FLUX DENSITIES AND POSITIONS OF SOUTHERN GALACTIC SOURCES AT 1410 MHz

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Summary

Flux densities and positions have been determined for sources in the 1410 MHz survey of the Southern Milky Way (Hill 1968) carried out with the Parkes 210 ft radio telescope.

I. Introduction

A survey at 1410 MHz of the Southern Milky Way between longitudes 281° to 355° and latitudes ±4° was carried out in 1962 by E. R. Hill using the Parkes telescope. A paper discussing the observing procedure and presenting a contour map of the region was published recently (Hill 1968).

The present paper lists the positions, flux densities, and, where possible, optical identifications of the sources in the survey. A spectral index has been determined for most sources by comparison with flux densities measured at 2650 MHz.

II. Results

The source list presented in Table 1 was compiled from the contour map of Hill (1968). It was decided that in general flux densities would not be calculated, or positions given, for any region enclosed by fewer than two contours. However, for source complexes such as that around G312·0+0·1 all points whose peak antenna temperatures lie above the chosen background temperature are given in the list. Column 1 of the table gives the source number using the galactic coordinate system introduced by Mezger and Henderson (1967). Column 2 gives the source number from previous surveys by Mathewson, Healey, and Rome (1962) (MHR), Mills, Slee, and Hill (1960, 1961) (MSH), and Wilson and Bolton (1960) (CTB). The positions given for sources (columns 3–6) are those of peak antenna temperatures (column 7), and have probable errors of ±1′ arc.

The assumed background temperature and integrated flux density in flux units† of the source are given in columns 8 and 9. Flux densities were calculated using a planimeter to find the area between adjacent contours. The antenna temperature scale of the map was based on an assumed peak antenna temperature of 53°K for the source 13S6A. Integration of the contours gives a flux density of 110 f.u. for this source, which can be compared with the value of 102±10 f.u. determined by Milne and Hill (1969) or with 130 f.u. by Mathewson, Healey, and Rome (1962).

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† 1 f.u. = 10^{-26} W m^{-2} Hz^{-1}.

TABLE 1

List of Galactic Sources at 1410 MHz

(1) Galactic Source Number	(2) Other Reference Numbers	(3) Galactic Coordinates l^{II} ° ′	(4) Galactic Coordinates b^{II} ° ′	(5) Position (1950.0) R.A. h m s	(6) Position (1950.0) Dec. ° ′	(7) Peak Antenna Temp. (°K)	(8) Back-ground Temp. (°K)	(9) Inte-grated Flux Density (f.u.)	(10) Source Complex Back-ground Temp. (°K)	(11) Source Complex Flux Density (f.u.)	(12) 2650 MHz Flux Density (f.u.)	(13) Spectral Index α	(14) Optical Identi-fication
G282.0-1.1	MHR9,MSH10-51	281 58	-1 08	10 04 45	-56 53	29.1	6.5	40	6	80			RCW46
G283.3-0.6		283 16	-0 33	10 15 05	-57 09	12.1							
G283.5-0.9		283 31	-0 54	10 15 10	-57 35	16.4	14	35					RCW48
G283.9-0.9		283 53	-0 52	10 17 35	-57 45	27.0			6	603			
G284.3-0.3	MHR10,MSH10-54	284 16	-0 19	10 22 15	-57 30	138	14	276					RCW49
G284.3+0.4		284 18	+0 24	10 25 10	-56 54	6.9							RCW50
G284.2-1.7		284 12	-1 44	10 16 00	-58 39	8.8	3	20					
G285.2+0.0		285 14	+0 00	10 29 35	-57 43	15.2	3	24					
G286.1-1.0		286 04	-1 03	10 31 05	-59 03	5.6	2	5.3					
G286.2-0.2		286 11	-0 09	10 35 15	-58 20	18	3	29					
G286.4-1.4		286 22	-1 22	10 31 50	-59 29	7.2	2	11					
G287.2+0.1		287 15	+0 04	10 43 15	-58 38	15.3							
G287.4-0.6	MHR11,MSH10-57	287 27	-0 38	10 42 05	-59 21	155	4	1380			920	-0.64	RCW53
G289.1-0.3		289 05	-0 20	10 54 40	-59 49	13.6	6	10			14	+0.6	
G289.7-0.2		289 42	-0 14	10 59 30	-59 59	7.5	6	2					
G289.8-1.2		289 48	-1 10	10 57 05	-60 53	23.2	6	66	6	123	45	-1.4	
G290.1-0.8	MHR13,MSH11-61	290 06	-0 45	11 00 45	-60 37	26.7	6	49			25		
G291.0-0.1		291 01	-0 05	11 09 45	-60 21	17					15		
G291.3-0.7		291 16	-0 43	11 09 50	-61 03	53	6	410	6	446	95	-0.39	RCW57(a)
G291.6-0.5	MHR14,MSH11-62	291 36	-0 31	11 12 50	-60 59	138					238		RCW57(b)
G292.2-0.1		292 13	-0 08	11 18 45	-60 50	6.8							
G292.0+1.8		292 02	+1 46	11 22 20	-58 59	9.5	1.5	11			10	-0.14	
G293.7+0.6		293 44	+0 39	11 32 30	-60 34	3.4	1.5	2.3			2	-0.22	
G294.1-2.3		294 08	-2 18	11 28 10	-63 30	3.4	1.5	2.5			2	-0.36	RCW61
G294.5-1.4		294 31	-1 22	11 33 45	-62 44	7.3	3.3	85			9	-2.2	
G295.0-1.7	MHR18,MSH11-65	294 59	-1 40	11 37 05	-63 09	15.2					12		RCW62
G295.2-0.6		295 10	-0 38	11 41 05	-62 12	15.4	3	28			20	-0.54	
G296.7-0.9		296 42	-0 56	11 53 20	-62 51	4.8	2	7.5			3	-1.45	
G296.8-0.3		296 49	-0 20	11 55 30	-62 16	5.2	2	6.4			4	-0.75	
G297.0-0.3		296 58	-0 20	11 56 45	-62 17	5.5							

G298.2-0.3		298 14	-0 18	12 07 30	-62 31	31.6					40		
G298.9-0.4		298 52	-0 23	12 12 50	-62 41	37.1			6	164	52	-0.84	
G299.0+0.2		299 01	+0 12	12 14 50	-62 08	7.5					4		
G300.5-0.2		300 31	-0 12	12 27 20	-62 42	4.8							
G300.6+0.1		300 37	+0 06	12 28 25	-62 24	>4			2	21			
G301.0-0.0		300 58	-0 03	12 31 20	-62 35	>4							
G301.0+1.1		301 01	+1 08	12 32 25	-61 24	4.7	1.5	9			7	-0.47	RCW65
G302.5-0.8		302 32	-0 46	12 44 50	-63 22	5.8	2	12			2.8	-2.26	RCW70
G303.5-0.7		303 32	-0 43	13 11 30	-63 13	>8	3	12			2	-2.88	
G304.6+0.1		304 36	+0 07	13 02 50	-62 26	11.8	4	12			8	-0.63	
G305.3+0.2	MHR25	305 20	+0 09	13 09 05	-62 22	73	6	339			224	-0.66	RCW74
G305.6+1.6	MHR26	305 39	+1 37	13 10 45	-60 52	6.9	2	26					
G307.1+1.2		307 07	+1 14	13 23 10	-61 06	8.6	2	8.8			7	-0.36	
G307.6-0.3		307 39	-0 16	13 29 25	-62 30	11.5	6	6.9			12	+0.88	
G308.7+0.6		308 44	+0 35	13 37 15	-61 29	13.5	4	18			21	+0.21	RCW79
G308.8+0.0		308 47	+0 00	13 38 35	-62 03	>12	6	12			12	-0.03	
G309.8+1.7	MHR29,MSH13-62	309 46	+1 40	13 43 55	-60 12	53	3	110			61	-0.94	13S6A
G309.8-0.0		309 51	-0 02	13 47 35	-61 51	10.7	8	5.1			13	+1.49	
G310.9-0.5		310 54	-0 28	13 57 10	-62 01	16	12	4.6			13	+1.65	
G311.2-0.3		311 09	-0 19	13 58 50	-61 49	14.8	12	2.2			3	+0.49	
G311.3+0.0		311 18	+0 02	13 59 15	-61 26	15	12	5.5			7	+0.38	
G311.5+0.4		311 32	+0 22	14 00 20	-61 03	17.9	12	9.4			10	+0.10	
G311.6-0.4		311 34	-0 26	14 02 30	-61 46	17.1	12	8	8	268	9	+0.19	
G312.0+0.1	MHR31,MSH14-61	311 59	+0 06	14 04 35	-61 11	26.2	12.5	50			28	-0.91	
G312.4-0.3		312 22	-0 19	14 08 40	-61 28	19					10		
G313.0-0.0		312 59	-0 03	14 12 50	-61 01	10.3					1		
G313.4+0.0		313 27	+0 02	14 16 15	-60 48	11.1					6		
G314.2-0.0		314 14	-0 01	14 22 25	-60 34	6.8					1		
G314.3+0.4		314 16	+0 22	14 21 35	-60 12	11	5	13.5			11	-0.19	
G315.1-2.4		315 08	-2 25	14 37 00	-62 27	>6							RCW86
G315.4-2.5	MHR35,MSH14-63	315 23	-2 30	14 39 15	-62 26	4.7			2	20*			
G315.7-2.4		315 40	-2 22	14 41 05	-62 11	4.4							
G316.3-0.0		316 18	-0 01	14 37 50	-59 47	14.8	9	6.1			12	+1.07	
G316.8-0.0		316 46	-0 02	14 41 15	-59 36	32.9	11.5	28			34	+0.31	
G317.0+0.3		317 00	+0 16	14 41 55	-59 14	21.1	13	9.2	6	209	17	+0.97	
G317.2+0.2		317 15	+0 11	14 44 00	-59 13	15.9					12		
G317.6-0.3		317 37	-0 18	14 48 15	-59 29	10					4		

* Hill (1967) quotes a flux density of 30 f.u. for G315.4−2.5. The discrepancy between these two values appears to be due to the choice of background levels.

(1) Galactic Source Number	(2) Other Reference Numbers	(3) Galactic Coordinates l^{II} ° ′	(4) b^{II} ° ′	(5) Position (1950.0) R.A. h m s	(6) Dec. ° ′	(7) Peak Antenna Temp. (°K)	(8) Back-ground Temp. (°K)	(9) Inte-grated Flux Density (f.u.)	(10) Source Back-ground Temp. (°K)	(11) Complex Flux Density (f.u.)	(12) 2650 MHz Flux Density (f.u.)	(13) Spectral Index α	(14) Optical Identi-fication
G318.1-0.6		318 04	-0 39	14 52 40	-59 36	11.9	6	16			17	+0.11	
G319.2-0.4		319 12	-0 22	14 59 25	-58 49	12	6	12			19	+0.69	
G319.4+0.0		319 24	+0 00	14 59 25	-58 24	10	6	6.5			12	+0.97	
G320.2+0.8		320 10	+0 48	15 01 35	-57 20	9.5	4	6.5			10	+0.68	RCW87
G320.3-0.3		320 16	-0 16	15 06 10	-58 12	14.8	7	15			12	-0.40	
G320.3-1.0		320 20	-1 03	15 09 35	-58 51	20.1	6	37			23	-0.09	RCW89
G320.3-1.4		320 20	-1 22	15 10 55	-59 07	11					12		
G320.4+0.1		320 23	+0 06	15 05 30	-57 50	8.5	6.5	11			5	+0.43	
G320.7+0.2		320 43	+0 12	15 07 20	-57 34	13.3					9		
G321.1-0.5		321 04	-0 31	15 12 20	-58 01	15.1	6	13			21	+0.79	RCW91
G322.1+0.2		322 04	+0 10	15 16 00	-56 54	4.6	3.5	16				-0.17	
G322.2+0.6	MHR41	322 09	+0 37	15 14 45	-56 29	>12					14		RCW92
G326.2-1.7	MHR44,MSH15-56	326 14	-1 44	15 48 30	-56 02	34.2	2.8	133			91	-0.60	
G326.3+0.7		326 17	+0 44	15 38 15	-54 03	14.9	8	12	6	74	30	+1.49	RCW94
G326.6+0.6		326 39	+0 35	15 40 55	-53 57	35	8	34			50	+0.61	RCW95
G326.4-0.4		326 22	-0 24	15 43 30	-54 54	18.5							
G326.5-0.5		326 32	-0 32	15 44 55	-54 54	18.5	16	3.4			18	+2.64	
G326.7-0.6		326 40	-0 33	15 45 45	-54 50	18.5			8	224			
G326.9-0.1		326 54	-0 06	15 45 05	-54 20	23.3	16	12			20	+0.77	
G327.3-0.5		326 17	-0 32	15 49 00	-54 26	41.1	16	30			54	+0.93	RCW97
G327.3+0.5		327 18	+0 28	15 44 50	-53 39	17.5	10	13			12	-0.13	
G327.7-0.3		327 41	-0 20	15 50 15	-54 02	16.6					9		
G327.9+0.0		327 52	+0 02	15 49 40	-53 38	17.9					20		
G328.3+0.4		328 18	+0 25	15 50 20	-53 04	>18	13	14	11	61	8	-0.33	
G328.4+0.2	MHR46,MSH15-57	328 22	+0 14	15 51 25	-53 10	21.5					11		
G328.7-0.0		328 44	-0 02	15 54 25	-53 08	14.7					2		
G329.1+0.3		329 08	+0 20	15 54 55	-52 36	12.8	12	27			6		
G329.6+0.4	MHR47,MSH15-58	329 34	+0 22	15 56 55	-52 17	17.1							
G331.4+1.0		331 21	+1 02	16 02 45	-50 37	10.4	7	3.5					
G330.9-0.4		330 54	-0 23	16 06 40	-51 58	24.6							
G331.3-0.3		331 20	-0 20	16 08 30	-51 38	24.4			12	181	111	-0.78	
G331.5-0.0		331 32	-0 02	16 08 10	-51 17	43.8							
G332.0+0.2		331 58	+0 10	16 09 20	-50 50	17.1							

G332.4-0.4		332 23	-0 21	16 13 30	-50 56	26.9	16	19			27	+0.56	RCW103
G332.4+0.1	MSH16-51	332 27	+0 06	16 11 50	-50 34	23.6	16	9.7			14	+0.94	
G332.8-0.6		332 45	-0 35	16 16 10	-50 51	40	25	123	12	461	164	+0.46	RCW106
G333.1-0.4	MHR51	333 04	-0 26	16 17 00	-50 31	62.7							
G333.6-0.2		333 36	-0 11	16 18 15	-49 58	>60	25	60			122	+1.13	
G332.9+0.8		332 56	+0 48	16 11 00	-49 43	12.9	9	5			5	0	
G336.5-1.5		336 30	-1 28	16 36 15	-48 45	16.6	11	15			6	-1.45	RCW108
G337.3+1.0		337 20	+0 57	16 29 00	-46 30	13.5	8	8.1			5	-0.76	
G334.8-0.1	MHR52	334 45	-0 08	16 23 00	-49 07	>16							
G334.9-0.3		334 52	-0 16	16 24 10	-49 08	17.3	12	34					
G335.2+0.0		335 10	+0 02	16 24 05	-48 40	17.4							
G335.8-0.1		335 48	-0 08	16 27 25	-48 22	18.4					10		
G336.5-0.2		336 28	-0 10	16 30 20	-47 54	32.5	25	7			35		
G336.8+0.0	MHR55,CTB33	336 51	+0 01	16 31 05	-47 29	48.8	25	72			70		
G337.9-0.5		337 54	-0 28	16 37 25	-47 03	25					16		
G338.0-0.1		337 58	-0 06	16 36 05	-46 45	37.5	30	9.6	12	764	80	-1.34	
G338.4+0.1	MHR56,MSH16-47, CTB34	338 27	+0 04	16 37 10	-46 16	54.8	30	31			95		
G338.9+0.5		338 52	+0 32	16 36 50	-45 39	18.3	12	8.9			11		
G339.0-0.1		338 59	-0 06	16 39 55	-46 00	16					3		
G339.1-0.4		339 07	-0 21	16 41 35	-46 03	15.9					4		
G339.2+0.2		339 14	+0 10	16 39 45	-45 38	14.7					3		
G339.6-0.1		339 34	-0 04	16 42 05	-45 32	12.8					1		RCW109
G340.2-0.2		340 12	-0 14	16 44 55	-45 08	19.8	12	29			14	-1.19	
G340.5+0.4		340 30	+0 21	16 43 40	-44 33	13.2	10.5	5.4			2	-1.57	
G340.8-1.0		340 48	-1 03	16 50 50	-45 13	20.2	9	21			18	-0.24	
G341.2-0.3		341 14	-0 18	16 49 05	-44 25	15.8	11	17			11	-0.69	
G342.2+0.0		342 09	+0 00	16 51 05	-43 31	15.5	11	54			12	-2.38	
G342.3+0.2		342 18	+0 15	16 50 35	-43 14	17.4							
G343.5-0.1	MHR60	343 30	-0 04	16 56 00	-42 30	23.8	14	15			15	0	
G345.0+1.5	MHR61,CTB35	345 02	+1 31	16 54 30	-40 19	21.7					13		
G345.2+1.1		345 13	+1 04	16 57 00	-40 27	20.2			8	139	18	-1.30	
G345.3+1.4		345 20	+1 25	16 55 55	-40 09	30.2					30		
G345.4-1.0		345 24	-1 00	17 06 15	-41 34	25	7.5	45			33	-0.48	RCW117
G345.6-0.1		345 36	-0 04	17 02 55	-40 51	21.7	12	18			28	+0.67	
G346.2-0.1		346 09	-0 05	17 04 45	-40 25	16.2					9		
G346.5+0.0		346 31	+0 02	17 05 25	-40 03	15.1			11	29	1	-1.49	
G346.6-0.2		346 34	-0 10	17 06 25	-40 08	>16					2.5		
G347.6+0.2		347 37	+0 13	17 08 05	-39 04	21.8	14	9.4			22	+1.35	
G348.3-1.0	MHR62,CTB38	348 16	-1 00	17 15 10	-39 15	15.9	10	4.4			10	+1.3	RCW121
G348.2+0.4		348 13	+0 27	17 09 00	-38 27	13.2					7.5		RCW120
G348.5+0.1	MHR63,MSH17-33, CTB37	348 28	+0 06	17 11 10	-38 27	41.1			10	96	45	-0.42	
G348.7+0.3		348 40	+0 20	17 10 50	-38 09	27.6					21		

(1) Galactic Source Number	(2) Other Reference Numbers	(3) Galactic Coordinates l^{II} ° ′	(4) b^{II} ° ′	(5) Position (1950.0) R.A. h m s	(6) Dec. ° ′	(7) Peak Antenna Temp. (°K)	(8) Back-ground Temp. (°K)	(9) Inte-grated Flux Density (f.u.)	(10) Source Complex Back-ground Temp. (°K)	(11) Flux Density (f.u.)	(12) 2650 MHz Flux Density (f.u.)	(13) Spectral Index α	(14) Optical Identi-fication
G348.6-0.6		348 39	-0 34	17 14 35	-38 43	17.8	13	8.8			15	+0.85	
G348.7-1.0		348 43	-1 02	17 11 05	-38 08	38.7	12	59			62	+0.09	RCW122
G349.1+0.0		349 07	+0 02	17 13 25	-38 58	19.6	12	15			12	-0.35	
G349.8+0.1		349 45	+0 08	17 14 50	-37 24	22.1	12	12			13	+0.19	
G349.8-0.5		349 50	-0 32	17 17 45	-37 42	15.8	10	14			7.5	-0.42	RCW123
G350.1+0.1		350 07	+0 07	17 15 55	-37 06	15	11	4.6			5	+0.13	RCW125
G350.6+0.9		350 36	+0 54	17 14 10	-36 15	13.9 }	11	330			9 }	-0.32	RCW126
G351.4+0.8	MHR64,MSH17-34, CTB39	351 22	+0 45	17 17 00	-35 43	82.7 }					261 }		RCW127
G351.6+0.2		351 34	+0 11	17 19 50	-35 52	21.4	12	15			21.5	+0.62	
G351.7-1.2		351 40	-1 12	17 25 45	-36 34	19.6	6	32			43	+0.49	
G353.2+0.7	MHR65,CTB40	353 10	+0 42	17 22 10	-34 16	103.9	11	560			313	-0.92	RCW131
G353.5-0.0	MSH17-36	353 30	-0 01	17 26 00	-34 24	18.9	11	22			20.5	-0.08	

An attempt at consistency has been made, but the estimate of both background temperature and flux density is somewhat subjective, particularly where there is confusion. In such cases the flux density of the source complex (column 11) has also been calculated. The background temperature chosen for the source complex (column 10) is in general lower than that for the individual sources.

The integrated flux densities of sources at 2650 MHz, taken from the 11 cm surveys for latitudes between ±2° and longitudes 286°·5 to 288° (Beard and Kerr 1966), 288° to 307° (Thomas and Day 1969*a*), 307° to 330° (Day, Thomas, and Goss 1969), 330° to 334° (Beard 1966), 334° to 345° (Thomas and Day 1969*b*), and 345° to 5° (Beard, Thomas, and Day 1969) are given in column 12. An estimate of the spectral index of the sources (column 13) has also been made from the 1410 and 2650 MHz flux densities, the spectral index α being given by $S = A\nu^{\alpha}$, where A is a constant. For many sources there is confusion at 1410 MHz, and the apparent spectral index has limited significance. Where there is confusion the spectral index of the source complex is usually given.

Column 14 lists the optical identifications obtained from the catalogue of Rodgers, Campbell, and Whiteoak (1960).

III. References

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