SOME IDENTIFICATIONS FOR WEAK SOURCES IN THE PARKES CATALOGUE FOR DECLINATIONS +20° TO −20°

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Abstract

Accurate positions and flux densities at 2700 MHz have been measured for 156 weak sources in the Parkes catalogue for declinations 0° to +20° and 0° to −20°. Identifications are suggested for 22 of the sources, 6 with galaxies and 16 with possible quasi-stellar objects.

I. Introduction

The sections of the Parkes catalogue for declinations 0° to +20° (Day *et al.* 1966) and 0° to −20° (Shimmins *et al.* 1966) contain 1192 radio sources from a finding survey at 408 MHz. The positions of the sources in the catalogue measured at 1410 or 2700 MHz were estimated to have an r.m.s. uncertainty of 1′ arc. More accurate positions and flux densities at 2700 MHz have since been determined for most of these sources. Measurements of all the sources with flux densities greater than 1·0 f.u.† at 2700 MHz were reported by Shimmins, Clarke, and Ekers (1966) and a further set of positions was given by Shimmins (1968). More accurate positions for the sources between declinations +4° and −4° are contained in the Parkes 2700 MHz catalogue for this zone (Wall, Shimmins, and Merkelijn 1971). Some of the weaker sources for which possible identifications had been suggested were measured by Bolton, Shimmins, and Merkelijn (1968), and many of the weaker sources between declinations +4° and +20° which are common to the 4C catalogue were reported by Wills and Bolton (1969). Finally, Merkelijn (1969) has determined accurate positions for all the weaker sources where galaxies had been noted on the Palomar Sky Survey prints within a few minutes of arc of their catalogue positions.

The present paper reports accurate flux densities at 2700 MHz and positions for most of the remainder of the sources in the two parts of the Parkes catalogue referred to above. This work was undertaken so that a complete sample of sources in these two zones would be available for an examination of the source counts and statistics of the identifications.

II. Observations

The observations were made with the 64 m telescope and the 2700 MHz receiver (Batchelor, Brooks, and Cooper 1968) between 17 and 20 October 1970. The receiver input was switched between two feed horns, one of which was on axis and the other 18′·5 arc off axis. The positions were measured by making forward and reverse scans through the source position at a rate of 0°·5 per minute. A calibrated noise signal was injected into the input of the receiver ahead of each scan pair. The flux density

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† 1 flux unit (f.u.) = 10^{-26} W m^{-2} Hz^{-1}.

scale was determined by comparing the calibration noise signal with the source Hydra A, whose flux density is adopted as 23·5 f.u. at 2700 MHz.

The data were analysed on-line in a PDP–9 computer and on completion of a pair of scans the source coordinate and flux density and the apparent half-power beamwidth of the telescope were printed out. The first measured coordinate was used to set the telescope for the second pair of scans in the other coordinate. If the second measured coordinate differed by more than 2′ arc from that set for the first scan pair, then a third pair of scans was made with the correct setting. The position angle of the feed was changed by 90° between each pair of scans and the average of the two flux densities in the orthogonal position angles was used for the final flux density; an appropriate correction was applied to the value obtained from the first scan pair for any error in the first set coordinate less than 2′ arc. A small correction of up to 2% was applied to the flux densities in the computer to allow for the change in telescope efficiency with zenith angle.

Most of the observations were made within 2 hr in hour angle of the meridian to minimize telescope pointing corrections, which were determined from observations of a number of calibration sources whose positions are known to better than 2″ arc. These observations were made at intervals of about $1\frac{1}{2}$ hr throughout the observing period. Pointing corrections were determined in the manner described by Merkelijn (1969) and Wills and Bolton (1969) and applied to the measured positions. The accuracy of the present measurements is believed to be similar to that of the measurements of Merkelijn and of Wills and Bolton. For sources stronger than 0·3 f.u. the estimated r.m.s. errors in the positions are $\sim 10''$ arc and are set by uncertainties in the calibrator measurements and short-term variations in the telescope pointing. Signal-to-noise ratio and confusion affect the observations at lower flux densities and the r.m.s. errors in position increase to $\sim 30''$ arc for sources of 0·1 f.u. Errors in flux densities are believed to be of the same order as in the two papers cited above, i.e. $\sim 5\%$ for sources $\geqslant 0{\cdot}4$ f.u. and $\sim 15\%$ for sources of 0·1 f.u.

Confusing sources were found near about 10% of the sources observed. In some cases their positions were also measured and are reported in Table 1, and in other cases the approximate location is noted in column 11 of this table.

III. Identification Procedure

The positions of all the sources were examined on prints of the Palomar Sky Survey with the aid of computer-drawn transparent overlays containing the position of the source and the positions of 10 reference stars from the Smithsonian catalogue. Identifications are suggested in those cases where the difference between the measured radio position and the estimated optical position of a likely object was less than 20″ arc. As might be expected, very few new identifications were found—only 22 out of 162 sources. The fact that most of these are possible quasi-stellar objects is also to be expected in view of Merkelijn's (1969) previous measurements on all catalogue sources where there was a galaxy on the Palomar Sky Survey prints within a few minutes of arc of the catalogue position.

Figs. 1–3.—Finding charts for the new identifications. The charts are 10′ arc square and the scale is approximately 5 mm = 1′ arc. North-east is to the top left-hand corner of each chart.

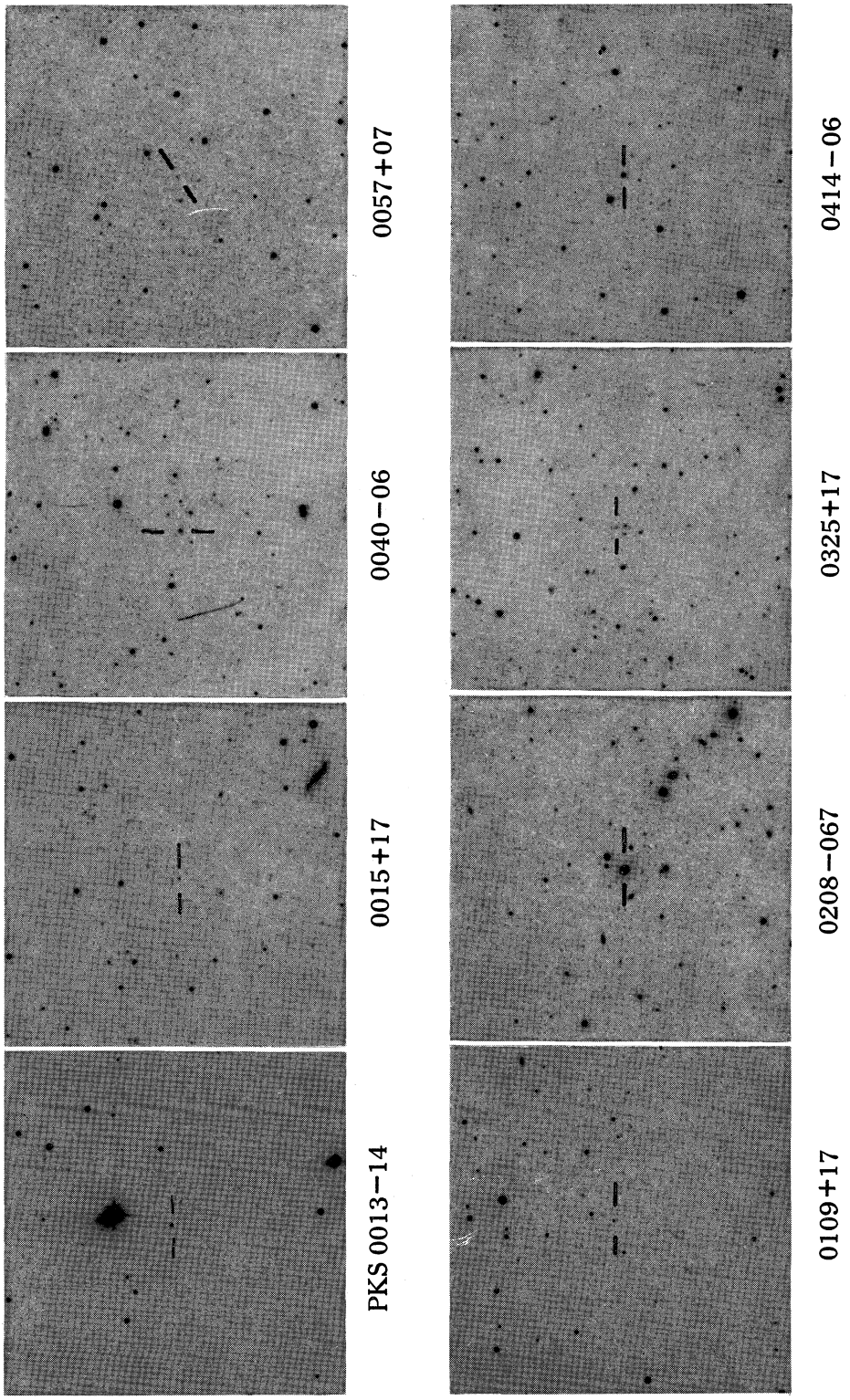

PKS 0013−14
0015+17
0040−06
0057+07
0109+17
0208−067
0325+17
0414−06

Fig. 1

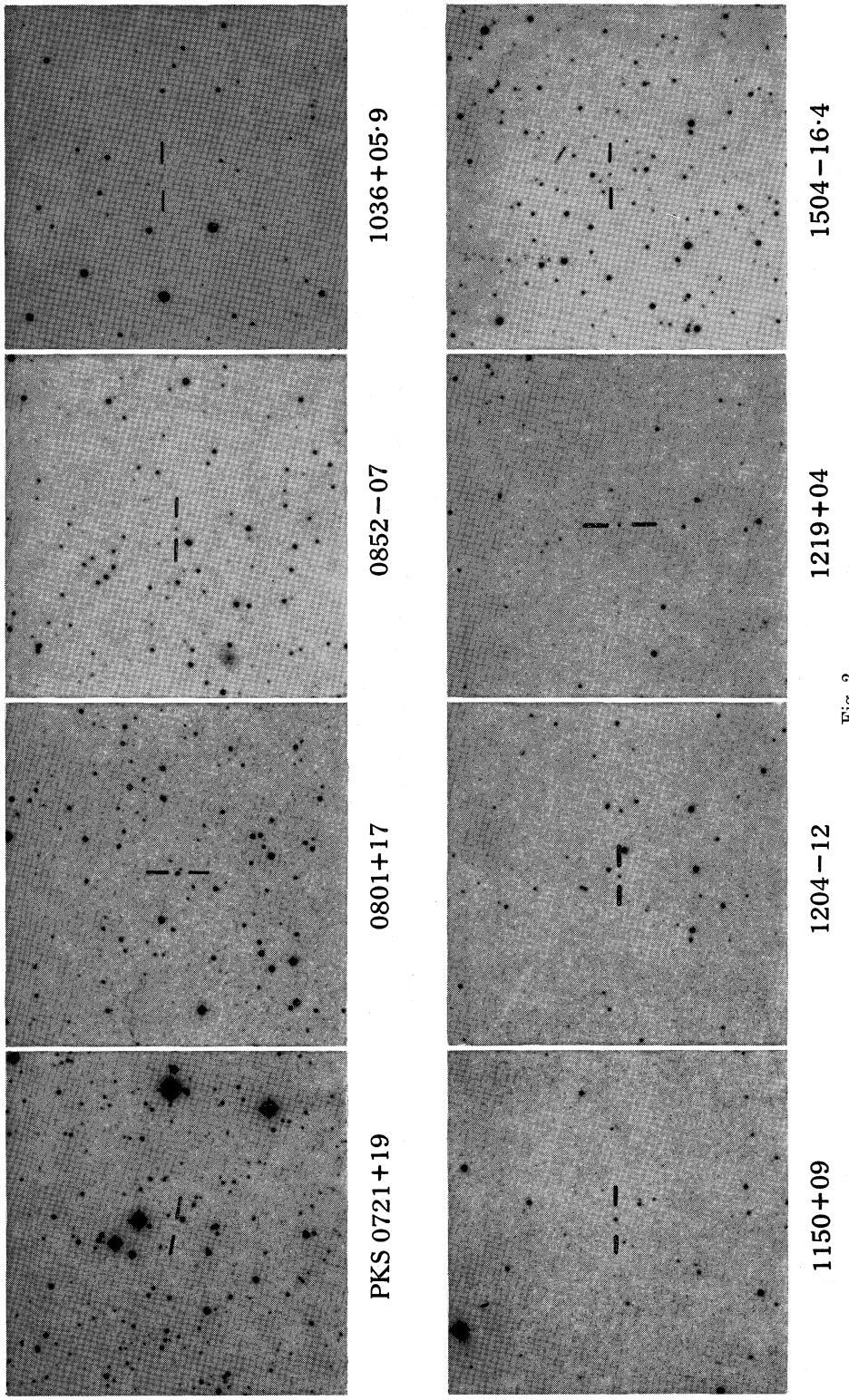
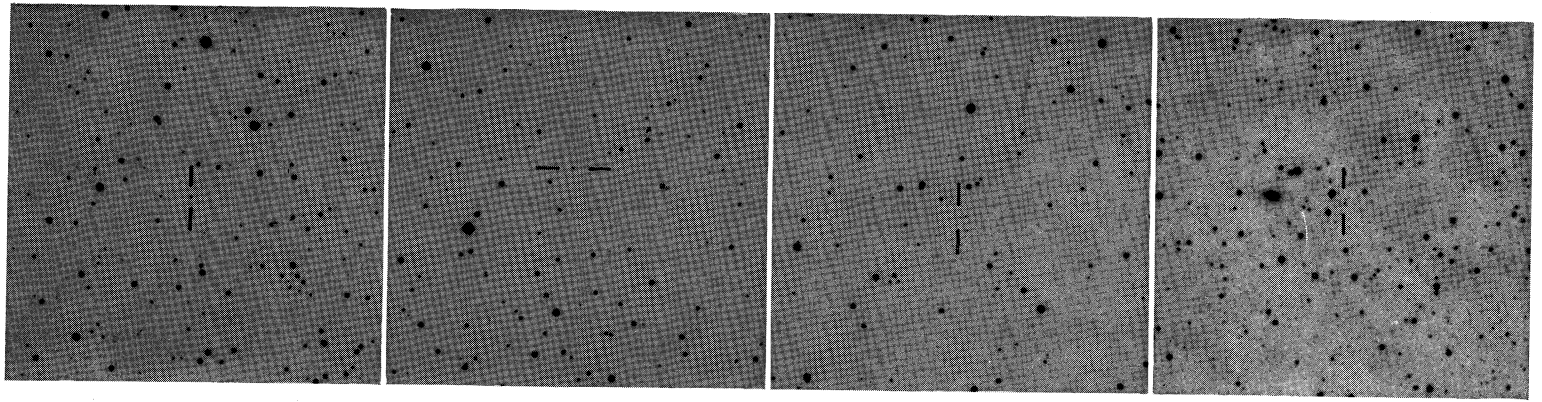

PKS 0721+19
0801+17
0852−07
1036+05·9
1150+09
1204−12
1219+04
1504−16·4

Fig. 2



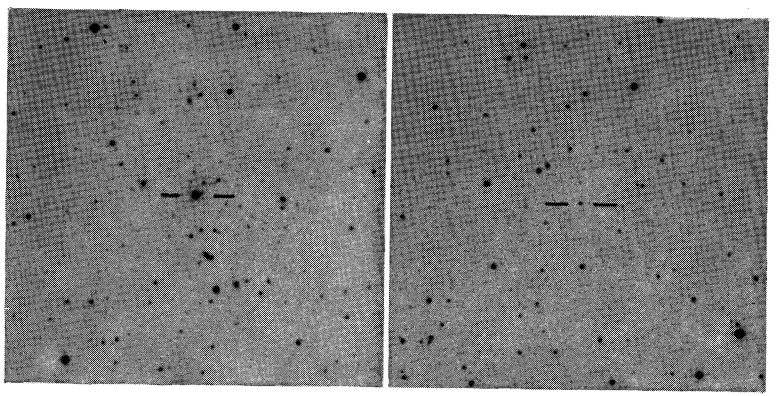


Fig. 3

TABLE 1

POSITIONS AND IDENTIFICATIONS OF SOURCES

(1) Parkes Catalogue Number	(2) Position (1950·0) R.A. h m s	(3) Dec. ° ′ ″	(4) Galactic Coords. l^{II} °	(5) b^{II} °	(6) S_{2700} (f.u.)	(7) S_{408} (f.u.)	(8) α	(9) Type	(10) Mag.	(11) Remarks	(12) Other Catalogue Number
0013−14	00 13 46·5	−14 46 45	88	−75	0·42	2·1	0·85	QSO?	17	1^s f., 0′·1 s.	
0015+17	00 15 02·5	17 52 43	112	−44	0·50	2·5	0·75	QSO?	18	$0^s·4$ f., 0′·1 n.	4C 17·05
0018−09	00 18 18·0	−09 13 55	100	−70	0·32	2·4	1·10	III			NRAO 20
0033−16	00 33 06·4	−16 51 30	103	−79	0·46	2·3	0·85	III		Faint g? 0′·4 n.p.	
0040−06	00 40 15·3	−06 30 00	117	−69	0·62	2·1	0·60	N	17	1^s p., 0′·2 s.	4C −06·3
0049+11	00 49 09·7	11 45 34	113	−51	0·34	1·6		III		Conf. source 11′ n.	
0057+07	00 57 49·8	07 22 20	127	−55	0·41	2·1		QSO?	18·5	0′·2 n.; conf. source 8′ n.	4C 07·3
0100+14	01 00 04·1	14 35 40	127	−48	0·41	7·1		III		Conf. source 10′ s.p.	4C 14·4
0102−07	01 02 37·2	−07 09 18	133	−70	0·38			IIIb			
0109+17	01 09 09·2	17 37 55	130	−45	0·29	1·6		QSO?	18	0′·1 n.; conf. source 13′ f.	
0134+09	01 34 39·0	09 14 51	141	−52	0·55	2·0	0·65	III		Ext. to higher R.A.	4C 09·6
0146+06	01 46 08·7	06 06 15	148	−54	0·29	3·0		III		Conf. source 13′ f.	
0153−05	01 53 32·1	−05 17 59	161	−63	0·44	2·1	0·80	III			4C 08·3
0158+18	01 58 55·3	18 22 01	145	−41	0·58	1·4	0·40	QSO		1^s f.; see Note A*	4C 18·7
0200+19	02 00 43·5	19 37 02	145	−40	0·44	1·6	0·60	IIIb			4C 19·7
0207+15	02 07 30·0	15 18 24	149	−43	0·52	2·1	0·75	III			
0208−067	02 08 23·4	−06 47 37	169	−62	0·36			E	15	1^s f.	
0208−06	02 08 33·8	−06 58 54	169	−62	0·39	2·1		III		Conf. with 0208−067; 17^m E 1′ s.	
0211+12	02 11 02·6	12 04 45	152	−46	0·15	1·6	1·30	III			
0213+17	02 13 45·9	17 52 50	150	−40	0·39	2·1	0·90	III			4C 17·11
0213−13·5	02 13 24·2	−13 27 31	182	−66	0·46	3·4	1·20	III			
0235+09	02 35 49·3	09 57 24	161	−45	0·56	2·6	0·80	III			
0250+00	02 51 07·3	00 47 58	175	−50	0·24	2·2	1·15	III			4C 00·10
0259+07	02 59 10·7	07 13 20	170	−43	0·41	3·4	1·10	III			4C 07·10
0315−14	03 15 08·1	−14 42 02	200	−54	0·30	2·6	1·15	III			
0317+02	03 17 03·3	02 24 44	179	−44	0·22	1·7	1·10	III			
0325+17	03 25 28·8	18 00 01	167	−31	0·34	3·4	1·20	g	18	$0^s·5$ f.	
0329+16	03 29 26·3	17 02 49	169	−31	0·21	1·6		III		Conf. source 16′ p.	
0332−18	03 32 49·5	−18 42 31	209	−52	0·39			III			
0345+16	03 45 21·5	16 57 24	172	−28	0·29	1·0	0·50	III		Conf. source 40′ n.	
0348+17·6	03 48 20·3	17 34 14	172	27	0·20	2·0	1·20	III		18^m E 0′·6 f.; conf. source 30′ s.; see Note B*	4C 17·9
0351+01	03 51 29·7	01 19 33	187	−38	0·22	2·1	1·15	III			
0401−08	04 01 01·7	−08 38 56	200	−41	0·44	4·6		IIIb		Conf. source 16′ n.	
0414−06	04 14 49·3	−06 01 07	199	−37	0·48	3·0	0·80	QSO?	16		3C 110
0420−08	04 20 48·0	−08 38 36	203	−37	0·38	2·6	1·00	III		Faint g 0′·5 s.p.	
0425+17	04 25 03·4	17 46 20	179	21	0·54	1·8	0·65	IIIa			4C 17·26
0429−17	04 29 45·2	−17 10 32	214	−38	0·50			III			
0446+11	04 46 20·3	11 16 47	187	−21	1·09	2·6	0·25	III		Radio variable?	

0452+10	04 52 21·1	10 04 24	189	−20	0·28	2·8	1·20	III			
0459−12	04 59 31·1	−12 10 40	212	−30	0·43	3·0	1·05	III			
0507+17	05 07 07·3	17 57 02	185	−13	0·50	1·7	0·65	IIIc			
0510+12	05 11 05·7	12 20 51	190	−15	0·36	3·1	1·15	III			
0511+05	05 11 27·8	05 22 23	196	−19	0·45	1·2	0·30	III		BSO 0′·5 n.f. has no UVX	4C 05·23
0514+10	05 13 59·9	10 54 28	192	−15	0·65	3·3	0·85	III			4C 10·16
0523+11	05 23 27·4	11 38 30	192	−13	0·50	3·1	0·95	IIIa			
0531+05	05 31 56·9	05 01 56	199	−15	0·35	4·0	1·25	IIIa		BSO 0′·6 p.	4C 05·23
0532+10	05 32 02·9	10 02 58	195	−12	0·60	5·5		IIIa		Conf. source 20′ s.	4C 10·21
0534+08	05 34 01·1	08 47 08	196	−12	0·35	1·7	0·85	IIIa		Radio variable?	4C 08·18
0534+04	05 34 51·4	04 12 17	200	−14	0·23	2·4	1·20	IIIa			4C 04·19
0536−13	05 36 12·8	−13 16 12	217	−22	0·71	3·8	0·90	III			
0544−17	05 44 02·0	−17 26 59	222	−22	0·51	3·8	1·15	III		BSO 0′·3 p.	
0549−10	05 49 11·4	−10 24 04	216	−18	0·54	3·0	0·90	IIIa			
0551−17	05 51 38·1	−17 10 45	222	−20	0·44	2·3	0·90	III			
0605−07	06 05 39·3	−07 26 50	215	−13	0·35	4·5		IV		Conf. source 19′ p.	
0612−03	06 12 38·2	−03 30 51	212	−10	0·41			IIIa			4C −03·22
0614−14	06 14 19·2	−14 19 36	222	−14	0·54			III			
0636−16	06 36 24·6	−16 46 37	227	−10	0·72	3·8	0·85	III			
0705−07	07 05 24·7	−07 24 31	222	0	0·47	3·2	1·00	111			
0706−15	07 06 57·0	−15 22 05	229	−3	0·79	1·4	0·20	III		BSO 0′·4 p.	
0707+09	07 07 44·5	09 25 04	207	8	0·57	2·5	0·75	III			4C 09·27
0709+00	07 09 07·9	00 53 27	215	4	0·31	2·0	1·00	III			
0717+15	07 17 01·9	15 02 21	201	14	0·30	1·8	0·95	III			4C 14·22
0717+17	07 17 34·9	17 04 34	203	13	0·45	2·7	0·95	III			4C 17·40
0721+19	07 21 01·5	19 10 57	199	16	0·69	3·0	0·80	g	18		4C 19·29
0723+10	07 23 06·0	10 38 00	207	12	0·71	3·4	0·85	III			
0725+12	07 25 46·4	12 16 22	206	14	0·56	3·4	0·95	III			
0733−17	07 33 32·1	−17 29 01	234	1	2·64	3·9	0·10	III			
0737+07	07 37 25·4	07 36 18	212	14	0·15	1·7		III		Conf. source 30′ p.	4C 07·20
0745−18	07 45 08·5	−18 49 12	236	3	0·61	4·6	1·05	III			
0748+18	07 49 01·2	18 46 05	202	21	0·55	2·5	0·80	III			4C 18·22
0801+17	08 01 28·0	17 30 03	205	24	0·41	1·7	0·75	QSO?	16	1^{s}·4 f., 0′·3 s.	
0817+18	08 17 53·3	18 22 52	206	28	0·58			III			
0826+09	08 26 53·0	09 34 45	216	26	0·39	3·0	1·05	III			4C 09·29
0852−07	08 52 42·6	−07 03 37	235	23	0·65	3·2	0·85	QSO?	18	0^{s}·3 f., 0′·1 n.	3C 209
0901+13	09 01 12·3	13 10 08	216	35	0·14			III			
0907+18	09 07 06·3	18 33 57	210	39	0·38	4·2		III		Very faint db? 0′·4 n.p.; conf. with 0907+187	4C 18·28
0907+187	09 07 14·9	18 44 18	210	39	0·19			III			
0914+11	09 14 41·0	11 26 28	220	37	0·31	3·3	1·20	III		Ext. in R.A.	
0942−19	09 42 58·8	−19 39 12	254	25	0·46	2·8		III		Conf. source 10′ n.	
1028+09	10 28 02·5	09 08 27	235	52	0·16	1·6		III		Conf. source 10′ n.	
1036+05·5	10 36 10·6	05 28 12	242	52	0·28			III		Conf. with 1036+05·9	4C 05·44
1036+05·9	10 36 51·1	05 51 52	241	52	0·35	3·3		g	18	1^{s} f.; conf. with 1036+05·5	
1123+20	11 23 13·8	20 09 14	229	69	0·25	2·7		III		Conf. with 1123+203	
1123+203	11 23 19·7	20 22 27	229	69	0·60			III		Conf. with 1123+20	
1126+10	11 26 37·3	10 08 17	251	64	0·32	2·6	1·10	III			

* See additional notes at end of table.

TABLE 1 (*Continued*)

(1) Parkes Catalogue Number	(2) Position (1950·0) R.A. h m s	(3) Dec. ° ′ ″	(4) Galactic Coords. l^{II} °	(5) b^{II} °	(6) S_{2700} (f.u.)	(7) S_{408} (f.u.)	(8) α	(9) Type	(10) Mag.	(11) Remarks	(12) Other Catalogue Number
1146+05	11 46 13·3	05 12 07	266	63	0·30	3·0	1·20	III			4C 05·50
1150+09	11 50 38·9	09 30 53	263	67	0·51	2·5	0·85	QSO?	17	0^s·5 p., 0′·1 s.	4C 09·39
1203−06	12 03 58·2	−06 58 05	285	54	0·36	3·4	1·20	IIIb			
1204−12	12 04 04·9	−12 37 27	286	49	0·54			QSO?	17·5	1^s p., 0′·1 n.	
1209−19	12 08 50·1	−19 09 02	290	42	0·31	3·0		III		Conf. source 30′ f.	
1209+12	12 09 07·6	12 38 36	269	73	0·17	1·9	1·20	III		See Note C*	
1213+12	12 13 16·0	12 38 40	272	73	0·28	2·3	1·10	III			
1219+04	12 19 48·4	04 29 59	285	66	1·04	3·2	0·60	QSO?	17·5	0′·1 s.; radio variable	4C 04·42
1225+07	12 25 26·8	07 42 47	286	70	0·29	2·5	1·15	III		Ext. in Dec.	
1250+11	12 50 28·8	11 55 28	304	75	0·35	2·8	1·10	III			
1354−13	13 54 19·5	−13 49 21	326	46	0·64	2·6	0·75	III			
1401−04	14 01 24·3	−04 23 13	335	54	0·63	2·8	0·80	III			
1420−18	14 20 50·5	−18 02 39	332	39	0·56	2·5	0·80	III			
1433−04	14 33 04·0	−04 00 17	346	50	0·40			III			
1449+13	14 49 09·9	13 56 10	13	59	0·41	2·5	0·95	III			
1455−06	14 55 19·4	−06 01 18	350	45	0·46			III			
1502+04	15 02 36·5	03 58 53	3	50	0·24	2·7		III		Conf. source 20′ f.	4C 03·31
1504−16·4	15 04 04·0	−16 26 32	344	35	0·38			QSO?	18	1^s f.	
1509−12	15 09 39·6	−12 14 21	348	38	0·30	2·6	1·15	III			
1522−18	15 22 22·4	−18 52 16	346	31	0·54	3·3	0·95	III			
1537−05	15 37 51·8	−05 04 50	1	38	0·47	3·0	1·00	III			4C −05·68
1558+11	15 58 51·2	11 38 45	23	43	0·21	3·0	1·30	III			
1607−09	16 07 19·7	−09 10 55	3	30	0·72	3·7	0·85	III			
1609−14	16 09 14·4	−14 11 39	359	26	0·48	2·3	0·80	III			
1614+04	16 14 33·2	04 15 49	17	36	0·16	2·1	1·30	III		Faint g 0′·6 f.	4C 04·57
1614−09	16 14 36·0	−09 55 18	3	28	0·54	5·2	1·20	QSO?	18	1^s p.	
1640−15	16 41 00·6	−15 21 04	3	19	0·60	5·7	1·20	IIIa			
1642−18	16 42 29·7	−18 29 45	1	17	0·44	2·9	1·00	IIIa			
1701+05	17 00 59·8	05 06 28	25	26	0·27	3·1	1·25	IIIa			
1725−06	17 25 09·7	−06 56 05	17	15	0·21			IIIa		Conf. with 1726−06	4C −06·50
1726−06	17 26 36·7	−06 57 36	17	15	0·32			IIIa		Conf. with 1725−06	
1738−05	17 38 57·5	−05 24 07	20	13	0·53			IIIa		Ext.	
1802+11	18 02 45·2	11 01 30	38	15	0·49	4·3	1·15	IIIa			3C 368
1804+15	18 04 41·0	15 42 54	42	17	0·37	3·3	1·15	IIIa			
1851−16	18 51 24·3	−16 14 42	19	−8	0·44			IIIc			
1923−18	19 23 04·5	−18 42 53	20	−16	0·68	2·4	0·65	III			
1933−17	19 33 21·1	−17 18 15	22	−17	0·34	3·6	1·20	IIIc			
1937−03	19 37 43·2	−03 34 17	35	−12	0·48	4·6	1·20	IIIc			4C −03·71
1941−07	19 41 27·6	−07 30 52	32	−15	0·38	6·4		IIIc		Conf. source 15′ f.	
1948−10	19 48 48·5	−10 03 27	31	−18	0·40			IIIc			

2001+13	20 01 00·6	13 57 29	54	−9	0·64	4·0	0·95	IIIc				4C 14·73
2003+15	20 03 30·1	15 51 26	56	−8	0·28	3·9	1·30	IIIc				4C 15·68
2008+06	20 08 02·3	06 22 48	48	−16	0·22	1·1	0·85	IIIc				
2021+07	20 21 02·7	07 53 56	48	−14	0·20	1·7	1·15	III				
2025+15	20 25 02·6	15 33 19	58	−13	0·27	5·5		III		Ext. in Dec.		4C 15·70
2028−07	20 28 21·1	−07 51 50	37	−26	0·79	3·6	0·80	III				3C 413
2037−08	20 37 10·6	−08 36 24	38	−28	0·12	3·4	1·70	III				
2042+03	20 42 51·8	03 13 34	50	−23	0·17	2·8	1·35	III				4C 03·48
2046+14	20 46 20·6	14 43 30	61	−18	0·18	1·0	0·90	III				
2046−07	20 46 27·8	−07 10 41	40	29	0·31			III				
2046+12	20 46 44·8	12 36 15	59	−19	0·20	3·2	1·35	III				
2058−17	20 58 54·8	−18 00 00	30	−37	0·59	5·7		QSO?	18	$0^s·5$ p., 0′·1 s.; conf. source 20′ p.		
2109+16	21 10 04·4	16 36 52	66	−21	0·07	1·6		III		Very faint BSO?; conf. with 2109+163		
2110+163	21 10 11·5	16 22 04	66	−21	0·12			III				
2110−16	21 10 36·9	−16 01 30	34	−38	0·57	1·6	0·45	QSO?	19	$0^s·5$ p., 0′·1 n.		
2120−16	21 20 13·9	−16 40 34	34	−41	0·78	7·5		III		Conf. source 20′ s.p.		
2120+09	21 20 46·5	09 54 58	62	−27	0·65	2·8	0·75	QSO?	18	$0^s·5$ f.		
2131−178	21 31 21·6	−17 49 31	34	−44	0·11			III				
2132−17	21 32 31·0	−17 48 02	34	−44	0·68	2·8		III		Conf. with 2131−178		
2203+05	22 03 49·3	05 41 39	66	−38	0·64	1·7	0·45	III				4C 05·82
2227+03	22 27 42·0	03 36 28	70	−44	0·12	1·3		III		Conf. source 10′ f.		
2229+06	22 29 12·2	06 46 46	73	−42	0·31	1·8	0·95	III				4C 06·74
2234−17	22 34 56·2	−17 28 18	44	−58	0·67	4·8	1·05	III				
2236−17	22 36 30·2	−17 36 21	44	−58	1·02	4·8	0·80	E	16	0′·3 n.; see Note D*		
2241−16	22 41 09·5	−16 23 04	47	−58	0·39	2·0	0·85	III				
2243−19	22 43 08·6	−19 11 08	42	−60	0·27	2·5	1·15	III		BSO? 0′·3 f.		
2247+13	22 47 15·5	13 15 24	83	−40	0·92	4·5	0·85	QSO?	18	1^s f.		4C 13·84
2257+12	22 57 08·3	12 20 35	85	−42	0·25	2·2		IIIb		Conf. with 2258+123		4C 12·80
2258+123	22 58 13·3	12 20 57	85	−42	0·24			III				
2315+15	23 15 34·2	15 30 05	92	−41	0·24	1·5	0·95	III				4C 15·78
2324+043	23 24 15·0	04 18 28	87	−52	0·10			III				
2325+04	23 25 30·9	04 18 52	87	−52	0·15	3·7		III		Conf. with 2324+043		4C 04·79
2344−07	23 44 07·0	−07 45 05	82	−65	0·52	1·8	0·65	III				
2348+16	23 48 41·7	16 02 16	103	−44	0·41	2·5	0·95	III				4C 18·64
2348−16	23 48 58·2	−16 24 34	68	−72	0·39	2·8	1·05	III				
2356+01	23 56 40·7	01 50 50	98	−58	0·14	1·7		III		Conf. with 2357+018; see Note E*		
2357+018	23 57 16·1	01 53 26	98	−58	0·10			III		BSO 0′·7 f.		
2359−14	23 59 49·1	−14 23 21	79	−73	0·50			III				

* Additional notes:

A. 0158+18. This object was identified by Wills and Bolton (1969) and the identification has been confirmed by Wills (personal communication) from photometry. The present position is in closer agreement with that of the optical counterpart than the position given by Wills and Bolton.

B. 0348+17·6. The previously suggested identification by Clarke, Bolton, and Shimmins (1966) with the galaxy 0′·6 f. is retracted.

C. 1209+12. The previously suggested identification by Clarke, Bolton, and Shimmins (1966) with the galaxy 1′·5 s.f. is retracted.

D. 2236−17. This was originally identified as a QSO 1′ s.p. the present identification by Bolton and Ekers (1966). The source position was remeasured because no ultraviolet excess was found with the Mount Stromlo 74 in. telescope for the suggested QSO.

E. 2356+01. Merkelijn and Wall (1970) have suggested a $17·5^m$ elliptical galaxy 0′·8 s.p. the present position as the identification for this source. The radio position is difficult to measure accurately because of a confusing source.

Finding charts for the new identifications are given in Figures 1–3. These were prepared from the prints of the Palomar Sky Survey; the blue prints were used for the charts of suggested quasi-stellar objects and the red prints for the galaxies.

IV. Positions, Flux Densities, and Identifications

Table 1 contains the positions and flux densities for all the sources and the suggested identifications where available.

Column 1 gives the Parkes catalogue number; a seven-digit number has been assigned to those confusing sources for which positions were also measured (the seventh digit represents tenths of a degree in declination). Column 7 gives the flux density at 408 MHz, taken from the Parkes catalogue. Column 8 gives the mean spectral index ($S \propto \nu^{-\alpha}$) for the source for the frequency range 408–2700 MHz; no entry is made where no estimate of the flux density at 408 MHz was given in the Parkes catalogue or where the observations at 2700 MHz indicated that the 408 MHz flux density could have been affected by a confusing source. Such confusing sources are noted in column 11. Column 9 contains the suggested identification and column 10 an estimate of the photographic magnitude of a suggested galaxy or the visual magnitude of a possible quasi-stellar object. Where no identification is suggested a field classification is given in column 9 for the region within $0'{\cdot}5$ arc of the radio position: III, field contains stars of normal colour; IIIa, field and adjacent regions contain mainly red stars, indicating possible obscuration; IIIb, blank field; IIIc, very crowded star field; IV, field and adjacent regions heavily obscured.

Additional comments are given in column 11 where the field contains objects of interest which are just outside the position difference of 20″ arc considered acceptable for a suggested identification. Column 11 also gives the positions of suggested identifications relative to their radio positions. Abbreviations used in this column and in column 9 are: n., north; s., south; p., preceding; f., following; g, galaxy; N, compact galaxy; E, elliptical galaxy; db, double galaxy; QSO?, possible quasi-stellar object; BSO, blue stellar object; UVX, ultraviolet excess; conf. source, confusing source; conf. with, confused with; ext., extended.

Column 12 contains alternative designations for the sources from the 3C, 4C, and NRAO catalogues.

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