars.	20 and 90	5	16.1
AW-173	Wilking, B. Mundy, L. Howe, J.	Missouri Caltech Texas	Cold IRAS sources.	2 and 6	26	1.1
AW-198	Willson, R. Lang, K.	Tufts Tufts	Dynamic spectra of microwave bursts from active stars.	20 cm line	29	5.5
AW-199	Willson, R. Lang, K.	Tufts Tufts	Survey of active cool stars.	6	29	3.4
VM-88	Moran, J. Greenhill, L. Reid, M. Gwinn, C. Downes, D. Genzel, R. Hirabayashi, H.	CFA Harvard CFA CFA IRAM MPIR, Bonn Nobeyama	Motions of water masers in M33.	1.3 cm phased array VLB	26,28	37

VLA UTILIZATION FEBRUARY 1988 (Cont.)

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
VM-95	Moran, J.	CFA	The very luminous water maser in	1.3 cm	25	11
	Greenhill, L.	Harvard	NGC 3079.	phased array		
	Reid, M.	CFA		VLB		
	Haschick, A.	Haystack				
	Hirabayashi, H.	Nobeyama				
	Baan, W.	Arecibo				
VU-17	Unwin, S.	Caltech	New flare in 3C279.	1.3 cm	27	9
	Zensus, A.	Caltech		single antenna		
	Cohen, M.	Caltech		VLB		
VW-46	Witzel, A.	MPIR, Bonn	Flat spectrum subluminal	1.3 cm	27	8
	Schalinsky, C.	MPIR, Bonn	1803+784.	single antenna		w/AH303,
	Krichbaum, T.	MPIR, Bonn		VLB		AH304,test
	Hummel, K.	NRAL				
	Biermann, P.	MPIR, Bonn				
	Johnston, K.	NRL				
	Simon, R.	NRL				
VZ-17	Zensus, A.	Caltech	Monitoring 3C345.	1.3 cm	26	13.3
	Cohen, M.	Caltech		single antenna	w/AA81,AC216,	
	Unwin, S.	Caltech		VLB	AH303,AH304,	
	Wehrle, A.	Caltech				test
		JPL	Tests	4 cm	28,29	8.1
	NRAO Staff		Planned Power Outage (Wye Only)		8-9	36.6
			Move/Operations			23.3
			Baselines/Startup/Pointing			44.8
			Electronics/etc.			38.3
			Software			50.9
			General Tests			79.8

The average downtime for the month of February 1988 was approximately 8.73 percent.

$$\text{Average downtime of operational antennas} = \frac{\text{Total number of antenna-hours of operational antennas lost due to hardware and software failures during scheduled observing}}{\text{Total number of antenna-hours of operational antennas scheduled}} \times 100$$

Where "antenna hours" definition is: An array consisting of N antennas operating for Y hours is defined to have YN antenna hours operation.

The array was scheduled 100 percent (697.9 hours) of the time: 62.5 percent (436.1 hours) to astronomical programs, 19.5 percent (136.0 hours) to scheduled test/calibration, and the remaining 18.0 percent (125.8 hours) went to scheduled maintenance.

The array was in the B configuration from February 01 to February 03.
The array was in the BCD hybrid configuration from February 03 through February 29.

The total number of programs run for the month of February, 1988 was 48.

The following independent proposals shared simultaneous observing time (58.2 hours total simultaneous observing):

AA81/AP152	0.5
AA81/AP152/VZ17	0.8
AA81/VZ17	4.7
AC216/AP152	2.3
AH303/AH304	6.0
AH303/VW46	5.2
AH303/VZ17	0.8
AH304/VW46	0.0
AH304/VZ17	0.8
AJ303/AH304	6.5
AJ303/AH304	6.0
AJ303/AH304	6.0
AL150/VU17	0.3
AM217/MOVE/OPS	8.5
VW46/TEST	2.8
VZ17/AC216	3.0
VZ17/TEST	4.0

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VLA UTILIZATION JANUARY 1988 (Cont.)

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
AH-301	Hjellming, R. Gehrz, R. Taylor, A. Seaquist, E.	NRAO-VLA Minnesota Calgary Toronto	Systematic observations of two new radio novae.	1.3,2,3.6, 6 and 20	9,24	7.5
AJ-156	Jaffe, W. Hoessel, J. Oke, J.	Leiden Wisconsin Caltech	Medium deep optical/radio survey.	20	19,20, 21,22	33.6
AJ-160	Joshi, M. Bagchi, J. Kapahi, V.	TIFR TIFR NRAO-VLA/TIFR	Spectral index mapping of very steep spectrum sources in clusters.	90	16	1.3
AK-186	Keto, E. Garay, G. Ho, P. Reid, M.	Lawrence Livermore Lab Santiago Harvard CFA	Defining the collapsing core of G34.3+0.2 at 0.4".	1.3 cm line	26,29	16
AK-192	Katgert, P. Oort, M.	Leiden Leiden	Redshift- and luminoisty- dependence of linear radio sizes of ellipticals.	20	16,17	9
AK-194	Kundu, M. Agrawal, P. White, S.	Maryland NASA/MSFC Maryland	Microwave observations of certain X-ray emitting dM flare stars.	6,20 and 90	10	18
AL-162	Lazio, J. Spangler, S. Cordes, J.	Iowa Iowa Cornell	Studies of rotation measure fluctuations in the Cygnus region.	20	31	12
AM-229	Menten, K. Johnston, K. Wilson, T. Walmsley, C. Henkel, C.	MPIR, Bonn/SAO NRL MPIR, Bonn MPIR, Bonn MPIR, Bonn	Methanol absorption in W3(OH).	1.3 cm line	23	10
AM-231	Morris, M. Omont, A. Likkel, L. Forveille, T.	Calif, Los Angeles Grenoble Calif, Los Angeles Grenoble	Is IRAS 21282+5050 a pre-planetary nebula?	2 and 6	23	4.5
AO-80	Owen, F. Perley, R.	NRAO-VLA NRAO-VLA	Observations of B3 classical doubles.	6	16,27, 28	19
AR-165	Rupen, M. Condon, J.	Princeton NRAO-CV	A systematic search for radio supernovae in nearby galaxies.	6	17	24
AR-168	Rusk, R.	Toronto	Radio polarimetry of 1807+698 (3C371).	6 and 18	25	2
AR-173	Richards, P. Heaton, B.	Rutherford Appleton Lab Kent	Characteristics of ionized gas associated with the exciting stars in compact molecular clouds detected by IRAS.	20	21	2
AS-211	Sramek, R. Weiler, K. van der Hulst, J. Panagia, N.	NRAO-VLA NRL NFRA STScI	Statistical properties of radio supernovae.	2,6 and 20	11,26	2.9
AS-306	Sukumar, S. Cowsik, R. Allen, R.	Illinois Washington U-St Louis Illinois	High resolution study of a double-lobed X-ray source.	6,20 and 90	26	2
AS-314	Saikia, D. Yates, G. Pedlar, A. Axon, D. Unger, S.	NRAL NRAL NRAL NRAL RGO	Sersic-Pastoriza galaxies: a link between Seyfert and starburst galaxies?	6	31	6.5
AS-325	Sukumar, S. Allen, R.	Illinois Illinois	NGC 5236 (M83).	20 and 90	23	7.5
AS-326	Sukumar, S. Allen, R.	Illinois Illinois	Edge on galaxy NGC 4565.	20 and 90	26,28	15.6
AT-89	Torres, A. Gull, T. Hollis, M. Yusef-Zadeh, F.	NASA/GSFC NASA/GSFC NASA/GSFC NASA/GSFC	The Hourglass in M8.	6	22	4
AV-151	van Gorkom, J. Knapp, G. Ekers, R.	NRAO-VLA Princeton NRAO-VLA	A search for atomic and molecular gas in elliptical radio galaxies.	6 cm line	12,14	24.5
AV-154	Viallefond, F. Zheng, X.	NRAO-VLA CFA	Low frequency survey of the sources in the spiral M33 and large scale disk emission.	90 cm line	30	9
AW-202	Wrobel, J. Heeschen, D.	NMIMT NRAO-CV	Survey of a volume-limited sample of E/SO galaxies: spectral indices between 6 and 20.	20	9,24, 30,31	18
AW-203	Wilson, T. Johnston, K. Pauls, T. Walmsley, C. Henkel, C.	MPIR, Bonn NRL NRL MPIR, Bonn MPIR, Bonn	Distribution and kinetic temperature of OH in W3 (OH).	1.3 cm line	25	10
AZ-34	Zirin, H. Gary, D.	Caltech Caltech	High-resolution studies of the quiet sun.	6	28	9

VLA UTILIZATION JANUARY 1988 (Cont.)

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
AH-301	Hjeliming, R. Gehrz, R. Taylor, A. Seaquist, E.	NRAO-VLA Minnesota Calgary Toronto	Systematic observations of two new radio novae.	1.3,2,3.6, 6 and 20	9,24	7.5
AJ-156	Jaffe, W. Hoessel, J. Oke, J.	Leiden Wisconsin Caltech	Medium deep optical/radio survey.	20	19,20, 21,22	33.6
AJ-160	Joshi, M. Bagchi, J. Kapahi, V.	TIFR TIFR NRAO-VLA/TIFR	Spectral index mapping of very steep spectrum sources in clusters.	90	16	1.3
AK-186	Keto, E. Garay, G. Ho, P. Reid, M.	Lawrence Livermore Lab Santiago Harvard CFA	Defining the collapsing core of G34.3+0.2 at 0.4".	1.3 cm line	26,29	16
AK-192	Katgert, P. Oort, M.	Leiden Leiden	Redshift- and luminoisty- dependence of linear radio sizes of ellipticals.	20	16,17	9
AK-194	Kundu, M. Agrawal, P. White, S.	Maryland NASA/MSFC Maryland	Microwave observations of certain X-ray emitting dM flare stars.	6,20 and 90	10	18
AL-162	Lazio, J. Spangler, S. Cordes, J.	Iowa Iowa Cornell	Studies of rotation measure fluctuations in the Cygnus region.	20	31	12
AM-229	Menten, K. Johnston, K. Wilson, T. Walmsley, C. Henkel, C.	MPIR, Bonn/SAO NRL MPIR, Bonn MPIR, Bonn MPIR, Bonn	Methanol absorption in W3(OH).	1.3 cm line	23	10
AM-231	Morris, M. Omont, A. Likkel, L. Forveille, T.	Calif, Los Angeles Grenoble Calif, Los Angeles Grenoble	Is IRAS 21282+5050 a pre-planetary nebula?	2 and 6	23	4.5
AO-80	Owen, F. Perley, R.	NRAO-VLA NRAO-VLA	Observations of B3 classical doubles.	6	16,27, 28	19
AR-165	Rupen, M. Condon, J.	Princeton NRAO-CV	A systematic search for radio supernovae in nearby galaxies.	6	17	24
AR-168	Rusk, R.	Toronto	Radio polarimetry of 1807+698 (3C371).	6 and 18	25	2
AR-173	Richards, P. Heaton, B.	Rutherford Appleton Lab Kent	Characteristics of ionized gas associated with the exciting stars in compact molecular clouds detected by IRAS.	20	21	2
AS-211	Sramek, R. Weiler, K. van der Hulst, J. Panagia, N.	NRAO-VLA NRL NFRA STScI	Statistical properties of radio supernovae.	2,6 and 20	11,26	2.9
AS-306	Sukumar, S. Cowsik, R. Allen, R.	Illinois Washington U-St Louis Illinois	High resolution study of a double-lobed X-ray source.	6,20 and 90	26	2
AS-314	Saikia, D. Yates, G. Pedlar, A. Axon, D. Unger, S.	NRAL NRAL NRAL NRAL RGO	Sersic-Pastoriza galaxies: a link between Seyfert and starburst galaxies?	6	31	6.5
AS-325	Sukumar, S. Allen, R.	Illinois Illinois	NGC 5236 (M83).	20 and 90	23	7.5
AS-326	Sukumar, S. Allen, R.	Illinois Illinois	Edge on galaxy NGC 4565.	20 and 90	26,28	15.6
AT-89	Torres, A. Gull, T. Hollis, M. Yusef-Zadeh, F.	NASA/GSFC NASA/GSFC NASA/GSFC NASA/GSFC	The Hourglass in M8.	6	22	4
AV-151	van Gorkom, J. Knapp, G. Ekers, R.	NRAO-VLA Princeton NRAO-VLA	A search for atomic and molecular gas in elliptical radio galaxies.	6 cm line	12,14	24.5
AV-154	Viallefond, F. Zheng, X.	NRAO-VLA CFA	Low frequency survey of the sources in the spiral M33 and large scale disk emission.	90 cm line	30	9
AW-202	Wrobel, J. Heeschen, D.	NMIMT NRAO-CV	Survey of a volume-limited sample of E/SO galaxies; spectral indices between 6 and 20.	20	9,24, 30,31	18
AW-203	Wilson, T. Johnston, K. Pauls, T. Walmsley, C. Henkel, C.	MPIR, Bonn NRL NRL MPIR, Bonn MPIR, Bonn	Distribution and kinetic temperature of OH in W3 (OH).	1.3 cm line	25	10
AZ-34	Zirin, H. Gary, D.	Caltech Caltech	High-resolution studies of the quiet sun.	6	28	9

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
AZ-35	Zheng, X. Reid, M. Birkinshaw, M. Ho, P.	Nanjing CFA Harvard Harvard	The low frequency characteristics of NGC 6251.	90 cm line	8	6
		JPL	Tests	4 cm	11,14	7.5
	NRAO Staff		Array Shutdown - Computer Modifications		1-7	170.6
			Computer Hardware/Software			24.6
			Baselines/Startup/Pointing			22.0
			Electronics/etc.			28.6
			Software			36.4
			Power Shutdown			9.3
			General Tests			49.7

The average downtime for the month of January, 1988 was approximately 10.25 percent.

$$\text{Average downtime of operational antennas} = \frac{\text{Total number of antenna-hours of operational antennas lost due to hardware and software failures during scheduled observing}}{\text{Total number of antenna-hours of operational antennas scheduled}} \times 100$$

Where "antenna hours" definition is: An array consisting of N antennas operating for Y hours is defined to have YN antenna hours operation.

The array was scheduled 100 percent (746.1 hours) of the time: 54.3 percent (404.9 hours) to astronomical programs, 9.6 percent (71.7 hours) to scheduled test/calibration, and the remaining 36.1 percent (269.4 hours) went to scheduled maintenance.

The array was in the B configuration from January 01 through January 31.
The total number of programs run for the month of January, 1988 was 45.

The following independent proposals shared simultaneous observing time (0.0 hours total simultaneous observing):

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