

Accurate Positions of Selected 4C Sources

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Positions and flux densities at 1417 MHz of 490 radio sources have been measured using the two 90-ft steerable parabolooids at the Owens Valley Radio Observatory as an east-west and a north-south interferometer. After confusion has been taken into account, most of the positions are accurate to within $\pm 20''$ in each coordinate and most flux densities to within ± 0.1 f.u. (One flux unit = $1 \text{ f.u.} = 10^{-26} \text{ W m}^{-2} \text{ Hz}^{-1}$.)

I. INTRODUCTION

AS part of a continuing program of identification of radio sources with optical objects, positions and flux densities have been measured for 490 sources chosen from the 20° to 40° zone of the 4C catalogue (Pilkington and Scott 1965). The criteria used in selection were that the source must be more than 10° from the galactic plane and have a flux at 178 MHz of at least 2.5 f.u. The declination measurements were made with north-south baselines of 1160λ (800 ft) and 290λ (200 ft), and the right ascensions were determined using an east-west baseline of 1160λ (800 ft). A single spacing in the *E-W* configuration was felt to be sufficient for the majority of the sources because the maximum quoted error for the right ascensions in the 4C catalogue is $2''$, which is sufficiently accurate to preclude the possibility of lobe ambiguities. An east-west baseline of 490λ (400 ft) was used to pick up approximately 50 sources in the region from 21^h to 1^h that were missed in the main series of observations; for these additional observations the frequency was determined by a concurrent program and was approximately 1200 MHz. The entire observation program was spread over a period of 16 months, and the schedule is presented in Table I.

All sources were observed for a minimum of 4 min, giving an rms noise of approximately 0.09 f.u. The mean positional error introduced by receiver noise is less than $5''$; in the 800 ft observations this is comparable to the errors introduced by confusion and instrumental phase jitter, as discussed below. Almost all observations were made within 20 min of meridian transit.

TABLE I. Observation program.

Series	Observers ^a	Date	Baseline	Obs./Source
60 Brightest	2	Nov/65	1160λ <i>NS</i>	2
			1160λ <i>EW</i>	3
430 Remaining	1, 2	Feb-Mar/66	1160λ <i>NS</i>	1
			1160λ <i>EW</i>	2
430 Remaining	3	June/66	290λ <i>NS</i>	3
60 Brightest pickup	1	Oct/66	290λ <i>NS</i>	2
	3	Mar/67	490λ	2

^a 1 = G. Stanley; 2 = J. Wyndham; 3 = E. Olsen.

II. REDUCTION

The instrumentation used with the Owens Valley interferometer has been described by Read (1963), and the technique of reduction of the data has been sketched out by Fomalont, Wyndham, and Bartlett (1967). The positions of the radio sources were not measured on an absolute basis, but were determined relative to the known positions of certain "calibrator sources" drawn from the list given by Fomalont (1967). Most of these calibrators have been identified with quasi-stellar objects, and they are unresolved at the interferometer spacings used in the present observations. The flux densities are similarly determined relative to these calibrators, one of which was observed on the average every 2 h. The baseline parameters (the hour angle and declination of the point at which the extended baseline intersects the celestial sphere, and the length of the baseline measured in wavelengths of the observing frequency) were also determined, using a number of strong calibrators ranging in declination from -15° to 80° , as described by Fomalont, Wyndham, and Bartlett (1967).

III. ERRORS

There are four major sources of error in position and flux: changes in instrumental gain and phase, confusion by a nearby strong source, confusion by one or more unknown weak sources in the beam, and resolution of extended sources. The instrumental gain and phase are determined in the reduction program, and the jitter amounts to ± 10 millilobes in phase and $\pm 10\%$ in gain for a single observation. The half-power beamwidth is $34'$ at $\lambda = 21 \text{ cm}$, and a survey of the 3C catalogue (Edge, Shakeshaft, McAdam, Baldwin, and Archer 1959), the Parkes catalogue (Day, Shimmins, Ekers, and Cole 1965), and the NRAO catalogue (Pauliny-Toth, Wade, and Heeschen 1966) does not disclose a known source within $20'$ of any of the selected 4C sources. Fomalont has investigated the confusion due to one or more unknown weak sources in the beam, and he has found the rms confusion at $\lambda = 21 \text{ cm}$ to be 0.12 f.u. (Fomalont, Wyndham, and Bartlett 1967). The error due to possible resolution of some sources

TABLE II. POSITIONS OF 490 RADIO SOURCES

SOURCE (1)	RIGHT ASCENSION (2)	DECLINATION (3)	FLUX (4)	S.I. (5)	NOTE (6)	ALTERNATE LISTING (7)
4C38.01	00 ^h 03 ^m 46 ^s .7 (2.0) C	38 ^o 43'59" (30) B	0.48	-0.83		
4C21.01	00 04 52.9 (1.2) C	21 47 31 (21) B	0.70	-0.85		
4C33.01	00 07 51.5 (2.0) D	33 12 49 (25) B	0.61	-0.73	(3)	
4C27.01	00 08 58.7 (1.4) C	27 47 14 (11) A	0.69	-0.66		NRA010
4C20.01	00 11 16.3 (1.0) C	20 30 30 (15) B	0.98	-0.81		
4C32.01	00 12 29.9 (0.8) C	31 59 32 (8) A	1.73	-0.57		3C6,NRA013
4C32.02	00 13 34.4 (1.9) C	32 22 37 (15) A	0.96	-0.58	(3)	
4C21.02	00 15 39.7 (1.2) C	21 25 06 (21) B	0.77	-0.74		
4C25.01	00 17 02.8 (1.1) C	25 45 55 (14) A	0.80	-0.57	(3)	
4C24.01	00 18 44.5 (2.6) D	24 11 23 (17) B	0.87	-0.71		CTD2
4C37.01	00 25 32.8 (1.7) C	37 20 55 (31) B	0.49	-0.82		
4C21.03	00 29 10.9 (1.2) C	21 37 05 (20) B	0.74	-0.80		
4C26.01	00 33 26.9 (2.0) D	26 15 31 (45) B	0.43	-0.90		
4C38.03	00 35 04.7 (1.4) C	38 31 28 (9) A	0.80	-0.76		
4C36.01	00 35 05.6 (1.0) C	36 31 00 (8) A	0.78	-0.56		
4C35.01	00 36 21.5 (2.0) D	35 47 42 (40) B	0.35	-0.97	(5)	
4C25.02	00 38 41.0 (1.6) D	25 33 45 (8) A	0.54	-1.07		
4C32.04	00 39 07.2 (1.1) C	31 56 09 (14) B	1.12	-0.58	(3)	
4C39.03	00 39 32.8 (1.3) C	39 53 27 (11) A	0.69	-0.68		
4C30.01	00 44 27.7 (1.6) C	30 11 20 (8) A	0.67	-0.78		
4C37.03	00 49 31.8 (1.2) C	37 59 05 (8) A	0.97	-0.67		NRA042
4C29.01	00 50 60.0 (0.9) C	29 08 57 (25) B	0.68	-0.70		
4C30.02	00 51 07.3 (2.6) D	30 58 31 (8) A	0.60	-0.79		
4C38.04	00 52 10.8 (2.0) D	38 05 43 (14) A	0.32	-1.03		NRA046
4C26.03	00 55 41.8 (0.8) C	26 35 58 (11) B	1.75	-0.52		
4C25.03	01 00 08.3 (0.6) A	25 36 05 (14) B	1.09	-0.71	(5)	CTD8
4C25.04	01 08 37.4 (0.7) A	25 49 08 (26) B	0.59	-0.73	(1)	
4C29.02	01 10 38.9 (0.6) A	29 42 10 (20) B	0.70	-0.65		CTD9
4C23.04	01 21 05.9 (0.6) A	23 50 29 (12) B	1.20	-0.54	(4)	
4C25.05	01 23 56.5 (2.0) D	25 43 53 (23) B	0.67	-0.63		
4C23.05	01 24 26.7 (1.4) A	22 58 35 (37) B	0.38	-1.03		
4C32.07	01 25 11.5 (0.7) A	32 29 05 (8) A	0.51	-1.09	(1)	
4C25.06	01 27 37.3 (0.6) A	25 52 40 (10) B	1.72	-0.38	(5)	CTD11
4C25.07	01 28 33.3 (0.6) A	25 05 16 (9) B	1.80	-0.75		CTD12
4C24.02	01 30 37.9 (0.8) A	24 12 43 (25) B	0.62	-0.73		
4C29.03	01 34 04.4 (0.6) A	29 59 10 (10) B	1.70	-0.62		CTD13
4C38.06	01 34 53.7 (1.4) A	38 35 56 (29) B	0.53	-0.77		
4C22.02	01 35 28.4 (0.6) A	22 45 50 (17) B	1.11	-0.81		
4C39.04	01 36 32.3 (1.6) D	39 41 55 (14) B	1.04	-0.68	(3)	
4C38.07	01 40 42.2 (2.3) A	38 47 08 (34) B	0.49	-1.04	(4)	NRA081
4C27.05	01 43 35.2 (0.7) A	27 50 46 (9) A	0.60	-0.86	(1)	
4C26.05	01 47 14.9 (0.7) A	26 44 11 (24) B	0.60	-0.82		CTD14
4C20.08	01 48 00.7 (0.6) A	20 02 29 (20) B	0.85	-0.82		
4C24.03	01 52 08.8 (0.6) A	24 11 37 (44) B	0.59	-0.71		
4C29.04	01 53 04.0 (0.7) A	29 52 55 (11) A	0.55	-0.83		
4C20.09	01 ^h 53 ^m 49 ^s .3 (1.8) A	20 ^o 48'45" (22) B	0.65	-0.74	(2)	
4C31.06	01 54 23.7 (0.6) A	31 51 31 (8) A	1.00	-0.68	(1)	
4C33.04	01 57 49.8 (0.8) A	33 23 09 (36) B	0.70	-0.70	(5)	
4C39.05	01 57 53.4 (1.8) A	39 20 25 (21) B	0.70	-0.63	(4)	
4C29.05	01 58 43.9 (0.6) A	29 18 40 (17) B	1.13	-0.70	(1)	NRA087
4C36.02	02 01 24.5 (3.5) A	36 21 43 (50) A	0.21	-1.19		
4C29.06	02 04 11.6 (0.8) C	29 16 53 (8) A	2.28	-0.41	(4)	3C59,NRA093,CTD17
4C35.03	02 06 39.2 (0.6) A	35 33 41 (8) A	2.20	-0.55	(4)	
4C21.09	02 08 24.7 (0.6) A	21 05 41 (12) B	1.48	-0.69		3C60,NRA094
4C34.06	02 11 58.2 (0.6) A	34 52 43 (8) A	1.00	-0.73	(1)	
4C27.07	02 14 08.2 (0.6) A	27 51 01 (8) A	0.95	-0.72	(1)	CTD18
4C20.10	02 17 19.6 (0.6) A	20 22 00 (22) B	0.70	-0.61		
4C39.06	02 18 45.8 (0.8) A	39 43 05 (28) B	1.08	-0.86	(5)	NRA0100
4C26.08	02 22 24.6 (0.6) A	26 39 50 (24) B	0.77	-0.85		
4C34.07	02 23 09.4 (0.6) A	34 07 36 (8) B	2.51	-0.24	(1)	
4C36.04	02 25 02.2 (1.5) C	36 49 04 (28) B	0.78	-0.56	(5)	
4C37.06	02 28 09.9 (1.0) A	37 29 00 (240) D	0.34	-0.96		
4C35.05	02 29 26.4 (0.6) A	35 17 43 (9) A	0.70	-0.90	(1)	
4C28.06	02 32 39.0 (0.6) A	28 55 55 (8) A	1.62	-0.79	(1)	
4C30.03	02 34 01.3 (0.9) A	30 12 50 (11) A	0.67	-0.74	(4)	
4C27.09	02 35 17.5 (0.6) A	27 12 29 (9) A	0.65	-1.00	(1)	
4C29.08	02 41 43.6 (0.6) A	29 12 08 (8) A	0.76	-0.84	(1)	NRA0115
4C37.07	02 44 24.3 (0.6) A	37 42 18 (9) A	0.66	-0.64	(1)	
4C28.08	02 44 45.2 (0.6) A	28 11 10 (20) B	0.84	-0.82		
4C29.09	02 45 44.2 (0.7) A	29 43 17 (12) A	0.56	-0.74	(1)	
4C33.05	02 46 54.2 (0.6) A	33 20 20 (8) A	0.74	-0.75		
4C38.08	02 50 43.1 (0.6) A	38 26 54 (120) D	1.00	-0.69		
4C20.11	02 51 08.4 (0.6) A	20 02 54 (18) B	0.89	-0.83		3C74,NRA0117,P0251+20
4C34.09	02 58 35.6 (0.6) A	35 00 13 (9) B	1.99	-0.44	(1)	
4C35.06	02 58 43.6 (0.7) A	35 38 07 (18) B	0.82	-0.84	(4)	
4C27.10	03 00 18.7 (0.6) A	27 41 43 (11) A	0.86	-0.68		
4C34.10	03 00 20.1 (0.7) A	34 35 34 (11) A	0.82	-0.69	(3)	
4C25.10	03 02 01.7 (0.7) A	25 40 17 (29) B	0.47	-0.88		
4C34.12	03 02 33.1 (0.8) A	34 10 21 (9) A	0.55	-0.78	(1)	
4C30.04	03 08 31.9 (0.6) A	30 32 05 (8) A	1.14	-0.63	(2)	
4C24.05	03 09 39.8 (0.6) A	24 11 59 (29) B	0.91	-0.89	(5)	3C83,NRA0127,CTD23
4C26.11	03 10 25.5 (0.8) A	26 13 52 (10) A	0.54	-0.79	(1)	NRA0129
4C36.05	03 11 27.5 (0.7) A	36 19 34 (21) B	0.68	-0.75		
4C31.10	03 13 17.4 (1.5) C	31 55 13 (29) B	0.51	-0.84	(3)	
4C31.11	03 13 17.4 (0.6) A	31 13 41 (8) A	0.91	-0.56		
4C34.13	03 13 45.8 (0.8) A	34 26 10 (9) A	0.79	-0.78		
4C28.09	03 15 35.8 (0.6) A	28 04 39 (9) A	0.84	-0.74	(2)	
4C31.12	03 22 04.7 (0.7) A	31 18 06 (13) A	0.54	-0.76		
4C24.06	03 22 06.8 (0.6) A	24 33 57 (19) B	0.79	-0.67		
4C21.11	03 22 33.4 (0.9) A	21 19 24 (36) B	0.48	-0.83		

TABLE II. (CONTINUED)

SOURCE (1)	RIGHT ASCENSION (2)	DECLINATION (3)	FLUX (4)	S.I. (5)	NOTE (6)	ALTERNATE LISTING (7)
4C29.10	03 ^h 25 ^m 32. ^s 8 (0.6) A	29 ^o 11' 28" (17) A	0.58	-0.81	(5)	3C92,NRA0143
4C31.13	03 37 00.8 (0.6) A	31 59 23 (8) A	1.49	-0.83	(3)	
4C31.14	03 40 01.5 (0.8) A	31 05 34 (8) A	0.95	-0.60	(2)	
4C27.11	03 43 24.7 (0.7) A	27 43 56 (23) B	0.64	-0.81	(4)	
4C30.05	03 46 18.2 (0.8) A	30 06 18 (8) A	0.50	-0.86		
4C26.12	03 49 02.6 (0.6) A	26 15 20 (8) A	1.31	-0.77	(1)	CT025
4C22.06	03 49 36.5 (0.6) A	22 10 58 (31) B	0.75	-0.68	(1)	
4C21.13	03 49 45.2 (0.6) A	21 17 22 (8) A	0.78	-0.56	(1)	
4C26.13	03 57 45.5 (2.6) D	26 10 33 (41) B	0.36	-0.97		
4C26.14	03 59 29.9 (0.7) A	26 48 39 (24) A	0.48	-0.81		
4C20.13	04 03 25.4 (1.5) C	20 48 54 (23) B	0.62	-0.69	(2)	3C108,NRA0167
4C22.08	04 09 44.5 (0.6) A	22 57 31 (8) A	1.42	-0.62	(1)	
4C26.15	04 10 20.3 (0.8) A	26 41 02 (29) B	0.56	-0.92		
4C23.08	04 18 21.2 (0.6) A	23 41 57 (8) A	0.64	-0.73	(1)	
4C21.16	04 21 18.2 (0.6) A	21 19 10 (15) B	1.07	-0.60	(5)	
4C22.10	04 47 44.8 (1.4) A	22 54 32 (10) A	0.40	-0.88	(1)	
4C35.14	06 55 57.6 (0.6) A	35 57 31 (36) B	0.52	-0.81		
4C35.15	06 58 27.2 (0.6) A	35 22 35 (15) B	1.23	-0.74	(2)	
4C23.18	06 58 29.0 (1.1) A	23 17 02 (38) B	1.15	-0.55	(5)	
4C37.18	07 00 41.8 (0.6) A	37 31 29 (8) A	0.77	-0.79		
4C38.20	07 04 08.6 (0.6) A	38 27 11 (22) B	0.84	-0.93		
4C26.26	07 06 01.6 (0.6) A	26 09 35 (17) B	1.14	-0.50		
4C35.17	07 18 09.7 (0.8) A	35 57 11 (30) B	0.55	-0.73		
4C31.27	07 21 17.6 (0.6) A	31 37 41 (8) A	1.09	-0.71	(2)	
4C39.17	07 22 25.2 (0.6) A	39 23 30 (18) B	1.19	-0.41		
4C24.15	07 26 22.5 (0.8) A	24 39 38 (64) B	0.39	-1.16		
4C25.21	07 30 05.7 (0.6) A	25 42 42 (8) A	1.26	-0.46		
4C29.25	07 33 01.5 (0.6) A	29 06 16 (10) A	0.84	-0.80		
4C36.13	07 33 46.0 (0.6) A	36 10 09 (12) B	1.29	-0.65	(2)	
4C21.23	07 36 54.0 (3.5) A	21 01 04 (32) A	0.57	-0.99	(4)	
4C39.18	07 40 36.7 (0.7) A	39 10 20 (9) A	0.67	-0.72		
4C37.19	07 42 19.1 (0.7) A	37 38 19 (40) B	0.70	-0.79		
4C21.24	07 44 07.3 (1.9) A	20 57 12 (20) A	0.20	-1.20	(1)	
4C31.31	07 47 02.3 (0.6) A	31 27 24 (8) A	1.27	-0.36	(4)	
4C39.19	07 46 59.4 (1.6) A	39 49 20 (26) B	0.60	-0.71	(2)	
4C39.20	07 48 28.8 (1.1) A	39 50 28 (31) B	0.48	-0.80		
4C29.26	07 49 41.9 (0.7) A	29 54 05 (13) A	0.55	-0.80		
4C38.22	07 53 30.8 (1.2) A	38 18 34 (29) B	0.54	-0.81		
4C39.21	07 54 47.2 (0.7) A	39 37 40 (8) A	0.64	-0.73	(1)	
4C37.21	07 55 42.3 (0.6) A	37 56 44 (8) B	3.24	-0.60	(5)	
4C39.22	07 56 55.7 (2.0) D	39 44 25 (55) B	0.26	-1.35		CT053
4C30.13	08 01 35.1 (0.6) A	30 20 51 (11) B	1.45	-0.57	(2)	
4C22.19	08 05 58.5 (0.9) A	22 31 01 (8) A	0.49	-0.86	(1)	
4C27.18	08 07 10.7 (0.7) A	27 10 16 (11) A	0.49	-0.82		
4C34.27	08 07 50.9 (1.0) A	34 52 24 (240) D	0.33	-1.00		
4C35.18	08 ^h 09 ^m 33. ^s 1 (0.6) A	36 ^o 00' 33" (15) B	1.02	-0.75		
4C32.24	08 09 49.9 (0.6) A	32 52 09 (8) A	1.26	-0.67		
4C37.23	08 10 10.2 (0.6) A	37 02 36 (240) D	0.69	-0.77		
4C38.23	08 11 54.0 (0.8) A	38 50 10 (40) B	0.48	-0.83		
4C38.24	08 13 30.5 (0.8) A	37 59 41 (25) B	0.62	-0.82	(3)	
4C29.28	08 14 02.1 (1.0) A	29 26 53 (12) A	0.65	-0.77	(2)	3C197,NRA0287
4C22.20	08 14 38.2 (0.6) A	22 46 30 (8) A	1.20	-0.59	(1)	
4C30.15	08 17 25.9 (0.9) A	30 45 33 (36) B	0.41	-0.87		
4C22.21	08 20 28.4 (0.6) A	22 32 47 (8) A	2.55	-0.27	(1)	
4C39.23	08 21 36.5 (0.6) A	39 27 32 (8) B	2.27	-0.36	(3)	
4C34.28	08 22 01.1 (0.6) A	34 28 57 (8) A	1.16	-0.57	(4)	
4C38.25	08 23 49.5 (1.1) A	37 59 33 (31) B	0.54	-0.78		
4C35.20	08 24 23.2 (0.6) A	35 47 00 (8) A	1.04	-0.46		
4C24.17	08 25 44.3 (0.9) A	24 45 60 (27) B	0.54	-0.78		
4C37.24	08 27 55.2 (0.6) A	37 52 19 (8) A	2.53	-0.58	(1)	
4C25.22	08 35 52.6 (0.6) A	25 38 05 (15) B	1.19	-0.61	(1)	
4C29.31	08 40 07.5 (0.6) A	29 54 43 (11) A	0.93	-0.78		
4C31.32	08 44 53.8 (0.8) A	31 58 45 (16) B	1.00	-0.84	(5)	
4C34.29	08 50 35.6 (0.6) A	34 17 46 (8) A	0.85	-0.57	(1)	
4C29.32	08 53 00.0 (0.6) A	29 09 43 (10) A	0.87	-0.77		
4C34.30	08 54 34.2 (0.6) A	34 15 45 (8) A	1.85	-0.74		3C211,NRA0308
4C22.22	09 01 56.4 (0.6) A	22 31 41 (8) A	0.78	-0.91	(1)	
4C32.27	09 04 49.2 (0.6) A	32 01 19 (8) A	0.99	-0.61	(2)	
4C39.24	09 05 04.2 (1.7) A	39 44 12 (44) B	0.32	-1.01	(4)	
4C24.19	09 07 28.2 (0.6) A	24 31 37 (8) A	0.94	-0.59		
4C23.21	09 10 43.0 (0.6) A	23 49 28 (18) B	1.08	-0.51		CT060
4C34.31	09 14 11.7 (0.6) A	34 59 19 (8) A	0.97	-0.58	(1)	
4C23.22	09 14 59.2 (1.3) A	23 18 29 (32) A	0.39	-0.97	(5)	
4C22.23	09 15 37.3 (0.6) A	22 45 21 (8) A	1.00	-0.87	(1)	
4C38.29	09 18 39.5 (0.6) A	38 07 05 (8) A	1.28	-0.63	(1)	
4C31.33	09 19 10.8 (0.6) A	31 23 54 (8) A	0.88	-0.93	(1)	
4C21.25	09 19 53.4 (0.6) A	21 49 55 (25) B	0.67	-0.65		
4C32.28	09 22 32.5 (0.7) A	32 12 53 (8) A	0.58	-0.78	(1)	
4C36.14	09 22 34.2 (0.6) A	36 39 15 (25) B	0.89	-0.57		
4C39.25	09 23 55.4 (0.6) A	39 15 26 (10) B	2.86	-0.31	(5)	
4C31.34	09 27 34.6 (0.8) A	31 24 56 (36) B	0.42	-0.99	(3)	3C221,NRA0324
4C32.30	09 29 35.4 (0.7) A	32 45 14 (19) B	0.78	-0.63		
4C39.26	09 31 60.0 (0.6) A	39 55 33 (8) A	1.18	-0.81	(1)	
4C25.26	09 32 40.0 (0.6) A	25 23 39 (19) B	0.80	-0.64		
4C25.27	09 34 16.2 (0.8) A	25 34 54 (11) A	0.49	-0.79	(1)	
4C26.28	09 36 01.1 (0.6) A	26 13 01 (25) B	0.73	-0.76		CT061 3C229,NRA0338,CT062
4C39.27	09 37 60.0 (0.7) A	39 07 48 (24) B	0.80	-0.81		
4C26.29	09 39 38.1 (0.6) A	26 40 40 (8) A	0.73	-0.83	(1)	
4C28.23	09 40 08.3 (0.6) A	28 48 33 (21) B	0.72	-0.62		
4C24.22	09 49 10.5 (0.6) A	24 36 40 (8) A	1.92	-0.59	(2)	

TABLE II. (CONTINUED)

SOURCE (1)	RIGHT ASCENSION (2)	DECLINATION (3)	FLUX (4)	S.I. (5)	NOTE (6)	ALTERNATE LISTING (7)
4C28.24	09 ^h 49 ^m 13 ^s 0 (0.6) A	28 ^o 42' 26" (8) A	1.29	-0.48		CTD63
4C25.29	09 50 48.3 (0.6) A	25 30 29 (8) A	1.16	-0.77	(1)	
4C21.26	09 51 21.5 (1.3) A	21 37 13 (16) B	1.08	-0.54	(2)	
4C35.21	09 52 48.9 (0.7) A	35 47 23 (9) A	0.52	-0.88	(1)	
4C32.32	09 54 59.1 (1.4) A	32 15 31 (21) B	0.74	-0.81	(2)	
4C38.30	09 55 02.1 (0.7) A	38 43 23 (80) B	0.53	-0.88	(5)	
4C27.20	09 55 16.9 (0.8) A	27 46 36 (18) A	0.65	-0.65		
4C32.33	09 55 25.6 (0.6) A	32 38 26 (8) A	1.59	-0.44	(3)	3C232,NRA0342
4C22.25	09 57 34.4 (0.6) A	22 48 09 (12) B	1.35	-0.49	(2)	
4C25.30	09 58 36.7 (0.6) A	25 40 38 (43) B	0.49	-0.99		
4C20.20	10 00 11.6 (0.6) A	20 06 31 (8) A	1.18	-0.71	(2)	
4C20.21	10 01 37.7 (1.0) A	20 43 40 (32) B	0.48	-0.97		
4C32.34	10 01 38.9 (0.6) A	32 06 28 (8) A	1.45	-0.72		
4C22.26	10 01 58.7 (0.6) A	22 39 50 (27) B	0.61	-0.88	(1)	
4C29.36	10 03 54.6 (0.6) A	29 03 57 (19) B	0.78	-0.56		
4C21.27	10 08 23.6 (0.6) A	21 27 36 (8) A	0.85	-0.86	(1)	
4C29.37	10 11 28.8 (0.6) A	29 18 44 (8) A	0.94	-0.65		CTD65
4C28.25	10 11 46.7 (0.8) A	28 04 20 (31) B	0.57	-0.71		
4C23.24	10 12 00.0 (0.6) A	23 16 35 (15) B	1.27	-0.49	(5)	
4C39.29	10 14 15.5 (0.6) A	39 22 20 (8) A	1.24	-0.77	(1)	
4C39.30	10 14 24.2 (2.3) A	39 46 25 (21) B	0.72	-0.95	(4)	
4C37.27	10 17 45.0 (1.0) A	37 25 11 (62) B	0.54	-0.84	(5)	
4C31.35	10 17 48.4 (0.6) A	31 53 22 (8) A	0.95	-0.84		
4C25.32	10 19 23.2 (1.3) A	25 38 29 (8) A	0.87	-0.61	(4)	
4C39.31	10 19 59.2 (0.7) A	39 24 09 (8) A	0.49	-0.82		
4C20.22	10 22 36.9 (0.6) A	20 25 33 (45) A	1.09	-0.88	(2)	3C242,NRA0354,P1022+20
4C23.25	10 28 07.7 (0.7) A	23 20 40 (9) A	0.55	-0.92	(1)	
4C28.26	10 28 10.4 (0.6) A	28 11 15 (14) A	0.69	-0.64		
4C25.33	10 29 59.2 (0.6) A	25 17 46 (8) A	0.86	-0.78	(1)	
4C32.36	10 36 02.0 (0.6) A	32 21 40 (9) A	0.74	-0.75		
4C39.33	10 42 23.3 (0.6) A	39 12 38 (11) A	0.74	-0.59		
4C37.28	10 43 22.3 (3.3) A	37 14 39 (19) A	0.23	-1.15		
4C29.39	10 44 39.0 (0.8) A	29 43 45 (25) B	0.62	-0.67		
4C28.27	10 47 34.9 (0.6) A	28 46 35 (9) A	0.52	-0.89		CTD67
4C24.23	10 48 46.4 (0.7) A	24 03 46 (8) A	0.58	-0.78		CTD68
4C34.33	10 49 10.8 (0.6) A	34 29 11 (8) A	0.71	-0.80	(1)	
4C29.40	10 51 55.3 (4.0) D	29 06 07 (32) B	0.63	-0.66		
4C30.20	10 57 21.6 (1.1) A	30 42 49 (18) B	0.86	-0.94	(4)	3C248,NRA0361
4C35.24	10 59 23.8 (0.6) A	35 11 21 (8) A	0.75	-0.82	(1)	
4C36.18	11 04 41.5 (0.6) A	36 32 28 (8) A	0.80	-0.64		
4C39.34	11 05 50.8 (0.6) A	39 15 04 (15) B	1.01	-0.63	(2)	3C251,NRA0364
4C37.29	11 07 03.5 (0.6) A	37 54 53 (8) A	1.54	-0.76	(2)	
4C21.30	11 12 55.3 (0.8) A	21 49 50 (25) B	0.70	-0.67		
4C29.41	11 13 53.9 (0.6) A	29 31 44 (8) A	1.99	-0.49	(2)	CTD72
4C26.31	11 14 06.6 (0.7) A	26 04 25 (11) A	0.75	-0.77		
4C20.25	11 ^h 13 ^m 19 ^s 5 (0.6) A	20 ^o 22' 20" (12) B	1.28	-0.48	(4)	
4C30.21	11 23 28.7 (0.6) A	30 20 09 (8) A	1.01	-0.76	(1)	NRA0374
4C32.37	11 25 30.3 (0.8) A	32 33 33 (22) B	0.98	-0.61	(2)	NRA0375
4C37.30	11 25 49.2 (1.0) A	37 45 44 (91) B	0.29	-1.06		
4C37.31	11 29 55.3 (0.9) A	37 08 42 (180) D	0.58	-0.72		
4C33.27	11 30 31.8 (3.0) D	33 47 44 (8) A	1.08	-0.64		
4C33.28	11 30 53.0 (0.6) A	33 34 42 (8) A	0.97	-0.77	(2)	
4C30.22	11 32 16.3 (0.6) A	30 22 05 (8) A	1.12	-0.85	(1)	3C261,NRA0378
4C26.32	11 33 12.3 (0.8) A	26 13 49 (16) A	0.72	-0.86		NRA0379
4C26.33	11 34 52.8 (1.0) A	26 36 17 (36) B	0.43	-0.95		
4C23.28	11 38 59.0 (0.6) A	23 25 44 (8) A	0.74	-0.96	(1)	
4C21.33	11 39 43.4 (0.6) A	21 45 57 (8) A	0.75	-0.98		
4C30.23	11 41 45.4 (0.6) A	30 14 43 (20) B	1.03	-0.60	(5)	
4C29.43	11 43 47.4 (0.6) A	29 19 03 (8) A	0.57	-0.77		
4C25.36	11 44 39.8 (0.6) A	25 36 56 (9) A	0.86	-0.70		CTD75
4C36.19	11 48 13.6 (0.6) A	36 38 54 (8) A	0.66	-0.73	(1)	
4C22.31	11 48 27.3 (1.0) A	22 43 21 (17) A	0.30	-1.00	(1)	
4C38.31	11 48 54.1 (0.6) A	38 42 11 (26) B	0.63	-0.85	(1)	
4C26.34	11 50 13.0 (0.9) A	26 31 34 (31) B	0.45	-0.86		
4C22.32	11 50 34.3 (1.5) A	22 46 19 (31) B	0.46	-0.80	(2)	
4C38.32	11 51 21.3 (1.8) A	38 29 13 (25) B	1.45	-0.61	(5)	
4C29.44	11 51 37.9 (0.6) A	29 32 52 (8) A	1.72	-0.66	(1)	CTD76
4C31.38	11 53 44.1 (0.6) A	31 44 48 (8) A	3.24	-0.40	(1)	NRA0389
4C26.35	11 55 54.2 (1.2) A	26 38 15 (25) B	0.76	-0.65	(5)	
4C29.45	11 56 58.2 (0.6) A	29 31 34 (10) B	1.98	-0.17	(5)	CTD77
4C25.37	11 58 13.6 (0.6) A	25 13 28 (26) B	0.78	-0.81		
4C25.38	11 58 51.1 (0.6) A	25 37 11 (10) A	0.80	-0.73		
4C29.46	12 02 19.9 (0.6) A	29 46 38 (8) A	1.14	-0.80	(1)	
4C22.33	12 04 00.6 (0.6) A	22 32 30 (15) B	1.29	-0.47	(5)	
4C37.33	12 04 21.0 (0.8) A	37 08 27 (8) A	0.76	-0.75	(2)	
4C35.27	12 04 59.9 (0.6) A	35 20 21 (34) B	0.60	-0.82	(1)	
4C39.35	12 05 19.9 (0.6) A	39 12 43 (9) A	0.73	-0.76		
4C23.29	12 06 32.9 (0.6) A	23 26 45 (8) A	0.82	-0.73	(5)	
4C24.25	12 10 11.3 (0.6) A	24 15 05 (21) A	0.48	-0.80		
4C20.27	12 10 23.6 (0.6) A	20 49 25 (8) A	1.42	-0.73		
4C23.30	12 16 19.8 (0.9) A	23 32 43 (33) B	0.43	-0.90	(5)	
4C20.28	12 16 27.5 (0.7) A	20 12 30 (20) B	0.77	-0.70	(3)	
4C22.35	12 18 13.6 (0.6) A	22 50 18 (150) D	0.88	-0.73	(5)	
4C31.40	12 19 22.8 (0.7) A	31 47 26 (8) A	0.73	-0.94	(1)	
4C26.37	12 22 02.9 (0.7) A	26 29 59 (21) B	0.70	-0.84		
4C21.35	12 22 23.5 (0.6) A	21 39 29 (8) A	1.46	-0.73	(1)	
4C20.29	12 25 41.1 (0.6) A	20 39 56 (8) A	1.39	-0.54	(1)	
4C26.38	12 29 55.8 (2.0) A	26 22 58 (49) A	0.15	-1.49	(6)	
4C39.37	12 32 39.6 (1.0) A	39 38 42 (180) D	0.29	-1.40		
4C26.39	12 34 02.6 (0.6) A	26 51 46 (13) A	0.62	-0.92		

TABLE II. (CONTINUED)

SOURCE (1)	RIGHT ASCENSION (2)	DECLINATION (3)	FLUX (4)	S.I. (5)	NOTE (6)	ALTERNATE LISTING (7)
4C37.34	12 ^h 34 ^m 24 ^s .4 (0.6) A	37°11'47" (8) A	1.07	-0.74	(1)	
4C32.40	12 36 42.5 (0.6) A	32 46 54 (8) A	0.86	-0.59	(1)	
4C28.31	12 39 31.0 (0.6) A	28 47 41 (34) B	0.59	-0.73		
4C23.32	12 41 23.6 (1.0) A	23 00 23 (10) A	0.44	-0.84	(1)	
4C36.21	12 42 25.2 (0.6) A	36 25 53 (8) A	0.72	-0.70	(1)	
4C38.33	12 44 23.7 (0.7) A	38 58 05 (10) A	0.76	-0.76	(4)	
4C32.41	12 44 55.8 (0.7) A	32 25 37 (12) A	0.44	-0.84	(1)	
4C23.33	12 46 37.2 (0.6) A	23 50 32 (31) B	0.86	-0.51	(5)	
4C33.30	12 47 26.9 (1.1) A	33 39 57 (12) B	1.42	-0.45	(2)	
4C30.25	12 48 00.5 (0.8) A	30 33 09 (8) A	0.50	-0.79	(1)	
4C26.40	12 51 41.2 (0.6) A	26 46 20 (42) B	0.68	-0.76	(5)	
4C37.35	12 53 56.1 (0.6) A	37 29 35 (19) B	0.83	-0.86	(3)	
4C36.22	12 55 31.7 (0.6) A	37 01 03 (18) B	1.10	-0.50		
4C21.37	12 56 07.3 (0.7) A	21 35 21 (8) A	0.55	-0.82	(1)	
4C23.34	12 57 51.8 (0.7) A	23 44 27 (46) B	0.45	-0.83		
4C38.34	12 57 53.4 (0.8) A	38 20 11 (18) B	0.82	-0.78		
4C38.35	13 01 25.0 (0.6) A	38 12 28 (8) A	0.64	-0.85	(1)	
4C38.36	13 02 40.0 (0.9) A	38 48 23 (12) A	0.62	-0.89	(1)	
4C32.42	13 09 31.8 (0.6) A	32 46 18 (8) A	0.69	-0.83	(5)	
4C20.31	13 10 35.9 (0.6) A	21 00 13 (8) A	1.31	-0.47	(1)	
4C29.47	13 16 43.9 (2.0) D	29 54 07 (14) B	1.11	-0.51		
4C36.23	13 17 30.8 (0.6) A	36 16 25 (38) B	0.51	-0.80		
4C27.25	13 19 53.1 (0.6) A	27 01 34 (8) A	1.28	-0.54		
4C23.35	13 19 57.3 (0.6) A	23 00 54 (8) A	0.88	-0.61	(5)	
4C32.43	13 20 28.0 (0.6) A	32 31 42 (8) A	0.98	-0.70	(1)	
4C29.48	13 20 41.8 (0.6) A	29 57 23 (8) A	1.50	-0.47		
4C36.24	13 22 35.3 (0.6) A	36 38 22 (8) A	1.03	-0.48		
4C22.38	13 24 29.8 (0.6) A	23 00 18 (21) B	0.96	-0.81	(2)	
4C32.44	13 24 40.2 (0.6) A	32 09 19 (8) B	5.43	-0.03	(5)	
4C31.42	13 26 05.5 (0.6) A	31 00 04 (8) A	0.74	-0.83	(1)	NRA0423
4C25.44	13 28 57.8 (0.6) A	25 02 20 (20) B	2.03	-0.52	(5)	
4C27.26	13 33 13.8 (0.6) A	27 32 14 (19) B	0.85	-0.80		
4C35.30	13 40 17.8 (0.6) A	35 22 13 (8) A	1.00	-0.58		
4C32.45	13 40 47.2 (0.6) A	31 58 46 (8) A	0.99	-0.48	(5)	
4C38.37	13 43 27.0 (0.6) A	38 38 17 (8) A	0.91	-0.54		
4C37.39	13 43 43.3 (0.9) A	37 08 42 (180) D	0.38	-0.93		
4C24.28	13 45 54.0 (0.6) A	24 30 33 (8) A	0.58	-1.02	(1)	
4C28.34	13 46 04.1 (0.6) A	28 48 07 (8) A	0.79	-0.99	(1)	
4C29.49	13 46 31.5 (0.6) A	29 54 41 (35) B	0.79	-0.70		3C290,NRA0430
4C26.42	13 46 33.6 (0.6) A	26 50 35 (8) A	1.18	-0.69		
4C21.40	13 47 16.6 (0.6) A	21 22 25 (8) A	1.32	-0.84	(1)	3C291,NRA0431
4C32.46	13 54 31.2 (0.7) A	32 34 27 (16) A	0.73	-0.85	(3)	
4C38.38	14 01 04.9 (0.6) A	38 42 24 (15) A	0.73	-0.73	(3)	
4C23.36	14 05 38.8 (0.7) A	23 47 58 (22) B	1.15	-0.54	(5)	
4C24.30	14 06 03.5 (0.6) A	24 01 34 (8) A	1.23	-0.69	(1)	CT084
4C31.44	14 07 48.52 (1.3) A	31 03 07 (8) A	1.19	-0.82	(2)	
4C37.40	14 08 35.7 (0.6) A	37 01 55 (15) B	1.23	-0.56		
4C25.45	14 13 38.0 (0.7) A	25 23 45 (10) A	0.58	-0.70		
4C36.25	14 14 26.5 (1.3) A	36 01 24 (180) D	0.44	-0.94		
4C27.28	14 17 44.8 (0.6) A	27 15 25 (8) A	1.32	-0.64	(1)	CT085
4C21.41	14 22 06.8 (2.5) A	21 04 18 (33) B	0.44	-0.91	(2)	
4C20.33	14 22 37.6 (0.6) A	20 14 01 (8) A	1.94	-0.65	(3)	
4C30.27	14 22 51.9 (0.6) A	30 41 24 (25) B	0.69	-0.64		
4C24.31	14 23 34.1 (0.6) A	24 17 36 (8) A	1.71	-0.73	(2)	CT087
4C38.39	14 24 06.5 (1.5) A	38 01 12 (180) D	0.14	-1.55	(6)	
4C28.35	14 25 28.4 (0.6) A	28 46 59 (8) A	0.86	-0.75		
4C22.41	14 27 06.8 (0.6) A	22 01 20 (8) A	1.02	-0.55	(1)	
4C25.46	14 30 27.7 (0.6) A	25 08 52 (12) A	0.54	-0.83	(1)	
4C31.46	14 33 06.3 (0.6) A	31 53 44 (8) A	0.70	-0.90	(1)	3C301,NRA0447
4C24.32	14 35 34.1 (0.8) A	24 52 11 (9) A	0.50	-0.85	(1)	
4C28.36	14 35 58.9 (0.6) A	28 34 47 (8) A	0.91	-0.66	(3)	NRA0450
4C34.39	14 36 43.9 (0.6) A	34 03 45 (25) B	0.70	-0.76		
4C35.33	14 38 59.4 (0.7) A	35 43 35 (34) B	0.44	-0.97		
4C28.37	14 44 33.0 (0.6) A	28 09 24 (48) A	1.17	-0.47		CT088
4C21.42	14 44 34.4 (0.6) A	21 43 56 (24) B	0.61	-0.68	(1)	
4C20.34	14 46 33.0 (0.6) A	20 38 04 (8) A	0.90	-0.86	(1)	3C304,NRA0454
4C39.42	14 50 09.4 (1.4) A	39 09 53 (39) B	0.38	-0.91		
4C35.34	14 53 49.1 (0.6) A	35 21 45 (8) A	0.73	-0.70	(1)	
4C25.47	14 55 35.7 (0.6) A	25 19 38 (33) B	0.64	-0.68	(5)	
4C28.38	14 55 41.1 (2.1) A	28 44 00 (16) B	0.91	-0.65	(4)	
4C33.34	15 02 27.8 (0.6) A	33 55 08 (8) A	0.63	-0.83	(1)	
4C37.42	15 06 13.4 (0.6) A	38 01 16 (8) A	1.06	-0.62	(3)	
4C32.48	15 10 11.8 (0.6) A	32 09 22 (8) A	0.96	-0.53	(1)	
4C37.43	15 12 47.5 (0.7) A	37 01 52 (8) A	0.90	-0.81	(2)	
4C24.33	15 16 28.9 (1.3) A	24 37 35 (20) A	0.20	-1.27	(1)	
4C27.31	15 21 18.3 (1.2) A	27 15 49 (15) A	0.40	-0.92	(1)	
4C28.39	15 21 21.4 (0.6) A	28 47 06 (19) B	0.81	-0.54	(3)	
4C37.44	15 26 34.8 (0.6) A	37 48 29 (8) A	1.14	-0.75		
4C34.41	15 28 43.9 (1.9) A	34 02 46 (39) B	0.37	-1.05		
4C20.36	15 30 19.3 (0.6) A	20 16 44 (8) A	0.68	-0.66	(1)	
4C35.37	15 31 44.2 (0.6) A	35 54 41 (8) A	0.73	-0.61	(1)	
4C34.42	15 39 31.2 (0.6) A	34 20 22 (12) A	0.86	-0.70	(3)	
4C37.45	15 42 53.7 (0.7) A	37 23 09 (29) B	0.68	-0.76	(1)	
4C30.29	15 47 12.7 (0.6) A	30 56 21 (8) A	1.30	-0.80	(1)	
4C38.40	15 47 55.3 (0.6) A	38 37 27 (8) A	0.68	-0.91	(1)	
4C33.36	15 48 53.3 (0.6) A	33 29 16 (8) A	0.78	-0.84	(1)	
4C33.37	15 49 31.7 (0.8) A	33 52 34 (10) A	0.56	-0.94	(1)	
4C24.35	15 53 42.6 (0.8) A	24 15 05 (9) A	0.48	-0.88	(1)	
4C34.43	15 59 36.6 (0.6) A	34 31 50 (17) B	0.96	-0.76	(2)	
4C24.36	16 02 48.4 (0.7) A	24 03 56 (10) A	0.67	-0.65		

TABLE II. (CONTINUED)

SOURCE (1)	RIGHT ASCENSION (2)	DECLINATION (3)	FLUX (4)	S.I. (5)	NOTE (6)	ALTERNATE LISTING (7)
4C28.40	16 ^h 06 ^m 10 ^s (0.6) A	28 ^o 57'12" (10) A	0.67	-0.80		
4C33.39	16 08 10.0 (0.6) A	33 06 25 (8) A	2.11	-0.59	(2)	3C329,NRA0493
4C39.43	16 08 57.0 (0.6) A	39 04 60 (13) A	0.86	-0.66	(4)	
4C22.43	16 10 09.7 (0.6) A	22 29 57 (8) A	1.54	-0.74	(5)	3C331,NRA0495
4C39.44	16 11 58.7 (1.0) A	39 15 32 (33) B	0.52	-0.89		
4C28.41	16 14 44.8 (2.0) D	28 17 12 (13) A	0.36	-1.01		
4C21.47	16 15 05.2 (0.6) A	21 14 51 (8) A	1.99	-0.60	(3)	3C333,NRA0497
4C33.40	16 16 26.9 (0.6) A	33 55 42 (8) A	0.86	-0.60		
4C25.48	16 23 02.4 (0.6) A	25 12 08 (8) A	0.74	-0.80		
4C26.48	16 23 12.4 (0.6) A	26 57 55 (14) B	1.05	-0.58	(3)	
4C21.48	16 25 22.4 (0.6) A	21 19 05 (8) A	1.12	-0.98	(1)	
4C36.28	16 26 58.5 (0.9) A	36 19 28 (8) A	0.70	-0.79	(2)	
4C39.46	16 32 19.1 (0.6) A	39 06 10 (8) A	1.00	-0.46	(1)	
4C37.47	16 33 16.5 (0.7) A	37 28 13 (9) A	0.61	-0.72	(1)	
4C26.49	16 34 34.9 (0.6) A	26 54 12 (8) A	1.24	-0.83	(5)	3C342,NRA0510
4C39.47	16 35 17.2 (1.7) A	39 36 07 (53) A	0.12	-1.48	(6)	
4C20.40	16 38 30.5 (1.7) A	20 58 46 (18) A	0.22	-1.19	(1)	
4C38.42	16 38 48.3 (0.7) A	38 32 18 (10) A	0.62	-0.85	(1)	
4C30.30	16 40 43.3 (0.6) A	30 01 25 (8) A	0.62	-0.89	(1)	
4C37.49	16 41 20.6 (0.6) A	37 35 12 (8) A	1.49	-0.85	(1)	3C344,NRA0514
4C37.50	16 46 12.9 (0.6) A	37 59 46 (39) B	0.92	-0.94	(5)	
4C27.34	16 51 57.9 (0.6) A	27 09 38 (9) A	0.73	-0.73		
4C32.52	16 57 51.3 (0.6) A	32 39 23 (55) B	0.95	-0.60	(5)	
4C30.31	16 58 21.2 (0.9) A	30 12 48 (10) A	0.44	-0.89	(1)	
4C28.42	16 58 41.4 (0.8) A	28 37 19 (51) B	0.51	-0.77	(5)	
4C29.50	17 02 10.9 (0.6) A	29 51 06 (8) A	1.49	-0.72	(1)	CTD98
4C38.43	17 03 23.0 (0.9) A	38 44 41 (8) A	1.42	-0.80		3C350,NRA0521
4C34.45	17 07 49.1 (0.6) A	34 29 32 (11) A	0.59	-0.95	(1)	
4C24.40	17 08 29.3 (0.7) A	24 20 04 (34) B	0.48	-0.81		CTD99
4C28.43	17 11 27.3 (0.6) A	28 16 38 (8) A	0.92	-0.60	(1)	
4C29.51	17 11 35.7 (1.0) A	29 51 59 (26) B	0.57	-0.75	(4)	
4C27.35	17 12 04.9 (2.3) A	27 17 57 (26) B	0.57	-0.71	(5)	
4C34.46	17 13 45.5 (0.8) A	34 38 41 (8) A	0.52	-0.81	(1)	
4C22.45	17 17 02.8 (0.6) A	22 48 00 (8) A	1.72	-0.34	(1)	
4C24.41	17 19 57.3 (0.6) A	24 17 08 (24) B	0.73	-0.71	(1)	CTD100
4C34.47	17 21 33.1 (0.6) A	34 20 18 (15) B	1.11	-0.73	(5)	
4C38.44	17 29 00.5 (0.6) A	38 17 31 (31) B	0.75	-0.62		NRA0529
4C27.36	17 29 12.9 (1.0) A	27 30 53 (11) A	0.34	-0.96	(1)	
4C21.50	17 29 10.3 (0.7) A	21 07 00 (23) B	0.67	-0.81	(5)	
4C32.53	17 29 21.6 (0.8) A	32 35 08 (23) B	0.66	-0.68	(5)	
4C20.42	17 30 41.6 (0.6) A	20 40 25 (8) A	0.89	-0.90	(1)	3C359,NRA0531
4C24.42	17 35 33.4 (0.6) A	24 02 35 (8) A	1.76	-0.59	(1)	CTD101
4C31.48	17 37 02.5 (1.0) A	31 27 55 (8) A	0.52	-0.79		
4C31.49	17 39 07.2 (0.6) A	31 06 39 (8) A	0.86	-0.65	(1)	
4C29.52	17 40 01.0 (0.6) A	29 31 22 (33) B	0.63	-0.74	(5)	
4C39.50	17 ^h 41 ^m 07 ^s (1.5) A	39 ^o 02'05" (39) B	0.37	-0.99		
4C27.38	17 41 58.2 (0.6) A	27 54 08 (8) A	0.78	-0.63	(1)	CTD102
4C20.43	17 44 18.6 (0.6) A	20 10 02 (8) A	0.89	-0.70	(3)	
4C23.45	17 44 25.7 (0.6) A	23 43 59 (15) B	1.10	-0.67	(3)	
4C25.52	17 49 39.8 (2.0) D	25 54 44 (9) A	0.50	-0.89	(2)	
4C29.53	17 49 51.6 (0.6) A	29 50 50 (9) A	1.09	-0.74	(4)	
4C27.40	17 51 15.1 (0.6) A	27 01 25 (8) A	1.00	-0.76	(1)	CTD104
4C24.43	17 53 31.0 (0.7) A	24 30 04 (42) B	0.64	-0.68		
4C37.51	17 54 02.4 (0.9) A	37 43 05 (11) A	0.50	-1.14	(1)	3C364,NRA0539
4C39.51	17 54 21.3 (1.9) A	39 49 53 (62) B	0.23	-1.19		
4C39.52	17 56 54.5 (0.9) A	39 40 42 (180) D	0.35	-1.00		
4C21.51	17 59 40.7 (0.6) A	21 09 41 (18) A	0.88	-0.69	(3)	
4C20.44	18 03 36.2 (0.8) A	20 28 06 (20) B	0.72	-0.69	(2)	
4C26.54	18 04 51.5 (0.6) A	26 05 13 (8) A	0.99	-0.59	(3)	NRA0545
4C23.47	18 04 52.3 (0.6) A	23 32 35 (16) B	0.90	-0.69	(1)	NRA0544
4C39.54	18 05 21.8 (2.0) D	39 03 21 (36) B	0.40	-0.88	(2)	
4C32.54	18 06 50.4 (0.9) A	32 34 04 (9) A	0.42	-0.86	(1)	NRA0546
4C37.52	18 09 49.1 (0.6) A	37 12 47 (8) A	0.89	-0.77	(1)	
4C33.44	18 14 11.4 (0.7) A	33 26 21 (25) B	0.62	-0.74	(3)	
4C37.53	18 16 41.9 (1.8) A	37 01 00 (180) D	0.17	-1.35	(6)	
4C39.56	18 19 42.2 (0.6) A	39 41 17 (8) A	3.78	-0.28	(2)	
4C22.48	18 21 25.6 (0.7) A	23 00 34 (19) A	0.57	-0.85	(5)	
4C23.48	18 23 16.3 (2.6) D	23 01 39 (15) A	0.24	-1.17		
4C29.56	18 29 17.9 (0.6) A	29 04 57 (8) A	3.14	-0.25	(4)	CTD107
4C31.51	18 32 24.9 (0.6) A	31 34 01 (8) A	2.47	-0.44	(3)	
4C23.56	21 05 01.2 (1.6) C	23 20 05 (28) B	0.52	-1.01	(3)	
4C21.58	21 05 51.2 (0.7) A	21 28 10 (9) A	0.62	-0.93	(1)	NRA0646
4C23.57	21 07 46.6 (0.6) A	23 49 15 (8) A	0.59	-0.83	(1)	NRA0649
4C24.52	21 14 49.1 (0.6) A	24 46 56 (8) A	1.50	-0.57	(1)	CTD129
4C22.58	21 18 25.0 (1.8) C	22 40 57 (36) B	0.39	-0.90		
4C22.59	21 42 31.3 (0.6) A	22 36 21 (9) A	0.69	-0.62	(1)	
4C24.56	21 47 11.5 (0.6) A	24 53 29 (8) A	0.80	-0.93	(1)	
4C28.52	21 47 42.4 (2.0) C	28 58 10 (9) A	0.41	-0.87		
4C21.59	21 49 25.8 (0.6) A	21 15 57 (8) A	1.00	-0.80		
4C26.59	21 56 10.2 (2.0) D	26 38 54 (27) B	0.54	-0.79		
4C29.64	21 56 27.9 (1.0) C	29 44 46 (13) B	1.23	-0.69		CTD133
4C31.63	22 01 01.2 (0.6) A	31 31 10 (8) A	1.93	-0.29	(1)	
4C24.57	22 02 57.7 (0.8) A	24 00 05 (32) B	0.46	-0.85	(3)	
4C26.60	22 03 43.0 (1.8) C	26 27 14 (33) B	0.56	-0.72		
4C33.53	22 04 31.3 (1.6) D	33 15 45 (16) B	0.94	-0.72		
4C33.54	22 07 41.9 (0.6) A	32 59 52 (23) B	0.78	-0.65	(3)	
4C34.58	22 22 01.4 (0.6) A	34 33 34 (9) A	0.78	-0.63	(3)	
4C21.60	22 22 45.8 (0.8) C	21 15 45 (10) B	1.74	-0.46		
4C26.63	22 30 22.7 (1.7) C	26 39 54 (15) A	0.38	-0.93		
4C35.53	22 31 22.5 (0.9) C	35 45 17 (11) B	1.36	-0.70		

TABLE II. (CONTINUED)

SOURCE (1)	RIGHT ASCENSION (2)	DECLINATION (3)	FLUX (4)	S.I. (5)	NOTE (6)	ALTERNATE LISTING (7)
4C33.56	22 ^h 33 ^m 53 ^s .9 (0.6) A	33 ^o 16'32" (20) B	0.80	-0.64	(3)	
4C20.54	22 34 07.8 (0.6) A	20 17 24 (8) A	0.86	-0.65	(1)	
4C33.57	22 39 08.2 (0.6) A	33 21 37 (8) A	1.32	-0.79		
4C38.53	22 41 52.7 (0.8) A	38 33 57 (33) B	0.43	-0.94	(1)	
4C27.48	22 42 41.5 (2.0) D	27 27 19 (10) A	0.38	-0.95		
4C31.64	22 43 05.5 (1.3) C	31 36 12 (18) B	0.83	-0.65		
4C36.47	22 44 12.0 (0.9) C	36 40 43 (9) B	1.89	-0.74	(3)	
4C36.48	22 45 58.0 (1.2) C	36 26 30 (22) B	0.64	-1.09	(3)	
4C20.55	22 46 52.4 (0.7) A	20 32 41 (8) A	1.10	-0.51	(5)	
4C36.49	22 48 56.7 (1.4) C	36 27 27 (8) A	0.93	-0.61	(5)	
4C37.67	22 51 36.2 (0.6) A	37 55 02 (15) B	1.00	-0.80	(3)	
4C24.61	22 51 44.4 (0.6) A	24 29 29 (8) A	2.08	-0.13	(3)	
4C35.56	22 54 23.1 (1.0) A	35 25 43 (21) B	0.75	-0.58	(4)	
4C39.72	23 03 44.0 (0.6) A	39 11 04 (21) B	0.75	-0.74	(3)	
4C25.59	23 08 55.1 (0.6) A	25 31 31 (8) A	1.26	-0.56	(1)	
4C27.49	23 10 13.7 (2.0) D	27 30 40 (26) B	0.57	-0.73	(5)	
4C39.73	23 15 25.0 (0.6) A	39 36 14 (9) A	0.95	-0.72		
4C37.69	23 16 03.2 (0.6) A	36 59 20 (21) B	0.78	-0.79	(1)	
4C35.57	23 16 25.0 (1.4) A	35 50 45 (39) B	0.50	-0.83	(5)	
4C28.56	23 17 24.5 (0.6) A	28 11 59 (8) A	0.98	-0.52	(1)	
4C29.67	23 19 16.4 (2.0) D	29 39 21 (9) A	0.39	-1.08		
4C27.50	23 19 33.5 (0.9) C	27 16 27 (8) A	1.85	-0.20	(5)	
4C27.51	23 22 30.3 (1.3) C	27 46 52 (8) A	0.76	-0.68		
4C27.52	23 25 28.5 (0.6) A	26 59 26 (8) A	1.40	-0.70		
4C29.68	23 25 42.9 (0.6) A	29 20 45 (8) A	1.40	-0.75	(2)	
4C29.69	23 29 31.0 (0.6) A	29 39 48 (14) B	1.24	-0.83	(2)	
4C20.57	23 33 56.3 (1.9) A	20 51 26 (50) A	0.13	-1.78	(6)	
4C22.63	23 37 52.2 (0.6) A	22 04 21 (8) A	2.68	-0.40	(5)	
4C23.59	23 39 08.8 (1.7) C	23 36 11 (34) B	0.43	-0.94	(2)	
4C25.60	23 39 20.6 (1.8) C	25 54 00 (44) B	0.33	-1.25		
4C29.70	23 42 33.0 (0.6) A	29 25 37 (16) B	1.05	-0.49		
4C30.45	23 48 33.1 (0.6) A	30 02 34 (22) B	0.79	-0.67	(3)	
4C21.63	23 48 57.3 (0.7) A	21 47 42 (34) B	0.49	-0.79	(3)	
4C28.57	23 49 24.7 (1.1) C	28 03 53 (18) B	0.83	-0.53	(3)	
4C28.58	23 49 27.9 (2.0) D	28 53 56 (63) B	0.22	-1.24		
4C32.69	23 49 48.4 (0.6) A	32 47 42 (23) B	0.73	-0.85	(1)	
4C32.70	23 51 39.5 (0.6) A	32 38 05 (15) B	1.04	-0.95	(1)	
4C28.59	23 53 21.4 (0.7) A	28 19 08 (53) A	0.62	-0.69		
4C31.67	23 55 40.2 (1.9) C	31 13 47 (39) B	0.36	-0.95		
4C27.54	23 56 03.0 (0.6) A	27 37 57 (8) A	1.02	-0.75	(2)	
						CTD136
						CTD139
						3C463,NRA0713
						CTD141
						CTD142
						3C466,NRA0717
						NRA0722
						NRA0723

can only be determined through a more detailed observation program. However, since only approximately 15% of the sources observed here exhibit a visibility at either 800-ft spacing which is less than one-half of that at the 200-ft spacing, the phase error due to resolution is assumed to be of minor importance. The final estimated error in position quoted in Table II is a worst-case combination of the instrumental error and confusion.

IV. SPECTRA OF THE 4C SOURCES

The spectral index α for each source has been calculated using the 178 MHz flux densities quoted in the 4C catalogue and the 1417 MHz flux densities found at the Owens Valley Observatory from

$$S(\nu_2) = S(\nu_1)(\nu_2/\nu_1)^\alpha,$$

where $\nu_1 = 178$ MHz, $\nu_2 = 1417$ MHz, and $S(\nu)$ is the flux density observed at frequency ν . Figure 1 is a histogram of the spectral indices of 300 sources which were observed at all three spacings at 1417 MHz and whose declinations as determined by the two *NS* spacings did not differ by more than $30''$, indicating the absence of large-scale structure. The mean spectral index is $\bar{\alpha} = -0.79 \pm 0.02$, and the standard deviation is $\sigma = 0.19$. The posing of more stringent conditions (for example, requiring that the three flux densities observed at the different antenna spacings agree to within 0.15 f.u.) does not alter these results. No dependence of $\bar{\alpha}$ on flux density at 178 MHz is apparent. These results are in close agreement with the findings of Long, Smith, Stewart, and Williams (1966) and of Williams and Collins (1967).

V. DESCRIPTION OF TABLE II

The final results of the observations appear in Table II, which is arranged as follows:

Column 1. The name of the source as listed in the 4C catalogue. The sources are arranged in order of increasing right ascension.

Column 2. The right ascension in hours, minutes, and seconds of time (epoch 1950.0), followed by the estimated error in seconds of time and the spacing which was used to determine the position. $A = 800$ ft *EW*, $C = 400$ ft *EW*, D is the position originally quoted in the 4C catalogue.

Column 3. The declination in degrees, minutes, and second of arc (epoch 1950.0), followed by the estimated error in seconds of arc and the spacing which was used to determine the position. $A = 800$ ft *NS*, $B = 200$ ft *NS*, D is the position originally quoted in the 4C catalogue.

Column 4. The flux density at 1417 MHz. Usually this is the value found at the 200-ft *NS* spacing. In

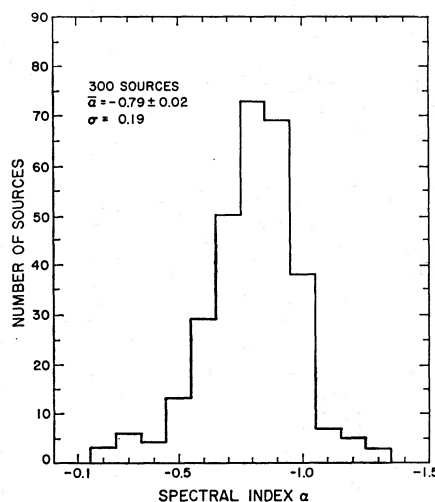


FIG. 1. Histogram of spectral indices for 300 selected sources.

some cases, however, the flux density observed at one of the longer spacings is significantly greater and is quoted here. The error in this value is approximately 0.1 f.u.

Column 5. The spectral index α determined from the 178 MHz flux density quoted by Cambridge and the 1417 MHz flux density appearing here.

Column 6. Reference to the following notes: (1) Unresolved at 800-ft spacings. The 1417 MHz flux densities determined at the three spacings must agree to within 0.2 f.u. (2) Partially resolved at the 800-ft *EW* spacing. The flux density observed at this spacing is lower than that observed at the 200-ft *NS* spacing by at least 0.3 f.u. (3) Partially resolved at the 800-ft *NS* spacing. The flux density observed at this spacing is less than that observed at the 200-ft *NS* spacing by at least 0.3 f.u. (4) Partially resolved at both of the 800-ft spacings. (5) The positions determined from the two *NS* spacings disagree by more than $60''$ and/or the flux density at one or both 800-ft spacings is at least 0.3 f.u. greater than that of the 200-ft *NS* spacing. These discrepancies are probably due to large-scale structure or confusion. (6) Probably undetected; the flux density at all spacings is less than 0.2 f.u.

Column 7. The name of the source as it appears in the 3C, Parkes, or NRAO catalogues.

At this time the optical fields of these positions are being studied and the identifications will appear in a forthcoming paper.

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