THE PARKES CATALOGUE OF RADIO SOURCES

DECLINATION ZONE 0° TO +20°

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Summary

This paper gives details of 564 radio sources between declinations 0° and +20°. The sources were selected from a survey carried out at 408 Mc/s with the 210 ft reflector at the Australian National Radio Astronomy Observatory, Parkes, N.S.W. The survey did not include two small areas near the galactic plane. Additional measurements of flux density and position were made at 1410 and 2650 Mc/s. Some discussion of the results on spectra, source counts, and source identification is included, and a comparison is made between this survey and other published catalogues covering the same region.

I. Introduction

This paper contains the results of the third part of a survey for radio sources between declinations +25° and −90° that is being made with the 210 ft reflector at the Australian National Radio Astronomy Observatory, Parkes, N.S.W. The first and second parts of the survey have already been published and cover the zones −20° to −60° (Bolton, Gardner, and Mackey 1964) and −60° to −90° (Price and Milne 1965). The present paper refers to the zone between 0° and +20°, with the exception of two areas within ±10° of the galactic plane which will be the subject of a separate investigation. The area is 1·88 steradians. The survey, which is principally aimed at extragalactic radio sources, is being carried out to provide a basic catalogue of the area for subsequent detailed measurements, such as precise position, spectrum, and polarization.

As with the earlier sections of the Catalogue, the observations consisted of an initial finding survey at a frequency of 408 Mc/s, measurements of flux density and position at 1410 Mc/s, and measurements of flux density and position at 2650 Mc/s. Later sections of the paper refer to the determination of source positions, flux density, spectra, identification, extended sources, and source counts, and finally, a comparison is made between the results of this survey and other published catalogues covering the same region.

II. Observations and Equipment

The observational procedure used for the survey and the characteristics of the receiving equipment have been given in detail in the first part of the Catalogue (Bolton, Gardner, and Mackey 1964)†. Briefly, for the initial finding survey, carried

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† Hereafter referred to as the BGM survey.

out at 408 Mc/s, the double-sideband receiver (Mackey 1964) had an i.f. bandwidth of 8 Mc/s and system temperature of approximately 300°K. With a 2 s time constant, peak-to-peak noise fluctuations were about $0 \cdot 5$ degK. At this frequency the telescope has a beamwidth of 48′ arc, and the results are limited by confusion between sources and background irregularities rather than by system noise.

The observations at 408 Mc/s consisted of a series of scans, at a rate of $2 \cdot 5$°/min, between declinations 0° and +20°. Adjacent scans were made at intervals of 2^m of right ascension (approximately 30′ arc). From these records, objects were selected

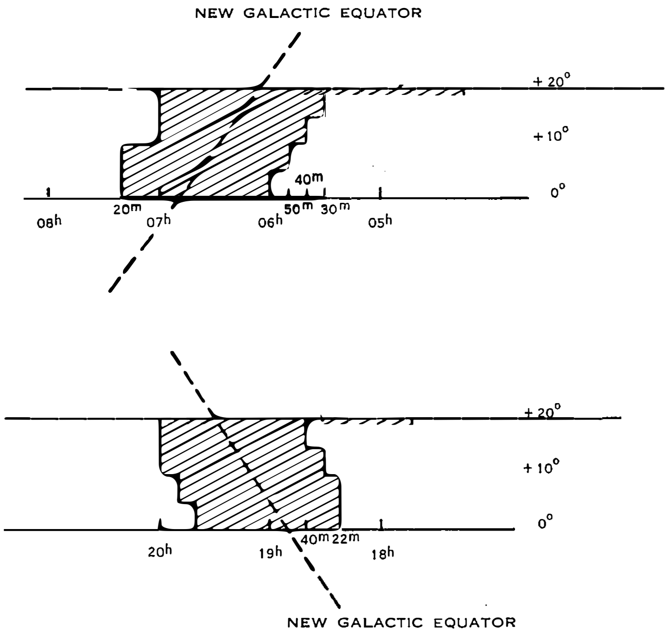

Fig. 1.—Regions of the sky near the galactic plane that were not included in the survey.

which stood out from the background as discrete radio sources. All sources that had been listed in other catalogues covering this region were looked for on the survey records. The declination of the object could be determined to approximately 5′ arc from the individual scans, and a comparison between the amplitude of the signals on adjacent scans gave an estimate of the right ascension. The two regions near the galactic plane that were not included are shown in Figure 1.

All the objects selected from the initial survey at 408 Mc/s were re-observed at a frequency of 1410 Mc/s (the nominal 21 cm wavelength of the BGM survey). The receiver (Gardner and Milne 1963), a degenerate parametric with a 10 Mc/s bandwidth and system temperature of 150°K, had, with a 2 s time constant, peak-to-peak noise fluctuations of about $0 \cdot 5$ degK. The procedure for the 1410 Mc/s observations was to drive at $0 \cdot 5$°/min through the position of the source found at 408 Mc/s and determine a more precise right ascension. With this right ascension, declination scans were made across the source to determine a more accurate value of declination. This position, when corrected for telescope pointing errors and precessed to mean position for epoch 1950·0, is that shown in Table 1. From the records, the flux densities of the sources in flux units (1 flux unit (f.u.) = 10^{-26} W m^{-2} (c/s)$^{-1}$) were measured. Sources with flux densities less than 0·3 f.u. at 1410 Mc/s were omitted from the Catalogue, except where it was desirable from other considerations, such as close proximity to other sources, to include them. As a separate investigation, the percentage polarization of sources greater than 3 f.u. at 1410 Mc/s were measured by F. F. Gardner (Division of Radiophysics, CSIRO), and the results of these measurements have been included.

Following the 1410 Mc/s positioning of a source, a right ascension scan at 2·5°/min on the source declination was taken to obtain the 408 Mc/s flux density.

For the 2650 Mc/s (nominal 11 cm) observations, a degenerate parametric receiver (Cooper, Cousins, and Gruner 1964) with an overall system temperature of approximately 150°K and bandwidth 40 Mc/s was used. With a 2 s time constant, peak-to-peak fluctuations were approximately 0·15 degK. A similar observational procedure was used as for the 1410 Mc/s observations, and this provided an independent check of numerical errors in the reduction of the 1410 Mc/s positions. Here the declination and right ascension scan rates were carefully set to values of 0·25°/min and 0·25 (sec δ)°/min respectively, so that beam broadening effects, and thus an estimate of angular size, could be made.

III. Notes on the Catalogue

Table 1, which is largely self-explanatory, contains the details of the 564 sources in the declination zone 0° to +20°. Additional information concerning its use is given below.

Column 1.—Catalogue number consisting of the hours and minutes of right ascension and the sign and degrees of declination.

Columns 2 and 3.—Mean position for epoch 1950·0. For a discussion of position errors see Section IV.

Columns 4 and 5.—Annual precession in right ascension and declination (in seconds of time and seconds of arc respectively).

Columns 6, 7, 8, 9, and 10.—Flux densities in units of 10^{-26} W m^{-2} (c/s)$^{-1}$ at frequencies of 85·5, 178, 408, 1410, and 2650 Mc/s. The values at 85·5 Mc/s are from the Mills, Slee, and Hill (1958) catalogue and at 178 Mc/s from the Revised 3C catalogue increased by 8% (see Section V). An attempt has been made to evaluate the individual flux densities of the sources where, particularly at 408 Mc/s, confusion with other sources or with background irregularities makes the measurements uncertain. Where the flux-density errors are thought to be greater than those quoted for the survey, the estimated flux has been enclosed in parentheses. In some cases the flux quoted includes a contribution from other sources; this is indicated in column 13. Flux densities at 2650 Mc/s that are in doubt owing to source extension, as indicated by beam broadening at 2650 Mc/s, are also enclosed by parentheses.

TABLE 1. PARKES CATALOGUE OF RADIO

Catalogue Number	Position (1950·0)		Annual Precession		Flux Density (10^{-26} W m^{-2} (c/s)$^{-1}$)				
	R.A. h m s	Dec. ° ′	Δα s	Δδ ″	$S_{85·5}$	S_{178}	S_{408}	S_{1410}	S_{2650}
0002+12	00 02 18	+12 31·9	3·07	20·0			7·2	2·4	1·1
0003+19	00 03 08	+19 35·6	3·07	20·0			1·2	0·9	0·4
0003+15	00 03 31	+15 52·4	3·07	20·0			2·6	0·9	0·7
0007+12	00 07 22	+12 28·2	3·08	20·0			5·0	1·9	1·2
0010+00	00 10 34	+00 35·2	3·07	20·0	20		5·1	1·6	0·9
0015+17	00 15 07	+17 53·9	3·10	20·0			2·5	0·9	0·6
0017+15	00 17 49	+15 24·4	3·10	20·0		16·2	6·6	2·1	1·2
0029+01	00 29 28	+01 11·3	3·07	19·9			(2·0)	0·5	<0·2
0030+19	00 30 02	+19 37·4	3·13	19·9			3·1	1·9	1·1
0030+06	00 30 31	+06 11·5	3·09	19·9	25		4·3	1·0	0·4
0031+01	00 31 49	+01 05·3	3·07	19·8	20		(3·0)	0·5	0·3
0033+18	00 33 31	+18 22·1	3·13	19·8		10·3	6·7	2·0	1·0
0034+19	00 34 37	+19 44·5	3·14	19·8			2·4	0·7	0·3
0035+13	00 35 10	+13 04·4	3·12	19·8		12·4	5·0	1·8	1·1
0036+03	00 36 45	+03 03·5	3·08	19·8	14		4·1	1·6	1·1
0037+04	00 37 18	+04 39·0	3·09	19·8			3·8	0·8	0·5
0038+09	00 38 16	+09 48·0	3·11	19·8	37	25	12·2	4·7	3·0
0038+08	00 38 22	+08 36·8	3·10	19·8			4·8	1·5	0·9
0040+06	00 40 55	+06 26·7	3·09	19·7	14		2·4	0·5	0·3
0042+13	00 42 47	+13 24·2	3·13	19·7			2·6	1·5	0·8
0045+11	00 45 36	+11 49·4	3·12	19·6			1·2	0·5	0·3
0049+11	00 49 06	+11 47·2	3·13	19·6			1·6	0·7	0·3
0049+17	00 49 11	+17 31·0	3·16	19·6			5·6	1·5	0·7
0057+07	00 57 47	+07 23·5	3·11	19·4			2·2	0·7	0·4
0059+14	00 59 30	+14 29·9	3·16	19·4			(7·4)	(1·6)	0·7
0059+05	00 59 36	+05 38·7	3·10	19·4			1·5	0·7	0·4
0100+14	01 00 05	+14 35·8	3·16	19·4			(7·1)	(1·2)	0·7
0103+06	01 03 16	+06 11·3	3·11	19·3			2·8	0·6	0·2
0106+01	01 06 08	+01 19·3	3·08	19·2			3·5	1·4	0·9
0106+13	01 06 14	+13 04·1	3·16	19·2		53	33·6	14·2	(6·7)
0106+17	01 06 58	+17 37·5	3·19	19·2			(0·5)	0·5	(0·2)
0109+17	01 09 18	+17 38·4	3·19	19·1			(1·6)	0·6	0·3
0109+14	01 09 24	+14 28·1	3·17	19·1			5·3	1·5	0·8
0109+02	01 09 32	+02 40·7	3·09	19·1			1·9	0·6	0·3
0110+15	01 10 17	+15 12·6	3·18	19·1			4·4	1·0	0·6
0114+07	01 14 47	+07 25·8	3·12	19·0			(3·0)	1·6	0·8
0115+02	01 15 49	+02 42·9	3·09	19·0			(4·5)	1·5	1·0
0116+08	01 16 25	+08 14·2	3·13	18·9	14		6·3	2·2	1·6
0118+03	01 18 29	+03 28·3	3·10	18·9	(16)		(5·0)	1·2	0·6
0119+11	01 19 04	+11 33·4	3·27	18·9			3·0	1·2	0·9
0119+03	01 19 42	+03 16·6	3·09	18·8	(16)		(5·0)	0·7	0·2
0124+18	01 24 12	+18 57·7	3·23	18·7			2·6	1·5	1·4
0124+09	01 24 46	+09 00·2	3·14	18·7	16		4·3	1·8	1·1
0128+03	01 28 40	+03 58·6	3·10	18·6	18		5·3	2·2	1·0
0128+06	01 28 45	+06 08·9	3·12	18·6	23	11·9	4·1	1·5	0·8

SOURCES, DECLINATION ZONE 0° TO +20°

Spectrum		Remarks	Galactic Coordinates		Other Catalogue Numbers	
Index	S_{400}		l^{II} °	b^{II} °	3C	MSH
1·0±0·1	7·9±0·6	III	106	−48		
0·9±0·4	2·5±0·4		108	−42	1	
0·6±0·2	2·3±0·3	III	107	−45		
0·8±0·1	5·8±0·5	II	107	−49		
0·9±0·1	5·0±0·4	III	103	−61	5	00+0*2*
0·7±0·2	2·4±0·3	III	112	−44		
0·9±0·1	7·0±0·5	III QSO 18·2^{m}	112	−47	9	
—		II	113	−61		
0·6±0·2	3·9±0·4	II	117	−43	12	
1·2±0·1	4·1±0·4	III	115	−56		00+0*7*
1·2±0·1	2·9±0·5	II	114	−61		00+0*6*
0·9±0·1	6·3±0·4	III	118	−44	14	
1·1±0·3	2·7±0·5	III	118	−43		
0·9±0·1	5·5±0·4	III	118	−49	16	
0·7±0·1	4·3±0·3	I E 14·3^{m}	117	−59		00+0*10*
1·1±0·2	3·6±0·5	III	118	−58		
0·8±0·0	12·3±0·5	III MSH flux low	119	−53	18	00+0*11*
0·9±0·2	4·7±0·5	III	119	−54		
1·1±0·1	2·4±0·3	II	119	−56		00+0*12*
0·7±0·2	3·4±0·4	III	121	−49		
0·8±0·4	1·3±0·3	III	122	−51		
1·0±0·4	2·1±0·4	III	123	−51		
1·1±0·2	5·9±0·6	III	123	−45	23	
0·9±0·3	2·2±0·4	III	127	−55		
—		S_{408} & S_{1410} incl. 0100+14	127	−48	(30)	
0·8±0·4	1·7±0·3	II	128	−57		
—		III S_{408} & S_{1410} incl. 0059+14	127	−48	(30)	
1·4±0·3	3·1±0·7	III	129	−56		
0·7±0·2	3·5±0·4	III (QSO)	132	−61		
0·7±0·1	33·0±1·7	I SO 16^{m} P 8% ext. in δ	129	−49	33	
—		II	129	−45		
1·1±0·5	2·4±0·4	III	130	−45		
1·0±0·2	5·4±0·5	III	130	−48		
1·0±0·3	2·0±0·4	III	133	−60		
1·1±0·2	4·2±0·5	I db. 15·9^{m}	131	−47		
1·1±0·3	6·4±0·6	III (QSO)	134	−55		
0·6±0·3	3·4±0·3	III	136	−59	(37)	
0·7±0·1	5·5±0·3	III	135	−54		01+0*2*
1·1±0·3	4·8±0·5	III (QSO) S_{408} incl. 0119+03	137	−58	(39)	(01+0*3*)
0·6±0·2	2·8±0·3	III	135	−50		
2·0±0·6	8·5±1·6	III S_{408} incl. 0118+03	138	−58	(39)	(01+0*3*)
0·3±0·2	2·2±0·2	I E 15·5^{m}	134	−43		
0·8±0·1	4·7±0·3	III	138	−53		01+0*5*
0·8±0·1	5·5±0·4	III	142	−57		01+0*6*
1·0±0·1	5·0±0·3	III	140	−55	44	01+0*7*

TABLE 1

Catalogue Number	Position (1950·0)		Annual Precession		Flux Density (10⁻²⁶ W m⁻² (c/s)⁻¹)				
	R.A. h m s	Dec. ° ′	Δα s	Δδ ″	$S_{85\cdot5}$	S_{178}	S_{408}	S_{1410}	S_{2650}
0132+07	01 32 39	+07 56·2	3·14	18·4	15		6·8	2·4	1·3
0134+09	01 34 41	+09 13·7	3·16	18·4			2·0	1·1	0·5
0138+13	01 38 28	+13 38·3	3·20	18·2		12·4	7·4	2·8	1·6
0146+06	01 46 08	+06 06·3	3·13	17·9	19		3·4	0·8	0·4
0146+00	01 46 16	+00 07·2	3·07	17·9			2·6	(0·5)	(0·5)
0150+00	01 50 15	+00 07·3	3·07	17·8			1·9	0·5	0·3
0153+03	01 53 11	+03 17·4	3·10	17·7	27		(5·9)	1·0	0·6
0153+05	01 53 43	+05 21·8	3·13	17·6			1·8	1·0	0·4
0157+01	01 57 38	+01 10·3	3·08	17·5	16		4·5	0·6	0·4
0158+18	01 58 53	+18 22·0	3·29	17·4			1·6	1·1	0·6
0200+19	02 00 43	+19 36·6	3·31	17·3			2·2	0·7	0·4
0202+14	02 02 06	+14 59·5	3·25	17·3			4·4	3·6	3·0
0203+05	02 03 22	+05 12·4	3·13	17·2			1·2	<0·5	<0·2
0204+06	02 04 23	+06 44·5	3·15	17·2			3·0	1·4	1·0
0206+16	02 06 59	+16 49·3	3·26	17·0			1·9	(<0·5)	(0·2)
0207+09	02 07 04	+09 36·0	3·19	17·0	23		2·6	1·2	0·8
0207+15	02 07 28	+15 18·0	3·26	17·0			2·1	0·9	0·6
0209+07	02 09 47	+07 08·8	3·16	16·9			(3·2)	0·5	0·3
0210+05	02 10 55	+05 33·5	3·14	16·9			3·5	0·6	0·5
0211+12	02 11 03	+12 05·6	3·22	16·9			1·8	<0·5	0·2
0211+02	02 11 07	+02 47·8	3·10	16·9	24		4·5	0·7	0·2
0213+17	02 13 52	+17 52·6	3·31	16·7			2·1	0·7	0·5
0214+10	02 14 24	+10 51·1	3·21	16·7			2·3	1·3	0·7
0215+02	02 15 50	+02 44·1	3·10	16·6			3·5	0·7	0·3
0216+13	02 16 29	+13 28·2	3·20	16·5			1·6	0·5	0·3
0217+01	02 17 29	+01 41·1	3·09	16·5			2·5	0·5	0·4
0218+11	02 18 06	+11 06·6	3·22	16·5			(5·1)	1·4	0·8
0219+08	02 19 15	+08 14·1	3·18	16·5	24		4·7	2·4	1·6
0226+08	02 26 41	+08 37·5	3·19	16·1			1·4	0·6	0·3
0229+13	02 29 05	+13 09·9	3·26	15·9			(2·3)	1·2	1·4
0235+09	02 35 46	+09 59·3	3·22	15·6			2·6	1·3	(0·4)
0236+02	02 36 03	+02 19·3	3·10	15·6			3·0	0·5	<0·2
0237+09	02 37 43	+09 44·6	3·21	15·5			(1·1)	<0·5	0·3
0238+08	02 38 25	+08 31·1	3·20	15·5			3·1	1·3	0·8
0239+12	02 39 12	+12 37·3	3·26	15·4			3·3	0·7	0·3
0248+05	02 48 22	+05 58·2	3·16	14·9			3·4	1·3	0·6
0249+15	02 49 02	+15 37·7	3·26	14·8			1·8	0·7	0·4
0249+08	02 49 31	+08 14·1	3·20	14·8			3·5	1·2	0·4
0250+00	02 50 42	+00 47·0	3·24	14·7	10		2·2	0·5	0·2
0251+18	02 51 00	+18 52·6	3·39	14·7			1·5	0·6	0·4
0251+20	02 51 03	+20 02·8	3·40	14·7			(1·4)	0·8	0·5
0252+02	02 52 35	+02 43·3	3·11	14·6			2·4	0·8	0·5
0253+13	02 53 44	+13 22·4	3·29	14·6			(1·5)	0·6	0·6
0254+09	02 54 00	+09 16·3	3·22	14·5			3·0	1·7	0·7
0255+05	02 55 04	+05 50·7	3·16	14·5	51	25	16·2	5·9	3·3

(*Continued*)

Spectrum		Remarks	Galactic Coordinates		Other Catalogue Numbers	
Index	S_{400}		l^{II} °	b^{II} °	3C	MSH
0·8±0·1	5·9±0·4	III	141	−53		01+0*8*
0·9±0·3	2·9±0·4	III	141	−52		
0·8±0·1	7·3±0·4	III	141	−47	49	
1·1±0·1	3·4±0·4	III	148	−54		01+0*11*
—		III resolved at 2650	152	−59		
1·0±0·3	1·8±0·4		154	−59		
1·1±0·1	4·7±0·5	III	152	−56		01+0*13*
1·0±0·3	2·9±0·4	I E 13·2^{m} NGC 741/742	153	−53		
1·1±0·1	3·3±0·4	III MSH flux low	156	−57		01+0*14*
0·7±0·3	2·4±0·3	III	145	−41		
0·9±0·3	2·2±0·4	III	145	−40		
0·2±0·1	4·6±0·3	III	148	−44		
—		II	155	−53		
0·6±0·2	2·9±0·3	III	154	−51		
—		ext. at 1410	148	−42		
1·0±0·1	4·6±0·4	II	153	−48		02+0*2*
0·7±0·3	2·1±0·3	III	149	−43		
0·8±0·6	1·4±0·3	III	155	−50		
1·0±0·2	3·1±0·5	III	157	−52		
1·2±0·3	1·8±0·5	III	152	−46		
1·3±0·1	3·5±0·4		159	−54		02+0*3*
0·7±0·3	1·9±0·3		150	−40		
0·7±0·2	3·0±0·3	III	154	−47		
1·3±0·2	3·6±0·6	III	161	−53		
0·9±0·4	1·6±0·3		153	−44		
0·9±0·3	2·2±0·4	II	163	−54		
0·9±0·3	4·3±0·4	III	155	−46		
0·8±0·1	6·4±0·4	III	158	−48	64	02+0*5*
0·9±0·4	1·7±0·3	III	160	−47		
−0·2±0·3	0·9±0·1	III	157	−42		
0·6±0·3	2·6±0·4	III ext.	161	−45		
1·4±0·4	3·1±0·7	III	168	−51		
—			162	−44		
0·7±0·2	3·2±0·4	I db. 14·8^{m} NGC 1044	163	−45		
1·3±0·2	3·4±0·6	III	160	−42		
1·0±0·2	4·0±0·5	III	168	−46		
0·8±0·3	1·9±0·3		161	−38		
1·2±0·2	4·4±0·6	III	167	−44		
1·1±0·1	1·9±0·3	III	174	−49		02+0*8*
0·7±0·4	1·5±0·3	III (QSO)	159	−35		
0·7±0·4	2·0±0·3		158	−34	(74)	
0·8±0·3	2·3±0·3	III (QSO)	173	−48		
0·0±0·5	0·6±0·1	III	164	−39		
0·9±0·2	4·5±0·5	III	167	−42		
0·8±0·0	15·4±0·6	I db. 13^{m}	170	−45	75	02+0*10*

TABLE 1

Catalogue Number	Position (1950·0)		Annual Precession		Flux Density (10^{-26} W m^{-2} (c/s)$^{-1}$)				
	R.A. h m s	Dec. ° ′	Δα s	Δδ ″	$S_{85\cdot5}$	S_{178}	S_{408}	S_{1410}	S_{2650}
0255+13	02 55 49	+13 22·1	3·29	14·4			(1·8)	0·5	0·3
0259+01	02 59 05	+01 43·3	3·10	14·2	27		4·1	<0·5	<0·2
0259+07	02 59 11	+07 14·3	3·20	14·2			3·4	0·7	0·4
0300+16	03 00 24	+16 14·8	3·34	14·1		10·2	5·8	3·2	1·9
0305+03	03 05 49	+03 54·9	3·13	13·8	34	16·2	15·0	7·6	5·1
0307+16	03 07 08	+16 55·0	3·36	13·7		26	14·3	5·3	2·5
0312+10	03 12 42	+10 02·0	3·24	13·4			3·3	1·5	0·9
0312+06	03 12 52	+06 57·5	3·19	13·4			1·6	0·5	0·2
0316+16	03 16 06	+16 16·9	3·36	13·1		8·0	8·4	8·2	4·3
0317+02	03 17 03	+02 25·6	3·11	13·1			1·7	0·7	<0·2
0319+12	03 19 07	+12 10·3	3·29	12·9			(2·9)	2·0	1·6
0319+17	03 19 26	+17 39·1	3·39	12·9			3·5	1·2	0·5
0320+11	03 20 33	+11 55·6	3·49	12·9			(2·2)	0·6	0·3
0320+05	03 20 42	+05 23·1	3·18	12·8			6·9	2·9	1·7
0324+11	03 24 40	+11 58·1	3·14	12·6			3·8	1·1	0·6
0325+02	03 25 20	+02 23·5	3·11	12·5	41	17·5	10·9	4·7	2·9
0325+17	03 25 21	+17 58·7	3·41	12·5			3·4	0·5	0·3
0329+16	03 29 22	+16 59·5	3·39	12·2			1·6	0·6	0·2
0333+12	03 33 43	+12 53·2	3·31	11·9			4·1	2·3	1·2
0338+07	03 38 14	+07 26·0	3·21	11·6			3·8	1·4	0·7
0340+04	03 40 53	+04 48·4	3·16	11·4	35	10·3	8·1	2·5	1·6
0341+06	03 41 15	+06 30·5	3·19	11·4			2·3	0·5	0·3
0342+15	03 42 26	+15 18·5	3·37	11·3			1·8	0·6	<0·2
0345+17	03 45 09	+17 39·0	3·23	11·1			(2·0)	0·6	0·3
0345+16	03 45 20	+16 57·0	3·41	11·1			(1·1)	<0·5	0·2
0347+05	03 47 08	+05 43·0	3·18	11·0	15		9·0	3·3	2·0
0347+13	03 47 12	+13 11·0	3·33	11·0			2·8	0·5	<0·2
0348+17·1	03 48 18	+17 03·0	3·41	10·9			(2·5)	0·7	0·5
0348+17·6	03 48 22	+17 34·6	3·41	10·9			(2·0)	<0·5	<0·2
0349+18	03 49 29	+18 32·8	3·44	10·8			3·0	0·5	0·3
0351+01	03 51 28	+01 19·1	3·09	10·7			2·1	0·6	0·3
0353+12	03 53 00	+12 23·6	3·32	10·5			3·4	0·9	0·4
0353+18	03 53 41	+18 53·6	3·46	10·5			2·7	0·9	0·5
0356+14	03 56 12	+14 28·2	3·36	10·3			3·7	1·2	0·8
0356+10	03 56 15	+10 17·7	3·28	10·3		44	27·5	10·8	(5·8)
0358+00	03 58 36	+00 28·8	3·08	10·1	19	11	5·5	1·6	1·1
0359+19	03 59 19	+19 20·9	3·47	10·0			2·0	0·8	0·5
0401+15	04 01 10	+15 54·2	3·40	9·9			3·3	(0·8)	(0·5)
0404+03	04 04 43	+03 33·7	3·14	9·7	37	16·2	11·7	5·1	3·5
0408+07	04 08 34	+07 00·4	3·21	9·4			2·7	1·6	1·0
0408+17	04 08 47	+17 05·4	3·43	9·3			3·2	0·9	0·6
0410+11	04 10 55	+11 04·9	3·30	9·2		21	11·7	3·9	2·5
0411+14	04 11 41	+14 08·7	3·37	9·1			5·0	2·0	1·5
0411+05	04 11 50	+05 27·0	3·18	9·1	9		4·2	1·9	1·1
0417+17	04 17 23	+17 46·0	3·45	8·7		10·8	2·8	0·8	0·5

(*Continued*)

Spectrum		Remarks	Galactic Coordinates		Other Catalogue Numbers	
Index	S_{400}		l^{II} °	b^{II} °	3C	MSH
0·8±0·6	1·4±0·3	I SO? ∼17^m	164	−39		
1·2±0·2	4·2±0·6	II	175	−47		02+0*11*
1·1±0·2	3·3±0·5		170	−43		
0·6±0·1	6·5±0·4	I E 15·5^m	163	−36	76·1	
0·5±0·0	14·4±0·5	I SO 13^m NGC 1218 P 2·5%	175	−45	78	03+0*3*
0·9±0·1	14·6±0·7	III P 7%	164	−34	79	
0·7±0·2	3·6±0·4	III	171	−39		
1·1±0·4	1·9±0·5	III	174	−41		
C		III P < 1% CTA 21	167	−34		
0·7±0·5	1·7±0·4	III	179	−44		
0·4±0·2	3·1±0·2	III S_{408} incl. 0320+11	171	−36		
1·1±0·2	4·1±0·5	III	166	−32	85	
1·1±0·5	2·4±0·4	S_{408} incl. 0319+12	171	−36		
0·8±0·1	7·2±0·5	II	177	−41		
1·0±0·2	3·8±0·5	III	172	−35		
0·7±0·0	11·7±0·5	I E 15·5^m	181	−42	88	03+0*5*
1·3±0·2	3·3±0·6	III	167	−31		
1·2±0·4	2·2±0·5	III	169	−31		
0·7±0·2	5·2±0·4	III	173	−33	90	
0·9±0·2	4·2±0·5	III	179	−36		
0·9±0·0	8·0±0·4	III QSO 18·1^m 3C flux low	182	−38	93	03+0*8*
1·1±0·3	2·2±0·4	III	180	−36		
0·9±0·5	1·8±0·4	II	173	−30		
1·1±0·5	2·4±0·4		172	−28		
—		III	172	−28		
0·7±0·1	7·6±0·4	III MSH flux low	182	−36		03+0*10*
1·4±0·4	2·9±0·7	III QSO	176	−31		
0·5±0·4	1·4±0·2	II S_{408} incl. uncat. source	173	−28		
—			172	−27		
1·2±0·3	2·9±0·6	III	172	−27		
1·0±0·3	2·2±0·4	III	187	−38		
1·1±0·2	3·6±0·5	III	177	−31		
0·9±0·2	2·8±0·4	III	172	−26		
0·8±0·2	3·5±0·4	III	176	−28	96	
0·7±0·1	26·8±1·5	I E 16^m ext. in δ	180	−31	98	
0·8±0·1	5·2±0·3	III–IV P 6%	190	−37	99	03+0*12*
0·7±0·3	2·0±0·3	I E 17^m	173	−24		
—		III resolved at 2650	176	−26		
0·7±0·0	11·9±0·5	III	188	−34	105	04+0*3*
0·6±0·2	3·2±0·3	III	185	−31	106	
0·9±0·2	3·0±0·4	III	176	−24		
0·8±0·1	11·3±0·6	III–IV	182	−28	109	
0·6±0·1	4·7±0·4	IV	179	−26		
0·7±0·1	4·0±0·3	III	187	−31		04+0*4*
1·1±0·1	3·7±0·4	III–IV	177	−22	114	

TABLE 1

Catalogue Number	Position (1950·0)		Annual Precession		Flux Density (10^{-26} W m^{-2} (c/s)$^{-1}$)				
	R.A. h m s	Dec. ° ′	Δα s	Δδ ″	$S_{85 \cdot 5}$	S_{178}	S_{408}	S_{1410}	S_{2650}
0417+10	04 17 32	+10 39·6	3·29	8·7			1·6	0·7	
0417+15	04 17 33	+15 08·8	3·39	8·7			3·3	1·1	0·8
0418+14	04 18 59	+14 38·7	3·38	8·6			3·2	1·1	
0419+14	04 19 40	+14 01·7	3·37	8·5			(4·3)	(<0·5)	
0421+00	04 21 16	+00 23·8	3·08	8·4	(14)		(4·8)	1·7	1·1
0422+00	04 22 14	+00 30·7	3·07	8·3	(14)		(4·8)	1·4	1·3
0422+17	04 22 30	+17 49·9	3·46	8·3			2·5	0·7	0·4
0422+08	04 22 58	+08 27·4	3·25	8·2			1·9	1·5	0·8
0423+04	04 23 40	+04 45·0	3·17	8·2	13		3·9	1·2	0·5
0425+17	04 25 00	+17 46·0	3·46	8·1			1·8	1·1	0·9
0428+01	04 28 31	+01 06·5	3·09	7·9	20		6·8	1·4	0·9
0430+05	04 30 34	+05 15·0	3·18	7·6			5·5	4·4	3·0
0432+04	04 32 37	+04 28·9	3·17	7·5			2·1	1·2	0·6
0432+03	04 32 55	+03 29·8	3·14	7·4	25		2·4	(1·1)	(0·2)
0439+01	04 39 25	+01 15·9	3·10	6·9	14	(10·3)	4·4	1·0	0·6
0442+02	04 42 03	+02 41·9	3·13	6·7	30		(3·5)	1·0	0·5
0442+15	04 42 32	+15 04·5	3·41	6·6			3·5	0·5	<0·2
0443+02	04 43 42	+02 53·7	3·13	6·6			(0·9)	0·5	
0444+17	04 44 12	+17 06·9	3·46	6·5			(2·9)	0·7	0·3
0446+17	04 46 15	+17 36·0	3·47	6·3			(1·9)	0·6	0·3
0446+11	04 46 19	+11 18·3	3·32	6·3			2·6	1·3	(0·6)
0452+10	04 52 20	+10 04·4	3·30	5·8			2·8	0·6	0·3
0454+06	04 54 24	+06 40·0	3·22	5·7	13		2·7	0·8	0·8
0458+01	04 58 08	+01 26·5	3·10	5·3	15		3·4	0·8	0·6
0505+03	05 05 01	+03 03·0	3·14	4·8			3·0	1·0	0·7
0507+17	05 07 07	+17 57·7	3·49	4·6			1·7	0·6	0·5
0510+12	05 10 57	+12 20·7	3·35	4·3			3·1	0·7	0·3
0511+05	05 11 26	+05 22·8	3·19	4·2			1·2	0·9	0·5
0511+00	05 11 31	+00 53·6	3·09	4·2	38	17·5	8·0	3·0	1·6
0514+10	05 14 05	+10 53·3	3·32	4·0			3·3	1·1	0·7
0514+14	05 14 53	+14 06·6	3·40	3·9			1·7	0·6	<0·2
0517+14	05 17 55	+14 06·5	3·40	3·7			1·5	0·5	0·4
0518+16	05 18 19	+16 35·7	3·46	3·6		20	17·5	9·3	7·1
0519+01	05 19 44	+01 10·6	3·10	3·5			2·0	0·8	0·5
0520+17	05 20 59	+17 23·2	3·48	3·4			2·4	0·7	0·4
0521+07	05 21 39	+07 47·0	3·25	3·3			2·3	0·9	0·6
0523+11	05 23 39	+11 38·6	3·34	3·2			3·1	1·0	0·5
0527+08	05 27 00	+08 57·3	3·28	2·9			2·8	1·0	0·5
0528+06	05 28 51	+06 27·9	3·22	2·7	30	19·5	10·3	3·2	1·6
0530+04	05 30 27	+04 04·0	3·16	2·6			5·1	2·1	1·2
0531+09	05 31 42	+09 39·1	3·29	2·5			(5·5)	0·9	0·4
0531+05	05 31 59	+05 04·1	3·19	2·4			4·0	0·6	0·3
0532+10	05 32 04	+10 02·4	3·30	2·4			(5·5)	0·9	0·6
0534+08	05 34 03	+08 46·6	3·27	2·3			1·7	0·9	0·5
0534+04	05 34 51	+04 09·3	3·16	2·2			2·5	0·6	<0·2

(*Continued*)

Spectrum		Remarks	Galactic Coordinates		Other Catalogue Numbers	
Index	S_{400}		l^{II} °	b^{II} °	3C	MSH
0·7±0·5	1·6±0·4		183	−27	(113)	
0·7±0·2	3·0±0·3	III	179	−24		
0·9±0·3	3·3±0·5		180	−24		
—		ext. in α at 1410	181	−24		
0·7±0·3	4·1±0·3	III S_{408} incl. 0422+00	194	−32		(04+05)
0·1±0·3	1·6±0·1	III S_{408} incl. 0421+00	194	−32		(04+05)
1·0±0·3	2·5±0·4		178	−21		
0·7±0·3	3·2±0·3	II	186	−27		
1·0±0·1	3·5±0·3	III	190	−29		04+06
0·3±0·3	1·7±0·2	III	179	−21		
1·0±0·1	5·4±0·4	III	194	−30	118	04+07
C		I blue gal. 17^m	190	−27	(120)	
0·8±0·3	2·9±0·4	III	191	−27		
1·5±0·3	2·5±0·4	resolved at 2650	192	−28		04+08
1·0±0·1	3·8±0·3	III	196	−28	124	0, S1
1·2±0·1	4·7±0·6		195	−26	(126)	04+010
1·6±0·3	3·6±0·8	III	184	−19		
			195	−26	(126)	
1·3±0·5	3·8±0·6	III–IV possibly ext.	182	−18		
1·1±0·5	2·4±0·4	III–IV	182	−17		
0·9±0·2	3·5±0·4	III ext. in δ	187	−21		
1·2±0·3	2·8±0·5	III	189	−20		
C		III	193	−22		04+012
0·9±0·1	3·3±0·3	III	198	−24		04+014
0·7±0·2	2·8±0·3	II	198	−21		
0·6±0·3	1·4±0·2	III	185	−13		
1·2±0·2	3·2±0·6	III possibly ext.	190	−15		
0·7±0·4	2·0±0·3	III	196	−19		
0·9±0·0	8·9±0·4	II P 1·5%	200	−21	135	05+02
0·8±0·2	3·2±0·4	III	192	−15		
0·8±0·5	1·7±0·4	III	189	−13		
0·6±0·4	1·3±0·2	III	189	−13		
0·4±0·1	16·5±0·7	III QSO P 8%	187	−11	138	
0·7±0·3	2·0±0·3	III	201	−19		
0·9±0·3	2·4±0·4	III	187	−10		
0·7±0·3	2·2±0·3	III–IV	196	−15		
1·0±0·2	3·4±0·5	III–IV	192	−13	(140)	
0·9±0·2	3·1±0·4	III–IV	195	−14		
0·9±0·0	9·2±0·4	III–IV	198	−15	142·1	05+05
0·8±0·1	5·4±0·5	III	200	−15		
1·3±0·4	4·5±0·6	III–IV S_{408} incl. 0532+10	195	−12		
1·4±0·2	4·0±0·7	III–IV	199	−15		
0·6±0·4	2·0±0·2	III–IV S_{408} incl. 0531+09	195	−12		
0·7±0·3	2·1±0·3	III–IV	196	−12		
1·2±0·4	2·6±0·6	III–IV	200	−14		

TABLE 1

Catalogue Number	Position (1950·0)		Annual Precession		Flux Density (10^{-26} W m^{-2} $(c/s)^{-1}$)				
	R.A. h m s	Dec. ° ′	Δα s	Δδ ″	$S_{85\cdot5}$	S_{178}	S_{408}	S_{1410}	S_{2650}
0549+00	05 49 40	+00 32·1	3·08	0·9			8·3	(0·7)	(<0·2)
0558+02	05 58 59	+02 29·8	3·13	0·1			(2·6)	0·6	0·4
0706+19	07 06 39	+19 59·3	3·53	−5·7			2·0	0·8	0·4
0707+09	07 07 47	+09 23·7	3·28	−5·8			2·5	1·0	0·5
0710+11	07 10 12	+11 52·1	3·34	−6·0		17·2	8·6	2·7	1·3
0711+14	07 11 11	+14 42·3	3·40	−6·1		12·4	5·2	2·0	1·1
0717+17	07 17 30	+17 03·5	3·46	−6·6			2·7	0·8	0·4
0717+15	07 17 31	+15 02·6	3·41	−6·7			1·8	0·5	0·4
0721+19	07 21 10	+19 12·0	3·50	−7·0			3·0	1·4	0·6
0721+15	07 21 33	+15 18·3	3·41	−7·0		(10·3)	3·9	1·2	0·6
0721+16	07 21 54	+16 07·1	3·43	−7·0		(10·3)	4·0	1·5	0·8
0722+12	07 22 41	+12 42·6	3·35	−7·1			3·3	0·6	0·3
0723+10	07 23 09	+10 37·7	3·30	−7·1			3·4	1·3	0·6
0725+14	07 25 19	+14 44·0	3·39	−7·3		14·0	6·3	2·1	1·1
0725+12	07 25 46	+12 17·5	3·34	−7·3			3·4	0·7	0·6
0727+15	07 27 43	+15 20·8	3·41	−7·5			2·3	1·7	0·9
0727+17	07 27 49	+17 45·8	3·47	−7·5			2·8	0·6	0·3
0731+02	07 31 16	+02 09·9	3·11	−7·8	21		4·6	1·2	0·5
0732+18	07 32 07	+18 15·0	3·48	−7·8			2·0	0·8	0·4
0733+07	07 33 15	+07 44·1	3·23	−7·9			(2·4)	0·6	0·3
0735+07	07 35 00	+07 40·4	3·23	−8·1			(3·3)	0·4	0·3
0735+17	07 35 14	+17 48·9	3·46	−8·1			1·3	2·6	2·0
0736+01	07 36 37	+01 44·3	3·11	−8·1			2·9	2·9	2·0
0737+07	07 37 21	+07 35·2	3·23	−8·3			(1·9)	0·4	0·2
0742+02	07 42 27	+02 07·3	3·11	−8·7	36	11·9	5·2	1·4	0·7
0748+16	07 48 10	+16 29·0	3·42	−9·1			2·7	0·7	0·4
0748+18	07 48 59	+18 46·7	3·42	−9·2			2·5	0·9	0·5
0753+02	07 53 10	+02 19·0	3·12	−9·5			2·9	0·9	0·5
0758+14	07 58 48	+14 23·2	3·37	−9·9		11·9	9·5	2·7	1·2
0801+17	08 01 25	+17 30·5	3·43	−10·1			1·7	0·6	0·4
0802+10	08 02 02	+10 25·0	3·28	−10·2		11·3	7·7	2·0	0·8
0802+16	08 02 12	+16 22·6	3·41	−10·2			4·0	0·7	0·4
0812+13	08 12 01	+13 07·6	3·33	−10·9			4·8	1·7	1·0
0812+02	08 12 51	+02 04·8	3·11	−11·0	22		6·0	2·0	1·0
0817+18	08 17 51	+18 22·2	3·43	−11·3			(5·2)	1·0	0·6
0818+17	08 18 54	+17 58·3	3·42	−11·4			(5·2)	1·9	1·3
0819+06	08 19 53	+06 06·9	3·19	−11·5	60	17·8	6·6	2·3	(0·8)
0826+09	08 26 51	+09 34·6	3·25	−12·0			3·4	0·9	0·4
0827+07	08 27 26	+07 54·5	3·22	−12·0			4·4	1·3	0·8
0829+18	08 29 28	+18 42·1	3·43	−12·2			1·9	1·1	0·8
0830+11	08 30 40	+11 39·3	3·29	−12·2			4·1	1·1	(0·2)
0831+17·5	08 31 20	+17 27·0	3·40	−12·3			(5·9)	(0·4)	0·2
0831+17·2	08 31 56	+17 11·7	3·39	−12·3			(5·9)	(1·9)	1·1
0832+14	08 32 18	+14 22·0	3·34	−12·4			5·8	1·0	(0·4)
0838+13	08 38 00	+13 24·9	3·31	−12·7		10·8	7·3	2·6	1·8

(*Continued*)

Spectrum		Remarks	Galactic Coordinates		Other Catalogue Numbers	
Index	S_{400}		l^{II} °	b^{II} °	3C	MSH
—		IV ext. > 20′ in α and δ at 1410	206	−13		
0·6±0·5	1·3±0·2	III–IV	205	−10		
0·9±0·3	2·3±0·4		197	13		
0·9±0·3	2·9±0·4		207	08		
1·0±0·1	8·6±0·5		205	10	175	
0·9±0·1	5·8±0·4		202	12	175·1	
1·0±0·3	2·8±0·4		201	14	176	
0·7±0·3	1·5±0·3		203	13		
0·9±0·2	4·0±0·5		199	16		
1·0±0·2	4·1±0·5		203	14	(177)	
0·9±0·2	4·3±0·4		202	14	(177)	
1·3±0·2	3·3±0·6		205	13		
1·0±0·2	4·0±0·5		207	12		
0·9±0·1	6·6±0·4		204	15	181	
0·9±0·2	2·9±0·4		206	14		
0·7±0·2	3·6±0·4		203	15		
1·2±0·3	2·8±0·5		201	16		
1·2±0·2	5·0±0·6		216	10		07+03
0·9±0·3	2·3±0·4		201	18		
1·1±0·5	2·4±0·4	III	211	13		
0·5±0·7	0·7±0·1		211	14		
C			202	18		
0·4±0·2	4·2±0·3		217	11		
1·1±0·8	1·6±0·4	III	212	14		
1·1±0·0	5·8±0·4		217	13	187	07+04
1·0±0·3	2·6±0·4		204	20		
0·9±0·3	2·6±0·4	III	202	21		
0·9±0·2	2·9±0·4		218	15	(188)	
1·0±0·1	8·7±0·5	3C flux low	208	22	190	
0·7±0·3	1·6±0·3		205	24		
1·1±0·1	7·1±0·5	III QSO	212	21	191	
1·2±0·2	3·9±0·6		206	23		
0·8±0·2	4·9±0·5		210	24		
0·9±0·1	5·8±0·4	III QSO	221	20		08+02
0·8±0·4	2·8±0·3	S_{408} incl. 0818+17	206	28		
0·6±0·2	4·1±0·3	S_{408} incl. 0817+18	206	28		
1·1±0·1	9·0±0·6	I 17·5^{m} ext. in δ	218	23	198	08+03
1·1±0·2	3·6±0·5		216	26		
0·9±0·2	4·3±0·5		217	25		
0·5±0·3	2·0±0·2		206	30		
1·1±0·2	4·2±0·6	possibly ext.	214	28		
—		S_{408} incl. 0831+17·2	208	30	201	
—		S_{408} incl. 0831+17·5	208	30	202	
1·4±0·2	6·0±0·8	ext.	211	29		
0·7±0·1	6·7±0·4		213	30	207	

TABLE 1

Catalogue Number	Position (1950·0)		Annual Precession		Flux Density (10^{-26} W m^{-2} (c/s)$^{-1}$)				
	R.A. h m s	Dec. ° ′	Δα s	Δδ ″	$S_{85\cdot5}$	S_{178}	S_{408}	S_{1410}	S_{2650}
0840+07	08 40 16	+07 33·0	3·20	−12·9	14		3·1	0·7	0·3
0841+15	08 41 06	+15 59·7	3·36	−13·0			3·9	0·9	0·3
0845+09	08 45 27	+09 51·0	3·24	−13·2			(2·2)	0·5	0·5
0845+06	08 45 58	+06 05·9	3·17	−13·4			3·9	1·1	0·7
0846+10	08 46 54	+10 00·2	3·24	−13·3			(2·3)	0·6	0·4
0850+14	08 50 24	+14 04·1	3·31	−13·6		17·3	(10·0)	2·6	1·2
0851+14	08 51 56	+14 16·5	3·32	−13·7		13·5	(10·1)	2·2	1·5
0853+03	08 53 00	+03 24·4	3·13	−13·7			2·6	0·7	0·4
0853+06	08 53 40	+06 46·2	3·18	−13·8			3·0	0·8	(0·2)
0854+09	08 54 37	+09 59·4	3·24	−13·8	14		3·9	1·0	0·4
0855+14	08 55 56	+14 21·0	3·31	−13·9		16·7	7·0	2·6	1·7
0858+18	08 58 05	+18 45·0	3·39	−14·1			4·1	1·2	0·7
0900+12	09 00 53	+12 42·3	3·28	−14·2			(3·1)	0·6	<0·2
0901+13	09 01 13	+13 12·3	3·29	−14·2			(3·1)	<0·5	<0·2
0903+11	09 03 20	+11 16·2	3·25	−14·4			2·4	0·6	0·5
0903+08	09 03 30	+08 55·4	3·21	−14·4			2·2	0·7	0·3
0903+16	09 03 44	+16 58·2	3·35	−14·4		10·8	4·6	1·4	0·9
0905+04	09 05 17	+04 26·8	3·14	−14·5			2·9	0·6	0·3
0906+01	09 06 27	+01 33·7	3·09	−14·6			2·6	1·3	1·2
0907+18	09 07 09	+18 36·4	3·38	−14·6			4·2	0·9	0·4
0909+16	09 09 14	+16 30·6	3·34	−14·7			4·6	1·1	0·8
0909+08	09 09 30	+08 23·8	3·37	−14·7	13		2·3	0·8	0·4
0911+17	09 11 15	+17 28·4	3·35	−14·9			5·4	1·3	0·8
0914+11	09 14 43	+11 27·0	3·25	−15·1			3·3	1·3	(0·3)
0915+05	09 15 04	+05 35·0	3·15	−15·1			1·6	0·7	(0·4)
0917+18	09 17 25	+18 06·1	3·35	−15·2			2·9	1·0	0·6
0919+08	09 19 25	+08 41·7	3·20	−15·3			2·2	0·5	0·2
0922+06	09 22 13	+06 22·4	3·16	−15·5			2·3	0·5	<0·2
0922+14	09 22 22	+14 57·6	3·29	−15·5			2·8	0·7	0·4
0927+02	09 27 47	+02 01·3	3·10	−15·8			2·6	0·7	0·3
0932+02	09 32 43	+02 16·1	3·10	−16·0	14		3·1	0·8	0·5
0933+04	09 33 51	+04 36·9	3·13	−16·1	24	9·7	5·1	0·9	0·3
0936+02	09 36 42	+02 12·4	3·10	−16·3			2·3	0·8	0·3
0939+14	09 39 30	+14 01·2	3·26	−16·4		27	13·0	4·0	1·8
0940+02	09 40 39	+02 58·3	3·11	−16·5			2·6	1·1	0·7
0940+00	09 40 45	+00 09·2	3·07	−16·5			2·8	1·2	0·7
0941+10	09 41 34	+10 00·0	3·20	−16·5	32	14·6	8·7	2·3	1·0
0942+17	09 42 27	+17 09·6	3·30	−16·5			2·6	1·0	0·7
0945+07	09 45 06	+07 39·9	3·17	−16·7	89	30·0	22·1	7·8	4·3
0947+14	09 47 26	+14 33·8	3·26	−16·8		17·3	10·4	3·5	1·8
0949+00	09 49 26	+00 11·8	3·07	−16·9	(36)	23	(12·0)	(3·2)	1·5
0950+00	09 50 13	+00 14·4	3·07	−16·9	(36)		(12·0)	(3·2)	0·5
0955+03	09 55 33	+03 39·7	3·11	−17·2	18		4·4	0·9	0·4
0957+00	09 57 42	+00 19·5	3·07	−17·3			3·1	1·0	0·6
0957+14	09 57 49	+14 15·3	3·24	−17·3			3·1	1·3	0·7

(*Continued*)

Spectrum		Remarks	Galactic Coordinates		Other Catalogue Numbers	
Index	S_{400}		l^{II} °	b^{II} °	3C	MSH
1·1±0·1	2·7±0·3		219	28		08+07
1·4±0·2	4·3±0·7		211	32		
0·0±0·6	0·5±0·1	S_{408} incl. 0846+10	218	30		
0·9±0·2	3·7±0·4		221	29		
0·6±0·5	1·3±0·2	III S_{408} incl. 0845+09	218	31		
1·0±0·1	8·4±0·7	QSO 17·4^m S_{408} incl. 0851+14	214	33	208	
0·8±0·1	6·5±0·5	S_{408} incl. 0850+14	214	34	208·1	
1·0±0·3	2·6±0·4		225	29		
1·1±0·3	3·1±0·6	ext. in α	222	31		
1·0±0·1	3·3±0·3		219	32		08+09
0·8±0·1	7·6±0·4	P < 1%	214	35	212	
0·9±0·2	4·1±0·5		209	37	(213)	
—		III S_{408} incl. 0901+13	216	35		
—		III S_{408} incl. 0900+12	216	35		
0·8±0·3	2·0±0·3	II	218	35		
1·1±0·3	2·5±0·5	III	221	34	(214)	
0·9±0·1	4·7±0·4	III (QSO)	212	37	215	
1·2±0·3	2·9±0·5	III	226	32		
0·3±0·2	2·2±0·2	III	229	31		
1·3±0·2	4·3±0·6	III	210	39		
0·9±0·2	4·2±0·5	III	213	38		
1·0±0·1	2·7±0·3	III (QSO) possibly ext.	222	35		09+01
1·0±0·2	5·2±0·5	III	212	39		
0·8±0·3	3·3±0·5	III ext.	220	37		
0·7±0·5	1·6±0·4	III ext.	226	35		
0·8±0·2	2·9±0·4	II	212	41		
1·3±0·3	2·4±0·6	III	223	37		
1·2±0·4	2·4±0·6	III	226	37		
1·0±0·2	2·7±0·4	III QSO	217	41		
1·2±0·3	2·8±0·5	III possibly ext.	232	36		
1·0±0·1	3·0±0·3	II	232	37		09+04
1·2±0·1	3·9±0·4	III	230	38	222	09+03
1·1±0·3	2·8±0·5	III	233	38		
1·0±0·1	13·2±0·7	III	220	44	225	
0·7±0·2	2·7±0·3	II	233	39		
0·8±0·2	3·0±0·4	III (QSO)	236	37		
1·0±0·0	7·5±0·4	III	225	43	226	09+05
0·7±0·2	2·5±0·3	III	216	46		
0·8±0·0	21·8±0·8	I gal. ~ 16·5^m	229	42	227	09+07
0·9±0·1	10·1±0·5	III (QSO)	220	46	228	
1·0±0·1	10·1±0·8	III (QSO) S_{408} & S_{1410} incl. 0950+00	238	39	230	(09+08)
—		S_{408} & S_{1410} incl. 0949+00	238	39		(09+08)
1·1±0·1	3·6±0·4	III	235	42		09+010
0·9±0·2	3·1±0·4	III QSO	239	41		
0·8±0·2	3·5±0·4	III	222	48		

TABLE 1

Catalogue Number	Position (1950·0)		Annual Precession		Flux Density (10^{-26} W m^{-2} (c/s)$^{-1}$)				
	R.A. h m s	Dec. ° ′	$\Delta\alpha$ s	$\Delta\delta$ ″	$S_{85\cdot5}$	S_{178}	S_{408}	S_{1410}	S_{2650}
1003+14	10 03 57	+14 36·8	3·24	−17·5			2·2	0·8	0·4
1004+13	10 04 42	+13 03·8	3·22	−17·6			3·3	1·3	0·8
1005+07	10 05 20	+07 46·1	3·16	−17·6	30	26	16·4	6·2	3·5
1008+06	10 08 19	+06 40·0	3·14	−17·7	39	14·0	12·3	3·1	1·3
1011+11	10 11 40	+11 04·9	3·19	−17·8			2·5	1·0	0·5
1017+04	10 17 53	+04 06·7	3·11	−18·1			1·9	0·8	0·5
1022+20	10 22 36	+20 24·5	3·27	−18·3			3·6	1·3	0·5
1023+06	10 23 54	+06 44·4	3·13	−18·3	35		5·2	0·9	0·4
1027+00	10 27 35	+00 51·9	3·08	−18·4			2·1	1·0	0·9
1028+09	10 28 21	+09 14·4	3·15	−18·5			1·6	<0·5	0·2
1031+11	10 31 23	+11 30·0	3·17	−18·6			5·1	1·3	(0·5)
1036+05·5	10 36 39	+05 28·4	3·11	−18·7			(3·3)	(0·4)	0·4
1036+05·9	10 36 54	+05 52·4	3·12	−18·7			(3·3)	0·6	(0·2)
1039+02	10 39 05	+02 57·5	3·09	−18·8	13		7·3	2·8	1·6
1040+12	10 40 04	+12 20·5	3·17	−18·8		10·3	7·6	3·0	2·0
1041+05	10 41 03	+05 53·9	3·11	−18·9			2·9	0·4	0·2
1044+15	10 44 01	+15 59·7	3·19	−19·0			5·4	1·0	0·6
1048+00	10 48 00	+00 14·2	3·07	−19·1	21		3·3	0·8	
1049+08	10 49 45	+08 19·7	3·13	−19·1			2·1	0·6	<0·2
1055+01	10 55 54	+01 52·0	3·08	−19·3	14		5·3	3·8	3·5
1056+09	10 56 59	+09 17·7	3·13	−19·3	19		3·2	0·5	0·3
1101+11	11 01 57	+11 20·3	3·14	−19·4			2·9	0·6	0·3
1105+14	11 05 31	+14 51·0	3·15	−19·5			3·0	1·4	(0·5)
1106+18	11 06 17	+18 53·5	3·17	−19·5			1·6	0·8	0·4
1107+10	11 07 12	+10 59·5	3·13	−19·5			2·0	1·7	0·8
1108+03	11 08 48	+03 25·5	3·09	−19·5	15		4·7	1·2	0·5
1111+11	11 11 57	+11 07·5	3·12	−19·6			3·0	0·8	0·3
1116+12	11 16 18	+12 50·5	3·13	−19·7			5·5	1·9	1·6
1117+14	11 17 53	+14 37·1	3·13	−19·7			5·6	2·1	1·2
1120+05	11 20 35	+05 46·1	3·09	−19·7	19	(9·7)	5·2	1·8	0·8
1122+05	11 22 04	+05 11·9	3·09	−19·8			5·7	1·4	0·5
1122+19	11 22 06	+19 36·0	3·15	−19·8		(9·7)	(2·7)	0·9	
1123+19	11 23 11	+19 53·2	3·15	−19·8			(2·7)	(0·8)	0·2
1123+20	11 23 16	+20 08·2	3·15	−19·8			(2·7)	(0·8)	0·5
1123+12	11 23 57	+12 38·0	3·11	−19·8			(4·2)	1·0	0·6
1126+10	11 26 42	+10 12·1	3·10	−19·8			2·6	0·6	<0·2
1134+01	11 34 53	+01 34·1	3·07	−19·9			3·6	1·1	0·6
1137+12	11 37 57	+12 19·4	3·10	−20·0			3·5	1·6	0·8
1138+01	11 38 37	+01 30·1	3·07	−20·0	15		7·2	2·1	1·6
1138+05	11 38 43	+05 57·3	3·08	−20·0	8		1·8	0·8	0·3
1139+18	11 39 03	+18 50·6	3·11	−20·0			2·5	0·6	0·4
1142+19	11 42 35	+19 53·3	3·11	−20·0		26	19·3	5·5	2·7
1146+05	11 46 17	+05 12·4	3·08	−20·0	11		(3·0)	0·6	0·3
1147+13	11 47 25	+13 03·4	3·08	−20·0		14·5	6·9	2·4	1·0

(Continued)

Spectrum		Remarks	Galactic Coordinates		Other Catalogue Numbers	
Index	S_{400}		l^{II} °	b^{II} °	3C	MSH
0·9±0·3	2·4±0·4	III	223	50		
0·8±0·2	3·4±0·4		225	49		
C		III	232	47	237	10+01
C		III	234	47	238	10+02
0·9±0·3	2·9±0·4	III	229	50		
0·7±0·3	2·0±0·3	III	239	47		
1·1±0·2	4·4±0·5	III	217	56	242	
1·3±0·1	4·8±0·4	III	237	50	243	10+06
0·4±0·3	1·7±0·2	III	245	47		
1·1±0·3	1·6±0·4	III possibly ext.	235	52		
1·1±0·2	5·2±0·6	III ext. in δ	232	54		
—		II S_{408} incl. 1036+05·9	242	52		
—		III S_{408} incl. 1036+05·5 resolved at 2650	241	52		
0·7±0·1	6·3±0·4	III	246	51		10+07
0·7±0·1	7·1±0·4	III QSO 17·3^{m}	233	56	245	
1·4±0·3	2·9±0·7	III	242	53		
1·2±0·2	5·2±0·6	III	228	59		
1·2±0·1	3·5±0·6		251	50		10+09
1·0±0·4	2·1±0·5	III	241	56		
C		II	251	53		10+010
1·2±0·1	2·9±0·4	III	242	58		10+011
1·2±0·3	2·9±0·5		240	60		
0·6±0·3	3·0±0·4	III ext. in α	235	63		
0·8±0·3	2·1±0·3	III	227	65		
0·8±0·2	4·0±0·4	III (QSO)	243	61		
1·0±0·1	3·9±0·4	III	254	56		11+02
1·2±0·3	3·4±0·6	II	244	62		
0·6±0·1	4·8±0·4	III QSO	242	64		
0·8±0·1	5·8±0·5	III	239	65		
0·9±0·1	5·1±0·4	III	255	60	257	11+05
1·3±0·2	6·3±0·7	III	256	60		
			230	69	258	
—		S_{408} & S_{1410} incl. 1123+20	229	69		
—		S_{408} & S_{1410} incl. 1123+19	229	69		
0·8±0·4	2·8±0·3	III	245	65		
1·2±0·4	2·7±0·6		251	64		
1·0±0·2	3·7±0·5	III	265	59	(262)	
0·8±0·2	4·2±0·4	I E 16·5^{m}	252	68		
0·7±0·1	5·9±0·4	III	267	59	(262)	11+08
0·9±0·1	2·1±0·3		262	63		11+09
0·9±0·3	2·3±0·4		237	72		
1·0±0·1	17·5±0·8	I 13^{m} NGC 3862 $P < 1\%$	236	73	264	
1·0±0·1	2·2±0·4	III	266	63		11+012
1·0±0·1	7·3±0·5	II	255	70	267	

TABLE 1

Catalogue Number	Position (1950·0)		Annual Precession		Flux Density (10^{-26} W m^{-2} (c/s)$^{-1}$)				
	R.A. h m s	Dec. ° ′	Δα s	Δδ ″	$S_{85\cdot5}$	S_{178}	S_{408}	S_{1410}	S_{2650}
1150+11	11 50 29	+11 25·1	3·08	−20·0			2·6	0·7	0·4
1150+09	11 50 36	+09 29·9	3·08	−20·0			(2·5)	0·7	0·4
1151+09	11 51 33	+09 57·4	3·08	−20·0			(2·3)	0·6	0·3
1152+04	11 52 23	+04 40·4	3·07	−20·0	12		4·0	0·8	0·3
1156+11	11 56 52	+11 03·1	3·07	−20·0			2·0	0·8	0·2
1203+04	12 03 50	+04 22·6	3·07	−20·0	25		6·5	1·5	0·9
1209+12	12 09 09	+12 38·0	3·06	−20·0			1·9	0·6	0·2
1211+00	12 11 14	+00 05·2	3·07	−20·0			1·5	0·5	0·3
1213+12	12 13 18	+12 38·2	3·05	−20·0			2·3	<0·5	0·3
1215+03	12 15 04	+03 54·5	3·06	−20·0	30		7·8	2·2	1·2
1216+06	12 16 52	+06 05·6	3·06	−20·0	100	48	41·5	16·5	(9·1)
1217+02	12 17 40	+02 19·6	3·06	−20·0	12		1·7	0·8	0·5
1218+09	12 18 01	+09 44·3	3·05	−20·0	24		4·9	1·1	0·5
1219+04	12 19 49	+04 30·6	3·06	−20·0			3·2	1·0	0·6
1221+16	12 21 23	+16 24·2	3·03	−20·0			2·5	0·6	0·4
1222+13	12 22 33	+13 09·7	3·04	−19·9		19·5	14·1	6·6	4·3
1225+07	12 25 31	+07 41·6	3·05	−19·9			2·5	0·8	(0·3)
1226+02	12 26 34	+02 19·1	3·06	−19·9	167	72	55·1	41·2	37·3
1228+12	12 28 17	+12 39·4	3·03	−19·9		1050			
1233+16	12 33 59	+16 49·7	3·01	−19·8			8·8	2·2	(0·8)
1241+16	12 41 30	+16 39·1	3·00	−19·7		17·3	9·4	2·9	1·6
1245+17	12 45 32	+17 02·5	2·99	−19·7			1·5	0·6	0·2
1246+09	12 46 17	+09 33·1	3·02	−19·6	14		4·2	0·8	0·4
1248+05	12 48 54	+05 03·1	3·04	−19·6			(3·1)	0·6	0·4
1249+09	12 49 11	+09 12·2	3·02	−19·6			5·1	1·8	1·0
1250+11	12 50 32	+11 55·6	3·01	−19·6			(2·8)	0·8	0·3
1251+15	12 51 03	+15 58·8	2·98	−19·5		10·3	6·8	1·7	0·9
1252+11	12 52 08	+11 57·1	3·00	−19·5			(2·8)	1·2	1·1
1303+09	13 03 05	+09 10·8	3·01	−19·3	22		5·2	1·6	0·7
1305+06	13 05 19	+06 59·5	3·02	−19·2	22		5·4	1·0	
1309+04	13 09 50	+04 10·5	3·04	−19·1	8		1·7	0·6	0·3
1312+01	13 12 07	+01 20·3	3·06	−19·1			(0·8)	0·5	
1313+07	13 13 47	+07 17·8	3·01	−19·0	16		5·5	2·2	1·2
1317+17	13 17 54	+17 58·7	2·92	−18·9			6·1	1·8	1·0
1318+11	13 18 52	+11 22·9	2·98	−18·9			5·3	2·5	1·4
1320+03	13 20 46	+03 23·9	3·04	−18·8			4·6	1·4	0·7
1326+06	13 26 42	+06 57·3	3·01	−18·6			2·0	<0·5	<0·2
1330+02	13 30 19	+02 16·1	3·05	−18·5	19	12·5	6·9	2·9	1·6
1340+05	13 40 14	+05 19·7	3·02	−18·2			4·9	1·9	1·0
1341+14	13 41 58	+14 23·6	2·92	−18·1			(5·2)	1·4	0·7
1345+12	13 45 07	+12 32·2	2·94	−18·0			8·8	5·3	3·8
1346+09	13 46 04	+09 58·7	2·96	−17·9			(2·9)	0·8	(0·3)
1352+16	13 52 11	+16 28·5	2·89	−17·7		10·3	(2·9)	1·3	(0·4)
1352+00	13 52 32	+00 54·6	3·06	−17·7			(1·9)	0·6	

(*Continued*)

Spectrum		Remarks	Galactic Coordinates		Other Catalogue Numbers	
Index	S_{400}		l^{II} °	b^{II} °	3C	MSH
1·0±0·3	2·6±0·4	II	259	69		
0·9±0·5	2·1±0·3	III	263	67		
1·1±0·5	2·4±0·4	II	262	68		
1·1±0·1	2·9±0·4	III	270	64		11+0*13*
1·3±0·4	3·1±0·6	III	264	70		
1·0±0·1	5·7±0·4	III	276	65		12+0*2*
1·2±0·4	2·4±0·5	II	269	73		
0·9±0·4	1·5±0·3	III	283	61		
1·1±0·2	2·4±0·5	III	272	73		
1·0±0·1	7·3±0·5	II	283	65		12+0*4*
0·6±0·0	37·7±1·5	I E 11^m NGC 4261 ext. in a 3C flux low	282	67	270	12+0*5*
0·9±0·1	2·7±0·3	III QSO	285	64		12+0*7*
1·1±0·1	4·4±0·4	II	279	71		12+0*6*
0·9±0·2	3·2±0·4	III	285	66		
0·9±0·3	2·3±0·4	III	271	77	271	
0·6±0·1	13·8±0·6	I E2 M84	278	74	272·1	
0·9±0·3	2·5±0·5	III ext.	286	70		
C		III QSO 12·7^m	290	64	273	12+0*8*
		I E2 9·9^m M87 Virgo A	284	74	274	
1·1±0·1	9·0±0·8	II ext. in δ	284	79		
0·9±0·1	9·1±0·5	III QSO	293	79	275·1	
1·2±0·4	2·1±0·5	III possibly ext.	298	80		
1·1±0·1	3·2±0·4	III	301	72		12+0*10*
0·6±0·5	1·3±0·2		303	68		
0·9±0·1	5·3±0·5	II	303	72		
1·6±0·5	5·7±0·9	III S_{408} incl. 1252+11	304	75		
1·0±0·1	6·1±0·4	III	306	79	277·2	
0·1±0·3	1·4±0·1	III QSO S_{408} incl. 1250+11	306	75		
1·0±0·1	5·1±0·4	III	314	71	(281)	13+0*1*
1·1±0·1	4·4±0·6	III	314	69	(281)	13+0*3*
0·9±0·1	1·9±0·3	III	316	66		13+0*4*
			316	63		
0·8±0·1	5·4±0·4	I E 15·5^m	320	69		13+0*5*
1·0±0·1	6·2±0·6	III	340	78		
0·7±0·1	5·9±0·5	II or (QSO)	328	73		
1·0±0·2	4·8±0·5	II	322	65		
—		III (QSO)	328	68		
0·7±0·1	6·8±0·4	II	326	63	287·1	13+0*7*
0·9±0·2	5·3±0·5	II	334	65		
1·1±0·3	5·6±0·5	III (QSO)	349	72		
0·5±0·1	9·2±0·5	I SO 16·6^m	347	70		
—		III (QSO) ext.	343	68		
1·0±0·2	4·6±0·6	II ext.	00	72	293·1	
			336	59		

TABLE 1

Catalogue Number	Position (1950·0) R.A. h m s	Position (1950·0) Dec. ° ′	Annual Precession Δα s	Annual Precession Δδ ″	Flux Density (10^{-26} W m^{-2} (c/s)$^{-1}$) $S_{85\cdot5}$	S_{178}	S_{408}	S_{1410}	S_{2650}
1353+18	13 53 51	+18 35·5	2·85	−17·6			(4·0)	0·8	0·3
1354+01	13 54 15	+01 18·4	3·05	−17·6	19		(8·5)	1·9	
1354+19	13 54 47	+19 34·9	2·84	−17·6			6·0	2·3	1·5
1355+01	13 55 20	+01 01·6	3·06	−17·6			(8·5)	1·9	
1357+19	13 57 23	+19 39·5	2·83	−17·5			(2·6)	0·5	<0·2
1405+10	14 05 46	+10 24·5	2·94	−17·1			2·8	0·6	0·3
1405+01	14 05 58	+01 30·4	3·05	−17·1			1·8	0·7	0·4
1407+17	14 07 40	+17 47·2	2·84	−17·0			6·5	1·6	0·7
1411+09	14 11 36	+09 28·3	2·95	−16·8			3·3	1·3	0·8
1414+11	14 14 29	+11 02·1	2·92	−16·7		13·5	8·3	4·7	2·2
1416+04	14 16 09	+04 39·6	3·01	−16·6	22		(2·5)	<0·5	
1416+06	14 16 41	+06 42·2	2·98	−16·6	114	48	24·4	6·2	2·7
1418+04	14 18 16	+04 41·6	3·01	−16·5			(2·5)	<0·5	
1420+19	14 20 41	+19 49·6	2·79	−16·3		17·3	10·9	4·1	1·9
1424+03	14 24 57	+03 29·3	3·02	−16·2			3·0	0·7	0·4
1425+04	14 25 42	+04 33·3	3·00	−16·1	13		3·1	0·8	(0·3)
1427+07	14 27 35	+07 29·4	2·96	−16·0			5·8	2·1	1·0
1431+06	14 31 48	+06 34·8	2·97	−15·8	17		3·7	1·2	0·7
1434+03	14 34 24	+03 37·2	3·02	−15·7	31		8·1	2·7	1·8
1444+07	14 44 03	+07 41·1	2·95	−15·1	19		3·0	0·6	0·3
1444+17	14 44 49	+17 59·4	2·78	−15·1			4·9	1·2	0·5
1445+16	14 45 33	+16 47·6	2·80	−15·0			2·5	0·7	(0·3)
1446+00	14 46 10	+00 30·2	3·06	−15·0			3·1	1·7	1·0
1446+04	14 46 28	+04 13·8	3·00	−15·0			2·4	0·8	(0·4)
1449+13	14 49 11	+13 56·4	2·84	−14·8			2·5	0·9	0·4
1451+09	14 51 32	+09 47·5	2·91	−14·7			1·1	0·7	
1452+16	14 52 05	+16 34·3	2·80	−14·7			(4·9)	1·6	1·0
1453+16	14 53 46	+16 39·7	2·79	−14·6			(4·1)	1·4	0·7
1455+11	14 55 35	+11 57·3	2·87	−14·5			1·4	0·5	0·3
1502+04	15 02 39	+04 00·2	3·00	−14·0			(2·7)	0·5	0·2
1503+09	15 03 56	+09 46·3	2·90	−13·9			2·1	0·6	
1504+03	15 04 13	+03 59·2	3·00	−13·9			(2·7)	<0·5	(<0·2)
1505+01	15 05 55	+01 14·2	3·05	−13·8			(3·4)	1·3	1·0
1508+05	15 08 20	+05 54·2	2·97	−13·7	24		3·4	0·9	(0·2)
1508+08	15 08 34	+08 03·7	2·93	−13·6	42	30	11·5	3·8	1·7
1508+18	15 08 49	+18 15·4	2·74	−13·6			(4·5)	0·9	0·3
1509+01	15 09 50	+01 32·8	3·04	−13·6	20		6·4	2·3	1·1
1509+15	15 09 58	+15 51·4	2·79	−13·5			3·5	0·9	0·6
1514+00	15 14 14	+00 26·1	3·06	−13·3	16		4·4	2·5	1·8
1514+07	15 14 18	+07 12·8	2·94	−13·3	140	46	26·4	5·6	2·2
1514+18	15 14 43	+18 41·4	2·75	−13·1			6·3	1·3	0·7
1518+04·7	15 18 42	+04 41·1	2·98	−13·0			(4·3)	(4·3)	2·2
1518+04·5	15 18 47	+04 31·1	2·98	−13·0			(4·3)	(4·3)	0·5

(*Continued*)

Spectrum		Remarks	Galactic Coordinates		Other Catalogue Numbers	
Index	S_{400}		l^{II} °	b^{II} °	3C	MSH
1·6±0·5	5·7±0·9		06	73		
0·8±0·1	5·3±0·6	III S_{408} incl. 1355+01	337	60		13+0*12*
0·7±0·1	5·9±0·5	III	09	73		
		III S_{408} incl. 1354+01	337	59		
—		III	10	73		
1·2±0·3	2·8±0·5	III	353	65		
0·8±0·3	1·9±0·3	III	342	58		
1·2±0·1	6·8±0·7	I E 13·4^{m} NGC 5490	09	70		
0·8±0·2	3·4±0·4	II	354	64		
C		I E 13^{m} NGC 5532	358	64	296	
—		S_{408} incl. 1418+04	349	59		14+0*6*
1·1±0·0	22·8±0·8	III QSO	352	61	298	14+0*5*
—		S_{408} incl. 1416+04	350	59		
0·9±0·1	10·9±0·6	II	18	68	300	
1·1±0·2	2·9±0·5	III	351	57		
1·0±0·2	2·9±0·5	III ext.	353	58		14+0*7*
1·0±0·1	6·4±0·6	II	357	59		
0·9±0·1	4·0±0·3	III	357	58		14+0*9*
0·8±0·1	8·3±0·5	III	354	55		14+0*10*
1·2±0·1	2·9±0·4	III	03	56		14+0*14*
1·2±0·2	5·2±0·6	III	20	62		
1·1±0·4	2·6±0·5	III ext.	18	61		
0·7±0·2	3·7±0·4	III	354	51		
0·9±0·4	2·4±0·5	III ext. in δ S_{408} incl. uncat. sources	359	54		
1·0±0·3	2·9±0·4	III	13	59		
0·4±0·7	1·1±0·3		08	56		
0·7±0·3	4·1±0·3	I E 14·9^{m}	19	60	306	
1·1±0·3	5·6±0·5	III	19	59		
0·8±0·4	1·4±0·3	III (QSO)	12	57		
1·5±0·7	3·1±0·7	III S_{408} incl. 1504+03 & uncat. sources	03	50		
1·0±0·4	2·1±0·5		11	54	(312)	
—		III ext. in α S_{408} incl. 1502+04 & uncat. source	03	50		
0·4±0·3	2·2±0·2	III	00	48		
1·2±0·1	3·8±0·6	II ext.	06	51		15+0*3*
1·0±0·0	11·5±0·5	III MSH flux low	09	52	313	15+0*2*
1·7±0·5	8·1±1·2		25	57		
0·9±0·1	6·1±0·4	III	02	48		15+0*4*
0·9±0·2	3·3±0·4	III (QSO)	21	55		
0·6±0·1	5·4±0·3	III	01	46		15+0*6*
1·2±0·0	23·4±0·8	I 16^{m} P 5%	09	50	317	15+0*5*
1·2±0·1	6·2±0·6	III	26	56	316	
—		II S_{408} & S_{1410} incl. 1518+04·5	07	48		
—		S_{408} & S_{1410} incl. 1518+04·7	07	48		

TABLE 1

Catalogue Number	Position (1950·0) R.A. h m s	Position (1950·0) Dec. ° ′	Annual Precession Δα s	Annual Precession Δδ ″	Flux Density (10^{-26} W m^{-2} (c/s)$^{-1}$) $S_{85\cdot5}$	S_{178}	S_{408}	S_{1410}	S_{2650}
1519+07	15 19 20	+07 52·8	2·93	−12·9	50	11·9	3·4	<0·5	
1523+03	15 23 23	+03 19·2	3·01	−12·7			5·0	2·2	1·2
1532+13	15 32 04	+13 59·0	2·80	−12·1			(4·9)	0·9	0·4
1532+01	15 32 23	+01 42·3	3·04	−12·0			3·2	1·2	1·0
1535+13	15 35 06	+13 55·5	2·80	−11·9			4·6	1·3	0·9
1542+02	15 42 59	+02 00·0	3·03	−11·3	16		3·3	0·9	0·7
1558+08	15 58 00	+08 47·2	2·89	−10·2			3·0	0·8	0·6
1558+11	15 58 57	+11 38·9	2·83	−10·1			3·0	0·6	0·2
1559+02	15 59 59	+02 06·8	3·03	−10·0	100	43	23·1	7·4	4·9
1602+01	16 02 15	+01 25·7	3·04	−9·7	45	26	(10·2)	3·7	2·1
1603+00	16 03 42	+00 08·6	3·07	−9·7	35		(7·9)	2·2	1·4
1606+10	16 06 20	+10 36·9	2·85	−9·5			(4·4)	1·6	0·9
1611+04	16 11 43	+04 13·5	2·89	−9·1	27		4·3	1·3	0·5
1614+04	16 14 46	+04 12·6	2·98	−8·9			2·1	<0·5	0·2
1617+13	16 17 27	+13 45·8	2·77	−8·7			(2·3)	0·7	0·3
1618+17	16 18 12	+17 43·8	2·68	−8·6		10·8	6·3	2·2	1·1
1641+17	16 41 36	+17 21·2	2·67	−6·7		(11·9)	10·3	3·4	2·2
1642+13	16 42 25	+13 11·2	2·77	−6·7			(5·9)	1·3	0·7
1643+13	16 43 06	+13 29·0	2·77	−6·6			(5·2)	0·8	0·4
1645+17	16 45 36	+17 26·0	2·67	−6·4		(11·9)	4·3	1·9	1·1
1648+16	16 48 28	+16 53·3	2·68	−6·2			(4·7)	0·6	0·3
1648+05	16 48 42	+05 04·5	2·95	−6·1	890	350	161	46·0	24·6
1659+01	16 59 28	+01 03·8	3·04	−5·2			2·2	0·5	0·3
1701+05	17 01 08	+05 06·1	2·95	−5·1			3·1	0·6	0·3
1708+00	17 08 01	+00 40·3	3·05	−4·5			2·2	1·2	1·0
1718+19	17 18 28	+19 14·9	2·61	−3·6			(3·0)	0·5	
1719+19	17 19 54	+19 36·9	2·60	−3·5			(3·0)	0·5	
1732+16	17 32 28	+16 02·9	2·69	−2·4			4·0	1·4	0·7
1739+17	17 39 30	+17 22·6	2·65	−1·8			5·0	1·7	1·0
1751+04	17 51 08	+04 31·0	2·96	−0·8		(97)	(7·0)	(1·5)	(0·3)
1755+03	17 55 20	+03 15·0	3·00	−0·4	(48)		(15)	<0·5	
1759+13	17 59 22	+13 51·5	2·74	−0·1			7·5	2·0	0·9
1801+01	18 01 44	+01 00·9	3·04	+0·2			5·5	1·4	0·9
1802+10	18 02 14	+10 00·4	2·83	0·2			(3·7)	1·1	0·5
1802+11	18 02 44	+11 01·3	2·81	0·2		15	4·3	1·1	0·7
1804+15	18 04 43	+15 43·8	2·69	0·4			(3·3)	0·8	0·4
1811+09	18 11 48	+09 21·2	2·85	1·0			2·6	0·9	0·6
1820+17	18 20 05	+17 59·1	2·64	1·8			5·4	1·9	1·1
1821+10	18 21 36	+10 42·7	2·82	1·9			2·1	0·8	0·8
1833+15	18 33 34	+15 14·5	2·72	2·9			1·6	1·0	0·5
1834+19	18 34 24	+19 40·3	2·60	3·0			4·2	1·8	(0·8)
1836+17	18 36 10	+17 09·5	2·66	3·2		26	15·9	7·6	(4·0)
1949+02	19 49 41	+02 22·8	3·02	9·2	64	28	15·4	5·1	3·6
2000+00	20 00 58	+00 21·0	3·06	10·1			4·5	0·6	0·3
2001+13	20 01 01	+13 58·0	2·78	10·1			(4·0)	0·9	0·6

(*Continued*)

Spectrum		Remarks	Galactic Coordinates		Other Catalogue Numbers	
Index	S_{400}		l^{II} °	b^{II} °	3C	MSH
1·8±0·2	3·3±0·5	III (QSO)	12	49	318·1	15+07
0·8±0·1	5·6±0·5	III	07	46		
1·3±0·4	4·5±0·6	III	22	50		
0·6±0·2	2·8±0·3	III	07	43		
0·8±0·2	4·3±0·4	III	22	49		
0·9±0·1	3·6±0·3	III	09	41		15+013
0·8±0·2	2·7±0·4		20	42		
1·4±0·3	3·3±0·7	III	23	43		
0·9±0·0	23·6±0·8	I 17^m	13	38	327	16+01
0·9±0·0	11·6±0·6	III	12	37	327·1	16+02
0·9±0·1	7·9±0·6	II	11	36		16+03
0·9±0·3	5·0±0·4	III	23	41		
1·1±0·1	4·7±0·4	III	17	37		16+05
1·3±0·3	2·2±0·5		17	36		
1·3±0·5	3·8±0·6		28	40	(335)	
0·9±0·1	6·3±0·4	III (QSO)	33	41	334	
0·8±0·1	10·1±0·7	II	35	36	(346)	
1·0±0·3	4·5±0·4	S_{408} incl. 1643+13	31	33		
1·1±0·4	3·2±0·4	III S_{408} incl. 1642+13	31	34	347	
0·8±0·2	4·7±0·4		35	34	(346)	
1·1±0·5	2·4±0·4		36	34		
1·0±0·0	16·7±3·8	I 18^m P 1% Herc. A	23	29	348	16+010
1·0±0·3	2·1±0·4	III	21	25		
1·2±0·2	3·1±0·6		25	26		
0·4±0·2	2·0±0·2	III	21	23		
		S_{408} incl. 1719+19	41	28		
		S_{408} incl. 1718+19	42	28	354	
0·9±0·2	4·4±0·5	III	39	24		
0·9±0·2	5·0±0·5	II	41	23		
		III–IV complex source	30	15	(363·1)	
		complex source	30	13		17+03
1·1±0·1	7·9±0·7	III	40	17		
1·0±0·1	5·2±0·5		28	11		
1·2±0·4	5·3±0·6		37	15		
1·1±0·1	5·2±0·4		38	15	368	
1·1±0·4	3·2±0·4		42	17		
0·8±0·2	2·5±0·3		37	13		
0·9±0·1	5·5±0·5		46	14	(375)	
0·4±0·3	1·6±0·2		40	11		
0·8±0·3	2·4±0·3		45	10		
0·7±0·2	4·3±0·5	I ext. in α	49	12		
0·6±0·1	16·1±1·0	I 16^m ext. in δ	47	11	386	
0·8±0·0	15·9±0·6	I E 16·5^m (QSO)	42	−12	403	19+010
1·5±0·2	4·5±0·7	III	42	−16	406	
0·6±0·4	2·0±0·2	III	54	−09		

TABLE 1

Catalogue Number	Position (1950·0)		Annual Precession		Flux Density (10^{-26} W m^{-2} (c/s)$^{-1}$)				
	R.A. h m s	Dec. ° ′	Δα s	Δδ ″	$S_{85\cdot5}$	S_{178}	S_{408}	S_{1410}	S_{2650}
2003+15	20 03 33	+15 50·7	2·74	10·3			3·9	0·6	0·3
2004+11	20 04 29	+11 52·1	2·83	10·4			3·3	1·3	0·5
2008+06	20 08 10	+06 19·5	2·94	10·6			1·1	0·3	0·2
2012+01	20 12 02	+01 03·4	3·05	10·9			2·5	1·0	0·5
2019+09	20 19 43	+09 52·0	2·88	11·5	27	15	9·4	3·4	1·4
2021+07	20 21 01	+07 53·2	2·92	11·6			1·7	0·6	0·2
2021+16	20 21 17	+16 52·5	2·74	11·6			2·3	1·3	(0·5)
2022+11	20 22 56	+11 56·5	2·85	11·7			3·5	1·3	(0·4)
2025+15	20 25 10	+15 36·1	2·78	11·9			5·5	0·5	(<0·2)
2028+07	20 28 12	+07 51·1	2·92	12·0			1·4	0·5	0·2
2029+18	20 29 17	+18 48·7	2·71	12·2			3·1	0·7	0·3
2033+18	20 33 17	+18 47·2	2·71	12·3			(3·3)	1·4	0·5
2033+19	20 33 26	+19 40·2	2·69	12·4			(3·1)	0·6	0·5
2041+17	20 41 56	+17 01·3	2·76	13·0			4·3	0·9	0·3
2042+03	20 42 57	+03 13·6	3·01	13·1	11		2·8	0·5	0·2
2045+06	20 45 40	+06 50·1	2·95	13·3	22	13·4	(9·8)	2·6	1·1
2046+14	20 46 26	+14 44·4	2·81	13·3			1·0	<0·5	0·3
2046+12	20 46 43	+12 36·6	2·84	13·3			(3·2)	(0·6)	0·2
2049+16	20 49 05	+16 41·7	2·77	13·5			1·8	0·8	(0·3)
2049+14	20 49 29	+14 57·4	2·80	13·5			2·0	1·0	0·5
2101+19	21 01 58	+19 04·9	2·74	14·3			2·2	<0·5	0·2
2103+12	21 03 48	+12 27·8	2·86	14·4			3·3	1·4	1·1
2109+16	21 09 58	+16 32·6	2·78	14·8			1·6	<0·5	<0·2
2116+18	21 16 10	+18 04·9	2·78	15·1			5·3	1·4	0·6
2120+16	21 20 25	+16 51·8	2·81	15·4		12·5	8·0	1·7	0·7
2120+09	21 20 44	+09 54·5	2·92	15·4			2·8	0·8	0·5
2120+15	21 20 51	+15 35·3	2·83	15·4		11·4	3·5	1·3	0·7
2123+00	21 23 14	+00 42·4	3·06	15·6			1·9	0·7	0·4
2125+09	21 25 20	+09 31·7	2·94	15·7			1·0	<0·5	<0·2
2126+07	21 26 34	+07 19·8	2·96	15·7	27	10·3	6·6	2·4	1·1
2127+04	21 27 59	+04 49·0	3·00	15·8			3·0	4·2	3·3
2130+12	21 30 27	+12 44·6	2·88	15·9			2·9	1·0	(0·4)
2137+17	21 37 38	+17 10·1	2·83	16·3			3·0	0·8	(0·2)
2138+14	21 38 24	+14 25·1	2·87	16·3			2·5	1·1	0·9
2139+02	21 39 39	+02 49·3	3·03	16·4	18		3·1	1·0	0·5
2142+04	21 42 44	+04 18·1	3·01	16·6	11		3·5	1·5	(0·8)
2144+15	21 44 57	+15 07·1	2·87	16·7		11·4	9·1	3·1	1·3
2145+06	21 45 31	+06 44·1	2·98	16·7			3·4	3·0	3·1
2147+14	21 47 58	+14 35·3	2·88	16·8			(7·9)	2·9	1·3
2148+14	21 48 20	+14 19·7	2·88	16·8		(16·3)	(6·0)	2·3	1·2
2148+19	21 48 29	+19 49·3	2·81	16·8			2·4	0·9	0·5
2148+13	21 48 34	+13 33·9	2·89	16·8		(16·3)	(4·5)	1·1	
2148+12	21 48 35	+12 08·3	2·91	16·8			(3·6)	1·4	(0·4)
2149+17	21 49 58	+17 21·1	2·84	16·9			1·3	1·0	0·8
2150+05	21 50 56	+05 22·8	3·00	16·9	17		3·0	1·3	0·6

(*Continued*)

Spectrum		Remarks	Galactic Coordinates		Other Catalogue Numbers	
Index	S_{400}		l^{II} °	b^{II} °	3C	MSH
1·4±0·2	3·9±0·7	III	56	−09		
1·1±0·2	4·2±0·5	III	53	−11		
0·9±0·5	1·0±0·3	III–IV	48	−14		
0·9±0·3	2·9±0·4	III	44	−18		
0·9±0·0	8·5±0·4	III	53	−15	411	$20+0_{81}$
1·2±0·4	2·2±0·5	II	51	−16		
0·5±0·3	2·3±0·3	III ext. in δ	59	−12		
0·8±0·3	3·6±0·5	III ext. in α	55	−15		
1·9±0·3	5·7±1·0	III ext. in α	59	−13		
1·1±0·4	1·7±0·4	III	52	−18		
1·2±0·2	3·2±0·6	III	62	−12	(415)	
1·6±0·3	10·9±1·1	III–IV	62	−13		
0·3±0·5	0·9±0·1		63	−12		
1·4±0·2	4·7±0·7	III	62	−15		
1·2±0·1	2·1±0·3	III	50	−23		20+0*8*
0·9±0·1	6·6±0·4	II P 4·5%	54	−22	424	20+0*10*
0·6±0·5	1·0±0·2	III	61	−18		
—		III S_{408} & S_{1410} incl. uncat. sources	59	−19		
0·7±0·4	1·8±0·4	III ext.	63	−17		
0·8±0·3	2·6±0·4	III	61	−18		
1·3±0·3	2·3±0·6	III	67	−18		
0·5±0·2	3·0±0·3	II	62	−22		
—			66	−21		
1·2±0·2	5·7±0·6	III	68	−21		
1·2±0·1	7·0±0·5	II 3C flux low	68	−23	432	
0·9±0·2	2·7±0·4	III	62	−27		
1·0±0·1	4·5±0·4	III	67	−24	434	
0·8±0·3	2·0±0·3	II	54	−33		
—			63	−28		
0·9±0·0	6·6±0·4	III	61	−30	435	21+0*4*
C			59	−32		
0·9±0·3	2·9±0·5	III ext.	66	−27		
1·1±0·3	3·1±0·6	ext. in α	71	−26		
0·5±0·2	2·2±0·2	III	69	−28		
1·0±0·1	3·6±0·4	III	59	−35		21+0*7*
0·7±0·1	3·6±0·5	III ext. in δ	61	−35		21+0*9*
C		III	71	−28	437	
C		III	64	−34		
1·3±0·2	14·4±1·0	III	71	−29		
1·0±0·2	8·4±0·6	III	71	−30	(437·1)	
0·9±0·3	2·6±0·4	III	75	−26		
			70	−30	(437·1)	
		III (QSO) possibly ext.	69	−31		
0·3±0·3	1·4±0·2	III	74	−28		
1·0±0·1	3·8±0·3	III	63	−36		21+0*11*

TABLE 1

Catalogue Number	Position (1950·0)		Annual Precession		Flux Density (10^{-26} W m^{-2} (c/s)$^{-1}$)				
	R.A. h m s	Dec. ° ′	Δα s	Δδ ″	$S_{85\cdot5}$	S_{178}	S_{408}	S_{1410}	S_{2650}
2152+14	21 52 11	+14 29·6	2·89	17·0		(16·3)	(5·5)	1·1	
2152+02	21 52 31	+02 12·2	3·04	17·0	15		2·5	0·6	(0·2)
2159+04	21 59 33	+04 20·7	3·02	17·3	8		(2·9)	1·9	1·0
2201+04	22 01 44	+04 25·2	3·02	17·4			(1·2)	1·0	0·8
2202+18	22 02 41	+18 51·0	2·84	17·5			2·0	0·6	0·3
2203+05	22 03 47	+05 41·3	3·00	17·5			1·7	1·1	(0·7)
2209+08	22 09 33	+08 05·7	2·98	17·8			4·1	1·9	1·4
2210+01	22 10 02	+01 37·9	3·05	17·8			4·2	3·1	1·9
2211+08	22 11 12	+08 59·6	2·97	17·8	31		2·5	0·8	0·5
2212+13	22 12 17	+13 36·1	2·92	17·8		22	13·1	3·7	(1·3)
2215+02	22 15 14	+02 04·8	3·05	18·0			1·4	1·1	0·9
2217+08	22 17 30	+08 46·5	2·98	18·1			1·8	<0·5	0·3
2217+12	22 17 32	+12 52·7	2·94	18·1			1·5	0·8	0·5
2221+02	22 21 36	+02 32·5	3·04	18·2	8		1·6	<0·5	0·2
2222+05	22 22 40	+05 12·0	3·02	18·3	16		3·5	0·8	0·5
2226+08	22 26 36	+08 58·8	2·98	18·4	19		5·0	0·6	0·5
2227+03	22 27 37	+03 36·8	3·03	18·4			1·3	<0·5	<0·2
2228+16	22 28 43	+16 08·5	2·92	18·5			(1·6)	0·7	0·3
2229+06	22 29 06	+06 45·7	3·01	18·5			1·8	0·6	0·2
2230+11	22 30 05	+11 29·0	2·96	18·5		5·1	7·1	6·7	5·3
2236+06	22 36 20	+06 51·9	3·01	18·7			1·5	<0·5	0·3
2238+12	22 38 01	+12 57·1	2·96	18·8			1·3	<0·5	0·2
2239+11	22 39 02	+11 30·3	2·97	18·8			2·5	0·8	0·5
2241+18	22 41 31	+18 01·2	2·92	18·9			(2·7)	1·1	0·5
2243+17	22 43 38	+17 29·4	2·93	18·9			(1·8)	0·6	0·3
2247+13	22 47 16	+13 15·9	2·97	19·0			4·5	1·7	0·9
2247+11	22 47 17	+11 19·2	2·98	19·0			7·3	2·7	1·3
2247+14	22 47 55	+14 04·6	2·96	19·1			4·5	2·0	1·6
2248+06	22 48 16	+06 47·0	3·02	19·1	15		3·9	1·6	0·9
2249+18	22 49 05	+18 32·9	2·93	19·1		9·7	4·6	2·4	1·2
2250+03	22 50 07	+03 29·1	3·04	19·1	11		1·7	0·5	0·3
2251+15	22 51 28	+15 53·4	2·96	19·2		16·2	15·8	12·8	10·0
2251+11	22 51 41	+11 20·9	2·99	19·2			3·7	1·6	0·9
2252+12	22 52 33	+12 57·7	2·98	19·2		14	9·0	3·2	1·5
2254+16	22 54 38	+16 42·8	2·95	19·2			3·6	1·4	(0·7)
2257+12	22 57 32	+12 21·1	2·99	19·3			2·2	(<0·5)	(<0·2)
2258+19	22 58 43	+19 26·2	2·94	19·3			3·0	1·1	0·4
2258+08	22 58 59	+08 22·5	3·02	19·3			2·3	0·6	0·4
2304+00	23 04 13	+00 38·7	3·06	19·5			1·6	<0·5	0·3
2305+18·8	23 05 14	+18 45·5	2·96	19·5			(3·2)	1·1	0·8
2305+18·3	23 05 25	+18 19·5	2·96	19·5			(3·2)	0·9	0·4
2305+02	23 05 41	+02 13·2	3·06	19·5			1·2	0·7	0·4
2307+10	23 07 59	+10 39·7	3·01	19·5			3·1	0·7	0·7
2308+07	23 08 08	+07 19·0	3·03	19·5	22		5·8	1·7	1·0

(*Continued*)

Spectrum		Remarks	Galactic Coordinates		Other Catalogue Numbers	
Index	S_{400}		l^{II} °	b^{II} °	3C	MSH
			72	−30	(437·1)	
1·1±0·2	2·6±0·5	III ext.	61	−38		21+0*12*
0·7±0·1	3·8±0·4	II	64	−38		21+0*14*
0·4±0·3	1·6±0·2	I	65	−39		
1·0±0·3	2·1±0·4	III	77	−29		
0·4±0·4	1·7±0·3	III ext.	66	−38		
0·6±0·2	4·0±0·3	II	70	−38		
0·5±0·1	5·4±0·4	III	64	−42		
1·2±0·1	4·4±0·4	III MSH flux high	71	−37		22+0*3*
0·9±0·1	12·2±0·9	I db. 14·3^m NGC 7236/7 P 4% ext. in α and δ	75	−34	442	
0·3±0·3	1·5±0·2	III	65	−43		
1·0±0·3	1·8±0·4	III	72	−38		
0·6±0·3	1·7±0·3	II	76	−36		
1·1±0·2	1·5±0·4	III	67	−44		22+0*4*
1·0±0·1	3·3±0·3	III	70	−42		22+0*5*
1·1±0·1	3·8±0·4	III	74	−40		22+0*6*
—		III	70	−44		
1·3±0·5	3·8±0·6	III	81	−35		
1·2±0·4	2·3±0·5	III	73	−42		
C		III QSO 17·3^m P 6·5% CTA 102	77	−39		
0·9±0·3	1·5±0·3	III	75	−43		
1·0±0·4	1·3±0·4	II	81	−39		
0·8±0·3	2·4±0·4	III	80	−40		
1·2±0·4	5·3±0·6	S_{408} incl. 2243+17	85	−35	(451)	
1·1±0·5	2·4±0·4	S_{408} incl. 2241+18	85	−36	453	
0·9±0·2	4·9±0·5		83	−40		
0·9±0·1	8·0±0·6	I E 14·4^m	82	−41		
0·5±0·2	4·1±0·3	III	84	−39		
0·8±0·1	4·3±0·3	II	78	−45		22+0*9*
0·8±0·1	5·5±0·4	III	87	−36	454	
1·0±0·1	2·1±0·3	III	75	−48		22+0*11*
0·2±0·1	16·0±0·6		86	−38	454·3	
0·8±0·2	4·1±0·4	III	83	−42		
0·9±0·1	8·8±0·5	I E 15·2^m	84	−41	455	
0·8±0·3	3·7±0·5	II ext. in α	88	−38		
—		III resolved at 2650	85	−42		
1·1±0·2	3·8±0·5	III	90	−36		
0·9±0·3	2·1±0·4		82	−45		
0·9±0·3	1·6±0·3	III	77	−52		
0·5±0·3	2·1±0·2	III S_{408} incl. 2305+18·3	92	−37		
1·3±0·4	4·5±0·6	III S_{408} incl. 2305+18·8	91	−38		
0·7±0·4	1·6±0·3	III	79	−51		
0·7±0·2	2·5±0·3	III	87	−45		
0·9±0·1	5·5±0·4	I E 14·9^m	84	−48		23+0*2*

TABLE 1

Catalogue Number	Position (1950·0)		Annual Precession		Flux Density (10^{-26} W m^{-2} (c/s)$^{-1}$)				
	R.A. h m s	Dec. ° ′	Δα s	Δδ ″	$S_{85\cdot5}$	S_{178}	S_{408}	S_{1410}	S_{2650}
2308+13	23 08 36	+13 42·0	3·00	19·5			2·2	<0·5	0·2
2309+12	23 09 29	+12 12·1	3·00	19·6			1·8	<0·5	<0·2
2309+18	23 09 37	+18 28·9	2·97	19·6			5·7	2·0	0·9
2309+09	23 09 55	+09 03·5	3·02	19·6	29	14	8·8	2·6	1·5
2310+05	23 10 16	+05 01·5	3·04	19·6	18	10·8	9·1	3·2	1·7
2313+10	23 13 01	+10 11·5	3·02	19·6			2·2	1·2	0·9
2313+12	23 13 14	+12 26·5	3·01	19·6			1·7	0·8	(0·4)
2313+01	23 13 44	+01 13·2	3·06	19·6			3·3	1·2	0·6
2313+03	23 13 59	+03 48·3	3·05	19·6	57	24	14·8	4·6	2·3
2315+15	23 15 34	+15 29·9	3·00	19·7			1·5	0·6	(0·2)
2318+02	23 18 16	+02 40·7	3·06	19·7			1·9	0·7	0·4
2318+07	23 18 04	+07 57·2	3·03	19·7			(4·0)	0·8	0·5
2319+07	23 19 58	+07 55·9	3·04	19·7			(4·0)	1·1	1·0
2325+04	23 25 32	+04 22·4	3·05	19·8	17		(3·7)	0·6	<0·2
2328+10	23 28 06	+10 43·9	3·03	19·8			1·5	1·2	0·9
2329+17	23 29 26	+17 14·1	3·01	19·9			2·9	1·1	(0·3)
2334+08	23 34 01	+08 33·8	3·05	19·9			3·0	1·1	(0·5)
2335+03	23 35 30	+03 11·6	3·06	19·9			3·4	1·4	1·1
2337+13	23 37 58	+13 16·4	3·04	20·0			5·8	1·9	(0·8)
2338+04	23 38 27	+04 14·0	3·06	20·0			5·4	1·6	1·0
2338+03	23 38 55	+03 02·2	3·06	20·0			3·8	1·0	0·4
2343+00	23 43 26	+00 39·8	3·07	20·0			1·9	<0·5	<0·2
2344+09	23 44 07	+09 13·0	3·05	20·0			2·7	2·1	1·4
2345+18	23 45 56	+18 27·2	3·04	20·0			5·4	1·8	0·7
2348+16	23 48 45	+16 02·0	3·05	20·0			2·5	0·8	0·4
2350+05	23 50 17	+05 43·7	3·06	20·0			1·9	1·3	(0·5)
2354+14	23 54 44	+14 32·5	3·06	20·0			3·7	1·4	0·5
2356+01	23 56 54	+01 54·3	3·07	20·0			1·7	<0·5	<0·2
2357+00	23 57 22	+00 26·3	3·07	20·0			2·3	<0·5	0·3

Columns 11 and 12.—The values of spectral index and flux density at 400 Mc/s that are the best fit to all the flux densities available (excluding those in parentheses). The estimated r.m.s. errors are given in each case.

Column 13.—Remarks and miscellaneous data. The numerals I–IV refer to the classification of the optical field within a rectangle $\pm 1'\cdot 0$ arc from the position of the source, defined by Harris and Roberts (1960), as follows.

Class I: The error rectangle includes one or more galaxies brighter than $m_{pg} = 17$.

Class II: The error rectangle includes one or more galaxies brighter than $m_{pg} = 19\cdot 5$ and fainter than $m_{pg} = 17$.

(*Continued*)

Spectrum		Remarks	Galactic Coordinates		Other Catalogue Numbers	
Index	S_{400}		l^{II} °	b^{II} °	3C	MSH
1·3±0·3	2·3±0·6	III	89	−42		
—			82	−44		
1·0±0·1	6·4±0·6	III	93	−38	457	
0·9±0·0	7·9±0·4	III	86	−46	456	23+03
0·7±0·1	7·5±0·4	III	83	−50	458	23+04
0·5±0·2	2·2±0·2	III	88	−46		
0·6±0·5	1·7±0·4	II ext.	90	−44		
0·9±0·2	3·6±0·4		80	−53		
0·9±0·0	13·9±0·6	III QSO P < 1%	83	−51	459	23+05
0·7±0·5	1·5±0·4	III ext.	92	−41		
0·8±0·3	2·0±0·3	I E 17^m	83	−53		
0·7±0·4	2·0±0·3	I 13·8^m possibly ext. S_{408} incl. 2319+07	88	−48		
0·2±0·3	1·3±0·1	III possibly ext. S_{408} incl. 2318+07	88	−49		
1·2±0·1	2·7±0·5	III S_{408} incl. uncat. source	87	−52		23+08
0·4±0·3	1·8±0·2	III (QSO)	93	−47		
0·8±0·3	2·9±0·5	III ext.	97	−41		
0·8±0·3	3·0±0·5	II ext.	94	−50		
0·6±0·2	3·1±0·3		90	−54		
0·9±0·2	5·9±0·6	ext. in a	98	−46		
0·9±0·1	5·2±0·5		92	−54		
1·2±0·2	4·2±0·6		91	−55		
—			91	−58		
0·5±0·2	3·5±0·3	III	98	−50		
1·1±0·2	6·3±0·6	II	103	−42	467	
1·0±0·3	2·7±0·4	III	103	−44		
0·3±0·4	1·8±0·3	II ext.	98	−54		
1·1±0·2	4·7±0·6	III	104	−46		
—		III	98	−58		
1·1±0·2	2·4±0·5		97	−60		

Class III: The error rectangle includes no galaxies above the plate limit.

Class IV: The field is heavily obscured.

Where an optical identification has been made, the following abbreviations apply:

QSO = quasi-stellar object; (QSO) = possible quasi-stellar object; gal. = galaxy, type not yet determined; SO = SO galaxy; E = elliptical galaxy; db. = dumb-bell galaxy.

Other abbreviations used are as follows.

P—polarization measured at 1420 Mc/s, percentage indicated; ext.—source appears extended at 2650 Mc/s; resolved—source resolves into more than one component at the stated frequency; S . . . incl.—flux density at the stated frequency includes some flux from sources indicated or from an uncatalogued source.

Columns 14 and 15.—New galactic coordinates.

Columns 16 and 17.—Catalogue numbers as given by Edge *et al.* (1959)* and by Bennett (1962)* and the catalogue numbers of sources as given by Mills, Slee, and Hill (1958)†.

Brackets around a 3C number indicate that some doubt exists as to the identity between the 3C and Parkes Catalogue source; 3C sources that had to be lobe shifted to fit Catalogue source positions are also given in parentheses. MSH sources that are resolved into more than one source at higher frequencies are placed in parentheses also.

IV. Source Position Errors

(a) *Pointing Errors*

As outlined in the first part of the Catalogue (BGM survey), pointing errors with this type of telescope arise from four sources, as follows (method of compensation given, where applicable):

(i) the master equatorial instrument (Bowen and Minnett 1962)—the polar axis of this is aligned to within 6″ arc of the true pole, and there are errors of 6″ to 10″ arc due to flexure of the mirror tube;

(ii) misalignment of the optical axis of the error detector with the direction of the master equatorial instrument—the misalignment errors are from 2″ to 3″ arc in zenith angle component and up to 6″ arc in azimuth component;

(iii) beam squint, i.e. misalignment of the radio beam with the optical axis of the error detector—the beam squint components are now less than 0′·3 arc but were larger during the earlier part of the survey; the pointing corrections for beam squint are given by

$$\Delta\alpha = 4\sec\delta\,(\Delta x\cos p + \Delta z\sin p) \quad \text{seconds of time,}$$

$$\Delta\delta = (-x\sin p + z\cos p) \quad \text{minutes of arc,}$$

where x and z are respectively the azimuth and zenith angle components of beam squint, in minutes of arc, and p is the parallactic angle (positive before transit);

(iv) refraction—compensation is introduced electrically, to within $\pm 6''$ arc.

Pointing corrections for known master equatorial errors and beam squint errors of up to 0′·7 arc have been applied to all the measured source positions.

(b) *Errors in Position Arising from System Noise and Short-term Instabilities*

Errors in the determination of source position arise from system noise and short-term receiver instabilities. The effects of these were estimated by taking the difference in positions obtained in the forward and reverse scans for a large sample of sources. This difference had an r.m.s. scatter of 0′·85 arc for all the sources, being 0′·4 arc for sources stronger than 2 f.u. (at 1410 Mc/s).

* Hereafter referred to as 3C.

† Hereafter referred to as MSH.

(c) *Total Errors*

It is thought that for the sources stronger than 2 f.u. at 1410 Mc/s the r.m.s. error in Catalogue position is less than $0'\cdot5$ arc in each coordinate, increasing to $1'\cdot0$ arc for the weaker sources.

(d) *Comparison of Catalogue Positions with Known Source Positions*

There are 17 sources in the area whose radio positions are known either from optical identifications, lunar occulations, transit measurements, or from interferometer results. The Catalogue positions for these sources were compared with the best-known positions, and it was found that there were small systematic differences in both right

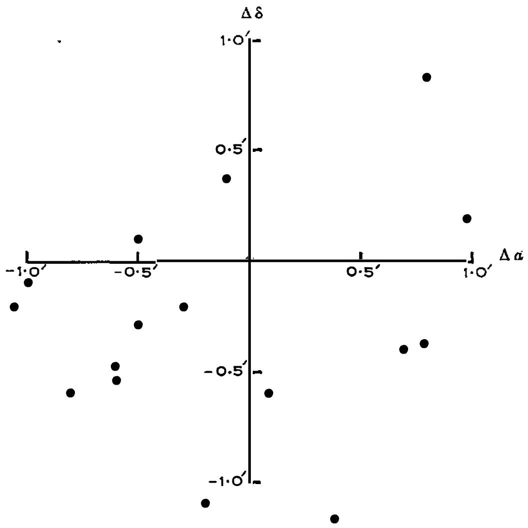

Fig. 2.—Differences between the best-known radio positions and those given in the Catalogue, for 17 sources.

ascension and declination (1^s in α and $0'\cdot2$ in δ). Corrections to all Catalogue positions were applied to remove these systematic differences. The remaining differences in right ascension and declination are given in Figure 2. It will be seen that the majority of the sources are within $\pm1'\cdot0$ arc for each coordinate, and this agrees with the estimate of positional accuracy. A comparison of the declinations of 25 sources in the area with the declinations given by Read (1963) shows that the Catalogue declinations are possibly $0'\cdot1$ arc too far north; the r.m.s. scatter between the declinations given by Read and the Catalogue declinations was $0'\cdot4$ arc.

V. Determination of Flux Densities

(a) *Measurements from Records*

The flux densities were measured at 408, 1410, and 2650 Mc/s. At 1410 and 2650 Mc/s the mean amplitude of four scans was measured as a fraction of the calibration signal. At 408 Mc/s the average of two scans was taken, namely, a right ascension scan taken during positioning and a declination scan from the original survey. The aerial calibrations given in the BGM section of the Catalogue were used, the calibration signal being obtained from a noise tube via a directional coupler in the signal lead. The multiplying factors used to convert aerial temperatures to flux densities were 1·47, 1·64, and 1·80 at 408, 1410, and 2650 Mc/s respectively. In addition, at 2650 Mc/s, Hydra A (23·5 f.u.) and 3C 273 (37 f.u.) were measured at each observing session and used to check the calibration. At the conclusion of the survey, the flux densities of 40 sources were compared with the flux densities of the same sources as given by Conway, Kellermann, and Long (1963)*. It was found that at 408 Mc/s the mean of the Catalogue flux densities was 8% greater than the mean of the CKL values, and at 1410 Mc/s the mean of the flux densities was 3% less than the CKL mean value.

TABLE 2

ERRORS IN FLUX-DENSITY MEASUREMENTS

Source of Error	Error at Given Frequency		
	408 Mc/s	1410 Mc/s	2650 Mc/s
Variation in calibration signal (r.m.s.)	5%	5%	5%
Unknown polarization	0	1%	2%
Angular extent of source $\{S_{2650} \geqslant 0 \cdot 7$ f.u.	0	0	1%
Angular extent of source $\{S_{2650} < 0 \cdot 7$ f.u.	0	0	2%
Noise fluctuation (r.m.s.)	0·5 f.u.	0·1 f.u.	0·05 f.u.
Confusion effects (r.m.s.)	0·7 f.u.	0·1 f.u.	0·03 f.u.
Estimated total error (r.m.s.)	5%±0·86 f.u.	5%±0·14 f.u.	6%±0·06 f.u.

(b) *Errors in Flux-density Measurements*

Individual flux-density measurements will have an error with respect to the flux scale as defined in the BGM survey.

There are two types of error, namely, those proportional to flux density and those that are independent of flux density. The former comprise (i) variation in calibration signal or aerial–feed combination; (ii) errors due to polarization of the source; and (iii) errors arising from angular extent of the source. In the latter category there are errors due to (i) noise fluctuation on the record and (ii) confusion effects. The values of these errors have been estimated and are shown in Table 2.

Errors due to polarization may be as high as 15% at 2650 and 1410 Mc/s, and the estimates of 1–2% given are r.m.s. values. The r.m.s. values of the error due to noise fluctuations have been found from the difference between forward and reverse scans for a large sample of sources.

Confusion effects are very small at higher frequencies, but at 408 Mc/s the r.m.s. confusion error is 0·9 f.u., determined from the difference between flux densities obtained from scans in declination and right ascension. The confusion error in the average of two scans would be 0·7 f.u.

* Hereafter referred to as CKL.

VI. Spectra of Sources

The spectral index α is defined by the expression $S = kf^{-\alpha}$, where S is the flux density at frequency f. For each source the straight line $\log S = -\alpha \log f +$ const. was determined as the best fit to the individual fluxes, ignoring those in parentheses. Each flux used was weighted as the inverse square of its r.m.s. error. The r.m.s. errors used were 10%+2·5 f.u. at 85·5 Mc/s, 10%+2·2 f.u. at 178 Mc/s, and the values listed in Table 2 at 408, 1410, and 2650 Mc/s. The spectral index and flux density at 400 Mc/s, together with their expected r.m.s. errors derived from the quoted flux errors, are tabulated in columns 11 and 12 of the Catalogue.

The r.m.s. error corresponding to the goodness of fit was calculated for each source, and where this is significantly greater than the expected error, i.e. indicating a departure from the power-law spectrum, it is indicated by a "C" for curved in column 11. These sources are listed in Table 3. Observations of these were repeated and, for some of them, additional observations at 5000 Mc/s were made; the resulting spectra are shown in Figure 3.

Table 3

SOURCES WITH CURVED SPECTRA

0316+16 (CTA 21)	1226+02 (3C 273)
0430+05	1441+11 (3C 296)
0454+06	2127+04
0735+17	2144+15 (3C 437)
1005+07 (3C 237)	2145+06
1008+06 (3C 238)	2230+11 (CTA 102)
1055+01	

The mean, $\bar{\alpha}$ $(= (1/n) \sum_{i=1}^{n} \alpha_i)$, and variance, S_α $(= (n-1)^{-1} \sum_{i=1}^{n} (\bar{\alpha}-\alpha_i)^2)$, of the distribution of the spectral indices of all sources for which more than two flux densities are available are given in Table 4. These statistics are also given for sources with flux density at 408 Mc/s greater than 4·0 f.u., the limit of the BGM survey. There is no significant difference in the mean spectral indices of the weak and strong sources.

In order to determine the component of the variance of the spectral index distribution due to the intrinsic differences of sources, we need to know the contribution of the flux errors to the total variance. For an individual source, the scatter of the fluxes from the power-law spectrum is not a very useful estimate of the flux errors because of the small numbers of points involved, but it may be used to obtain a reliable upper estimate of the average effect of the flux errors for all sources. The r.m.s. value of this estimate is 0·015 for the whole survey and 0·010 for sources with flux densities greater than 4 f.u. at 408 Mc/s. The estimates calculated from the quoted flux errors are 0·038 and 0·012 respectively, indicating that the quoted component that is independent of flux density is probably overestimated. Using the former estimate, we obtain for the intrinsic dispersion in the spectral indices of all sources a standard deviation of 0·21 and of 0·20 for the stronger sources.

The spectral indices between flux densities at adjacent frequencies were calculated for each source; the mean and variance of the spectral indices for each range

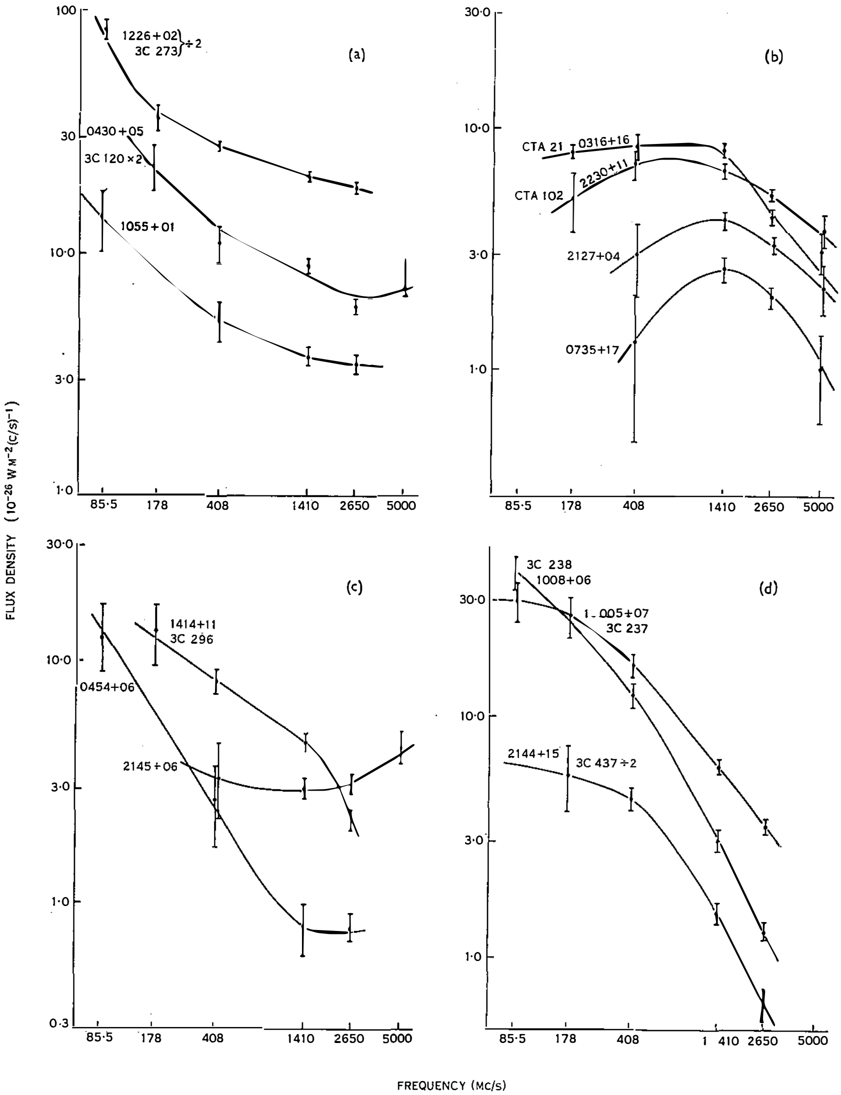

Fig. 3.—Plots of all sources in the survey having curved spectra.

are given in Table 3. The increased dispersion for the 1410–2650 Mc/s range is consistent with that expected from the flux errors for the shorter range of frequency.

Possible differences in calibration at each frequency preclude physical interpretation of the difference in mean spectral index for each range.

VII. Identification

The positions of most of the sources have been examined on the 48 in. Palomar Sky Survey plates by Margaret Clarke and J. G. Bolton (Division of Radiophysics, CSIRO). Field classifications I–IV, as defined by Harris and Roberts (1960), are given, with an indication of the source identification (quasi-stellar object, possible quasi-stellar object, or galaxy) where this has been made. These identifications will be discussed in detail in a later paper.

The classes I–IV given in column 13 of Table 1 refer to the classification of the optical field within a rectangle $\pm 1'$ arc from the position of the source.

Table 4

Distribution of spectral indices

	All Sources			$S_{408} > 4\cdot0$ f.u.		
	Mean	Variance	Number	Mean	Variance	Number
All frequencies	0·89	0·061	382	0·87	0·051	182
85·5–408 Mc/s	0·92	0·09	98	0·82	0·06	67
178 –408 Mc/s	0·66	0·14	78	0·62	0·11	75
408 –1410 Mc/s	0·87	0·10	416	0·91	0·09	173
1410–2650 Mc/s	0·93	0·16	428	0·95	0·11	156

VIII. Extended Sources

Nineteen sources were resolved at 1410 Mc/s, two of these into three components. A further nine sources were resolved at 2650 Mc/s. In addition, five sources were found to include components too small to be catalogued.

For the 2650 Mc/s observations, the declination and right ascension scan rates were carefully set to values of $0\cdot25°$/min and $0\cdot25$ (sec δ)°/min. Beam broadening was measured to detect angular-size effects. The standard deviation in beamwidth, σ, is approximately equal to (r.m.s. noise × beamwidth)/(amplitude). This corresponds to approximately 3′ arc for $S_{2650} \geqslant 0\cdot7$ f.u. and approximately 5′ arc for $S_{2650} < 0\cdot7$ f.u.

Forty sources which broaden the beam significantly, and which have apparently steep spectral index between 1410 and 2650 Mc/s, have been listed as extended in column 13 of Table 1. For these sources no attempt has been made to calculate the integrated flux, the value of the peak amplitude being given in parentheses.

Some of the sources that are extended by less than the above limit may have their flux densities underestimated because of undetected resolution. For a double source, this underestimation can be as much as 15% for $S_{2650} \geqslant 0\cdot7$ f.u. and 35% for $S_{2650} < 0\cdot7$ f.u. The available statistics on the diameters of sources give an r.m.s. error in flux density of 1% and 2% respectively.

IX. Source Counts

The present survey gives the flux density, at three frequencies, of 564 sources in an area of 1·88 steradians. The relationship between the flux density and the number of sources per steradian above a given level of flux density is shown in

Figure 4. For sources with flux density greater than $3\cdot5$ f.u. at 408 Mc/s, these relations are linear with slopes of $1\cdot60$ at 2650 Mc/s, $1\cdot65$ at 1410 Mc/s, and $1\cdot80$ at 408 Mc/s; the statistical uncertainty in these slopes is $\pm0\cdot15$. For weaker sources the survey is incomplete owing to confusion effects in the 408 Mc/s finding survey.

X. Comparison with Other Catalogues

(*a*) *Comparison with 3C and Revised 3C Catalogues*

All the 85 Revised 3C sources in the area were found. 3C 177 and 3C 437·1 were resolved into two and three sources respectively, and 3C 296 has to be lobe-shifted north from the Revised 3C position, which brings it back to the position given in the original 3C catalogue.

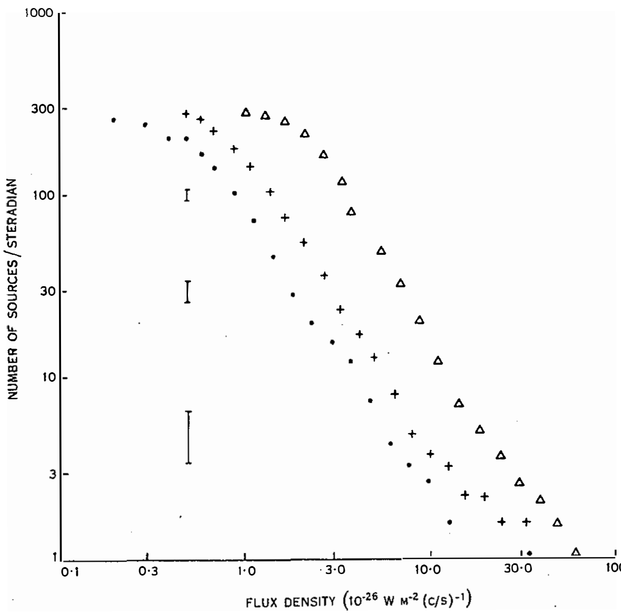

Fig. 4.—Relationship between the flux density and the number of sources per steradian above a given level of flux density. The error bars indicate the statistical uncertainty. ● 2650 Mc/s; + 1410 Mc/s; △ 408 Mc/s.

A search was made for all 3C sources in the area, and 42 sources (in addition to those in the Revised 3C catalogue) were found. Of these, (3C) 37, 120, 140, 213, 262, 375, and 451, if all shifted one lobe to the north, and 3C 312 shifted one lobe south, agree closely in position with sources in the present Catalogue.

The differences between the Catalogue positions of Revised 3C sources measured at 1410 Mc/s and the positions given in the Revised 3C catalogue were calculated and are shown in Figure 5. In general, the agreement between the positions in right ascension is within $1'\cdot5$ arc. The agreement in declination shows a much larger scatter, up to $15'$ arc. Ten sources are sufficiently far out in position to be off the diagram.

(b) *Comparison with MSH Catalogue*

The MSH catalogue covers declinations up to +10°, and a comparison has been made both of the number of sources and of their positions in this region.

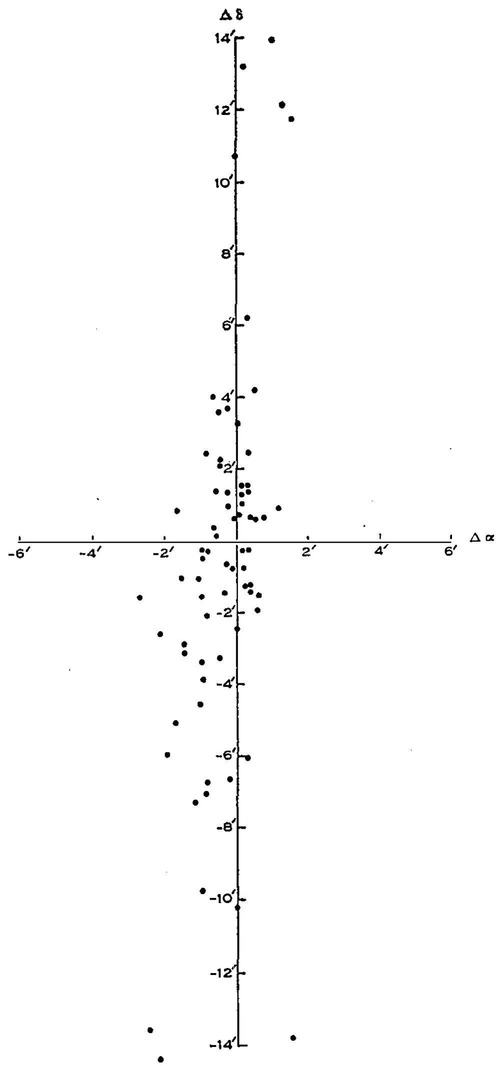

Fig. 5.—Differences between the positions of sources measured at 1410 Mc/s and those given in the Revised 3C catalogue.

Figure 6 shows a comparison of the sources that were found in the present survey with those that were not, as a function of flux density. Of the 250 MSH sources in the area, 117 were found and 133 were not found. Of those not found, we should have expected to find at least 82 of the sources since, with average spectra, they would have had strengths greater than 4 f.u. at 408 Mc/s.

An investigation was carried out on all strong MSH sources with MSH flux greater than 20 f.u. (17 sources in all). Of these, in eight cases no source was found on the 408 Mc/s records, and the other nine corresponded with extended ridges which

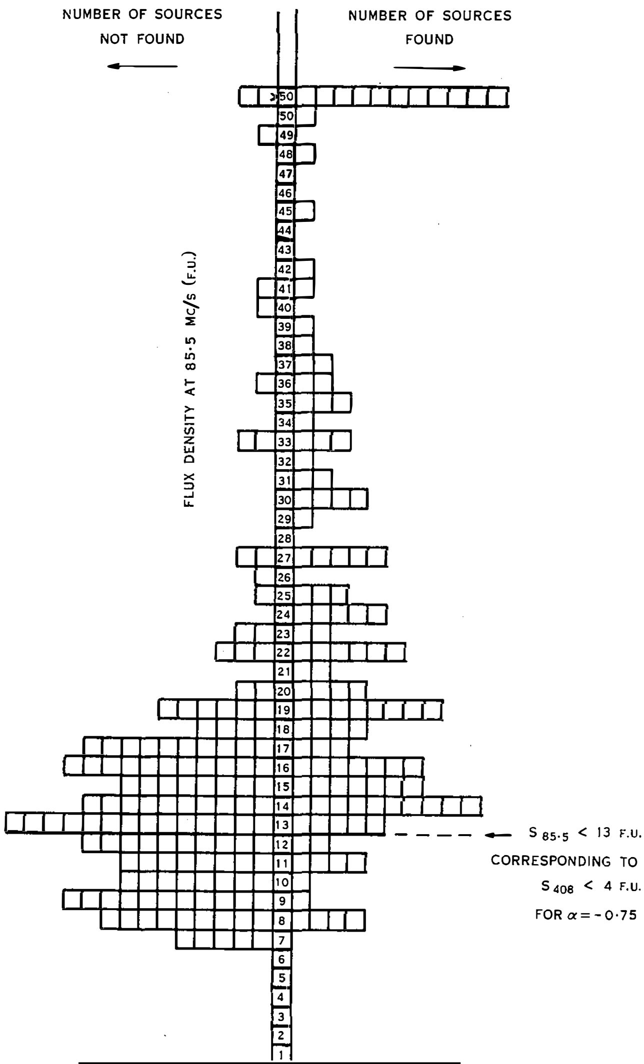

Fig. 6.—Comparison of MSH sources that were found with those that were not found in the present survey (declination range 0°–10°), as a function of flux density at 85·5 Mc/s. Each square represents one source.

appear to be galactic background irregularities. Five of these nine are in the region between 17^h and 18^h. In all cases, no source was found at 1410 Mc/s within $\frac{1}{2}$° of the position.

The 408 Mc/s survey records were inspected in the vicinity of another 65 sources with flux density above 13 f.u., and in about half the cases there are small background irregularities, which in many cases are extended in either right ascension or declination.

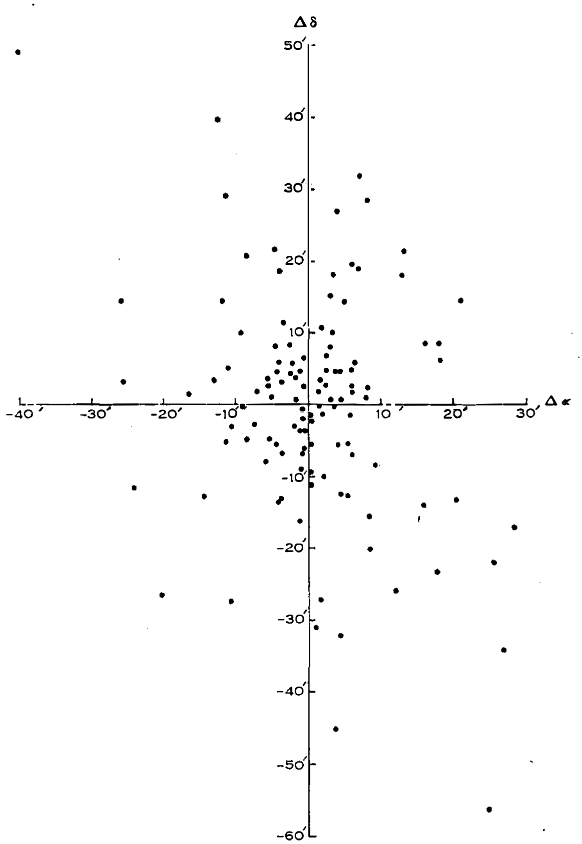

Fig. 7.—Differences between the Catalogue positions of sources and those given by MSH.

A comparison of the MSH positions and those of the present Catalogue is shown in Figure 7. The positional differences are distributed equally between right ascension and declination. Figure 7 shows that 52% of the differences are less than 10′ arc and 78% of the differences are less than 20′ arc.

XI. Acknowledgments

The 210 ft radio telescope at Parkes is the main instrument of the Australian National Radio Astronomy Observatory operated by the Division of Radiophysics, CSIRO. We are indebted to Mr. J. G. Bolton, the Director of the Observatory, for his guidance and help throughout the project. Thanks are due to the staff of the Division who provided the receivers used for the survey and to the maintenance staff at Parkes who operated and maintained the radio telescope.

Much of the detailed analysis of the records was carried out by Mrs. Jennifer Ekers, who was also responsible for the computer programming. Mr. J. Rothwell and Mr. P. Crosthwaite were members of the original survey team but, owing to other commitments, withdrew before completion of the survey.

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