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CATALOG OF CO RADIAL VELOCITIES TOWARD GALACTIC H II REGIONS

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ABSTRACT

This is a catalog of 242 molecular cloud complexes which are associated with optical H II regions. CO observations were made toward all but five of the H II regions in the Sharpless catalog and toward 62 additional suspected H II regions, 33 of which are previously uncataloged. Radial velocities are tabulated for each molecular cloud complex found to be associated with an H II region. The CO antenna temperature and line width are given for the most intense CO line seen toward each source. The catalog also summarizes previous CO observations as well as the optical distances to the stars exciting the H II regions. Radio-quiet H II regions (those with 1.4 GHz flux densities <100 mJy) are found to be well correlated with objects having no associated CO. A list of kinematically distinct complexes is tabulated to facilitate investigations of the motions of the complexes.

Subject headings: interstellar: molecules — nebulae: H II regions

I. INTRODUCTION

Since the discovery of interstellar CO (Wilson, Jefferts, and Penzias 1970), it has become clear that mostH II regions have accompanying molecular clouds. Although the peak emission from many of these clouds is detectable in a few seconds of integration with present instruments, no systematic survey of CO related to H II regions has been undertaken. Blitz (1979) has shown, for example, that such a survey can be used to determine the rotation curve of the outer part of the Milky Way. It is with the intention of studying the kinematics and dynamics of the Galaxy that we have surveyed nearly all of the *optical* H II regions in the Galaxy accessible to northern hemisphere instruments for associated CO emission.

The CO observations provide roughly an order of magnitude improvement in the accuracy of the center-of-mass radial velocity of the H II region/molecular cloud complexes for the following reasons: (i) in the vicinity of the Sun, where the molecular clouds have been fully mapped, the molecular gas is almost invariably the most massive component of the complex. (ii) Radiofrequency measurements can usually be made with an accuracy more than an order of magnitude better than optical recombination line (usually Hα) or stellar radial velocity measurements. (iii) Recombination line measurements include motions of gas streaming off the surfaces of the molecular clouds; the line velocity may be shifted from the center-of-mass velocity by several kilometers per second.

II. OBSERVATIONS

We have observed $\sim 90\%$ of the H II regions in the Sharpless (1959) catalog. Of the 10% we did not observe, all but five have been extensively observed by others. In addition, we observed 62 objects not listed in the Sharpless catalog which appear to be H II regions. These objects, 33 of which have not been previously cataloged, were found by perusing the Palomar Observatory Sky Survey (POSS) prints. We searched for nebulous objects brighter on the red plate than on the blue which tended to be circular rather than filamentary in appearance. We included any red nebulous object which appeared to be related to dust obscuration. We did not examine the POSS plates in a systematic manner and concentrated our search in the "windows" where H II regions known to be at large distances have been found. Even in the northern sky, we do not expect that this catalog is a complete listing of optical H II regions because of the incompleteness of our search. Our primary goal has been to get accurate information on the radial velocities of the CO clouds associated with the optical H II regions; information on the line strengths and line widths was of secondary importance.

a) Data Taking

The observations were made using the 7 m telescope at the Bell Telephone Laboratories (BTL) in Holmdel, New Jersey, and the 5 m telescope at the Millimeter

Wave Observatory[1] near Fort Davis, Texas. Where it was possible to do so, observations were made by frequency switching an amount significantly larger than the full velocity extent of the CO lines. This procedure gives a $\sqrt{2}$ improvement over beam switching in the signal to noise for a given amount of telescope time and obviates the need to find an emission-free reference position. In general, frequency switching can be used only for objects in the second and third galactic quadrants. In the first quadrant, the typical CO emission profile is too broad for frequency switching. Observations there were made by position switching between the source and a reference position which was found to be emission-free to a level $\lesssim 1$ K.

The velocity resolution of all the observations is 0.65 km s^{-1}. The velocity coverage was such that the full velocity extent of the H I (determined from the Weaver and Williams 1974 survey) in the direction of a particular H II region was within the passband. The beam of the BTL telescope is 1.'7, and for the MWO telescope it is 2.'3.

For small, roughly circular H II regions with diameters $\lesssim 20'$, typically five spectra were taken: one at the center, and one displaced by an angle equal to the radius of the H II region north, south, east, and west of the center. For the larger H II regions, and those with filamentary shapes, we observed regions which show evidence of dust clouds interacting with an ionization front. In some cases, no interaction is apparent, and we tried to find locations where dark clouds are adjacent to the optical nebulae. In these cases, even if CO is detected, its association with an H II region is doubtful in the absence of additional information. In all cases where detections were made, the molecular emission is resolved; detections were always made in at least two positions, but, more commonly, detections were made in all of the positions we searched.

b) Associating the CO *with the* H II *Regions*

In order to determine whether a particular CO line is associated with an H II region, we used whatever information was available, including the longitude and latitude of the object (to estimate the expected amount of background emission), the appearance on the POSS plates, and the Hα velocities (Georgelin 1975; Treffers 1981) where available. For most molecular clouds, the CO antenna temperature exceeds 10 K only in regions of active star formation. Therefore, CO lines >10 K are usually unambiguous evidence that an H II region is associated with a particular velocity component. CO is also closely confined to the plane of the Galaxy (Cohen and Thaddeus 1979). Detection of high latitude CO, especially toward directions of dust obscuration, is, in general, also clear evidence for association with an optical nebula even if the observed line is weak. In the galactic plane, optical obscuration is essentially always accompanied by detectable CO emission. If only one velocity component is detected in the direction of a dust cloud which is clearly interacting with an H II region, again the association is usually unambiguous.

Because there is relatively little background CO along the line of sight outside the solar circle, the spatial coincidence of high velocity CO with distant H II regions is also good evidence for associating the molecules with the ionized gas, even if the CO emission is weak. However, because the H II regions known to be at large galactocentric distances are particularly important for determining the CO rotation curve, a number of the most distant objects were mapped to assure the correctness of the association. Mapping is, of course, the best way to be convinced that an apparent association is real, and $\sim 20\%$ of the Sharpless objects have been at least partially mapped by us or by others. These are indicated in the catalog.

In most cases our observing procedure allowed us to identify a particular CO line with a particular H II region. Nevertheless, a number of questionable associations remain, especially in the first quadrant where there is often a great deal of background gas along the line of sight. These are indicated in the catalog, and most of the ambiguities can be resolved by additional mapping.

III. EXPLANATION OF THE CATALOG

The first five columns give data relevant to the optical optical H II regions. Column (1) gives the Sharpless number of the H II regions. Nebulae known not be H II regions, such as planetary nebulae and supernova remnants, have been excluded from the catalog. We nevertheless observed some of these, and the results are given in the notes. We list at the end the 65 H II regions we have identified which do not appear in the Sharpless catalog; of these 65, there are three we did not observe. The 29 objects which appear in other catalogs are identified in column (15), "comments."

Columns (2) and (3) give the 1950 coordinates of the approximate center of light of the H II regions. The positions have been listed because the positions of a number of H II regions, many of those from S3 to S32 especially, are in error in the Sharpless catalog. The listed positions have been determined from transparent overlay grids on which the positions of the SAO stars in the field of the overlays have been marked. The grids were kindly provided by W. L. Peters. Columns (4) and (5) give the galactic longitude and latitude, respectively, of the position given in columns (2) and (3).

[1]The Millimeter Wave Observatory is operated by the Electrical Engineering Research Laboratory of the University of Texas at Austin with support from the National Aeronautics and Space Administration, the National Science Foundation, and McDonald Observatory.

Columns (6)–(10) give data relevant to the CO observations. The parameters of the CO lines in columns (6)–(8) are for the strongest line we observed toward a given H II region. If an object has been more extensively observed by other workers, the line parameters in columns (6)–(8) are usually taken from the previously published work. In most cases we have taken at least one spectrum near the peak CO position as a check.

Column (6) gives the velocity centroid of the CO emission weighted by the intensity at each location at which a detection was made. In principle, the velocity centroid of a strong line can be determined to a fraction of the resolution (0.65 km s^{-1}). However, the velocity centroid at each of the observed points may differ because of the velocity structure of the molecular complex (such as that which would arise from independently moving clumps in the complex) or an overall systematic velocity gradient of the cloud complex. The quoted velocity uncertainties are 1 σ formal errors of the intensity-weighted velocity centroid for all of the detected lines. In general, we assume a minimum velocity uncertainty of 0.4 km s^{-1}.

Velocities in parentheses indicate that the association of the CO emission with an H II region is uncertain. "No Detection" means that no CO was detected at any of the positions we observed to the limit of our sensitivity (typically 0.5 K). "No Definite Detection" means that weak emission was observed which is probably unrelated to the H II region. "Cannot Associate" means that relatively strong emission was detected which could not be definitely associated with the H II region. This is usually due to multiple strong velocity components along the line of sight, a situation which occurs most frequently in the first quadrant. Where possible, Hα velocities were used to resolve the ambiguities.

Column (7) gives the antenna temperature at the position of the strongest CO emission. Because we did not, in general, map the CO emission, these values may not be the peak CO temperatures in the cloud complex. For this reason, and because the observations were made with telescopes of somewhat different spatial resolution, getting accurately calibrated line strengths was not a high priority in the observations. The peak antenna temperatures should generally be accurate to at least 25% and in most cases to better than 10%.

Column (8) gives the full width at half-maximum of the strongest CO line. This quantity was measured directly from the profiles and is not based on Gaussian fitting because of the complex nature of many of the profiles.

Columns (9) and (10) give the galactic coordinates of the position of the strongest CO line. This position rarely differs from the position in columns (4) and (5) by more than the radius of the H II region.

Column (11) gives the CO reference for the observations presented in the catalog. If more than one reference is given, the parameters of the CO line at the peak position are generally taken from the most extensive or well-sampled observations. To insure the uniformity of the data, we did not include information available from other molecular species.

Column (12) gives the distance to the stars exciting the H II regions. These are determined by spectrophotometry of the stars and are in all cases taken from the published literature. In many cases, the distances include observations of other cluster and association members in order to obtain the most accurate determination. We have made an effort to evaluate the published distances, and we include what we believe to be the best available values.

Column (13) gives the optical diameter of the H II region taken from the Sharpless catalog and from measurements of the red POSS prints for the newly cataloged objects.

Column (14) describes the degree of mapping toward the H II region and the reference for the CO map. A blank in column (14) means that only a few points have been observed.

Column (15) gives other identifications for the H II regions and associated objects and an indication if there is additional explanatory material given in the notes. For objects in the listing of "CO Velocities for Additional H II Regions," references to other catalogs are as follows: LBN = Lynds (1965), PK = Perek and Kohoutek (1967), DG = Dorschner and Gürtler (1963), Ber = Bernes (1977), vdB = van den Bergh (1966), PP = Parsamian and Petrossian (1979), M = Marsalkova (1974), and RCW = Rogers, Campbell, and Whiteoak (1960).

IV. DISCUSSION

a) Statistical Considerations

The observations toward the 313 objects in the Sharpless catalog may be summarized as follows:

194	Detections and associations (68%)
9	Questionable detections and associations (03%)
38	No detection (13%)
21	No definite detection (7%)
26	Cannot associate (9%)
5	No observations
11	Planetary nebulae
8	Supernova remnants
1	Not found

For the 65 additional suspected H II regions:

47	Detections and associations (76%)
4	Questionable detections and associations (6%)
4	No detection (6%)
4	No definite detection (6%)
3	Cannot associate (5%)
3	No observations

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CATALOG OF CO VELOCITIES TOWARD GALACTIC H II REGIONS

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A. CO Velocities toward Galactic H II Regions Included in the Sharpless Catalog

S	HII Region α(1950)	HII Region δ(1950)	HII Region ℓ	HII Region b	CO Observations V_{CO} (km s^{-1})	CO Observations T_A^* (K)	CO Observations ΔV (km s^{-1})	Peak CO position ℓ	Peak CO position b	CO ref	d* (kpc)	diameter (arcmin)	mapping	comments
1	15 55.8	-25 58	347.22	20.24	NO DETECTION					1		150		
2	16 59.0	-38 02	347.36	2.26	CANNOT ASSOCIATE					1		60		
3	17 08.9	-38 24	348.25	0.49	-8.7 ± 1.3	20	5.5	348.20	0.36	1		12		
4	17 14.9	-39 15	348.25	0.96	-14.2 ± 0.6	18	7.8	348.24	-0.98	1		5		
5	17 15.3	-38 25	348.97	-0.54	NO DEFINITE DETECTION					1		100		(notes)
6	PLANETARY NEBULA NGC 6302 [48]									1		4		(notes)
7	15 57.4	-22 48	349.84	22.26	NO DETECTION					1		240		
8	17 16.5	-35 49	351.23	0.77	-4.3 ± 1.5	37	6.5	351.36	0.61	1	1.7 ± 0.3 [46]	120		NGC 6334
9	16 18.1	-25 28	351.31	17.50	4.5 ± 0.5	2	2.0	351.89	17.17	1		80		
10	17 14.0	-33 58	352.44	2.26	NO OBSERVATIONS					1		60		
11	17 21.7	-34 10	353.11	0.84	-3.9 ± 1.0	25	5.2	352.80	0.64	1	1.74 ± 0.3 [46]	90		
12	17 30.6	-32 30	355.61	0.22	CANNOT ASSOCIATE					1		120		
13	17 25.9	-31 30	355.89	1.61	CANNOT ASSOCIATE					1		40		
14	NOT FOUND													
15	17 45.7	-31 18	358.34	-1.85	1.0 ± 0.5	10	2.5	358.27	-1.78	1		30		
16	17 43.3	-29 17	359.79	-0.35	16.4 ± 1.1	18	5.5	359.73	-0.42	1		20		(notes)
17	17 42.0	-28 50	0.02	0.13	CANNOT ASSOCIATE					1		25		(notes)
18	17 44.6	-29 12	359.97	-0.49	18.8 ± 0.4	28	3.3	359.95	-0.47	1		4		(notes)
19	17 44.9	-29 07	0.11	-0.56	18.1 ± 0.9	16	5.9	0.18	-0.46	1		12		(notes)
20	17 44.0	-28 44	0.33	-0.19	19.2 ± 0.4	25	6.5	0.33	-0.19	1		10		(notes)
21	17 47.2	-28 52	0.59	-0.86	16.7 ± 0.5	34	7.2	0.58	-0.86	1		5		(notes)
22	17 50.3	-24 58	4.29	0.55	CANNOT ASSOCIATE					1	(1.2 ± 0.4) [22,24]	60		(notes)
23	16 10.7	-8 14	4.31	29.59	NO DETECTION					1		50		
24	16 08.4	-6 56	5.80	30.84	-0.1 ± 0.4	4	2.5	5.08	30.84	1		30		(notes)
25	18 01.3	-24 20	6.09	-1.29	12.0 ± 1.5	30	3.5	5.95	-1.30	41	1.8 ± 0.2 [28]	90	partial [41]	M8;SGR OB1 (notes)
26	17 54.5	-23 20	6.10	0.56	CANNOT ASSOCIATE					1		20		
27	16 34.4	-10 28	6.28	23.58	3.0 ± 1.5	7	<1.0	4.24	22.51	1	0.17 ± 0.05 [24]	480		(notes)
28	17 57.5	-23 25	6.45	-0.08	CANNOT ASSOCIATE					1		40		W28
29	18 06.6	-23 58	7.00	-2.16	11.0 ± 1.0	18	3.0	6.90	-2.45	1	1.3 ± 0.5 [24]	40		(notes)
30	17 59.6	-23 01	7.04	-0.26	CANNOT ASSOCIATE					1	1.8 ± 0.2 [39]	20		M20;SGR OB1 (notes)
31	18 07.1	-23 48	7.21	-2.18	8.7 ± 0.7	26	3.3	7.29	-2.11	1	0.85 ± 0.27 [22]	8		(notes)
32	18 06.7	-23 39	7.29	-2.03	8.9 ± 0.5	22	3.3	7.36	-2.09	1	1.8 ± 0.6 [22]	8		(notes)
33	15 57.3	-1 28	8.33	36.34	0.8 ± 0.5	7	1.0	8.54	36.41	1		35		(notes)
34	18 04.0	-21 40	8.72	-0.51	CANNOT ASSOCIATE					1	(1.4 ± 0.5) [22]	90		(notes)
35	18 12.9	-20 16	10.94	-1.64	NO DETECTION					1	1.6 ± 0.6 [22]	20		
36	16 02.9	0 31	11.38	36.35	2.4 ± 0.4	3	1.3	11.53	36.19	1		45		(notes)
37	18 14.8	-19 44	11.63	-1.78	12.8 ± 1.4	31	3.6	11.40	-1.71	1,6	(0.6 ± 0.2) [22]	20	partial [6]	NGC 6589
38	18 05.8	-18 16	11.88	0.77	28.5 ± 3.0	12	6.5	11.90	0.76	1		3		(notes)
39	18 13.9	-18 41	12.45	-1.10	CANNOT ASSOCIATE					1		3		(notes)
40	18 09.1	-17 45	12.71	0.35	CANNOT ASSOCIATE					1		15		(notes)
41	18 12.9	-18 15	12.72	-0.69	16.8 ± 0.7	9	3.0	13.43	-1.40	1	2.2 ± 0.4 [22]	90		(notes)
42	18 07.4	-16 49	13.33	1.16	CANNOT ASSOCIATE					1		3		(notes)
43	18 13.5	-17 25	13.52	-0.41	CANNOT ASSOCIATE					1		15		(notes)
44	18 13.6	-16 45	14.11	-0.11	19.3 ± 1.0	10	2.6	14.02	-0.13	1	2.1 ± 0.6 [22]	60		(notes)

S	HII Region α(1950)	δ(1950)	ℓ	b	CO Observations V_{CO} (km s^{-1})	T_A^* (K)	ΔV (km s^{-1})	Peak CO position ℓ	b	CO ref	d* (kpc)	diameter (arcmin)	mapping	comments
45	18 17.9	-16 11	15.09	-0.74	20 ± 2.0	50	5.0	15.00	-0.68	18,19	2.2 ± 0.2 [28]	60	complete [18]	M17;SER OB1 (notes)
46	18 03.3	-14 09	15.18	3.31	18.0 ± 1.0	10	2.0	15.42	3.31	1	2.0 ± 0.7 [22]	25		
47	18 14.9	-15 38	15.24	0.16	CANNOT ASSOCIATE					1	(3.7 ± 1.2) [22]	5		
48	18 19.5	-14 36	16.68	-0.34	44.6 ± 1.3	16	5.9	16.58	-0.35	1,11	2.9 ± 0.9 [14,22]	10		
49	18 15.8	-13 59	16.80	0.75	24.2 ± 2.0	27	4	17.06	0.70	35	2.2 ± 0.22 [28]	90	partial [35]	M16;SER OB1;NGC 6611
50	18 22.7	-14 44	16.92	-1.07	CANNOT ASSOCIATE					1	1.7 ± 0.5 [22]	35		
51	18 37.9	-16 36	16.96	-5.18	NO DETECTION					1		35		
52	PLANETARY NEBULA VV-513 [48]									1		2		(notes)
53	18 22.4	-13 15	18.20	-0.32	50.0 ± 2.0	17	6.5	18.21	-0.32	1		15		
54	18 15.1	-11 45	18.68	1.97	27.6 ± 0.5	8	2.6	18.90	2.09	1	2.0 ± 0.2 [28]	140		SER OB2;NGC 6604
55	18 29.4	-11 48	20.28	-1.14	CANNOT ASSOCIATE					1		5		(notes)
56	18 28.3	-9 45	21.98	0.04	69.9 ± 2.5	10	7.8	21.73	-0.02	1		7		(notes)
57	18 27.8	-8 39	22.89	0.67	(99.0 ± 1.0)	(8)	(13)	22.83	0.48	1	1.5 ± 0.4 [22]	2		(notes)
58	18 28.7	-8 30	23.13	0.55	37.2 ± 1.0	10	2.0	23.13	0.54	1		8		
59	18 34.3	-7 38	24.53	-0.28	45.1 ± 2.0	10	6.5	24.48	-0.20	1		20		
60	18 34.0	-6 44	25.29	0.21	43.8 ± 2.1	12	3.3	25.36	0.24	1		20		(notes)
61	18 30.3	-5 02	26.36	1.82	43.0 ± 0.6	15	3.9	26.44	1.75	1		2		
62	18 25.0	-3 51	26.81	3.54	CANNOT ASSOCIATE					1		4		(notes)
63	19 54.9	-14 15	27.34	-20.94	4.6 ± 0.5	5	<1.0	27.34	-20.87	1		55		(notes)
64	18 29.0	-1 57	28.96	3.54	6.7 ± 1.2	11	2.5	28.74	3.56	1		25		
65	18 44.3	-3 47	29.09	-0.71	52.4 ± 1.0	15	2.5	29.05	-0.76	1		7		
66	18 42.9	-2 03	30.48	0.41	CANNOT ASSOCIATE					1	3.2 ± 1.0 [14]	8		(notes)
67	18 46.8	-2 24	30.60	-0.62	(95.5 ± 1.5)	(9)	(5.2)	30.58	-0.73	1	0.4 ± 0.1 [14]	10		(notes)
68	18 22.6	0 49	30.69	6.23	(7.3 ± 1.4)	(20)	(3.9)	31.59	5.33	1,6		8	partial [6]	(notes)
69	18 41.9	-0 20	31.88	1.43	55.4 ± 1.0	16	2.3	31.83	1.46	1,6		20	partial [6]	
70	18 12.2	07 02	35.10	11.38	19.8 ± 1.5	4	2.5	35.13	11.36	1		5		(notes)
71	PLANETARY NEBULA VV-473 [48]											3		(notes)
72	19 01.3	2 14	36.40	-1.70	64.2 ± 1.0	11	3.9	36.42	-1.78	1		25		
73	16 09.0	22 00	37.69	44.56	2.4 ± 0.5	5	1.3	37.62	44.71	1		75		
74	19 06.4	5 31	39.90	-1.29	48.1 ± 1.8	12.5	3.6	39.86	-1.23	1		3		(notes)
75	18 56.8	7 02	40.16	1.51	NO DEFINITE DETECTION					1		10		(notes)
76	18 54.0	7 44	40.45	2.45	CANNOT ASSOCIATE					1		7		(notes)
77	19 45.7	1 01	40.56	-12.08	17.8 ± 0.4	2.5	1.3	40.56	-12.11	1		8		(notes)
78	19 00.9	14 03	46.84	3.85	NO DETECTION					1		12		
79	19 21.0	13 52	48.97	-0.55	NO DEFINITE DETECTION					1		40		(notes)
80	PLANETARY NEBULA M1-67 [48]									1		2		(notes)
81	19 58.9	11 39	51.61	-9.67	NO DETECTION					1		10		(notes)
82	19 28.1	18 09	53.54	0.01	24.0 ± 1.0	20.5	2.5	53.56	0.04	1,30	1.1 ± 0.4 [22]	9		
83	19 22.4	20 41	55.12	2.42	NO DETECTION					1		2		
84	19 46.8	18 16	55.85	-3.80	NO DETECTION					1	5.0 ± 1.6 [22]	15		
85	19 01.2	25 45	57.40	9.05	NO DETECTION					1		6		
86	19 41.0	23 09	59.39	-0.15	26.8 ± 1.4	13	2.6	59.66	-0.21	1	1.9 ± 0.2 [28]	40		NGC 6823;VUL OB1
87	19 44.3	24 30	60.92	-0.13	22.7 ± 1.0	15	4.6	60.94	-0.18	1	2.3 ± 0.7 [14]	10		(notes)
88	19 43.8	25 13	61.49	0.32	22.9 ± 1.0	36	4.5	61.47	0.08	1,6	2.0 ± 0.6 [14]	25	partial [6]	(notes)
89	19 48.0	26 21	62.94	0.11	25.6 ± 1.0	8	4.6	62.92	0.12	1		5		
90	19 47.2	26 44	63.18	0.46	22.2 ± 1.0	21	5.2	63.12	0.44	1,6	4.0 ± 1.3 [22]	6	partial [6]	(notes)

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91	19 33.6	29 29	64.07	4.43	NO DEFINITE DETECTION					1		120		(notes)
92	19 44.6	28 07	64.08	1.65	NO DETECTION					1	4.4 ± 1.4 [22,24]	50		
93	19 53.0	27 04	64.13	-0.47	21.3	13	3.7	64.14	-0.47	1		1	partial [6]	
94	19 25.9	31 21	64.93	6.77	NO DETECTION					1		25		(notes)
95	PLANETARY NEBULA NGC 6842 [48]									1		1		
96	19 26.8	32 35	66.10	7.18	NO DETECTION					1		25		
97	19 54.1	30 07	66.87	0.91	21.0 ± 1.0	11	3.0	66.83	0.87	1		10		
98	19 56.8	31 17	68.15	1.02	NO DETECTION					1		15		
99	19 58.9	33 21	70.15	1.73	-22.9 ± 2.0	14	4.5	70.15	1.71	1,6	8.0 ± 2.5 [14]	5	partial [6]	(notes)
100	19 59.9	33 22	70.27	1.57	-24.5 ± 1.0	15	6.5	70.27	1.59	1	8.9 ± 2.9 [14,22]	4		(notes)
101	19 58.1	35 09	71.58	2.84	13.7 ± 0.4	8	3.3	71.59	2.76	1	2.5 ± 0.8 [22]	20		(notes)
102	20 29.7	30 26	71.41	-5.32	NO DETECTION					1		40		
103	SUPERNOVA REMNANT CYGNUS LOOP													(notes)
104	20 15.8	36 35	74.76	0.62	0 ± 2	9	5.2	74.79	0.57	1,30	4.4 ± 1.4 [22]	7		
105	20 10.2	38 11	75.46	2.43	NO DETECTION					1	1.2 ± 0.5 [22]	18		NGC 6888
106	20 25.6	37 13	76.40	-0.61	-1 ± 1.5	25	5.5	76.40	-0.61	1,12		3	extensive [12]	
107	20 40.8	36 09	77.39	-3.70	NO DETECTION					1	2.8 ± 0.9 [22]	5		
108	20 20.8	40 05	78.18	1.81	CANNOT ASSOCIATE					1	1.5 ± 0.4 [22]	180		γ CYG (notes)
109	20 31.8	40 10	79.49	0.15	NO OBSERVATION					1	1.4 ± 0.4 [22,24]	1080		(notes)
110	21 18.7	32 14	79.60	-12.17	NO DETECTION					1		50		
111	21 39.7	29 52	81.19	-17.01	NO DETECTION					1		90		
112	20 32.2	45 29	83.78	3.28	-4.0 ± 2.0	12	7.2	83.78	3.28	1,12	2.1 ± 0.7 [22]	15		
113	21 18.8	38 12	83.95	-8.03	NO DETECTION					1		15		
114	21 19.2	38 29	84.21	-7.87	NO DETECTION					1		9		
115	20 32.9	46 42	84.84	3.91	CANNOT ASSOCIATE					1	3.0 ± 0.6 [22]	50		(notes)
116	PLANETARY NEBULA ABELL 58 [48]									1		2		(notes)
117	20 57.0	44 07	85.49	-0.99	0 ± 3	24	4.5	84.64	0.20	2,12	0.8 ± 0.3 [22]	240	extensive [2,12]	NGC 7000
118	21 35.0	39 59	87.49	-8.92	NO DEFINITE DETECTION					1		480		
119	21 16.6	43 43	87.60	-3.84	3.5 ± 1.5	6	5.0	87.06	-4.19	1	0.7 ± 0.25 [22,24]	160		
120	21 02.1	49 40	90.23	2.04	-65.6 ± 0.5	1.5	1.5	90.20	2.06	1		1		(notes)
121	21 03.6	49 28	90.23	1.72	-60.9 ± 0.5	2	4.2	90.23	1.72	1		1		(notes)
122	23 06.3	14 39	89.18	-41.12	-6.2 ± 2.1	5	4.6	89.01	-41.36	1		40		
123	21 40.4	44 18	91.14	-6.35	NO DETECTION					1		13		
124	21 36.6	50 07	94.48	-1.54	-43.4 ± 1.1	7	2.3	94.57	-1.45	1	2.6 ± 0.6 [22]	70		
125	21 51.6	47 02	94.41	-5.51	8.0 ± 1.0	33	1.5	94.40	-5.57	30,37	1.0 ± 0.16 [22]	9	extensive [37]	IC 5146 (notes)
126	22 31.2	38 19	95.39	16.80	-0.2 ± 0.4	20	2.0	96.72	-15.14	1	0.6 ± 0.2 [28]	160		LAC OB1
127	21 27.1	54 24	96.29	2.60	-94.7 ± 0.4	6	3.3	96.27	2.57	1		2	partial [9]	
128	21 30.6	55 38	97.50	3.16	-72.5 ± 0.4	8	3.6	97.56	3.16	1,30		1	partial [9]	(notes)
129	21 10.5	59 45	98.50	7.97	-13.9 ± 0.7	7	2.0	99.06	7.40	1	0.4 ± 0.13 [22,23]	140		
130	20 42.5	63 02	98.86	12.64	NO DETECTION					1		3		
131	21 37.4	57 15	99.29	3.73	NEEDS EXTENSIVE MAPPING					1,43	0.86 ± 0.1 [28]	170		IC 1396;CEP OB2(notes)
132	22 16.9	55 52	102.79	-0.65	-48.5 ± 1.5	9	3.3	102.96	-0.80	1	4.2 ± 1.5 [14,22]	90		
133	21 27.8	64 05	103.07	9.56	NO DEFINITE DETECTION					1		80		(notes)
134	22 09.8	59 09	103.82	2.61	-16.1 ± 0.5	16	3.0	103.72	2.18	1	0.9 ± 0.3 [22]	160		
135	22 20.0	58 31	104.57	1.34	-20.7 ± 0.5	16	3.3	104.59	1.37	1,6,30	1.4 ± 0.4 [22]	15	partial [6]	(notes)
136	21 15.7	68 03	105.06	13.22	NO DEFINITE DETECTION					1		5		(notes)

	HII Region				CO Observations			Peak CO position							
S	α(1950)	δ(1950)	ℓ	b	V_{CO} (km s^{-1})	T_A^* (K)	ΔV (km s^{-1})	ℓ	b	CO ref	d* (kpc)		diameter (arcmin)	mapping	comments
137	21 55.8	64 27	105.63	7.85	-10.3 ± 1.4	5	2.0	105.15	7.12	1	0.6 ± 0.2	[22]	90		
138	22 30.8	58 13	105.62	0.35	-52.0 ± 1.0	13	5.2	105.63	0.36	1,16			1		
139	22 33.0	58 05	105.80	0.09	-46.5 ± 0.5	6	1.5	105.77	-0.15	1	3.3 ± 1.1	[14]	25		(notes)
140	22 17.5	63 01	106.76	5.30	-8.5 ± 1.0	27	5.2	106.81	5.31	5,6	0.9 ± 0.1	[13,22]	30	extensive [5,6]	(notes)
141	22 26.9	61 23	106.81	3.32	-65.0 ± 1.0	4	2.0	106.83	3.35	1			5		(notes)
142	22 45.6	56 47	107.14	-0.96	-41.0 ± 0.5	11	2.3	107.28	-0.90	1,30	3.4 ± 0.3	[28]	30	complete [30]	NGC 7380;CEP OB1
143	22 47.5	58 00	107.29	-1.43	NO DETECTION					1	3.7 ± 1.2	[22]	4		(notes)
144	22 42.9	59 37	107.67	0.82	NO DEFINITE DETECTION					1			4		(notes)
145	22 23.9	64 03	107.92	5.78	-8.8 ± 0.5	17	2.6	108.18	5.55	1			90		
146	22 47.5	59 39	108.20	0.59	-49.5 ± 0.5	13	5.5	108.20	0.58	1,6			2	partial [6]	
147	22 53.6	58 12	108.27	-1.07	-57 ± 2	4	3.0	108.28	-1.08	1			2		(notes)
148	22 54.2	58 16	108.35	-1.05	-53.1 ± 1.3	9	3.0	108.34	-1.05	1	5.5 ± 1.8	[22]	2		(notes)
149	22 54.3	58 17	108.38	-1.05	-53.1 ± 1.3	3	3.6	108.34	-1.12	1	5.4 ± 1.7	[12]	1		(notes)
150	22 29.5	64 51	108.86	6.15	-8.8 ± 0.4	17	1.5	109.00	6.29	1			40		
151	23 00.9	56 48	108.58	-2.75	-56.2 ± 0.6	13	3.9	108.69	-2.63	1	(2.4 ± 0.8)	[22]	20		
152	22 56.7	58 32	108.77	-0.95	-50.4 ± 0.5	22	5.2	108.75	-0.93	1	3.6 ± 1.1	[14]	2	partial [28]	(notes)
153	22 57.2	58 28	108.80	-1.02	-50.6 ± 0.4	21	5.2	108.77	-0.99	1	4.0 ± 1.3	[14,22]	5		(notes)
154	22 49.4	60 54	108.97	1.60	-11.5 ± 0.9	10	2.3	109.17	1.47	1	1.4 ± 0.4	[22]	60		(notes)
155	22 54.7	62 20	110.17	2.62	-10 ± 1.5	29	2.9	110.22	2.55	49	0.73 ± 0.12	[4]	60	complete [49]	CEP OB3
156	23 03.1	59 59	110.11	0.06	-51 ± 2	17	4.6	110.11	0.05	1,6,16	6.4 ± 2.0	[14]	2	partial [6,16]	
157	23 13.9	59 46	111.28	-0.65	-43 ± 2	23	4.7	111.28	-0.66	16,30	2.5 ± 0.4	[22,24]	90	extensive [30]	(notes)
158	23 11.5	61 14	111.55	0.82	-56.1 ± 1.1	21	8.8	111.54	0.78	1	2.8 ± 0.9	[14,22]	10		NGC 7538
159	23 13.6	60 51	111.64	0.37	-56 ± 1.0	26	3.0	111.61	0.37	16,30			7	extensive [30]	(notes)
160	23 03.8	64 24	111.93	4.08	CANNOT ASSOCIATE					1	0.9 ± 0.3	[22]	80		(notes)
161A	23 13.3	61 35	111.88	1.07	-10.0 ± 1.0	6	2.5	111.89	0.88	1	2.8 ± 0.9	[22]	55		(notes)
161B	23 13.3	61 35	111.88	1.07	-51.9 ± 0.7	11	3.9	111.89	0.88	1	2.8 ± 0.9	[22]	55		(notes)
162	23 18.5	60 55	112.22	0.23	-44.7 ± 0.5	3	3.3	112.19	0.22	1	3.5 ± 1.1	[22]	40		NGC 7635 (notes)
163	23 31.0	60 30	113.54	-0.65	-44.9 ± 3.8	5	2.5	113.52	-0.57	1	2.3 ± 0.7	[22]	10		(notes)
164	23 36.0	59 41	113.91	-1.62	NO DETECTION					1	5.0 ± 1.6	[22,24]	3		
165	23 37.4	61 39	114.61	0.23	-33.0 ± 1.0	6	3.5	114.65	0.14	1	1.6 ± 0.5	[22]	10		
166	23 39.8	60 41	114.63	-0.78	NO DEFINITE DETECTION					1			10		(notes)
167	23 33.2	64 36	114.98	3.18	-63.6 ± 0.5	7	2.5	114.99	3.21	1			2		
168	23 50.6	60 11	115.79	-1.59	-40.6 ± 1.4	17	2.9	115.79	-1.65	1,6	3.8 ± 1.2	[14]	7	partial [6]	(notes)
169	23 51.5	60 05	115.88	-1.71	-39.0 ± 0.9	10	3.9	115.83	-1.70	1	(1.5 ± 0.5)	[22]	5		(notes)
170	23 59.1	64 20	117.63	2.26	-43.7 ± 1.0	7	3.9	117.57	2.26	1	2.3 ± 0.7	[22]	20		(notes)
171	00 02.1	66 52	118.40	4.70	CANNOT ASSOCIATE					51	0.84 ± 0.1	[28]	180	extensive [51]	W1;CEP OB4 (notes)
172	0 12.8	60 58	118.63	-1.32	-40.8 ± 0.5	7	2.3	118.63	-1.32	1			1		
173	0 19.1	61 27	119.44	-0.93	-34.5 ± 2.8	9	3.3	119.40	-0.84	1	2.7 ± 0.9	[22]	30		
174	23 44.7	80 39	120.28	18.40	-2.7 ± 0.6	1.3	1.3	120.17	18.40	1			10		(notes)
175	0 24.5	64 25	120.36	1.95	-49.6 ± 0.5	13	1.3	120.36	1.97	1	1.7 ± 0.5	[22]	2		
176	0 28.9	57 00	120.25	-5.48	NO DETECTION					1			10		
177	0 28.9	62 25	120.68	-0.09	-34.2 ± 0.4	5.5	1.0	120.63	-0.14	1	2.5 ± 0.8	[22]	2		
178	22 28.1	87 30	121.41	25.36	-3.6 ± 1.0	4	2.6	125.05	25.63	1			420		(notes)
179	0 37.5	62 35	121.67	0.02	NO DEFINITE DETECTION					1			1		(notes)
180	0 45.8	62 39	122.63	0.06	NO DETECTION					1	(6.1 ± 2.0)	[22]	15		

S	HII Region α(1950)	δ(1950)	ℓ	b	CO Observations V_{CO} (km s^{-1})	T_A^* (K)	ΔV (km s^{-1})	Peak CO position ℓ	b	CO ref	d* (kpc)	diameter (arcmin)	mapping	comments
181	0 46.2	64 56	122.70	2.34	-36.6 ± 0.4	9	2.0	122.72	2.37	1		15		
182	0 47.2	64 28	122.81	1.87	-27.0 ± 0.7	4	2.0	122.81	1.87	1		2		
183	0 50.9	65 26	123.19	2.84	-10.3 ± 1.4	5	3.3	123.00	3.02	1		35		(notes)
184	0 49.9	56 20	123.12	-6.26	-30.4 ± 1.1	14	3.4	123.04	-6.32	17	2.2 ± 0.7 [22]	40	extensive [17]	NGC 281
185	0 56.9	60 43	123.97	-1.87	(-16.2 ± 0.5)	(3.4)	(2.0)	123.84	-1.96	1	0.21 ± 0.07 [20,22]	120		γ CAS (notes)
186	1 05.6	62 52	124.90	0.33	-43 ± 2.6	8	2.8	124.89	0.32	16		1		(notes)
187	1 19.8	61 35	126.66	-0.79	-14.9 ± 0.4	27	3.5	126.72	-0.73	6		10	partial [6]	
188	1 27.4	58 06	128.07	-4.11	NO DETECTION					1		9		
189	2 08.3	63 56	131.58	2.66	NO DEFINITE DETECTION					1		2		(notes)
190	2 29.6	61 13	134.80	0.94	-46.0 ± 5.3	29	6.1	133.71	1.21	40	2.1 ± 0.2 [28]	150	complete [40]	W3;IC 1795;CAS OB6
191	2 32.9	59 25	135.87	-0.56	NO DEFINITE DETECTION					1		2		(notes)
192	2 43.3	61 46	136.08	2.11	-46.3 ± 0.6	7	3.3	136.13	2.08	1		1		(notes)
193	2 43.6	61 47	136.00	2.12	-47.2 ± 1.0	2	2.3	136.09	2.12	1		2		(notes)
194	2 43.4	61 43	136.11	2.07	-46.5 ± 1.0	3	3.6	136.14	2.07	1		2		(notes)
195	2 36.1	59 24	136.36	-0.38	NO DEFINITE DETECTION					1		3		(notes)
196	2 47.7	62 00	136.45	2.53	-45.1 ± 0.9	3.5	3.3	136.51	2.50	1		4		(notes)
197	2 38.1	59 24	136.49	-0.32	NO DEFINITE DETECTION					1		5		(notes)
198	2 46.2	59 29	137.38	0.20	NO DEFINITE DETECTION					1	2.9 ± 0.9 [22]	9		(notes)
199	2 50.6	60 12	137.57	1.09	-39 ± 1.0	24	3.6	138.30	1.56	42	2.1 ± 0.2 [28]	120		W5;CAS OB6 (notes)
200	3 02.5	62 37	138.09	4.12	-9.7 ± 0.5	3	1.6	138.16	4.09	1		6		
201	2 59.2	60 17	138.48	1.65	-40 ± 1.4	18	2.7	138.47	1.60	6,16		5	partial [6]	
202	3 14.8	59 27	140.59	1.92	-11.5 ± 2.0	7	2.3	139.99	2.09	1	0.8 ± 0.3 [22]	170		(notes)
203	3 18.2	54 42	143.51	-1.86	CANNOT ASSOCIATE					1		45		(notes)
204	3 51.7	57 17	145.78	2.98	NO DETECTION					1		40		
205	3 52.3	53 03	148.54	-0.24	(-25.8 ± 1.0)	(6)	(1.3)	148.84	-1.24	1	0.9 ± 0.3 [22]	120		(notes)
206	3 59.4	51 11	150.58	-0.94	-22.6 ± 0.5	17	3.1	150.68	-0.77	1,6	3.3 ± 0.8 [14,45]	50	partial [6]	NGC 1491 (notes)
207	PLANETARY NEBULA VV 1-2 [48]									1	7.6 ± 0.8 [45]	4		(notes)
208	4 15.9	52 51	151.31	1.99	-30.2 ± 0.4	13	9.8	151.27	1.97	1	7.6 ± 0.8 [45]	1		
209	4 07.3	51 02	151.60	-0.25	-52.2 ± 2.4	6	4.6	151.61	-0.24	1		14		(notes)
210	4 27.1	52 26	152.80	2.91	NO DEFINITE DETECTION					1		20		(notes)
211	4 33.1	50 47	154.65	2.46	-37.6 ± 0.9	7	2.5	154.65	2.46	1		2		(notes)
212	4 36.7	50 22	155.35	2.60	-35.3 ± 0.3	7	2.3	155.39	2.65	1	6.0 ± 0.6 [45]	5	extensive [9]	NGC 1624
213	4 17.1	44 48	157.09	-3.62	-31.0 ± 0.4	3.5	2.5	157.08	-3.61	1		1		
214	4 18.0	44 15	157.59	-3.90	NO DETECTION					1		4		
215	4 14.1	42 29	158.31	-5.67	NO DEFINITE DETECTION					1		2		(notes)
216	4 41.3	46 43	158.57	0.76	NO DEFINITE DETECTION					1		80		(notes)
217	4 55.0	47 55	159.15	3.32	-20.5 ± 1.1	11	2.5	159.15	3.27	1	5.2 ± 0.8 [45]	9		
218	5 37.3	52 09	159.52	11.29	3.4 ± 0.4	3.3	1.9	159.61	11.36	1		70		(notes)
219	4 52.5	47 19	159.36	2.60	-24.5 ± 1.2	8	3.0	159.36	2.57	1,6	4.2 ± 0.6 [45]	3	partial [6]	
220	4 58.0	46 16	160.76	-12.27	7 ± 3	20	~4	160.61	-17.80	3,20,50	0.40 ± 0.04 [28]	320		NGC 1499;Per OB2(notes)
221	SUPERNOVA REMNANT [11,29]									1				(notes)
222	4 26.9	35 09	165.35	-9.02	-1.0 ± 1.0	17	1.8	165.36	-9.00	2	>0.8 [25]	6	partial [31]	NGC 1579;Lk Hα 101
223	SUPERNOVA REMNANT [29]									1				(notes)
224	SUPERNOVA REMNANT [11,29]									1	2.4 ± 0.6 [43]			(notes)
225	5 23.5	40 34	168.09	3.07	CANNOT ASSOCIATE					1	3.7 ± 0.9 [43]	10		
226	5 07.6	37 55.5	168.48	-0.97	-32.9 ± 1.0	4	2.5	168.46	-0.88	1		3	complete [9]	

S	HII Region α(1950)	δ(1950)	ℓ	b	CO Observations V_{CO} (km s^{-1})	T_A^* (K)	ΔV (km s^{-1})	Peak CO position ℓ	b	CO ref	d* (kpc)	diameter (arcmin)	mapping	comments
227	5 16.4	38 54	168.70	1.00	NO DEFINITE DETECTION					1	4.3 ± 1.4 [22]	20		
228	5 10.1	37 23	169.21	-0.90	-8.7 ± 2.5	16	3.5	169.19	-0.90	1,16,44		8	partial [16,44]	
229	5 13.0	34 24	171.96	-2.17	(6.7 ± 1.0)	(8)	(1.6)	171.35	-2.26	1	0.51 ± 0.16 [22]	65		IC 405 (notes)
230	5 19.2	34 05	172.96	-1.31	NO OBSERVATIONS							300		(notes)
231	5 36.0	35 53	173.36	2.55	-18.1 ± 0.9	11	2.9	173.47	2.55	1	2.3 ± 0.7 [22]	12		
232	5 39.1	36 10	173.45	3.23	-23.0 ± 0.5	9	3.3	173.43	3.17	1	1.0 ± 0.3 [22]	40		(notes)
233	5 35.5	35 50	173.36	2.44	-18.4 ± 0.5	16	3.9	173.35	2.40	1		2		
234	5 24.8	34 23	173.36	-0.18	-13.4 ± 0.7	8	2.5	173.48	-0.05	1	2.3 ± 0.7 [22]	12		
235	5 37.7	35 49	173.61	2.81	-18.8 ± 1.7	32	3.4	173.62	2.81	1,6	1.6 ± 0.5 [22]	10	partial [6]	
236	5 19.3	33 19	173.60	-1.74	-7.2 ± 0.5	7	2.5	173.60	-1.78	1	3.2 ± 0.3 [28]	55		IC 410; AUR OB2
237	5 28.3	34 12.5	173.89	0.26	-4.3 ± 0.7	9	1.3	173.97	0.25	1	1.8 ± 0.3 [45]	7		NGC 1931
238	4 19.7	19 25	176.24	-20.88	8.1 ± 0.9	7	2.1	176.24	-20.88	1,32	0.15 ± 0.05 [3,31]	1		T TAURI NEBULA
239	4 28.4	18 00	178.91	-20.12	7.0 ± 1.0	11	2	178.91	-20.12	1,31	0.15 ± 0.05 [3,31]	5		(notes)
240	SUPERNOVA REMNANT SHAJN 147													
241	6 00.9	30 15	180.89	4.14	-6.5 ± 1.0	16	4.6	180.79	4.03	1	4.7 ± 1.2 [45]	10	extensive [9]	
242	5 48.7	27 00	182.36	0.19	0.0 ± 0.5	10	2.5	182.36	+ 0.19	1	2.1 ± 0.7 [22]	7		
243	5 36.3	23 15	184.07	-4.16	3.7 ± 2.3	6	2.5	184.16	- 4.04	1		6		(notes)
244	SUPERNOVA REMNANT CRAB NEBULA													
245	3 59.9	3 59	186.34	-34.31	NO DEFINITE DETECTION					1	0.21 ± 0.02 [22]	720		(notes)
246	4 59.3	14 01	186.96	-16.57	7.5 ± 0.5	11	1.3	187.22	-16.69	1		65		(notes)
247	6 05.5	21 37	188.93	0.79	2.9 ± 1.2	5	3.9	188.96	0.85	1	3.5 ± 0.9 [45]	9		
248	SUPERNOVA REMNANT IC 443													(notes)
249	6 17.9	23 06	189.00	4.03	-5.3 ± 2.6	12	5.2	189.45	4.38	1	1.6 ± 0.5 [45]	80		
250	4 37.5	7 12	189.67	-24.87	NO DETECTION					1		10		
251	4 30.2	5 45	189.84	-27.18	NO DETECTION					1		35		
252	6 06.7	20 30	190.03	0.49	7.5 ± 1.0	30	4.5	189.81	0.33	39	1.5 ± 0.15 [28]	40	extensive [39]	
253	6 22.8	20 03	192.23	3.59	14.4 ± 0.5	8	2.5	192.23	3.59	1	4.4 ± 0.4 [45]	5		
254	6 09.4	18 03	192.49	-0.14	7.5 ± 0.7	30	4	192.61	-0.04	1,21	2.5 ± 0.4 [45]	11		(notes)
255	6 10.2	17 59	192.64	-0.00	7.5 ± 0.7	30	4	192.61	-0.04	1,21	2.5 ± 0.4 [45]	3	extensive [21]	(notes)
256	6 09.7	17 57	192.61	-0.12	7.5 ± 0.7	30	4	192.61	-0.04	1,21	2.5 ± 0.4 [45]	1		(notes)
257	6 09.9	17 59	192.60	-0.07	7.5 ± 0.7	30	4	192.61	-0.04	1,21	2.5 ± 0.4 [45]	3		(notes)
258	6 10.6	17 56	192.73	0.06	8.0 ± 0.5	8	3.7	192.61	-0.04	1	2.5 ± 0.4 [45]	1		(notes)
259	6 08.7	17 27	192.93	-0.58	22.8 ± 0.5	8	2.5	192.91	-0.63	54	8.3 ± 2.6 [45]	2	complete [54]	
260	4 52.5	5 35	193.41	-22.67	NO DETECTION					1		22		
261	SUPERNOVA REMNANT [29]										1.4 ± 0.4 [22]	45		(notes)
262	5 04.1	6 06	194.60	-19.95	NO DETECTION					1		20		
263	5 19.0	8 21	194.65	-15.62	0.3 ± 1.0	13	1.3	194.59	-15.74	1,6	0.45 ± 0.14 [22]	22		
264	5 32.5	9 54	195.06	-11.97	12 ± 0.5	15	2.3	196.92	-10.37	36	0.40 ± 0.13 [28]	390		λ ORI;ORI OB2
265	5 15.9	7 23	195.08	-16.78	-1.6 ± 1.1	8	3.9	195.23	-16.98	1		70		(notes)
266	6 16.0	15 18	195.66	-0.09	31.2 ± 0.5	10	3.6	195.65	-0.07	1		1		
267	PLANETARY NEBULA VV 1-5 [48]									1	3.5 ± 1.1 [45]	4		(notes)
268	6 04.7	13 20	196.38	-2.85	4.8 ± 0.5	14	2.3	195.97	-2.74	1		60		
269	6 11.7	13 50	196.45	-1.69	17.5 ± 0.7	20	3.7	196.45	-1.68	1,6	3.8 ± 1.0 [45]	4	partial [6]	
270	6 07.4	12 49	196.83	-3.10	25.6 ± 0.4	16	2.3	196.83	-3.11	1		1		

	HII Region				CO Observations			Peak CO position							
S	α(1950)	δ(1950)	ℓ	b	V_{CO} (km s^{-1})	T_A^* (K)	ΔV (km s^{-1})	ℓ	b	CO ref	d* (kpc)	diameter (arcmin)	mapping	comments
271	6 12.1	12 23	197.77	-2.31	20.5 ± 0.5	5	1.9	197.80	-2.33	1	4.8 ± 0.5 [45]	2		(notes)
272	6 12.3	12 22	197.81	-2.29	20.6 ± 0.5	6	1.9	197.82	-2.33	1	4.8 ± 0.5 [45]	1		(notes)
273	6 38.1	9 57	202.90	2.17	7 ± 1	20	6.3	203.24	2.09	8	0.8 ± 0.15 [57,58]	250	complete [8]	NGC 2264;MON OB1
274	PLANETARY NEBULA [33]									1		8		(notes)
275	6 29.1	4 58	206.29	-2.12	14.3 ± 0.1	21	3.1	207.02	-1.82	8	1.6 ± 0.2 [8]	100	complete [8]	ROSETTE NEBULA;MON OB2
276	5 25.0	-4 00	206.72	-20.46	NO OBSERVATIONS						0.5 ± 0.05 [34]	1200	complete [34]	BARNARD'S LOOP (notes)
277	5 38.2	-2 28	206.91	-16.83	9.6 ± 2.1	31	4.9	206.63	-16.22	34,56	0.5 ± 0.05 [34]	120	complete [34]	NGC 2024 (notes)
278	5 17.3	-5 42	207.40	-22.94	9.2 ± 1.7	14	1.5	207.57	-23.07	34	0.5 ± 0.05 [34]	50	complete [34]	(notes)
279	5 32.9	-4 49	208.46	-19.10	8 ± 1.5	8	-	208.45	-19.09	34	0.5 ± 0.05 [34]	20	complete [34]	NGC 1972 (notes)
280	6 31.7	2 34	208.71	-2.64	CANNOT ASSOCIATE					1	1.7 ± 0.5 [34]	40		(notes)
281	5 32.5	-5 29	209.04	-19.50	8 ± 1.5	60	6.5	208.99	-19.39	1,34	0.5 ± 0.05 [28]	60	complete [34]	ORION NEBULA (notes)
282	6 35.4	1 32	210.05	-2.30	(23.3 ± 0.5)	(1.4)	(1.7)	209.91	-2.15		1.5 ± 0.5 [22]	35		(notes)
283	6 35.9	0 45	210.81	-2.56	49.4 ± 2.8	2.5	2.7	210.81	-2.56	1	9.1 ± 2.9 [45]	3	extensive [9]	
284	6 42.5	0 17	211.19	-1.32	45.0 ± 0.7	8	2.7	211.86	-1.18	1	5.2 ± 0.8 [45]	80		
285	6 52.7	-0 26	213.81	0.61	45.3 ± 1.1	2.9	3.0	213.81	0.61	1	6.9 ± 0.7 [45]	1	complete [9]	
286	6 52.1	-4 28	217.32	-1.37	49.8 ± 1.8	4	4.2	217.31	-1.39	1		6		
287	6 57.1	-4 43	218.13	-0.39	27.2 ± 0.8	12	5.1	218.15	-0.35	1	3.2 ± 0.8 [45]	12		
288	7 06.1	-4 13	218.72	1.83	56.7 ± 0.8	5	3.5	218.77	1.95	1,44	3.0 ± 1.2 [45]	1		
289	6 43.5	-7 16	218.85	-4.55	NO DETECTION					1	7.9 ± 0.8 [45]	11		
290	PLANETARY NEBULA ABELL 20 [46]									1		17		(notes)
291	6 53.0	-7 57	220.53	-2.77	NO DEFINITE DETECTION					1		8		(notes)
292	7 02.1	-10 22	223.70	-1.89	18.4 ± 1.0	20	3.5	224.10	-1.96	7	1.15 ± 0.14 [7,10]	21	complete [7]	CMA OB1 (notes)
293	6 59.4	-11 14	224.17	-2.87	14.6 ± 0.5	6	2.0	224.17	-2.87	1,7	1.15 ± 0.14 [7,10]	11	complete [7]	CMA OB1 vdB-88(notes)
294	7 14.2	-9 21	224.19	1.22	32.9 ± 1.1	7	2.3	224.19	1.22	1,7	4.6 ± 1.5 [45]	7	complete [7]	
295	7 00.3	-11 23	224.41	-2.74	13.8 ± 1.0	5	1.3	224.41	-2.74	1,7	1.15 ± 0.14 [7,10]	8	complete [7]	CMA OB1 vdB-90(notes)
296	7 03.4	-11 08	224.54	-1.95	15.0 ± 1.3	~10	~2.5	224.43	-0.78	7	1.15 ± 0.14 [7,10]	200	complete [7]	CMA OB1 (notes)
297	7 02.9	-12 15	225.47	-2.58	11.7 ± 0.5	10	2.3	225.44	-2.63	7	1.15 ± 0.14 [7,10]	7	complete [7]	CMA OB1 vdB-94(notes)
298	7 16.1	-13 08	227.75	-0.15	(39 ± 6)	(4)	(3.9)	227.78	-0.06	52	6.3 ± 2.5 [45]	22	complete [7]	NGC 2359 (notes)
299	7 28.4	-15 11	230.97	1.49	47.6 ± 0.4	8	2.0	230.97	1.49	1	4.4 ± 0.6 [45]	1		
300	7 28.8	-15 18	231.12	1.51	52.8 ± 2.5	6	5.8	231.01	1.55	1	4.4 ± 0.6 [45]	3		
301	7 07.6	-18 23	231.45	-4.41	53.0 ± 0.4	9	3.3	231.52	-4.33	1	5.8 ± 0.9 [45]	9		
302	7 29.4	-16 52	232.57	0.89	16.6 ± 0.3	19	3.3	232.63	1.01	1	2.2 ± 0.7 [22]	21		RCW 7
303	6 51.9	-22 21	233.36	-9.48	NO DETECTION					1		90		(notes)
304	6 41.4	-24 04	233.89	-12.40	NO DETECTION					1		200		
305	7 27.9	-18 25	233.75	-0.18	44.1 ± 0.6	13	2.0	233.77	-0.15	1	5.2 ± 1.4 [45]	4		
306	7 28.4	-19 00	234.32	-0.36	(44.1 ± 0.5)	(3)	(2.9)	234.28	-0.43	1	4.2 ± 0.4 [45]	30		RCW 10 (notes)
307	7 33.3	-18 38	234.57	0.83	46.3 ± 0.7	9	2.4	234.57	0.83	1,6	2.2 ± 0.5 [45]	6	partial [6]	
308	6 52.1	-23 52	234.76	-10.10	NO DETECTION					1	1.6 ± 0.7 [22]	35		(notes)
309	7 29.9	-19 19	234.77	-0.20	44.0 ± 1.7	22	2.5	234.64	-0.21	1,6	5.5 ± 0.8 [45]	12	partial [6]	
310	7 11.0	-24 29	237.26	-6.52	22.3 ± 1.0	22	2.5	239.65	-4.94	1,38	1.5 ± 0.5 [26,38]	480	complete [38]	(notes)
311	7 50.3	-26 18	243.16	0.36	51.0 ± 1.6	5	2.5	243.20	0.44	1	4.1 ± 0.6 [22]	45		NGC 2467;PUP OB1
312	8 57.0	-25 29	251.19	13.09	NO OBSERVATION							720		(notes)
313	PLANETARY NEBULA [48]											12		(notes)

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NOTES ON THE OBSERVATIONS

OBJECT

S5 Weak line (T=3K, V=-18 km s^{-1}) which does not appear to be associated.
S6 No CO detected.
S16 S16-S20 appear to be related to a single giant molecular cloud complex.
S17 See S16; too many strong (T ~ 15K) lines at various velocities to clearly associate with the HII region.
S18 See S16.
S19 See S16.
S20 See S16.
S21 May also be part of S16-S20 complex.
S22 T=6K line at V=19 km s^{-1} may be associated with this object.
S24 Bright dark cloud.
S25 S25, S29, S31, S32 appear to be related to a single giant molecular cloud complex.
S27 ζ Oph excites; related to Sco-Cen association.
S29 See S25.
S30 Component at V = 17.5 km s^{-1} is probably associated.
S31 See S25.
S32 See S25.
S33 Bright dark cloud.
S34 Two strong (T=10-15K) lines occur in this vicinity at V=18.1, V=37.5 km s^{-1}.
S36 Bright dark cloud.
S38 Components at V = 26, V = 31 km s^{-1} both appear to be related.
S39 A line at T = 7K, V = 39.0 is not obviously associated.
S40 Two strong lines T = 12K, V = 17.3 km s^{-1}; T = 10K, V = 30 km s^{-1} are present. Low velocity line seems more closely associated; may be part of S45 complex.
S41 May be part of S45 complex.
S42 Two T = 6K lines at V = 25, V = 28 km s^{-1} are present, but needs mapping to show association with HII region.
S43 Two strong (T = 11K) lines at V = 18, V = 40 km s^{-1} are present. Needs mapping. Possibly related to S45 complex.
S44 Possibly related to S45 complex.
S45 Quoted line width is ^{13}CO line width. Possibly related to S40, S41, S43, S44.
S52 Note that the Sharpless position is incorrect; should be α_{1950} = 19 43 35; δ_{1950} = -23 15 00.
S55 There is a weak (T = 4K) line at V = 50 km s^{-1}, which is close to the Hα velocity of 46 km s^{-1} (ref 36), but the sources needs to be mapped to show an association.
S56 Velocity assignment is based on Hα [ref 36] velocity. There are other strong lines in this vicinity.
S57 Although the 99 km s^{-1} component reaches a maximum in the vicinity of the HII region, the very large velocity and the difference between the CO and Hα velocity [ref 22, 55] make velocity assignment doubtful.
S60 Although there are other observed components, the V = 44 km s^{-1} component is most closely associated and is near the Hα velocity [ref 55].
S62 There are several weak features with 2.6 < V < 13.5 km s^{-1} and 25 < T < 5 K.
S63 Bright dark cloud.
S66 At least five lines with 8 < V < 120 km s^{-1}.
S67 Although the detection seems convincing, the high velocity is significantly different from the Hα velocity (ref 58) and must be considered doubtful.
S68 Blair et al. [ref 6] found a bright cloud near the HII region, but its brightest part is almost a degree away. We found only weak lines near the position of the HII region, but with a velocity similar to that of Blair et al. It appears that the optical HII region may be a background object, and the cloud is visible only in relief against the HII region. No Hα velocity is available.
S70 Bright dark cloud.
S71 Possible CO detection T = 4K, V = 33.0 km s^{-1}, but not definitely associated.
S74 The V = 48.1 km s^{-1} component is almost certainly related but there is an additional moderately strong line at V = 13 km s^{-1}, which is probably a foreground cloud.
S75 There is line at V = 29 km s^{-1} which is the only component present but there is no clear association with the HII region.
S76 There are components at V = 29 and V = 34 km s^{-1}. Both may be associated, but the 34 km s^{-1} component seems more closely associated with the nebula.
S79 There is a T = 4k line at V = 15.7 km s^{-1}, but not clearly related to the HII region.
S80 No CO detected; listed as a planetary but may be the shell of a Wolf Rayet star.
S81 Bright dark cloud.

OBJECT	
S87	Appears related to S88.
S88	See S87.
S90	Uncertainty in CO velocity is estimated.
S91	A T = 1.2K line at V = 19.7 km s^{-1} occurs in this vicinity but does not appear to be related to the complex
S95	No CO detected.
S99	Appears related to S100; error in CO velocity is estimated.
S100	See S99.
S101	There is another moderately strong component at 6 km s^{-1}. The 13.7 km s^{-1} component is more closely associated with the ionization front and is nearly equal to the Hα velocity [ref 22,55].
S103	There is associated CO at V = 11 km s^{-1}. T = 20 K [ref 53].
S108	Strong emission from several lines with $-12 < V < +7$ and V = 45 km s^{-1}.
S109	Too large to find dust clouds which appear to be interacting.
S115	Several lines were detected with $-20 < V < +6$ km s^{-1}.
S116	Weak CO line at V = −10.6 km s^{-1}, not necessarily associated.
S120	The Hα velocity is −74.4 km s^{-1} [ref 55]. Therefore, in spite of the weakness of the line, it appears to be associated with the HII region.
S121	CO appears to be definitely related in spite of the weakness of the line, especially since it peaks at the position of the HII region.
S125	Line width quoted is for ^{13}CO.
S128	Listed as planetary nebula, Abell 63, in [ref 48], but the strength of the CO line and its clear association with the nebula suggest that object has probably been misidentified.
S131	The best estimate of the velocity is 0 ± 5 km s^{-1}, but the object needs extensive mapping to determine the velocity accurately. Small scale mapping shows clouds, each apparently associated with the HII region with velocities of −1, −1.6, +1.0 and −8 km s^{-1}.
S133	A line of T = 2K, V = 0.8 km s^{-1} was found, but is not obviously related.
S135	Israel's [ref 30] velocity of −20.8 km s^{-1} differs from that of Blair et al. [ref 6] by 4 km s^{-1}. We observed three positions near the eastern peak of Blair et al. and obtained a mean velocity of −20.7 ± 0.4 km s^{-1}. The reason for the discrepancy between Israel and Blair et al. is unclear and we adopt our values for consistency.
S136	Bright dark cloud. Weak emission (T = 3K, V = 2.6 km s^{-1}) was found but does not appear to be related to the clearly evident obscuration.
S139	Although there are a few weak components at other velocities, the velocity assignment is confirmed by Hα measurements [ref 22, 55].
S140	The error in the CO velocity is estimated
S141	The velocity assignment is based on the H_α velocity of −64.6 km s^{-1} [ref 55]. There is a foreground cloud at V = −7 km s^{-1}, which has a small intensity variation near the position of the HII region.
S143	CO observations were not made at the optimum position.
S144	There are weak (T < 2K) lines at V = −52 km s^{-1}, but there is no evidence that they are associated.
S147	See S149.
S148	See S149.
S149	Related to S147 and S148.
S152	Probably related to S153.
S153	See S152.
S154	Distance given is the mean of both determinations.
S157	Error in CO velocity is estimated.
S159	Error in CO velocity is estimated.
S160	There is a component at V = −30.6 ± 1.0 km s^{-1} which may be related, but other components are also present.
S161	There appear to be two HII regions in the same line of sight. There are two widely separated velocities for the CO clouds, and both lines are strong. Furthermore, the Hα spectrum [ref 55] shows two velocity components at V = −44.8 and V = −8.9 km s^{-1}, each close to the CO velocities. It is unclear which HII region is at the distance given by ref. 8.
S162	Although the line is weak, the velocity assignment is made on the basis of agreement with the Hα velocity [ref 22].
S163	There are two almost equally strong lines at V = −40 and V = −47 km s^{-1} both of which appear to be related to the HII region. The given velocity is the weighted mean of all the CO data.
S166	Weak lines (T < 1K) at V = −48.7 km s^{-1} are near the Hα velocity [ref 55] but are too weak to conclude they are associated.
S168	Apparently related to S169.
S169	See S168.
S170	Other weak components (T < 3.5K) near zero velocity are unrelated. This is confirmed by Hα velocity [ref 22, 55].
S171	Velocity structure is too fragmented and chaotic to get good center of mass velocity without complete mapping.
S174	Because of high latitude, we expect any CO detected to be related to the emission nebula in spite of the weakness of the line.
S178	Bright dark clouds.
S179	Weak lines at V = −22 and V = −53.8 km s^{-1}.

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OBJECT	
S183	Bright dark cloud.
S185	It is not clear whether the CO is associated.
S186	The error in the CO velocity is estimated.
S189	There are weak lines at $-9 < V < 0$ km s^{-1}, but none appear to be associated.
S191	Weak lines at $-43 < V < 0$ km s^{-1}. None appear to be associated.
S192	S192, S193, S194 appear to be related to a single molecular complex.
S193	See S192.
S194	See S192.
S195	Weak lines ($T < 1.7$K) with $-12 < V < 10$ km s^{-1} all of which are probably unrelated.
S196	Possibly related to S192 - S194 complex.
S197	A weak line at $T < 1.5$K, $V = -1.7$ km s^{-1} is probably unrelated.
S198	A few weak $T < 2$K lines are present but almost surely are unrelated.
S199	Error in CO velocity is estimated.
S202	There are two components, equally strong at $V = -13.5$ and $V = -10$ km s^{-1}. Both are probably related to the HII region.
S203	There are numerous moderately strong ($T = 6$K) lines over a wide range of velocities in the positions we searched.
S205	Probable velocity assignment based on Hα [ref 55] velocity. There is another line present at one position at $V = -7$ km s^{-1} which is probably foreground.
S206	There are two components with $T = 6$K at $V = -6$, $V = -26$.
S207	No CO detected; extensively searched.
S209	Velocity assignment based on Hα velocity [ref 55]. Another line is present at $V = -25$ km s^{-1}, $T = 4$K.
S210	There are weak lines with $-33 < V < -3$ km s^{-1}, none is clearly associated.
S211	The component at $V = -37.6$ km s^{-1} peaks directly on the HII region. Another component at $V = 0$ km s^{-1} $T = 5$K is also present and appears to be due to a foreground cloud.
S215	There are weak lines at $V = -7.8 \pm 0.4$ and -1.6 ± 0.3 km s^{-1}; Neither is clearly associated.
S216	There are weak lines at $V = -4.7 \pm 0.7$ and $+4.6 \pm 0.4$ km s^{-1}; Neither is clearly associated.
S218	Bright dark cloud
S220	The velocity is the center of mass velocity of the extended molecular complex. Interaction of the association members with the HII region and molecular cloud indicates S220 is related to Per OB2 cloud mapped by [3,50]. In immediate vicinity of S220, [20] finds $V(CO) = -3.8 \pm 2.0$ km s^{-1}, $T = 15$K at $\alpha(1950) = 3\ 53\ 28$, $\delta(1950) = 36\ 59\ 56$.
S221	CO detected at $V = -14.7 \pm 0.7$ km s^{-1}, $T = 3$K; $V = -7.2 \pm 0.5$, $T_A = 5$K.
S223	No CO detected.
S224	Distance may not be meaningful because the observed stars may not be responsible for the ionization. Possible detection at $V = -3$ km s^{-1}.
S229	The CO cloud may not be related to the HII region.
S230	Large diffuse nebula probably related to S229, S236, S234, and S237.
S232	There are other weak unrelated components.
S239	Part of the Taurus dark cloud complex.
S243	There are two components present at $V = +5.3$ and 2.1 km sec. It is unclear whether one or both are related to the HII region.
S245	Weak ($T \sim 1$K), narrow lines at $V = 6$, 7.5 km s^{-1}. It is unclear whether they are associated with the HII region.
S246	Bright dark cloud.
S248	$V(CO) = -2.8 \pm 1.0$ km s^{-1} [ref 15].
S254	S254, S255, S256, S257, and S258 are all related to a single giant molecular cloud complex.
S255	See S254.
S256	See S254.
S257	See S254.
S258	See S254.
S261	Distance given may not be meaningful because stars may be unrelated to the ionization. Possibly associated CO at $V = 11.3 \pm 1.8$ km s^{-1}.
S265	Bright dark cloud.
S267	Probable CO detection at $T = 1.6$K, $V = 11.6 \pm 0.5$ km s^{-1}.
S271	Related to S272.
S272	See S271.
S274	No CO detected.
S276	Related to Orion A complex (S281) and ORI OB1 association.
S277	See S281; Part of ORI OB1.
S278	See S281; Part of ORI OB1.
S279	See S281; Velocity is center of mass velocity for the associated giant molecular cloud complex; Part of ORI OB1.

OBJECT	
S280	There are two lines present; V = 24 km s^{-1}, T = 2.9K, V = 11 km s^{-1}, T = 2.1K.
S281	Related to S276, S277, S278, S279; velocity is center of mass velocity for the associated giant molecular cloud complex. Temperature and line width are for BN-KL object; Part of ORI OB1.
S282	In spite of its weakness, the given velocity component appears to be related to the HII region. It is also close to the Hα velocity [55].
S290	No CO detected.
S291	There is a weak line (T = 1.5K, V = 32.1 km s^{-1}) not obviously related to the HII region.
S292	Related to S293, S295, S296, S279.
S293	See S292.
S295	See S292.
S296	See S292.
S297	See S292.
S298	Wolf-Rayet Shell source; CO has three widely separated components [ref 52]. CO velocity is estimate of center of mass velocity and is quite uncertain. Velocity components at V = 37, 54 and 67 km s^{-1}, but 37 km s^{-1} component is most massive.
S303	Related to S308.
S306	Weakness of the line and proximity in space and velocity to S305 may mean that the CO is not related to this HII region, but is part of the complex related to S305.
S308	Possible 1K line at V = 37.3; Wolf-Rayet shell source, related to S303.
S310	Related to VY CMa.
S312	Too large and diffuse for meaningful observations.
S313	No CO detected; extensively searched.

REFERENCES.—(1) This work. (2) Bally and Scoville 1980. (3) Baran 1981. (4) Blaauw, Hiltner, and Johnson 1959. (5) Blair *et al.* 1978. (6) Blair, Peters, and Vanden Bout 1975. (7) Blitz 1978. (8) Blitz and Thaddeus 1980. (9) Blitz 1981. (10) Claria 1974. (11) Clark and Caswell 1976. (12) Cong 1977. (13) Crampton and Fisher 1974. (14) Crampton, Georgelin, and Georgelin 1978. (15) De Noyer 1979. (16) Dickinson, Frogel, and Persson 1974. (17) Elmegreen and Lada 1978. (18) Elmegreen and Lada 1976. (19) Elmegreen, Lada, and Dickinson 1979. (20) Elmegreen and Elmegreen 1978. (21) Evans, Blair, and Beckwith 1977. (22) Georgelin 1975. (23) Georgelin and Georgelin 1976. (24) Georgelin, Georgelin, and Roux 1973. (25) Herbig 1971. (26) Herbig 1972. (27) Herbst, Racine, and Warner 1978. (28) Humphreys 1978. (29) Ilovaisky and Lequeux 1972. (30) Israel 1978. (31) Knapp *et al.* 1976. (32) Knapp *et al.* 1977. (33) Kohoutek 1978. (34) Kutner *et al.* 1977. (35) Lada and Baliunas 1981. (36) Lada and Black 1976. (37) Lada and Elmegreen 1979. (38) Lada and Reid 1978. (39) Lada and Wooden 1979. (40) Lada *et al.* 1978. (41) Lada *et al.* 1976. (42) Loren and Wootten 1978. (43) Loren, Peters, and Vanden Bout 1975. (44) Lucas and Encrenaz 1975. (45) Moffatt, FitzGerald, and Jackson 1979. (46) Neckel 1978. (47) Parsamian and Petrossian 1979. (48) Perek and Kohoutek 1967. (49) Sargent 1977. (50) Sargent 1979. (51) Sargent and Blitz 1981. (52) Schneps *et al.* 1981. (53) Scoville *et al.* 1977. (54) Sewall and Jackson 1980. (55) Treffers 1980. (56) Tucker, Kutner, and Thaddeus 1973. (57) Turner 1976. (58) Walker 1956.

B. CO Velocities toward Additional H II Regions

	HII Region				CO Observations			Peak CO position						
	α(1950)	δ(1950)	ℓ	b	V_{CO} (km s^{-1})	T_A^* (K)	ΔV (km s^{-1})	ℓ	b	CO ref	d* (kpc)	diameter (arcmin)	mapping	comments
1	17 58 54	-23 41	6.38	-0.49	NO OBSERVATIONS							2		
2	20 02 50	29 02	66.96	-1.28	11.6 ± 0.4	20	2.5	66.98	-1.26	1		5		IC 4954/5 (notes)
3	20 25 55	30 21	70.85	-4.69	NO DETECTION					1		1		(notes)
4	20 59 34	50 10	90.31	2.67	1.1 ± 0.5	7	5.2	90.40	2.44	1		0.5		Ber-29 (notes)
5	21 12 19	47 44	89.95	-0.52	CANNOT ASSOCIATE					1		1		PK 089-0.1 (notes)
6	21 34 35	52 13	95.65	0.24	-74.2 ± 0.5	4	2.3	95.65	0.24	1		3		
7	21 18 42	55 16	96.02	4.06	(-79.9 ± 0.5)	(1.2)	(2.5)	96.14	4.13	1		5		very faint (notes)
8	21 39 30	52 21	96.29	-0.17	-54.2 ± 3	8	1.9	96.29	-0.17	1		5		very faint (notes)
9	21 01 35	59 19	97.40	8.51	3.3 ± 0.4	9	2.5	97.39	8.50	1		1		DG 168
10	21 54 45	57 47	101.42	2.66	-61.0 ± 0.4	5	1.9	101.46	2.66	1		1		(notes)
11	21 41 47	65 53	105.39	9.88	-10.1 ± 0.8	21	3.0	105.38	9.88	1		10		DG 176
12	22 49 00	58 54	108.03	-0.18	-49.9 ± 0.4	2.5	2.0	108.03	-0.18	1		12		LBN 107.8-0.3 (notes)
13	22 50 19	58 45	108.12	-0.38	(-13.0 ± 0.4)	(2.5)	(1.3)	108.01	-0.50	1		15		
14	23 00 00	59 12	109.44	-0.51	-47.0 ± 0.5	16	4.6	109.05	-0.33	1		70		(notes)
15	23 02 39	59 48	109.99	-0.08	-51.5 ± 0.6	17	3.9	109.99	-0.08	1		0.5		(notes)
16	23 01 42	60 08	110.02	0.27	-51.9 ± 0.9	8	5.2	110.03	0.29	1		1.5		DG 189 (notes)
17	23 03 49	59 59	110.20	0.21	-50.8 ± 0.5	16	5.0	110.20	0.21	1		0.5		PP-104 (notes)
18	23 04 10	60 00	110.24	0.16	-52.8 ± 1.1	16	3.3	110.24	0.16	1		1		(notes)
19	23 03 10	60 17	110.24	0.33	NO DETECTION					1		2		(notes)
20	0 31 02	69 10	121.48	6.62	CANNOT ASSOCIATE					1		1		DG 5
21	0 40 23	61 38	121.97	-0.95	NO DETECTION					1		1		vdB 4
22	2 02 10	68 47	129.57	7.12	NO DEFINITE DETECTION					1		2		(notes)
23	2 18 40	59 41	134.10	-0.98	NO DEFINITE DETECTION					1		2		LBN 134.0-1.0
24	2 34 40	63 49	134.34	3.56	-9.7 ± 0.4	4	2.0	134.32	3.72	1		20		part of S171
25	2 53 02	58 42	138.52	-0.11	NO DEFINITE DETECTION					1		2		very faint
26	3 03 35	58 19	139.92	0.20	NO OBSERVATION					1		4		(notes)
27	3 03 00	56 35	140.70	-1.35	(-40.0 ± 1.6)	(7)	(3.3)	140.82	-1.28	1		90		LBN 140.8-1.4 (notes)
28	3 26 00	59 32	141.73	2.76	-10.2 ± 0.4	8	2.0	141.73	2.76	1		20		LBN 141.7+2.9 (notes)
29	3 25 50	58 42	142.18	2.06	-10.9 ± 0.5	7	2.3	142.27	1.92	1		30		DG 17 (notes)
30	3 14 40	53 54	143.50	-2.82	NO DETECTION					1		3		LBN 143.5-2.9
31	3 21 05	54 47	143.81	-1.57	-32.2 ± 0.9	17	2.3	143.81	-1.51	1		2		
32	3 47 53	51 21	149.09	-1.98	-7.9 ± 0.4	17	2.0	149.09	-1.98	1		1.5		PK 149-1.1 (notes)
33	3 56 12	51 25	150 05	-1.11	-5.5 ± 0.4	8	2.0	150.06	-1.12	1		1.5		
34	4 03 25	51 16	150.99	-0.47	-27.7 ± 0.4	13	3.0	150.99	-0.47	1		5		
35	3 51 10	41 57	155.50	-8.91	-7.6 ± 0.4	4	1.3	155.53	-8.89	1		3		(notes)
36	3 52 30	42 02	155.63	-8.68	-7.2 ± 0.4	4	1.3	155.63	-8.68	1		3		(notes)
37	3 55 54	41 48	156.28	-8.45	-7.5 ± 0.5	2.6	2.0	156.28	-8.45	1		3		(notes)
38	3 56 22	41 48	156.35	-8.39	-7.3 ± 0.5	2.9	2.0	156.35	-8.39	1		3		(notes)
39	3 57 25	41 55	156.42	-8.18	-5.9 ± 0.5	0.7	1.3	156.42	-8.18	1		3		(notes)
40	4 34 40	48 34	156.46	1.15	NO DEFINITE DETECTION					1		2		(notes)
41	3 57 35	41 48	156.51	-8.24	-6.8 ± 0.5	3.1	2.0	156.51	-8.24	1		3		(notes)
42	4 24 20	46 13	156.98	-1.74	(-2.0 ± 0.5)	(3.4)	(<1.0)	157.03	-1.66	1		8		(notes)
43	4 51 15	46 35	159.79	1.97	CANNOT ASSOCIATE					1		15		LBN 160.1+1.9 (notes)
44	4 48 00	45 30	160.27	0.85	-25.2 ± 0.5	9	3.9	160.27	0.85	1		5		LBN 160.2+1.0 (notes)

	HII Region				CO Observations			Peak CO position							
	α(1950)	δ(1950)	ℓ	b	V_{CO} (km s^{-1})	T_A^* (K)	ΔV (km s^{-1})	ℓ	b	CO ref	d* (kpc)	diameter (arcmin)	mapping	comments
45	5 06 38	38 46	167.68	-0.63	-9.3 ± 0.5	6	1.3	167.71	-0.64	1		0.5		
46	5 37 32	35 40	173.71	2.70	-16.9 ± 0.5	22	4.6	173.71	2.70	1		0.3		M 173+02/3 (notes)
47	5 37 28	35 38	173.75	2.67	-16.8 ± 0.5	20	3.0	173.76	2.69	1		0.7		M 173+02/3 (notes)
48	5 48 12	25 43	183.40	-0.57	-9.1 ± 0.6	11	3.9	183.37	-0.56	1		0.5		
49	5 58 52	26 25	184.00	1.85	NO OBSERVATIONS							0.5		
50	5 47 12	23 50	184.88	-1.73	2.3 ± 0.3	9	3.7	184.86	-1.72	1		0.3		IC 2144
51	6 15 43	23 23	188.52	3.71	-7.0 ± 0.5	17	2.8	188.55	3.65	1		10		LBN 188.7+3.8 (?)
52	6 11 48	19 02	191.91	0.83	7.3 ± 0.5	17	2.5	191.92	0.86	1		1		(notes)
53	6 42 00	1 11	211.14	-1.00	37.1 ± 1.0	2.3	3.2	211.16	-0.99	1		2		
54	6 44 18	1 22	211.25	-0.41	21.4 ± 0.5	13	2.0	211.27	-0.35	1	8.7 ± 2.8 [45]	3	complete [9]	NGC 2282
55	6 54 45	-2 45	216.10	0.01	23.5 ± 0.5	8	2.0	216.17	-0.02	1		25		very faint (notes)
56	6 56 47	-3 51	217.31	-0.05	26.7 ± 0.5	14	3.9	217.31	-0.05	1		0.25		(notes)
57	6 56 48	-3 56	217.39	-0.08	25.9 ± 0.4	17	3.9	217.39	-0.08	1		1		(notes)
58	6 58 25	-3 47	217.44	0.35	49.9 ± 0.4	7	2.3	217.46	0.38	1		3		
59	6 56 57	-4 12	217.64	-0.17	25.7 ± 0.4	11	2.3	217.67	-0.19	1		3		(notes)
60	6 47 32	-7 35	219.58	-3.81	11.2 ± 0.4	4	2.0	219.58	-3.81	1		<1		
61	6 55 40	-7 52	220.78	-2.16	9.9 ± 0.7	5	2.0	220.74	-2.17	1		1		NGC 2313
62	6 57 17	-7 43	220.80	-1.72	13.4 ± 0.4	15	2.5	220.78	-1.75	1		2		NGC 2316
63	6 54 51	-8 16	221.01	-2.51	13.4 ± 0.5	7	3.3	220.91	-2.48	1		10		PP-66
64	6 58 10	-8 47	221.85	-2.51	40.0 ± 0.5	15	3.0	221.84	-2.05	1		5		DG 114
65	17 17 08	-38 55	348.77	-1.12	-11.9 ± 1.0	25	7.2	348.73	-1.06	1		6		RCW 122

OBJECT	
2	Source consists of 3 closely spaced HII regions each 1' diameter.
3	Cluster of stars with small (~20") circumstellar emission.
5	There are many lines present.
6	There are other weaker components present in the spectra.
7	There is an apparently local feature at T = 3.2K , V = 0.7 km s^{-1}. The region needs to be mapped or an H_α velocity needs to be obtained to assure association.
8	There are two components present at V = -51.2 km s^{-1}, T = 8K and V = -58 km s^{-1}, T = 4K both of which appear to be associated.
10	There is a T = 5K line near 0 velocity, but it shows no intensity variation with position as the high velocity line does; probably a foreground feature
12	The line is weak, but is strongest at the optical center of the HII region.
14	Probably related to S156.
15	Probably related to S156.
16	Probably related to S156.
17	Probably related to S156.
18	Probably related to S156.
19	Probably related to S156; a few weak (T < 1K) lines near V = -52 km s^{-1} are probably outer parts of cloud related to 18, 14-17.
22	Weak line at V = -2.8 km s^{-1}, T ≈ 1K is present but is probably not associated.
23	Many weak lines.
26	Cluster of stars with red nebulosity each ~ 1' diameter. The entire region is 4' in diameter.
27	A line at V = 2.3 km s^{-1} is as strong as T = 4K , but is probably unrelated.
28	Probably related to S202.
29	Probably related to S202.
32	Listed as a planetary nebula in referance 45, but the strength of the CO and its clear association with the nebula suggest that the object has probably been misidentified.
35	With 36, there are diffuse circular nebulae which appear to be part of a single bright dark cloud.
36	See 35.
37	Related to 38, 39, 41.
38	See 37.
39	See 37.
40	Weak (T < 1.3K) lines at V = 0.3 ± 0.4 km s^{-1}.
41	See 37.
42	CO not definitely related.
43	There are two lines (V = -15 km s^{-1}, T = 2.5K; V = -30 km s^{-1}, T = 3.5K) present. It is unclear if they are related to the nebula.
44	A component at V = 4.2 km s^{-1}, T = 4-5K is also present, but does not vary in intensity across field. Almost surely foreground.
46	Probably related to 47.
47	See 46.
52	Group of 3 HII regions/reflection nebulae.
56	Probably related to 57.
57	See 56, 59.
59	May be related to 57.

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TABLE 1

KINEMATICALLY DISTINCT COMPLEXES

Source	V (km s^{-1})	ℓ	b	d (kpc)	Other Associated HII Regions
S3	-8.7 ± 1.3	348.20	0.36		
S4	-14.2 ± 0.6	348.24	-0.98		
S8	-4.3 ± 1.5	351.36	0.61	1.74 ± 0.31	
S9	4.5 ± 0.5	351.89	17.17		
S11	-3.9 ± 1.0	352.80	0.64	1.74 ± 0.31	
S15	1.0 ± 0.5	358.27	-1.78		
S16	18.1 ± 1.2	.04	-0.39		S17,S18,S19,S20
S21	16.7 ± 0.5	.58	-0.86		
S24	-0.1 ± 0.4	5.08	30.84		
S25	10.6 ± 1.7	6.60	-0.78	1.8 ± 0.2	S29,S31,S32
S27	3.0 ± 1.5	356.19	13.24	0.17 ± 0.05	
S33	0.8 ± 0.5	8.54	36.41		
S36	2.4 ± 0.4	11.53	36.19		
S37	12.8 ± 1.4	11.40	-1.71		
S38	28.5 ± 3.0	11.90	0.76		
S45	19.4 ± 1.2	13.70	-0.20	2.2 ± 0.2	S40,S41,S43,S44
S46	18.0 ± 1.0	15.42	3.31	2.0 ± 0.6	S47
S48	44.6 ± 1.3	16.58	-0.35	2.9 ± 0.9	
S49	24.2 ± 2.0	17.06	0.70	2.2 ± 0.2	
S53	50.0 ± 0.5	18.21	-0.32		
S54	27.6 ± 0.5	18.90	2.09	2.0 ± 0.2	
S56	69.9 ± 2.5	21.73	-0.02		
S58	37.2 ± 1.0	23.13	0.54		
S59	45.1 ± 2.0	24.48	-0.20		
S60	43.8 ± 2.1	25.36	0.24		
S61	43.0 ± 0.6	26.44	1.75		
S63	4.6 ± 0.5	27.34	-20.87		
S64	6.7 ± 1.2	28.74	3.56		
S65	52.4 ± 1.0	29.05	-0.76		
S69	55.4 ± 1.0	31.83	1.46		
S70	19.8 ± 1.5	35.13	11.36		
S72	64.4 ± 2.0	36.42	-1.78		
S73	2.4 ± 0.5	37.62	44.71		
S74	48.1 ± 1.8	39.86	-1.23		
S77	17.8 ± 0.4	40.56	-12.11		
S82	24.0 ± 1.0	53.56	0.04	1.1 ± 0.4	
S86	26.8 ± 1.4	59.66	-0.21	2.0 ± 0.2	S86, S87, S88, S89, S90, S93 may form a single kinematic group.
S87	22.8 ± 1.0	61.21	-0.05	2.2 ± 0.5	S88
S89	25.6 ± 1.0	62.92	0.12		
S90	22.2 ± 1.0	63.12	0.44	4.0 ± 1.3	
S93	21.3 ± 1.3	64.14	-0.47		
S97	21.1 ± 1.0	66.83	0.87		
S99	-23.7 ± 2.0	70.21	1.65	8.6 ± 2.1	S100
S101	13.7 ± 0.4	71.59	2.76	2.5 ± 0.8	
S104	0.0 ± 2.0	74.79	0.57	4.4 ± 1.4	
S106	-1.0 ± 1.5	76.40	-0.61		
S112	-4.0 ± 2.0	83.78	3.28	2.1 ± 0.7	
S117	0.0 ± 3.0	84.68	-0.62	1.0 ± 0.3	
S119	3.5 ± 1.5	87.06	-4.19	0.72 ± 0.25	
S120	-65.6 ± 0.5	90.20	2.06		
S121	-60.9 ± 0.5	90.23	1.72		
S122	-6.2 ± 2.1	89.01	-41.36		
S124	-43.4 ± 1.1	94.57	-1.45	2.6 ± 0.6	
S125	8.0 ± 1.0	94.72	-5.57	1.01 ± 0.16	
S126	-0.2 ± 0.4	96.72	-15.14	0.60 ± 0.20	
S127	-94.7 ± 0.4	96.27	2.57		
S128	-72.5 ± 0.4	97.56	3.16		
S129	-13.9 ± 0.7	99.06	7.40	0.40 ± 0.13	
S132	-48.5 ± 1.5	102.96	-0.80	4.2 ± 1.5	
S134	-16.1 ± 0.5	103.70	2.18	0.88 ± 0.28	
S135	-20.7 ± 0.5	104.59	1.37	1.4 ± 0.4	
S137	-10.3 ± 1.4	105.15	7.12	0.62 ± 0.20	
S138	-52.0 ± 1.0	105.63	0.36		
S139	-46.5 ± 0.5	105.77	-0.15	3.3 ± 1.1	
S140	-8.5 ± 1.0	106.81	5.31	0.9 ± 0.1	
S141	-65.0 ± 1.0	106.83	3.35		
S142	-41.0 ± 0.5	107.28	-0.90	3.4 ± 0.3	
S145	-8.8 ± 0.5	108.18	5.55		
S146	-49.5 ± 0.5	108.20	0.58		
S147	-54.1 ± 2.0	108.32	-1.08	5.5 ± 1.8	S148,S149
S150	-8.8 ± 0.4	109.00	6.29		
S151	-56.2 ± 0.6	108.69	-2.63		
S152	-50.5 ± 0.5	108.76	-0.96	3.8 ± 0.9	S153
S154	-11.5 ± 0.9	109.17	1.47	1.4 ± 0.4	
S155	-10.0 ± 1.5	113.00	2.00	0.73 ± 1.2	
S156	-51.0 ± 2.0	110.11	0.05	6.1 ± 2.0	
S157	-43.0 ± 2.0	111.28	-0.66	2.5 ± 0.4	
S158	-56.1 ± 1.1	111.54	0.78	2.8 ± 0.9	
S159	-56.0 ± 1.0	111.61	0.37		
S161A	-10.0 ± 1.0	111.89	0.88		
S161B	-51.9 ± 0.7	111.89	0.88		
S162	-44.7 ± 0.5	112.19	0.22	3.5 ± 1.1	
S163	-44.9 ± 3.8	113.52	-0.57	2.3 ± 0.7	
S165	-33.0 ± 1.0	114.65	0.14	1.6 ± 0.5	
S167	-63.6 ± 0.5	114.99	3.21		
S168	-39.8 ± 1.4	115.81	-1.68	3.8 ± 1.2	S169
S170	-43.7 ± 1.0	117.57	2.26	2.3 ± 0.7	
S172	-40.8 ± 0.5	118.63	-1.32		
S173	-34.5 ± 2.8	119.40	-0.84	2.7 ± 0.9	
S174	-2.7 ± 0.6	120.17	18.40		
S175	-49.6 ± 0.5	120.36	1.97	1.7 ± 0.5	
S177	-34.2 ± 0.4	120.63	-0.14	2.5 ± 0.8	
S178	-3.6 ± 1.0	125.05	25.63		
S181	-36.6 ± 0.4	122.72	2.37		

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TABLE 1—*Continued*

Source	V (km s^{-1})	ℓ	b	d (kpc)	Other Associated HII Regions
S182	-27.0 ± 0.7	122.81	1.87		
S183	-10.3 ± 1.4	123.00	3.02		
S184	-30.4 ± 1.1	123.21	-6.35	2.2 ± 0.7	
S186	-43.0 ± 2.6	124.89	0.32		
S187	-14.9 ± 0.4	126.72	-0.73		
S190	-46.0 ± 5.3	133.80	0.80	2.1 ± 0.2	
S192	-46.7 ± 1.0	136.12	2.09		S193,S194
S196	-45.1 ± 0.9	136.51	2.50		
S199	-39.0 ± 1.0	137.30	1.40	2.1 ± 0.2	
S200	-9.7 ± 0.5	138.16	4.09		
S201	-40.0 ± 1.4	138.47	1.60		
S202	-11.5 ± 2.0	139.99	2.09	0.80 ± 0.25	
S206	-22.6 ± 0.5	150.68	-0.77	3.3 ± 0.8	
S208	-30.2 ± 0.4	151.27	1.97	7.6 ± 0.8	
S209	-52.2 ± 2.4	151.61	-0.24		
S211	-37.6 ± 0.9	154.65	2.46		
S212	-35.3 ± 0.3	155.39	2.65	6.0 ± 0.6	
S213	-31.0 ± 0.4	157.08	-3.61		
S217	-20.5 ± 1.1	159.15	3.27	5.2 ± 0.8	
S218	+3.4 ± 0.4	159.61	11.36		
S219	-24.5 ± 1.2	159.36	2.57	4.2 ± 0.6	
S220	+7.0 ± 3.0	160.00	-19.00	0.4 ± 0.04	
S222	-1.0 ± 1.0	165.36	-9.00		
S226	-32.9 ± 1.0	168.46	-0.88		
S228	-8.7 ± 2.5	169.19	-0.90		
S231	-18.4 ± 1.7	173.47	2.55	2.0 ± 0.5	S233, S235
S232	-23.0 ± 0.5	173.43	3.17	1.0 ± 0.3	
S234	-13.4 ± 0.7	173.35	2.40	2.3 ± 0.7	
S236	-7.2 ± 0.5	173.48	-0.05	3.2 ± 0.3	
S237	-4.3 ± 0.7	173.62	2.81	1.8 ± 0.3	
S238	7.6 ± 1.0	173.60	-1.78	0.15 ± 0.05	S239
S241	-6.5 ± 1.0	180.79	4.03	4.7 ± 1.2	
S242	0.00 ± 0.5	182.36	0.19	2.1 ± 0.7	
S243	3.7 ± 2.3	184.16	-4.04		
S246	7.5 ± 0.5	187.22	-16.69		
S247	2.9 ± 1.2	188.96	0.85	3.5 ± 0.9	
S249	-5.3 ± 2.6	189.45	4.38	1.6 ± 0.5	
S252	7.5 ± 1.0	189.88	0.30	1.5 ± 0.15	
S253	14.4 ± 0.5	192.23	3.59	4.4 ± 0.4	
S254	7.5 ± 0.7	192.61	-0.04	2.5 ± 0.4	S255, S256, S257, S258
S259	22.8 ± 0.5	192.93	-0.58	8.3 ± 2.6	
S263	0.3 ± 1.0	194.59	-17.54	0.45 ± 0.14	
S264	12.0 ± 0.5	196.95	-10.29	0.40 ± 0.13	
S265	-1.6 ± 1.1	195.23	-16.98		
S266	31.2 ± 1.1	195.65	-0.07		
S268	4.8 ± 0.5	195.97	-2.74		
S269	17.5 ± 0.7	196.45	-1.68	3.8 ± 1.0	
S270	25.6 ± 0.4	196.83	-3.11		
S271	20.5 ± 0.5	197.81	-2.33	4.8 ± 0.5	S272
S273	7.0 ± 1.0	202.00	1.60	0.8 ± 0.15	
S275	14.3 ± 0.1	207.50	-2.00	1.6 ± 0.2	
S281	8.8 ± 2.1	208.90	-17.50	0.5 ± 0.5	S276, S277, S278, S279
S283	49.4 ± 2.8	210.81	-2.56	9.1 ± 2.9	
S284	45.0 ± 0.7	211.86	-1.18	5.2 ± 0.8	
S285	45.3 ± 1.1	213.81	0.61	6.9 ± 0.7	
S286	49.8 ± 1.8	217.31	-1.39		
S287	27.2 ± 0.8	218.15	-0.35	3.2 ± 0.8	
S288	56.7 ± 0.8	218.77	1.95	3.0 ± 1.2	
S292	16.7 ± 1.5	224.00	-2.00	1.15 ± 0.15	S293, S295, S296, S297
S294	32.9 ± 1.1	224.19	1.22	4.6 ± 1.5	
S299	50.1 ± 2.5	230.97	1.49	4.4 ± 0.6	S300
S301	53.0 ± 0.4	231.52	-4.33	5.8 ± 0.9	
S302	16.6 ± 0.3	232.63	1.01	2.2 ± 0.7	
S305	44.1 ± 0.6	233.77	-0.15	5.2 ± 1.4	
S307	46.3 ± 0.7	234.57	0.83	2.2 ± 0.5	
S309	44.0 ± 1.7	234.64	-0.21	5.5 ± 0.8	
S310	22.3 ± 1.0	239.87	-4.47	1.6 ± 0.5	
S311	51.0 ± 1.6	243.20	0.44	4.1 ± 0.6	
			ADDITIONAL HII REGIONS		
2	11.6 ± 0.4	66.98	-1.26		
4	1.1 ± 0.5	90.40	2.44		
6	-74.2 ± 0.5	95.65	0.24		
8	-54.2 ± 3.0	96.29	-0.17		
9	3.3 ± 0.4	97.39	8.50		
10	-61.0 ± 0.4	101.46	2.66		
11	-10.1 ± 0.8	105.38	9.88		
12	-49.9 ± 0 4	108.83	-0.18		
14	-47.0 ± 0.5	109.05	-0.33		
24	-9.7 ± 0.4	134.32	3.72		
28	-10.2 ± 0.5	141.73	2.76		
29	-10.9 ± 0.5	142.27	1.92		
31	-32.2 ± 0.9	143.81	-1.51		
32	-7.9 ± 0.4	149.09	-1.98		
33	-5.5 ± 0.4	150.06	-1.12		
34	-27.7 ± 0.4	150.99	-0.47		
35	-7.4 ± 0.4	155.58	-8.79		36
37	-6.9 ± 0.9	156.39	-8.32		38,39,41
44	-25.2 ± 0.5	160.06	-1.12		
45	-9.3 ± 0.5	167.71	-0.64		
46	-16.9 ± 0.5	173.74	2.70		47
48	-9.1 ± 0.6	183.37	-0.56		
50	2.3 ± 0.3	184.86	-1.72		

TABLE 1—*Continued*

Source	V (km s^{-1})	ℓ	b	d (kpc)	Other Associated HII Regions
51	-7.0 ± 0.5	188.55	3.65		
52	7.3 ± 0.5	191.92	0.86		
53	37.1 ± 1.0	211.16	-0.99		
54	21.4 ± 0.5	211.25	-0.35	8.7 ± 2.8	
55	23.5 ± 0.5	216.17	-0.02		
56	25.9 ± 0.4	217.35	-0.07		57
58	49.9 ± 0.4	217.46	0.38		
59	25.7 ± 0.4	217.67	-0.19		56 (?)
60	11.2 ± 0.4	219.58	-3.81		
61	9.9 ± 0.7	220.74	-2.17		
62	13.4 ± 0.4	220.78	-1.75		
63	13.4 ± 0.5	220.91	-2.48		
64	40.0 ± 0.5	221.84	-2.05		
65	-11.9 ± 1.0	348.73	-1.06		

Thus, a lower limit to the percentage of H II regions in the Sharpless catalog which have associated molecular clouds is ~ 70%. It is a lower limit because many of the objects which have been listed as "Cannot Associate" do have accompanying molecular clouds, but these could not be identified without additional mapping. Furthermore, some of the objects for which no detection or no definite detection has been made may not be H II regions. Some may be unidentified planetary nebulae, and some of the filamentary objects may be old supernova remnants which have lost their nonthermal radio signature.

Sharpless objects which have little or no associated molecular material (those with no detections or no definite detections, viz., "naked" H II regions) tend to be radio quiet (1.4 GHz flux densities <100 mJy). Naked H II regions are 20% of our sample. In a survey of 168 of the Sharpless objects, Felli and Churchwell (1972) found that 34 (20%) were radio quiet. Yet 19 (56%) of the radio-quiet H II regions were naked H II regions. Felli and Perinotto (1974) concluded that most of the radio-quiet H II regions are likely to be faint nearby H II regions excited by stars of relatively late spectral type. These stars, of spectral type B1–B9, live for times sufficiently long to be able to drift long distances from their placental molecular clouds. The correlation between radio-quiet and naked H II regions is, therefore, not surprising.

Twelve (34%) of the radio-quiet H II regions have detected associated molecular clouds, and 17 (13%) of the H II regions with flux densities >100 mJy are naked H II regions. Some of the former may be reflection nebulae, but we have no independent data to support this conjecture. The latter class of objects may indicate that some early-type stars, albeit a small percentage, are not formed in massive molecular clouds, and the mechanisms that govern their formation may be different from those of the large majority of massive stars. In some cases, however, a molecular cloud may be present which we did not detect with our search technique. Another possibility is that the molecular cloud has been completely destroyed by the recently formed stars.

For the 65 additional objects, three of which were not observed, the majority are associated with very strong CO emission, confirming that they are indeed H II regions. Many of the rest are relatively high latitude objects (in this case, high latitude means $|b| > 20$), with CO line strengths comparable to similar H II regions listed in the Sharpless catalog.

b) Independence of the Molecular Complexes

In a number of cases, two or more H II regions are associated with a single molecular cloud complex. In order to study the motions of the complexes in the Galaxy, it is necessary to have a statistically unbiased sample of kinematically distinct objects. Table 1 is a listing of the objects we detected which appear to be kinematically distinct on the basis of CO mapping where available, of the distances to the exciting stars, and of the agreement (or lack of agreement) of the CO velocities for objects which are separated by relatively small angles. The coordinates and velocities listed in Table 1 are for the center of mass of the entire complex.

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