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Positions of 352 Small-Diameter Radio Sources

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Positions, 1425-MHz flux densities, and diameters or diameter limits are given for 352 small-diameter radio sources. The positions have estimated rms errors of about 2.5 sec of arc. The majority of the sources have angular diameters of less than 30 sec of arc in both the east–west and north–south directions.

I. INTRODUCTION

In order to extend the survey of brightness distribution of discrete radio sources at 21-cm wavelength (Fomalont 1967, 1968), observations have been made with the interferometer at the Owens Valley Radio Observatory using its north–south baseline. The sources observed are those which were studied earlier by Fomalont using the east–west baseline. The object is to obtain the approximate two-dimensional structure of a large number of sources by synthesizing orthogonal fan beam scans. However, a majority of the sources are unresolved, or only slightly resolved, at the maximum resolution of the instrument in both directions. The observations of these small-diameter sources yield the position of the centroid of the source, its flux density, and at most a measure of the second moment of the radio brightness distribution. The accuracy of the position measurements is typically a few seconds of arc. Because these unresolved sources will contribute little to an examination of radio source structure, the position and diameter information are published separately in the present paper. The observations of the resolved sources will be presented in a later paper.

II. OBSERVATIONS AND CALIBRATIONS

Nearly all of the observations with an east–west baseline were carried out in 1965 and published elsewhere (Fomalont 1967, 1968). The observing list of about 550 sources included all objects contained in catalogues published before 1965 having a 21-cm flux density (either measured or extrapolated) of 2 flux units (1 f. u. $=10^{-26}$ W m^{-2} Hz^{-1}) or more and declination north of $-50°$. The completeness of the source list varies from 50% to 90% depending on the region of sky.

The complete list of sources was observed with east–west antenna spacings of 289 and 2312 wavelengths. Sources which had the same apparent intensities and positions at these two spacings were presumed to be unresolved and were, in general, not observed at intermediate spacings. The diameter limit for these sources is given as the diameter (full-width at half-intensity) of the largest simple Gaussian source compatible with the large spacing observation. Thus a source with a visibility amplitude of 0.9 ± 0.1 at a spacing of 2312λ would have a diameter of 21 arc sec or less.

Other sources were observed at a number of east–west spacings and were found to have a smooth decrease of visibility amplitude and no apparent change of source position with increasing antenna spacing. For these sources, an east–west diameter is quoted which is the diameter of a simple Gaussian having the same second moment as the source brightness distribution (Moffet 1962). It is known that many sources are composed of two nearly equal emission regions, and a two-component model might be more appropriate than a simple Gaussian. If desired, the quoted diameters may be converted to a separation of an equal-intensity point double by multiplying by 0.85.

All of these unresolved or slightly resolved sources were observed during 1966 at a north–south antenna separation of 2312λ in order to determine their declinations. Since the effective fringe spacing is only $89'' \times \sec(\delta-\phi)$, where $\phi=37\overset{\circ}{.}25$, the latitude of the observatory, declination ambiguities of plus or minus one or more fringes were likely. These were generally resolved by comparison with other published declinations, mainly from the Parkes Catalogues (Shimmins, Clarke, and Ekers 1966; Bolton, Gardner, and Mackey 1964; Day, Shimmins, Ekers, and Cole 1966), the NRAO Catalogue (Pauliny-Toth, Wade, and Heeschen 1966), the position measurements of Adgie and Gent (1966), or previous measurements made with the Owens Valley Interferometer (Read 1963; Wyndham and Read 1965; Fomalont, Wyndham, and Bartlett 1967).

The observations were recorded in digital form and were reduced to apparent amplitude and phase by means of a digital computer. The raw amplitudes and phases were then corrected for instrumental gain and phase drifts using the calibration program described by Fomalont, Wyndham, and Bartlett (1967). A group of 70 calibrator sources with small diameters and accurately known positions (either from measurement of the optical counterpart or from accurately measured radio positions) were used as standards for this program. These calibrators are designated with a C, C1, or C2 in column 7 of Table I. There are a sufficient number of these that the calibration is over-determined, and an error in the assumed position of any calibrator would be apparent (as indeed several were).

The final error in the position is determined by the residual uncertainty in this calibration procedure,

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TABLE I. Positions and diameter limits.

Source designation (1)		Flux density (2)	(1950.0) R. A. (h m s s) (3)	Dec. (° ′ ″ ″) (4)	E–W diameter (arc sec) (5)	N–S diameter (arc sec) (6)	Comments (7)
P0017-00		2.15 ± 0.16	00 00 48.34 ± 0.11	-17 43 51.0 ± 3.5	<15	<18	
3C2	P0003-00	3.83 ± 0.06	00 03 48.82 ± 0.07	-00 21 06.5 ± 1.0	<15	<21	C
P0008-42		4.45 ± 0.17	00 08 21.81 ± 0.18	-42 10	<15		
3C5	P0010+00	1.38 ± 0.08	00 10 37.01 ± 0.31	00 35 01.3 ± 2.2	<18	<30	
3C6.1		3.39 ± 0.09	00 13 35.6 ± 1.3	79 00 11.9 ± 2.0	<15	<25	
P0016-12		2.25 ± 0.12	00 16 18.72 ± 0.10	-12 59 15.3 ± 2.5	<21	<25	
3C9	P0017+15	2.18 ± 0.06	00 17 49.85 ± 0.18	15 24 15.6 ± 1.6	<15	<18	C
NRAO20	P0018-09	0.60 ± 0.10	00 18 17.35 ± 0.65	-09 14 15 ±10	<18	<50	
P0019-00		3.15 ± 0.15	00 19 51.88 ± 0.11	-00 01 46.2 ± 2.5	<21	<21	
P0021-29	M00-2/9	2.88 ± 0.08	00 22 00.46 ± 0.20	-29 45 31.0 ± 4.5	<15	<50	C
P0023-26	M00-2/10	8.75 ± 0.25	00 23 19.07 ± 0.09	-26 18 51.4 ± 3.6	<15	<35	
3C11.1		2.88 ± 0.15	00 26 54.2 ± 0.7	63 42 08.5 ± 1.7	<25	<18	CONFUSED BY 3C10
3C12	P0030+19	1.97 ± 0.06	00 30 01.24 ± 0.19	19 37 19.4 ± 1.6	<15	<15	
P0032-20	M00-2/16	1.93 ± 0.07	00 32 38.92 ± 0.21	-20 20 31.3 ± 2.8	<15	<30	
3C14	P0033+18	2.00 ± 0.06	00 33 29.37 ± 0.14	18 21 28.1 ± 1.8	17 ± 5	20 ± 5	
3C15	P0034-01	4.13 ± 0.12	00 34 30.58 ± 0.18	-01 26	<15		
3C17	P0035-02	6.17 ± 0.11	00 35 47.13 ± 0.13	-02 24	18 ± 5		
3C19		3.16 ± 0.11	00 38 14.03 ± 0.23	32 53 42.5 ± 1.5	<15	<15	
3C18	P0038+09	4.35 ± 0.11	00 38 14.57 ± 0.12	09 46 56.1 ± 4.1	17 ± 5	41 ± 5	
P0039-44	M00-4/10	3.55 ± 0.12	00 39 47.28 ± 0.30	-44 31	<15		
3C20		11.20 ± 0.40	00 40 19.6 ± 0.4	51 47 08.9 ± 1.5	42 ± 3	<18	1
P0042-35	M00-3/15	2.57 ± 0.09	00 42 17.09 ± 0.17	-35 47	<15		
3C22		2.34 ± 0.07	00 48 04.88 ± 0.25	50 55 45.0 ± 1.5	25 ± 3	<15	
3C23	P0049+17	1.25 ± 0.08	00 49 08.72 ± 0.29	17 30 53.1 ± 3.5	<18	<35	
P0049-43	M00-4/14	2.74 ± 0.07	00 49 55.24 ± 0.18	-43 23	21 ± 5		
3C26	P0051-03	2.20 ± 0.09	00 51 35.67 ± 0.34	-03 50 13.5 ± 3.0	<15	<40	
3C27		7.16 ± 0.15	00 52 44.9 ± 0.9	68 06 06.2 ± 2.0	31 ± 3	22 ± 5	
3C28		1.44 ± 0.15	00 53 08.70 ± 0.20	26 08 21.4 ± 2.8	<25	<30	2
P0056-00		2.65 ± 0.15	00 56 32.37 ± 0.10	-00 09 22.6 ± 2.5	<15	<21	
P0114-21	M01-2/6	3.97 ± 0.21	01 14 26.11 ± 0.14	-21 07 53.9 ± 2.9	<15	<30	
P0116+08	M01+0/2	2.35 ± 0.15	01 16 24.24 ± 0.20	08 14 09.9 ± 1.7	<15	<18	
3C38	P0117-15	4.95 ± 0.13	01 17 59.70 ± 0.18	-15 35 59.6 ± 4.0	<15	38 ±10	
3C41		3.51 ± 0.14	01 23 54.82 ± 0.10	32 57 35.6 ± 1.5	<15	<15	
P0125-14	M01-1/11	2.45 ± 0.10	01 25 03.66 ± 0.68	-14 28 26.0 ± 3.0	<15	<30	
3C42		2.79 ± 0.09	01 25 42.89 ± 0.13	28 47 29.3 ± 1.8	22 ± 3	23 ± 5	
3C43		3.04 ± 0.15	01 27 15.09 ± 0.16	23 22 52.8 ± 1.5	<15	<18	C
3C45	P0132+07	2.24 ± 0.10	01 32 37.51 ± 0.20	07 55 46.4 ± 2.7	<15	<18	
3C48		15.63 ± 0.19	01 34 49.81 ± 0.08	32 54 20.7 ± 1.5	<15	<15	C
3C49	P0138+13	2.79 ± 0.08	01 38 28.50 ± 0.13	13 38 20.9 ± 1.6	<15	<18	C
3C52		4.02 ± 0.09	01 45 15.33 ± 0.25	53 17 45 ± 6	25 ± 3	55 ±10	
P0155-10		2.05 ± 0.08	01 55 13.10 ± 0.15	-10 58 16.6 ± 2.5	<15	<25	
P0157-31	M01-3/15	3.70 ± 0.08	01 57 58.43 ± 0.17	-31 07 58.4 ± 4.0	<15	<40	C
3C57	P0159-11	3.24 ± 0.09	01 59 30.32 ± 0.25	-11 46 58.4 ± 2.3	<15	<25	
P0201-44	M02-4/1	2.62 ± 0.08	02 01 40.25 ± 0.37	-44 04	<15		
P0202+14	NRAO91	3.70 ± 0.15	02 02 07.31 ± 0.15	14 59 51.1 ± 2.2	<15	<30	
P0207-11	M02-1/3	1.58 ± 0.12	02 07 40.19 ± 0.25	-11 12 01 ± 8	<18	<35	
3C63	P0218-02	3.34 ± 0.06	02 18 21.90 ± 0.12	-02 10 35.5 ± 3.0	<15	<40	C
NRAO100		1.00 ± 0.10	02 18 43.0 ± 1.0	39 41 50 ±15	<30	75 ±20	CONFUSED BY 3C65
P0220-42		1.04 ± 0.06	02 20 19.19 ± 0.26	-42 14	<15		
3C65	NRAO103	3.10 ± 0.30	02 20 36.78 ± 0.30	39 47 16 ± 4	<15	<25	CONFUSED BY NRAO100
3C67		3.00 ± 0.10	02 21 17.97 ± 0.21	27 36 36.2 ± 1.5	<15	<15	
P0222-23	M02-2/7	2.05 ± 0.10	02 22 45.85 ± 0.40	-23 26 18.4 ± 3.1	<15	<30	C,1
3C68.1		2.44 ± 0.10	02 29 27.04 ± 0.30	34 10 56.0 ± 1.8	<15	<25	
3C69		3.57 ± 0.06	02 34 18.13 ± 0.45	58 58 54 ± 5	23 ± 3	52 ± 5	
4C28.07	CTD20	1.55 ± 0.15	02 34 55.88 ± 0.27	28 32 10.0 ± 3.0	<15	<24	2
P0235-19	M02-1/10	4.73 ± 0.11	02 35 25.16 ± 0.22	-19 45 30.2 ± 2.7	32 ± 3	<35	
3C71	NGC1068	4.90 ± 0.06	02 40 07.07 ± 0.08	-00 13 31.5 ± 1.9	<15	<21	C
P0310-15		2.06 ± 0.12	03 10 25.78 ± 0.15	-15 01 03.9 ± 2.5	<25	<25	
P0312+10		1.60 ± 0.13	03 12 38.27 ± 0.18	10 01 39.5 ± 3.0	23 ± 3	30 ±10	
CTA21	P0316+16	8.03 ± 0.20	03 16 09.10 ± 0.27	16 17 40.8 ± 1.6	<15	<18	C
P0319+12		1.94 ± 0.10	03 19 08.00 ± 0.42	12 10 32.6 ± 1.7	<15	<18	
P0319-29		2.05 ± 0.13	03 19 24.29 ± 0.26	-29 51 38.0 ± 4.2	<15	<40	
P0320+05		2.85 ± 0.13	03 20 41.49 ± 0.14	05 23 34.5 ± 1.8	<15	<18	
3C90	P0333+12	2.21 ± 0.13	03 33 40.57 ± 0.20	12 52 40.1 ± 1.7	<15	<18	
3C91		3.40 ± 0.07	03 34 03.72 ± 0.18	50 36 03.5 ± 1.5	<15	<18	C
CTA26	P0336-01	2.0	03 36 58.90 ± 0.15	-01 56 17.7 ± 1.9	<18	<21	VARIABLE
3C93	P0340+04	2.86 ± 0.07	03 40 51.60 ± 0.12	04 48 24.4 ± 1.8	16 ± 5	19 ± 5	C
3C93.1		2.15 ± 0.11	03 45 35.52 ± 0.34	33 44 05.8 ± 1.5	<15	<15	
3C94	P0350-07	2.7	03 50 05.41 ± 0.08	-07 19 57.2 ± 2.1	<15	<21	POSSIBLE VARIABLE
P0357-16	M03-1/11	2.07 ± 0.07	03 57 59.66 ± 0.16	-16 18 36.9 ± 3.0	20 ± 3	<25	

amounting to about ±0.02 fringe in phase, and for the weaker sources by a random error due to confusion. The rms confusion amplitude was found to be 0.12 f. u., resulting in a phase error of about 0.020 fringe for a one flux unit source. For strong sources, the rms error in position is taken as ±1″.5 in right ascension and

TABLE I (*continued*)

Source designation (1)		Flux density (2)	(1950.0) R. A. (h m s s) (3)	Dec. (° ′ ″ ″) (4)	E–W diameter (arc sec) (5)	N–S diameter (arc sec) (6)	Comments (7)
P0403-13		4.00 ± 0.15	04 03 13.98 ± 0.10	-13 16 23.4 ± 2.5	<15	<25	
P0405-12	M04-1/2	3.33 ± 0.15	04 05 27.42 ± 0.33	-12 19 30.3 ± 2.3	<15	<35	
4C74.08		2.80 ± 0.15	04 07 05.0 ± 1.4	74 43 23.2 ± 2.1	<15	<21	
P0413-21	M04-2/4	2.58 ± 0.10	04 13 53.75 ± 0.15	-21 03 55.6 ± 2.9	<15	<30	
P0427-36	M04-3/6	2.12 ± 0.10	04 27 52.11 ± 0.18	-36 38	<15		
3C119		8.55 ± 0.16	04 29 07.86 ± 0.16	41 32 09.5 ± 1.5	<15	<15	C
3C120	P0430+05	3.4	04 30 31.50 ± 0.15	05 14 59.0 ± 1.2	<15	<15	VARIABLE,1
3C123		47.51 ± 1.54	04 33 55.24 ± 0.15	29 34 14.0 ± 1.2	<15	27 ± 5	
P0438-43	M04-4/9	6.46 ± 0.17	04 38 43.80 ± 0.25	-43 39	<15		C
3C125		2.02 ± 0.08	04 42 51.31 ± 0.61	39 39 40.6 ± 2.6	<15	<18	
P0445-22		2.05 ± 0.06	04 45 29.36 ± 0.17	-22 09	<15		
3C131		2.84 ± 0.09	04 50 10.55 ± 0.18	31 24 31.7 ± 2.2	<15	<30	
P0451-28		2.44 ± 0.12	04 51 15.32 ± 0.45	-28 12 33.2 ± 3.6	<15	<40	
P0453-20	M04-2/22	4.45 ± 0.15	04 53 14.16 ± 0.10	-20 39 00.9 ± 2.8	<15	<30	C
P0453-30	M04-3/14	3.31 ± 0.15	04 53 17.98 ± 0.34	-30 11 35 ± 6	<15	65 ±15	
3C132		3.28 ± 0.09	04 53 42.42 ± 0.12	22 44 42.2 ± 1.6	<15	<21	1,C1
P0454-46	M04-4/12	2.22 ± 0.10	04 54 24.64 ± 0.48	-46 21	<15		
3C133		5.51 ± 0.13	04 59 54.23 ± 0.20	25 12 11.5 ± 1.5	<15	<15	C
3C137		2.01 ± 0.06	05 15 37.97 ± 0.30	50 51 30.0 ± 3.0	42 ± 3	20 ± 5	
3C138	P0518+16	9.64 ± 0.20	05 18 16.46 ± 0.08	16 35 26.2 ± 1.6	<15	<18	C
P0519-20	M05-2/4	1.89 ± 0.08	05 19 30.17 ± 0.16	-20 50 29.1 ± 2.9	<15	<30	
P0521-36	M05-3/6	16.25 ± 0.27	05 21 13.21 ± 0.19	-36 30 19 ± 5	14 ± 3	<50	C1
3C141		2.10 ± 0.20	05 23 26.00 ± 0.30	32 47 27.6 ± 3.0	<25	<35	2
3C142.1	P0528+06	3.22 ± 0.06	05 28 48.00 ± 0.21	06 28 16.4 ± 3.1	31 ± 3	31 ± 5	
P0530+04		1.97 ± 0.05	05 30 25.41 ± 0.26	04 03 50.9 ± 1.8	<15	<18	
3C147		22.24 ± 0.35	05 38 43.58 ± 0.30	49 49 42.6 ± 1.5	<15	<15	C
P0547-40	M05-4/10	2.55 ± 0.07	05 47 47.79 ± 0.18	-40 52	28 ± 3		
3C152		1.74 ± 0.08	06 01 30.02 ± 0.30	20 21 35.0 ± 1.6	<15	<18	
P0602-31	M06-3/2	2.93 ± 0.11	06 02 22.57 ± 0.20	-31 55 44 ± 5	<15	52 ±15	
P0604-20	M06-2/2	2.80 ± 0.20	06 04 24.70 ± 0.25	-20 21 38.1 ± 2.5	<25	<35	2
3C153		4.15 ± 0.10	06 05 44.56 ± 0.15	48 04 49.5 ± 1.5	<15	<15	C
P0605-06		4.30 ± 0.25	06 05	-06 22 32.5 ± 3.0		<40	
P0605-08		2.53 ± 0.12	06 05	-08 34 22.9 ± 3.5		<40	
P0614-34	M06-3/6	2.95 ± 0.10	06 14 48.97 ± 0.26	-34 55 13.9 ± 4.7	<15	<50	
3C158	NRAO232	2.17 ± 0.09	06 18 50.10 ± 0.13	14 33 40.7 ± 1.6	<15	<18	
3C159		1.95 ± 0.15	06 21 34.30 ± 0.30	40 05 32.2 ± 2.7	27 ±10	27 ± 5	CONFUSED BY 4C40.16
4C40.16		1.00 ± 0.20	06 21 49.0 ± 2.0	40 22 48 ±10	<30	<30	CONFUSED BY 3C159
NRAO234		2.58 ± 0.11	06 22 54.71 ± 0.19	14 42 05.0 ± 1.6	<15	<18	
3C161	P0624-05	19.25 ± 0.22	06 24 43.05 ± 0.16	-05 51 13.9 ± 2.0	<15	20 ±10	C1
3C166		2.63 ± 0.05	06 42 24.66 ± 0.16	21 24 54.5 ± 3.4	<15	34 ± 5	C1
P0642-43	M06-4/12	1.81 ± 0.08	06 42 54.38 ± 0.36	-43 41	56 ± 3		
P0646-39	M06-3/12	2.63 ± 0.11	06 46 32.60 ± 0.14	-39 53 47 ±10	27 ± 3	90 ±30	
3C171		3.89 ± 0.09	06 51 10.81 ± 0.20	54 12 50.0 ± 1.6	<15	<18	C
3C173.1		2.53 ± 0.09	07 02 47.4 ± 0.7	74 54 12 ±10	<15	53 ±10	
P0704-23	M07-2/1	3.56 ± 0.08	07 04 27.31 ± 0.20	-23 06 58.6 ± 3.0	<15	<30	C
P0709-20	M07-2/3	2.08 ± 0.16	07 09 37.43 ± 0.30	-20 38 15 ± 5	<15	70 ±15	
3C175	P0710+11	2.61 ± 0.10	07 10 15.60 ± 0.35	11 51 20.5 ± 2.3	48 ± 3	23 ± 5	
3C175.1	P0711+14	1.96 ± 0.12	07 11 14.48 ± 0.40	14 41 32.7 ± 1.6	<15	<18	
P0715-25	M07-2/4	4.10 ± 0.10	07 15 13.46 ± 0.13	-24 59 26.2 ± 4.0	<15	<35	
3C179		2.14 ± 0.09	07 23 04.9 ± 0.8	67 54 53.4 ± 1.7	16 ± 3	<18	
3C181	P0725+14	2.37 ± 0.05	07 25 20.31 ± 0.18	14 43 46.4 ± 1.6	<15	<18	C
P0727-36		1.81 ± 0.06	07 27 18.04 ± 0.18	-36 23 04 ±20	20 ± 5	<75	
3C184		2.49 ± 0.10	07 33 59.1 ± 1.8	70 30 05.0 ± 1.8	<15	<18	
P0735+17		2.53 ± 0.12	07 35 14.13 ± 0.22	17 49 11.0 ± 2.2	<15	<30	VARIABLE
P0736+01		2.47 ± 0.07	07 36 42.56 ± 0.21	01 43 59.8 ± 1.9	<15	<21	VARIABLE,C2
3C186		1.32 ± 0.05	07 40 56.86 ± 0.28	38 00 32.4 ± 1.5	<15	<15	C
P0745-19	M07-1/17	2.34 ± 0.11	07 45 18.10 ± 0.26	-19 10 17.4 ± 3.5	<15	<30	
P0748-45	M07-4/12	1.80 ± 0.06	07 48 03.74 ± 0.27	-45 28	<15		
P0748-44	M07-4/13	2.38 ± 0.08	07 48 06.78 ± 0.14	-44 05	<15		
3C190	P0758+14	2.61 ± 0.11	07 58 45.13 ± 0.14	14 23 02.2 ± 1.6	<15	<21	
3C194		2.06 ± 0.06	08 06 37.98 ± 0.27	42 36 55.8 ± 1.5	<15	<21	
3C196		14.23 ± 0.33	08 09 59.43 ± 0.13	48 22 07.0 ± 1.5	<15	<15	C
P0812+02	M08+0/2	1.95 ± 0.15	08 12 47.20 ± 0.20	02 04 13.4 ± 4.5	<18	39 ±10	2
3C196.1	P0812-02	1.95 ± 0.05	08 12 57.15 ± 0.13	-02 59 16.0 ± 1.9	<15	<21	C1
P0825-20	M08-2/4	3.69 ± 0.11	08 25 03.75 ± 0.22	-20 16 29.6 ± 2.8	<15	<30	C2
4C37.24		2.45 ± 0.13	08 27 55.09 ± 0.18	37 52 16.9 ± 2.0	<15	<21	
3C202	P0831+17.2	1.78 ± 0.08	08 31 58.52 ± 0.23	17 11 10.6 ± 1.6	<15	<25	
3C205		2.43 ± 0.17	08 35 09.6 ± 1.0	58 04 48.0 ± 1.8	<15	21 ± 5	
3C207	P0838+13	2.59 ± 0.08	08 38 01.80 ± 0.18	13 23 05.8 ± 1.6	<15	<18	C
3C208	P0850+14	2.26 ± 0.11	08 50 23.44 ± 0.50	14 04 16.1 ± 1.6	<18	<25	CONFUSED BY 3C208.1

$\pm 1''.5$ sec $(\delta-\phi)$ in declination. No declinations are given for sources south of $-40°$ because of the extreme foreshortening of the baseline at those declinations.

Flux densities at the observed frequency of 1425 MHz are given. Only one mode of linear polarization was accepted with the electric vector aligned in position

TABLE I (*continued*)

Source designation (1)		Flux density (2)	(1950.0) R. A. (h m s s) (3)	Dec. (° ′ ″ ″) (4)	E–W diameter (arc sec) (5)	N–S diameter (arc sec) (6)	Comments (7)
P0850-20	M08-2/16	2.16 ± 0.09	08 50 44.96 ± 0.31	-20 36 05.4 ± 2.9	<15	<30	
P0851-14	M08-1/16	1.82 ± 0.09	08 51 28.04 ± 0.32	-14 16 27.6 ± 3.5	<15	<25	
3C208.1	P0851+14	2.21 ± 0.15	08 51 54.0 ± 0.50	14 17 16.0 ± 2.5	<18	<25	CONFUSED BY 3Q208
3C212	P0855+14	2.65 ± C.08	08 55 55.74 ± 0.13	14 21 23.8 ± 3.0	<15	30 ± 5	C
3C213.1		2.09 ± 0.11	08 58 05.16 ± 0.38	29 13 33.2 ± 2.1	<15	25 ± 5	
P0859-25	M08-2/19	5.87 ± 0.12	08 59 36.79 ± 0.25	-25 43 30.0 ± 3.5	36 ± 3	<35	
3C215	P0903+16	1.66 ± 0.04	09 03 44.23 ± 0.15	16 58 17.3 ± 3.0	21 ± 3	40 ± 5	C1
3C217		2.22 ± 0.08	09 05 41.14 ± 0.18	38 00 29.6 ± 2.0	16 ± 3	<15	
3C216		3.99 ± 0.08	09 06 17.34 ± 0.17	43 05 59.2 ± 1.5	<15	<15	C
P0920-39	M09-3/4	2.53 ± 0.12	09 20 48.76 ± 0.26	-39 46 45 ± 6	16 ± 3	<90	
3C220.1		2.20 ± 0.07	09 26 32.0 ± 1.0	79 19 44.0 ± 2.0	25 ± 3	<21	
3C220.2		1.87 ± 0.11	09 27 30.00 ± 0.30	36 14 38.7 ± 1.5	<15	<18	
3C220.3		2.83 ± 0.08	09 31 11.6 ± 2.0	83 28 54.3 ± 2.1	<15	<25	
3C226	P0941+10	2.33 ± 0.15	09 41 36.20 ± 0.15	10 00 08.0 ± 3.0	<21	33 ± 5	2
3C228	P0947+14	3.69 ± 0.12	09 47 27.65 ± 0.15	14 34 00.0 ± 3.0	<15	54 ± 5	
3C230	NRAO339	3.20 ± 0.20	09 49 25.20 ± 0.30	00 12 34.8 ± 2.5	<18	<21	CONFUSED BY NRAO340
NRAO340		0.70 ± 0.15	09 50 12.0 ± 2.0	00 15	<75		
3C231	M82	8.11 ± 0.16	09 51 43.0 ± 0.7	69 54 58.9 ± 2.7	35 ± 3	27 ± 5	
3C236		3.35 ± 0.10	10 03 05.50 ± 0.15	35 08 48.8 ± 1.5	<15	<15	1
3C237	P1005+07	6.45 ± C.14	10 05 22.06 ± 0.10	07 44 58.4 ± 2.0	<15	<18	C1
3C238	P1008+06	2.96 ± 0.12	10 08 23.11 ± 0.27	06 39 27.6 ± 1.9	<15	<25	C1
P1015-31	M10-3/5	3.83 ± 0.13	10 15 53.65 ± 0.24	-31 29 14.3 ± 4.0	<15	<50	
P1018-42	M10-4/4	4.20 ± 0.15	10 17 56.74 ± 0.19	-42 36	<15		
3C241		1.74 ± C.C6	10 19 09.49 ± 0.17	22 14 41.2 ± 1.6	<15	<21	
3C244.1		3.81 ± 0.09	10 30 19.50 ± 0.40	58 30 06 ± 4	<15	67 ±15	
P1039+02	M10+0/7	2.86 ± 0.11	10 39 04.10 ± 0.27	02 58 16.3 ± 1.8	<15	<21	
3C245	P1040+12	3.17 ± 0.07	10 40 06.07 ± 0.12	12 19 15.2 ± 1.7	<15	<18	C
P1055+01	M10+0/10	3.88 ± 0.10	10 55 55.39 ± 0.15	01 50 05.4 ± 2.5	<15	<30	VARIABLE
3C249	P1059-01	2.80 ± 0.15	10 59 30.65 ± 0.20	-01 00 08.4 ± 3.3	18 ± 3	<40	
3C249.1		2.36 ± 0.09	11 00 26.5 ± 1.2	77 15 09.6 ± 2.0	25 ± 5	<25	
P1103-20	M11-2/2	2.40 ± 0.15	11 03 54.65 ± 0.18	-20 52 46.0 ± 2.8	<15	<30	
3C254		3.14 ± 0.08	11 11 53.23 ± 0.10	40 53 41.4 ± 1.5	14 ± 3	<15	C
P1116-46		2.32 ± 0.10	11 16 06.69 ± 0.23	-46 18	17 ± 5		
P1116+12		2.42 ± 0.04	11 16 20.76 ± 0.14	12 51 08.7 ± 1.7	<15	<18	C
P1117+14		2.52 ± 0.08	11 17 51.05 ± 0.13	14 37 21.9 ± 1.6	<15	<21	
P1127-14		6	11 27 35.80 ± 0.08	-14 32 58 ± 4	<15	<30	POSSIBLE VARIABLE
P1136-13	M11-1/8	4.5	11 36 38.37 ± 0.18	-13 34 09.3 ± 2.3	25 ± 5	<30	POSSIBLE VARIABLE
P1136-32	M11-3/8	2.30 ± 0.08	11 36 47.76 ± 0.33	-32 06 10 ±10	18 ± 5	67 ±15	
P1138+01	NRAO382	2.72 ± 0.12	11 38 34.40 ± 0.22	01 30 57.2 ± 1.9	<15	<21	
P1139-28	M11-2/8	2.57 ± 0.10	11 39 04.21 ± 0.21	-28 34 16.2 ± 3.6	<15	<40	
3C263.1		3.11 ± 0.25	11 40 49.20 ± 0.10	22 23 37.0 ± 1.6	<18	<18	2
P1143-48	M11-4/6	2.69 ± 0.17	11 43 02.91 ± 0.56	-48 19	<15		
P1151-34	M11-3/4	6.45 ± 0.22	11 51 49.83 ± 0.26	-34 48 50.8 ± 4.7	<15	<50	C2
3C268.1		6.68 ± 0.16	11 57 45.5 ± 0.8	73 17 27.5 ± 1.8	27 ± 3	<21	
P1201-C4.1	M12-0/1	2.51 ± 0.08	12 01 28.52 ± 0.15	-04 06 00.2 ± 2.5	22 ± 3	23 ±10	
3C268.3		3.82 ± 0.20	12 03 54.0 ± 0.7	64 30 19.9 ± 1.7	<15	<18	
P1215-45	M12-4/3	4.62 ± 0.23	12 15 28.31 ± 0.22	-45 45	<15		
3C270.1		2.64 ± 0.08	12 18 03.99 ± 0.36	33 59 49.2 ± 1.5	<15	<18	C
P1221-42		2.45 ± 0.09	12 21 04.08 ± 0.42	-42 19	<15		C1
3C273	P1226+02	40	12 26 32.94 ± 0.10	02 19 39.2 ± 1.8	<15	<21	VARIABLE
P1232-41	M12-4/4	1.89 ± 0.07	12 32 59.65 ± 0.24	-41 37	<15		
3C275	P1239-04	3.66 ± 0.10	12 39 44.80 ± 0.24	-04 29 52.8 ± 2.0	<15	<21	1
3C275.1	P1241+16	2.94 ± 0.13	12 41 27.54 ± 0.24	16 39 17.2 ± 1.6	<15	<21	
P1245-19		5.39 ± 0.18	12 45 45.26 ± 0.53	-19 42 55.6 ± 2.7	<15	<75	C2
P1245-41	NGC4696	4.26 ± 0.15	12 46 03.86 ± 0.26	-41 02	23 ± 5		
3C277.1		2.51 ± 0.C7	12 50 15.05 ± 0.27	56 50 36.6 ± 2.9	<15	29 ± 5	C
COM A	3C277.3	3.22 ± 0.12	12 51 46.02 ± 0.17	27 53 47.5 ± 2.5	23 ± 3	34 ± 5	
3C279	P1253-05	11	12 53 35.89 ± 0.08	-05 31 07.5 ± 2.5	<15	<21	VARIABLE,C
3C280		5.19 ± C.18	12 54 41.25 ± 0.18	47 36 31.8 ± 1.5	<15	<15	
P1306-09	M13-0/2	4.22 ± 0.21	13 06 02.03 ± 0.31	-09 34 31.5 ± 2.2	<15	<25	
3C282		1.93 ± 0.09	13 06 31.3 ± 0.5	66 00 10.5 ± 1.8	<15	<25	
3C283	P1309-22	5.41 ± 0.24	13 08 57.37 ± 0.23	-22 00 39 ± 6	<15	<35	
P1318+11		2.23 ± 0.06	13 18 49.67 ± 0.22	11 22 29.0 ± 1.7	<15	<18	
P1327-21		2.C2 ± C.11	13 27 23.49 ± 0.30	-21 26 36.7 ± 2.9	16 ± 5	<35	C
3C287		7.31 ± 0.18	13 28 16.00 ± 0.12	25 24 37.2 ± 1.7	<15	<15	C
3C286		15.44 ± 0.27	13 28 49.67 ± 0.16	30 46 01.7 ± 1.5	<15	<15	C
P1335-06	M13-0/11	3.26 ± 0.C7	13 35 31.39 ± 0.10	-06 11 54.8 ± 2.1	<15	<50	C
3C288		3.39 ± 0.11	13 36 38.36 ± 0.22	39 06 22.3 ± 1.5	<15	<15	C
P1340+05		1.47 ± 0.08	13 40 12.42 ± 0.15	05 19 38.8 ± 2.0	<15	<18	
3C289		2.25 ± C.15	13 43 27.95 ± 0.42	50 01 31.0 ± 1.5	<15	<15	

angle zero. The flux densities are based on the intensity scale of Conway, Kellermann, and Long (1963) and are not corrected for the increase of atmospheric attenuation at large zenith angles. Since the flux densities are based primarily on the close-spacing observation of 289λ, they may underestimate the zero-spacing flux

TABLE I (*continued*)

Source designation (1)		Flux density (2)	(1950.0) R. A. (h m s s) (3)	(1950.0) Dec. (° ′ ″ ″) (4)	E–W diameter (arc sec) (5)	N–S diameter (arc sec) (6)	Comments (7)
P1344-07	M13-0/13	1.95 ± 0.08	13 44 23.48 ± 0.27	-07 48 26.4 ± 2.1	<15	<25	
P1345+12		5.40 ± 0.16	13 45 06.30 ± 0.19	12 32 22.7 ± 1.7	<15	<18	C1
P1346-39	M13-3/4	2.03 ± 0.10	13 46 52.23 ± 0.28	-39 07	<15		
P1354+01	M13+0/12	2.36 ± 0.15	13 54 28.30 ± 0.30	01 18	18 ± 3		CONFUSED BY P1355+01
P1354+19		2.28 ± 0.09	13 54 42.03 ± 0.25	19 33 43.8 ± 2.9	<15	29 ± 5	
P1355+01		1.50 ± 0.30	13 55 20.10 ± 1.00	01 02	<75		CONFUSED BY P1354+01
3C294		1.25 ± 0.08	14 04 34.48 ± 0.36	34 25 40.1 ± 1.7	<18	<15	
3C295		22.45 ± 0.60	14 09 33.64 ± 0.25	52 26 13.5 ± 1.4	<15	<18	C2
3C298	P1416+06	5.96 ± 0.09	14 16 38.76 ± 0.08	06 42 22.6 ± 1.8	<15	<18	C
P1416-49	M14-4/4	2.28 ± 0.14	14 16 45.63 ± 0.31	-49 23	38 ± 5		
3C299		3.03 ± 0.13	14 19 06.47 ± 0.29	41 58 30.1 ± 1.5	<15	<15	
P1420-27	M14-2/8	2.48 ± 0.09	14 19 55.37 ± 0.20	-27 14 19.3 ± 3.5	28 ± 3	<40	C2
P1422-29	M14-2/10	2.40 ± 0.10	14 22 32.90 ± 0.23	-29 46 23.5 ± 3.7	<15	<40	
P1424-41		3.20 ± 0.13	14 24 46.53 ± 0.27	-41 53	<15		1
3C300.1	P1425-01	2.94 ± 0.12	14 25 56.56 ± 0.16	-01 10 41.1 ± 1.9	<15	<30	
P1434+03	M14+0/10	2.74 ± 0.08	14 34 25.80 ± 0.28	03 37 12.5 ± 1.8	<15	<18	
3C303		2.59 ± 0.09	14 41 23.60 ± 0.22	52 14 19.2 ± 1.6	25 ± 3	<18	
P1446+00		1.70 ± 0.07	14 46 06.42 ± 0.17	00 30 43.9 ± 1.9	<15	<30	
3C305		2.90 ± 0.07	14 48 17.13 ± 0.25	63 28 37.0 ± 1.7	<15	<18	C
P1453-10	M14-1/21	3.90 ± 0.08	14 53 12.25 ± 0.11	-10 56 51.5 ± 2.6	<15	30 ±10	C1
3C309.1		8.39 ± 0.32	14 58 57.0 ± 0.7	71 52 10.3 ± 1.8	<15	<18	C2
P1509+01	M15+0/4	2.31 ± 0.07	15 09 52.96 ± 0.19	01 32 23.2 ± 1.9	<15	<25	
P1510-C8		3.95 ± 0.11	15 10 08.98 ± 0.26	-08 54 45.3 ± 2.1	<15	<30	VARIABLE,C2
3C317	P1514+07	5.44 ± 0.09	15 14 16.97 ± 0.10	07 12 16.6 ± 3.0	<15	30 ± 5	
P1514-24		2.32 ± 0.10	15 14 45.43 ± 0.30	-24 11 22.0 ± 4.1	<15	<50	C,1
3C318	P1517+20	2.66 ± 0.09	15 17 50.67 ± 0.22	20 26 54.2 ± 1.6	<15	<18	C2
P1523+03		2.05 ± 0.10	15 23 18.20 ± 0.12	03 18 59.0 ± 1.8	<15	<21	
M15-4/3		5.08 ± 0.13	15 26 52.37 ± 0.30	-42 21	44 ± 3		
P1528-29		1.43 ± 0.10	15 28 55.12 ± 0.27	-29 19 55.5 ± 3.8	<15	<50	
3C323.1		2.51 ± 0.07	15 45 31.30 ± 0.20	21 01 38.5 ± 3.0	28 ± 3	50 ±10	
3C324		2.50 ± 0.09	15 47 37.33 ± 0.25	21 34 43.7 ± 1.6	<15	<18	
3C325		3.41 ± 0.10	15 49 14.1 ± 0.6	62 50 21.5 ± 1.7	<15	<18	
3C326.1	P1553+20	2.28 ± 0.11	15 53 57.41 ± 0.15	20 12 59.9 ± 1.6	<15	22 ± 5	
P1602-28	M16-2/1	2.66 ± 0.09	16 02 06.36 ± 0.35	-28 51 07 ± 5	42 ± 3	55 ±15	
3C327.1	P1602+01	4.11 ± 0.08	16 02 12.89 ± 0.17	01 26 01.6 ± 1.9	<15	<21	C1
P1603+00	M16+0/3	2.04 ± 0.08	16 03 39.13 ± 0.30	00 08 30.3 ± 2.2	<15	<25	C1
CTD93		4.68 ± 0.09	16 07 09.21 ± 0.20	26 49 19.5 ± 1.3	<15	<15	
3C334	P1618+17	2.06 ± 0.05	16 18 06.81 ± 0.30	17 43 37.7 ± 2.7	44 ± 3	27 ± 5	
P1621-11	M16-1/8	2.48 ± 0.09	16 21 13.35 ± 0.15	-11 33 47.0 ± 2.3	<15	<35	
3C336		2.60 ± 0.08	16 22 32.47 ± 0.15	23 52 06.5 ± 2.2	<15	22 ± 5	C1
P1622-29		1.92 ± 0.12	16 22 57.09 ± 0.49	-29 44 41.0 ± 4.1	<15	<75	
3C341		2.28 ± 0.25	16 26 02.00 ± 0.30	27 48 13.7 ± 4.9	48 ±10	49 ±10	2
3C337		3.18 ± 0.11	16 27 19.73 ± 0.35	44 25 37.4 ± 1.5	38 ±10	<21	
3C340		2.53 ± 0.07	16 27 29.80 ± 0.32	23 26 43.6 ± 1.5	38 ± 3	<18	
3C343		4.83 ± 0.18	16 34 01.4 ± 0.6	62 51 43.0 ± 1.7	<15	<18	CONFUSED BY 3C343.1
3C343.1		4.49 ± 0.17	16 37 55.1 ± 0.5	62 40 34.0 ± 1.7	<15	<18	CONFUSED BY 3C343
3C345		7	16 41 17.67 ± 0.29	39 54 10.5 ± 1.0	<15	<21	VARIABLE,C
3C346	P1641+17	3.74 ± 0.12	16 41 34.50 ± 0.14	17 21 20.9 ± 1.6	<15	<21	
3C347	P1642+13	1.41 ± 0.10	16 42 21.90 ± 0.20	13 10 43.5 ± 2.0	<21	<30	CONFUSED BY P1643+13
P1643-22	M16-2/9	2.16 ± 0.08	16 43 04.95 ± 0.22	-22 22 36 ± 5	<15	52 ±10	
P1643+13		1.00 ± 0.30	16 43 11.3 ± 4.0	13 29	<90		CONFUSED BY 3C347
P1644-10	M16-1/19	2.1	16 44 44.80 ± 0.20	-10 39 12 ±10	<18	<50	POSSIBLE VARIABLE
NRAO517	P1645+17	2.15 ± 0.09	16 45 27.76 ± 0.21	17 25 27.7 ± 1.6	<15	<18	
3C351		3.20 ± 0.08	17 04 04.48 ± 0.30	60 48 50.3 ± 2.7	23 ± 5	27 ± 5	C2
3C352		1.95 ± 0.08	17 09 17.84 ± 0.38	46 05 05.6 ± 2.0	<15	<25	1
NRAO530	P1730-13	5	17 30 13.50 ± 0.15	-13 02 49 ± 5	<18	<25	VARIABLE
P1732-09		2.15 ± 0.12	17 32 23.73 ± 0.10	-09 14 48.8 ± 2.5	<15	<30	
M17-1/14		3.66 ± 0.30	17 55 48.10 ± 0.20	-16 16 44.0 ± 4.0	<25	<25	
P1759+13		1.68 ± 0.06	17 59 21.50 ± 0.22	13 51 22.3 ± 2.1	<15	21 ± 5	
M17-2/17		6.30 ± 0.30	18 00 08.33 ± 0.31	-27 48 22 ±12	<25	<40	
3C371		2.22 ± 0.11	18 07 17.7 ± 0.6	69 48 57.2 ± 1.3	29 ± 3	23 ± 5	VARIABLE
P1827-36		7.36 ± 0.27	18 27 37.03 ± 0.14	-36 04 38 ± 5	<15	<75	C2
3C380		14.67 ± 0.20	18 28 13.41 ± 0.17	48 42 40.5 ± 1.4	<15	<15	VARIABLE,C
4C29.56	CTD107	3.01 ± 0.12	18 29 17.94 ± 0.38	29 04 57.2 ± 1.5	<15	<15	
3C383		1.95 ± 0.07	18 33 32.7 ± 0.6	65 19 13.3 ± 1.7	<15	<18	
P1839-48	M18-4/3	3.13 ± 0.16	18 39 27.00 ± 0.29	-48 39	40 ± 5		
3C388		5.52 ± 0.15	18 42 35.49 ± 0.27	45 30 22.4 ± 1.5	31 ± 3	<21	
3C390		4.69 ± 0.11	18 43 15.35 ± 0.25	09 50 29.3 ± 1.7	<15	<18	
3C394		2.77 ± 0.16	18 57 04.52 ± 0.29	12 54 56.2 ± 1.7	<15	<18	
3C395		3.50 ± 0.14	19 01 02.24 ± 0.36	31 55 13.3 ± 1.5	<15	<15	

density if structure with an over-all size greater than 4 min of arc is present. This is unlikely for most of the sources.

III. TABULAR DATA

The flux density, position, and diameter limits for 352 small-diameter sources are given in Table I. In

TABLE I (*continued*)

Source designation (1)		Flux density (2)	(1950.0) R. A. (h m s s) (3)	(1950.0) Dec. (° ′ ″ ″) (4)	E–W diameter (arc sec) (5)	N–S diameter (arc sec) (6)	Comments (7)
P1932-46	M19-4/6	11.88 ± 0.29	19 32 19.63 ± 0.24	-46 28	26 ± 3		
P1938-15	M19-1/11	6.81 ± 0.16	19 38 24.61 ± 0.28	-15 31 35.2 ± 2.5	<15	<25	C2
3C401		4.91 ± 0.08	19 39 38.40 ± 0.30	60 34 30.4 ± 2.0	<15	20 ± 5	C
CTD114		4.93 ± 0.10	19 44 42.00 ± 0.40	25 05 19.3 ± 3.8	24 ±10	33 ± 5	
4C25.55	CTD117	1.65 ± 0.07	19 50 42.54 ± 0.30	25 19 04 ± 4	<15	38 ± 5	
CTD118		1.76 ± 0.15	19 52 56.60 ± 0.40	27 04 54.0 ± 4.9	54 ±10	49 ± 5	
P1953-42	M19-4/13	3.22 ± 0.18	19 53 48.13 ± 0.47	-42 31	<15		
P1955-35	M19-3/5	1.71 ± 0.20	19 55 48.60 ± 0.40	-35 43	<25		2
CTD120		1.65 ± 0.07	19 58 59.70 ± 0.44	25 43 22 ± 4	<15	39 ± 5	
3C409		13.43 ± 0.36	20 12 18.16 ± 0.27	23 25 41.5 ± 2.2	<15	22 ± 5	
3C410		10.04 ± 0.27	20 18 03.91 ± 0.21	29 32 43.2 ± 1.7	26 ± 3	16 ± 5	
3C411	P2019+09	3.25 ± 0.08	20 19 44.36 ± 0.15	09 51 32.9 ± 1.7	19 ± 3	<21	
P2025-15	M20-1/6	1.41 ± 0.08	20 25 18.88 ± 0.56	-15 41 15 ± 7	<18	<30	
P2030-23	M20-2/8	2.26 ± 0.08	20 30 20.79 ± 0.31	-23 03 35.2 ± 4.2	46 ± 5	42 ±10	
P2032-35	M20-3/7	5.40 ± 0.12	20 32 37.45 ± 0.26	-35 04 33.6 ± 4.9	<15	<50	
3C418		6	20 37 07.32 ± 0.28	51 08 35.8 ± 1.2	<15	<15	VARIABLE
3C422	P2044-02	2.24 ± 0.07	20 44 34.06 ± 0.29	-02 47 26.7 ± 1.9	<15	<21	
3C424	P2045+06	2.40 ± 0.04	20 45 44.36 ± 0.12	06 50 09.8 ± 1.8	<15	<18	C2
P2052-47		2.37 ± 0.08	20 52 50.50 ± 0.34	-47 27	<15		
P2053-20	M20-2/14	2.74 ± 0.07	20 53 12.89 ± 0.22	-20 08 06.7 ± 2.8	30 ± 3	<30	
3C427.1		3.72 ± 0.25	21 04 45.9 ± 1.0	76 21 04.6 ± 2.7	<25	<30	1
3C428		2.13 ± 0.08	21 06 42.34 ± 0.21	49 24 26 ± 4	31 ± 5	67 ±15	
3C429		2.8	21 11 39.76 ± 0.60	62 02 35.0 ± 2.0	<15	<18	POSSIBLE VARIABLE
P2111-25		2.29 ± 0.11	21 11 44.99 ± 0.17	-25 54 19.2 ± 3.2	<15	<50	
P2113-21	M21-2/3	2.97 ± 0.09	21 13 45.68 ± 0.34	-21 08 22.2 ± 2.9	<15	<50	
P2115-30	M21-3/4	2.59 ± 0.09	21 15 11.42 ± 0.24	-30 31 55.3 ± 3.9	<15	<40	C2
3C430		7.56 ± 0.18	21 17 01.88 ± 0.40	60 35 34 ± 4	41 ± 5	56 ± 5	
3C433		12.36 ± 0.21	21 21 30.57 ± 0.12	24 51 17.9 ± 3.0	17 ± 3	30 ± 5	C1
3C435	P2126+07	2.12 ± 0.20	21 26 37.55 ± 0.23	07 19 51.4 ± 2.5	34 ± 3	<30	1
P2127+04		4.09 ± 0.08	21 28 02.60 ± 0.20	04 49 03.2 ± 2.5	<15	<20	
P2128-20	M21-2/9	2.14 ± 0.10	21 28 12.50 ± 0.26	-20 50 12.3 ± 2.8	<15	<30	
3C435.1	NRAO663	1.59 ± 0.11	21 33 47.1 ± 1.7	83 44 05.3 ± 2.5	<18	<30	1
P2140-43	M21-4/7	2.72 ± 0.09	21 40 24.11 ± 0.31	-43 27	<15		
3C437	P2144+15	3.08 ± 0.13	21 45 01.29 ± 0.13	15 06 45.5 ± 2.0	<15	37 ± 5	
P2145+06		3.00 ± 0.10	21 45 35.96 ± 0.16	06 43 43.3 ± 1.8	<15	<18	
P2146-13	M21-1/19	1.60 ± 0.20	21 46 45.87 ± 1.37	-13 18 11 ±20	<25	<25	
P2147+14	NRAO667	2.60 ± 0.20	21 47 59.40 ± 0.20	14 35 43.3 ± 1.6	<25	<18	
P2148+14	NRAO668	2.20 ± 0.20	21 48 21.00 ± 0.20	14 19 34.2 ± 1.6	<25	<18	
P2149-20		1.90 ± 0.10	21 49 04.14 ± 0.13	-20 00 08 ± 5	<18	<45	
P2149-28	M21-1/14	3.01 ± 0.12	21 49 10.48 ± 0.40	-28 42 36.8 ± 3.6	<15	<40	
3C438		6.65 ± 0.18	21 53 45.55 ± 0.25	37 46 13.4 ± 1.5	<15	<15	C
P2159+04	M21+0/14	1.50 ± 0.07	21 59 28.70 ± 0.20	04 20 46.8 ± 1.8	18 ± 3	30 ±10	
3C440		2.76 ± 0.20	22 01 50.4 ± 0.8	62 25 56.9 ± 1.7	<15	<18	
P2203-18	M22-1/1	6.17 ± 0.40	22 03 26.10 ± 0.25	-18 50 16 ±10	<18	<40	
3C441		2.65 ± 0.15	22 03 49.17 ± 0.35	29 14 45.8 ± 2.3	<15	27 ± 5	C1
P2209+08		1.85 ± 0.07	22 09 32.10 ± 0.29	08 04 25.8 ± 2.0	<15	<18	
P2210+01		2.74 ± 0.10	22 10 05.17 ± 0.17	01 38 00.2 ± 1.9	<15	<18	
P2213-45		1.82 ± 0.07	22 13 52.19 ± 0.65	-45 36	<15		
P2216-28		2.10 ± 0.20	22 16 53.60 ± 0.40	-28 11 33.3 ± 3.6	<18	<45	1
3C446	P2223-05	5.85 ± 0.09	22 23 11.06 ± 0.09	-05 12 17.6 ± 2.0	<15	<21	VARIABLF,C
P2226-41	M22-4/3	2.72 ± 0.09	22 26 22.52 ± 0.26	-41 07	<15		
P2226-38		2.00 ± 0.15	22 26 52.60 ± 0.35	-38 39 13 ± 6	<18	<120 ±	1
CTA102	P2230+11	6.78 ± 0.13	22 30 07.71 ± 0.14	11 28 22.7 ± 1.7	<15	<18	C
P2247+14		2.00 ± 0.15	22 47 56.83 ± 0.33	14 03 56.3 ± 1.6	<15	<18	
3C454	P2249+18	2.00 ± 0.12	22 49 07.79 ± 0.43	18 32 44.0 ± 1.8	<15	<35	C2
P2250-41	M22-4/6	4.46 ± 0.14	22 50 12.71 ± 0.22	-41 14	26 ± 5		
3C454.2		2.21 ± 0.08	22 50 13.1 ± 0.8	64 24 14.0 ± 1.7	<15	<18	
3C454.3	P2251+15	11	22 51 29.35 ± 0.10	15 52 55.9 ± 1.3	<15	<21	VARIABLE,C2
3C455	P2252+12	2.71 ± 0.10	22 52 34.55 ± 0.13	12 57 35.7 ± 1.7	<15	<18	
P2259-37	M22-3/5	2.69 ± 0.08	22 59 37.27 ± 0.23	-37 34 11 ± 5	<15	<120 ±	C
P2305-41		1.46 ± 0.07	23 05 05.46 ± 0.42	-41 49	<15		
3C456	P2309+09	2.54 ± 0.06	23 09 56.60 ± 0.35	09 03 09.4 ± 1.7	<15	<18	
3C459	P2313+03	4.52 ± 0.08	23 14 02.22 ± 0.12	03 48 55.4 ± 1.8	<15	<18	C
P2318-16		2.30 ± 0.12	23 18 24.93 ± 0.13	-16 39 18 ± 5	<18	<45	
P2322-12	M23-1/12	1.88 ± 0.04	23 22 43.71 ± 0.12	-12 23 57.5 ± 2.5	<15	<25	C
P2323-40	M23-4/3	3.33 ± 0.14	23 23 51.98 ± 0.48	-40 44	<15		
3C462		2.40 ± 0.11	23 24 30.71 ± 0.22	40 31 38.3 ± 1.5	<15	<18	
3C466		2.20 ± 0.10	23 37 51.89 ± 0.51	22 04 14.2 ± 3.8	<15	<21	
P2344+09		1.7	23 44 03.51 ± 0.23	09 14 06.9 ± 1.3	<15	<18	POSSIBLF VARIABLE
3C468.1		4.80 ± 0.20	23 48 26.8 ± 0.6	64 23 37.1 ± 1.7	<15	<18	
P2354-35		1.30 ± 0.06	23 54 26.24 ± 0.28	-35 12 13 ±20	40 ± 3	<50	
3C470		1.77 ± 0.10	23 56 02.42 ± 0.46	43 48 01.3 ± 1.5	<15	<21	

column 1, the common source names are listed, and in column 2 the flux density and standard error at 1425 MHz are presented. For those sources which are known to be variable (Kellermann and Pauliny-Toth 1968; Kellermann 1969), or possibly variable (suggested by a flux density discrepancy in the observations), only an approximate flux density with no error is given. In columns 3 and 4 the right ascension and declination with standard errors at epoch 1950.0 are listed. The east–west and north–south diameters with standard errors are given in columns 5 and 6. Finally in column 7, brief comments are given for a few sources: C = east–west and north–south phase calibrator, C1 = east–west calibrator, C2 = north–south calibrator, 1 = possible large-scale structure, 2 = confused by a nearby source. For sources with no observations in one coordinate only an approximate position and no diameter information are listed for the missing coordinate.

The right ascensions are nearly the same as those published by Fomalont (1968). A comparison of those right ascensions with new optical and recent accurate radio right ascensions showed that they were 4 arc sec late for declinations greater than 60°. The scarcity of accurately known optical calibrators at high declinations probably led to this systematic error. The correction has been incorporated in the right ascensions of Table I. Also, a few strong radio sources not included in the original survey were added in the north–south observations; right ascensions for these sources were determined in a special observing run with a 1600-ft east–west baseline in 1967.

IV. COMPARISONS WITH OTHER CATALOGUES

The data in Table I have been compared with other published optical and radio positions (Adgie and Gent 1965; Macdonald, Kenderdine, and Neville 1968; Wade 1970; Shimmins, Clarke, and Ekers 1966; Bolton 1968; Bolton and Kinman 1966; Bolton, Shimmins, Ekers, Kinman, Lamla, and Wirtanen 1966; Kinman, Bolton, Clarke, and Sandage 1967; Kristian and Sandage 1970; Sandage, Veron, and Wyndham 1965; Veron 1966). Except for the right-ascension correction to high declination sources discussed in the previous section, there appear to be no other systematic errors greater than about ~1.5 sec of arc, and the quoted errors for the radio positions are compatible with the residuals of the several comparisons.

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REFERENCES

Adgie, R. L., and Gent, H. 1966, *Nature* **209**, 549.
Bolton, J. G. 1968, *Publ. Astron. Soc. Pacific* **80**, 5.
Bolton, J. G., and Kinman, T. D. 1966, *Astron. J.* **145**, 951.
Bolton, J. G., Shimmins, A. J., Ekers, J., Kinman, T. D., Lamla, E., and Wirtanen, C. A. 1966, *ibid.* **144**, 1229.
Bolton, J. G., Gardner, F. F., and Mackey, M. B. 1964, *Australian J. Phys.* **17**, 340.
Conway, R. G., Kellermann, K. I., and Long, R. J. 1963, *Monthly Notices Roy. Astron. Soc.* **125**, 261.
Day, G. A., Shimmins, A. J., Ekers, R. D., and Cole, D. J. 1966, *Australian J. Phys.* **19**, 35.
Fomalont, E. B. 1967, *Publ. Owens Valley Radio Obs.* **1**, No. 3.
——. 1968, *Astrophys. J. Suppl.* **15**, 203.
Fomalont, E. B., Wyndham, J. D., and Bartlett, J. F. 1967, *Astron. J.* **72**, 445.
Kellermann, K. I. 1969 (private communication).
Kellermann, K. I., and Pauliny-Toth, I. I. K. 1968, *Ann. Rev. Astron. Astrophys.* **6**, 417.
Kinman, T. D., Bolton, J. F., Clarke, R. W., and Sandage, A. 1967, *Astrophys. J.* **147**, 848.
Kristian, J., and Sandage, A. 1970, *Astrophys. J.* **162**, 391.
Moffet, A. T. 1962, *Astrophys. J. Suppl.* **7**, 93.
Macdonald, G. H., Kenderdine, S., and Neville, A. C. 1968, *Monthly Notices Roy. Astron. Soc.* **138**, 259.
Pauliny-Toth, I. I. K., Wade, C. M., and Heeschen, D. S. 1966, *Astrophys. J. Suppl.* **13**, 65.
Read, R. B. 1963, *Astrophys. J.* **138**, 1.
Sandage, A., Veron, P., and Wyndham, J. D. 1965, *ibid.* **142**, 1965.
Shimmins, A. J., Clarke, M. E., and Ekers, R. D. 1966, *Australian J. Phys.* **19**, 649.
Veron, P. 1966, *Astrophys. J.* **144**, 861.
Wade, C. M. 1970, *Astrophys. J.* **162**, 381.
Wyndham, J. D., and Read, R. B. 1965, *Astron. J.* **70**, 120.