

## VLA UTILIZATION DECEMBER 1987

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
AA-76	Anantharamaiah, K. Narayan, R.	NRAO-VLA Steward Obs	Scattering in the inner galaxy.	20	12,24	3
AB-401	Baum, S. O'Dea, C.	NFRA NFRA	Search for OH absorption in 3C84.	18 cm line	15	6.2
AB-414	Becker, R. White, R.	Calif, Davis STScI	Monitoring radio flux of HD 193793 and P Cygni.	2 and 6	17	2
AB-444	Barsony, M.	Caltech	Imaging of S87 over 3 orders of magnitude in spatial scale.	2, 6 and 18	7	7
AB-454	Bridle, A. Browne, I. Burns, J. Dreher, J. Hough, D. Laing, R. Lonsdale, C. Scheuer, P. Wardle, J.	NRAO-CV NRAL New Mexico MIT JPL RGO Haystack Cavendish Lab Brandeis	Sidedness in jets in high luminosity sources.	6	5	24
AB-458	Burke, B. Hewitt, J. Roberts, D.	MIT Haystack Brandeis	Time variation of 0957+561 A,B.	6	9	2.5
AB-465	Baily, J. Forrest, W. Fulbright, H.	Bell Labs Rochester Rochester	HI in high velocity bipolar flows.	20 cm line	4	6
AC-173	Cameron, R. Parma, P. de Ruiter, H.	Mt Stromlo Bologna Bologna	PKS 2149-158, a binary radio jet system.	6, 18 and 21	5,26	16
AC-176	Crane, P. Dahari, O. Ford, H. Jacoby, G. Ciardullo, R.	NRAO-VLA STScI STScI NOAO STScI	Anomalous spiral arms of NGC 4258.	20	11	4.5
AC-187	Campbell, B. Simon, M.	New Mexico SUNY-Stony Brook	Outflow young stellar objects.	2 and 6	23	12
AC-188	Campbell, B. Stooke, J.	New Mexico Colorado	Inner disk and jet structure in L1551 IRS 5.	1.3, 2 and 6	8,9, 10	17.5
AC-207	Cornwell, T. Yusef-Zadeh, F.	NRAO-VLA NASA-Goddard	Followup observations of a unique HH object.	6 and 20	17	10.1 w/Move/Op
AD-160	de Pater, I.	Calif, Berkeley	Jupiter patrol.	6 and 20	12,13	12.1
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	2.5
AD-204	Duric, N. Dittmar, M. Crane, P.	New Mexico New Mexico NRAO-VLA	Multifrequency scaled array study of four normal spiral galaxies.	20	24	8
AD-208	Duric, N. Morissette, K.	New Mexico New Mexico	SNRs in M33.	20	1	3
ADHOC	van Breugel, W.	Calif, Berkeley			14	3
AF-151	Frail, D. Cordes, J. Hankins, T. Weisberg, J. Seagquist, E.	Toronto Cornell Dartmouth Carleton College Toronto	Neutral hydrogen absorption measurements of distant pulsars in the inner galaxy.	20 cm line	12,13	13.4
AF-152	Feigelson, E.	Penn State	Mapping of the radio galaxy PKS 0745-191.	2, 6 and 20	13	5
AG-248	Giovannini, G. Feretti, L. Venturi, T.	Bologna Bologna Bologna	Low frequency observations of NGC 4869.	90	10	4
AH-278	Hewitt, J. Turner, E. Burke, B.	Haystack Princeton MIT	The unusual ring-shaped source 1129+052: what is it?	1.3 and 2	22	5
AH-287	Hewitt, J. Burke, B. Turner, E.	Haystack MIT Princeton	Observations of the gravitational lens candidate 1042+178.	2	18	2
AH-293	Hansch, R. Miley, G.	STScI STScI	The rich X-ray cluster Abell 2256.	20 and 90	26	9.1
AI-32	Inoue, M. Kato, T. Tabara, H. Aizu, K.	Nobeyama Utsunomiya Utsunomiya Rikkyo	Large rotation measure source Hyd A.	2	20	4 w/AP152

## VLA UTILIZATION DECEMBER 1987 (Cont.)

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
AJ-160	Joshi, M. Bagchi, J. Kapahi, V.	TIFR TIFR NRAO-VLA/TIFR	Spectral index mapping of very steep spectrum sources in clusters.	90	27	4
AK-177	Kronberg, P. Sramek, R.	Toronto NRAO-VLA	Monitoring M82.	1.3 and 2	16	4.5
AK-180	Kronberg, P. Zukowski, E.	Toronto Toronto	Rotation measure maps of three radio-extended quasars.	2	12	6
AK-184	Kazes, I. Mirabel, F. Dickey, J.	Meudon IAP, Argentina Minnesota	OH and continuum observations of two megamaser galaxies.	2, 6 and 20 cm line	10	3
AK-191	Knapp, G. Jura, M. van Gorkom, J. Kim, D. Guhathakurta, P.	Princeton Calif, Los Angeles NRAO-VLA Calif, Los Angeles Princeton	Mapping and measuring the spectrum of the continuum emission from the elliptical galaxies NGC 5018 and NGC 2974.	1.3,2,3.6, 20 and 90	28	4
AL-146	Leahy, J. Perley, R.	NRAL NRAO-VLA	Bridges in nearby 3C sources.	20 and 90	3,7 w/Test/Perley	29.5 17.5
AL-161	Lang, K. Willson, R.	Tufts Tufts	Compact transient sources on the sun.	2, 6 and 20	11,18	17.5 w/AL163
AL-163	Lang, K. Willson, R. Strong, K. Holmon, G.	Tufts Tufts Lockheed-SMM/XRP NASA-Goddard	Simultaneous SMM and VLA observations of coronal loops.	6 and 20	11,18	17.5 w/AL161
AM-224	McCarthy, P. van Breugel, W. Spinrad, H.	Calif, Berkeley Calif, Berkeley Calif, Berkeley	Radio properties of Lyman Alpha proto-galaxies.	2	14	12
AO-76	O'Dea, C. Gregorini, L. Feretti, L. Giovannini, G.	NFRA Bologna Bologna Bologna	Complex radio emission in Abell 568.	6	26	8
AP-135	Perley, R.	NRAO-VLA	Rotation measure of 3C295.	2 and 6	3	12
AP-151	Pedlar, A. Anantharamaiah, K. van Gorkom, J. Ekers, R.	NRAL NRAO-VLA NRAO-VLA NRAO-VLA	Continuum image of the galactic center.	90	27	8
AP-152	Preston, R. Purcell, G. Ulvestad, J. Jones, D. Linfield, R.	JPL JPL JPL JPL JPL	Phobos lander VLBI reference sources.	6 cm single antenna VLB	20	2.3 w/AI32
AR-169	Rudy, D. Muhleman, D. Berge, G. Paige, D.	Calif, Los Angeles Caltech Caltech Calif, Los Angeles	Polarization studies of Ganymede and Callisto.	2 and 6	19,20	22
AS-80	Sramek, R. van der Hulst, J. Weiler, K.	NRAO-VLA NFRA NRL	Supernovae SN1980 in NGC 6946 and SN1979c in M100.	2	20	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	2.5
AS-271	Seagquist, E. Bell, M.	Toronto NRC	Absorption by H2CO against the strong nuclear continuum radio source in Centaurus A.	6 cm line	13	6
AS-293	Sramek, R. Skillman, E.	NRAO-VLA NFRA	The SNR in NGC 5471.	2	5	8
AS-303	Saikia, D. Wlita, P. Cornwell, T. Junor, W.	NRAL Georgia State NRAO-VLA NRAL	Observations of the nearby radio galaxy 1759+211.	6	10	4
AS-304	Shara, M. White, R. Becker, R.	STScI STScI Calif, Davis	Multifrequency mapping of the shell of the old nova Ck Vul.	6 and 20	23	6
AS-309	Sumi, D. Norman, M. Smarr, L.	Illinois Illinois Illinois	Structure of cooling inflow galaxies.	2, 6 and 20	19,21	24.5
AS-316	Simonetti, J. Cordes, J.	NRAO-CV Cornell	Faraday rotation through the molecular cloud L1551.	6 and 20	18	9
AS-320	Schmeiz, J. Gonzalez, R. Holman, G. Strong, K.	NASA-Goddard NRAO-VLA NASA-Goddard Lockheed-SMM/XRP	Coronal magnetic structures observing campaign.	6 and 20	4	9.5
AT-90	Taylor, A. Waters, L. Bjorkman, K. Persi, P.	Calgary Utrecht Colorado IAS, CNR	Radio survey of IRAS selected Be stars.	2	4	6.5

VLA UTILIZATION DECEMBER 1987 (Cont.)

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
AV-96	van der Hulst, J. Sramek, R. Weiler, K.	NFRA NRAO-VLA NRL	Radio supernova in NGC 4258.	6 and 20	20	2
AV-150	van Breugel, W. McCarthy, P. Heckman, T. Miley, G. Baum, S.	Calif, Berkeley Calif, Berkeley Maryland STScI NFRA	Extended line emission in powerful radio galaxies.	2	11	4
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, 6 and 20	14,15, 17	24
AW-206	Wolszczan, A. Kulkarni, S. Cordes, J. Dewey, R. Blaskiewicz, M.	Arecibo Caltech Cornell Cornell Cornell	A new millisecond pulsar candidate.	20	7	1.3
AY-22	Yun, M. Ho, P. Lo, K.	Harvard Harvard Illinois	HI synthesis mapping of M82.	21 cm line	22	8
AZ-35	Zheng, X. Reid, M. Birkinshaw, M. Ho, P.	Nanjing Obs CFA Harvard Harvard	The low frequency characteristics of NGC 6251.	90	27	8
		JPL	Tests	4 cm	11,15	7
	NRAO Staff		Standard Field Observation		6	12.0
			Holiday/Shutdown			36.9
			Baselines/Startup/Pointing			45.5
			Electronics/etc.			45.9
			Software			48.8
			Shutdown/Computer Modifications			87.0
			General Tests			39.3

The average downtime for the month of December, 1987 was approximately 7.18 percent.

Average downtime of =  $\frac{\text{Total number of antenna-hours of operational antennas lost due to hardware and software failures during scheduled observing}}{\text{Total number of antenna-hours of operational antennas scheduled}}$  x 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 95.1 percent (709.2 hours) of the time: 58.3 percent (435.2 hours) to astronomical programs, 12.4 percent (92.3 hours) to scheduled test/calibration, and the remaining 24.4 percent (181.7 hours) went to scheduled maintenance.

The array was in the B configuration from December 01 through December 31.  
 The total number of programs run for the month of December, 1987 was 54.

The following independent proposals shared simultaneous observing time (28.9 hours total simultaneous observing):

AG207/Move/Op	5.0
AL146/Test	4.1
AL161/AL163	17.5
AP152/AI32	2.3

## VLA UTILIZATION NOVEMBER 1987

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
AA-68	Anantharamaiah, K. Radhakrishnan, V. Shukre, C.	NRAO-VLA Raman Res Inst Raman Res Inst	Positronium recombination lines.	6 and 20	29	8.5
AB-414	Becker, R. White, R.	Calif, Davis STScI	Monitoring radio flux of HD 193793 and P Cygni.	2 and 6	19	2.1
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	16,17 w/VL99, VM80, VG56	24
AB-463	Brinks, E. Pagel, B. Terlevich, R.	RG0 RG0 RG0	High resolution HI observations of NGC 5253 and NGC 5408.	20 cm line	1	4
AB-464	Bally, J. Yusef-Zadeh, F.	Bell Labs NASA-Goddard	Cometary source G359.2-0.8.	2, 6 and 20	7	8
AB-465	Bally, J. Forrest, W. Fulbright, H.	Bell Labs Rochester Rochester	HI in high velocity bipolar flows.	20 cm line	28	6
AB-466	Bietenholz, M. Kronberg, P.	Toronto Toronto	High resolution studies of the Crab nebula.	6 and 20	20	6 w/VG56
AC-205	Condon, J. Helou, G. Sanders, D. Soifer, B.	NRAO-CV IPAC Caltech Caltech	IRAS bright galaxy sample.	20	15,21	17.9 w/VG54
AC-219	Cordova, F. Mason, K. Hjellming, R.	Los Alamos Mullard Sp Sp Lab NRAO-VLA	Soft X-ray source 0656+14.	20	3	2.5
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, Alpha Her, Alpha Sco.	2 and 6	15,17	4 w/VG56
AD-203	Drake, S. Linsky, J.	SASC Tech Colorado	Are warm supergiants radio continuum sources? Survey of B2-F8 I stars.	6	11	24
AD-206	de Pater, I. Dickel, J.	Calif, Berkeley Illinois	Saturn.	2	14	9
AD-208	Duric, N. Morissette, K.	New Mexico New Mexico	SNRs in M33.	20	30	9
AD-209	Dickel, H. Goss, W.	Illinois NRAO-VLA	H2CO absorption and H76 alpha study of NGC 6334.	6 cm line	6	7.5
AE-50	Ekers, R. Morris, M. Yusef-Zadeh, F.	NRAO-VLA Calif, Los Angeles NASA-Goddard	Sgr A west.	1.3 and 2	27	7.5
AE-51	Elitzur, M. Hollis, J. Michalitsianos, A. Kafatos, M.	Kentucky NASA-Goddard NASA-Goddard George Mason Univ	Search for continuum emission at the S10 Maser position in R Aquarii.	2	4,7	8.5
AF-137	Felgelson, E. Montmerle, T. Andre, P.	Penn State CEN Saclay CEN Saclay	Monitoring radio flaring stars in the Rho Oph cloud.	2, 6 and 20	1	1
AF-147	Fanti, C. Fanti, R. Parma, P. Schilizzi, R. Spencer, R. van Bruegel, W.	Bologna Bologna Bologna NFRA NRAL Calif, Berkeley	Search for extended structure associated with CSS radio sources.	20	16,19	10.1 w/V8631
AF-148	Feldman, P. Van Horn, H.	Herzberg Inst Rochester	Observations of nearby cool, strongly convective white dwarfs.	6	9	14 w/Move/Op
AF-150	Frail, D. Cordes, J. Seaquist, E. Weisberg, J.	Toronto Cornell Toronto Carleton Coll.	Astrometry of pulsars in the inner galaxy.	20	1	3
AG-145	Geldzahler, B. Schwartz, P. Gear, W. K. Ade, P. Robson, E. Nolt, I. Smith, M.	NRL NRL Royal Obs Queen Mary Coll Lancashire Polytechnic Oregon Royal Obs	Simultaneous multifrequency observations of blazars.	1.3,2,6, 20 and 90	15,19	4
AG-247	Garrington, S. Laing, R. Leahy, J. Conway, R.	NRAL RG0 NRAL NRAL	Origin of depolarization asymmetry.	6, 18 and 20	19	18 w/VG56

## VLA UTILIZATION NOVEMBER 1987 (Cont.)

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
AG-252	Goss, W. Viallefond, F. Boullanger, F. Peimbert, M.	NRAO-VLA NRAO-VLA Caltech UNAM	Survey of the spiral M101.	90	30	8
AG-254	Gaume, R. Claussen, M.	NRL Massachusetts	The rotating molecular envelope of Sgr B2 F.	2 cm line	2	8.1
AH-254	Hjellming, R. Gehrz, R. Taylor, A. Seaquist, E.	NRAO-VLA Minnesota Calgary Toronto	Three pre-1987 and bright 1987 novae.	1.3, 2, 6 and 20	27	2
AH-271	Hill, G. Lilly, S. Stockton, A.	Hawaii Hawaii Hawaii	Radio source population at $z = 0.5$ .	20	14, 15, 17	16.1 w/VM80, VG56
AH-277	Helfand, D. Backer, D. Backer, R.	Columbia Calif, Berkeley Calif, Davis	Search for millisecond pulsars in globular clusters.	20 and 90	21, 22	16 w/VG54
AI-32	Inoue, M. Kato, T. Tabara, H. Aizu, K.	Nobeyama Utsunomiya Utsunomiya Rikkyo	Large rotation measure source Hyd A.	2	18	4 w/VG56
AK-182	Kundu, M. Schmahl, E. White, S. Nitta, N.	Maryland Maryland Maryland Maryland	Coronal magnetic structures.	6 and 20	28	9.5
AK-185	Kapahi, V. Subrahmanya, C.	NRAO-VLA TIFR	Complete sample of quasars from deep optical identifications of radio sources from the Molonglo Reference Catalog.	6 and 20	5, 6	6.5
AK-189	Kundu, M. Shevgaonkar, R.	Maryland Maryland	Simultaneous observations of dMe flare stars.	20 and 90	1, 2	16
AL-140	Lestrade, J. Preston, R. Mutel, R. Boloh, L. Charlot, P.	JPL JPL Iowa CNES IGN	Search for compact extragalactic sources near RS CVn stars.	6 and 90	5	2
AL-146	Leahy, J. Perley, R.	NRAL NRAO-VLA	Bridges in nearby 3C sources.	20 and 90	25	11
AL-150	Lestrade, J. Preston, R.	JPL JPL	Statistical properties of RS CVn stars.	6	4	1
AL-156	Lind, K. van Breugel, W.	NRAO-CV Calif, Berkeley	An edge-brightened jet in PKS 0623-206.	6	6, 7	16
AL-164	Lonsdale, C. Muxlow, T. Barthel, P.	Haystack NRAL Caltech	Double hotspots.	6	22	15.5
AM-221	Morganti, R. Fanti, C. Fanti, R. Parma, P. de Ruiter, H.	Bologna Bologna Bologna Bologna Bologna	Jets in low luminosity radio galaxies.	6	29	5 w/AM222
AM-222	Morganti, R. de Ruiter, H. Fanti, R. Parma, P. Ferrari, A. Massaglia, S. Trussoni, E.	Bologna Bologna Bologna Bologna Torino Torino Torino	Knots in low luminosity radio galaxy jets.	6	25, 29	6 w/AM221
AO-74	O'Dea, C. Baum, S. Killeen, N.	NFRA NFRA Illinois	Giant galaxies in accretion flows.	2	5, 22, 28	13.5
AP-145	Phillips, J. Mampaso, A. Zijlstra, A.	Queen Mary College IAC Leiden	Core mapping of Type I planetary nebulae.	2	14, 30	2.5
AR-162	Rodriguez, L. Mendoza, E.	UNAM UNAM	Radio continuum from T Tauri stars with large u-filter excesses.	6	10	9 w/Move/Op
AR-167	Roeser, H. Perley, R. Hiltner, P. Meisenheimer, K.	MPIA, Heidelberg NRAO-VLA MPIA, Heidelberg MPIA, Heidelberg	Mapping of optically identified hotspots in classical double radio sources.	2, 6 and 20	29	12
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	8	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	6	2

VLA UTILIZATION NOVEMBER 1987 (Cont.)

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
AS-286	Stine, P. Weedman, D.	Penn State Penn State	Relationship between radio and IR emission in starburst galaxies.	6 and 20	21,22 w/VG56, VG54	10.5
AS-300	Siemieniec, G. Urbanik, M. Beck, R. Hummel, E.	Krakow Krakow MPIR, Bonn MPIR, Bonn	The radio disks of NGC 891 and NGC 3628.	90	14,23	6.5
AS-316	Simonetti, J. Cordes, J.	VPI & SU Cornell	Faraday rotation through the molecular cloud L1551.	6 and 20	24	6
AT-91	Taylor, A. Seaquist, E. Bode, M.	Calgary Toronto Lancashire Polytechnic	Hen 1383 - another stellar radio jet.	2,6 and 20	8	8
AU-27	Umana, G. Catalano, S. Gibson, D.	Catania Catania MIT, Lincoln Labs	Survey of nearby Be stars.	2	1	15.5
AV-146	Viallefond, F. Heydari,	NRAO-VLA ESO, Chile	HI observations in the low metallicity blue compact galaxy Mk 600.	20 cm	27	7
AW-193	White, S. Kundu, M. Jackson, P.	Maryland Maryland Maryland	Further observations of narrow-band flaring on red dwarf stars.	6 and 20	1,5	9.5
AZ-31	Zhao, J. Burns, J. Owen, F.	New Mexico New Mexico NRAO-VLA	Turbulent radio jets in cluster galaxies.	6 and 20	20,27	12.6 w/VG56
VF-15	Fix, J. Mutel, R.	Iowa Iowa	High spectral resolution observations of OH/IR stars.	18 cm phased array MK II VLB	12	12.3
VG-54	Gwinn, C. Bartel, N. Wolszczan, A. Cordes, J. Mutel, R.	CFA CFA Arecibo Cornell Iowa	Pulsar interstellar scattering.	90 cm single antenna MK II VLB	21	12 w/AS286, AH272, AC205
VG-56	Ghosh, T. Rao, A. Ananthkrishnan, S. Simon, R.	TIFR TIFR TIFR NRL	Low frequency variables	18 and 90 single antenna MK II VLB	17,20	48.3 w/AG247, test, AH271, AD188, AB434, AI32, AZ31, AB466, AS286
VH-32	Hewitt, J. Burke, B. Turner, E. Lawrence, C. Schneider, D.	Haystack MIT Princeton Caltech Inst Adv Studies	Gravitational lens candidate 1042+178.	18 cm phased array MK III VLB	13	6.5
VL-99	Lonsdale, C. Geldzahler, B.	Haystack NRL	0123+633.	18 cm single antenna MK III VLB	16	1.0 w/AB434
VM-80	Marscher, A. Rickett, B. Padrielli, L. Romney, J. Bartel, N.	Boston Calif, San Diego Bologna NRAO-CV CFA	The low frequency variable NRAO 140.	18 cm single antenna MK II VLB	16	10.4 w/AB434, AH271
WV-47	Wilkinson, P.	NRAL	Source 41.9+58 in M82.	18 cm phased array MK III VLB	15	19.5
V8631	Briggs, F.	Pittsburg	Low frequency variable 0605-08.	90 cm single antenna VLB	18	12.4 w/test, AF147
Adhoc	Many	JPL	Tests	4 cm	6,24	4.3
	NRAO Staff		Holiday/Shutdown		20,22	7.5
			Baselines/Startup/Pointing			26.2
			Electronics/etc.			69.3
			Software			41.9
			Move/Operations			54.2
			General Tests			17.0
						52.2

VLA UTILIZATION NOVEMBER 1987 (Cont.)

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
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The average downtime for the month of November, 1987 was approximately 7.32 percent.

Average downtime of operational antennas =  $\frac{\text{Total number of antenna-hours of operational antennas lost due to hardware and software failures during scheduled observing}}{\text{Total number of antenna-hours of operational antennas scheduled}}$  x 100  
 Where "antenna hours" definition is: An array consisting of N antennas operating for Y hours is defined to have NY antenna hours operation.

The array was scheduled 96.4 percent (695.8 hours) of the time: 67.5 percent (487.4 hours) to astronomical programs, 15.6 percent (112.3 hours) to scheduled test/calibration, and the remaining 13.3 percent (96.1 hours) went to scheduled maintenance.

The array was in the A/B configuration from November 01 - November 12.  
 The array was in the B configuration from November 12 - November 30.  
 The total number of programs run for the month of November, 1987 was 60.

The following independent proposals shared simultaneous observing time (104.1 hours total simultaneous observing):

AB434/VG56	12.0
AB434/VL99	1.0
AB434/VM80	8.8
AB446/VG56	6.0
AC205/VG54	1.4
AD188/VG56	3.0
AF147/V8631	4.7
AF148/Move/Op	8.3
AG247/VG56	5.4
AH271/VG56	6.5
AH271/VM80	1.6
AH277/VG54	8.0
AI32/VG56	1.6
AM221/AM222	5.0
AR162/Move/Op	6.7
AS286/VG54	2.7
AS286/VG56	4.3
AZ31/VG56	6.0
Test/V8631	4.7
Test/V8631	3.0
Test/VG56	1.0
VG56/Test	2.5

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VLA UTILIZATION OCTOBER 1987

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
AA-68	Anantharamiah, K. Radhakrishnan, V. Shukre, C.	NRAO-VLA Raman Res Inst Raman Res Inst	Positronium recombination lines.	6	30	3.5
AA-76	Anantharamiah, K. Narayan, R.	NRAO-VLA Steward Obs	Scattering in the inner galaxy.	90	5	3
AB-408	Bookbinder, J. Caillaud, J. Gary, D. Glampapa, M. Golub, I. Linsky, J. Gibson, D.	Colorado Colorado Caltech Nat Solar Obs SAO Colorado MIT-Lincoln Lab	A first-epoch, volume-limited, multifrequency survey of M dwarf stars.	1.3, 2, 6 and 20	16	16
AB-414	Becker, R. White, R.	Calif, Davis STScI	Monitoring radio flux of HD 193793 and P Cygni.	2 and 6	22	2.1
AB-434	Braun, R. Perley, R. Gull, S. Rudnick, L.	NRAO-VLA NRAO-VLA Cambridge Minnesota	Physical processes in Cassiopeia A.	6 and 20	8	8
AB-440	Brown, R.	NRAO-CV	Extended structure of 0235+164.	18 and 20	28	1.5
AB-441	Bastian, T. Dulk, G. Walter, F. Bookbinder, J.	NRAO-VLA Colorado Colorado Colorado	Radio emission from post-common envelope binaries.	2, 6 and 20	20	13.5
AB-447	Barthel, P.	Caltech	Radio spectra of very high redshift quasars.	1.3, 2, 6, 18, 20 and 90	9	3 w/test
AB-456	Burke, B. Hewitt, J. Roberts, D.	MIT Haystack Brandeis	Time variation of 0957+561 A,B.	6	15	2
AB-457	Brown, A. Bookbinder, J.	Colorado Colorado	Parallax of T Tauri.	6	5	6
AB-460	Benz, A. Gudel, M.	ETH ETH	Radio observations of dwarf novae.	6 and 18	12, 14, 15, 17, 21, 23	15.5
AB-461	Benz, A. Gudel, M.	ETH ETH	Broadband radio observations of the quiescent emission of a flare star.	1.3, 2, 6, 18, 20 and 90	15, 20	10
AB-462	Bandiera, R. Brinks, E.	Arcetri RGO	Optical knots in Kepler's SNR.	6	31	4
AB-463	Brinks, E. Pagel, B. Terlevich, R.	RGO RGO RGO	High resolution HI observations of NGC 5253 and NGC 5408.	20 cm line	26, 29, 30, 31	20
AC-200	Cohen, N. Falco, E.	Boston CFA	Overluminous radio galaxies as gravitational lens candidates: 3C13.	6	5	6.5
AC-206	Chanugam, G. Dulk, G. Bastian, T.	Louisiana State Colorado NRAO-VLA	Radio observations of magnetic cataclysmic variable stars: AE Agr.	2, 3 and 6	29	5.5
AC-208	Caganoff, S. Bicknell, G. Ekers, R.	NRAO-VLA/Mt Stromlo Mt Stromlo NRAO-VLA	A grab bag of southern sources.	20	25	12.2
AD-184	Drake, S. Reimers, D. Brown, A.	SASC Tech Hamburg Colorado	Zeta Aurigae and similar binaries containing B dwarf secondaries.	2 and 6	27	8
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	14	1 w/move
AD-206	de Pater, I. Dickel, J.	Calif, Berkeley Illinois	Saturn.	2	9	8
AF-137	Felgelson, E. Montmerle, T. Andre, P.	Penn State CEN Saclay CEN Saclay	Monitoring radio flaring stars in the Rho Oph cloud.	2, 6 and 20	25	1
AF-146	Fabbiano, G. Gioia, I.	CFA CFA	High resolution observations of early-type galaxies observed in X-rays with the Einstein Observatory.	6	24, 25	8.5
AG-145	Geldzahler, B. Schwartz, P. Gear, W. K. Ade, P. Robson, E. Nolt, I. Smith, M.	NRL NRL Royal Obs Queen Mary Coll Lancashire Polytechnic Oregon Royal Obs	Simultaneous multifrequency observations of blazars.	1.3, 2, 6, 20 and 90	8, 10, 24	4
AH-254	Hjellming, R. Gehrz, R. Taylor, A. Sequist, E.	NRAO-VLA Minnesota Calgary Toronto	Three pre-1987 and bright 1987 novae.	1.3, 2, 6 and 20	4, 17	12.5



VLA UTILIZATION OCTOBER 1987 (Cont.)

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
AH-287	Hewitt, J. Burke, B. Turner, E.	Haystack MIT Princeton	The gravitational lens candidate 1042+178.	2 and 6	10	3
AH-288	Hjellming, R. Johnston, K.	NRAO-VLA NRL	Search for radio spectra typical of conical jets in X-ray binaries; LSI 61 degrees 303.	1.3, 2, 6, 18 and 20	14, 18, 22, 26, 28	10 w/move
AH-289	Hjellming, R. Bastian, T. Dulk, G.	NRAO-VLA NRAO-VLA Colorado	Search for emission from He star CCV's, the AM CVn binaries.	2, 6 and 20	19, 22	8
AH-291	Hutchings, J. Neff, S. Gower, A.	DAO NASA/GSFC Victoria	Radio galaxies at $z < 1.0$ ; comparison with radio quasars.	6 and 20	3, 10	14
AI-32	Inoue, M. Kato, T. Tabara, H. Aizu, K.	Nobeyama Utsumomiya Utsumomiya Rikkyo	Large rotation measure source Hyd A.	6	8, 29, 30	10.3
AJ-131	Johnston, K. Florkowski, D. de Vegt, C. Wade, C.	NRL USNO Hamburg NRAO-VLA	Parallax of the nearby stars UX Ari and HR 5110.	6	5	9.9
AK-151	Kundu, M. Jackson, P. White, S.	Maryland Maryland Maryland	Narrowband flares on red dwarf stars.	6 and 20	13	1.3 w/move
AK-185	Kapahi, V. Subrahmanya, C.	TIFR/NRAO-VLA TIFR	Quasars from the Molongo reference catalog.	6 and 20	26	5
AK-187	Kronberg, P. Wolfe, A. Briggs, F.	Toronto Pittsburgh/Mt Wilson Pittsburgh	Faraday rotation mapping of the unusual strong absorption-line quasar, P0458-02.	1.3, 2 and 6	12	5
AK-188	Kulkarni, S. Rand, R. Goss, W.	Caltech Caltech NRAO-VLA	Deep imaging of globular clusters.	20	18, 19, 23	27.3
AL-164	Lonsdale, C. Muxlow, T. Barthel, P.	Haystack NRAL Caltech	Double hotspots.	6	9, 10	15
AM-193	Migenes, V. Johnston, K. Pauls, T. Norris, R. Wilson, T.	Pennsylvania NRL NRL CSIRO MFR, Bonn	Masers in OMC-1.	1.3 and 18 cm line	10	10
AM-217	Morris, D. Mutel, R.	Iowa Iowa	Radio emission in RS CVn binaries and comparable single stars.	6	26	15
AM-219	Menon, T. Hickson, P.	British Columbia British Columbia	Structure of compact group galaxies.	20	3, 4	5.5
AM-224	McCarthy, P. van Breugel, W. Spinrad, H.	Calif, Berkeley Calif, Berkeley Calif, Berkeley	Radio properties of Lyman Alpha Proto-Galaxies.	6 and 20	11	12
AN-46	Narayan, R. Cornwell, T. Anantharamaiah, K.	Steward Obs NRAO-VLA NRAO-VLA	High time-resolution imaging of a scatter-broadened radio source.	6, 20 and 90	5, 6, 7, 8, 10, 11, 12, 13, 15	16.6
AP-131	Pauls, T. Schwartz, P. Johnston, K.	NRL NRL NRL	Positronium recombination lines toward Sgr A.	6 cm line	26, 29	8.7
AP-142	Pedlar, A. Saikia, D. Unger, S. Whittle, M.	NRAL NRAL RGO Virginia	Polarization observations of Seyfert nuclei.	2	1	4 w/VA17
AP-145	Phillips, J. Mampaso, A. Zijlstra, A.	Queen Mary College IAC NRAO-VLA	Core mapping of Type I planetary nebulae.	2 and 6	12	1
AP-152	Preston, R. Purcell, G. Ulvestad, J. Jones, D. Linfield, R.	JPL JPL JPL JPL JPL	Phobos iander VLBI reference sources.	6	4, 8, 12	8.5
AR-160	Roeser, H. Perley, R.	MPIA, Heidelberg NRAO-VLA	Pictor A.	2, 6 and 20	3, 4	10
AR-166	Roeser, H. Perley, R. Meisenheimer, K.	MPIA, Heidelberg NRAO-VLA MPIA, Heidelberg	Hotspots, jet and lobes of Pictor A.	2	1, 26, 29	9.3
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	15	2

VLA UTILIZATION OCTOBER 1987 (Cont.)

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
AR-171	Rao, A. Subrahmanyan, R. Narasimha, D. Swarup, G.	TIFR TIFR TIFR TIFR	High resolution observations of a compact double radio source.	1,3,2 and 6	4	3
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	11,23	6
AS-294	Strom, R.	NFRA	A probable neutron star in CTB80.	6,20 and 90	3,11	5.5
AS-310	Surdej, J. Courvoisier, T. Kellermann, K. Kuhr, H. Magain, P. Refsdal, S. Swings, J.	Liege ESO, FRG NRAO-CV MPIA, Heidelberg ESO, Chile Hamburg Obs Liege	The most luminous quasars as gravitationally lensed objects.	2 and 6	3,4	6
AS-313	Stocke, J. Morris, S. Maccacaro, T. Gioia, I.	Colorado Mt. Wilson CFA CFA	Search for "radio quiet" BL Lacertae objects and for BL Lacs in clusters.	6	24	4
AS-315	Simon, R. Johnston, K.	NRL NRL	Large scale structure of superluminal sources.	6	2	6
AT-87	Torbett, M. Campbell, B.	Kentucky New Mexico	Radio emission and morphology of variable stars.	2 and 20	18	8
AT-91	Taylor, A. Sequist, E. Bode, M.	Calgary Toronto Lancashire Polytechnic	Hen 1383 - another stellar radio jet.	2,6 and 20	24	6
AV-151	van Gorkom, J. Knapp, G. Ekers, R.	NRAO-VLA Princeton NRAO-VLA	Search for atomic and molecular gas in elliptical radio galaxies.	6 and 20 cm line	12	24
AV-152	van Buren, D. Miley, G.	STScI STScI	Search for high redshift molecules in absorption.	2,6 and 20 cm line	17	6
AW-169	Winglee, R. Dulk, G. McKean, M.	Colorado Colorado Colorado	Substellar and planet-like companions of nearby stars.	20 and 90	30	16
AW-193	White, S. Kundu, M. Jackson, P.	Maryland Maryland Maryland	Further observations of narrow-band flaring on red dwarf stars.	6 and 20	31	6.5
AY-21	Yin, Q.	Peking	Optical selected clumpy galaxies.	6 and 20	3	10
AZ-31	Zhao, J. Burns, J. Owen, F.	New Mexico New Mexico NRAO-VLA	Turbulent radio jets in cluster galaxies.	6 and 20	4	5
VA-17	Alef, W. Preuss, E. Kellermann, K.	MPIR, Bonn MPIR, Bonn NRAO-CV	Variability in 3C11 and 3C390.3.	6 cm single antenna VLB	1	4
VG-51	Gurvits, L. Kardashev, N. Popov, M. Schilizzi, R. Pauliny-Toth, I. Kellermann, K.	Space Research Inst Space Research Inst Space Research Inst NFRA MPIR, Bonn NRAO-CV	Radio structures of quasars with Z greater than three.	6 cm phased array VLB	2	9.1
VH-36	Hoolmeyer, J. Barthel, P. Schilizzi, R.	Leiden Caltech NFRA	Motion in cores of two large quasars.	6 cm phased array VLB	1	13
	NRAO Staff		Standard Field Observation			12.0
			Baselines/Startup/Pointing			58.0
			Electronics/etc.			45.0
			Software			42.2
			Move/Operations			26.8
			General Tests			56.7

VLA UTILIZATION OCTOBER 1987 (Cont.)

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
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The average downtime for the month of October, 1987 was approximately 6.58 percent.

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 NY antenna hours operation.

The array was scheduled 100 percent (747.1 hours) of the time: 69.2 percent (517.2 hours) to astronomical programs, 19.1 percent (142.7 hours) to scheduled test/calibration, and the remaining 11.7 percent (87.2 hours) went to scheduled maintenance.

The array was in the A configuration from October 1 - 12.

The array was in the A/B configuration from October 12 - 31.

The total number of programs run for the month of October, 1987 was 65.

The following independent proposals shared simultaneous observing time (18.3 hours total simultaneous observing):

AB447/Test	3.0
AD188/Move/Op	1.0
AH288/Move/Op	2.0
AK151/Move/Op	1.3
AP142/VA17	4.0
Test/Move	6.0
Test/Move	1.1

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VLA UTILIZATION SEPTEMBER 1987

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
AA-64	Antonucci, R. Barvainis, R.	STScI NRAO-CV	Testing the synchrotron hypothesis for quasar infrared emission. PKS 0114+074.	6, 20 and 90	4, 13	5
AA-73	Akujor, C.	Nigeria		20	5, 8	3
AB-414	Becker, R. White, R.	Calif, Davis STScI	Monitoring flux of HD 193793 and P Cygni.	2 and 6	22	1.5
AB-440	Brown, R.	NRAO-CV	The extended structure of 0235+164.	18 and 20	26	1
AB-444	Barsony, M.	Caltech	Imaging of S87 over three orders of magnitude in spatial scale. The redshift cutoff for radio galaxies at z greater than 2. Time variation of 0957+561 A,B.	6 and 18	2	2.5
AB-448	Baldwin, J. Dingley, S.	MRAO MIT		20	19	20
AB-456	Burke, B. Hewitt, J.	MIT Haystack		6	27	3.2 w/vm87
AB-457	Roberts, D. Brown, A.	Brandeis Colorado	Parallax of T Tauri.	6	3, 5	12
AC-166	Bookbinder, J. Carilli, G. Dreher, J. Perley, R.	Colorado MIT/NRAO-VLA MIT NRAO-VLA	Further studies of Cygnus A.	20 and 90	1	3.5
AC-187	Campbell, B. Simon, M.	New Mexico SUNY	High resolution studies of outflow young stellar objects.	2 and 6	18	12
AD-188	Drake, S. Simon, T. Florkowski, D. Stencel, R. Bookbinder, J. Linsky, J.	NASA-Goddard Hawaii USNO Colorado Colorado Colorado	Variability of emission in M supergiants: Alpha Ori.	2 and 6	20	1
AD-195	De Muzion, M. Oort, M. Roland, J.	Leiden Obs Leiden Obs Leiden Obs	SNR G70.7+10.2.	20 and 90	9	1
AD-196	Dickel, J. Mufson, S. Lasker, B. Hester, J.	Illinois Indiana STScI Caltech	Filaments in IC443.	18	17	14
AD-202	Djorgovski, G. Gorenstein, M. Perley, R.	CFA CFA NRAO-VLA	Lensed QSO candidate 1145-071.	6 and 20	21	6
AE-51	Elitzur, M. Hollis, J. Michalitsianos, A. Kafatos, M.	Kentucky NASA/GSFC NASA/GSFC Geo. Mason Univ	Search for emission at the S10 Maser position in R Aquarii.	6	22	8
AF-122	Fich, M.	Waterloo	Compact flat spectrum sources in the outer galaxy.	6	1	1.5
AF-147	Fanti, C. Fanti, R. Schilizzi, R. Spencer, R. van Breugel, W.	Bologna Bologna NFRA NRL Calif, Berkeley	Search for extended structure associated with CSS radio sources.	20	3	5
AF-149	Fix, J. Reynolds, S.	Iowa N. Carolina State	A possible Crab-like supernova remnant in M33.	6	9	8.5
AF-152	Feldzelson, E.	Penn State	Mapping the radio galaxy PKS 0745-191.	2, 6 and 20	13	6
AG-145	Geldzahler, B. Schwartz, P. Gear, W. Ade, P. Robson, I. 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	1	1

VLA UTILIZATION SEPTEMBER 1987 (Cont.)

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
AG-247	Garrington, S. Lainy, R. Leahy, J. Conway, R.	NRAL RCO NRAL NRAL	Origin of depolarization asymmetry.	6, 18 and 20	10, 13	36
AG-257	Gibson, D.	MIT-Lincoln Labs	AR Lacertae.	6	12, 15 w/AS308, AP145	8.5
AH-247	Hummel, E. Dettmar, R. Bajaja, E. Mielebinski, R.	MPIR, Bonn Bonn IAR MPIR, Bonn	Large and small scale structure of M104.	20	17	2
AH-278	Hewitt, J. Turner, E. Burke, B.	Haystack Princeton MIT	The unusual ring-shaped source 1129+052: what is it?	1.3, 2, 6 and 18	20	9.5
AJ-154	Johnston, K. Hjelming, R. Vermeulen, R. Schilizzi, R.	NRL NRAO-VLA Leiden NFRA	SS433.	1.3 and 20	21	8
AK-176	Kwok, S. Aquist, O.	Calgary Calgary	High resolution radio survey of compact planetary nebulae.	2 and 6	18, 20	16
AK-179	Kavabe, R. Okumura, S. Ishiguro, M. Kanzawa, T. Fomalont, E.	Nobeyama Nobeyama Nobeyama Nobeyama NRAO-CV	The disk structure of H2O masers in the bipolar flow source NGC 2071.	1.3 cm line	21	35
AL-146	Leahy, J. Perley, R.	NRAL NRAO-VLA	Bridges in nearby 3C sources.	20 and 90	14	24
AL-150	Lestrade, J. Preston, R.	JPL JPL	Statistical properties of RS CVn stars.	6	13	1
AL-159	Lynds, R. Petrosian, V.	NOAO Stanford	Giant luminous arcs in two clusters of galaxies.	20	23 w/VB74, VM42	10.5
AM-205	Miley, G. Chambers, K. van Breugel, W.	STScI Johns Hopkins Calif, Berkeley	Study of ultra-steep spectrum radio sources.	2 and 6	24	1.8 w/VM42
AM-215	Mchardy, I. Marwick, R. Cooke, B. George, I.	Leicester Leicester Leicester Leicester	0414+009: An X-ray bright BL Lac with a radio trail in a distant cluster of galaxies.	6, 20 and 90	12	8
AN-44	Norris, R. Allen, D. Roche, P.	CSIRO AAT UC, London	Compact structure in obscured active galaxies.	6 and 18	4, 5	14
AO-74	O'Dea, C. Baum, S.	NRAO-CV Maryland/NRAO-CV	Radio properties of giant galaxies in accretion flows.	2 and 6	21	14
AP-134	Perley, R. Ekers, R.	NRAO-VLA NRAO-VLA	Superluminal expansion of 3C273 and 3C279 on arcsecond scales.	2 and 6 cm line	7, 10	24 w/AS307
AP-135	Perley, R.	NRAO-VLA	Rotation measure of 3C295.	2 and 6	12	12
AP-142	Pedlar, A. Saihia, D. Unger, S.	NRAL NRAL RCO	Polarization observations of Seyfert nuclei.	2	30	20.2 w/VA17
AP-144	Whittle, M.	Virginia				
AP-144	Price, R. Gower, A.	Victoria Victoria	Selected intermediate-redshift quasars.	2	19	6
AP-145	Phillips, J. Mampaso, A. Zijlstra, A.	Queen Mary Coll IAC NRAO-VLA	Core mapping of Type I planetary nebulae.	2 and 6	15, 20	3.5 w/AG257
AS-80	Stramek, R. van der Hulst, J. Weiler, K.	NRAO-VLA NFRA NRL	Supernova SN1980 in NGC 6946 and SN1979c in M100.	2, 6 and 20	8, 18	4 w/Test/JPL

VLA UTILIZATION SEPTEMBER 1987 (Cont.)

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
AS-211	Sramek, R. Weiler, K. van der Hulst, J.	NRAO-VLA NRL NFRA	Statistics of supernovae.	6 and 20	5, 18	2
AS-293	Panagia, N. Sramek, R. Skillman, E.	STScI NRAO-VLA NFRA	The SNR in NGC 5471.	6	5	8.5
AS-294	Strom, R.	NFRA	A probable neutron star in CTB 80.	6, 20 and 90	3, 4	16
AS-298	Schwartz, P.	NRL	Ionization associated with S140 IRS1.	2 and 20	11	7
AS-302	Saikia, D. Steppe, H. Saiter, C. Cornwell, T.	NRAL IRAM IRAM NRAO-VLA	Rotation measure, spectra and relativistic beaming.	2, 6, 18 and 20	26	12 w/VW87
AS-303	Saikia, D. Witta, P. Cornwell, T. Junor, W.	NRAL Georgia State NRAO-VLA NRAL	The nearby radio galaxy 1759+211.	6, 18 and 20	17	8
AS-307	Sukumar, S. Allen, R.	Illinois Illinois	Cosmic ray propagation in normal spiral galaxies.	90	11	12
AS-308	Sukumar, S. Allen, R.	Illinois Illinois	Spiral structure and star formation in normal galaxies.	90	9, 12	12 w/LAG257
AS-309	Sumi, D. Norman, M. Smart, L.	Illinois/Caltech Illinois Illinois	Survey of the radio structure of cooling inflow galaxies.	6 and 20	6	12
AV-96	van der Hulst, J. Sramek, R. Weiler, K.	NFRA NRAO-VLA NRL	Radio supernova in NGC 4258.	6 and 20	18	2
AV-148	Viallefond, F. Zheng, X.	NRAO-VLA CFA	Low frequency survey of M33 radio sources, electron temperature of some HII regions and large scale disk emission.	90	6	12
AV-150	van Breugel, W. McCarthy, P. Heckman, T. Miley, G.	Calif, Berkeley Calif, Berkeley Maryland STScI	Extended line emission in powerful radio galaxies.	2, 6, 18 and 20	7	16.5
AV-152	van Buren, D. Miley, G.	Johns Hopkins STScI	Search for high redshift molecules in absorption.	2, 6 and 20 cm line	15	8
AV-173	Milking, B. Mundy, L. Howe, J.	Missouri Caltech Texas	Survey of cold IRAS sources.	2 and 6	25	1.1
AV-188	Wehrle, A. Morris, M.	Calif, Los Angeles Calif, Los Angeles	The "figure-8" radio structure of NGC 2992.	2	4	8
VA-17	Alef, W. Preuss, E. Kellermann, K.	MPiR, Bonn MPiR, Bonn NRAO-CV	Variability in 3C11 and 3C390.3.	6 cm single antenna VLB	30	20.2 w/AP142
VB-74	Barthel, P. Pearson, T. Readhead, A.	Caltech Caltech Caltech	Third epoch survey.	6 cm phased array VLB	23, 26, 28, 29	39.7 w/AL159, Move/Op
VB-79	de Bruyn, A. Brouw, W. Schilizzi, R. Brouwer, F.	NFRA NFRA NFRA Delft Univ	SS433 astrometry.	6 cm phased array MK III VLB	27	8.6
VB-81	Bartel, N. Rogers, A. Shapiro, I.	CFA Haystack CFA	Expansion of SN1979c.	6 cm phased array MK III VLB	26	10.1

VLA UTILIZATION SEPTEMBER 1987 (Cont.)

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
VG-50	Gorenstein, M. Falco, E. Shapiro, I. Corey, B. Rogers, A.	CFA CFA CFA CFA	0957+56 A,B.	6 cm phased array MK III VLB	28	14.3
VG-51	Gurvits, L. Kardashev, N. Popov, M. Schilizzi, R. Pauliny-Toth, I. Kellermann, K.	Haystack Space Research Inst. Space Research Inst. NFRA MPIR, Bonn NRAO-CV	Radio structures of quasars with Z greater than three.	6 cm phased array MK III VLB	24	24.2
VH-36	Hooimeyer, J. Barthel, P. Schilizzi, R.	Leiden Caltech NFRA	Motion in cores of two large quasars.	6 cm phased array VLB	25	10.9
VM-87	Marr, J. Backer, D.	Calif, Berkeley Calif, Berkeley	NGC 1275.	6 cm single antenna VLB	26	18
VM-42	Walker, R. Seierstad, G. Unwin, S. Cohen, M.	NRAO-VLA NRAO-GB Caltech Caltech	Monitoring 3C120.	6 cm single antenna VLB	24, 28	11.5
	JPL Tests NRAO Staff			4	2, 4, 18, 21	7.9
			Baselines/Startup/Pointing Electronics/etc. Software General Tests			45.2 48.7 28.0 25.3

The average downtime for the month of September, 1987 was approximately 9.61 percent.

Average downtime of operational antennas lost due to hardware and software failures during scheduled observing =  $\frac{\text{Total number of antenna-hours of operational antennas scheduled where "antenna-hours" definition is: An array consisting of N antennas operating for Y hours is defined to have YN antenna-hours operation.}}{\text{Total number of antenna-hours of operational antennas scheduled}} \times 100$

The array was scheduled 100 percent (722.0 hours) of the time: 80.4 percent (580.3 hours) to astronomical programs, 9.0 percent (65.0 hours) to scheduled test/calibration, and the remaining 10.6 percent (76.7 hours) went to scheduled maintenance.

The array was in the A configuration during the month of September.

The total number of programs run for the month of September, 1987 was 64.

The following independent proposals shared simultaneous observing time (63.5 hours Total Simultaneous Observing):

AS308/AG257	6.0
AP145/AG257	2.5
AS80/Test/JPL	1.2
AJ154/Test/JPL	1.2
AL159/VB74	5.3
AL159/VW42	3.5
AM205/VW42	1.8
VG51/VW42	0.2
AS302/VM87	11.8
VM87/Base lines	5.0
AB456/VM87	1.2
VB74/Move/Op	3.1
VW42/Move/Op	0.5
AP142/VA17	20.2

## VLA UTILIZATION AUGUST 1987

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
AA-65	Andre, P. Montmerle, T. Feigelson, E.	CEN SacJay CEN SacJay Penn State	Three young radio stars in the Rho Ophiuchi cloud.	1.3, 2, 6, 20 and 90	6	8.5
AA-71	Aller, H. Aller, M. Hughes, P.	Michigan Michigan Michigan	Polarization and spectra of the cores of active extragalactic objects.	2, 4 and 6	24	13.8
AA-72	Antonucci, R. Barvainis, R. Wills, B. Wills, D.	STScI NRAO-CV Texas Texas	Extended radio emission around newly discovered blazars.	20	30	12
AB-408	Bookbinder, J. Callault, J. Gary, D. Gampapa, M. Golub, L. Linsky, J. Gibson, D.	Colorado Colorado Caltech Nat Solar Obs SAO Colorado MMMT	Survey of M dwarf stars.	1.3, 2, 6 and 20	8	24
AB-414	Becker, R. White, R.	Calif, Davis STScI	Monitoring flux of HD 193793 and P Cygni.	2 and 6	9	1.5 W/AL160
AB-434	Braun, R. Perley, R. Gull, S. Rudnick, L. Brown, R.	NRAO-VLA NRAO-VLA Cambridge Minnesota NRAO-CV	Physical processes in Gas A.	6 and 20	13	12
AB-440	Brown, R.	NRAO-CV	The extended structure of 0235+164.	18 and 20	21	1
AB-446	Bookbinder, J. Stencel, R. Drake, S. Linsky, J. Brown, A.	Colorado Colorado NASA/GSFC (SASC) Colorado Colorado	Studies of the winds of luminous M stars: Alpha Ori.	2	28	6
AB-449	Barthel, P. Lonsdale, C. Miley, G.	Caltech Haystack STScI	Medium resolution observations of high redshift quasars.	20	15	24
AB-457	Brown, A. Bookbinder, J.	Colorado Colorado	Parallax of T Tauri.	6	20	6
AC-166	Carilli, C. Dreher, J. Perley, R.	MIT MIT MIT	Further studies of Cygnus A.	20 and 90	17, 31	16.5
AC-173	Cameron, R. Parma, P. de Ruiter, H.	MTA-Stromio Bologna Bologna	PKS 2149-158: a binary radio jet system.	6, 18 and 21	18, 19	16.8
AC-188	Campbell, B. Stoake, J.	New Mexico Colorado	Inner disk and jet structure in L1551 IRS 5.	1.3, 2, 6 and 20	6, 11	20.5
AC-193	Cowan, J. Branch, D.	Oklahoma Oklahoma	Search for radio emission from Type II intermediate age supernovae.	20	1, 3	24
AC-195	Clegg, A.	Cornell	Possible small-scale ionized bipolar flows.	1.3	30	2.5
AC-198	Claussen, M.	Massachusetts	Structure of OH masers around RAFGL 2343.	2, 6 and 18 cm line	9	6
AC-201	Cohen, N. Benson, P. Feldman, P. Little-Marenin, I. Little, S.	Boston Wellesley Herzberg Wellesley Bentley College	Sources near EU Andromedae.	1.3 and 6	6	3
AC-203	Cordes, J. Dewey, R. Hankins, T.	Cornell Cornell Dartmouth	Gated astrometry of pulsars.	6 and 20	1, 2	15.1
AC-204	Cordova, F. Mason, K.	LANL Mullard Space Sci Lab	Simultaneous radio and infrared observations of flares in Cyg X-3.	1.3 and 2	27, 29	20



VLA UTILIZATION AUGUST 1987 (Cont.)

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
AD-188	Drake, S. Simon, T. Florkowski, D. Stencel, R. Bookbinder, J.	NASA-Goddard Hawaii USNO Colorado Colorado Colorado	Variability of emission in M supergiants: Alpha Ori, Alpha Sco, and Alpha 1 Her.	2 and 6	1,27	4.5
AF-115	Linsky, J. Feigelson, E. Schwartz, D. Madsiski, G.	Penn State CFA	Radio structure of X-ray selected BL Lac objects.	20	27	11
AF-137	Feigelson, E. Montmerle, T. Andre, P.	Penn State CEN Saclay CEN Saclay	Monitoring radio flaring stars in the Rho Oph cloud.	2, 20	12,30	2
AF-147	Fanti, C. Fanti, R. Schilizzi, R. Spencer, R. van Breugel, W.	Bologna Bologna NFRA NRL Calif, Berkeley	Search for extended structure associated with CSS radio sources.	20	14	5
AG-145	Geldzahler, B. Schwartz, P. Gear, W. Ade, P. Robson, I. 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	24,27, 31	3.7
AG-249	Greenhill, L. Moran, J. Reid, M.	Harvard CFA CFA	The H2O maser regions in M33.	1.3,2, and 6 cm line	9,10, 13	24
AG-252	Goss, W. Vallfond, F. Boulianger, F. Peimbert, M.	NRAO-VLA NRAO-VLA Caltech UNAM	Radio continuum survey of the spiral M101.	6 and 90	10	17 w/AL160
AH-275	Hughes, V.	Queen's Univ.	The variable source CepA West.	2, 6 and 20	11	8 w/Test/JPL
AH-276	Hanisch, R. Batuski, D. Burns, J.	STScI STScI New Mexico	Head-tail radio sources in poor clusters of galaxies.	6 and 20	24,27	14
AJ-152	Johnston, K. Russell, J. de Veigt, C.	NRL NRL Hamburger Sternwarte	Radio astrometric positions.	6 and 20	22	36
AJ-153	Johnston, K. Florkowski, D. de Veigt, C.	NRL USNO Hamburger Sternwarte	Search for calibrators near radio stars.	6	29	2.5
AK-174	Kandalayan, R. Willson, A.	Byurakan Obs Maryland	Two Seyfert galaxies suspected of variable radio emission.	6 and 20	26,27	2
AK-178	Kargert, P. Oort, M.	Leiden Leiden	Redshift dependence of linear sizes of ellipticals.	20	22	20
AL-143, 144, 145	Lang, K. Willson, R. Lynds, R.	Tufts Tufts NOAO	Capella and Vw Cephei: survey of cool stars.	2, 6 and 20	7 Simult projects	24 12
AL-159	Lynds, R. Petrosian, V.	NOAO Stanford	Giant luminous arcs in two clusters of galaxies.	20	1	12
AL-160	Lestrade, J. Niell, A. Preston, R.	JPL JPL JPL	Phase referenced VLBI observations of RS CVn binary systems.	4 cm single antenna MK III VLB	9	8.5 w/AB414, AC249
AM-198	Mazzarella, J. Aller, H. Galme, R.	Michigan Michigan Michigan	Continuum structures in four double-nucleus Markarian galaxies.	20	14	12

VLA UTILIZATION AUGUST 1987 (Cont.)

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
AM-213	McCarthy, P. van Breugel, W. Spinrad, H. Djorgovski, G.	Calif, Berkeley Calif, Berkeley Calif, Berkeley CFA	Extremely distant radio galaxies.	2 and 6	16	24
AM-221	Morganti, R. Fanti, C. Fanti, R. Parma, P. de Ruiter, H.	Bologna Bologna Bologna Bologna Bologna	Jets in low luminosity radio galaxies.	6	15, 20, 21	15
AP-136	Pottasch, S. Zijlstra, A. Bignelli, R.	Kapteyn Lab NRAO-VLA NRAO-VLA	Additional measurements for a general survey of planetary nebulae.	6	11	2.5
AR-154	Rucinski, S.	Toronto	Coronal radio emission of late A/early F-type dwarfs.	2, 2 and 20	12	3.5
AR-161	Rodriguez, L. Canto, J. Curiel, S. Torrelles, J. Ho, P.	UNAM UNAM UNAM Ins Ast. Andalucia Harvard	Focusing of the Herbig-Haro 1-2 jet.	6 and 20	18, 21	18
AS-211	Sramek, R. Weiler, K. van der Hulst, J. Panagia, N.	NRAO-VLA NRL NFRA STScI	Statistics of supernovae.	6 and 20	21, 28	3
AS-286	Stine, P. Weedman, D.	Penn State Penn State	Relationship between radio and IR emission in starburst galaxies.	20	4, 9	10
AS-305	Spangler, S. Cordes, J.	Iowa Cornell	Strong interstellar scattering near the supernova remnant G33.6+0.1.	6, 20 and 90	20	10
AT-86	Tarter, J. Kardashev, N. Slysh, V.	Calif, Berkeley Space Research Inst Space Research Inst	Is the IRAS source G357.3-1.3 a Dyson sphere?	20 cm line	18	1
AT-87	Torbett, M. Campbell, B.	Kentucky New Mexico	Radio emission and morphology of variable stars.	2, 2 and 20	13	4.5
AV-145	Viallefond, F. Lequeux, J.	NRAO-VLA Marseille Marseille	High density HI clumps in the blue compact galaxy I Zw 18.	21 cm line	15	12
AV-149	Comte, G. van Breugel, W. Ebnerer, K. Miley, G. Heckman, T. Baum, S. Muxlow, T.	Calif, Berkeley Calif, Berkeley STScI Maryland Maryland NRAL	Optical emission line source 3C277.3.	90	29	8.5
AV-151	van Gorkom, J. Knapp, G. Ekers, R.	NRAO-VLA Princeton NRAO-VLA	Search for atomic and molecular gas in elliptical radio galaxies.	20 cm line	2, 13	24
AW-188	Wehrle, A. Morris, M.	Calif, Los Angeles Calif, Los Angeles	The "figure-8" radio structure of NGC 2992.	2	30, 31	16
AW-191	Wootten, H.	NRAO-CV	Structure of the IRAS 16293 protostellar environment.	1.3 and 2	30	3
AZ-30	Zijlstra, A. Bignelli, R.	NRAO-VLA NRAO-VLA	Identification of a suspected radio galaxy.	20	18	1
AZ-31	Zhao, J. Burns, J. Owen, F.	New Mexico New Mexico NRAO-VLA	Turbulent radio jets in cluster galaxies.	6 and 20	25	5.5
AZ-32	Zheng, X. Reid, M. Birkinshaw, M. Ho, P.	CFA Harvard Harvard Harvard	The low frequency characteristics of NGC 6251.	90	28	10

VLA UTILIZATION AUGUST 1987 (Cont.)

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
AZ-33	Zuckerman, B. Weintraub, D.	Calif, Los Angeles Calif. Los Angeles	Circumstellar emission around T Tauri binary systems.	6	25,29	13
	JPL Tests			4	10,26	4.4
	NRAO Staff		Baselines/Startup/Pointing Electronics/etc. Software General Tests			39.9 47.1 24.0 20.6

The average downtime for the month of August, 1987 was approximately 5.90 percent.

Average downtime of = Total number of antenna-hours of operational antennas lost due to hardware and software failures during scheduled observing / Total number of antenna-hours of operational antennas scheduled where "antenna-hours" definition is: An array consisting of N antennas operating for Y hours is defined to have YN antenna-hours operation. X 100

The array was scheduled 100 percent (746.1 hours) of the time: 82.4 percent (614.9 hours) to astronomical programs, 8.1 percent (60.1 hours) to scheduled test/calibration, and the remaining 9.5 percent (71.1 hours) went to scheduled maintenance.

The array was in the A configuration during the month of August.

The total number of programs run for the month of August, 1987 was 57.

The following independent proposals shared simultaneous observing time (57.4 hours Total Simultaneous Observing):

AL143/AL144/AL145	48.0
AB414/AL160	1.0
AG249/AL160	7.5
AG252/Tests/JPL	0.9

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VLA UTILIZATION JULY 1987

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
AA-70	Altschuler, D. Hummel, E. Loiseau, N.	Puerto Rico MPIR, Bonn MPIR, Bonn	Galaxies with multiple nuclei.	20	31	12
AB-414	Becker, R. White, R.	Calif, Davis STScI	Monitoring flux of HD 193793 and P Cygni.	2 and 6	24	2
AB-434	Braun, R. Perley, R. Gull, S. Rudnick, L.	NRAO-VLA NRAO-VLA Cambridge Minnesota	Physical processes in Gas A.	6 and 20	29	12
AB-436	Bietenholz, M. Kronberg, P. Brown, R.	Toronto Toronto NRAO-CV	High resolution studies of the Crab nebula. The extended structure of 0235+164.	20	6	6
AB-451	Becker, R. Helfand, D.	Calif, Davis Columbia	Compact radio sources in supernova remnants: G351.2+0.1.	6, 20 and 90	15	4
AB-452	Boisse, P. Kazes, I. Bergeron, J. Dickey, J.	ENS, Paris Meudon IAP Minnesota	Mapping 0446-208 and nearby galaxy.	20	10	1
AB-454	Bridle, A. Browne, I. Burns, J. Dreher, J. Hough, D. Lainig, R. Lonsdale, C. Scheuer, P. Wardle, J.	NRAO-CV NRAL New Mexico MIT JPL RGO Haystack Cavendish Lab Brandeis	Investigation of sidedness of jets in high luminosity sources.	6	10	48
AB-456	Burke, B. Hewitt, J. Roberts, D.	MIT Haystack Brandeis	Time variation of 0957+561 A,B.	6	20	2
AB-457	Brown, A. Bookbinder, J.	Colorado Colorado	Reference sources near T Tauri.	6	3	1.5
AC-149	Clarke, D. Burns, J. Norman, M. Christiansen, W.	New Mexico New Mexico LANL North Carolina	Search for active magnetic field effects in extragalactic radio sources: 3C3388.	6 and 20	5	15
AC-170	Chance, D. Yusef-Zadeh, F.	STScI NASA/GSFC	Orion nebula.	20	18	10
AC-197	Claussen, M. Lo, K.	Massachusetts Illinois	Distribution of luminous water masers in the nucleus of NGC 1068.	1.3 cm line	26	8
AC-199	Clifton, T. Kulkarni, S.	Calif, Berkeley Caltech	Proper motion of PSR0748-28 and interstellar scattering of PSR1849+00.	20	9, 10	7.5
AC-203	Cordes, J. Dewey, R. Hankins, T.	Cornell Cornell Dartmouth	Gated astrometry of pulsars.	6 and 20	21, 31	8.9
AD-188	Drake, S. Simon, T. Florkowski, D. Stencel, R. Bookbinder, J. Linsky, J.	NASA-Goddard Hawaii USNO Colorado Colorado Colorado	Variability of emission in M supergiants: Alpha Ori, Alpha Sco, and Alpha 1 Her.	2 and 6	3, 8	4
AD-194	Drake, S. Linsky, J. Shore, S. Eltzsur, M.	NASA/GSFC Colorado NMIMT NASA/GSFC	Radio emission from early-type magnetic stars. Further studies of red giants.	2, 6 and 20	2	24.5 w/AD197
AD-197	Drake, S. Eltzsur, M. Linsky, J.	NASA/GSFC NASA/GSFC Colorado	Further studies of red giants.	2 and 6	2	24.5 w/AD194

VLA UTILIZATION JULY 1987 (Cont.)

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
AD-199	Dulk, G. Bookbinder, J. McKean, M. Zlobec, P.	Colorado Colorado Colorado Trieste	Fine structures in solar active regions and Type I radio bursts.	1.3, 2, 6, 18, 20 and 90	17	12
AD-204	Duric, N. M. Dittmar, M. Crane, P.	New Mexico New Mexico NRAO-VLA	Multi-frequency, scaled array study of 4 normal spiral galaxies.	90	27	15
AF-143	Fischer, M. Gonzales, P. Gibson, D.	La Plata Jr. High La Plata Jr. High NM/MT	Globular cluster X-ray binary 4U1820-30.	20	1	1.1 w/Move/Op
AG-145	Geldzahler, B. Schwartz, P. Gear, W. Ade, P. Robson, I. 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, 6, 13, 18	4.5
AG-243	Giovannini, G. Feretti, L.	Bologna Bologna	The extended source near Coma A.	90	5	1.5
AG-248	Giovannini, G. Feretti, L. Venturi, T.	Bologna Bologna Bologna	Low frequency observations of NGC 4869.	90	23	2
AG-250	Gregorini, L. Padrielli, L. Parma, P.	Bologna Bologna Bologna	Radio galaxies of intermediate strength.	6	13	3.5
AG-251	Gregory, P. Duric, M. Taylor, A.	British Columbia New Mexico NRAL	New galactic variable radio sources.	1.3, 2, 6 and 20	14	12
AH-195	Hjellming, R. Davis, R.	NRAO-VLA NRAL	Recurrent nova RS Oph.	1.3	4	4
AH-234	Heeschen, D. Wrobel, J.	NRAO-CV NM/MT	Clumpy irregular galaxies.	6	24	12
AH-254	Hjellming, R. Gehrz, R. Taylor, A.	NRAO-VLA Minnesota NRAL	Three recent novae.	1.3, 2, 6 and 20	1	9.5
AH-270	Seagulist, E. Hummel, E. van der Hulst, J. Sramek, R.	Toronto MP/R, Bonn NFRA NRAO-VLA	Monitoring NGC 4194 in search of supernovae.	2 and 6	6	5
AH-271	Hill, G. Lilly, S. Stockton, A.	Hawaii Hawaii Hawaii	The radio source population at $z \approx 0.5$ .	20	23, 28	10
AH-279	Hjellming, R.	NRAO-VLA	Imaging the stable remnant of the recurrent nova RS Ophiuchi.	2, 6 and 20	16, 17	20
AH-280	Hogg, D.	NRAO-CV	Search for variation in radio emission of WR star HD191765.	2, 6 and 20	16	3 w/Move/Op
AH-282	Hutchings, J. Neff, S. Gower, A.	DAO NASA/GSFC Victoria	Evolution of radio-loud AGN with distance and luminosity.	6 and 20	20	12.5
AJ-154	Johnston, K. Hjellming, R. Vermeulen, R. Schilizzi, R.	NRL NRAO-VLA Leiden NFRA	Extended observations of SS433.	1.3 and 20	6	8
AJ-155	Johnston, K. Wade, C. Seidelmann, P. Webster, W. Hobbs, R.	NRL NRAO-VLA USNO NASA/GSFC CTA	Spatial distribution of 1 Ceres and 2 Pallas 2cm emission.	2	9, 12	22

VLA UTILIZATION JULY 1987 (Cont.)

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
AK-168	Kulkarni, S. Backer, D. Clifton, T. Middleditch, J. Lyne, A.	Caltech Calif, Berkeley Calif, Berkeley LANL NRAL	M 28 pulsar investigation.	20	30	1
AK-170	Kundu, M. White, S. Schmahl, E. Pick, M.	Maryland Maryland Maryland Meudon	Simultaneous microwave and meterwave solar imaging observations.	6, 20 and 90	19	12
AK-177	Kronberg, P. Sramek, R.	Toronto NRAO-VLA	Monitor M82.	1.3, 2 and 6	30	10
AK-180	Kronberg, P. Zukowski, E.	Toronto Toronto	Rotation measure maps of three radio-extended quasars.	2, 6 and 20	26	9
AL-139	Lang, K. Willson, R. Trottet, G.	Tufts Tufts Paris	Solar noise storms.	90	13	12
AL-142	Leahy, J.	NRAL	Faraday rotation and depolarization in 3C132.	6, 18 and 20	28	8
AL-151	Langston, G. Heflin, M. Lehar, J. Burke, B.	MIT MIT MIT MIT	High redshift observation of 21 cm absorption.	90 cm line	25	6
AL-152	Langston, G. Carilli, C. Burke, B.	MIT MIT MIT	Observations of core-jet radio sources from the MG-VLA snap shot survey.	6, 18 and 20	22	16
AL-153	Langston, G. Heflin, M. Burke, B.	MIT MIT MIT	Four lens candidates detected with VLBI.	2	19	2
AL-154	Langston, G. Heflin, M. Burke, B.	MIT MIT MIT	Time variation of 2016+112.	6	28	3
AL-158	Little, L. Heaton, B.	Kent Kent	Twin beams from a young B star?	2	30	3
AM-192	Masson, C. Lo, K.	Caltech Illinois	Proper motions in the galactic center.	6	14	8.5
AM-205	Claussen, M. Miley, G. Chambers, K. van Breugel, W.	Massachusetts StSCI Johns Hopkins Calif, Berkeley	Study of ultra-steep spectrum radio sources.	2 and 6	16, 18, 30	14.5
AM-212	Marscher, A. Shaffer, D.	Boston Interferometrics Inc.	4C39.25.	1.3, 2, 6 and 20	16	8
AM-218	Menten, K. Walmisley, C. Henkel, G. Wilson, T. Wadiak, E.	MPiR, Bonn MPiR, Bonn MPiR, Bonn MPiR, Bonn NRAO-CV	Methanol masers.	1.3 cm line	25	9
AP-133	Johnston, K. Preston, R. Meier, D. Jauncey, D. Tzioumis, A.	NRL JPL JPL CSIRO Sydney	Imaging of 0403-132 and 0405-123.	1.3, 2 and 6	27	1.5
AR-163	Rodriguez, L. Garcia-Barreto, J. Gomez, Y. Moran, J.	UNAM UNAM UNAM CFA	Angular expansion of NGC 6302.	6	13, 23	8.5

VLA UTILIZATION JULY 1987 (Cont.)

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
AS-211	Sramek, R. Weller, K. van der Hulst, J. Panagia, N.	NRAO-VLA NRL NRAO STScI	Statistics of supernovae.	6 and 20	9	1
AS-268	Smith, H. Simon, R. Mozurkewich, D. Sequist, E. Bell, M.	NRL NRL NRL NRC	A dense disk around NGC 2071: a selected bipolar flow.	2 and 20	4	4
AS-271	Sequist, E. Bell, M.	Toronto NRC	Absorption by H <sub>2</sub> CO, HI and OH against the strong nuclear continuum source in Centaurus A.	6, 18 and 20 cm line	20, 25	12
AS-280	Sequist, E.	Toronto	Expansion of the compact nebula VY2-2.	1.3, 2, 6 and 20	20, 28	8
AS-290	Simon, R. Johnston, K.	NRL NRL	Arc second scale maps of 3C395.	6 and 20	24	12
AS-291	Saslaw, W. Cotton, W. Benson, J.	Virginia NRAO-CV NRAO-CV	Galactic stars superimposed on background radio sources.	6	1, 4 w/Move/Op	10
AS-295	Simon, M. Vader, P.	SUNY, Stony Brook Yale	Radio mapping of the infrared loud quasar IRAS 00275-2859.	6 and 20	24	3.5
AS-304	Shara, M. White, R. Becker, R.	STScI STScI Calif. Davis	Mapping the shell of the old nova CK Vul.	6 and 20	18	6
AT-60	Taylor, A. Sequist, E. Kenyon, S.	NRAO Toronto SAO	Radio-optical-UV monitoring of sybiotic stars.	1.3, 2, 6 and 20	26	12
AT-88	Teraby, S. Vogel, S. Myers, P.	Gaitech RPI SAO	Water masers around low mass stars.	1.3 cm line	19, 21	9
AU-28	Uivestad, J. Antonucci, R. Goodrich, R.	JPL STScI Calif, Santa Cruz	Narrow-line Seyfert 1 galaxies.	6 and 20	29, 31	11
AU-30	Uivestad, J. Antonucci, R.	JPL STScI	NGC 253.	6 and 20	10, 21	16
AV-146	Vallfond, F. Heydari,	NRAO-VLA ESO, Chile	HI observations in the low metallicity blue compact galaxy M6600.	20 cm line	9	12
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.	20 cm line	3, 7, 10, 20	4
AW-169	Winglee, R. Dulk, G. McKean, M.	Colorado Colorado Colorado	Search for bursts from nearby stars.	20 and 90	3	12
AW-189	Walker, R. Benson, J.	NRAO-VLA NRAO-CV	Superluminal motion of 4 arcsec knot in 3C120.	6	5	13
	Summer Students				4	3
	JPL Staff		Tests	4	22	4.5
	NRAO Staff		Baselines/Startup/Pointing			62.3
			Electronics/etc.			57.3
			Software			21.5
			General Tests			13.0

The average downtime for the month of July, 1987 was approximately 5.24 percent.

Average downtime of operational antennas =  $\frac{\text{Total number of antenna-hours of operational antennas lost due to hardware and software failures during scheduled observing}}{\text{Total number of antenna-hours of operational antennas scheduled}}$  x 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: 80.1 percent (597.5 hours) to astronomical programs, 9.3 percent (69.7 hours) to scheduled test/calibration, and the remaining 10.6 percent (78.8 hours) went to scheduled maintenance.

The array was in the A configuration during the month of July.

The total number of programs run for the month of July, 1987 was 69.

The following independent proposals shared simultaneous observing time (35.6 hours Total Simultaneous Observing):

AF143/Move/Op	1.1
AS291/Move/Op	5.0
AD194/AD197	24.5
AB451/Move/Op	2.0
AH280/Move/Op	3.0

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VLA UTILIZATION JUNE 1987

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
AA-68	Anantharamaiah, K. Radhakrishnan, V. Shukre, C.	NRAO-VLA Raman Res Inst Raman Res Inst	Positronium recombination lines.	6 cm line	8, 10, 13	18
AB-414	Becker, R. White, R.	Calif, Davis STScI	Monitoring flux of HD 193793 and p Cygni.	2 and 6	6	1-5 w/VW87
AB-442	Backer, D. Cordes, J.	Calif, Berkeley NRAO-VLA/Cornell	Steep spectrum 4Q sources.	18 and 20	20	24 w/AU31
AB-447	Barthel, P.	Caltech	Radio spectra of very high redshift quasars.	1-3, 2, 6, 18 and 20	14, 15, 19	14 w/AU31
AD-188	Drake, S. Simon, T. Fiorowski, D. Stencel, R. Bookbinder, J. Linsky, J.	NASA-Goddard Hawaii USNO Colorado Colorado Colorado	Variability of emission in M supergiants: Alpha Ori, Alpha Sco, and Alpha 1 Her.	2 and 6	23	1
AD-200	Dulk, G. Bastian, T. McKean, M. Bookbinder, J. Le Queau, D. Klein, L. Bourgois, G. Lecacheux, A.	Colorado Colorado Colorado Colorado CRPE Obs de Paris Obs de Paris Obs de Paris	Dynamic spectroscopy of stellar radio sources.	2, 6, 20 and 90 cm line	28, 29	28
AF-138	Fomalont, E. Geldzahler, B.	NRAO-CV NRL	Component variability in Sco X-1.	6	1	9 w/VST1, VW84
AF-143	Fischer, M. Gonzalez, P. Gibson, D.	Laplata Jr. High Laplata Jr. High NMIMT	Globular cluster X-ray binary 4U1820-30.	20	30	0.4
AH-268	Hogan, C. Martin, H. Perley, R. Partridge, R.	Steward Obs Steward Obs NRAO-VLA Haverford Coll	Search for cosmic microwave background fluctuations.	2	2, 6, 8	16.5 w/VW84, VM87
AJ-151	Jackson, P. Kundu, M. White, S.	Maryland Maryland Maryland	High spatial resolution observations of three flare star systems.	2, 6, 20 and 90	18, 25	26.5 w/AU31, Move/Op
AJ-153	Johnston, K. Florowski, D.	NRL USNO	Search for calibrators near radio stars.	20	2	1.5 w/VW84
AK-163	Kundu, M. Schmahl, E. White, S.	Maryland Maryland Maryland	Three dimensional structures of coronal bright points.	2, 6 and 20	8, 12, 14	26.3
AL-137	Lang, K. Willson, R.	Tufts Tufts	Physical properties of RS CVn systems.	2, 6 and 20	21, 27, 28	14.9
AL-139	Lang, K. Willson, R. Trotter, G.	Tufts Tufts Meudon	Solar noise storms.	90	26, 27	15.5
AL-140	Lestrade, J. Preston, R. Mutel, R. Bojoh, L. Charlot, P.	JPL JPL Iowa JPL/CNES IGN	Search for compact extragalactic sources near RS CVn stars.	6	28	6
AL-141	Lang, K. Willson, R.	Tufts Tufts	Survey of active BY Draconis and W Ursae Majoris stars.	6 and 20	26, 27	17.6
AM-195	Myers, P. Terebey, S. Rodriguez, L. Cruz-Gonzalez, I.	SAO-CFA NCAR UNAM UNAM	Radio continuum from IRAS sources embedded in dense molecular cores.	6	4	3 w/VZ13, VL45

VLA UTILIZATION JUNE 1987 (Cont.)

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
AM-199	Mazzarella, J. Atter, H. Gaume, R.	Michigan Michigan Michigan	HI properties of double nucleus Markarian galaxies.	20 cm line	1,7	12 w/VST1, VZ13, VM45
AM-217	Morris, D. Motel, R.	Iowa Iowa	Investigation of emission in RS CVn binaries and comparable single stars.	6	11, 12	26.5 w/AU31, Move/Op
AN-45	Nelson, R. Spencer, R.	NRAL NRAL	Measurement of spectra and positions of X-ray binaries.	2, 6 and 20	23, 29	11
AP-136	Potasz, S. Zijlstra, A. Bignelli, R.	Kapteyn Lab NRAO-VLA NRAO-VLA	Additional measurements for a general survey of planetary nebulae.	6 and 20	1	1.5
AP-139	Palmer, P. Yusef-Zadeh, F. Goss, W. Lasenby, A. Lasenby, J.	Chicago NASA-Goddard NRAO-VLA Cambridge Cambridge	H110 Alpha line in Sgr B1 and Sgr B2.	6 cm line	1,3	19.5 w/VST1, VF13, VZ13
AR-147	Rucinski, S. Gibson, D.	David Dunlap Obs NMIMT	Survey of evolved W Ursa Majoris stars.	2, 6 and 20	21	13.5 w/AU31
AR-157	Rodriguez, L. Anlada, G.	UNAM Barcelona	An attempt to detect dust emission.	2 and 6	5, 7	14
AS-80	Sramek, R. van der Hulst, J. Weiler, K.	NRAO-VLA NRAO-VLA NRL	Monitoring supernovae SN1980 in NGC 6946 and SN1979c in M100.	2, 6 and 20	w/VZ13, VM87, VM45 23, 25	4
AS-211	Sramek, R. Weiler, K. van der Hulst, J. Panagia, N.	NRAO-VLA NRL NRAO-VLA STSci	Statistical properties of radio supernovae.	2, 6 and 20	3, 21, 29	4.5 w/VZ13
AS-275	Strine, P. Feigelson, E. Myers, P. Mathieu, R.	Penn State Penn State CFA CFA	Search for continuum flares in windless pre-main sequence stars.	6	29, 30	13
AS-284	Sequist, E. Taylor, A.	Toronto Groningen	Radio spectra of selected sybiotic stars.	2, 6 and 20	16	10.5
AU-27	Umama, G. Catalano, S. Gibson, D.	NMIMT Catanina NMIMT	Survey of nearby Be stars.	2	22	18 w/AU31, Move/Op
AU-31	Uson, J. Cornwell, T. Ekers, R. Laing, R.	NRAO-VLA NRAO-VLA NRAO-VLA RGO	Observations of the Sunyaev- Zel'dovich effect.	2	2, 6, 8, 11, 14 13-16, w/AB442, 18-22 AB447, AJ151, AM217, AR147, AU27, AU32, JPL/V VM84, VM87, VM45, Move/Op	34
AU-32	Umama, G. Shore, S.	NMIMT NMIMT	Observations of UU-Her type stars.	6 and 20	14, 15, 20	34 w/AU31
AV-96	van der Hulst, J. Sramek, R. Weiler, K.	NRAO-VLA NRAO-VLA NSF	Radio supernova in NGC 4258.	6 and 20	23	2
AW-169	Winglee, R. Dulk, G. McKean, M.	Colorado Colorado Colorado	Search for burst radiation from nearby stars.	20 and 90	26	12
AW-171	White, N. Stella, L. Smith, A.	ESA/ESOC ESA/ESOC ESA/ESOC	Survey of radio emission from X-ray binaries.	6	17, 18, 24	13.4 w/Move/Op
AW-185	Wootten, H. Butner, H. Loren, R.	NRAO-CV Texas Texas	Water maser location in the binary protostar in L1689N(IR).	1.3 cm line	30	2
AY-18	Young, J. Kenney, J. Tacconi, L.	Massachusetts Massachusetts Massachusetts	Atomic hydrogen distributions in isolated, interacting and Virgo galaxies.	20 cm line	4, 5, 6	25.5 w/VL45, VZ13

VLA UTILIZATION JUNE 1987 (Cont.)

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
VF-13	Fey, A. Spangler, S. Mutel, R. Dickey, J. Cordes, J.	Iowa Iowa Iowa Minnesota NRAO-VLA/Cornell	Measuring galactic distribution of angular broadening at low galactic latitudes.	6 cm phased array MK III VLB	2	4
VL-45	Lawrence, C. Readhead, A. Linfield, R. Jones, D. Preston, R. Schilizzi, R. Porcas, R. Booth, R. Burke, B.	Caltech Caltech JPL Caltech JPL NRAO MPIR, Bonn Onsala MIT	Strong source survey.	1.3 cm 3 antenna VLB	4	13 w/AM195, AV18
VM-82	Moran, J. Greenhill, L. Reid, M. Gwinn, C. Downes, D. Genzel, R.	CFA Harvard CFA CFA IRAM MPIR, Bonn	Water maser proper motions in M33/IC133.	1.3 cm phased array MK III VLB	7	13.4 w/VM88
VM-84	Morabito, D. Newhall, X.	JPL JPL	Mapping of the close pair 1342+662 and 1342+663.	6 cm phased array VLB	2	18.3 w/AF138, AJ153, AU31, AH268
VM-87	Marr, J. Backer, D.	Calif, Berkeley Calif, Berkeley	3C84 = NGC 1275.	1.3 cm 3 antenna VLB Elec. Startup, AU31, AH268	3,6	18 w/AR157, AB414, Tests, AU31, AH268
VM-88	Moran, J. Greenhill, L. Reid, M. Gwinn, C. Downes, D. Genzel, R.	CFA Harvard CFA CFA IRAM MPIR, Bonn	Water maser proper motions in M33/IC133.	1.3 cm phased array MK III VLB	4,7	28.9 w/VM82
VR-41	Hirabayashi, H. Roberts, D. Wardle, J. Cawthorne, T. Brown, L. Gabuzda, D.	Nobeyama Brandeis Brandeis Glasgow Brandeis Brandeis	Linear polarization of BL Lac objects - survey of structures and variability.	6 cm phased array MK III VLB	1	2.4
VS-71	Schallinski, C. Witzel, A. Kirchbaum, T. Hummel, E. Biermann, P. Johnston, K. Simon, R.	MPIR, Bonn MPIR, Bonn MPIR, Bonn MPIR, Bonn MPIR, Bonn NRL	Second epoch HDR observations of four new superluminial candidates.	6 cm phased array VLB	1	23.3 w/AP139, AM199, AP136, Tests, AF138
VM-45	Witzel, A. Schallinski, C. Johnston, K.	MPIR, Bonn MPIR, Bonn NRL	Monitoring structure of 1928+738.	1.3 cm 3 antenna VLB	7	12 w/AM199, AR157, AU31
VZ-13	Zensus, A. Cohen, M. Umwin, S. Biretta, J. JPL Staff	Caltech Caltech Caltech CFA	3C273, 3C345. Voyager image transmission.	1.3 cm 3 antenna VLB 4	3,4, 5,7 11	26.5 w/Startup, AS211, AP139, AM195, AV18, AR157, AM199 8 w/AU31

VLA UTILIZATION JUNE 1987 (Cont.)

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
NRAO Staff			Move/Operations/Startup			130.1
			Planned Power Outage			12.5
			Electronics/etc.			45.9
			Software			20.5
			General Tests			26.1

The average downtime for the month of June, 1987 was approximately 13.79 percent.

Average downtime of operational antennas =  $\frac{\text{Total number of antenna-hours of operational antennas lost due to hardware and software failures during scheduled observing}}{\text{Total number of antenna-hours of operational antennas scheduled where "antenna-hours" definition is: An array consisting of N antennas operating for Y hours is defined to have YN antenna-hours operation.}}$  X 100

The array was scheduled 100 percent (722.0 hours) of the time: 72.3 percent (522.4 hours) to astronomical programs, 18.3 percent (133.4 hours) to scheduled test/calibration, and the remaining 9.2 percent (66.2 hours) went to scheduled maintenance.

The total number of programs run for the month of June, 1987 was 46.

The following independent proposals shared simultaneous observing time (234.2 hours Total Simultaneous Observing):

AP139/VST1	4.1	AJ151/Move/Op	8.9
AM199/VST1	5.0	AJ151/AU31	5.5
AP136/VST1	1.5	AB442/AU31	11.5
VST1/Move/Op	3.0	AR147/AU31	5.5
VST1/Tests/Anantha	2.0	AU27/AU31	3.5
AF138/VST1	5.2	AU27/Move/Op	14.5
AF138/VM84	3.8	AF143/Move/Op	0.4
AJ153/VM84	1.5	VM82/VM88	13.4
AU31/VM84	6.5	VST1/Tests/Cordes	2.5
AH268/VM84	6.5		
VM87/Electronics	0.4		
VM87/Startup	2.6		
VZ13/Startup	3.4		
AS211/VZ13	1.0		
AP139/VZ13	8.5		
AM195/VZ13	0.1		
AM195/VL45	1.9		
AY18/VL45	11.1		
AY18/VZ13	6.7		
AR157/VZ13	3.8		
AR157/VM87	0.2		
AB414/VM87	1.5		
VM87/Tests/Vango rkom	1.5		
AU31/VM87	6.0		
AH268/VM87	5.8		
AM199/VZ13	3.0		
AM199/VM45	2.1		
AR157/VM45	7.0		
AU31/VM45	2.9		
AM217/AU31	14.0		
AU31/Tests/JPL	8.0		
AM217/Move/Op	3.8		
AB447/AU31	11.0		
AU31/AU32	16.5		
AM171/Move/Op	6.5		
AU31/Move/Op	13.5		

VLA UTILIZATION MAY 1987

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
AA-67	Anantharamaiah, K. Goss, W.	NRAO-VLA NRAO-VLA	Recombination line observations of Orion B.	20 cm line	2	12
AB-414	Dewdney, P. Becker, R.	DRAO SISCI	Monitoring flux of HD 193793 and P Cygni.	2 and 6	11	1.5
AB-426	White, R. Bowers, P.	NRL Princeton	HI toward Alpha Orionis.	21 cm line	9	10
AB-431	Knapp, G. Bowers, P.	NRAO Princeton	Search for HI in circumstellar envelopes of $\alpha$ Ceti, IRC+10216 and ORL2688.	20 cm line	16	11
AB-433	Bothun, G. Skillman, E.	Michigan NEFA	HI in IC 3475 - A stripped dwarf galaxy in the Virgo cluster.	20 cm line	15	8
AB-434	Braun, R. Perley, R. Gull, S. MRAO	NRAO-VLA NRAO-VLA MRAO	Physical processes in Cassiopeia A.	2 and 6	8, 27	15 w/Vc46
AB-435	Rudnick, L. Brown, R. Gordon, M.	Minnesota NRAO-CV NRAO-CV	Photodissociation regions in dark clouds.	20 cm line	10, 14	15
AB-436	Bietenholz, M. Kronberg, P.	Toronto Toronto	High resolution studies of the Crab Nebula.	2, 20 and 90	26	12.5 w/VM85
AC-186	Chapman, B. Petendill, G.	JPL MIT	The moon.	20 and 90	22	7
AC-194	Clifton, T. Kulkarni, S. Frail, D.	Caltech Caltech Toronto	HI absorption towards two galactic SNRs.	20 cm line	26, 30	9.2 w/Vc46
AD-188	Drake, S. Simon, T. Florkowski, D. Stencel, R. Bookbinder, J. Linsky, J.	NASA-Goddard Hawaii USNO Colorado Colorado Colorado	Variability of emission in M supergiants: Alpha Ori, Alpha Sco, and Alpha 1 Her.	2 and 6	22	3
AD-192	Dressel, L.	Rice	Neutral hydrogen in normal giant elliptical galaxies: NGC 938 and UGC 04170.	20 cm line	17, 18, 20, 23	52.1 w/Vs71, Vc46
AE-52	Erickson, W. Jacobson, A.	Maryland Los Alamos	Radio refraction study of ionospheric shock wave phenomena.	90	14	1.5
AG-145	Geldzahler, B. Schwartz, P. Gear, W. Ade, P. Robson, I. Noit, I. Smith, M.	NRL NRL Queen Mary Coll Queen Mary Coll Preston Polytechnic Oregon Royal Obs	Simultaneous multifrequency observations of blazars.	1.3, 2, 6, 20 and 90	19, 25, 27	4.5 w/Vc46, VM86
AG-242	Green, D.	MRAO	SNR G74.9+1.2 at 1.4 GHz: Distance and limits on any shell.	20 cm line	16	7
AG-245	Gull, S. Goss, W.	MRAO NRAO-VLA	Recombination lines from external galaxies M82 and NGC 253.	6, 20 and 90 cm line	3, 7	22.5 w/AL160
AG-246	Anantharamaiah, K. Goldstein, R. Muhleman, D. Grossman, A.	NRAO-VLA JPL Caltech Caltech	Radar echo reception from Saturn's rings.	3.6 cm line	24, 26, 28	21.5 w/VM86, Vc46, V878
AH-260	Henkel, C. Gusten, R. Zyilka, R.	MPIR, Bonn MPIR, Bonn MPIR, Bonn	On the nature of the galactic center molecular jet.	18 cm line	8	2.5
AH-261	Herter, T. Helffer, H. Ho, P.	Cornell Rochester Harvard	Helium abundances in galactic HI regions.	2 cm line	19	8
AH-262	Higdon, J.	Texas	Neutral hydrogen observations of the peculiar ring galaxy ARP 144.	20 cm line	15	7.5
AH-264	Hughes, V.	Queen's Univ	Large scale structure in Cep A.	6 and 20	11	2

VLA UTILIZATION MAY 1987 (Cont.)

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
AH-269	Hester, J. Braun, R. Cox, D. Raymond, J.	Caltech NRAO-VLA Wisconsin CFA	Relativistically supported recombination regions in the Cygnus loop.	2 and 6	5	12
AH-272	Higdon, J.	Texas	Neutral hydrogen observations of a sample of ring galaxies. Dynamics of ionized flows around OB clusters.	20 cm line	21, 24, 25	23.5
AH-273	Ho, P. Klein, R. Haschick, A.	Harvard Calif, Berkeley Haystack	Interstellar H I in two southern elliptical galaxies.	6 cm line	17	8
AJ-146	Jura, M. Kim, D. Knapp, G. van Gorkom, J. Guhathakurta, P.	Calif, Los Angeles Princeton NRAO-VLA Princeton	Search for calibrators near radio stars.	20 cm line	13, 20	12
AJ-153	Johnston, K. Florkowski, D. de Veigt, C.	NRL USNO Hamburg Sternwarte	Spectrum of SS 433.	1.3, 2, 6 and 20	23, 27, 28, 29	4.2 w/VM86, VC46
AJ-154	Johnston, K. Hjelming, R. Vermuelen, R. Schilizzi, R.	NRL NRAO-VLA Leiden NRAO-Dwingeloo	Determination of CBR temperature using H2CO: W51.	2 cm line	1, 2, 3	24 w/AL160
AK-158	Kogut, A. Smoot, G. Petuchowski, S. Bennett, C.	Calif, Berkeley Calif, Berkeley NASA-Goddard NASA-Goddard	Use of formaldehyde anomalous absorption to study clumping in globules.	6 cm line	9	10
AK-165	Kutner, M. Evans, N. Mundy, L.	Rensselaer Polytechnic Texas Caltech	Deep survey in a Space Telescope/ WFPC ultradeep survey area.	6 cm line	5, 6, 9, 10, 11	50.5
AK-172	Kristian, J. Windhorst, R. Fomalont, E. Kellermann, K.	Mt Wilson Mt Wilson NRAO-CV NRAO-CV	VLBI observation of Sgr A*.	3.6 phased array MK III VLB	16	7.2 w/AU31
AL-149	Lo, K. Backer, D. Johnston, K. Ekers, R.	Caltech Calif, Berkeley NRL NRAO-VLA	Statistical properties of RS CVn stars.	6	13	.4
AL-150	Lestrade, J. Preston, R.	JPL JPL	Phase referenced VLBI observations of two RS CVn binary systems.	3.6 single antenna VLBI	3	15.2 w/AG245, AK158
AL-160	Niell, A. Preston, R.	JPL JPL	The radio streamers near Sgr A.	6 cm line	27	7.5 w/AY17, VC46
AM-211	Morris, M. Yusef-Zadeh, F.	Calif, Los Angeles NASA-Goddard	Recombination lines towards the Crab nebula.	90 cm line	8	9
AO-76	O'Dea, C. Gregorini, L. Feretti, L. Giovannini, G.	NRAO-CV Bologna Bologna Bologna	Measurements of planetary nebulae with very low intrinsic brightness.	6	21	5
AP-129	Payne, H. Anantharamaiah, K. Erickson, W.	NRAO-GB NRAO-VLA Maryland	Continuum and recombination lines towards the galactic center.	90 cm line	18	6.5
AP-137	Pottasch, S. Feast, M. Zijlstra, A.	Kapteyn Lab SAO NRAO-VLA	Recombination lines from the Orion nebula.	6 cm line	28	10.5 w/VW42
AP-138	Pedlar, A. Anantharamaiah, K. van Gorkom, J. Ekers, R.	NRAO NRAO-VLA NRAO-VLA NRAO-VLA				
AP-140	Palmer, P. Yusef-Zadeh, F.	Chicago NASA-Goddard				

VLA UTILIZATION MAY 1987 (Cont.)

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
AS-211	Sramek, R. Weiler, K. van der Hulst, J.	NRAO-VLA NRL NRA STScI	Statistical properties of radio supernovae.	2, 6 and 20	14,24	2.0
AS-283	Sancisi, R. van Gorkom, J. van Albada, T.	Kapteyn Lab NRAO-VLA Kapteyn Lab	The size of the dark halo of the spiral galaxy NGC 3198.	20 cm line	1,7	26.1
AS-296	Salpeter, E. Dickey, J. Condon, J.	Cornell Minnesota NRAO-CV	Luminosity function of distant cluster galaxies.	20	14,22	25
AU-31	Uson, J. Cornwell, T. Ekers, R.	NRAO-VLA NRAO-VLA NRAO-VLA	Observations of the Sunyaev- Zel'dovich effect.	2	1, 10, 16,28	19.5 w/AL149, VM42
AW-173	Laing, R. Wilking, B. Mundy, L. Howe, J.	RG0 Missouri Caltech Texas	Survey of cold IRAS sources.	2 and 6	27,29	6.6 w/VM85
AY-17	Yusef-Zadeh, F. Morris, M.	NASA/Goddard Calif, Los Angeles	The galactic center threads.	2 and 6	27,30	11.3 w/AM211, VCU6
AY-20	Yusef-Zadeh, F. Cornwell, T.	NASA-Goddard NRAO-VLA	The HH 34 complex.	2, 6 and 20	11,28	10.5 w/VM42
VAH-54	Geldzahler, B. Cohen, N.	NRL Bentley Coll.	X-ray binary.	6 cm phased array MK 111 VLB	30	1.4
VB-76	Bartel, N. Rupen, M. Shapiro, I.	CFA Princeton CFA	Supernova 1986J in NGC 891.	6 cm phased array MK 111 VLB	30	5.6
VB-78	Bartel, P. Schilizzi, R. Miley, G.	Caltech NRA STScI	Giant radio galaxy 3C236.	6 cm phased array/ single dish VLB	28,29	13.5 w/tests, AG246, Move/Op
VC-46	Cohen, M. Barthel, P. Unwin, S. Zensus, A. Ailer, H. Ailer, M. Baath, L. Nicolson, G.	Caltech Caltech Caltech Caltech Michigan Michigan Onsala Hartebeesthoek	Study of a flux limited sample.	6 cm single antenna MK 11 VLB	23,26, 27,29	32 w/AD192, tests, AC194, AG246, AB434, AG145, AJ154, AM211, AY17, AJ153
VF-13	Fey, A. Spangler, S. Mutel, R. Dickey, J. Cordes, J.	Iowa Iowa Iowa Minnesota Cornell	Measuring galactic distribution of angular broadening at low galactic latitudes.	6 cm phased array MK 11 VLB	23	20.9
VL-49	Lestrade, J. Boloh, E. Mutel, R. Niell, A. Preston, R.	JPL JPL Iowa Haystack JPL	Phase referencing RS CVn binaries for mapping and astrometry.	6 cm phased array MK 111 VLB	25	10.5
VM-86	MCarthy, I. Marscher, A. Gear, W.	Leicester Boston Royal Obs	The extremely variable quasar 1156+295.	1.3 and 6 cm single antenna w/AB436, AJ153, VLB	26,27	12 AG246, AG145, AM173
VR-41	Roberts, D. Wardle, J. Cavthorne, T. Brown, L. Brown, L. Gabuzda, D.	Brandeis Brandeis Glasgow Brandeis Brandeis	Linear polarization of BL Lac objects - survey of structures and variability.	6 cm phased array MK 111 VLB	31	21.6
VS-68	Shaffer, D.	Interferometrics Inc.	Is there a compact radio source in the infrared-loud quasar?	6 cm phased array MK 111 VLB	27	5 w/Move/Op



VLA UTILIZATION MAY 1987 (Cont.)

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
VS-71	Schalinski, C. Witzel, A. Krichbaum, T. Hummel, E. Biermann, P. Johnston, K. Simon, R.	MPIR, Bonn MPIR, Bonn MPIR, Bonn MPIR, Bonn MPIR, Bonn NRL	Second epoch observations of four new superluminal candidates.	6 cm single antenna VLB	23	6 w/AD192
VM-42	Walker, C. Seielstad, G. Unwin, S. Cohen, M. JPL Staff	NRAO-VLA NRAO-GB Caltech	Monitoring 3C120.	6 cm single antenna VLB	28	13 w/AJ154, AU31, AY20, AP140
	NRAO Staff		Tests	4	22, 23	4.5 w/VCH46
			Baselines/Startup/Pointing			52.0
			Standard Field Observation			12.2
			Calibrator Flux Ratios			24.0
			Electronics/etc.			40.1
			Software			12.0
			General Tests			17.4

The average downtime for the month of May, 1987 was approximately 6.55 percent.

Average downtime of = Total number of antenna-hours of operational antennas lost due to hardware and software failures during scheduled observing X 100

operational antennas = Total number of antenna-hours of operational antennas scheduled 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: 79.2 percent (590.8 hours) to astronomical programs, 13.8 percent (103.1 hours) to scheduled test/calibration, and the remaining 7.0 percent (52.1 hours) went to scheduled maintenance.

The total number of programs run for the month of May, 1987 was 57.  
The following independent proposals shared simultaneous observing time (100.4 hours Total Simultaneous Observing):

AM211/AY17	1.3
AK158/AL160	0.6
AG245/AL160	14.6
AU31/AL149	7.2
AD192/VST1	6.0
AD192/VCH46	3.1
VCH46/Tests/JPL	1.9
AC194/VCH46	3.0
AG246/VCH46	5.9
AB434/VCH46	7.0
AG145/VCH46	0.1
AJ154/VCH46	2.3
AY17/AM211/VCH46	6.2
AJ153/VCH46	2.2
AY17/VCH46	0.3
AB436/VM86	4.9
AJ153/VM86	2.0
AG246/VM86	1.1
AG145/VM86	0.9
AM173/VM86	3.1
VS68/Move/Op	5.0
AJ154/VM42	0.8
AU31/VM42	1.5
AY20/VM42	0.5
AP140/VM42	10.2
VB78/Tests/Bagri	1.8
AG246/VB78	1.7
VB78/Move/Op	5.2

VLA UTILIZATION APRIL 1987

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
AB-414	Becker, R. White, R.	Calif, Davis STScI	Monitoring flux of HD 193793 and P Cygni.	2 and 6	5,28	3
AB-431	Bowers, P. Knapp, G.	NRL Princeton	Search for HI in circumstellar envelopes of o Ceti, IRC+10216 and CRL2688.	20 cm line	7	5
AB-437	Beck, R. Hummel, E. Loiseau, N. Berkhuijsen, E.	MPIR, Bonn MPIR, Bonn MPIR, Bonn MPIR, Bonn	The magnetic field in M31.	20	4,13	24
AB-438	Baldwin, J. Dingley, S. Warner, P.	MRAO MRAO MRAO	The evolution function of large radio galaxies.	6	26	15.5
AB-439	Birkirshaw, M. Mandolesi, N. Partidge, B. Perley, R.	CFA Bologna Haverford Coll NRAO-VLA	The Sunyaev-Zel'dovich effect - Preliminary looks at more clusters.	6 and 20	9,12	13.2
AB-443	Buta, R. Higdon, J.	Texas Texas	Neutral hydrogen observations of ringed barred spiral galaxies.	20 cm line	19	8
AC-135	Cameron, R. Parma, P. de Ruiter, H.	Mt Stromlo Bologna Bologna	Statistical study of structure dumbbell galaxy radio sources.	20	14	1
AD-188	Drake, S. Simon, T. Florkowski, D. Stencel, R. Bookbinder, J. Linsky, J.	NASA-Goddard Hawaii USNO Colorado Colorado Colorado	Variability of emission in M supergiants: Alpha Ori, Alpha Sco, and Alpha 1 Her.	2 and 6	9	2
AD-198	de Grijp, M. Miley, G. Keel, W.	Leiden Obs STScI Leiden Obs	Study of faint WIRs - searching for High-Z IR Seyferts.	6	23,28	12
AF-138	Fomalont, E. Geldzahler, B.	NRAO-CV NRL	Component variability in Sco X-1.	6	4	9
AF-140	Fich, M. Terebey, S.	Waterloo Caltech	Star formation within extended IRAS sources in the galaxy.	6	19	8
AF-141	Fich, M.	Waterloo	Survey of small HI regions in the outer galaxy.	6 and 20	23	12
AH-253	Hanisch, R. Neff, S.	STScI NASA-Goddard	The radio halo source in the Coma cluster.	90	8	5
AH-263	Helles, C. Koo, B. Reach, W.	Calif, Berkeley Calif, Berkeley Calif, Berkeley	Survey of 60 selected IRAS point sources.	20	17,21	12 w/Move/Op
AH-265	Hollis, J. Yusef-Zadeh, F.	NASA-Goddard NASA-Goddard	Imaging of M20 and M8.	6 and 20	19,23, 24,25	17
AH-266	Hollis, J. Michalitsianos, A. Karatos, M.	NASA-Goddard NASA-Goddard George Mason	Large scale structure of the R Aquarii circumbinary nebulaosity.	6 and 20	11	8
AH-268	Hogan, C. Martin, H. Perley, R. Partidge, R.	Steward Obs Steward Obs NRAO-VLA Haverford Coll	Search for cosmic microwave background fluctuations.	2	4,5, 7,11	25.3
AH-274	Hardy, E. Noraau, L.	Laval Laval	The HI environment of high redshift quasars.	90 cm line	22,25	12.5
AI-31	Irwig, J. Seagquist, E.	Toronto Toronto	A survey of edge-on spiral galaxies.	6 and 20	27,29	18
AJ-147	Jackson, J. Ho, P.	Calif, Berk'ey Harvard	NH3 toward the galactic center.	1.3 cm line	9,12	19

VLA UTILIZATION APRIL 1987 (Cont.)

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
AJ-150	Jackson, J. Welch, W. Dreher, J.	Calif, Berkeley Calif, Berkeley MIT	NH3 (2,2) and (3,3) in W49.	1.3 cm 1.3 cm 1 line	6	10
AK-166	Keto, E. Ho, P. Haschick, A.	Harvard Harvard Haystack	High excitation NH3 around W33-main.	1.3 cm 1 line	18,21	9.5
AK-172	Kristian, J. Windhorst, R. Fomalont, E. Kellermann, K.	Me Wilson Me Wilson NRAO-CV NRAO-CV NRAO-CV	Deep survey in a Space Telescope/ WFPC ultradeep survey area.	6	8	2
AK-173	Killeen, N. Ekers, R.	NRAO-CV NRAO-VLA	Neutral hydrogen in NGC 1399.	20 cm 1 line	5,9	12
AK-175	Keto, E. Ho, P.	Harvard Harvard	Defining the kinematics of molecular material around DR21.	1.3 cm 1 line	26,27	16.5
AL-140	Lestrade, J. Preston, R. Muter, R. Boloh, L. Charlot, P.	JPL/BDL JPL IOWA CNES IGN	Search for compact extragalactic sources near RS CVn stars.	20	12	5
AL-147	Lubowich, D. Anantharamiah, K. Pasachoff, J.	Am Inst Phys NRAO-VLA Williams Coll.	Search for a localized source of deuterium near the galactic center.	90 cm 1 line	17	8
AM-207	Molnar, L. Edelson, R.	CFA Caltech	Mapping the region around Cyg X-3.	2, 6 and 20	25	3
AM-216	McCutcheon, W. Dawdney, P. Purton, C.	British Columbia DRAO DRAO	Observations of S211, S212 and an IR/CO source.	6 cm 1 line	27,28	6
AP-130	Pompea, S. Eiston, R. Rieke, G.	Steward Obs Steward Obs Steward Obs	Starburst inhibition in Sa galaxies.	6	21,24	10
AP-132	Pottasch, S. Zijlstra, A. Bignelli, R.	Kapteyn Lab NRAO-VLA NRAO-VLA	A search for objects in transition between OH/IR stars and planetary nebulae.	2	16	5
AP-136	Pottasch, S. Zijlstra, A. Bignelli, R.	Kapteyn Lab NRAO-VLA NRAO-VLA	Additional measurements for a general survey of planetary nebulae.	6 and 20	3,6	3
AR-158	Rudolph, A. Palmer, P. Ho, P.	Chicago Chicago Harvard	Ammonia in HH7-111R.	1.3 cm 1 line	16,17, 18	36
AR-159	Ricker, G. Vanderspek, R.	MIT MIT	Search for radio emission from a recurrent optical flash source.	6 and 20	2	2
AS-211	Sramek, R. Weller, K. van der Hulst, J. Panagia, N.	NRAO-VLA NRL NRAO STScI	Statistical properties of radio supernovae.	2, 6 and 20	1,12,30	3.6
AS-283	Sancisi, R. van Gorkom, J. van Albada, T.	Kapteyn Lab NRAO-VLA Kapteyn Lab	The size of the dark halo of the spiral galaxy NGC 3198.	20 cm 1 line	20,24, 25,28, 30	57.9
AS-297	Schneider, S.	Virginia	Extended HI around NGC 5701.	20 cm 1 line	10	12
AS-300	Siemieniec, G. Urbanik, M. Beck, R.	Krakow Krakow MPIR, Bonn	The radio disks of NGC 891 and NGC 3628.	20	6,10	24
AT-60	Hummel, E. Taylor, A. Sequist, E. Kenyon, S.	Kapteyn Lab Kapteyn Lab Toronto SAO	Radio-Optical-UV monitoring of Symbiotic stars.	1.3,2,6 and 20	30	12

VLA UTILIZATION APRIL 1987 (Cont.)

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
AU-31	Uson, J. Cornwell, T. Ekers, R. Lainq, R.	NRAO-VLA NRAO-VLA NRAO-VLA RGO	Observations of the Sunyaev-Zel'dovich effect.	2	23	2.5
AV-139	Van Gorkom, J. Knapp, G. Raimond, E. Faber, S. Callagher, J.	NRAO-VLA Princeton NFRA Lick Obs Lowell Obs	HI distribution and kinematics in the active elliptical NGC 4278.	20 cm line	3,12, 13	36.5
AV-143	Van Buren, D. Fich, M. Chu, Y. Abbott, D.	Johns Hopkins Waterloo Illinois Colorado	Search for neutral hydrogen shells associated with stellar wind bubbles.	21 cm line	19,24	11
AV-148	Viallefond, F. Zheng, X.	NRAO-VLA CFA	Low frequency survey of M33 radio sources and large scale disk emission.	90	6	3
AW-157	Williams, B. Van Gorkom, J.	N. Carolina NRAO-VLA	HI study of two compact groups of galaxies.	20 cm line	2	8
AW-165	Wiklund, T. Rydbeck, G. Winberg, A.	Onsala Onsala Onsala	Detailed mapping of HI in the dwarf elliptical galaxy NGC 185.	20 line	2,3	24
AW-187	Weinberg, D. Guhathakurta, P. Van Gorkom, J.	Princeton Princeton NRAO-VLA	The HI rotation curve of UGC 12591.	20 cm line	20	10
	JPL Staff NRAO Staff		Tests Baselines/Startup/Pointing Electronics/etc. Software General Tests	4	18,22	8 49.9 55.0 16.0 42.5

The average downtime for the month of April, 1987 was approximately 8.23 percent.

Average downtime of operational antennas lost due to hardware and software failures during scheduled observing =  $\frac{\text{Total number of operational antennas lost due to hardware and software failures during scheduled observing}}{\text{Total number of operational antennas scheduled}} \times 100$   
 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: 77.6 percent (559.8 hours) to astronomical programs, 12.5 percent (90.2 hours) to scheduled test/calibration, and the remaining 9.9 percent (71.0 hours) went to scheduled maintenance.

The total number of programs run for the month of April, 1987 was 46.  
 The following independent proposals shared simultaneous observing time (4.4 hours Total Simultaneous Observing):

AH263/Move/Op 4.4

870601PDH/ap



VLA UTILIZATION MARCH 1987

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
AA-62	Anantha ramiah, K.	NRAO-VLA	Recombination line and continuum towards W44.	20 and 90 cm line	21,22	18.5
AA-63	Appleton, P. van Gorkom, J. Ghigo, F. Struck-Marcell, C.	Iowa State NRAO-VLA Minnesota Iowa State	HI observations of Arp 143 (NGC 2445/4).	20 cm line	5	8
AA-66	Anantha ramiah, K. Payne, H. Erickson, W.	NRAO-VLA NRAO-CB Maryland	Recombination lines from cold gas towards Cas A.	90 cm line	28	5
AB-396	Braun, R. Walterbos, R. Brinks, E.	NRAO-VLA Leiden ESO	The interstellar medium of M31.	20 cm line	13	6
AB-414	Becker, R. White, R.	Calif, Davis STScI	Monitoring flux of HD 193793 and P Cygni.	2 and 6	16	2
AB-419	Braun, R. Liszt, H.	NRAO-VLA NRAO-CV	Wide-field imaging of four galactic HI region complexes.	20	12	20.5
AB-429	Barsony, M.	Caltech	S87.	2 and 6	9	5
AC-166	Carilli, C. Dreher, J. Perley, R.	MIT MIT NRAO-VLA	Further studies of Cygnus A.	2	24	11
AC-168	Casertano, S. van Gorkom, J.	Princeton NRAO-VLA	Search for late-type disk galaxies with extended HI envelopes.	20 cm line	6,7	25
AC-173	Cameron, R. Parma, P. de Ruiter, H.	MT Stromlo Bologna Bologna	PKS 2149-158, a binary radio jet system.	6, 21	31	8
AC-176	Crane, P. Dahari, O. Ford, H. Jacoby, G. Ciardullo, R.	NRAO-VLA STScI STScI NOAO STScI	Anomalous spiral arms of NGC 4258.	6	25	4
AD-188	Drake, S. Simon, T. Florkowski, D. Stencel, R. Bookbinder, J. Linsky, J.	NASA-Goddard Hawaii USNO Colorado Colorado Colorado	Variability of emission in M supergiants: Alpha Ori, Alpha Sco, and Alpha 1 Her.	2 and 6	11,14	4.5
AE-48	Evans, N. Kutner, M. Mundy, L.	Texas Rensselaer Caltech	Embedded continuum sources in the S140 molecular cloud.	2	30	7
AF-128	Fiedler, R. Dennison, B. Johnston, K.	NRL VPI & SU NRL	Refractive scintillation in CTA 26.	20 and 90	13,21	3
AF-137	Fergelson, E. Montmerle, T. Andre, P.	Penn State CEN Saclay CEN Saclay	Monitoring radio flaring stars in the Rho Oph cloud.	2, 6 and 20	8	1
AG-145	Geldzahler, B. Schwartz, P. Gear, W. Ade, P. Robson, E. Nolt, J. Smith, M.	NRL NRL Queen Mary Coll Queen Mary Coll Preston Polytech Oregon Royal Obs	Simultaneous multifrequency observations of blazars.	1.3,2,6, 20 and 90	22,30, 31	4.5
AG-224	Gaume, R. Mutel, R.	Michigan Iowa	Evidence of supernova induced star formation?	6 cm line	28	2
AG-226	Gunn, J. Knapp, G. van Gorkom, J.	Princeton Princeton NRAO-VLA	Measurement of the thickness of the HI disks in the edge-on spiral galaxies NGC 891/4565/7814.	20 cm line	26,29, 30	16.5

VLA UTILIZATION MARCH 1987 (Cont.)

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
AG-230	Gottesman, S. Hunter, J. T. Hawarden, T.	Florida Florida Royal Obs	The peculiar ellipsoidal galaxy NGC 660.	21 cm line	6	8
AG-235	Gaume, R. Claussen, M.	Michigan Massachusetts	Cometary HII regions: water masers and ammonia emission.	1.3 cm line	6, 7	12
AG-236	Glendening, B. Kronberg, P.	Toronto Toronto	HI observations of NGC 2146a.	2, 6 and 21 cm line	22	12
AG-237	Gottesman, S. Hunter, J. Erickson, L.	Florida Florida Florida	HI observations of small galaxy groups near NGC 3893 and NGC 4111.	20 cm line	13, 14, 15	25
AG-241	Green, D.	MRAO	G 92.4+1.4: Bubble or SNR?	90	31	1.5
AG-243	Giovannini, G. Feretti, L.	Bologna Bologna	The extended source near Coma A.	90	6	4
AH-248	Hummel, E. Glave, R. Krause, M. Beck, R.	MPIR, Bonn MPIR, Bonn MPIR, Bonn MPIR, Bonn	High resolution polarization observations of IC 342.	6 and 20 cm line	14, 16, 20	18
AH-250	Helvand, D. Becker, R.	Columbia Calif, Davis	Survey of the galactic plane near $l = 0$ .	90	19	10.5
AH-252	Hummel, E. Schlickeiser, R. Lesch, H. Wielbinski, R.	MPIR, Bonn MPIR, Bonn MPIR, Bonn MPIR, Bonn	Linear polarization measurement of the radio halo of NGC 4631.	20	27, 28	12
AH-258	Helvand, D. Yusef-Zadeh, F. Seiradakis, J. Becker, R.	Columbia NASA-Goddard Thessalonika Calif, Davis	The extended galactic plane radio source 1952+28: extragalactic or galactic?	20	15	4.5
AK-162	Kassim, N. Erickson, W.	Maryland Maryland	New SNR candidates.	90	20	8
AK-167	Keto, E. Ho, P.	Harvard Harvard	The expanding molecular shell around W33-main.	1.3 cm line	13, 14	16
AM-172	Haschick, A. Menten, K. Wilson, T. Wallmsley, C. Henkel, C. Madiak, E. Johnston, K.	Haystack MPIR, Bonn MPIR, Bonn MPIR, Bonn MPIR, Bonn NRAO-CV NRL	A compact methanol emission region in Orion.	1.3 cm line	15	8
AM-195	Myers, P. Terebey, S. Rodriguez, L. Cruz-Gonzalez, I.	CFA NCAR UNAM UNAM	Radio continuum from IRAS sources embedded in dense molecular cores.	6	19, 29	8
AM-196	Magri, C. Haynes, M.	Cornell Cornell	Star formation in normal spiral galaxies.	20	16	12
AM-201	Miley, G. Chambers, K. van Breugel, W.	STScI Johns Hopkins Calif, Berkeley	Ultra steep spectrum sources.	2	15, 16, 19	12.5
AO-62	O'Donoghue, A. Owen, F. Ettek, J.	NRAO-VLA NRAO-VLA NRAO-VLA NRAO-VLA NRAO-VLA MIMT	Wide angle tail sources.	6	31	1
AP-123	Pedlar, A. Anantharamaiah, K. van Gorkom, J. Ekers, R.	NRAO-VLA NRAO-VLA NRAO-VLA NRAO-VLA	Continuum and recombination line observations of the galactic center.	90	25	2
AP-126	Palmer, P. de Pater, I. Snyder, L.	Chicago Calif, Berkeley Illinois	Search for OH emission from Comet Wilson (19861).	18 cm line	3	8.6

VLA UTILIZATION MARCH 1987 (Cont.)

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
AR-158	Rudolph, A. Palmer, P. Ho, P.	Chicago Chicago Harvard	Ammonia in HH7-11R.	1.3 cm line	23,26, 27	36
AS-80	Sramek, R. van der Hulst, J. Weiler, K.	NRAO-VLA NRAO-VLA NRL	Monitoring supernovae SN 1980 in NGC 6946 and SN 1979c in M100.	2.6 and 20	4,16	4 w/Move/Op
AS-211	Sramek, R. Weiler, K. van der Hulst, J. Panagia, N.	NRAO-VLA NRL NRAO-VLA STScI	Statistical properties of radio supernovae.	2.6 and 20	4,31	2.9 w/Move/Op
AS-283	Sancisi, R. van Gorkom, J. van Albada, T. Schweizer, F. Phillips, M. van Gorkom, J.	Kapteyn Lab NRAO-VLA Kapteyn Lab DTM CTIO NRAO-VLA	The size of the dark halo of the spiral galaxy NGC 3198.	20 cm line	29,30	24
AS-289	Schweizer, F. Phillips, M. van Gorkom, J.	DTM CTIO NRAO-VLA	A search for HI in elliptical galaxy IC2006.	21 cm line	28	5
AT-84	Torrelles, J. Marcaide, J. Ho, P. Szczepanski, J. Rodriguez, L. Canto, J.	Andalucia Andalucia Harvard MIT UNAM UNAM	Ammonia temperatures of supersonic molecular outflows: NGC 2404 and MonR2	1.3 cm line	8,9, 10	36
AT-85	Turner, B. Rickard, L. Kazes, I. Bottinelli, L. Guguenheim, L. Le Squerin, A. Fraix-Burnet, D. Patey, I.	NRAO-CV NRL Meudon Meudon Meudon Meudon Meudon	Possible time variations of the OH megamaser in UGC 8696.	18 cm line	8	6
AU-29	Uson, J. Bagri, D. Anantharamaiah, K.	NRAO-VLA NRAO-VLA NRAO-VLA	Search for redshifted 21 cm emission from Zel'dovich pancakes.	90 cm line	2,3,10, 20,21,24	54
AV-96	van der Hulst, J. Sramek, R. Weiler, K.	NRAO-VLA NRAO-VLA NRL	Monitoring radio supernova in NGC 4258.	6 and 20	5	2 w/Move/Op
AW-161	Whiteoak, J. Gardner, F.	CSIRO CSIRO	Observations of the large scale H2 13CO clouds in SGR B2.	6 cm line	5	8
AW-176	Wood, D. Churchwell, E.	Wisconsin Wisconsin	H66 alpha and Ammonia spectral line observations of arc shaped ultracompact HII regions.	1.3 cm line	23,26, 27	25
AW-180	Wadiak, J. Wootten, H.	NRAO-CV NRAO-CV	The distribution of excited H2CO in OMC1.	2 cm line	1	4
AZ-50	Zijlstra, A. Bignell, R.	NRAO-VLA NRAO-VLA	Identification of a suspected radio galaxy.	2	25	1
VAH-49	van Breugel, W.	Calif, Berkeley	Double QSO T145-071.	18 cm VLB	1	1 phased array w/Tests/Bignell
VF-13	Fey, A. Spangler, S. Mutel, R. Dickey, J. Cordes, J.	Iowa Iowa Iowa Minnesota Cornell	Distribution of angular broadening at low galactic latitudes.	18 cm phased array VLB	1,2	25.9
	JPL Staff NRAO Staff		Tests Baselines/Startup/Pointing Electronics/etc. Software General Tests	4 cm	25,28	5 45.2 52.2 32.0 53.2



VLA UTILIZATION MARCH 1987 (Cont.)

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
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The average downtime for the month of March, 1987 was approximately 4.16 percent.

Average downtime of operational antennas lost due to hardware and software failures during scheduled observing =  $\frac{\text{Total number of antenna-hours of operational antennas scheduled}}{\text{Total number of antenna-hours of operational antennas scheduled}} \times 100$   
 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: 75.9 percent (566.6 hours) to astronomical programs, 12.8 percent (95.2 hours) to scheduled test/calibration, and the remaining 11.3 percent (84.2 hours) went to scheduled maintenance.

The total number of programs run for the month of March, 1987 was 52.  
 The following independent proposals shared simultaneous observing time (6.5 hours Total Simultaneous Observing):

VAH49/Tests/Bignell	1.0
AS80/Move/Op	2.0
AS211/Move/Op	1.5
AV96/Move/Op	2.0

870410/PDH/ap

VLA UTILIZATION FEBRUARY 1987

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
AA-65	Andre, P. Montmerle, T. Feigelson, E.	CEN SacJay CEN SacJay Penn State	Detailed study of three young radio stars in the Ophiuchi cloud.	6 and 20	13, 15	7
AA-66	Anantharamaiah, K. Payne, H. Erickson, W.	NRAO-VLA NRAO-GB Maryland	Recombination lines from cold gas towards Cas A.	90 cm line	26	3.5
AB-343	Bosma, A. Carignan, G. Marcellin, M.	Marseille Kapteyn Lab Marseille	NGC 300.	20 cm line	2	3
AB-377	Athanassoula, E. Bicknell, G. Carter, D. Killeen, N.	Marseille Mt Stromlo Mt Stromlo NRAO-CV	NGC 3557.	6 and 20	15, 19	13
AB-396	Braun, R. Walterbos, R. Brinks, E.	NRAO-VLA Leiden ESO	The interstellar medium of M31.	20 cm line	25	3
AB-405	Brown, A.	Colorado	Bipolar flow source IRS7 and other PMS radio sources in Corona Australis.	1.3, 2, 6 and 18	2	6
AB-407	Bally, J. Stark, A. Wilson, R. Yusef-Zadeh, F.	Bell Labs Bell Labs Bell Labs NASA-Goddard	Survey of ten degrees near the galactic center.	6 and 20	20, 22	16
AB-414	Becker, R. White, R.	Calif, Davis SISel	Monitoring flux of HD 193793 and P Cygni.	2 and 6	5	1.5
AB-430	Bookbinder, J. Walter, F. Linsky, J.	Colorado Colorado Colorado	Search for magnetic dynamos in early F dwarf stars.	6	17, 18, 20	21 w/VM83
AC-172	Caganoff, S. Bicknell, J. Ekers, R.	Mt Stromlo Mt Stromlo NRAO-VLA	Relationship between optical and radio properties of powerful extragalactic radio sources.	6 and 20	9, 22	18
AC-177	Campbell, B.	New Mexico	Survey of young stellar objects in the southern galactic plane.	6	16, 17	17
AC-180	Claussen, M. Wilking, B.	Massachusetts Missouri	Water masers associated with the Rho Ophiuchus protostar.	1.3	9	2
AC-185	Cohen, N. Feldman, P. Costain, C.	Bentley Coll Herzberg Herzberg	Survey of precision-radial- velocity stars.	6, 20 and 90	8, 21, 24	21.5 w/Move/Op
AD-188	Drake, S. Simon, T. Florkowski, D. Stencel, R. Bookbinder, J. Linsky, J.	NASA-Goddard Hawaii USNO Colorado Colorado Colorado	Variability of emission in M supergiant Alpha Ori.	2 and 6	25	2 w/VM83
AF-128	Fiedler, R. Dennison, B. Johnston, K.	NRL VPI & SU NRL	Refractive scintillation in CTA 26.	20 and 90	1, 17, 25	3.5 w/VM83
AF-137	Feigelson, E. Montmerle, T. Andre, P.	Penn State CEN SacJay CEN SacJay	Monitoring radio flaring stars in the Rho Oph cloud.	2, 6 and 20	13, 23	2
AF-142	Fabbiano, G. Giola, I.	CFA CFA	Early type galaxies observed with Einstein.	6	1	10
AG-145	Geldzahler, B. Schwartz, P. Gear, W. Ade, P. Robson, E. Nolt, I. Smith, M.	NRL NRL Queen Mary Coll Queen Mary Coll Preston Polytech Oregon Royal Obs	Simultaneous multifrequency observations of blazars.	1.3, 2, 6, 20 and 90	5, 15, 16, 17	5.5 w/VS64, VM83

VLA UTILIZATION FEBRUARY 1987 (Cont.)

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
AG-228	Gregorini, L.	Bologna	Sample of dust lane galaxies observed at infrared wavelengths.	6	5,17	5.5
AG-235	Gaume, R. Claussen, M.	Michigan Massachusetts	Cometary HII regions.	1.3 cm line	5	W/V/S64, VL45
AH-195	Hjelming, R. Davis, R.	NRAO-VLA NRAL	Recurring nova RS Oph.	2 and 6	25	4
AH-218	Ho, P. Helles, C.	Harvard Calif. Berkeley	Survey for OH emission in magnetic(?) disk-like structures.	18 cm line	15	5.5
AH-233	Hollis, J. Brown, R. Kafatos, M.	NASA-Goddard NRAO-CV George Mason	An attempt to detect radio emission from the Sirius Binary system.	6 and 20	6	8
AH-259	Michalitsianos, A. Helfer, H. Woodward, C.	NASA-Goddard Rochester Rochester	Structure of the M8 Hourglass and G25.4-0.2S.	6 cm line	1	8
AI-30	Inoue, M. Fomalont, E. Tsuboi, M. Morris, M. Yusef-Zadeh, F. Tabara, H. Kato, T.	Nobeyama NRAO-CV Nobeyama UCLA NASA-Goddard Utsunomiya Utsunomiya	Peculiar magnetic fields in the galactic center region.	2	16	7
AK-117	Kundu, M. Schmahl, E. Hurford, G. Gary, D. Dulk, G. Bastian, T. Lang, K. Willson, R.	Maryland Maryland Caltech Caltech Colorado Colorado Tufts	Simultaneous observations of solar hard X-ray microbursts.	20	13,14,15, 16,17,20, 21,22,23	5.5 w/ test/ Walker? VL45, VM83
AK-156	Knapp, G. van Gorkom, J.	Princeton NRAO-VLA	H I rotation curve of the Sombbrero galaxy NGC 4594.	20 cm line	1,7	14.5
AK-159	Kassim, N. Baum, S.	Maryland NRAO-CV	Two peculiar SNRs with evidence for steep spectrum components.	2,6,20 and 90	8	6
AL-130	Lehto, H. Heeschen, D. Seielstad, G. Valtonen, M. Saslaw, W.	Virginia NRAO-CV NRAO-GB Turku Virginia	Simultaneous observations of OJ287 with Green Bank and Metsahovi.	1.3 and 2	8	9.5
AL-136	Lyne, A. Brown, R.	NRAL NRAO-CV	Search for SNRs near two young pulsars.	6 and 20	3	8
AM-197	Mollenhoff, C. Bender, R. Hummel, E.	MPIA, Heidelberg MPIA, Heidelberg MPIR, Bonn	Dust-lane ellipticals.	20	14,23	12.5 w/test/ Perley, Move/Op
AM-198	Mazzarella, J. Alier, H. Gaume, R.	Michigan Michigan Michigan	Continuum structures in four double nucleus Markarian galaxies.	2 and 6	9	4.5
AP-126	Palmer, P. de Pater, I. Snyder, L.	Chicago Calif. Berkeley Illinois	Search for OH emission from Comet Wilson (19861).	18 cm line	6,7, 28	27.5 w/VZ15
AR-152	Rosery, H. Perley, R.	MPIA, Heidelberg NRAO-VLA	The hotspot in Pictor A.	2,6 and 20	1,2	11
AR-156	Richter, O. van Gorkom, J. Ferguson, H. Huchtmeier, W. Whitmore, B.	STScI NRAO-VLA Johns Hopkins MPIR, Bonn STScI	The HI content of NGC 3312 and other galaxies in the Hydra I cluster.	20 cm line	4,5, 9	26

VLA UTILIZATION FEBRUARY 1987 (Cont.)

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
AS-211	Sramek, R. Weiler, K. van der Hulst, J.	NRAO-VLA NRL NFRA STSCI	Statistical properties of radio supernovae.	2, 6 and 20	11	3
AT-84	Torrelles, J. Marcaide, J. Ho, P. Szczepanski, J. Rodriguez, L.	Andalucia Andalucia Harvard MIT UNAM	Ammonia temperatures of supersonic molecular outflows: NGC 2404 and MonR2	1.3 cm line	12, 13	18.5
AV-140	van Gorkom, J. Weinberg, D. Knapp, G.	NRAO-VLA Princeton Princeton	H I line emission from the interacting E/SO galaxies NGC 4105/6.	20 cm line	3, 4	10
AW-174	Wootten, H. Mundy, L. Wilking, B.	NRAO-CV Caltech Missouri	Investigation of the structure of the Protostar 16293-2422.	1.3 cm line	14	8
AW-177	Loren, R. Wadiak, E. Wilson, T.	NRAO-CV MPIR, Bonn Virginia	H2CO emission in Rho Ophiuchi B.	2 cm line	21	8
AW-178	Wadiak, E. Wilson, T. Rood, R.	NRAO-CV MPIR, Bonn Virginia	H2CO emission in Rho Ophiuchi B.	6 cm line	18	2
AY-15	Yusef-Zadeh, F. Morris, M. Seiradakis, J. Lasenby, A. Wielebinski, R. Klein, U.	NASA-Goddard UCLA Thessaloniki MRAO MPIR, Bonn MPIR, Bonn	The polarized lobe at b 0 near the galactic center.	6 and 20	12	7.5
VB-68	Bartel, N. Boriakoff, V. Capallo, R. Gwinn, G. Ratnor, M. Shapiro, I. Seiber, W.	CFA Cornell Haystack CFA CFA CFA MPIR, Bonn	Millisecond pulsar astrometry.	18 cm phased array MK 111 VLB	27	8
VG-52	Geldzahler, B. Fomalont, E.	NRL NRAO-CV	Second epoch observations of the NE radio lobe of Sco X-1.	18 cm phased array MK 111 VLB	26	8 w/Move/Op
VL-45	Lawrence, C. Readhead, A. Linfield, R. Jones, D. Preston, R. Schilizzi, R. Porcas, R. Booth, R. Burke, B.	Caltech Caltech JPL Caltech JPL NRAO MPIR, Bonn Onsala MIT	Strong source survey.	1.3 cm 3 antenna VLB	17	10 w/AG228, AC177, AK117
VM-62	Moran, J. Greenhill, L. Reid, M. Gwinn, C. Downes, D. Genzel, R.	CFA Harvard CFA CFA IRAM MPIP, Garching	Precise measurements of the H2O maser positions in M33/IC133.	1.3 cm phased array MK 111 VLB	18	16 w/test/Perley
VM-83	Marscher, A. Shafer, D.	Boston Interferometrics	4C39.25: a different class of superluminal source?	1.3 and 18 cm	17, 25	19.8 3 antenna VLB w/AK117, AF128, AG145, Move/Op, AC177, AB430, AB396, AD188

VLA UTILIZATION FEBRUARY 1987 (Cont.)

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
VP-76	Pilbratt, Y. Baath, L. Porcas, R. Nicholson, B.	ESTEC Onsala MPIR, Bonn Hartebeesthoek	3C279.	18 cm single antenna VLB	26 w/Move/ Op, test/JPL	12
VS-64	Spencer, R. Junor, W. Muxlow, T.	NRAL NRAL NRAL	M87.	1.3 cm 3 antenna VLB	16 w/AC177, AG145, AG228	7.1
VZ-15	Zheng, X. Moran, J. Reid, M.	CFA CFA CFA	OH masers in G34.3+0.2.	18 cm single antenna AP126, tests/Bignelli	28 w/pointing, tests/Bignelli	13
	JPL Staff NRAO Staff		Tests Baselines/Startup/Pointing Electronics/etc. Software Move/Operations General Tests			49.4 51.0 19.7 26.7 79.8

The average downtime for the month of February, 1987 was approximately 6.43 percent.

Average downtime of operational antennas = Total number of antenna-hours of operational antennas lost due to hardware and software failures during scheduled observing / Total number of antenna-hours of operational antennas scheduled where "antenna-hours" definition is: An array consisting of N antennas operating for Y hours is defined to have YN antenna-hours operation. X 100

The array was scheduled 100 percent (673.9 hours) of the time: 69.1 percent (465.5 hours) to astronomical programs, 20.4 percent (137.7 hours) to scheduled test/calibration, and the remaining 10.5 percent (70.7 hours) went to scheduled maintenance.

The total number of programs run for the month of February, 1987 was 50.  
The following independent proposals shared simultaneous observing time (78.1 hours Total Simultaneous Observing):

- AM197/Tests/Perley 3.5
- AK117/Tests/Walker 3.5
- AC177/VS64 3.4
- AG145/VS64 3.0
- AG228/VS64 2.5
- AG228/VL45 1.6
- AC177/VL45 0.4
- AK117/VL45 8.0
- AK117/VM83 1.6
- AF128/VM83 1.1
- AG145/VM83 1.0
- AC177/VM83 1.0
- AB430/VM83 4.0
- VM82/Tests/Perley 4.7
- AM197/Move/Op 3.3
- AC185/Move/Op 2.8
- AB396/VM83 2.5
- AF128/VM83 0.3
- AD188/VM83 1.5
- VM83/Move/Op 2.0
- VG52/Move/Op 4.2
- VP76/Move/Op 0.7
- VP76/Tests/JPL 4.7
- VZ15/Pointing 7.3
- AP126/VZ15 2.2
- VZ15/Tests/Bignelli 9.0
- VZ15/Tests/Bignelli 1.8

VLA UTILIZATION JANUARY 1987

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
AA-59	Alexander, P. Baldwin, J. Warner, P.	MRAO MRAO MRAO	Energetics of the radio halo in A2256 and A2319.	90	2	14 w/Move/op
AA-64	Antonucci, R. Barvainis, R.	STScI MRAO-CV	Testing the synchrotron hypothesis for quasar infrared emission.	1.3, 2, 6	10	10
AA-66	Anantha ramiah, K. Payne, H. Erickson, W.	MRAO-VLA MRAO-CV Marvland	Recombination lines from cold gas towards Cas A.	90 cm line	12, 16	15.5
AB-129	Burke, B. Hewitt, J. Roberts, D.	MIT Haystack Brandeis	Monitoring time variations in 0957+561.	6	11	3
AB-414	Becker, R. White, R.	Calif, Davis STScI	Monitoring flux of HD 193793 and P Cygni.	2 and 6	16	1.5
AB-421	Boyle, B. Mead, A. Miller, L. Peacock, J. Shanks, T.	Edinburgh Edinburgh Royal Obs Royal Obs Durham	Radio properties of a faint optically-selected QSO sample.	20	18	1.5
AB-423	Bartel, P. Lonsdale, C. Miley, G.	Caltech Haystack STScI	Radio morphologies of low-redshift quasars at 15 GHz.	2	11	16
AB-424	Bertout, C. Cabrit, S.	Calif, Berkeley Massachusetts	The ionized wind of LK H alpha 234.	1.3, 6, 20	30	2.5
AB-425	Bertout, C. Roland, J. Andre, P.	Calif, Berkeley IAP, Paris IAP, Paris	Radio emission from young stellar objects.	1.3, 6, 20	15	5
AB-429	Barsony, M.	Caltech	Bipolar flow core source S87.	2 and 6	10	5
AC-178	Caillault, J. Patterson, J.	Colorado Columbia	Variability of V471 Tau.	6	22, 26	16
AC-179	Chammugam, G. Bastian, T. Dulk, G.	Louisiana State Colorado Colorado	Radio emission from magnetized cataclysmic variables.	2, 6, 20	29	w/Move/op 15.5
AC-180	Claussen, M. Wilking, B.	Massachusetts Missouri	Water masers associated with the Rho Ophiuchus protostar.	1.3	30	2
AC-183	Coleman, P. Surdelj, J. Turnshek, D. Briggs, F.	Groningen Liege STScI Pittsburgh	Broad absorption line QSOs.	2, 6, 20	26, 30	12.5
AD-188	Drake, S. Simon, T. Florkowski, D. Stencel, R. Bookbinder, J. Linsky, J.	NASA-Goddard Hawaii USNO Colorado Colorado Colorado	Variability of emission in three M supergiants: Alpha Ori, Alpha Sco A, and Alpha 1 Her.	2 and 6	28, 30	4
AD-193	Drake, S. Simon, T.	NASA/Goddard NASA/Goddard	A survey of pre-main sequence stars in the open cluster NGC 2264.	2, 6, 20	24	11.5
AF-123	Fomalont, E. Sanders, W.	NRAO-CV New Mexico State	Stellar radio luminosity function.	6	7, 15	8.5
AF-128	Fiedler, R. Dennison, B. Johnston, K.	NRL VPI & SU NRL	Refractive scintillation in CTA 26.	20 and 90	15	1.5

VLA UTILIZATION JANUARY 1987 (Cont.)

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
AG-145	Geldzahler, B. Schwartz, P. Gear, W. Ade, P. Robson, E. Nolt, I. Smith, M.	NRL NRL Queen Mary Coll Queen Mary Coll Preston Polytech Oregon Royal Obs	Simultaneous multifrequency observations of blazars.	1.3, 2, 6, 20 and 90	2, 3, 4	4
AG-234	Garcia-Barreto, J. Pismis, P.	UNAM UNAM	Emission from the barred galaxy NGC 4314.	2	23	7.5 w/Move/Op
AG-240	Gopal-Krishna	TIFR	CTD 93.	2 and 6	21	1
AH-231	Hummel, E. Jorsater, S. Lindblad, P. Sandqvist, A.	MIPR, Bonn ESO Stockholm Obs Stockholm Obs	The central region of NGC 613, a peculiar radio source.	2	2	6
AH-254	Hjelming, R. Gehrz, R. Taylor, A. Seagquist, E.	NRAO-VLA Minnesota Groningen Toronto	Radio observations of three pre-1987 and bright 1987 Novae to complement extensive infrared observations.	1.3, 2, 6 and 20	17, 24	11
AH-255	Haynes, M. Giovannelli, R.	Cornell Cornell	H I near extragalactic H I regions.	20 cm line	15	12
AH-256	Harris, H. Monet, D. Ables, H.	USNO USNO USNO	QSOs behind globular clusters.	6	27	7.5
AH-257	Heaton, B. Little, L.	Kent Kent	Molecular outflow source G35.2N.	2	16	2
AH-259	Heffer, H. Woodward, C.	Rochester Rochester	Structure of the M8 Hourglass and G25.4-0.25.	6 cm line	31	8
AJ-140	Jaffe, W. Owen, T. Caldwell, J.	STScI SUNY SUNY	Thermal radiation from Titan.	2	7, 15	8.5
AK-150	Kundu, M. Jackson, P. White, S.	Maryland Maryland Maryland	Complete sample of nearby flare stars.	6 and 20	20	3
AK-161	Kim, K. Landecker, T. Kronberg, P.	Toronto DRAO Toronto	Polarization observation of background sources near the OA184 SNR.	6, 18, 20, 21 and 22	17, 19	16
AL-112	Lake, G. Schommer, R. van Gorkom, J.	Bell Labs Rutgers NRAO-VLA	Rotation curves of dwarf galaxies.	20 line	2	8.5
AL-127	Lang, K. Willson, R.	Tufts Tufts	Narrow band emission from the dwarf M flare stars YZ Cmi, AD Leo and UV Ceti.	6 and 20	5, 6	20
AL-130	Lehto, H. Heeschen, D. Seielstad, G. Valtonen, M. Saslaw, W.	Virginia NRAO-CV NRAO-CB Turku Virginia	Simultaneous observations of OJ287 with Green Bank and Metsahovi.	1.3 and 2	18, 29, 30	19.5
AL-134	Little, L. Heaton, B.	Kent Kent	The dense molecular core of G34.3+0.1.	1.3 cm line	11	8
AL-150	Lestrade, J. Preston, R.	JPL JPL	Statistical properties of RSGVN stars.	6 cm	21, 28, 30	7.3
AM-188	Menon, T. Hickson, P.	British Columbia British Columbia	Luminosity functions of radio galaxies in compact groups.	6 and 20	25	9
AM-194	Migenes, V. Johnston, K. Pauls, T. Wilson, T.	Pennsylvania NRL NRL MPIR, Bonn	High resolution maps of the (3,2) hyperfine transition of NH3.	1.3 cm line	3	10

VLA UTILIZATION JANUARY 1987 (Cont.)

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
AM-198	Mazzarella, J. Alier, H. Gaume, R.	Michigan Michigan Michigan	Continuum structures in four double nucleus Markarian galaxies.	2 and 6	21	11
AM-202	Mitchell, K. Koo, D.	NASA/Goddard STScI	Detection of bright and faint optically selected quasar samples.	20	16	12
AM-203	Moran, J. Reid, M.	CFA CFA	Observation of the H110 alpha line toward W3(OH).	6 cm line	4,9	20
AM-204	Muhlman, D. Berge, G. Linfield, R. Jones, D.	Caltech Caltech JPL JPL	Astrometric measurements of Neptune/Triton system.	2	9,12,6	21
AP-114	Pedelty, J. Rudnick, L. Spinrad, H. van Breugel, W.	Minnesota Calif, Berkeley Calif, Berkeley	Extended extranuclear emission line gas in 3C337.	2	20	8
AP-128	Pottasch, S. Zijlstra, A. Biggell, R.	Groningen NRAO-VLA NRAO-VLA	Position measurements for two stellar OH masers.	2,6,18 and 20 cm line	17	1.5
AR-152	Roser, H. Perley, R.	MPIA, Heidelberg NRAO-VLA	Observations of the hotspot in Pictor A.	2,6,20	31	5
AS-211	Sramek, R. Weiler, K. van der Hulst, J. Panagia, N.	NRAO-VLA NRL NRAO STScI	Statistical properties of radio supernovae.	2,6,20	1,4	3.2
AS-280	Sequist, E.	Toronto	Expansion of the compact nebula VY2-2.	2 cm line	19	8.5
AS-282	Spangler, S. Lazio, J. Cordes, J. Mutel, R.	Iowa Iowa Cornell Iowa	Studies of rotation measure fluctuations in the Cygnus region.	6	18	12.5
AS-285	Surdej, J. Courvoisier, T. Kayser, R. Kellerman, K. Kuhnr, H. Refsdal, S. Swings, J. Borgeest, U.	ESO Hamburg Obs NRAO-CV MPIA, Heidelberg Hamburg Obs Liege Hamburg Obs	The most luminous quasars - search for gravitationally lensed objects.	6	25,26	7
AT-60	Taylor, A. Sequist, E. Kenyon, S.	Groningen Toronto SAO	Radio-optical-uv monitoring of symbiotic stars.	1.3,2, 6 and 20	25	12
AT-81	Tacconi-Garman, L. Young, J. Ball, R.	Massachusetts Massachusetts Caltech	The search for a neutral hydrogen bar in NGC 6946.	20 cm line	7	10
AT-82	Terebey, S. Vogel, S. Myers, P.	Caltech Caltech CFA	A search for water masers near young low mass stars.	1.3 cm line	23	14
AT-83	Turner, J. Ho, P. Beck, S.	Calif, Los Angeles Harvard Northeastern	Lifetimes of nuclear starbursts.	1.3	10,11	9
AU-29	Uson, J. Bagri, D. Anantharamiah, K.	NRAO-VLA NRAO-VLA NRAO-VLA	Search for redshifted HI radiation from Zeldovich pancakes.	90 cm line	20	5
AV-137	van Buren, D. Fich, M.	Colorado Waterloo	The expanding neutral shell associated with the HII region Sharpless 156.	20 cm line	22	8
AV-138	van Buren, D.	Colorado	High resolution mapping of M1-67, a rapidly expanding shell of ejecta from the WR star BAC 209.	2	26	8



VLA UTILIZATION JANUARY 1987 (Cont.)

Program	Observer	Affiliation	Program title	Bands (cm)	Obsv date	Sched hrs
AV-141	Velusamy, T. Venukopal, V.	TIFR TIFR	Mapping SNRs G18.95-1.1 and G54.4-0.3.	6 and 20	3	8
AV-142	Vogel, S. Carlstrom, J.	Caltech Calif, Berkeley	NH3 and continuum observations of a very massive young object in Sgr B2.	1.3 and 2 cm line	4,5	14
AV-144	van der Hulst, J. Skilling, E.	NFFRA NFFRA	HI in low surface brightness spiral galaxies.	20 cm line	10, 12, 14, 17	20
AW-175	Bothun, G. Mouterloot, J.	Michigan MPIR, Bonn	The closest H2O maser.	1.3 cm line	8	2
AY-16	Henkel, C. Yin, Q. Xu, W. NRAO Staff	MPIR, Bonn Peking Peking	Optically clumpy galaxies. Baselines/Startup/Shutdown/Pointing Electronics/etc. Software Holiday Move/Operations General Tests	6	3,7	6 47.6 47.4 17.5 16.0 55.8 51.3

The average downtime for the month of January, 1987 was approximately 7.94 percent.

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

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 97.9 percent (730.0 hours) of the time: 70.4 percent (525.2 hours) to astronomical programs, 18.8 percent (139.9 hours) to scheduled test/calibration, and the remaining 8.7 percent (64.9 hours) went to scheduled maintenance.

The total number of programs run for the month of January, 1987 was 60.

The following independent proposals shared simultaneous observing time (29.6 hours Total Simultaneous Observing):

- AA59/Move/Op 8.1
- AM198/Move/Op 8.0
- ACT178/Move/Op 3.0
- AG234/Move/Op 7.5
- AL130/Move/Op 3.0