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A CATALOGUE OF GALACTIC O STARS AND THE IONIZATION OF THE LOW DENSITY INTERSTELLAR MEDIUM BY RUNAWAY STARS

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RESUMEN

Presentamos un catálogo de 664 estrellas tipo O de nuestra galaxia. Para cada objeto se listan los siguientes datos: m_V, B — V, tipo espectral, distancia, velocidad radial, velocidad radial peculiar respecto al movimiento circular local de la estrella, la multiplicidad probable del objeto, la posibilidad de asociación de la estrella O con las regiones H II detectables en los mapas fotográficos del Palomar Sky Survey y la identificación de la región H II sobre la cual se encuentra proyectada la estrella.

Utilizando los datos del catálogo, se calcula la función de luminosidad para las estrellas O. La radiación capaz de ionizar hidrógeno, debida a las estrellas O no asociadas a regiones H II, es de 1.3×10^{-14} fotones cm^{-3} s^{-1}. Este resultado concuerda con el obtenido por Torres-Peimbert, Lazcano-Araujo y Peimbert (1974).

A partir de la componente radial de las velocidades peculiares, v_{pr}, de 386 estrellas O, encontramos 72 estrellas con $|v_{pr}| \geq 30$ km s^{-1}; de estos objetos, sólo 19 han sido propuestos con anterioridad como posibles estrellas "desbocadas". Además, 22 candidatos a desbocadas propuestos por otros autores, tienen $|v_{pr}| < 30$ km s^{-1}. Se estima que, del total de estrellas O considerado, entre 20 y 30% son estrellas desbocadas.

La distancia promedio al plano galáctico de las estrellas fuera de regiones H II densas es 108 pc, para aquellas dentro de regiones H II es 54 pc y para las posibles desbocadas 108 pc. El promedio de la componente radial de la velocidad peculiar para estrellas dentro de regiones H II de alta densidad es 14.6 km s^{-1}, mientras que esta misma resulta ser 22.9 km s^{-1} para estrellas fuera de regiones H II.

Se ha encontrado que, si bien de todas las estrellas consideradas 53 % está dentro de regiones H II, de las posibles estrellas desbocadas sólo 33% lo está.

Se discute brevemente la asociación entre estrellas O y regiones H II de alta densidad.

ABSTRACT

A catalogue of 664 galactic O stars is presented. For each object the following characteristics are presented: m_v, B — V, spectral type, distance, radial velocity, radial component of the peculiar velocity, possible multiplicity of the object, whether the O star is inside or outside the faintest H II regions detectable on the Palomar Sky Survey prints and identification of the H II region where the star is projected.

From this catalogue the luminosity function for O stars is computed. The hydrogen ionizing radiation from O stars not imbedded in H II regions is 1.3×10^{-14} photons cm^{-3} s^{-1}, and is very similar to that obtained by Torres-Peimbert, Lazcano-Araujo and Peimbert (1974).

Out of 386 O stars with known radial component of the peculiar velocities, v_{pr}, we have found 72 stars with $|v_{pr}| \geq 30$ km s^{-1}; only 19 of them had been proposed previously as runaway candidates. On the other hand, 22 runaway candidates proposed by other authors have $|v_{pr}| < 30$ km s^{-1}. It is estimated that 20 to 30% of the total number of O stars are runaways.

It is found that the mean distance to the galactic plane for O stars outside dense H II regions is 108 pc, for O stars inside H II regions, 54 pc, and for runaway candidates, 108 pc. The mean of the radial component of the peculiar velocities for stars inside dense H II regions is 14.6 km s^{-1}, while for those outside it is 22.9 km s^{-1}.

It is found that while, for the whole sample, 53% of the stars are inside H II regions, of the runaway candidates only 33% are inside. A brief discussion of the association between O stars and dense H II regions is given.

Key words: INTERSTELLAR MATTER — O-TYPE STARS — RUNAWAY STARS — STELLAR STATISTICS

I. INTRODUCTION

Torres-Peimbert, Lazcano-Araujo and Peimbert (1974), hereinafter Paper I, found that a large fraction of the OB stars were outside dense H II regions, i.e. the faintest H II regions detectable on the Palomar Sky Survey. Moreover, they suggested that these stars were mainly responsible for the ionization of the low density interstellar medium, LDIM (intercloud medium). Their study is based on all the O to B5 stars contained in the catalogue of Blanco *et al.,* (1968).

Encouraged by the results of Paper I, we decided to improve our knowledge of the ionization of the interstellar medium by including in our analysis all the galactic main sequence, or more luminous, O stars available in the literature. Since most of the data on O stars are scattered throughout the literature, in particular, the radial velocity and the projected location of the O stars with respect to dense H II regions, we decided to compile a general catalogue of galactic O stars. This catalogue is presented in §II and is intended to be useful to O-type star observers by providing a reference list for general studies on O-type stars.

In this paper we analyze those data in our catalogue which are relevant to the ionization of the interstellar medium. In §III we compute the number of hydrogen ionizing photons available to ionize the LDIM. In §IV we present a list of probable runaway O stars (from which we estimate the total fraction of runaway O stars); also in §IV we discuss the z distribution of O stars inside and outside dense H II regions, as well as that of the runaway stars. The conclusions are presented in §V.

II. THE CATALOGUE

a) *General considerations*

We present the Catalogue of Galactic O Stars (CGO) in Table 1. We have attempted to include all known O stars belonging to the Milky Way whose physical and kinematic properties indicate that they form part of the youngest stellar population, i.e. all galactic O stars of luminosities V and brighter.

Goy's (1973) catalogue of O stars has been extremely useful for the development of the CGO, but for the reasons just given, some stars in his catalogue have not been included in the CGO.

In particular, we excluded 46 stars of the following categories: i) objects that belong to the Magellanic clouds; ii) stars that we suspect are of type B; iii) nuclei of planetary nebulae (with the exception of HD 148937; this was included in the Planetary Nebulae Catalogue by Perek and Kohoutek [1967] but may not be a planetary nebula nucleus Pişmiş [1974]); iv) objects which have been identified as O subdwarfs, namely, HD 49798, BD + 75°325 and BD + 28°4211 (Thackeray 1970; Gould *et al.* 1957; MacRae *et al.* 1951); and v) Wolf-Rayet stars in the catalogue of Smith (1968). (In the strict sense, Wolf-Rayet stars should have been included in the present study, but were excluded because they present some peculiar problems concerning the determination of their physical properties).

Description of the left hand page of the catalogue by columns:

(1) The number on the Catalogue of Galactic O stars, CGO.
(2) Other identification.
(3) and (4) Right ascension, α, and declination, δ, for the equinox of 1975.0.
(5) and (6) Galactic longitude, l^{II}, and latitude b^{II}.
(7) Visual, or photographic magnitude with its quality index.
(8) Observed color index, B − V.
(9) Spectral type.
(10) Quality index of spectral type.

Description of the right hand page of the catalogue by columns:

(11) The CGO number.
(12) Distance of the star, d (in kpc), and its quality index.
(13) Distance perpendicular to the galactic plane, z (in pc).
(14) Adopted heliocentric radial velocity of the star, v_r (in km s^{-1}) followed by its quality index.
(15) Radial velocity of the star with respect to the Local Standard of Rest, v_{LSR} (in km s^{-1}).
(16) Radial component of the velocity of an object with respect to the LSR, at the same calculated position of the star, moving in the circular orbit defined by the galactic potential, v_{cr} (in km s^{-1}).
(17) Radial component of the peculiar velocity of the star, v_{pr} (in km s^{-1}). It is defined as the difference between the radial velocity of the star and the radial component of the circular velocity at the star's position (both with respect to the LSR).
(18) An indication of whether the star is inside ("I") or outside ("O") the faintest H II regions detected in the Palomar Sky Survey Prints.
(19) Identification of the H II region in which the star is imbedded. In the case of a star being outside an H II region, but in its vicinity, the H II region is identified and an indication of the angular distance to the H II region is given by the indexes "X", "Y", and "Z".
(20) The number of the star in the "General Catalogue of O-Type Stars" of Goy (1973).
(21) An asterisk in this column means that the star has a note at the end of Table 1.
(22) Remarks.

b) *Identification*

The stars are identified in the customary way by their respective catalogue abreviations, namely; "HD": Henry Draper and Henry Draper Extension; "BD": Bonner Durchmusterung; "CD": Córdoba Durchmusterung; "CP": Cape Photographic Durchmusterung; "LS": Luminous Stars in the Northern Milky Way; "LSS": Luminous Stars in the Southern Milky Way; "SA": Selected Areas; "HILT": Hiltner and Johnson (1956); "MILL": Miller (1972); "GEOR": Georgelin, Georgelin and Roux (1973); "MART": Martin (1967); "N": New General Catalogue. When a number of star names is available preference has been given to "HD" designations.

c) *Magnitude and B − V*

The magnitude given for most stars is the V magnitude in the U, B, V system, although for some stars the photographic magnitude is given instead of V (where no visual magnitude has been found in the literature). This is indicated by a "P" following the magnitude; obviously, these stars do not have B − V color index. We have indicated, for the stars with visual magnitude, whether or not the measurement of this magnitude is affected in some way. The notation is as follows: "V" after the magnitudes denotes that the star is an intrinsic variable, "M" indicates that the star forms part of a close multiple system, in which case the brightness of the companion ($\Delta m < 2$) and its proximity ($d < 10''$) may indeed contaminate the measurements of the magnitude of the star; a "C" follows the magnitude when some correction, to allow for the presence of a companion, has been applied.

In the "C" cases, Δm is given in square brackets following "SB" or "VB" in the remarks of the CGO (column 22). The value given for Δm is the magnitude difference between the O star and its companion, as given in the literature. The magnitude listed in the CGO corresponds to the observed visual intensity from which the intensity of the companion has been subtracted.

The photometric data used has been taken from Bigay, Garnier, Georgelin and Georgelin (1972); Crampton (1971); Crampton, Leir and Younger (1973); Crawford, Barnes, Hill and Perry (1971); Crawford, Barnes and Golson (1971*a,b*); Crawford, Barnes and Warren (1974); Drilling (1972); Feinstein, Marraco and Muzzio (1973); Georgelin, Georgelin and Roux (1973); Glaspey (1971); Hiltner and Johnson (1956); Humphreys (1970, 1973); Lesh (1968); Lutz and Lutz (1972); Lynga (1970); McCuskey, Pesch, and Snyder (1974); Moffat and Vogt (1973); Särg and Wramdemark (1970); Thackeray, Tritton and Walker (1973); Schild, Hiltner and Sanduleak (1969); Schild, Neugebauer and Westphal (1971); Walborn (1971, 1973*b*) and Wramdemark (1973).

TABLE 1

CATALOGUE OF GALACTIC O STARS

CGO (1)	Name (2)	$\alpha_{(1975)}$ (3)	δ (4)	l^{II} (5)	b^{II} (6)	m_V (7)	B-V (8)	Sp. Type (9)	(10)
1	BD+63 2093	0 0.3	+64 29	117 37	+2 16	10.00M	0.50	09.5V	M
2	BD+66 1673	0 0.4	+67 22	118 11	+5 5	10.09	1.34	09.0	N
3	BD+66 1674	0 0.9	+67 17	118 13	+5 0	9.60	1.10	0	N
4	BD+66 1675	0 0.9	+67 16	118 13	+4 59	9.05	1.09	07.0	N
5	N 7822 29	0 1.0	+67 17	118 14	+5 0	?		09.0	N
6	HD 225146	0 2.7	+60 58	117 13	-1 15	8.60	0.38	09.7IB	H
7	HD 225160	0 2.8	+62 5	117 26	-0 9	8.19	0.27	08.0IB(F)	H
8	BD+67 1598	0 3.6	+68 2	118 36	+5 41	9.14	0.79	09.0	N
9	HD 108	0 4.8	+63 32	117 56	+1 14	7.48	0.18	07.0IF	H
10	BD+63 12	0 12.2	+64 0	118 49	+1 34	9.76	0.55	09.0IB	L
11	HD 1337	0 16.4	+51 18	117 35	-11 5	6.62C	-0.13	09.5I	H
12	BD+60 39	0 20.3	+61 35	119 25	-0 57	9.46	0.24	09.0V	M
13	BD+61 74	0 24.6	+62 25	120 0	-0 11	9.55	0.32	09.0VNN	L
14	BD+62 79	0 25.1	+63 18	120 9	+0 42	9.22	0.41	09.5IV	L
15	LS I+64 26	0 25.9	+64 34	120 21	+1 57	11.04M	1.00	09.5V	M
16	BD+61 105	0 29.8	+62 18	120 36	-0 21	9.29	0.27	09.0V	L
17	HILT 8	0 38.3	+60 50	121 31	-1 53	9.99	0.37	09.0IV	L
18	HILT 9	0 46.7	+62 52	122 33	+0 7	11.40	0.48	07.5	N
19	HD 5005	0 51.4	+56 29	123 7	-6 15	7.76M	0.09	05.5F	H
20	HD 5005C	0 51.4	+56 29	123 7	-6 15	?		09.0V	H
21	HD 5689	0 58.1	+63 29	123 51	+0 46	9.13	0.34	06.5	N
22	BD+59 191	1 7.7	+60 29	125 7	-2 11	9.16	0.39	09.5II	M
23	BD+62 249	1 24.5	+62 54	126 51	+0 25	10.04	0.70	09.5V	L
24	HD 8768	1 26.4	+63 8	127 2	+0 41	8.69	0.40	09.5IV	L
25	BD+60 261	1 30.9	+61 0	127 52	-1 21	8.63	0.31	07.5III(N)((F))	H
26	HD 10125	1 39.1	+64 3	128 17	+1 49	8.22	0.31	09.7II	H
27	HD 232525	1 44.5	+53 29	131 5	-8 25	8.60P		09.5	N
28	HD 236894	1 50.5	+58 19	130 49	-3 30	9.37	0.19	08.0V	L
29	BD+59 367	1 56.8	+60 24	131 6	-1 17	9.77	0.53	09.5IB	L
30	HD 12323	2 0.8	+55 30	132 54	-5 53	8.90	-0.12	09.0VN	H
31	BD+61 370	2 1.8	+61 46	131 19	+0 11	10.06	0.70	09.0V	L
32	HD 12993	2 7.3	+57 48	133 7	-3 25	8.95	0.20	06.5V	H
33	HD 13022	2 7.7	+58 39	132 54	-2 35	8.76	0.32	09.5II-III((N))	H
34	HD 13268	2 9.7	+56 2	133 57	-5 0	8.18	0.13	07.0.	N
35	HD 13338	2 10.5	+57 49	133 31	-3 16	9.15	0.27	09.5V	L
36	HILT 23	2 10.8	+59 47	132 56	-1 23	11.03	0.97	09.0V	L
37	HD 13745	2 14.1	+55 53	134 35	-4 58	7.88	0.17	09.7II((N))	H
38	HD 14434	2 20.1	+56 48	135 4	-3 49	8.50	0.16	05.5VN((F))P	H
39	HD 14442	2 20.3	+59 27	134 12	-1 19	9.21	0.41	05.5V	H
40	BD+60 470	2 21.3	+60 43	133 53	-0 5	9.88V	0.70	08.0V	M
41	HD 14633	2 21.5	+41 24	140 47	-18 10	7.47	-0.21	08.5VN	H
42	BD+61 411	2 24.6	+61 53	133 50	+1 9	10.08	0.98	08.0	N
43	HD 14947	2 24.9	+58 45	134 59	-1 46	7.98	0.46	05.5F	H
44	HD 15137	2 26.3	+52 26	137 28	-7 35	7.80V	-0.08	09.5III	H
45	BD+60 497	2 30.0	+61 31	134 34	+1 2	8.80M	0.57	06.0V(N)	H
46	BD+60 498	2 30.3	+61 27	134 37	+0 59	9.92	0.54	09.5V	H
47	BD+60 499	2 30.6	+61 27	134 39	+1 0	10.32	0.55	09.5V	H
48	IC 1805 113	2 30.6	+61 15	134 44	+0 49	10.92	0.88	09.0V	L
49	BD+60 501	2 30.7	+61 22	134 42	+0 56	9.60M	0.46	06.5V	H
50	HD 15558	2 30.8	+61 21	134 43	+0 55	7.88	0.52	05.0III(F)	H

TABLE 1 (CONTINUED)

CGO (11)	d (12)	z (13)	V_r (14)	V_{LSR} (15)	V_{cr} (16)	V_{pr} (17)	H II (18)	Reg (19)	Goy (20)	(21)	Remarks (22)
1	2.29E	91			-30		I	667	627		
2	0.77K	68			-10		I	2	628		
3							I	2	629		
4	0.84K	73			-11		I	2	630		
5							I	2	631		
6	3.48B	-76	-33B	-29	-46	17	0				
7	3.18B	-8	-51C	-47	-42	-5	0		632		VVAR(>42)
8	1.07K	106			-14		I	1	633		
9	3.03B	65	-70D	-66	-40	-26	0		1		
10	4.51F	123			-59		0		2		
11	3.91B	-751	-32B	-29	-50	20	0		3	*	SB ORB[0.6] EB[0.2]
12	2.64D	-44			-36		I	4	4		
13	2.47F	-8			-33		0		5		
14	2.08F	25			-28		0		6		
15	1.85E	63			-25		I	5	7		
16	2.34F	-14			-32		0		8		
17	3.89F	-128			-52		0		9		
18	5.25K	11			-69		0		10		
19	3.68C	-401	-24A	-22	-50	28	I	11	11		
20			-34D	-32			I	11	11	*	
21	2.69K	36			-37		0		12		
22	3.78D	-144	-69D	-67	-52	-15	0		13		
23	1.77F	13			-25		0		14		
24	1.65F	20	-38B	-36	-24	-12	0		15		
25	2.81B	-66			-39		0		16		
26	2.74B	87	-38C	-36	-39	2	0		18		
27			-24C	-24			0				
28	2.98F	-182			-41		0		19		
29	4.85F	-109			-63		0		20		
30	2.28A	-234			-32		0		21		
31	1.85F	6			-27		0		22		
32	2.28A	-136	-102C	-102	-32	-70	0		23		
33	3.47B	-156	-57C	-57	-47	-10	0		24		
34	2.28A	-199	-127B	-127	-32	-95	0		25		
35	2.13F	-121	-42E	-42	-30	-12	0		26		
36	1.99F	-48			-28		0		27		
37	2.28A	-197	-22C	-23	-32	9	0		28		
38	2.28A	-152	-20C	-20	-32	11	0		30		
39	2.28A	-52			-32		0		31		
40	1.86E	-3			-27		0		32		
41	2.06B	-643	-41B	-45	-25	-19	0		34		VVAR(47)
42	1.39K	28			-20		I	18	35		
43	2.28A	-70	-53C	-53	-32	-21	0		36		VVAR(50)
44	3.37C	-445	-35C	-37	-44	7	0		37		
45	2.28A	41			-32		I	19	38		
46	2.28A	39			-32		I	19	39		
47	2.28A	40			-32		I	19	40		
48	2.28A	32			-32		I	19	41		
49	2.28A	37			-32		I	19	42		
50	2.28A	36	-47D	-47	-32	-15	I	19	43		

TABLE 1 (CONTINUED)

CGO (1)	Name (2)	α (1975) (3)	δ (4)	l^{II} (5)	b^{II} (6)	m_V (7)	B−V (8)	Sp. Type (9)	(10)
51	HD 15570	2 30.9	+61 16	134 46	+0 51	8.10	0.70	04.0IIF(+)	H
52	HD 15642	2 31.1	+55 14	137 4	−4 44	8.54	0.08	09.5III:N	H
53	HD 15629	2 31.4	+61 25	134 46	+1 1	8.42	0.42	05.0F	H
54	BD+60 513	2 32.1	+61 17	134 53	+0 55	9.41	0.50	07.0VN	H
55	BD+62 424	2 34.2	+62 51	134 31	+2 27	8.83	0.45	06.0V((F))	H
56	HD 16429	2 38.8	+61 10	135 41	+1 8	7.67	0.62	09.5I	H
57	HD 16691	2 41.0	+56 47	137 43	−2 45	8.70	0.48	05.0F	H
58	HD 16832	2 42.4	+56 33	138 0	−2 53	8.85	0.40	09.5II	H
59	LS I+59 153	2 48.0	+59 36	137 22	+0 11	11.01	0.62	09.5V	M
60	HD 17505	2 49.2	+60 20	137 11	+0 54	7.55C	0.40	06.0F	H
61	HD 17520	2 49.3	+60 18	137 12	+0 53	9.01C	0.32	09.0V	H
62	HD 17603	2 49.9	+56 57	138 46	−2 5	8.45	0.64	08.5IF	H
63	HD 237019	2 51.4	+60 22	137 25	+1 3	9.73	0.47	08.0V	M
64	BD+60 586	2 52.2	+60 33	137 25	+1 16	8.48M	0.30	08.0III	H
65	BD+56 739	2 53.0	+57 20	138 57	−1 33	9.92	1.00	09.5IB	L
66	BD+60 594	2 55.0	+61 19	137 22	+2 7	9.30	0.36	09.0V	H
67	HD 18326	2 57.5	+60 28	138 2	+1 30	7.82	0.38	07.0VN	M
68	HD 18409	2 58.5	+62 37	137 7	+3 27	8.36	0.42	09.7IB	H
69	HD 19820	3 12.1	+59 28	140 7	+1 32	7.32C	0.50	09.0III	H
70	HD 237090	3 13.1	+59 49	140 3	+1 54	8.86	0.53	09.0III	M
71	HD 24431	3 53.8	+52 34	148 50	−0 43	6.72	0.38	09.0V	H
72	HILT 52	3 57.0	+57 9	146 15	+3 6	10.08	0.27	07.5	N
73	BD+56 864	3 57.1	+57 9	146 16	+3 6	9.68	0.28	06.0NN	N
74	BD+56 866	3 57.4	+57 2	146 22	+3 3	10.28	0.36	09.0V	L
75	HD 24912	3 57.4	+35 43	160 23	−13 7	4.03	0.01	07.5I	H
76	HD 237211	4 1.3	+56 28	147 9	+2 57	8.98	0.49	09.5IB:P	H
77	BD+50 886	4 1.3	+51 15	150 35	−0 58	11.23	1.04	06.0	N
78	HD 30614	4 51.5	+66 18	144 4	+14 2	4.29	0.03	09.5I	H
79	LS V+47 24	4 56.9	+47 57	159 10	+3 18	11.32	0.42	09.5V	L
80	HD 34078	5 14.7	+34 17	172 5	−2 16	5.94	0.22	09.5V	H
81	LS V+38 12	5 18.4	+38 53	168 46	+1 0	11.25	0.52	09.0V	M
82	HD 34656	5 19.1	+37 25	170 3	+0 16	6.79M	0.02	07.0IF	H
83	HD 242908	5 20.9	+33 30	173 29	−1 40	9.04	0.28	04.0V(N)	H
84	HD 242926	5 21.0	+33 18	173 39	−1 45	9.35	0.34	07.0V	H
85	HD 242935	5 21.1	+33 23	173 35	−1 41	9.43M	0.20	07.0V	H
86	LS V+40 46	5 25.1	+40 31	168 9	+3 0	10.74	0.41	09.0V	M
87	HD 35619	5 26.0	+34 45	173 2	−0 5	8.55	0.24	07.0V	H
88	BD+34 1054	5 26.5	+34 24	173 23	−0 12	8.84	0.19	09.5V	M
89	BD+34 1058	5 27.0	+34 39	173 14	+0 2	8.78	0.26	08.0NN	N
90	HD 35921	5 28.0	+35 22	172 45	+0 36	7.30C	0.20	09.5III:N	L
91	BD+39 1328	5 30.4	+40 3	169 6	+3 35	9.84	0.57	08.5IB	H
92	HD 36486	5 30.7	−0 19	203 51	−17 45	2.20M	−0.21	09.5I	H
93	HD 36619	5 31.1	−23 28	226 45	−27 17	8.60	0.23	07.0	N
94	HD 36483	5 32.0	+36 27	172 17	+1 52	8.18	0.43	09.0V	H
95	HD 36841	5 33.2	−0 24	204 15	−17 14	8.62	0.03	08.0	N
96	HD 36861	5 33.7	+9 55	195 3	−12 1	3.56C	−0.19	08.0IIIF	H
97	HD 37022	5 34.1	−5 24	209 1	−19 23	5.13	0.03	07.0V	H
98	HD 36879	5 34.2	+21 23	185 13	−5 54	7.56	0.22	07.5III	H
99	HD 37041	5 34.2	−5 26	209 3	−19 23	5.07	−0.10	09.0V	H
100	HD 37043	5 34.2	−5 56	209 31	−19 36	3.00C	−0.25	08.5III	H

TABLE 1 (CONTINUED)

CGO (11)	d (12)	z (13)	V_r (14)	V_{LSR} (15)	V_{cr} (16)	V_{pr} (17)	H II (18)	Reg. (19)	Goy (20)	(21)	Remarks (22)
51	2.28A	34	-12C	-12	-32	20	I	19	44		
52	3.80B	-314	-46D	-47	-49	2	0				
53	2.28A	40	-38D	-38	-32	-6	I	19	45		
54	2.28A	36			-32		I	19	46		
55	2.31B	99	-36D	-36	-32	-3	I	19	47	*	
56	2.28A	45	-63D	-63	-32	-31	I	19	48	*	VVAR(81)
57	2.28A	-109	-41C	-42	-31	-11	0		49		
58	3.24B	-163			-43		0				
59	3.09D	10			-41		I	24	50		
60	2.28A	36	-17B	-17	-32	14	I	26	51		VVAR(33) SB[0.7]
61	2.28A	35	-52E	-52	-32	-21	I	26	52		VB[0.0]
62	2.28A	-83			-31		0		53		
63	2.39D	44	-68D	-68	-33	-36	I	26	54		
64	2.28A	50	-45C	-45	-31	-14	I	26	55		
65	2.72F	-73	-18C	-19	-36	17	0		56		
66	2.28A	84			-31		0	26Y	57		
67	1.27D	33	-35E	-36	-18	-17	I	26	58		VVAR(160)
68	2.95B	178	-42A	-42	-40	-2	0	25Z	59		
69	2.28A	61	-4C	-5	-31	26	I	29	61	*	SB ORB[1.6]
70	2.33D	77	-6E	-7	-31	24	I	29	62		
71	2.28A	-29	-10A	-13	-27	13	I	32	63		
72	3.82K	207	-32C	-34	-43	9	0	31Y	65		
73	4.33K	234			-47		0	31Y	66		
74	3.27G	174			-38		0	31Y	67		
75	0.40A	-90	67A	60	-3	63	0	33Y	68		
76	3.57B	183			-40		0	31Z	69		
77	3.09K	-52			-33		I	34	70		
78	1.07B	260	7A	7	-14	20	0		72		
79	4.70F	270			-34		I	46	73		
80	0.52B	-21	59A	50	-2	52	I	50	74	*	
81	4.09D	71			-17		I	51	75		
82	2.75C	13	1B	-7	-11	4	0	Z	76		VVAR?(41)
83	4.88B	-142			-12		I	53	77	*	
84	2.72B	-83	-8D	-17	-7	-10	I	53	78	*	
85	3.42C	-100	-5D	-14	-9	-5	I	53	79	*	VVAR(76)
86	3.77D	197			-17		0	55Y	80		
87	2.16B	-3	0A	-9	-7	-2	I	52	81	*	
88	2.06D	-7			-6		I	56	82	*	
89	2.06K	1			-6		I	52	83		
90	1.82F	19	-18E	-27	-6	-21	I	52	85	*	SB ORB?[0.6] EB[0.6]
91	4.55B	284	-72C	-79	-18	-61	0	55Y	86		
92	0.46A	-139	13B	-2	4	-6	0		88	*	SB ORB[>2]
93	2.24K	-1026			25		0		89		
94	1.13B	37	-1C	-9	-4	-5	I	52	87		VVAR(55)
95	2.63K	-779			23		0		90	*	
96	0.46A	-95	33A	20	3	16	I	59	91		VB[1.9]
97	0.46A	-152	25B	10	5	5	I		93	*	VVAR?(66:)
98	1.94B	-200	23C	11	5	7	0		92		
99	0.46A	-152	35C	20	5	15	I		95	*	SB ORB VB[1.3]
100	0.46A	-153	26B	11	5	6	I		96	*	SB ORB[1.5]

TABLE 1 (CONTINUED)

CGO (1)	Name (2)	α (1975) (3)	δ (4)	l^{II} (5)	b^{II} (6)	m_V (7)	B-V (8)	Sp.Type (9)	(10)
101	HD 37468	5 37.5	-2 36	206 48	-17 21	3.90C	-0.24	09.5V	H
102	HD 37366	5 37.8	+30 52	177 39	-0 8	7.58	0.09	09.5V	H
103	LS V+35 24	5 38.0	+35 53	173 26	+2 35	10.79	0.82	09.0V	M
104	BD+35 1201	5 39.3	+35 50	173 37	+2 47	10.54	0.88	09.5V	L
105	HD 37742	5 39.5	-1 58	206 27	-16 36	1.88C	-0.21	09.7IB	H
106	HD 37743	5 39.5	-1 58	206 27	-16 36	4.10P		09.5IV	L
107	HD 37737	5 40.8	+36 11	173 27	+3 13	8.00	0.31	09.5III(N)	H
108	HD 247042	5 43.7	+29 10	179 45	+0 3	9.52	0.16	09.5	N
109	HD 38666	5 45.1	-32 18	237 17	-27 6	5.17	-0.28	09.0V	H
110	HD 248894	5 52.5	+20 52	187 53	-2 32	9.29	0.24	08.0:V:NN	L
111	HD 39680	5 53.3	+13 50	194 5	-5 55	7.99	0.02	06.0V:[N]PE VAR	L
112	CD-28 2561	5 54.4	-28 38	234 6	-24 4	10.00P		06.5FP	H
113	LS V+30 31	6 2.2	+30 10	180 56	+4 2	10.95	0.31	09.0V	M
114	HD 41161	6 3.9	+48 15	164 58	+12 52	6.51P		08.0V	H
115	LS V+21 27	6 7.0	+21 37	188 55	+0 47	11.07	0.62	09.0V	M
116	HD 41997	6 7.5	+15 43	194 8	-1 59	8.41	0.39	07.5V(N)	H
117	HD 42088	6 8.2	+20 30	190 2	+0 29	7.55	0.06	06.5V	H
118	HD 252682	6 8.5	+13 7	196 32	-3 2	10.23	0.46	09.0V	L
119	HILT 77	6 9.3	+13 11	196 34	-2 49	10.57	0.46	09.0V	L
120	HD 253247	6 10.9	+18 2	192 30	-0 9	9.78	0.34	09.5V	M
121	HD 254755	6 17.0	+22 41	189 6	+3 20	8.85	0.59	09.0VP	L
122	HD 255055	6 18.2	+23 18	188 41	+3 51	9.38	0.26	09.0VP(E?)	M
123	HD 256035	6 21.4	+22 53	189 25	+4 19	9.16	0.55	09.0VP	M
124	HD 44597	6 22.0	+20 25	191 39	+3 17	9.02	0.26	09.0V	L
125	HD 44811	6 23.2	+19 43	192 25	+3 13	8.42	0.13	07.0V	H
126	HD 256725	6 23.5	+19 52	192 19	+3 21	9.70P		05.5	N
127	HD 45314	6 25.9	+14 54	196 58	+1 32	6.64	0.15	OPE	N
128	HD 46056	6 30.0	+4 51	206 20	-2 16	8.17M	0.18	08.0V	H
129	HD 46149	6 30.6	+5 3	206 14	-2 2	7.61	0.17	08.5V	H
130	HD 46150	6 30.6	+4 57	206 19	-2 5	6.75	0.13	05.5F	H
131	HD 46202	6 30.9	+5 0	206 18	-2 0	8.17	0.17	09.0V	H
132	HD 46223	6 31.0	+4 50	206 28	-2 3	7.27	0.22	05.0F	H
133	HD 46485	6 32.6	+4 33	206 54	-1 50	8.26	0.33	07.0VN(E)	H
134	HD 46573	6 33.0	+2 33	208 44	-2 40	7.92	0.34	07.5VF	H
135	HD 46966	6 35.1	+6 6	205 49	-0 33	6.86	-0.04	08.5V	H
136	HD 47129	6 36.0	+6 9	205 52	-0 20	6.48C	0.06	07.5IIIF	H
137	HD 47432	6 37.4	+1 38	210 2	-2 7	6.21	0.15	09.5I	H
138	BD-0 1385	6 39.0	-0 20	211 59	-2 39	9.87	0.31	08.0	N
139	HD 48149	6 39.3	-39 17	248 12	-18 50	7.61	0.19	08.5V	H
140	HD 47839	6 39.5	+9 55	202 56	+2 10	4.73C	-0.25	08.0IIIF	H
141	HD 48099	6 40.6	+6 23	206 12	+0 47	6.36	-0.05	06.5V	H
142	HD 48279	6 41.4	+1 45	210 24	-1 10	7.97M	0.11	08.0VN	H
143	BD+0 1576	6 43.6	+0 38	211 38	-1 12	9.25	0.44	09.0III	M
144	HD 292392	6 49.0	+0 28	212 24	-0 5	10.00P		08.0I	L
145	HD 265134	6 50.1	+13 39	200 47	+6 11	8.85P		09.0I	L
146	BD+1 1560	6 50.6	+1 25	211 45	+0 43	9.66	0.28	08.0	N
147	LS VI-04 19	6 58.2	-4 46	218 7	-0 25	10.75	0.47	09.5V	M
148	HD 52266	6 59.1	-5 46	219 6	-0 41	7.23	-0.01	09.5V	H
149	HD 52533	7 0.3	-3 5	216 51	+0 48	7.70M	-0.09	08.5V	H
150	HD 53975	7 5.5	-12 20	225 40	-2 18	6.47	-0.10	07.5V	H

TABLE 1 (CONTINUED)

CGO (11)	d (12)	Z (13)	V_r (14)	V_{LSR} (15)	V_{cr} (16)	V_{pr} (17)	H II (18)	Reg. (19)	Goy (20)	(21)	Remarks (22)
101	0.46A	-136	27B	12	5	7	I		101	*	VB[2.0]
102	1.32B	-3	17D	7	-1	9	0		100		VVAR(92)
103	2.19D	99			-6		I	61	99		
104	1.74F	84			-5		I	65	102		
105	0.46A	-131	20A	5	5	0	I		105	*	VB[2.2]
106	0.46A	-131	13E	-2	5	-7	I		106	*	
107	2.16B	121	-31D	-39	-6	-33	I	66	104		VVAR(120)
108	2.94K	3			-0		0			*	
109	0.75B	-343	109B	94	8	85	0		109		
110	2.68F	-118			9		0		110		
111	2.84F	-293	-8E	-21	16	-37	0		112	*	VVAR(>62)
112							0				
113	4.76D	335			2		I	70	113		
114	1.03H	229	6D	1	-7	8	0		114		SB(340)
115	3.28D	45			12		I	72	115		
116	1.50B	-52	-18D	-30	10	-40	I	73	116		VVAR(80)
117	1.38A	12	23A	11	6	5	I	74	117		
118	2.78F	-147			19		0		118		
119	3.25F	-160			21		0		119		
120	2.58D	-7			14		I	78	120		
121	1.23F	72	3D	-8	5	-13	0	84X	121	*	VVAR?(?)
122	2.48D	166			9		I	84	122		
123	1.50D	113			6		I	84	123		
124	2.10F	120			11		0		124		
125	2.37B	133	10C	-2	12	-14	0		125		
126			38D	27			0				
127			13D	1			0		126	*	VVAR?(92)
128	1.51A	-60	29C	15	16	-1	I	87	127		VVAR(95)
129	1.51A	-54	37A	23	16	7	I	87	129		
130	1.51A	-55	42C	28	16	12	I	87	128		
131	1.51A	-53	30A	16	16	-0	I	87	131		
132	1.51A	-54	43A	29	17	13	I	87	132		
133	1.51A	-48	13C	-1	17	-17	I	87	133		
134	1.51A	-70	29C	15	18	-2	I	88	134		VVAR?(64:)
135	1.51A	-15	40C	27	16	10	I	D14	135	*	
136	1.51A	-9	25B	12	16	-5	I	D14	136	*	SB ORB[0.8]
137	2.20B	-81	58B	44	25	19	0	89X	137		
138	3.18K	-147			36		0		138		
139	1.27B	-408			13						
140	0.79A	30	20C	7	8	-1	I	91	139		VB[2.8]
141	1.51A	21	31B	18	16	1	I	D14	140	*	
142	1.75C	-36	20D	6	21	-15	0	89Y	141		VVAR?(>70)
143	3.16D	-66	32C	18	36	-17	I	93	142	*	
144	3.30J	-5	46E	32	37	-5	0				
145	2.79J	300	23E	11	23	-12	0				
146	3.01K	38	24E	10	34	-24	0		144		
147	3.37D	-25	40C	26	42	-16	0	102X	145		
148	1.29B	-15	7D	-7	18	-25	0	102Z	146		VVAR?(68)
149	1.94C	27	6B	-8	26	-34	0		147		
150	1.21B	-48	33B	19	18	1	0	111X	149	*	

TABLE 1 (CONTINUED)

CGO (1)	Name (2)	α (1975) (3)	δ (1975) (4)	l^{II} (5)	b^{II} (6)	m_V (7)	B−V (8)	Sp.Type (9)	(10)
151	HD 54662	7 8.2	-10 17	224 9	-0 47	6.21	0.03	07.0III	H
152	LSS 207	7 8.8	-18 27	231 29	-4 24	10.87	0.44	06.0	N
153	HD 55879	7 13.3	-10 16	224 43	+0 21	6.00	-0.18	09.5II-III	H
154	N 2362 64	7 17.2	-24 57	238 10	-5 40	11.80	0.47	09.0III	M
155	HD 57060	7 17.6	-24 30	237 49	-5 22	4.90	-0.14	08.5IF	H
156	HD 57061	7 17.6	-24 55	238 11	-5 34	4.39	-0.16	09.0I	H
157	HD 57236	7 18.4	-21 57	235 38	-4 2	8.75	0.20	08.0V	M
158	HD 57682	7 20.8	-8 56	224 25	+2 36	6.42	-0.20	09.0V	H
159	HD 59114	7 26.8	-15 20	230 45	+0 52	9.69P		07.0	N
160	LSS 467	7 29.5	-19 3	234 19	-0 22	11.19	0.61	09.0	N
161	HD 59986	7 30.7	-16 55	232 35	+0 55	9.49	0.25	09.5V	M
162	LSS 499	7 30.9	-19 23	234 45	-0 14	10.71	0.50	09.0III	L
163	HD 60369	7 32.0	-28 17	242 41	-4 19	8.13	0.03	09.0III	M
164	HD 60848	7 35.7	+16 57	202 31	+17 31	7.70P		08.0VPE	M
165	HD 61347	7 37.2	-13 48	230 37	+3 48	8.43	0.17	09.0IB	L
166	HD 61827	7 38.9	-32 29	247 6	-5 3	7.65	0.62	08.0V	M
167	CD-29 4849	7 43.0	-29 16	244 43	-2 42	10.00	0.22	09.5III	L
168	HD 63005	7 44.7	-26 26	242 27	-0 57	9.14	-0.02	07.0V	M
169	HD 63150	7 45.0	-36 27	251 11	-5 54	8.40P		05.0	N
170	CD-26 4955	7 45.6	-26 37	242 43	-0 52	10.52	0.33	05.0	N
171	HD 64315	7 51.3	-26 22	243 9	+0 22	9.22	0.23	06.0:NN(E)	N
172	CD-26 5126	7 51.8	-26 25	243 15	+0 26	10.73V	0.29	07.0	N
173	HD 64568	7 52.5	-26 10	243 7	+0 42	9.39	0.11	05.0	N
174	HD 65087	7 54.9	-28 28	245 22	-0 2	10.00	0.18	09.0V	H
175	CD-29 5191	7 55.4	-29 20	246 10	-0 24	9.78V	0.21	09.5V	H
176	CD-26 5285	7 57.5	-26 30	244 0	+1 29	10.70	0.35	09.5V	L
177	CD-28 5216	7 57.8	-28 39	245 52	+0 24	11.33	0.28	09.0V	M
178	CD-28 5235	7 58.3	-28 49	246 4	+0 25	10.04	0.27	09.5E NN	N
179	HD 66811	8 2.7	-39 56	255 58	-4 42	2.26	-0.28	04.0I(N)F	H
180	HD 68450	8 10.1	-37 13	254 28	-2 2	6.44	-0.01	09.7IB	H
181	HD 69106	8 13.1	-36 51	254 29	-1 19	7.14	-0.09	05.0E	N
182	HD 69464	8 14.8	-35 33	253 36	-0 18	8.84	0.31	06.5IB	H
183	CD-35 4469	8 17.9	-36 2	254 22	-0 4	10.19	0.29	08.5V	M
184	CD-35 4471	8 18.0	-36 4	254 24	-0 4	9.17	0.32	09.5IV	M
185	HD 71304	8 24.0	-44 13	261 44	-3 47	8.40P		09.5IB	H
186	HD 73882	8 38.2	-40 20	260 11	+0 39	7.19M	0.40	08.5V((N))	H
187	HD 74194	8 40.0	-44 58	264 2	-1 57	7.54M	0.23	08.5IB(F)	H
188	HD 75211	8 46.1	-43 59	263 57	-0 28	7.50	0.41	09.0IB	H
189	HD 75222	8 46.5	-36 40	258 18	+4 11	7.41	0.38	09.7IAB	H
190	CD-44 4865	8 49.2	-44 30	264 42	-0 22	9.43	0.72	09.5IB	M
191	HD 75759	8 49.4	-42 0	262 48	+1 15	5.98M	-0.10	09.0VN	H
192	HD 75821	8 49.6	-46 27	266 15	-1 33	5.10	-0.22	09.5II	L
193	CD-43 4690	8 50.1	-43 45	264 13	+0 13	9.54	0.87	07.5	N
194	HD 76341	8 53.1	-42 24	263 33	+1 31	7.16	0.31	09.0III	M
195	HD 76535	8 54.1	-47 18	267 24	-1 31	8.58M	0.40	09.5III	M
196	HD 76556	8 54.2	-47 30	267 34	-1 38	8.20	0.41	05.5VN((F))	H
197	HD 76968	8 56.7	-50 39	270 13	-3 22	7.08M	0.18	09.7IB	H
198	CD-47 4551	8 57.0	-47 38	267 58	-1 22	9.00P		07.0	N
199	CD-48 4352	9 1.5	-48 35	269 10	-1 25	10.38M	0.75	09.0V	M
200	MILL II 10	9 2.4	-52 20	272 5	-3 48	11.82	0.96	09.5 PH.	N

TABLE 1 (CONTINUED)

CGO (11)	d (12)	z (13)	V_r (14)	V_{LSR} (15)	V_{cr} (16)	V_{pr} (17)	HII (18)	Reg. (19)	Goy (20)	(21)	Remarks (22)
151	1.36B	-19	60A	46	20	26	I	111	150		
152	6.00K	-460			75		I	113	151		
153	1.69B	10	33A	19	24	-5	I	111		*	
154	9.82D	-969			110		I	117	153		
155	1.64B	-154	5D	-9	23	-32	I	117	154	*	SB ORB EB[0.3]
156	1.40B	-136	40C	26	19	7	I	117	155		SB ORB
157	2.21D	-155	19B	5	31	-26	I	116	157		
158	1.20B	54	23B	9	17	-8	I	118	158		
159			54D	40			O				
160	3.52K	-23			48		I	120	160		
161	2.56D	41	41B	27	36	-9	I	123	161		
162	5.70F	-23			74		I	124	162		
163	3.33D	-250	87D	73	44	30	O				VVAR(54)
164	1.41I	423	15C	5	12	-8	O		163		
165	4.13F	274	39C	25	55	-30	O		164		
166	0.75D	-66			8		O		165	*	
167	6.14F	-289			77		O		167	*	
168	4.06D	-67			53		O		168		
169									169		
170	7.48K	-113			92		O		170		
171	3.75K	24	32D	19	49	-30	I	127	171		VVAR?(51)
172	5.50L	42			70		I	127	172		
173	6.03K	74	77B	64	76	-13	I	127	173		
174	3.68B	-2			47		O		174		
175	3.09C	-22			39		O		175		
176	3.89F	101			50		O		176		
177	5.92D	41			74		O		177		
178	3.21K	23			40		O		178		
179	0.46A	-37	-24B	-37	3	-40			181		
180	2.21B	-78	39B	26	22	5			182		
181	2.82K	-65	3D	-9	29	-38			183		VVAR(62)
182	3.89B	-20	43C	31	43	-13			184		
183	3.61D	-4	50E	38	39	-1			185		SB (170)
184	2.30D	-3	39D	27	23	4			186		VVAR?(47)
185	2.25H	-148	32C	20	16	4			187		
186	0.78C	9	22C	11	5	6			189		
187	2.52C	-86	-1C	-12	16	-28			190		VVAR(57)
188	1.93B	-16			11				191		
189	2.78B	203	66B	55	25	30					
190	3.19D	-20	36C	25	22	3			192		
191	0.85C	19	23C	12	4	8			193		SB ORB
192	1.36F	-37	7E	-4	5	-9			194		VVAR?(52)
193	1.30K	5	17C	6	6	-0			195		
194	1.45D	38	25A	14	8	6					
195	2.49E	-66	22D	11	12	-1			196		VVAR(59) SB?
196	2.00B	-57	3D	-8	8	-16			197		VVAR?(59)
197	2.28C	-134	-8C	-18	7	-26			198		VVAR?(43)
198			-13D	-24							
199	2.00E	-49			7				199		
200	2.81K	-186			8				200		

TABLE 1 (CONTINUED)

CGO	Name	α (1975)	δ	l^{II}	b^{II}	m_V	B-V	Sp. Type	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
201	HD 78344	9 5.1	-47 40	268 54	-0 22	8.96	1.10	09.5IA	L
202	HD 298429	9 29.8	-51 33	274 28	-0 15	9.67	0.55	09.0III	L
203	HD 298425	9 30.1	-51 19	274 20	-0 2	9.67V	0.54	09.0V	L
204	HD 302501	10 3.6	-58 25	282 34	-2 25	9.73	0.61	09.0III	M
205	HD 302505	10 4.7	-58 38	282 49	-2 31	9.54	0.42	09.5III	M
206	CP-56 2853	10 5.8	-57 18	282 9	-1 21	10.39	0.81	08.0	N
207	CP-57 2676	10 6.4	-57 54	282 34	-1 48	10.89	0.30	09.0V	L
208	HD 89137	10 14.7	-51 7	279 41	+4 28	7.60P		09.5V	L
209	CP-58 2074	10 17.3	-58 33	284 7	-1 31	9.88	0.15	09.5V	L
210	HD 90087	10 21.4	-59 39	285 10	-2 9	7.70P		09.5V	L
211	HD 90273	10 22.9	-57 32	284 11	-0 16	9.07	0.17	07.0	N
212	HD 305154	10 23.9	-60 5	285 39	-2 21	10.15	0.10	07.0	N
213	HD 302797	10 24.9	-58 48	285 5	-1 11	9.99	0.57	09.0IB	H
214	HD 90600	10 25.2	-60 15	285 53	-2 24	9.70P		08.0	N
215	HD 302897	10 27.0	-58 50	285 20	-1 5	10.12	0.49	09.5I	H
216	CP-59 2181	10 29.4	-59 41	286 3	-1 39	9.70P		09.0I	M
217	HD 91452	10 30.9	-63 49	288 19	-5 7	7.51	0.23	09.5IAB-IB	M
218	HD 91572	10 32.1	-58 3	285 31	-0 4	8.20	0.05	06.0V((F))	H
219	HD 305298	10 32.1	-60 11	286 35	-1 54	?		07.5	N
220	HD 91597	10 32.1	-60 43	286 51	-2 22	9.88	0.03	09.0:V:	L
221	HD 91651	10 32.6	-60 0	286 33	-1 43	8.86	-0.01	09.0V:N	H
222	CP-58 2312	10 33.2	-59 20	286 17	-1 6	9.70P		08.0	N
223	HD 91824	10 33.9	-58 2	285 42	+0 4	8.60P		07.0V((F))	H
224	HD 305371	10 35.0	-60 1	286 49	-1 35	10.32	0.26	09.0:V:	L
225	HD 92206	10 36.5	-58 28	286 13	-0 9	8.70P		07.0	N
226	HD 92504	10 38.6	-57 20	285 55	+0 59	8.42M	-0.05	08.5V	H
227	HD 92554	10 38.8	-60 47	287 36	-2 2	9.51	0.08	09.5II	L
228	HD 92714	10 40.1	-58 25	286 37	+0 8	9.40	0.28	05.0	N
229	HD 93027	10 42.3	-60 1	287 36	-1 8	8.90P		09.5V	H
230	HD 93028	10 42.3	-60 4	287 38	-1 11	8.36	-0.06	09.0V	H
231	CP-58 2611	10 42.8	-59 25	287 23	-0 35	9.63	0.28	07.5:V:	L
232	HD 93128	10 43.0	-59 25	287 24	-0 34	8.84	0.25	03.0V((F))	H
233	CP-58 2620	10 43.0	-59 25	287 24	-0 34	9.27	0.18	06.5V((F))	H
234	HD 93129AB	10 43.0	-59 26	287 25	-0 35	6.97M	0.16	03.0IF+03.0V((F))	H
235	HD 93130	10 43.0	-59 44	287 33	-0 51	8.06	0.22	06.0III(F)	H
236	HD 93146	10 43.1	-59 58	287 40	-1 3	8.80P		06.5V((F))	H
237	HD 93160	10 43.2	-59 26	287 26	-0 34	7.82	0.17	06.0III(F)	H
238	HD 93161AB	10 43.2	-59 27	287 27	-0 35	7.82M	0.21	06.5V((F))	H
239	HD 93204	10 43.5	-59 37	287 33	-0 43	8.42	0.10	05.0V((F))	H
240	HD 93205	10 43.5	-59 37	287 33	-0 43	7.75	0.05	03.0V	H
241	HD 93206	10 43.5	-59 52	287 40	-0 56	6.24M	0.13	09.7IB:(N)	H
242	HD 305523	10 43.6	-59 50	287 40	-0 54	8.40P		09.0II	H
243	HD 93222	10 43.6	-59 58	287 44	-1 1	8.11	0.05	07.0III((F))	H
244	CP-59 2600	10 43.7	-59 39	287 36	-0 44	8.61	0.21	06.0V((F))	H
245	HD 93249	10 43.8	-59 14	287 25	-0 21	8.42	0.08	09.0III	H
246	HD 93250	10 43.8	-59 26	287 30	-0 32	7.37	0.16	03.0V(F)	H
247	CP-59 2603	10 43.8	-59 36	287 35	-0 41	8.77	0.14	07.0V((F))	H
248	HD 303308	10 44.1	-59 32	287 35	-0 36	8.17	0.12	03.0V((F))	H
249	HD 93403	10 44.8	-59 16	287 33	-0 19	7.29M	0.22	05.0III(F) VAR	H
250	CP-57 3781	10 45.3	-58 31	287 15	+0 22	10.71P		08.0	N

TABLE 1 (CONTINUED)

CGO (11)	d (12)	z (13)	V_r (14)	V_{LSR} (15)	V_{cr} (16)	V_{pr} (17)	HII (18)	Reg. (19)	Goy (20)	(21)	Remarks (22)
201	2.41F	-15	-5C	-15	10	-25			201		
202	3.30F	-14	20B	11	8	3			202		
203	1.92G	-1	10B	1	1	-0			203		
204	3.12D	-132			-6				204		
205	3.77D	-165			-4				205		
206	2.02K	-48			-6						
207	4.70F	-148			2						
208	1.27J	99	3C	-5	-4	-1			206		
209	3.52F	-93			-7						
210	1.30J	-49	-2C	-9	-7	-2			207		
211	3.02K	-14	-5B	-12	-8	-4			208		
212	5.47K	-224			1				209		
213	4.88B	-101	6E	-1	-2	1					
214									210		
215	8.32B	-157	20E	13	31	-19					
216	3.20I	-92			-11				211		
217	3.58D	-319	-19E	-26	-14	-12					
218	3.01B	-3			-10				212		
219									213		
220	4.29F	-177			-9						
221	2.83B	-85	-4C	-11	-12	1			214		
222									215		
223	1.86H	2	-12D	-19	-10	-9			216		VVAR(72)
224	3.82F	-106			-11						
225			-10C	-17					218		
226	2.56C	44	-35E	-42	-11	-31			219		SB(115:)
227	6.82F	-242	-38C	-45	7	-52			220		
228	4.79K	11	5C	-2	-6	5			221		
229	1.74H	-34			-11						
230	2.41B	-50	-20C	-27	-13	-14			222		
231	3.06F	-31			-13						
232	5.57B	-55	-14C	-21	-3	-17			226		
233	3.58 B	-35			-12						
234	3.06C	-31			-13				225		
235	2.56B	-38			-13				224		
236	2.02H	-37			-12						
237	2.46B	-24	-16D	-23	-13	-10			227		VVAR?(50)
238	1.76C	-18	44E	37	-11	48				*	VVAR?(*)
239	3.91B	-49			-12				228		
240	4.45B	-56			-10				230		
241	1.66C	-27	-18C	-25	-10	-14			229		VVAR?(45)
242	2.19H	-34			-12						
243	3.16B	-56			-13				231		
244	2.91B	-37			-13						
245	3.55B	-22			-13						
246	3.21B	-30	1C	-6	-13	7			232		SB?
247	2.74B	-33			-13						
248	4.90B	-51	-8B	-15	-8	-7			233		
249	2.16C	-12	-10C	-17	-12	-4			234		SB ORB
250			-14C	-21					235		

TABLE 1 (CONTINUED)

CGO (1)	Name (2)	α (1975) (3)	δ (4)	l^{II} (5)	b^{II} (6)	m_V (7)	B-V (8)	Sp Type (9)	(10)
251	HD 305560	10 45.5	-60 26	288 9	-1 19	9.76	0.34	O9.5III	H
252	HD 305539	10 45.7	-59 46	287 52	-0 43	9.80P		O8.0	N
253	HD 93632	10 46.3	-59 58	288 2	-0 52	8.82P		O5.0III(F) VAR	H
254	HD 93521	10 47.0	+37 42	183 8	+62 8	6.89P		O9.0VP	M
255	HD 305619	10 47.3	-60 8	288 13	-0 57	9.44	0.46	O9.0IB	H
256	HD 93843	10 47.7	-60 6	288 15	-0 54	7.30	-0.03	O5.0III(F) VAR	H
257	HD 94024	10 49.0	-57 45	287 20	+1 16	8.80P		O8.0V((N))	H
258	HD 305644	10 50.5	-60 55	288 56	-1 29	9.92	0.12	O7.0	N
259	HD 303492	10 50.9	-58 50	288 3	+0 25	8.85	0.60	O9.0IAE	M
260	HD 94370	10 51.4	-58 37	288 1	+0 38	8.00P		O6.5III(F)	H
261	HD 94663	10 53.5	-58 40	288 17	+0 43	9.35	0.13	O9.5III	L
262	HD 303558	10 54.0	-58 35	288 18	+0 49	9.81	0.25	O9.0III	H
263	HD 94963	10 55.6	-61 34	289 45	-1 48	7.18	-0.09	O6.5III(F)	H
264	CP-63 1757	10 55.6	-63 41	290 40	-3 43	9.90P		O8.0	N
265	CP-62 1824	10 55.7	-62 52	290 20	-2 58	9.60P		O6.0	N
266	HD 95275	10 58.1	-54 44	287 10	+4 32	8.90P		O9.0V,B0I	N
267	CP-58 2908	10 58.1	-59 17	289 4	+0 24	9.80P		O9.0V	M
268	MILL IV 17	10 58.2	-60 3	289 24	-0 18	14.60	0.92	O9.5 PH.	N
269	MILL IV 43	10 59.4	-59 52	289 28	-0 4	13.40	1.12	O9.5 PH.	N
270	MILL IV 45	10 59.4	-59 52	289 28	-0 4	14.20	0.82	O9.0 PH.	N
271	MILL IV 11	10 59.4	-59 53	289 28	-0 5	15.20	0.90	O9.0 PH.	N
272	CP-61 2020	10 59.6	-62 6	290 25	-2 5	9.90P		O7.0:	N
273	HD 95589	10 59.8	-62 16	290 30	-2 14	9.63	0.27	O7.0	N
274	MILL IV 29	11 0.6	-60 28	289 51	-0 33	12.30	0.96	O9.5 PH.	N
275	CP-61 2030	11 0.6	-61 37	290 20	-1 36	9.40P		O9.0III	M
276	CP-61 2033	11 0.8	-61 55	290 28	-1 52	9.00P		O9.5V	M
277	MART 121	11 1.2	-61 41	290 25	-1 38	10.90P		O9.0III	H
278	CP-61 2050	11 2.2	-62 16	290 46	-2 7	9.80P		O9.5IA	M
279	HD 95992	11 2.2	-62 19	290 47	-2 10	9.10P		O9.0	N
280	CP-60 2483	11 2.3	-61 19	290 23	-1 15	9.10P		O9.0V	M
281	HD 96042	11 2.6	-59 18	289 37	+0 37	8.23	0.18	O9.5VE	L
282	HD 96264	11 3.9	-60 55	290 24	-0 48	7.60	-0.05	O9.0V	M
283	HD 96355	11 4.4	-61 18	290 37	-1 8	9.10P		O9.0III	M
284	MART 156	11 5.2	-61 23	290 44	-1 10	10.90P		O9.0III	M
285	HD 96622	11 5.9	-59 31	290 4	+0 35	8.91	0.12	O9.5IV	H
286	HD 96638	11 6.0	-59 39	290 8	+0 28	8.57	0.20	O8.0	N
287	HD 96670	11 6.2	-59 43	290 11	+0 25	7.42	0.15	O9.0III	H
288	CP-61 2070	11 6.2	-61 54	291 3	-1 36	9.20P		O9.0III	M
289	HD 96662	11 6.3	-53 37	287 49	+6 2	9.90P		O9.5IV	L
290	HD 96715	11 6.5	-59 49	290 16	+0 20	8.26	0.07	O4.0V((F))	H
291	MART 311	11 6.5	-61 51	291 3	-1 32	?		O9.0III	M
292	HD 96917	11 7.6	-56 55	289 17	+3 4	7.04	0.07	O8.5IB(F)	H
293	CP-59 3091	11 8.3	-60 10	290 36	+0 6	10.00P		O9.5III	L
294	CP-60 2571	11 8.6	-61 8	291 0	-0 47	8.80P		O9.5III	M
295	HD 96946	11 8.8	-60 37	290 50	-0 18	8.80P		O6.0V:	L
296	HD 97166	11 9.1	-60 6	290 40	+0 12	7.87	0.05	O7.5III((F))	H
297	HD 97253	11 9.7	-60 13	290 47	+0 7	7.12	0.15	O5.5III(F)	H
298	HD 97319	11 10.1	-60 58	291 7	-0 33	8.57	0.23	O9.5IB	L
299	HD 306097	11 10.2	-60 46	291 3	-0 22	8.91	0.63	O9.0III	L
300	HD 97434	11 10.8	-60 33	291 2	-0 8	8.07M	0.16	O7.5III(N)((F))	H

TABLE 1 (CONTINUED)

CGO (11)	d (12)	Z (13)	V_r (14)	V_{LSR} (15)	V_{cr} (16)	V_{pr} (17)	HII (18)	Reg. (19)	Goy (20)	(21)	Remarks (22)
251	4.66B	-107	-37E	-44	-10	-33					
252							0		237		
253	2.47H	-37			-13				238		
254	1.08I	956	-15C	-14	0	-14	0		236	*	VVAR?(74) SB?
255	4.41B	-73	-3D	-9	-12	2			239		
256	3.06B	-48	-9C	-15	-14	-1			240		
257	1.82H	40			-11						
258	4.79K	-124			-12						
259	4.39D	32	8E	2	-11	13			241		
260	1.90H	21			-12						
261	5.15F	64	-18	-7	-8	1			242		
262	5.32B	76			-7						
263	2.50B	-79	-4B	-10	-15	5			243		
264									244		
265									245		
266			-27B	-33					246		
267	2.15I	15			-14				247		
268	10.67K	-56			48				248		
269	4.66K	-5			-13				249		
270	10.52K	-12			46				250		
271	14.93K	-22			97				251		
272			32E	26							
273	3.40K	-133			-18				252		
274	3.50K	-34			-17				253		
275	2.50I	-70	-41C	-47	-16	-31			254		
276	1.77I	-58	41E	35	-13	48			255		
277	3.21H	-92	-41D	-47	-17	-30					
278	3.39I	-125	1C	-5	-18	13			257		
279			-8D	-14					256		
280	1.86I	-41	-33C	-39	-14	-26					
281	1.58F	17			-12				258		
282	1.68D	-23	-41D	-47	-13	-34					
283	2.36I	-47	10E	4	-16	20			259		
284	3.21J	-65	-22E	-28	-18	-10					
285	2.69B	27			-16				260		
286	2.03K	17			-14				261		
287	2.03B	15	2C	-4	-14	10			262		
288	2.41I	-67	-19D	-25	-17	-8			264		
289	2.27J	239			-13				263		
290	4.55B	26			-16						
291			-84E	-90							
292	2.50B	134	14D	8	-15	23			265		VVAR(69)
293	2.77J	5	-9D	-15	-17	2			266		
294	2.23I	-30	2D	-4	-16	12			267		
295	2.15J	-11	7C	1	-15	16					
296	2.83B	10			-17				268		
297	2.00B	4	1D	-5	-15	10			269		VVAR(115)
298	4.23F	-41	-20D	-26	-18	-8			270		
299	2.08F	-13	-14B	-20	-15	-5			271		
300	2.67C	-6	-21D	-27	-17	-9			272		VVAR?(43)

TABLE 1 (CONTINUED)

CGO (1)	Name (2)	α (1975) (3)	δ (4)	l^{II} (5)	b^{II} (6)	m_V (7)	B-V (8)	Sp. Type (9)	(10)
301	HD 97484	11 11.1	-60 56	291 13	-0 29	8.42M	0.31	05.0V	M
302	HD 97848	11 13.5	-58 53	290 44	+1 33	8.70	-0.02	09.0III	L
303	HD 97966	11 14.2	-59 17	290 58	+1 13	8.80	0.10	07.5V	M
304	HD 98084	11 15.0	-61 57	292 1	-1 14	10.00P		09.0III	M
305	CP-61 2163	11 15.5	-62 0	292 6	-1 16	9.50P		09.0V	M
306	CP-59 3300	11 16.1	-60 15	291 32	+0 24	10.00P		06.0	N
307	HD 99160	11 22.8	-61 12	292 38	-0 13	9.20	0.20	09.0II	M
308	HD 99546	11 25.4	-59 17	292 19	+1 42	8.29	-0.04	08.0	N
309	HD 99897	11 27.8	-62 30	293 36	-1 16	8.32	0.18	06.0V((F))	H
310	HD 100099	11 29.3	-63 41	294 8	-2 20	8.10	0.12	09.5III	M
311	HD 101008	11 35.8	-63 14	294 42	-1 41	9.14	-0.02	09.0V	L
312	HD 101131	11 36.6	-63 11	294 46	-1 37	7.13M	0.03	06.0V	H
313	CP-62 2158	11 36.8	-63 10	294 47	-1 36	9.28	0.04	09.5V	M
314	HD 101190	11 37.0	-63 2	294 46	-1 28	7.29M	0.04	06.0V((F))	H
315	HD 101191	11 37.0	-63 14	294 50	-1 39	8.48	0.08	08.0V((N))	H
316	HD 101205	11 37.1	-63 14	294 50	-1 39	6.48V	0.07	07.0IIIN((F))	H
317	HD 101223	11 37.2	-63 3	294 48	-1 28	7.37	0.05	08.0V((F))	H
318	HD 101298	11 37.8	-63 17	294 56	-1 41	8.07	0.09	06.0V((F))	H
319	HD 101413	11 38.5	-63 20	295 1	-1 42	8.36	0.08	08.0V	H
320	HD 101436	11 38.7	-63 20	295 2	-1 42	7.67M	0.07	06.5V	H
321	HD 101545	11 39.4	-62 25	294 52	-0 47	6.97C	0.01	09.5IB	L
322	CP-62 2241	11 41.8	-62 40	295 12	-0 58	10.26	0.35	09.0V	M
323	HD 104649	12 1.7	-62 31	297 24	-0 18	7.80V	0.01	09.5V	M
324	HD 105056	12 4.5	-69 26	298 56	-7 3	7.55	0.06	09.7IAEN	H
325	CP-57 5272	12 7.5	-58 32	297 24	+3 45	9.99	0.31	07.0	N
326	HD 105627	12 8.4	-62 26	298 9	-0 5	8.10P		09.0II-III	H
327	CP-59 4119	12 12.8	-60 27	298 22	+1 57	10.22	0.26	09.5VE	M
328	MILL VII 6	12 12.8	-62 48	298 42	-0 22	14.80	0.92	09.5 PH.	N
329	CP-59 4130	12 13.5	-60 10	298 24	+2 15	10.42	0.36	07.0	N
330	CP-60 3864	12 14.5	-61 11	298 40	+1 16	9.46	0.65	09.5IA:	L
331	CP-59 4152	12 15.3	-60 15	298 39	+2 12	10.73	0.30	09.5V	M
332	CP-61 3230	12 28.8	-62 21	300 29	+0 17	10.47	0.73	07.0	N
333	CP-59 4330	12 34.5	-60 23	301 1	+2 18	10.28	0.46	09.5IAB	M
334	HD 109978	12 38.1	-62 17	301 34	+0 26	8.84	0.41	09.5III	H
335	HD 110360	12 40.7	-60 30	301 48	+2 13	9.30	0.19	07.5V	M
336	HD 311999	12 48.6	-61 26	302 46	+1 19	11.20P		09.5IV	L
337	CP-60 4312	12 48.9	-61 27	302 48	+1 18	10.74	0.68	09.5V	M
338	HD 112244	12 54.5	-56 40	303 33	+6 4	5.33	0.01	08.5IAB(F)	H
339	HD 112784	12 58.6	-60 26	303 59	+2 17	8.33P		09.5III	L
340	CP-63 2513	13 2.9	-63 49	304 22	-1 7	9.20P		08.0	N
341	HD 113659	13 4.9	-64 57	304 31	-2 15	8.10P		09.0IV	L
342	CP-61 3452	13 5.3	-61 39	304 45	+1 2	9.28	0.78	09.5II	M
343	HD 114737	13 12.1	-63 26	305 25	-0 48	8.10P		09.0III	H
344	HD 114886	13 13.1	-63 26	305 31	-0 48	6.97C	0.12	09.0II-III	H
345	HD 115071	13 14.4	-62 27	305 45	+0 10	6.64	0.22	09.0VN	M
346	CP-61 3549	13 14.8	-62 26	305 48	+0 11	10.06	1.08	09.0III	M
347	HD 115455	13 17.0	-62 22	306 3	+0 13	7.95	0.19	07.5III((F))	H
348	CP-61 3587	13 17.3	-62 21	306 6	+0 14	9.50P		09.5V	M
349	HD 116852	13 28.0	-78 42	304 53	-16 6	7.60P		09.0III	L
350	HD 117797	13 32.5	-62 16	307 52	+0 4	9.19	0.50	08.0F	L

TABLE 1 (CONTINUED)

CGO (11)	d (12)	z (13)	V_r (14)	V_{LSR} (15)	V_{cr} (16)	V_{pr} (17)	HII (18)	Reg. (19)	Goy (20)	(21)	Remarks (22)
301	2.92E	-25	-39E	-45	-18	-27			273		
302	4.63F	125	-7B	-13	-16	4			274		
303	2.68D	57	-14B	-20	-17	-2			275		
304	2.78I	-60	-33E	-39	-19	-20			276		
305	2.02I	-45	27E	21	-16	37			278		
306									277		
307	4.94D	-19	-6B	-11	-20	8			279		
308	2.49K	74	-4B	-9	-18	9			280		
309	2.66B	-59	-3B	-8	-20	12			282		
310	2.94D	-120	2E	-3	-22	19			283		VVAR(155)
311	3.27F	-96	-19D	-24	-24	-0			284		VVAR?(44)
312	1.89C	-53	-4D	-9	-17	8			285		SB(327)
313	3.11D	-87	-11E	-16	-24	7			286		VVAR(58) SB?
314	2.00C	-51	6C	1	-18	19			288		
315	2.30B	-66	-3C	-8	-20	12			287		
316	1.45C	-42	-27E	-32	-14	-18			289		VVAR(137)
317	1.44B	-37	9C	4	-14	18			290	*	
318	2.68B	-79	1C	-4	-22	18			291		
319	2.18B	-65	-27E	-32	-19	-13			292		VVAR(98)
320	2.00C	-59	-3C	-8	-18	10			293		
321	2.74F	-37	-5D	-10	-22	12			294		VB[0.4]
322	3.28D	-55			-25						
323	1.64E	-9	-23C	-27	-17	-10					
324	5.30B	-650	-3B	-8	-33	25					VVAR(45)
325	3.80K	249			-29						
326	1.94H	-3	2C	-2	-20	18			295		
327	3.53D	120			-30				296		
328	11.70K	-75			28				297		
329	4.33K	170	-34D	-38	-32	-5			298		
330	5.65F	125	-37D	-41	-32	-9					
331	4.23D	162	-1E	-5	-33	28			299		VVAR?(70)
332	2.66K	13			-28						
333	9.33D	375			-12						
334	2.77B	21	-7C	-10	-30	19			301		
335	2.98D	115	-21D	-24	-31	7			302		VVAR(47)
336	2.87J	66			-31				303		
337	2.51D	57	-17B	-20	-28	9			304		
338	1.63B	172	24A	22	-20	42			305		
339	2.03J	81	-28B	-30	-25	-6			306		
340									307		
341	1.74J	-68			-22				308		
342	2.33D	42			-28						
343	1.94H	-27			-24				310		
344	1.98B	-28	-11B	-13	-25	11			311		VB[2.5]
345	0.74D	2	-102E	-104	-10	-94					VVAR(98)
346	1.90D	6	-30E	-32	-24	-8					VVAR(62)
347	2.42B	9	-40D	-42	-30	-12			312		VVAR(74)
348	1.97I	8			-25				313		
349	1.74J	-482	-47C	-51	-20	-31			314		
350	4.83F	6	-30B	-32	-51	19			315		

TABLE 1 (CONTINUED)

CGO (1)	Name (2)	α (1975) (3)	δ (1975) (4)	l^{II} (5)	b^{II} (6)	m_V (7)	B-V (8)	Sp. Type (9)	(10)
351	HD 118198	13 35.2	-63 31	307 58	-1 13	8.30P		09.5II-III	M
352	HD 120521	13 49.9	-58 24	310 43	+3 26	8.67	0.20	08.0IB(F)	H
353	HD 120678	13 51.1	-62 35	309 54	-0 40	8.40P		OPE	N
354	HD 122879	14 4.6	-59 35	312 15	+1 49	6.41	0.12	09.5I	M
355	HD 123056	14 5.6	-60 20	312 10	+1 4	8.20P		09.5V((N))	H
356	HD 123008	14 5.6	-64 20	311 1	-2 46	8.90	0.34	09.5I	M
357	HD 124314	14 13.2	-61 34	312 40	-0 24	6.64M	0.21	06.0V(N)((F))	H
358	HD 124979	14 16.5	-51 22	316 24	+9 7	7.80P		08.5	N
359	HD 125206	14 18.3	-60 58	313 27	-0 1	7.92	0.26	09.5IV:(N)	H
360	HD 125241	14 18.5	-60 46	313 32	+0 9	8.28	0.49	08.5IB	H
361	HD 127493	14 30.9	-22 33	331 26	+34 35	10.00P		09.0	N
362	HD 130298	14 47.7	-56 19	318 46	+2 47	10.00P		07.5V	L
363	HD 135240	15 15.0	-60 51	319 42	-2 53	5.08M	-0.06	07.5III((F))	H
364	HD 135591	15 16.8	-60 24	320 8	-2 38	5.43	-0.09	07.5III((F))	H
365	HD 329905	15 46.0	-48 33	330 24	+4 37	10.44	0.66	09.0I	L
366	CP-54 6791	15 53.6	-54 33	327 33	-0 48	10.39	0.56	09.0III	M
367	CP-53 6950	15 59.8	-54 5	328 33	-1 1	9.76	0.52	09.5II	H
368	HD 144647	16 7.4	-49 32	332 26	+1 36	9.97	0.66	08.0V	M
369	HD 144695	16 7.6	-49 52	332 15	+1 20	10.10P		09.0V	M
370	HD 144900	16 8.5	-48 54	333 1	+1 57	9.64M	0.73	09.0III-V	L
371	HD 144918	16 8.6	-48 58	332 59	+1 53	9.94M	0.79	07.0V	M
372	HD 144966	16 8.8	-46 55	334 24	+3 22	10.01	0.60	09.5V	L
373	HD 145217	16 10.2	-50 14	332 18	+0 47	9.96	0.85	08.0	N
374	CD-51 9977	16 16.2	-51 52	331 52	-1 4	10.63M	0.82	06.0	N
375	HD 146628	16 17.7	-49 42	333 33	+0 20	9.98	0.64	09.5I(A)	L
376	HD 147331	16 22.0	-52 15	332 14	-1 57	8.71	0.34	09.5I	M
377	HD 147617	16 23.6	-51 58	332 36	-1 55	9.79	0.27	09.5III	M
378	HD 328209	16 27.5	-44 25	338 29	+2 51	9.77	0.83	09.5I(A)	L
379	HD 148546	16 28.7	-37 56	343 22	+7 9	7.76	0.28	09.0IA	H
380	HD 148937	16 32.0	-48 4	336 21	-0 12	6.71M	0.34	06.5F	N
381	HD 149038	16 32.3	-44 0	339 23	+2 31	4.89	0.09	09.7IAB	H
382	HD 149404	16 34.7	-42 48	340 33	+3 1	5.46	0.40	09.0IA	H
383	HD 149452	16 35.3	-47 4	337 28	+0 3	9.05	0.59	09.0V	M
384	HD 149757	16 35.8	-10 31	6 17	+23 35	2.56	0.02	09.0V	H
385	HD 150135	16 39.5	-48 43	336 43	-1 34	6.89	0.13	06.5V	H
386	HD 150136	16 39.5	-48 43	336 43	-1 34	5.64	0.14	05.0III	H
387	HD 150197	16 39.8	-47 31	337 39	-0 49	9.51	0.40	09.0III	M
388	HD 150475	16 41.2	-37 48	345 7	+5 25	8.80P		08.5V	M
389	HD 325916	16 42.2	-41 53	342 10	+2 35	9.20P		09.5V	M
390	HD 150574	16 42.3	-46 6	339 0	-0 11	8.47	0.24	09.0III	M
391	HD 151003	16 44.7	-41 33	342 43	+2 26	7.11	0.16	09.0II	H
392	HD 328856	16 44.7	-47 2	338 33	-1 8	8.50	0.44	09.5III	M
393	HD 150958	16 44.7	-47 3	338 32	-1 8	7.28	0.35	06.5IA(N)F+	H
394	HD 151018	16 45.1	-45 50	339 30	-0 23	8.67	0.63	09.5I	M
395	HD 151300	16 46.9	-47 8	338 43	-1 29	9.29	0.47	06.0V	M
396	HD 151515	16 48.0	-41 57	342 48	+1 44	7.16	0.18	07.0II	H
397	HD 151564	16 48.2	-41 35	343 7	+1 55	7.99	0.11	09.5IV	M
398	HD 329027	16 48.5	-47 7	338 55	-1 40	9.85	0.83	09.5I	L
399	HD 326176	16 49.1	-41 42	343 8	+1 44	9.12	0.71	09.5II	L
400	HD 151804	16 49.8	-41 12	343 36	+1 56	5.22V	0.07	08.0IAF	H

TABLE 1 (CONTINUED)

CGO (11)	d (12)	z (13)	V_r (14)	V_{LSR} (15)	V_{cr} (16)	V_{pr} (17)	HII (18)	Reg (19)	Goy (20)	(21)	Remarks (22)
351	2.02I	-43			-26						
352	4.37B	261	-36B	-37	-52	15			316		
353									317		
354	2.51D	80	2B	2	-34	36			318		
355	1.48H	27	-39C	-40	-21	-19			320		
356	5.83D	-282	-21C	-22	-60	38			319		
357	1.18C	-8	-16D	-17	-17	0			321		VVAR(81)
358			-68B	-67					322		
359	1.41B	-0	-3D	-3	-20	17			323		VVAR(75)
360	2.48B	6	-47C	-47	-34	-13			324		
361			13B	20			0				
362	2.37J	115	-72D	-71	-34	-37			325		VVAR(87)
363	0.91C	-46	7D	8	-13	21			326	*	SB ORB
364	1.12B	-51	-3A	-2	-16	14			327		
365	7.31F	588	15B	19	-99	118			328		
366	4.53D	-63	-16D	-13	-64	51			329		
367	4.17B	-74	-42B	-39	-59	20					
368	2.05D	57	-18B	-14	-26	12			330		
369	2.28I	53	0E	4	-29	33			331		
370	2.01G	69	-18B	-13	-25	12			332		
371	1.91E	63	-40D	-35	-24	-12			333		VVAR(62) SB?
372	2.00F	118	-24C	-19	-24	5			334		VVAR?(48)
373	1.57K	21	54C	58	-20	78			335		
374	3.18L	-59			-42				337		
375	6.34F	37	-32B	-27	-88	61			338		
376	5.35D	-182	-71B	-67	-74	7			339		
377	5.20D	-174	-52C	-48	-72	24			340		
378	4.43F	220	-28C	-22	-53	31			341		
379	4.13B	514	-55C	-47	-40	-7			342		
380	0.88L	-3	-53B	-48	-10	-38			343		
381	1.30B	57	6A	12	-13	25			344		
382	1.21B	64	-48D	-42	-12	-30			345		
383	1.35D	1			-15				346		
384	0.15B	60	-15D	-2	0	-2	I	S24	347	*	VVAR?
385	1.36A	-37	-39C	-34	-15	-19			349		
386	1.36A	-37	23E	28	-15	43			348	*	VVAR(180).
387	3.77D	-54	-2E	3	-45	48			350		
388	1.78I	168	-22D	-14	-14	-1			351		
389	1.85I	84			-17				353		
390	2.91D	-9			-32				352		
391	2.00B	85	-33D	-26	-18	-8			356		VVAR(66)
392	2.27D	-45			-25				354		
393	2.78A	-55	-92D	-86	-31	-56			355	*	
394	3.52D	-24	-48D	-42	-39	-3			357		
395	2.78D	-72	-47D	-41	-31	-11			358		
396	2.00A	60	-2C	5	-18	23			359		
397	2.00A	67			-18				360		
398	4.59F	-134	-41C	-35	-55	20			361		
399	2.00A	60			-18				362		
400	2.00A	67	-65B	-58	-17	-41			363	*	

TABLE 1 (CONTINUED)

CGO (1)	Name (2)	α (1975) (3)	δ (1975) (4)	l^{II} (5)	b^{II} (6)	m_V (7)	B-V (8)	Sp.Type (9)	(10)
401	HD 152003	16 51.0	-41 45	343 19	+1 26	7.00	0.37	09.7IAB	H
402	HD 151990	16 51.5	-52 36	334 59	-5 32	9.00P		09.0III	L
403	HD 152147	16 51.8	-42 5	343 10	+1 6	7.23	0.40	09.7IB	H
404	CD-45 11034	16 51.9	-45 15	340 44	-0 56	11.08	0.89	08.5	N
405	HD 152199	16 52.0	-41 32	343 37	+1 25	8.60	0.24	09.5IV	M
406	HD 152200	16 52.1	-41 48	343 25	+1 14	8.41	0.12	09.5III	M
407	HD 152218	16 52.2	-41 40	343 32	+1 19	7.61	0.17	09.5IV(N)	H
408	HD 152219	16 52.2	-41 51	343 23	+1 12	7.64	0.18	09.5III((N))	H
409	HD 152245	16 52.3	-40 30	344 27	+2 2	8.37	0.12	09.5III	M
410	HD 152246	16 52.3	-41 3	344 2	+1 41	7.29	0.16	09.0III-IV((N))	M
411	HD 152233	16 52.3	-41 45	343 29	+1 15	6.56	0.14	06.0III:(F)P	H
412	HD 152247	16 52.4	-41 36	343 36	+1 19	7.18	0.22	09.5II-III	H
413	HD 152248	16 52.4	-41 47	343 28	+1 12	6.12V	0.17	07.0IB:(N)(F)P	H
414	HD 152249	16 52.4	-41 49	343 26	+1 11	6.49	0.22	09.5IAB C	H
415	CD-41 11037	16 52.5	-41 48	343 28	+1 11	7.90M	0.18	09.0III	H
416	HD 326331	16 52.6	-41 47	343 29	+1 11	7.51M	0.18	08.0V	M
417	HD 152333	16 52.8	-41 24	343 49	+1 23	8.02	0.22	09.5IV	M
418	HD 152314	16 52.8	-41 47	343 31	+1 9	7.86	0.19	09.5III-IV	H
419	HD 326329	16 52.8	-41 48	343 30	+1 8	8.60V	0.20	09.0III	M
420	CD-45 11051	16 52.8	-45 12	340 52	-1 1	10.96	0.96	08.5	N
421	HD 152405	16 53.2	-40 29	344 34	+1 54	7.20	0.11	09.7IB-II	H
422	HD 152408	16 53.2	-41 7	344 4	+1 30	5.82	0.18	08.0IF	H
423	HD 152386	16 53.3	-44 56	341 7	-0 56	8.08P		06.0:IAFPE	H
424	HD 152424	16 53.4	-42 2	343 23	+0 54	6.27M	0.39	09.5I	H
425	HD 152559	16 54.1	-40 44	344 28	+1 36	8.46	0.12	09.5III	M
426	HD 152590	16 54.3	-40 17	344 51	+1 52	8.42	0.14	07.5V	H
427	HD 152622	16 54.5	-40 26	344 45	+1 44	8.16	0.20	09.5III	M
428	HD 152623	16 54.5	-40 38	344 36	+1 37	6.73	0.12	07.0V(N)((F))	H
429	HD 152723	16 55.1	-40 29	344 47	+1 37	7.31M	0.14	06.5III(F)	H
430	CD-40 11035	16 57.1	-40 13	345 14	+1 29	9.80P		0	N
431	HD 322417	16 57.2	-40 12	345 16	+1 29	10.10	0.88	05.5	N
432	HD 153426	16 59.5	-38 9	347 9	+2 24	7.47	0.14	09.0II-III	H
433	CD-49 11137	17 1.7	-50 1	338 1	-5 11	10.27	0.39	09.5IA	L
434	HD 153919	17 2.3	-37 49	347 45	+2 11	6.51	0.27	06.5IAF+	H
435	HD 154368	17 4.9	-35 25	349 59	+3 13	6.18	0.55	09.5IAB	H
436	HD 154313	17 4.9	-42 18	344 29	-0 57	9.22P		08.0	N
437	HD 154643	17 6.6	-34 58	350 33	+3 12	7.14	0.28	09.5V	M
438	HD 154811	17 8.1	-47 0	341 4	-4 13	6.91	0.41	09.7IAB C	H
439	CD-38 11636	17 10.6	-38 28	348 13	+0 28	9.90P		09.0	N
440	HD 155806	17 13.6	-33 30	352 35	+2 54	5.52	0.01	07.5IIIE	H
441	HD 155775	17 13.6	-38 11	348 47	+0 10	6.72	-0.01	09.5K	N
442	HD 155889	17 14.1	-33 42	352 29	+2 42	6.55M	-0.02	09.0IV	H
443	HD 155913	17 14.6	-42 38	345 17	-2 36	8.30P		05.0VN((F))	H
444	HD 156134	17 15.7	-35 32	351 11	+1 22	8.06	0.61	09.5I	L
445	HD 156154	17 15.8	-35 30	351 14	+1 22	8.06	0.57	08.0IAB(F)	H
446	HD 156212	17 15.9	-27 45	357 35	+5 50	7.91	0.53	09.7IAB	H
447	CD-37 11455	17 17.0	-37 18	349 54	+0 8	9.40P		07.0	N
448	HD 156292	17 17.0	-42 52	345 21	-3 4	7.51	0.28	09.5III	H
449	HD 319699	17 17.8	-35 41	351 19	+0 56	9.63	0.77	07.0	N
450	HD 319703A	17 18.1	-36 4	351 2	+0 40	10.71	1.14	06.0	N

TABLE 1 (CONTINUED)

CGO (11)	d (12)	z (13)	V_r (14)	V_{LSR} (15)	V_{cr} (16)	V_{pr} (17)	HII (18)	Reg. (19)	Goy (20)	(21)	Remarks (22)
401	2.00A	50	-28D	-21	-17	-4			365		
402	2.32J	-224			-28				364		
403	2.00A	38	-28C	-21	-18	-4			366		
404	2.38K	-39	-104E	-98	-24	-74			367		
405	2.00A	49			-17				369		
406	2.00A	43			-17				368		
407	2.00A	46	-44E	-37	-17	-20			371	*	SB(336)
408	2.00A	42			-17				370		
409	2.00A	71			-16				376		
410	2.00A	59	8D	15	-17	32			377		VVAR(118)
411	2.00A	44	-16B	-9	-17	8			372		
412	2.00A	46	-17C	-10	-17	7			373		
413	2.00A	42	-35E	-28	-17	-11			375	*	SB ORB?(430)
414	2.00A	41	-22B	-15	-17	2			374		VVAR(46)
415	2.00A	41	23E	30	-17	47			378		
416	2.00A	41	-38D	-31	-17	-14			380		
417	2.00A	48			-17				384		
418	2.00A	40	-34D	-27	-17	-10			382		
419	2.00A	39			-17				383		
420	2.04K	-36	-21D	-15	-20	5			381		
421	2.00A	66	-8D	-1	-16	15			386		
422	2.00A	52	-140A	-133	-17	-116			387	*	
423	2.59H	-42	-17D	-11	-26	15			385		
424	2.00A	31	-18D	-11	-17	6			388		
425	2.00A	56			-16				389		
426	2.00A	65			-16				390		
427	2.00A	60			-16				391		
428	2.00A	56	-8D	-1	-16	15			392		VVAR?(50)
429	2.00A	56	-3C	4	-16	20			394		
430									395		
431	2.51K	65			-20				396		
432	2.42B	101	-6C	2	-17	19			397		
433	11.75F	-1061	-57C	-52	-93	41					
434	2.23B	85			-15				398		
435	1.25B	70	9C	17	-7	24			399		
436			-29C	-22							
437	0.83D	46	6D	15	-4	19					
438	2.12B	-156	-14C	-8	-21	12					
439									400		
440	1.01B	51	2C	11	-4	15			402		
441	1.02K	3	-4E	4	-6	10			401		SB(316)
442	1.37C	64	7B	16	-5	21			403		VVAR?(61)
443	2.15H	-98			-17						
444	2.73F	65	2C	11	-14	24			404		VVAR?(>53)
445	2.61B	62	-4C	5	-13	18			405		
446	2.84B	289	-46B	-36	-4	-32	0				
447									406		
448	1.80B	-96	-54E	-47	-14	-33					VVAR(189)
449	1.71K	28			-8				408		
450	2.12K	25	-22D	-14	-11	-3			409		

TABLE 1 (CONTINUED)

CGO (1)	Name (2)	α (1975) (3)	δ (1975) (4)	l^{II} (5)	b^{II} (6)	m_V (7)	B-V (8)	Sp. Type (9)	(10)
451	HD 156359	17 18.9	-62 54	328 40	-14 31	9.67	-0.14	09.0III	M
452	HD 319702	17 19.1	-35 51	351 20	+0 37	10.13	0.90	09.0	N
453	HD 156738	17 19.2	-36 3	351 11	+0 29	9.37	0.86	07.0	N
454	CD-37 11501	17 20.3	-37 52	349 49	-0 44	9.50P		06.0	N
455	HD 319718	17 23.9	-34 10	353 16	+0 46	10.43	1.45	07.0	N
456	HD 157857	17 24.9	-10 59	12 57	+13 19	7.78	0.18	06.5III(F)	H
457	HD 158186	17 27.6	-31 31	355 54	+1 37	7.00	0.04	09.5V	M
458	HD 159176	17 33.0	-32 34	355 39	+0 4	5.71	0.04	07.0V+07.0V	H
459	CD-29 13809	17 36.5	-29 6	358 59	+1 19	9.74M	0.68	09.0V	L
460	HD 160641	17 40.4	-17 56	8 56	+6 29	9.86	0.15	09.5IA	L
461	HD 160730	17 41.0	-24 17	3 35	+3 2	9.68	0.66	08.0V	M
462	HD 316232	17 44.2	-29 13	359 46	-0 10	10.27	0.68	09.0IV	L
463	HD 161853	17 47.7	-31 15	358 26	-1 52	7.94	0.23	08.0V((N))	H
464	HD 162978	17 53.3	-24 53	4 32	+0 19	6.20	0.04	08.5IIIF	H
465	HD 163181	17 54.6	-32 28	358 8	-3 45	6.62P		05.0	N
466	HD 163800	17 57.4	-22 31	7 3	+0 42	7.02	0.31	07.0IF	H
467	HD 163758	17 57.8	-36 1	355 22	-6 5	7.31	0.04	06.5IAF	H
468	HD 163892	17 57.9	-22 27	7 9	+0 38	7.44	0.09	09.0III	H
469	HD 164019	17 58.8	-28 36	1 55	-2 36	9.31	0.26	09.5I	L
470	HD 164438	18 0.4	-19 6	10 21	+1 48	7.48	0.34	09.0III	H
471	HD 164492	18 0.9	-23 1	7 0	-0 14	7.63	0.00	07.0I	H
472	HD 164794	18 2.3	-24 22	6 0	-1 11	5.97	0.03	04.0F	H
473	HD 164816	18 2.4	-24 19	6 3	-1 11	7.07	0.00	09.5III-IV(N)	H
474	HD 165052	18 3.6	-24 24	6 7	-1 28	6.87	0.09	06.5V(N)((F))	H
475	HD 165246	18 4.5	-24 12	6 24	-1 32	7.60P		08.0V(N)	H
476	HD 165921	18 7.8	-24 0	6 55	-2 6	7.70P		07.5V	M
477	HD 166546	18 10.5	-20 26	10 21	-0 55	7.25	0.05	09.0III	H
478	BD-14 4922	18 10.6	-14 56	15 11	+1 43	9.73	0.85	09.5II	L
479	HD 166734	18 11.1	-10 45	18 55	+3 37	8.42	1.09	07.5IF	H
480	BD-20 5043	18 12.6	-20 19	10 42	-1 17	9.52	0.85	06.0	N
481	HD 167330	18 13.8	-12 33	17 39	+2 10	8.23	0.66	09.0I	L
482	HD 167263	18 13.8	-20 24	10 45	-1 34	5.98	0.04	09.0III	H
483	HD 167264	18 13.8	-20 45	10 27	-1 45	5.38	0.07	09.7IAB	H
484	HD 167633	18 15.3	-16 32	14 20	-0 3	8.14	0.27	06.0V((F))	H
485	HD 167659	18 15.5	-18 59	12 12	-1 16	7.39	0.22	07.0IF	H
486	BD-12 4964	18 16.0	-12 19	18 6	+1 48	9.82	0.91	08.0	N
487	HD 167771	18 16.0	-18 28	12 42	-1 7	6.52	0.11	08.0IF	H
488	BD-12 4979	18 16.6	-12 15	18 14	+1 43	10.44	0.68	07.0F	N
489	BD-11 4586	18 16.7	-11 18	19 5	+2 9	9.40	1.00	08.0I	L
490	HD 167971	18 16.7	-12 15	18 15	+1 41	7.52	0.77	07.5IF	H
491	BD-12 4984	18 16.9	-11 58	18 31	+1 47	9.93M	0.83	09.0V	M
492	BD-13 4923	18 17.0	-13 45	16 58	+0 54	10.08	0.85	06.0	N
493	N 6611 166	18 17.1	-13 49	16 55	+0 52	10.35	0.60	09.0V	M
494	BD-13 4921	18 17.1	-13 50	16 54	+0 52	9.85	0.49	09.0V	L
495	HD 168075	18 17.2	-13 48	16 56	+0 51	8.77	0.44	06.5IIIF	H
496	HD 168076	18 17.2	-13 48	16 56	+0 51	8.24	0.44	04.0F	H
497	HD 168112	18 17.3	-12 6	18 27	+1 38	8.52	0.69	05.5F	H
498	BD-13 4927	18 17.3	-13 47	16 58	+0 51	10.08	0.84	08.0F	N
499	BD-13 4929	18 17.5	-13 47	16 59	+0 48	9.86	0.60	09.5V	M
500	HD 168137	18 17.5	-13 49	16 57	+0 47	8.95	0.39	08.0V	M

TABLE 1 (CONTINUED)

CGO (11)	d (12)	z (13)	V_r (14)	V_{LSR} (15)	V_{cr} (16)	V_{pr} (17)	HII (18)	Reg. (19)	Goy (20)	(21)	Remarks (22)
451	8.55D	-2143	-82B	-81	-99	18			407		
452	1.45K	16			-7				411		
453	1.34K	11	-2C	6	-6	13			410		
454									412		
455	2.09A	28	-21E	-12	-8	-4			413		VVAR?(91)
456	2.27B	523	59A	72	15	57	0		414		
457	1.09D	31	42E	51	-2	54	I	321	415		VVAR(244)
458	0.77B	1	-4E	5	-2	7	I	322	416		SB ORB?
459	1.64G	38			-1		0		417		
460	13.55F	1530	106E	118	46	72	0		418		
461	1.80D	95	-72D	-61	4	-65	0		419		
462	2.88F	-8			-0		0		420		
463	1.46B	-48	-20E	-11	-1	-9	I	334	421		VVAR(213)
464	1.35B	7	-11C	-0	3	-4	0	336X	422		
465			-42B	-33			0		423		SB ORB EB[0.4]
466	2.05B	25	5C	16	8	8	0	340Y	425	*	VVAR?(*)
467	4.43B	-469	-48B	-40	-14	-26			424		
468	2.23B	25	-9C	2	9	-7	0	340Y	426		
469	7.87F	-357	-27A	-17	20	-37	0		427		
470	1.61B	50	-27C	-15	9	-24	0		429		
471	1.59A	-6	-4B	7	6	1	I	340	430		VVAR(47)
472	1.59A	-33	12B	23	5	18	I	341	431		VVAR?(44)
473	2.16B	-45			7		I	341	432		
474	1.59A	-41	2C	13	5	8	I	341	433		VVAR(45)
475	1.37H	-37			5		I	341			
476	1.45I	-53	-30E	-19	5	-25	I	347	434		SB(481) [0.4]
477	2.16B	-35	3A	15	12	2	I	351	435		
478	2.61F	78			22		0		436		
479	1.35B	85	-11C	2	13	-11	0	361Y	437		
480	1.83K	-41	28D	40	11	29	I	355	438		
481	2.64F	100	-23D	-10	25	-35	0	361X	440		VVAR(>54)
482	1.22B	-33	1C	12	7	6	I	355	439		VVAR(50)
483	1.68B	-51	-6C	5	9	-4	I	365		*	VVAR(68)
484	2.16B	-2	-51C	-39	17	-55	I	357	441		VVAR(48)
485	2.19A	-48	15B	27	15	12	0	360Y	442	*	
486	1.36K	43			12		I	361	444	*	
487	2.19A	-43	-1D	11	15	-4	0	359X	443		VVAR(165)
488	2.81K	84			27		I	361	445	*	
489	2.67F	100			27		I	361	446		
490	1.39B	41	4C	17	13	4	I	361	447	*	
491	1.45E	45			13		I	361	448	*	
492	2.37K	37			21		I	364	450		
493	2.42D	37	1E	14	22	-8	I	364	451		
494	2.24F	34			20		I	364	449		
495	2.50B	37	25C	38	23	15	I	364	452		
496	3.11B	46	18D	31	29	1	I	364	453		
497	2.28B	65	-8C	5	22	-17	I	361	457	*	
498	1.68K	25	6E	19	15	4	I	364	456		
499	1.87D	26	2E	15	16	-2	I	364	454		SB
500	1.86D	25	22B	35	16	18	I	364	459		

TABLE 1 (CONTINUED)

CGO (1)	Name (2)	α (1975) (3)	δ (1975) (4)	l^{II} (5)	b^{II} (6)	m_V (7)	B−V (8)	Sp. Type (9)	(10)
501	BD−13 4930	18 17.5	−13 50	16 56	+0 47	9.44	0.27	09.5V	M
502	BD−12 4994	18 17.6	−12 7	18 28	+1 34	9.81	0.70	09.0II	L
503	BD−13 4941	18 18.6	−13 3	17 46	+0 54	9.75	1.08	09.5IV	L
504	HD 168461	18 18.9	−12 11	18 34	+1 15	9.54	0.68	08.0IV	M
505	HD 168444	18 18.9	−14 51	16 13	−0 0	8.86P		08.0V	L
506	BD−15 4930	18 18.9	−15 6	16 0	−0 8	9.42	0.74	06.0P	N
507	HD 168504	18 19.2	−13 58	17 1	+0 21	9.20P		08.0III	H
508	BD−16 4826	18 19.5	−16 3	15 14	−0 43	9.89	0.76	05.0	N
509	HD 168917	18 21.4	−14 23	16 55	−0 19	8.44	0.43	09.0V:	L
510	HD 168941	18 21.9	−26 58	5 49	−6 18	9.30P		09.5II	L
511	BD−11 4620	18 22.1	−11 56	19 9	+0 41	10.17	0.80	05.0	N
512	BD−10 4682	18 23.0	−10 50	20 14	+1 1	9.63	0.56	07.0	N
513	BD−12 5039	18 23.4	−12 6	19 10	+0 20	10.77	1.18	06.0	N
514	HD 169582	18 24.3	−9 47	21 19	+1 13	8.70	0.56	05.5I	H
515	HD 169727	18 25.2	−13 40	17 59	−0 49	9.29	0.79	06.0	N
516	HD 169755	18 25.4	−14 31	17 14	−1 14	9.26	0.53	09.0V	L
517	BD−8 4617	18 27.9	−8 35	22 47	+0 59	9.36	0.91	08.5V	L
518	HD 170452	18 28.6	−12 58	18 59	−1 13	8.75M	0.53	09.0:V	L
519	BD−13 5015	18 30.0	−13 35	18 36	−1 48	10.02	0.53	07.0	N
520	BD−6 4787	18 31.2	−6 15	25 14	+1 21	10.22	0.98	08.0N	N
521	BD−11 4674	18 32.4	−11 13	20 58	−1 12	10.18	1.11	09.5I	L
522	HD 171198	18 32.5	−12 17	20 2	−1 44	9.54	0.57	07.0	N
523	BD−8 4634	18 33.0	−8 7	23 47	+0 6	9.44	0.91	09.0?V?	L
524	BD−4 4503	18 34.2	−4 49	26 50	+1 21	10.83	0.75	07.0	N
525	HD 171589	18 34.9	−14 8	18 39	−3 6	8.28	0.32	07.5VF	H
526	HD 172175	18 37.7	−7 53	24 31	−0 50	9.44	0.63	06.0F	N
527	HD 172275	18 38.3	−7 23	25 2	−0 44	9.35	0.77	06.0	N
528	HD 173010	18 42.2	−9 22	23 44	−2 30	9.18	0.83	09.5IE	M
529	LS IV−02 16	18 44.2	−2 2	30 28	+0 25	12.20P		09.5III	M
530	HD 173783	18 46.1	−9 20	24 11	−3 21	9.31	0.51	09.0I	L
531	HD 173820	18 46.2	−6 20	26 52	−2 0	9.97	0.27	09.0I	L
532	BD−5 4769	18 47.2	−5 32	27 42	−1 51	10.40	0.75	08.0(I:)	L
533	BD−0 3584	18 52.3	−0 36	32 40	−0 43	9.98	0.62	08.0	N
534	HD 175514	18 54.2	+9 19	41 42	+3 23	8.59M	0.59	08.0V	M
535	HD 175754	18 56.1	−19 11	16 23	−9 54	7.04	−0.07	08.0IIIF	H
536	HD 175876	18 56.7	−20 27	15 18	−10 35	6.95M	−0.10	06.5III(N)(F)	H
537	BD+24 3843	19 40.9	+24 17	60 9	+0 37	10.34	0.99	08.0V	M
538	HD 344784	19 42.2	+23 14	59 24	−0 10	9.34	0.56	07.0IIIF	H
539	HD 338916	19 44.6	+25 18	61 28	+0 23	10.15	0.63	07.5	N
540	BD+24 3866	19 44.6	+25 3	61 15	+0 16	9.57	1.18	08.0F	N
541	HD 186980	19 45.3	+32 3	67 23	+3 40	7.45	0.08	08.0IIIF	H
542	HD 332755	19 45.6	+28 11	64 5	+1 39	8.77	0.20	07.0	N
543	BD+24 3881	19 46.0	+24 47	61 11	−0 8	9.12	0.69	06.0F	N
544	LS II+26 6	19 48.2	+26 43	63 6	+0 25	11.39	0.80	09.5III	M
545	BD+29 3772	19 49.7	+29 20	65 32	+1 28	10.10	0.50	07.0F	N
546	HD 188001	19 51.2	+18 37	56 29	−4 19	6.25M	0.01	08.0IF	H
547	HD 188209	19 51.3	+46 59	81 0	+10 6	5.64	−0.08	09.5I	H
548	HD 226868	19 57.4	+35 8	71 20	+3 4	10.00P		09.7IAB	H
549	HD 227018	19 58.9	+35 14	71 35	+2 52	8.99	0.38	06.5III	H
550	HD 189957	20 0.1	+41 55	77 25	+6 10	7.22	−0.06	09.5III	H

TABLE 1 (CONTINUED)

CGO (11)	d (12)	z (13)	V_r (14)	V_{LSR} (15)	V_{cr} (16)	V_{pr} (17)	HII (18)	Reg. (19)	Goy (20)	(21)	Remarks (22)
501	2.43D	33	15E	28	22	6	I	364	458		VVAR?(>26)
502	3.28F	90			33		I	361	460		
503	1.05F	17			9		I	362	461		
504	2.16D	47			21		I	362	464		
505	1.84J	0	-16B	-4	16	-19	I	368	462		
506	2.03K	-5	21D	33	17	16	I	368	463		
507	2.41H	15			22		I	364	465		
508	3.09K	-39			27		I	367	466		
509	1.27F	-7	-16B	-4	11	-14	0	369X	467		
510	2.59J	-284	105B	115	9	107	0		468		
511	3.33K	40			35		I	362	469		
512	2.28K	40			24		0		470		
513	2.06K	12			20		0	361Y		*	
514	2.97B	63	-14E	-1	33	-34	0		471		
515	1.79K	-25	-13C	-1	16	-17	0	371X	472		
516	1.61F	-35	6C	18	14	4	0	373X	473	*	
517	1.05F	18			11		0	377X	474	*	
518	1.28G	-27	-14C	-1	12	-13	0		475	*	
519	2.84K	-89			28		0		476		
520	1.48K	35			17		I	378			
521	3.63F	-76			41		0				
522	2.16K	-65	54E	67	22	45	0	383Y	477	*	VVAR(?)
523	1.04F	2			12		0	381Y	478	*	
524	3.05K	72			39		0		479		
525	1.56B	-84	15C	27	15	13	0		480		
526	2.39K	-35	-8D	5	28	-23	0	385X	481		VVAR(100)
527	1.89K	-24	23C	36	22	14	0		482		
528	3.37D	-147			41		0				
529	3.88I	28			54		I	389	483		
530	5.35F	-312			71		0		484		
531	10.09F	-352	43A	56	105	-49	0		485		
532	5.97F	-193			83		0		486		
533	2.18K	-27			30		0		487		
534	1.20E	71	29D	44	17	26	0		488		SB ORB
535	2.31B	-398	-12B	-1	20	-21	0		489		
536	2.28C	-419	17C	28	18	10	0		490		VVAR(90)
537	1.54D	17			17		0	404X	491		
538	2.75B	-8	20D	34	28	5	I	404	492		
539	2.40K	16	7E	21	24	-3	I	405	493		
540	0.83K	4			10		0	405X	494	*	
541	2.27B	145	4B	17	17	0	0		495		
542	2.52K	73			22		I	407	496		
543	1.90K	-4			20		0	406Y	497		
544	5.22D	38			29		0	410X	498		
545	3.08K	79			23		0	407Y	499		
546	2.46C	-185	10B	23	28	-5	0	409Y	500	*	
547	2.32B	407	-6A	6	3	4	0		501		
548	3.33H	178	-12D	1	15	-14	0	CYG420Y			
549	3.01B	150	41D	54	14	40	I	CYG420	502		
550	2.51B	270	43B	56	7	49	0	CYG426X	503		

TABLE 1 (CONTINUED)

CGO (1)	Name (2)	α (1975) (3)	δ (1975) (4)	l^{II} (5)	b^{II} (6)	m_V (7)	B-V (8)	Sp. Type (9)	(10)
551	HD 227245	20 1.4	+35 37	72 10	+2 38	9.74	0.62	07.0	N
552	HD 190429	20 2.6	+35 58	72 36	+2 37	7.12C	0.16	04.0IF+09.5III	H
553	HD 227465	20 3.5	+33 38	70 43	+1 13	10.28	0.47	07.0	N
554	HD 190864	20 4.7	+35 32	72 28	+2 1	7.76	0.20	07.0IIIF	H
555	HD 191139	20 6.1	+36 20	73 17	+2 13	7.98	0.22	09.5II	L
556	HD 227757	20 6.3	+36 17	73 16	+2 9	9.20	0.18	09.5V	M
557	HD 191201	20 6.4	+35 39	72 45	+1 48	7.70C	0.13	09.0III+09.0V	H
558	HD 191423	20 7.2	+42 32	78 38	+5 23	8.03	0.16	09.0III:N	H
559	HD 191612	20 8.5	+35 39	72 59	+1 26	7.82	0.24	07.5IIIF	H
560	HD 191781	20 9.0	+45 19	81 10	+6 37	9.54	0.64	09.7IAB N	H
561	HD 191978	20 10.1	+41 17	77 53	+4 15	8.02	0.14	08.5III((F))	H
562	HD 192001	20 10.2	+42 3	78 32	+4 40	8.25	0.32	09.5IV	H
563	HD 192281	20 11.7	+40 11	77 7	+3 24	7.55	0.38	05.5F	H
564	HD 228368	20 12.4	+34 57	72 49	+0 23	8.39	0.49	09.0V	L
565	HD 192639	20 13.6	+37 17	74 54	+1 29	7.11	0.35	07.5III	H
566	HD 228534	20 14.0	+37 19	74 58	+1 26	9.23M	0.27	09.5II:	L
567	HD 193117	20 16.1	+40 46	78 4	+3 1	8.70	0.61	09.5II	L
568	BD+41 368	20 16.3	+41 52	79 0	+3 36	9.10P		06.0	N
569	HD 228779	20 16.9	+34 44	73 10	-0 30	8.92	1.31	09.5IB	L
570	HD 193322	20 17.3	+40 39	78 6	+2 47	5.95C	0.09	08.5III	H
571	HD 228841	20 17.5	+38 48	76 36	+1 41	8.94	0.56	06.5VN((F))	H
572	HD 228854	20 17.8	+36 16	74 32	+0 13	9.54C	0.70	06.5+07.5	N
573	HD 193443	20 18.0	+38 11	76 8	+1 16	8.00C	0.41	09.0III	H
574	HD 193514	20 18.2	+39 11	76 59	+1 48	7.40	0.45	07.5IIIF	H
575	HD 193595	20 18.6	+38 58	76 51	+1 37	8.72	0.36	09.0V	L
576	HD 193611	20 18.8	+38 15	76 17	+1 11	9.20P		09.5V	M
577	HD 193682	20 19.3	+37 44	75 55	+0 48	8.41	0.51	05.0	N
578	HD 228989	20 19.4	+38 37	76 40	+1 17	9.72	0.77	09.0VNN	L
579	HD 193794	20 19.8	+39 16	77 14	+1 35	9.30P		09.5IV	L
580	HD 229043	20 20.1	+36 43	75 10	+0 5	9.94	0.83	09.5II	L
581	HD 194094	20 21.5	+38 37	76 53	+0 58	9.02	0.59	09.0III	M
582	N 6910 4	20 22.2	+40 41	78 40	+2 2	9.40P		08.0	N
583	HD 229196	20 22.4	+40 48	78 47	+2 4	8.54	0.90	06.0III(N)((F))	H
584	HD 194280	20 22.4	+38 51	77 11	+0 56	8.39	0.76	09.7IAB C	H
585	HD 194334	20 22.8	+38 48	77 11	+0 52	8.77	0.84	07.5V	L
586	HD 229232	20 23.0	+39 2	77 24	+0 56	9.52	0.82	04.0VN((F))	H
587	HD 229234	20 23.1	+38 27	76 55	+0 36	8.92	0.77	09.5II	M
588	HILT 205	20 23.2	+39 35	77 52	+1 14	9.86	1.18	07.0	N
589	BD+39 4168	20 23.4	+39 41	77 58	+1 15	9.99	1.07	07.0	N
590	BD+37 3927	20 24.1	+37 24	76 11	-0 10	10.15	1.25	08.0F	N
591	HD 194649	20 24.4	+40 9	78 27	+1 22	9.00	0.95	06.5	N
592	BD+36 4063	20 24.7	+37 18	76 10	-0 20	9.71	1.14	09.5IB	L
593	BD+40 4179	20 26.8	+40 31	79 1	+1 13	9.65	0.57	08.0V:	L
594	HD 195213	20 27.6	+40 43	79 17	+1 13	8.74	0.84	07.0	N
595	HD 195592	20 29.8	+44 14	82 22	+2 58	7.08	0.87	09.5I	H
596	CYG II 1	20 30.6	+41 29	80 14	+1 13	11.09	1.42	09.0V	M
597	BD+40 4212	20 30.7	+41 7	79 57	+0 59	10.38C	1.63	09.0	N
598	BD+40 4219	20 31.3	+41 21	80 12	+1 2	10.22	1.18	07.0III((F))	H
599	BD+40 4220	20 31.5	+41 13	80 7	+0 55	9.20V	1.67	07.0IANFP+09:	H
600	BD+40 4221	20 31.6	+41 19	80 13	+0 58	10.67M	1.22	08.0V	L

TABLE 1 (CONTINUED)

CGO (11)	d (12)	z (13)	V_r (14)	V_{LSR} (15)	V_{cr} (16)	V_{pr} (17)	HII Reg. (18) (19)	Goy (20)	(21)	Remarks (22)
551	2.21K	101	-13C	-0	12	-13	OCYG420Y	504		
552	2.73B	125	-12B	1	13	-12	ICYG	505	*	VVAR(*) VB[0.6]
553	3.48K	74			16		ICYG	506		
554	2.19B	77	-0B	13	12	1	ICYG	507		
555	2.78F	108	-13B	-0	12	-12	ICYG	510		
556	2.47D	93			12		ICYG	511		
557	2.38B	75	-5C	8	12	-4	ICYG	512		SB ORB[0.8]
558	2.66B	249	-28E	-16	5	-21	OCYG424Y	513		SB(365)
559	2.13B	53	-19C	-6	11	-18	ICYG	514		VVAR?(46)
560	5.18B	596	-13C	-1	-15	14	ICYG456	515		
561	2.72B	201	-18B	-6	6	-11	ICYG454	516		
562	1.51B	123	-29D	-17	5	-22	ICYG455	517		VVAR(70)
563	2.24B	133	-60B	-48	7	-55	ICYG464	518		
564	1.14F	8			8		ICYG	519		
565	1.32B	34	-2B	10	7	3	ICYG	520		
566	4.61G	115			4		ICYG	521		
567	2.26F	119			6		ICYG482	522		
568							ICYG484	523		
569	1.12F	-10			7		OCYG	525		
570	1.12B	54	-8B	4	5	-1	ICYG482	526		VVAR?(51) VB[2.2]
571	1.82B	53			7		ICYG492	527		
572	1.98K	7	9C	21	10	12	ICYG	528		SB ORB[0.3] EB[0.8]
573	1.85B	41	-29C	-17	8	-25	ICYG	529		VB[0.0]
574	1.31B	41	-20B	-8	6	-14	ICYG492	530		
575	1.59F	45			7		ICYG492	532		
576	1.85I	38	-11C	1	8	-7	ICYG	533		SB ORB[0.1:] EB[0.4]
577	2.21K	31			9		ICYG	534		
578	1.43F	32			7		ICYG	535		
579	2.02J	56	-35C	-23	7	-30	ICYG492	537		
580	2.95F	4			9		ICYG	538		
581	2.31D	39	-19C	-7	7	-14	ICYG529	539		
582			-38C	-26			I 538			
583	1.25B	45			5		ICYG538	541		
584	2.58B	42	-18C	-6	7	-13	ICYG529	540	*	
585	0.95F	14			5		ICYG	543	*	
586	2.88B	47			6		ICYG	545		
587	2.00D	21	-18D	-6	7	-13	OCYG529X	544	*	VVAR(99)
588	1.08K	23			5		ICYG544	546		
589	1.33K	29			5		ICYG544	547		
590	0.99K	-3			5		OCYG	548		
591	1.09K	26			5		ICYG553	549		
592	2.03F	-12			8		ICYG	550		
593	2.00F	43			5		ICYG564	551		
594	1.03K	22			4		ICYG577	552		
595	1.21B	63	-27C	-15	3	-18	ICYG581	553		VVAR(47)
596	1.10D	23			4		ICYG	554		
597	0.59K	10			2		ICYG	555		VB[2.6]
598	1.75B	32			4		ICYG	556		
599	1.13C	18	-35D	-23	4	-27	ICYG	558		SB ORB EB[0.3]
600	1.31G	22			4		ICYG	559		

TABLE 1 (CONTINUED)

CGO	Name	α (1975)	δ (1975)	l^{II}	b^{II}	m	B-V	Sp.Type	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
601	CYG II 22	20 32.1	+41 8	80 7	+0 47	11.68	2.01	0	N
602	CYG II 9	20 32.2	+41 11	80 10	+0 47	10.80	1.93	05.0IF	H
603	CYG II 7	20 32.3	+41 15	80 14	+0 49	10.49	1.44	03.0II	H
604	CYG II 8C	20 32.3	+41 13	80 13	+0 48	10.08M	1.35	06.0	N
605	BD+40 4227	20 32.3	+41 13	80 13	+0 48	9.01M	1.28	06.0IB(N)(F)	H
606	CYG II 8D	20 32.3	+41 13	80 13	+0 48	11.93M	1.43	09.0	N
607	GYG II 8B	20 32.3	+41 13	80 13	+0 48	10.31M	1.35	08.0	N
608	CYG II 18	20 32.6	+41 10	80 12	+0 43	11.09	1.91	0	N
609	CYG II 19	20 32.7	+41 14	80 16	+0 45	11.06	1.60	0	N
610	BD+41 3804	20 32.9	+41 27	80 28	+0 51	9.88	1.52	09.5IA	L
611	BD+45 3216	20 33.0	+45 34	83 47	+3 17	9.07M	0.39	08.0	N
612	BD+41 3807	20 33.3	+41 31	80 34	+0 50	10.04	1.44	05.0IF	H
613	BD+36 4145	20 35.3	+37 20	77 27	-2 1	8.95	0.65	09.0V	L
614	BD+42 3835	20 41.2	+43 5	82 42	+0 36	9.20	0.91	09.0P?	N
615	BD+45 3260	20 44.7	+46 14	85 33	+2 5	9.06	0.51	09.0V	N
616	HD 198864	20 52.0	+2 22	50 17	-25 32	8.90P		08.5	N
617	HD 199579	20 55.7	+44 50	85 42	-0 18	5.96M	0.05	06.5III	H
618	HD 201345	21 7.0	+33 18	78 27	-9 33	7.66V	-0.13	09.5VN	H
619	HD 202124	21 11.5	+44 25	87 17	-2 40	7.80	0.22	09.5I	H
620	HD 203064	21 17.5	+43 50	87 36	-3 51	4.99	-0.02	08.0V	H
621	HD 206183	21 37.7	+56 52	98 54	+3 24	7.40M	0.14	09.5V	M
622	HD 206267	21 38.2	+57 22	99 17	+3 44	6.13C	0.20	06.5V((F))+	H
623	HD 206327	21 38.4	+61 26	102 1	+6 46	8.50P		05.0	N
624	BD+49 3591	21 39.4	+50 23	94 49	-1 38	9.67M	0.52	07.5	N
625	HD 207198	21 44.3	+62 20	103 8	+6 59	5.96	0.31	09.0I	H
626	HD 207538	21 46.9	+59 35	101 36	+4 40	7.31	0.33	09.5V	H
627	HD 235673	21 56.8	+52 42	98 23	-1 34	9.14	0.21	07.0	N
628	HD 209481	22 1.2	+57 53	102 0	+2 11	6.05C	0.06	08.5III+09.5V	H
629	HD 209975	22 4.4	+62 10	104 53	+5 23	5.12	0.08	09.0I	H
630	BD+53 2790	22 7.0	+54 24	100 36	-1 6	9.86	0.25	09.5III	M
631	HD 210839	22 10.6	+59 17	103 49	+2 36	5.06	0.24	06.0I(N)FP	H
632	HD 210809	22 10.7	+52 18	99 51	-3 8	7.54	0.05	09.0I	H
633	BD+53 2843	22 17.7	+54 9	101 45	-2 12	9.50	0.21	08.0	N
634	HILT 241	22 21.3	+55 31	102 56	-1 20	10.29	0.27	05.0	N
635	HD 235825	22 22.5	+55 8	102 52	-1 45	9.28	0.24	09.0V	L
636	BD+54 2761	22 22.7	+55 34	103 7	-1 24	9.98	0.34	05.0F	N
637	BD+62 2078	22 24.7	+63 17	107 26	+5 1	9.72	1.11	07.0	N
638	HD 213023	22 26.0	+63 37	107 44	+5 13	8.49	0.81	09.0V:	L
639	BD+66 1521	22 31.7	+67 1	110 1	+7 50	8.30P		09.5V	L
640	LSIII+58 38	22 33.8	+58 10	105 46	+0 3	9.91	0.42	09.0P	N
641	HD 214680	22 38.2	+38 55	96 39	-16 59	4.88	-0.20	08.0III	H
642	HD 215835	22 45.9	+57 57	107 3	-0 54	9.25C	0.32	06.0V(N)+06.5	H
643	LSIII+57 93	22 48.3	+57 38	107 12	-1 20	10.82	0.35	09.5V	L
644	HD 216532	22 51.5	+62 18	109 38	+2 40	8.00	0.54	09.5V	H
645	BD+55 2840	22 54.1	+56 15	107 18	-2 55	10.01	0.45	07.0	N
646	HD 216898	22 54.7	+62 10	109 55	+2 23	8.00	0.53	09.0V	H
647	BD+57 2513	22 55.4	+58 24	108 23	-1 3	9.54M	0.64	09.5V	L
648	HD 217086	22 55.9	+62 36	110 14	+2 43	7.64	0.63	07.0VN	H
649	LSIII+58 70	22 58.2	+58 36	108 48	-1 2	11.30	0.46	09.5V	M
650	HD 240160	23 0.6	+56 51	108 22	-2 45	10.02	0.48	09.0	N

TABLE 1 (CONTINUED)

CGO (11)	d (12)	z (13)	V_r (14)	V_{LSR} (15)	V_{cr} (16)	V_{pr} (17)	HII (18)	Reg. (19)	Goy (20)	(21)	Remarks (22)
601							I	CYG	561		
602	1.23B	17			4		I	CYG	562		
603	2.41B	34			3		I	CYG	567		
604	1.19L	17			4		I	CYG	563		
605	1.10C	15	-32E	-20	4	-24	I	CYG	564		VVAR(56)
606	1.59L	22			4		I	CYG	565		
607	0.93L	13			3		I	CYG	566		
608							I	CYG	568		
609							I	CYG	569		
610	2.06F	31			4		O	CYG588X	570		
611	1.97L	113			1		I	CYG594	571		
612	1.71B	25			4		O	CYG588X	572		
613	1.19F	-42			5		I	CYG	573		
614	0.93K	10			2		I	CYG	574		
615	1.51K	55	-97E	-86	0	-86	O	CYG	575		
616							O		576		
617	1.18C	-6	-6C	5	1	4	I	CYG614	577		SB ORB
618	1.86C	-309	26C	36	6	31	O		579		
619	4.15B	-193	-25C	-15	-18	3	O	CYG619X	580	*	
620	0.53B	-36	-2C	8	0	8	I	619	583		VVAR(145)
621	1.14E	67	-4E	5	-7	12	I	628	584		
622	0.82B	53	-8C	1	-5	5	I	628	585		SB ORB[0.8]
623			-30C	-22			O				
624	2.24L	-64			-12		I	627	586		
625	1.51B	183	-18B	-10	-12	3	O		587		
626	0.84B	68	-15B	-7	-6	-1	O	628Z			
627	2.95K	-81	-48B	-40	-23	-17	O		589		
628	1.23B	47	-6C	2	-9	11	O		590		SB ORB[0.6]
629	1.41B	132	-13A	-5	-12	7	O		591		
630	5.52D	-106	-63C	-55	-56	1	O		592		
631	0.86B	39	-74A	-66	-7	-60	O	632X	594	*	
632	4.47B	-244	-78B	-70	-42	-28	O		593		
633	3.08K	-118	-9E	-2	-28	27	O		595		VVAR(165)
634	7.31K	-170			-81		O	633X	596		
635	2.43F	-74	-65E	-58	-22	-36	O	633Y	597		VVAR(67)
636	5.75K	-141	-82D	-75	-63	-12	O	633Y	598		
637	1.11K	97			-11		O	634Y	599		
638	0.77F	70	-36D	-29	-7	-22	I	636	600	*	VVAR(64)
639	1.51J	206			-16		O		601		
640	2.54K	2			-26		I	640	602		
641	0.53A	-153	-9A	-3	-2	-1	O	Y	604	*	
642	3.36B	-53	-35C	-28	-37	9	I	642	605		SB ORB[0.2] EB[0.1]
643	4.11F	-96			-47		O	642X	606		
644	0.72A	34	-30C	-24	-7	-16	I	649	607	*	
645	3.16K	-161			-35		O		608		
646	0.72A	30	-23A	-17	-7	-9	I	649	609		
647	1.53G	-28			-16		I	648	610		
648	0.72A	34	-16A	-10	-8	-2	I	649	611		
649	4.41D	-79			-52		I	651	612		
650	2.46K	-118			-27		O	652X	613		

TABLE 1 (CONTINUED)

CGO (1)	Name (2)	α (1975) (3)	δ (4)	l^{II} (5)	b^{II} (6)	m_V (7)	B−V (8)	Sp. Type (9)	(10)
651	HD 240165	23 1.2	+57 3	108 31	−2 36	10.13	0.47	09.5V	L
652	HD 218195	23 4.2	+58 7	109 19	−1 47	8.34M	0.27	09.0III	H
653	HD 218915	23 10.1	+52 55	108 4	−6 54	7.18	0.02	09.5I	H
654	GEOR	23 12.3	+61 22	111 31	+0 50	11.88	1.25	07.0	N
655	HD 219286	23 12.8	+59 40	110 57	−0 47	8.68	0.64	09.0	N
656	BD+61 2415	23 15.8	+61 45	112 2	+1 1	9.40P		09.0	N
657	BD+60 2522	23 19.7	+61 4	112 14	+0 13	8.66	0.40	06.5IIIF	H
658	SA19 1778	23 21.7	+62 0	112 46	+1 1	10.80	0.75	08.0(F)	N
659	LS I+60 8	23 31.8	+60 31	113 27	−0 46	10.94	0.75	09.5V	M
660	BD+62 2299	23 46.7	+63 15	115 53	+1 23	9.58	0.61	08.0	N
661	BD+61 2550	23 51.0	+61 59	116 4	+0 2	9.29	0.30	09.5II	L
662	BD+61 2559	23 52.3	+62 17	116 17	+0 18	9.72	0.29	09.0V	L
663	BD+66 1661	23 56.1	+67 25	117 48	+5 13	8.72	0.81	09.0V	M
664	HD 240464	23 57.5	+60 8	116 26	−1 56	9.59	0.31	09.0V	L

TABLE 1 (CONTINUED)

CGO (11)	d (12)	z (13)	V_r (14)	V_{LSR} (15)	V_{cr} (16)	V_{pr} 17	H II (18)	Reg. (19)	Goy (20)	(21)	Remarks (22)
651	2.54F	-115	-84E	-78	-28	-50	0	652X	614		
652	2.63C	-82	-27B	-21	-30	9	0		615		
653	4.11B	-494	-72B	-66	-47	-20	0		616		
654	2.48K	36			-29		I	655	617		
655	1.06K	-15	-66D	-60	-12	-49	I	656			VVAR(66)
656							I	657	618		
657	2.51B	10	-24C	-19	-30	12	I	660	619		
658	2.66K	47	-76D	-71	-32	-38	0	657Y	620		
659	2.50D	-33	-3E	2	-31	33	I	661	621		
660	1.84K	44			-23		0		622		
661	4.55F	3	-19E	-14	-59	44	0		623		
662	2.78F	15			-36		0		624		
663	0.86D	78			-11		I	2	625		
664	2.55F	-86			-33		0		626		

TABLE 1 (CONTINUED)

NOTES TO TABLE 1

CGO No.

11 HD 1337 = AO Cas. Possible apsidal motion with a 78 year period.

20 HD 5005C = ADS 791C. Visual companion to HD 5005, 3″.9 separation. Δm (A, C) = 0.8 mag. Component B is 1″.4 from A and about 2.0 mag. fainter.

55 BD + 62°424. Located in a very faint part of MA19.

56 HD 16429. One of the values for the radial velocity (+87.4 km s^{-1}, one plate) given for this star (H.A. Abt 1970, *Ap. J. Suppl.*, **19**, 387) has not been considered because it is 111 km s^{-1} larger than the maximum velocity yielded from 14 other plates. We suspect the discordant velocity refers to a nearby field F5 star (see Abt, Levy and Gandet 1972).

69 HD 19820 = CC Cas. Probably ellipsoidal variable (Δm = 0.1).

80 HD 34078 = AE Aur = HR 1712. Irregular variable m_v = 5.4 − 6.1. MA50 superimposed on MA52.

83 HD 242908. MA53 superimposed on MA52.

84 HD 242926. MA53 superimposed on MA52.

85 HD 242935. MA53 superimposed on MA52.

87 HD 35619. In MA52 and less than 0°.5 away from MA56 and MA58.

88 BD + 34°1054. MA56 superimposed on MA52.

90 HD 35921 = LY Aur. Orbit and light curve are preliminary. The relative velocity of the binary components is large (450 km s^{-1}) as deduced from only five spectrograms.

92 HD 36486 = δ Ori. Many orbits have been computed but systemic velocities differ appreciably (+12 to +23 km s^{-1}). We have used Miczaika's value (1952, *Zs. f. Ap.*, **30**, 229). Variations in brightness (Δm = 0.1 mag) could be of eclipsing nature.

95 HD 36841. Probably inside a reflection nebula near IC 434.

97 HD 37022 = θ^1C Ori. In the Orion Nebula, NGC 1976. The lines are broad and Si IV is absent (Conti and Alschuler 1971). Suspected variability in the velocity might be an error; more observations seem necessary.

99 HD 37041 = θ^2 Ori. In the Orion Nebula, NGC 1976. As in θ^1 Si IV lines are very weak.

100 HD 37043 = ι Ori. In the Orion Nebula, NGC 1976.

101 HD 37468 = HR 1931. In IC 434.

105 HD 37742 = ζ Ori. In IC 434.

106 HD 37743. In IC 434. Companion to HD 37742; separation 2″.7.

108 HD 247042 = BD + 29°981. Near a SN remnant.

111 HD 39680. Although the star is probably of variable velocity, the adopted velocity is the weighted average of Lick's mean of eight plates, as published in Wilson (1953), and the mean of two plates as given in Abt and Biggs (1972) because we could not find the individual plate velocities obtained at Lick.

121 HD 254755. McDonald observers suspect velocity variability in this star, but no velocity range is given (C. K. Seyfert and D. M. Popper 1941, *Ap. J.*, **93**, 461).

127 HD 45314. The star may be a subdwarf (Conti and Alschuler 1971). It has however been estimated that M_v = −6.8. (Hutchings 1970). Some H lines are filled in, and according to Hutchings, Hβ shows a P Cygni profile.

135 HD 46966. In a SN remnant: D14.

136 HD 47129. In a SN Remnant: D14.

141 HD 48099. In a SN remnant: D14; but at less than 1° away from an unnamed region.

143 BD + 0°1576. MA93 is a very faint region associated with a brighter one.

150 HD 53975. Less than 0°.5 away from MA110.

153 HD 55879. In a faint part of MA111.

155 HD 57060. Batten (1967) suggests that the systemic velocity is variable, with a range of about 25 km s^{-1}. The velocity adopted here is the average of the systemic velocities for the orbits computed in 1935, 1941, and 1958 (cited by Abt and Biggs 1972).

166 HD 61827. In a very faint H II region.

167 CD − 29°4849. Region is very faint, probably associated with this star and HD 61827.

238 HD 93161. Visual binary quoted by Thackeray *et al.* (1973) as having components 2″.0 apart and Δm = 0.1. The spectral types, according to these authors, are O6 for the Np component and O5 for the Sf one. The adopted velocity is the mean for both stars. They are both suspected of showing variable velocity; the range of the Sf component is 46 km s^{-1} and that of the Np one is hard to estimate owing to the large scatter in the two measurements published for each plate.

254 HD 93521. The H and K lines have been considered as stellar in origin and included in the computation of the radial velocity of this star (Plaskett, J. S. and Pearce, J. A. 1931, *Pub. Dom. Ap. Obs.*, **5**, 1). However, we were able to correct each of the 19 plates, since the authors list the H and K line velocities separately in all cases. The effect was to increase the scatter of the individual plate velocities, which strongly suggests real variations in velocity, not suspected by Plaskett and Pearce (although they did suggest possible doubling of lines). The star is probably a spectroscopic binary with very broad lines.

TABLE 1 (CONTINUED)

CGO No.

317 HD 101223. Magnitude and color index from Humphreys (1973). Thackeray, A. D. and Wesselink, A. J. (*M.N.R.A.S.*, **131**, 121 1965) give $m_v = 8.68$ and $B - V = 0.17$.

363 HD 135240 = δ Cir. The adopted velocity is the average of the systemic velocities resulting from two solutions for the orbital elements. The solutions correspond to different epochs and the values of v_0 are quite similar (+9.2 and +4.8). Apsidal motion and/or variable systemic velocity is suspected.

384 HD 149757. Published radial velocities are very discordant: Victoria, +31 (2 plates); Yerkes, −35(5); Lick, −20(4); Canberra, −1(3). Variability is suspected only by the observers of the latter observatory, but the velocity range deduced from their results is only 22 km s⁻¹.

386 HD 150136 = HR 6187. Visual multiple system companion to HD 150135 (CGO 385).

393 HD 150958. Radial velocity given here is from the absorption lines only; the velocity from the emission lines is −39 km s⁻¹.

400 HD 151804. The adopted velocity refers to the absorption lines only. Conti and Alschuler (1971) find Hβ with P Cygni profile, and it has been noted that O III λ3760 also shows such structure and suggested that all absorption lines arise from an expanding shell (Struve 1944). According to Struve, emission line velocity is +52.0 km s⁻¹.

407 HD 152218. Double lined spectroscopic binary with tentative v_0 value by Struve (1944).

413 HD 152248. Provisional orbit by Struve (1944), very uncertain. The strength of the lines of the components is almost equal, but the strongest one always appears to be blue-shifted relative to the weaker component.

422 HD 152408. Classified as a typical P Cygni-type object by Struve (1944). We list the absorption-line velocity average of three independent observations (8 plates). Emission-line velocity according to Struve is +12.3 (5 plates). Hutchings (1968) notes that the atmosphere of this star is expanding rapidly, and that the measurement of large negative radial velocity is due to this fact, since the strongest spectral lines are highly blue-shifted.

466 HD 163800. Considered of variable velocity, although no velocity range is given (Neubauer 1943). From the probable error given by the latter the range must be about 56 km s⁻¹, assuming that the variability is due to circular orbital motions.

483 HD 167264. In a very faint H II region, possibly MA365.

485 HD 167659. Less than 1° away from MA359 Conti and Alschuler (1971) note a very weak Si IV line on the spectrum of this star.

CGO No.

486 BD − 12°4964. MA361 superimposed on MA362.

488 BD − 12°4979. In the faint part of MA361 superimposed on MA362.

490 HD 167971. MA361 superimposed on MA362.

491 BD − 12°4984. MA361 superimposed on MA362.

497 HD 168112. MA361 superimposed on MA362.

513 BD − 12°5039. In region MA361.

516 HD 169755. A close companion in the spectrograph slit was mentioned (Neubauer 1943).

517 BD − 8°4617. Less than 0°.5 away from MA381.

518 HD 170452. Neubauer (1943) notes that the spectrum of this star is composite.

522 HD 171198. Declared of variable velocity by Neubauer (1943). He does not list the individual plate velocities or give velocity range, but we estimate that the latter is about 350 km s⁻¹. More observations are clearly needed for this star.

523 BD − 8°4634. Less than 1° away from MA385.

540 BD + 24°3866. Less than 0°.5 away from MA406.

546 HD 188001 = 9 Sge = HR 7574. It has been considered that the star's radial velocity may vary from −6 to +34 km s⁻¹ with a long period (Underhill, A. B. 1958, *Pub. Dom. Ap. Obs.*, **11**, 143). The star has an expanding atmosphere and its spectrum shows emission lines with widely different wavelength shifts (Hutchings 1970).

552 HD 190429 = AGC 13312AB. Visual binary with components 2″.0 apart. The radial velocity of each component has been measured independently several times. Both stars show velocity variability with range 63 km s⁻¹ (component A) and 121 km s⁻¹ (component B). The heliocentric velocity listed here is the weighted average of the adopted velocity for each star (−16 km s⁻¹ for A and −6 km s⁻¹ for B); the weight is the ratio of the number of plates to the velocity range.

584 HD 194280. Less than 0°.5 away from MA526.

585 HD 194334. Less than 0°.5 away from MA529 and MA526.

587 HD 229234. Belongs to NGC 6913 but its identification is ambiguous. We used the velocity by Abt, Levy and Gandet (1972) to compute the adopted velocity.

619 HD 202124. Less than 1° away from MA614.

631 HD 210839. In a broken H II regions (S 134) within a reflection nebula.

638 HD 213023. In a very faint part of MA636.

641 HD 214680 = 10 Lac = HR 8622. Short term irregular variations in the observed radial velocity have been found. These variations could be smoothed out in long-exposure plates (Grygar, J. 1964, *B.A.N.*, **17**, 305). The amplitude of the variations is 15 km s⁻¹. Less than 1° away from a very faint unnamed H II region.

644 HD 216532. In a very faint part of MA649.

d) *Spectral Type*

An adopted spectral type was presented for the stars of the catalogue. An index was assigned to each object indicating the quality of the spectral classification. This is presented in Table 1 immediately following the assigned type. The meaning of this index is as follows: "H" denotes high quality classification and is assigned only to spectral types determined by Conti, Alschuler, Walborn and Humphreys. "M" corresponds to spectral types that have been determined by other authors with two or more coincident spectra. "L" corresponds to spectral types that have been determined only once or of which the various determinations indicate that it is not well known (either because there is disagreement in the literature or there are acknowledged doubts about the spectral type itself). Finally, "N" was assigned to spectral types with no luminosity class or when very different luminosity classes were given The indexes "H", "M", "L" and "N", are in order of decreasing quality.

The spectral types were obtained from Andrews (1968); Bigay, Garnier, Georgelin and Georgelin (1972); Conti (1973*a*, *b*; 1974); Conti and Alschuler (1971); Crampton (1971); Crampton, Leir and Younger (1973); Crawford, Barnes and Golson (1971*a*, *b*); Crawford, Barnes, Hill and Perry (1971); Drilling (1972); Feinstein, Marraco and Muzzio (1973); Georgelin and Georgelin (1970); Georgelin, Georgelin and Roux (1973); Glaspey (1971); Graham (1970); Havlén (1972); Humphreys (1970, 1973); Jaschek, Conde and Sierra (1964); Landolt (1970); Lesh (1968, 1972); McCuskey, Pesch and Snyder (1974); Miller (1972); Moffat and Vogt (1973); Morton (1969); Schild, Hiltner and Sanduleak (1969); Schild, Neugebauer and Westphal (1971) and Walborn (1971, 1972, 1973*a*, *b*).

e) *Distance*

The assigned distance is followed in Table 1 by a quality index. In the case of stars that are members of clusters of known distance, we adopted for the stellar distance the corresponding cluster's distance, as given in Table 2.

To compute the distance for the rest of the stars we used the calibration of the intrinsic photometric characteristics listed in Table 3. The absolute visual magnitudes were derived from data given by Conti and Alschuler (1971) and Walborn (1972), and the intrinsic colors from Weaver and Ebert (1964). For the computation of the distance, the stars that have been classified as Of by Conti were assumed to be of luminosity class I, and those that have no luminosity class available, were assumed to be of class V.

For stars with photometric data and luminosity class, we used the calibration of Table 3 [assuming the normal reddening law, $A_v = 3\,E(B-V)$] to derive their distances. The quality index for the distance computed depends on the quality indexes of the magnitude and spectral type. A summary of the criteria used for the distance index is presented in Table 4A.

In order to compute the reddening for stars that only had photographic magnitude we assumed an absorption of 1 mag kpc^{-1} and a visual magnitude as follows

$$m_V = 0.11 - (B-V)_{obs} + m_p, \qquad (1)$$

as given by Allen (1973). The distance, assuming again $A_v = 3\,E(B-V)$, is then given by the implicit equation

TABLE 2

DISTANCE TO CLUSTERS*

Cluster or Association	Distance (kpc)
h and χ Persei	2.28
Perseus 2	0.40
Orion 1	0.46
Gemini 1	1.38
Monoceros 2 (NGC 2244)	1.51
Monoceros 1 (NGC 2264)	0.79
ζ Puppis	0.46
NGC 6193	1.36
Hogg 22 (OCI-981)	2.78
Scorpius 1	2.00
Pişmiş 24 (OCI-1016)	2.09
Sagittarius 1 (NGC 6530)	1.59
Sagittarius 4	2.19
Lacerta 1	0.53
Cepheus 5	0.72

* From Conti and Alschuler (1971); Moffat and Vogt (1973).

TABLE 3

ADOPTED MAGNITUDES AND INTRINSIC COLORS

	V		IV		III		II		Ib		I		Ia	
	M_v	B—V	M_v	B—V	M_v	B—V	M_v	B—V	M_v	B—V	M_v	B—V	M_v	B—V
O3	—6.6	—.32	—6.7	—.32	—6.7	—.32	—6.7	—.32	—6.8	—.32	—6.9	—.32	—7.0	—.32
O4	—6.2	—.32	—6.3	—.32	—6.3	—.32	—6.4	—.32	—6.5	—.32	—6.5	—.32	—7.0	—.32
O5	—5.8	—.32	—5.9	—.32	—6.0	—.32	—6.25	—.32	—6.25	—.32	—6.4	—.32	—7.0	—.32
O5.5	—5.5	—.32	—5.7	—.32	—5.8	—.32	—6.0	—.32	—6.2	—.32	—6.3	—.32	—7.0	—.32
O6	—5.3	—.32	—5.5	—.32	—5.8	—.32	—5.9	—.32	—6.0	—.32	—6.3	—.32	—7.0	—.32
O6.5	—5.0	—.32	—5.3	—.32	—5.5	—.32	—5.8	—.32	—6.0	—.32	—6.3	—.32	—7.0	—.32
O7	—4.8	—.32	—5.3	—.32	—5.5	—.32	—5.8	—.32	—6.0	—.31	—6.4	—.31	—7.0	—.31
O7.5	—4.6	—.32	—5.2	—.32	—5.5	—.32	—5.8	—.32	—6.0	—.30	—6.4	—.30	—7.0	—.30
O8	—4.5	—.31	—5.1	—.31	—5.5	—.31	—5.8	—.31	—6.0	—.29	—6.6	—.29	—7.0	—.29
O8.5	—4.4	—.31	—5.0	—.31	—5.5	—.31	—5.8	—.31	—6.0	—.28	—6.6	—.28	—7.0	—.28
O9	—4.3	—.31	—5.0	—.31	—5.5	—.31	—5.8	—.31	—6.0	—.28	—6.7	—.28	—7.0	—.28
O9.5	—4.2	—.30	—4.5	—.30	—5.5	—.30	—5.8	—.30	—6.0	—.25	—6.7	—.25	—7.0	—.25

TABLE 4

KEY FOR THE QUALITY INDEXES

A) DISTANCE

Index	Spectral Index	Magnitude Index	Distance Determination
A	...	...	from cluster
B	H	blank or C	photometric
C	H	V or M	photometric
D	M	blank or C	photometric
E	M	V or M	photometric
F	L	blank or C	photometric
G	L	V or M	photometric
H	H	P	(A_v = 1 mag/kpc)
I	L	P	(A_v = 1 mag/kpc)
J	M	P	(A_v = 1 mag/kpc)
K	N	blank or C	(luminosity class V)
L	N	V or M	(luminosity class V)

B) RADIAL VELOCITY

Index	ε_{max} (km s^{-1})	CONSTANT VELOCITY STARS n_{min}	$[\sigma_0 N^{-1/2}]_{max}^{*}$ (km s^{-1})	$[\sigma n^{-1/2}]_{max}^{\dagger}$ (km s^{-1})	VARIABLE VELOCITY STARS n_{min}	$[A n^{-1/2}]_{max}$ (km s^{-1})
A	4	6‡	5	...	...	...
B	6	4	6	4.6	6	15
C	9	3	12	10	5	25
D	20	2	30	20	4	60

* $N > 1$
† $N = 1$
‡ $n_f > 2$ in at least two determinations

$$0.11 - (B - V)_i + m_p - M_v + 5 = 5 \log d + \frac{4}{3}\frac{d}{1000}, \quad (2)$$

where d is the distance of the stars in parsecs, m_p the observed photographic magnitude, and $(B - V)_i$ and M_V the intrinsic color index and absolute magnitude of the star, both of them being determined by its spectral type.

f) *Radial Velocity*

The heliocentric radial velocities are listed in column 14 of the CGO. For almost every star, the original sources were consulted in order to obtain the observed velocity directly and to establish its quality. We will describe now the criteria that have been followed to obtain the listed velocities:

(i) for stars of constant velocity.

The stars for which no conclusive evidence of large velocity variations exists (≤ 35 km s^{-1}) were considered as being of constant velocity. Among these there is a significant fraction of stars with velocity variations difficult to establish owing to their very wide spectral lines and to the lack of information about internal errors. The adopted radial velocity for each of these stars is the weighted mean of all the velocity determinations found in the literature. This weight is dependent on the number of plates used in the determination; objective prism plates were given half weight.

(ii) for variable velocity stars.

We assumed that all variable velocity stars are spectroscopic binaries in the understanding that such variability may be due to causes other than multiplicity, such as observational errors arising from very ill-defined spectral lines. Instabilities in the outer atmosphere of supergiants may also contribute to variations in the observed stellar velocity. This is particularly important in extreme Of stars, where in at least one of them (HD 152408), variations of about 40 km s^{-1} are observed amongst the ions of low degree of ionization, strongly suggesting that the variability is not due to multiplicity (Hutchings 1968). Nevertheless, the restriction of velocity variations larger than 35 km s^{-1} for a star to be classified as a variable velocity star in this catalogue, allows us to expect that most of them are indeed spectroscopic binaries. More observations are required for these stars in order to ascertain the character of their velocity variations.

The listed velocity corresponds to our estimate of the systemic velocity. Two methods were used to estimate the systemic velocity: *a*) the mean of the maximum and minimum velocities; *b*) the average of all the observations. Both methods yielded very similar velocities and there were only a few cases in which they differed by more than 10 km s^{-1}. A weighted average of both methods was adopted; method (*a*) was given more weight in those cases with very few measurements, and method (*b*) was preferred when a large number of measurements was available or when single-plate measurements were not published. All the plates were given equal weight, except those obtained with an objective prism, which were given half weight. All the stars in this group are denoted in the Remarks of the CGO (column 22) by the "VVAR" symbol.

We consider that method (*a*) is valid because of the following reasons: the velocity of the center of mass, v_0, the maximum and minimum velocities, v_{max} and v_{min}, are related by

$$v_0 = \frac{v_{max} + v_{min}}{2} - K\ e\ \cos\omega\ ; \qquad (3)$$

where $2K = v_{max} - v_{min}$ is the amplitude, e is the eccentricity of the orbit, and ω is the longitude of the ascending node. It is well known that early-type spectroscopic binaries have, in general, very small eccentricities (the average eccentricity of the twenty-two O-type spectroscopic binaries, contained in this catalogue, with well known orbital elements, is 0.17), so it follows that

$$v_0 \simeq \frac{v_{max} + v_{min}}{2}.$$

Moreover, it can be easily shown that in the case of a circular orbit, the probability of observing a radial velocity within the intervals (v_0 + 0.7K, v_0 + K) and (v_0 − 0.7K, v_0 − K) is 0.5. Consequently, even with few measurements of the radial velocity, an approximate value of the amplitude and systemic velocity is derived if the orbital eccentricity is small.

We assigned a quality index to the adopted velocity of each star. In groups (i) and (ii) this quality index was based upon: the number, N, of independent determinations; the total number of plates, n_i, used for each determination; the total number of plates for the star, $n = \sum n_i$; and the velocity range, A, for stars of variable velocity. In Table 4B the criteria for the assigned quality index for the velocity are given. In this table we have defined σ as the standard deviation from the mean for a single published determination of the velocity ($N = 1$, $n > 2$), σ_0 as the standard deviation from the weighted mean of all the published independent determinations, and ϵ as the estimated absolute error in the adopted radial velocity. Index "E" was given when none of the requirements in Table 4B is fulfilled or in the case when there is no way of assessing the error in the determination.

(iii) Spectroscopic binaries with known orbital elements.

For these stars the adopted velocity is the systemic velocity as given by Batten (1967), Pédoussaut and Ginestet (1971), and Pédoussaut and Carquillat (1973), whenever available. For the few stars that have only preliminary orbits, the preliminary systemic velocity was adopted, disregarding all other published data. In either case the symbol "SB ORB" appears in the Remarks of the CGO (column 22).

The quality index assigned to the adopted velocity of the stars in this last group was the same given by Batten (1967) whenever he listed the star. This index refers to the quality of the orbital elements as a whole; hence, in the very few cases where the quality according to Batten (1967), was "E", we changed it to "D" unless the orbit was a provisional one. All other spectroscopic binaries with known orbital elements were assigned qualities according to the velocity range of the primary component and the precision given for their orbital elements.

The radial velocity data we used was mostly taken from the references listed by Abt and Biggs (1972). Information was also obtained from the catalogue by Wilson (1953). Additional references used are: Abt (1973); Abt, Levy and Gandet (1972); Crampton (1972); Garmany (1973); Hill (1971); Humphreys (1973); Lynga (1970); Roslund (1968); Thackeray, Tritton and Walker (1973); and for stars in NGC 6611, R. J. Trumpler as cited by Walker (1961).

g) *Kinematical Parameters*

The heliocentric radial velocities, v_r, of the stars were reduced to the LSR assuming the solar motion obtained by Woolley, Epps, Penston and Pocock (1970) from the local stars; namely, $u_\odot = 10$ km s^{-1}, $v_\odot = 10$ km s^{-1}, and $w_\odot = 7$ km s^{-1} (where $u_\odot$ is directed toward the galactic centre, $v_\odot$ toward the direction of galactic rotation and $w_\odot$ toward the northern galactic pole).

The projected position was also used to determine the angular velocity of the circular orbit; i.e., we assumed the circular velocity to be constant along cylinders centered at the galactic center. The radial component of the circular velocity is given by

$$v_{cr} = R_0(\Omega(R) - \Omega_0)\sin l \cos b, \qquad (4)$$

where R_0 is the distance from the Sun to the galactic centre, Ω_0 is the angular velocity of an object moving on a circular orbit of radius R_0, and R is the distance from the galactic centre to the projection of the star in the galactic plane. $\Omega(R)$ was calculated from

$$R\,\Omega(R) = 250 + 4.05\,(10 - R) - 1.62 \times (10 - R)^2, \text{ for } R < 10, \qquad (5)$$

and

$$R\,\Omega(R) = 885.44\,R^{-1/2} - 30\,000\,R^{-3}, \text{ for } R > 10; \qquad (6)$$

where $\Omega(R)$ is given in km s^{-1} kpc^{-1} and R is given in kpc. These equations were taken from Burton (1971). Finally, we adopted for the Sun's position $R_0 = 10$ kpc and $\Omega_0 = 25$ km s^{-1} kpc^{-1}.

The radial component of the peculiar velocity of the star was defined as

$$v_{pr} = v_{LSR} - v_{cr}\,. \qquad (7)$$

h) *Association to H II Regions*

We also present in Table 1 the H II regions associated with the stars included in our catalogue. Each star in the catalogue north of declination $-33°$ was identified on the prints of the *Palomar Sky Survey.* A star projected inside an H II region is designated by "I" (for inside), followed by the number of the catalogue of H II regions by Marsalková (1974) denoted by "MA". When the star is outside an H II region it is designated by "O" (for outside).

Some of the stars outside of H II regions were close enough to be considered as possibly being related to an H II region. The Marsalková number of the associated region is also listed. We have also indicated the proximity to an H II region by "X", "Y" and "Z", which correspond to a projected angular distance to the boundary of the H II region, ϕ, in the following manner: "X" for $\phi < 0\overset{\circ}{.}5$, "Y" for $0\overset{\circ}{.}5 < \phi < 1°$ and "Z" for $\phi > 1°$. We found a few stars inside or near H II regions which were not listed by Marsalková. The associated regions of these stars, recorded in other catalogues, are given in the notes.

We have also designated by "CYG", stars that were located inside the Cygnus Nebula and probably connected with it. (Nebula S109 of Sharpless [1959]). When a supernova remnant appears projected near an H II region or an O star, the number in Downes' (1971) catalogue of possible supernova remnants, is given in the notes.

i) *Remarks*

Stars with known or suspected radial velocity variability are listed in the following manner:

"VVAR", velocity variable, followed in parenthesis by the velocity range computed by us from all single-plate measurements available or given in the source; "VVAR?", suspected velocity variable, generally with scant information from which to definitively conclude its variability (a question mark in parenthesis implies that no single measurements were available to us and that, in the sources consulted, the velocity variability was stated with no mention as to its range). Spectroscopic binaries are listed in the following manner: "SB ORB" denotes a spectroscopic binary, single or double lined, with known orbital elements; "SB ORB?" stands for a spectroscopic binary with preliminary or provisional orbital elements; "SB" is for reportedly double lined spectroscopic binaries. A number in square brackets following any of these symbols denotes the magnitude difference between the two components, according to Conti and Alschuler (1971) or Petrie (1950), or as quoted by Batten (1967); the number in parenthesis that sometimes follows "SB ORB" or "SB", is the relative radial velocity of the components (in km s^{-1}), as given in the sources or as estimated by us; "SB?" corresponds to suspected double lined spectroscopic binaries, as noted by the observers. Visual binaries whose magnitudes were corrected for the contribution of the bright, nearby component, are denoted by "VB", followed, in brackets, by the difference in magnitude between the components; this difference has been used to obtain the magnitude listed in column 7 of the CGO. The eclipsing binaries are denoted by the "EB" symbol, followed in brackets by the depth of the primary eclipse in magnitudes.

III. IONIZATION OF THE LDIM

In Paper I the flux of photons available to ionize hydrogen, from OB stars not contained in dense H II regions, was obtained. In this paper we decided to compute this flux again for the following reasons: the number of O stars contained in our catalogue is considerably larger than that contained in the catalogue of Blanco *et al.*, (1968) and for many stars the data presented in this paper are of higher quality than those used in Paper I.

a) *Stars Inside and Outside Dense H II Regions*

In Table 5 we present the number of O stars inside and outside the H II regions detectable on the *Palomar Sky Survey* prints, altogether 370 objects.

TABLE 5

O STARS OUTSIDE OF DENSE H II REGIONS

Spectral Type	N_{in}	N_{out}	$\frac{N_{out}}{N_{in+out}}$
O3 – O5.5	20	9	0.31
O6 – O6.5	25	12	0.32
O7 – O7.5	35	25	0.42
O8 – O8.5	29	34	0.54
O9	46	42	0.48
O9.5 – O9.7	42	51	0.55
O3 – O9.7	197	173	0.47

b) *Luminosity Function*

From the data of Table 1 we obtained the observed number of stars within a sphere of radius r, for each spectral type, $\sum(\mathrm{Sp}, r)$, and compared it with the expected number of stars (description follows), $\sigma(\mathrm{Sp}, r)$; from this comparison the stellar density in the plane of the galaxy, $\Phi_0(\mathrm{Sp})$, was derived. Under the assumption that the stellar density decreases exponentially with the distance perpendicular to the galactic plane

$$\Phi(\mathrm{Sp}) = \Phi_0(\mathrm{Sp}) \exp -|z|/H, \quad (8)$$

the expected number of stars within r is given by

$$\sigma(\mathrm{Sp}, r) = \Phi_0(\mathrm{Sp})\, 2\pi a\, r^3\{1 - 2a^2 + 2a \times (1 + a) \exp -a\}, \quad (9)$$

where $a = H/r$.

From the data of Table 1, from expression (9) and for a scale height of $H = 78$ pc we have derived $\Phi_0(\mathrm{Sp})$ and given it in Table 6. A discussion on the scale height is presented in the next section.

Since the number of stars per unit area in a column perpendicular to the galactic plane, $S(\mathrm{Sp})$, is not sensitive to the adopted scale height, this quantity is also presented in Table 6. The number of stars per unit area is given by

$$S(\mathrm{Sp}) = \int_{-\infty}^{+\infty} \Phi(\mathrm{Sp})\, dz\, 2\, H\, \Phi_0\, (\mathrm{Sp}). \quad (10)$$

The stellar density was obtained for stars of each spectral type. It included objects of all luminosity

TABLE 6

LUMINOSITY FUNCTION AND UV LUMINOSITY

Spectral Type	Φ_0(Sp) (10^{-8} pc^{-3})	S(Sp) (10^{-6} pc^{-2})	$\mathcal{L}_H$(Sp) (10^{40} pc^{-3} s^{-1})
O3 – O4	.13:	.20:	....
O5 – O5.5	.45:	.68:	7.65
O6 – O6.5	1.3	2.0	6.04
O7 – O7.5	2.0	3.0	7.12
O8 – O8.5	2.2	3.3	6.67
O9	3.1	4.7	3.81
O9.5 – O9.7	3.6	5.5	6.73
O3 – O9.7		$A_H = 3.80 \times 10^{41}$ pc^{-3} s^{-1}	

classes. The reason for including all classes is that the luminosity classification is rather uncertain for early type stars.

From the comparison of the observed number counts with the predicted ones from equation (9), it is apparent that the sample is reasonably complete up to distances of approximately 2500 pc.

c) *Stellar Hydrogen Ionizing Luminosity*

We computed the flux of photons more energetic than $h\nu_1 = 13.6$ eV for each spectral type and luminosity classes I, III and V. In order to do it, we used the effective temperature scale given by Conti (1973*b*) and the bolometric correction calibration with effective temperature given by Morton (1969). No attempt was made to correct for changes in the bolometric correction due to different values of log g. The hydrogen ionizing photon flux, F_H (in photons cm^{-2} s^{-1}) was derived from the emergent fluxes of the model atmospheres by Mihalas (1972)

$$F_H = \int_{\nu_1}^{\infty} \pi F_\nu \, d\nu \,, \qquad (11)$$

where πF_ν is the emergent flux (in photons cm^{-2} s^{-1} hz^{-1}). The hydrogen ionizing luminosity (in photons s^{-1}) is given by $L_H = 4\pi R_*^2 F_H$. We adopted log g equal to 4.0, 3.8 and 3.3 for luminosity classes V, III and I, respectively. The effective temperature, bolometric correction, hydrogen ionizing photon flux and luminosity for each spectral type and luminosity are presented in Table 7.

TABLE 7

ADOPTED STELLAR PARAMETERS

		T_e (°K)	B. C.	F_H (10^{24} cm^{-2} s^{-1})	L_H (10^{49} s^{-1})
	V	55 000	−4.78	7.94	16.6
O3	III	52 500	−4.61	7.08	16.7
	I	50 000	−4.45	6.94	20.6
	V	50 000	−4.45	5.01	7.82
O4	III	47 500	−4.28	4.37	7.84
	I	45 000	−4.24	3.63	4.14
	V	47 000	−4.11	4.17	9.56
O5	III	44 500	−4.06	3.09	4.46
	I	42 500	−3.89	3.09	6.63
	V	42 000	−3.85	1.95	1.53
O6	III	40 000	−3.69	1.66	1.81
	I	38 000	−3.52	1.51	3.70
	V	38 500	−3.57	1.12	.610
O7	III	37 000	−3.45	.977	1.06
	I	35 000	−3.27	.955	2.52
	V	36 500	−3.41	.776	.342
O8	III	34 500	−3.23	.575	.676
	I	33 000	−3.12	.603	2.10
	V	34 500	−3.23	.457	.178
O9	III	32 500	−3.08	.316	.411
	I	31 000	−2.98	.347	1.50
	V	33 000	−3.12	.269	.103
O9.5	III	31 500	−3.02	.214	.298
	I	30 000	−2.89	.251	1.14

d) *Ionization of the Low Density Interstellar Medium*

We are interested in evaluating Λ_H, the rate of production of hydrogen ionizing photons that are not trapped in dense H II regions and are free to ionize the low density interstellar medium. In the plane of the galaxy

$$\Lambda_H = \sum_{Sp} \mathcal{L}_H(Sp) \,,$$

where

$$\mathcal{L}_H = \frac{N_{out}}{N_{in+out}} \Phi_0(Sp) \frac{<|z|>_{in+out}}{<|z|>_{out}} \times \sum_l L_H(Sp, l) \; f(Sp, l) \,. \qquad (12)$$

In these expressions N_{out}/N_{in+out} is the fraction of stars outside dense H II regions, it is given in Table 5 for each spectral type; the factor $<|z|>_{in+out}/<|z|>_{out}$ is introduced to take into account the different scale heights of the whole sample and that of the stars outside of dense H II regions, it is given

TABLE 8

MEAN DISTANCE TO THE GALACTIC PLANE*

Spectral Type	$<\|z\|>_{in}$ (pc)	$<\|z\|>_{out}$ (pc)	$<\|z\|>_{in+out}$ (pc)	$<\|z\|>_{total}$ (pc)
O3 – O5.5	58	99	71	59
O6 – O6.5	37	84	50	46
O7 – O7.5	44	89	62	63
O8 – O8.5	59	92	76	72
O9	60	120	89	75
O9.5 – O9.7	61	124	94	89
O3 – O9.7	54	108	78	73

* Objects with $|z| > 400$ pc were not included.

in Table 8; $L_H(Sp, l)$ is the luminosity of stars of spectral type Sp and luminosity class l, as given in Table 7; and $f(Sp, l)$ is the fraction of stars of each luminosity class for a given spectral type contained in a sphere of radius 2500 pc.

We have derived a value of $\Lambda_H = 3.80 \times 10^{41}$ photons pc^{-3} s^{-1}, with energy greater than 13.6 eV, produced by normal O stars, being free from dense H II regions (1.29×10^{-14} photons cm^{-3} s^{-1}).

To consider the contribution of B stars to Λ_H we will use the results of Paper I, where it was found that about 5% of the ionization of the LDIM is due to early type B stars. Consequently, from our results for O stars and those of Paper I for B stars, we have $\Lambda_{H_0}(OB) = 4.0 \times 10^{41}$ photons pc^{-3} s^{-1}, in very good agreement with Paper I.

The number of recombinations per unit time and unit volume is given by $N_e^2\alpha_B$, where α_B is the effective recombination coefficient to all levels except the first; for case B and $T_e = 10\,000$°K, $\alpha_B = 2.585 \times 10^{-13}$ cm^3 s^{-1} (Burgess and Seaton 1960). If we assume that in general, for all z

$$<N_e^2> = \Lambda_H/\alpha_B \qquad (13)$$

holds, then the scale height of the O stars outside H II regions (108 pc) and of the N_e^2 distribution will be the same and consequently

$$<N_e^2>_0 = 0.053 \text{ cm}^{-6}.$$

From this value we predict for the galaxy an emission measure in a direction perpendicular to the galactic plane

$$EM = \int_{-\infty}^{\infty} N_e^2(z)\, dz = 11 \text{ cm}^{-6} \text{ pc}$$

This value is slightly higher than that given in Paper I and partially reflects the higher scale height used in this paper for the stars outside dense H II regions.

In the cases of stars with a large flux of ionizing photons embedded in a medium of low hydrogen density, equation (13) breaks down and it is possible that a considerable fraction of the ionizing photons escape from the galaxy. Therefore the average electron density and the derived emission measure are upper limits to the real values. Without a knowledge of $N_H(z)$, particularly of the density fluctuations, it is not possible from our data to derive the fraction of ionizing photons that escape from the galaxy.

A fraction of the ionizing photons able to ionize the LDIM might be absorbed by dense H II regions near the plane of the galaxy. On the other hand, it is possible that a considerable fraction of the dense H II regions are density bounded and consequently that a fraction of the photons produced by stars inside dense H II regions are available to ionize the LDIM.

IV. RUNAWAY STARS

We will consider why about half of the O stars are outside dense H II regions. In Paper I it was suggested that the stars outside dense H II regions are ones of relatively high velocity which have escaped from their original H II region and that a fraction of these might correspond to the well known group of runaway stars. In this section we will examine the suggestion in more detail.

In Table 8 we present the mean distance to the galactic plane for the stars inside and outside dense H II regions. Those objects with $|z|$ values higher than 400 pc have not been considered; they represent about 5% of the sample and should be studied in more detail.

In this table, $< |z| >$ is given for stars inside and outside dense H II regions, the difference between the subscript (in + out) and (total) is that the former refers to data from north of declination −33°, while the latter refers to data from the whole sky. The values for $<|z|>_{in+out} \simeq <|z|>_{total}$, as is to be expected. On the other hand, from Table 8 it follows that $<|z|>_{out} \simeq 2 <|z|>_{in}$ for all the spectral types. This implies that the interstellar regions of high density are more concentrated to the plane than the O stars are as a group. In what follows we will discuss whether the O stars outside dense H II regions originated in dilute H II regions or if they escaped from dense ones.

From the peculiar velocities presented in our catalogue it is found that $<|v_{pr}|>_{in} = 14.6$ km s^{-1} while $<|v_{pr}|>_{out} = 22.9$ km s^{-1}. Here again, objects with z larger than 400 pc have not been considered. This result supports the idea that the O stars outside dense H II regions have abandoned their parental H II region; moreover those stars with peculiar velocities in the plane of the galaxy might be inside a dense H II region which does not correspond to their original one.

TABLE 9

RADIAL COMPONENT OF THE PECULIAR VELOCITY*

Distance (kpc)	N_{stars}	$<\|v_{pr}\|>$ (km s^{-1})
0 − 1	30	20.7
1 − 2	110	16.8
2 − 3	157	19.1
3 − 4	34	13.4
4 − 5	22	19.8
5 − 6	8	13.6
0 − 6	361	17.9

* Stars with $|z| > 400$ pc were not included.

In Table 9 we present the average radial peculiar velocity at different distance intervals from the solar neighborhood. It is clear that the average peculiar velocity is very uniform up to 6 kpc and consequently, that the different hypotheses and data that entered in our catalogue are still reliable to a distance of ~6 kpc. We have only six stars in the 6 to 11 kpc range with z smaller than 400 pc. The statistics in this range is no longer reliable.

In this paper we define a runaway star as an object with $|v_{pr}| \geq v_{min}$. Following Vitrichenko *et al.* (1965) we adopted for the limiting value of the velocity $v_{min} = 3\sigma$, where σ is the mean velocity dispersion in one direction, of the low velocity component of the distribution of space velocities. The value of σ is difficult to determine since errors in the distances and radial velocities, as well as the presence of a high velocity component of the velocity distribution, tend to increase the observed value of σ relative to its true value. This is particularly the case for O stars where the volume sampled is larger than for stars of other types. In the case of B0 stars, σ_1, σ_2 and σ_3 are equal to 11, 9 and 5 km s^{-1} respectively (Allen 1973). Therefore values of σ of about 10 km s^{-1} are valid for O stars.

This definition of a runaway star is well suited when only one component of the space velocity is known, which is our case since we are only considering the radial velocities of the O stars. The same definition has been applied by Vitrichenko *et al.* (1965) and also by Bekenstein and Bowers (1974), although they used $v_{min} = 36$ and 40 km s^{-1}, respectively. On the other hand Blaauw (1961) used as a criterion that the space velocity of the star is greater than 40 km s^{-1}. For comparison we have included in Table 12, the statistical properties of the sample of O high velocity stars for v_{min} equal to 30, 36 and 40 km s^{-1}.

In Table 10 we present a list of 72 O runaway candidates. We have included in the list all the objects with a peculiar radial velocity higher than 30 km s^{-1}. In column 1 the objects are identified according to our catalogue number (CGO); in column 2 the heliocentric radial velocity is given; in columns 3, 4 and 5, v_{c1}, v_{c2} and v_{c3} are given (these are the radial velocities expected for an object moving with circular motion around the center of the galaxy at heliocentric distances d/1.4, d and 1.4d, respectively); in column 6 the radial component of the peculiar velocity is presented; in column 7 we present a reliability index where an "A" is assigned if the star complies with the following three requirements: a) at d/1.4 and 1.4d the peculiar velocity is still higher than 30 km s^{-1}; b) the quality associated with the radial velocity is "D" or better and c) the quality associated with the distance is in the "A" to "F" range. All other objects are assigned a "B". In column 11 it is indicated whether the star is inside or outside dense H II regions and indications on the multiplicity of the system (velocity variability) are given in column 12.

TABLE 10

PROBABLE RUNAWAY STARS

CGO	V_r	V_{c1}	V_{c2}	V_{c3}	V_{pr}		d	z	Sp. Type	H II	Multiplicity	References
32	−102C	−23	−32	−44	−70	A	2.28A	−136	O6.5V	O		4
34	−127B	−23	−32	−43	−95	A	2.28A	−199	O7.0:	O		4
56	−63D	−23	−32	−43	−31	B	2.28A	45	O9.5I	I	VVAR(81)	
63	−68D	−24	−33	−44	−36	B	2.39D	44	O8.0V	I		
75	67A	−3	−3	−5	63	A	0.40A	−90	O7.5I	O		1, 3, 4
80	59A	−1	−2	−3	52	A	0.52B	−21	O9.5V	I		1, 2, 3, 4
91	−72C	−14	−18	−23	−61	A	4.55B	284	O8.5IB	O		
107	−31D	−5	−6	−8	−33	A	2.16B	121	O9.5III(N)	I	VVAR(120)	
109	109B	6	8	12	85	A	0.75B	−343	O9.0V	O		1, 3, 4
111	−8E	12	16	21	−37	B	2.84F	−293	O6.0V:[N]PE VAR	O	VVAR(>62)	
116	−18D	7	10	13	−40	A	1.50B	−52	O7.5V(N)	I	VVAR(80)	
149	6B	19	26	34	−34	B	1.94C	27	O8.5V	O		
155	5D	16	23	32	−32	B	1.64B	−154	O8.5IF	I	SB ORB	2
163	87D	31	44	60	30	B	3.33D	−250	O9.0III	O	VVAR(54)	
171	32D	35	49	68	−30	B	3.75K	24	O6.0:NN(E)	I	VVAR?(51)	
179	−24B	2	3	5	−40	A	0.46A	−37	O4.0I(N)F			2, 3
181	3D	20	29	43	−38	B	2.82K	−65	O.50E		VVAR(62)	
226	−35E	−10	−11	−10	−31	B	2.56C	44	O8.5V		SB(115:)	
227	−38C	−8	7	39	−52	B	6.82F	−242	O9.5II			3
238	44E	−9	−11	−13	48	B	1.76C	−18	O6.5V((F))		VVAR?	
251	−37E	−14	−10	3	−33	B	4.66B	−107	O9.5III			
275	−41C	−13	−16	−17	−31	B	2.50I	−70	O9.0III			
276	41E	−10	−13	−16	48	B	1.77I	−58	O9.5V			4
282	−41D	−10	−13	−16	−34	A	1.68D	−23	O9.0V			4
305	27E	−12	−16	−19	37	B	2.02I	−45	O9.0V			
338	24A	−15	−20	−27	42	A	1.63B	172	O8.5IAB(F)			
345	−102E	−7	−10	−14	−94	B	0.74D	2	O9.0VN		VVAR(98)	
349	−47C	−15	−20	−27	−31	B	1.74J	−482	O9.0III			
354	2B	−25	−34	−46	36	B	2.51D	80	O9.5I			2
356	−21C	−51	−60	−57	38	B	5.83D	−282	O9.5I			
362	−72D	−24	−34	−47	−37	B	2.37J	115	O7.5V		VVAR(87)	
365	15B	−73	−99	−98	118	A	7.31F	588	O9.0I			
366	−16D	−45	−64	−88	51	A	4.53D	−63	O9.0III			
369	0E	−20	−29	−42	33	B	2.28I	53	O9.0V			
373	54C	−14	−20	−28	78	B	1.57K	21	O8.0			
375	−32B	−61	−88	−111	61	A	6.34F	37	O9.5I(A)			
378	−28C	−36	−53	−82	31	B	4.43F	220	O9.5I(A)			
380	−53B	−7	−10	−14	−38	B	0.88L	−3	O6.5F			
386	23E	−11	−15	−21	43	B	1.36A	−37	O5.0III		VVAR(180)	
387	−2E	−30	−45	−68	48	B	3.77D	−54	O9.0III			

TABLE 10 (CONTINUED)

CGO	v_r	v_{c1}	v_{c2}	v_{c3}	v_{pr}		d	z	Sp. Type	H II	Multiplicity	References
393	−92D	−21	−31	−45	−56	A	2.78A	−55	O6.5IA(N)F+			
400	−65B	−12	−17	−25	−41	A	2.00A	67	O8.0IAF			
404	−104E	−16	−24	−35	−74	B	2.38K	−39	O8.5			
410	8D	−12	−17	−24	32	B	2.00A	59	O9.0III−IV((N))		VVAR(118)	
415	23E	−12	−17	−25	47	B	2.00A	41	O9.0III			
422	−140A	−12	−17	−24	−116	A	2.00A	52	O8.0IF			1, 2, 4
433	−57C	−114	−93	−24	41	B	11.75F	−1061	O9.5IA			
446	−46B	−3	−4	−6	−32	A	2.84B	289	O9.7IAB	O		
448	−54E	−10	−14	−20	−33	B	1.80B	−96	O9.5III		VVAR(189)	
456	59A	10	15	22	57	A	2.27B	523	O6.5III(F)	O		1, 4
457	42E	−2	−2	−3	54	B	1.09D	31	O9.5V	I	VVAR(244)	
460	106E	127	46	4	72	B	13.55F	1530	O9.5IA	O		
461	−72D	2	4	5	−65	A	1.80D	95	O8.0V	O		2
469	−27A	9	20	41	−37	B	7.87F	−357	O9.5I	O		
481	−23D	17	25	37	−35	B	2.64F	100	O9.0I	O	VVAR(>54)	2
484	−51C	12	17	24	−55	A	2.16B	−2	O6.0V((F))	I	VVAR(48)	
510	105B	6	9	13	107	B	2.59J	−284	O9.5II	O		
514	−14E	23	33	49	−34	B	2.97B	63	O5.5I	O		
522	54E	15	22	32	45	B	2.16K	−65	O7.0	O	VVAR(?)	2
531	43A	100	105	49	−49	B	10.09F	−352	O9.0I	O		
549	41D	13	14	13	40	A	3.01B	150	O6.5III	I		
550	43B	7	7	4	49	A	2.51B	270	O9.5III	O		
563	−60B	7	7	6	−55	A	2.24B	133	O5.5F	I		3
615	−97E	1	0	−2	−86	B	1.51K	55	O9.0V	O		4
618	26C	5	6	5	31	A	1.86C	−309	O9.5VN	O		
631	−74A	−5	−7	−10	−60	A	0.86B	39	O6.0I(N)FP	O		1, 2, 3, 4
635	−65E	−15	−22	−33	−36	B	2.43F	−74	O9.0V	O	VVAR(67)	
651	−84E	−19	−28	−41	−50	B	2.54F	−115	O9.5V	O		
655	−66D	−8	−12	−17	−49	B	1.06K	−15	O9.0	I	VVAR(66)	
658	−76D	−23	−32	−46	−38	B	2.66K	47	O8.0(F)	O		
659	−3E	−22	−31	−44	33	B	2.50D	−33	O9.5V	I		
661	−19E	−42	−59	−80	44	B	4.55F	3	O9.5II	O		

1) Blaauw (1961).
2) Vitrichenko, Gershberg and Metik (1965).
3) Feast and Shuttleworth (1965).
4) Bekenstein and Bowers (1974).

In column 13, previous references to runaway lists are given. It is clear that all the objects with a "B" in column 7 should be observed again to improve our knowledge of their distances and radial velocities and to decide if indeed they belong to the group of runaway O stars.

In Table 10 we find that 41 objects show negative radial components to the peculiar velocities while 31 show positive values. This might be a statistical fluctuation; but again, it might be due to a systematic effect. From an examination of the Of stars of all types we find that out of 13 objects in Table 10, ten show negative v_{pr}, while only three show a positive value. The tendency for negative values in the case of Of stars had been previously noted by Feast (1964) from a smaller sample. He considered the possibility that this result was due to a P Cygni profile effect in the spectral lines. However he was inclined to interpret the negative velocities as being due to the true stellar velocities. Moreover, he suggested that the higher fraction of runaway stars of the Of type could be due to their higher masses. From our catalogue we find that out of 386 O stars with radial peculiar velocities, 90 of them correspond to Of stars of all types and that from the 72 runaway candidates only 13 are Of stars. This result indicates that, if anything, the fraction of Of runaways, contrary to earlier results (Feast 1964; Feast and Shuttleworth 1965), is smaller than the average value for O stars. The $<v_{pr}>$ for the 90 Of objects is -4.2 km s^{-1}, and for the 77 non runaway candidates 0 km s^{-1}; which indicates that the P Cygni profile effect in most Of stars, if present, is very small, and that probably the velocity measurements of only very few objects are affected by it. It is clear that in the case of the 13 Of runaway candidates the radial velocities should be derived from lines not affected by P Cygni profile effects.

We have found four lists of OB runaway candidates in the literature: Blaauw (1961), Vitrichenko, Gershberg and Metik (1965), Feast and Shuttleworth (1965) and Bekenstein and Bowers (1974) comprising 9, 25, 10 and 15 O stars respectively; altogether 41 different O stars. According to our radial velocity criterion only 19 of them qualify as probable runaways (Table 10, column 13) and 22 of them do not; the latter are presented in Table 11, where the criterion used to propose them as runaway candidates is specified. It is clear that additional information on the distance and radial velocities is needed for the stars presented in Table 11, in particular for those proposed as runaways on the basis of their observed radial velocity.

Of the 72 objects in Table 10, 21 show signs of multiplicity (29%), while from the whole sample the fraction of variable velocity objects, probably variable velocity objects, and spectroscopic binaries is ~33%. However, of the 26 objects with an "A" in column 7 only 3 seem to be multiple (12%). Again, more observations are needed to verify these results. The presence of runaway multiple systems, if confirmed, presents serious problems to the mechanisms proposed to explain the runaway phenomenon (Ambartsumian 1955, Zwicky 1957, Blaauw 1961, Poveda *et al.* 1967) and it could imply the presence of collapsed companions (cf. Bekenstein and Bowers 1974). It is interesting to note that from the list of 55 OB runaway candidates by Bekenstein and Bowers, about 24% of them probably form part of multiple systems.

The number of stars from Table 10 with radial component of the peculiar velocity larger than v_{min} of 30, 36 and 40 km s^{-1} and $|z| \leq 400$ pc, is 67, 48 and 37, respectively. From these values, in what follows, we will derive the fraction of the galactic O stars that have peculiar space velocities, v, larger than v_{min} (runaway stars). Vitrichenko *et al.* found the following expressions to analyze the observed distribution of radial components of peculiar velocities larger than the limiting value, v_{min}

$$<|v_{pr}|> = v<|\cos\beta|> ,$$

$$<|\cos\beta|> = \frac{1}{4}\frac{(1-\cos 2\beta_{max})}{(1-\cos\beta_{max})}, \qquad (14)$$

$$\cos\beta_{max} = \frac{v_{min}}{v}, \qquad (15)$$

and

$$\frac{N_{rad}}{N_{sp}} = 1 - \cos\beta_{max} . \qquad (16)$$

In these relations v is the magnitude of the spatial velocity, β is the angle between the space velocity vector and the line of sight direction, β_{max} is the maximum angle sampled and N_{rad}/N_{sp} is the

TABLE 11
PROPOSED RUNAWAY O STARS BY OTHER AUTHORS

CGO	v_r (km s^{-1})	v_{pr} (km s^{-1})	d (kpc)	z (pc)	Spectral Type	H II	Mult.	Source*	Criterion†
9‡	−70D	−26	3.03B	65	O7.0 If	O		3,4	RV
43	−53C	−21	2.28A	−70	O5.5 f	O	VVAR	3	RV
50	−47D	−15	2.28A	36	O5.0 III(f)	I		3	RV
78	7A	20	1.07B	260	O9.5 I	O		1,4	SV
180	39B	5	2.21B	−78	O9.7 Ib			2	PM
208	3C	−1	1.27J	99	O9.5 V			2	PM
225	−10C				O7.0			2	PM
256§	−9C	−1	3.06B	−48	O5.0 III(f)var			2	PM
266	−27B				O9.0 V,B0 I			2	PM
312	−4D	8	1.89C	−53	O6.0 V		SB	2	PM
334	−7C	19	2.77B	21	O9.5 III			2	PM,RV
363	7D	21	0.91C	−46	O7.5 III ((f))		SB ORB	2	RV
364	−3A	14	1.12B	−52	O7.5 III ((f))			2	RV
381	6A	25	1.30B	57	O9.7 Iab			2	RV
384	−15D	−2	0.15B	60	O9.0 V	I	VVAR?	1,4	SV
429	−3C	20	2.00A	56	O6.5 III(f)			2	RV
518	−11C	−13	1.28G	−27	O9.0:V	O		2	PM
534	29D	26	1.20E	71	O8.0 V	O	SB ORB	2	RV
547	−6A	4	2.32B	407	O9.5 I	O		2	PM
595	−27C	−18	1.21B	63	O9.5 I	I	VVAR	2	PM
617	6C	4	1.18C	−6	O6.5 III	I	SB ORB	2	PM
620	−2C	8	0.53B	−36	O8.0 V	I	VVAR	1,4	SV

* Same as in Table 10.
† RV = radial velocity, SV = space velocity and PM = proper motion.
‡ CGO9 shows a P Cyg profile in H lines up to H10 (Conti and Alschuler 1971). Four objective prism plates taken at Haute Provence yield a radial velocity 63 km s^{-1} more negative than the average Mt. Wilson and Victoria velocities (average of 17 plates); hence the poor quality assigned to the velocity adopted.
§ There is a misprint in source (2) they give HD 92275 instead of HD 95275.

ratio of the number of stars having $|v_{pr}| > v_{min}$ to the total number of stars with $v > v_{min}$.

The deduction by Vitrichenko *et al.* is valid only for a velocity distribution that is isotropic and single-valued, as we show below.

In the case of an isotropic distribution of spatial velocities, $f(v)$, we have

$$\int_{v_{min}}^{\infty} f(v)\, dv = 1$$

and

$$<|v_{pr}|> = \int_{v_{min}}^{\infty} v\, f(v) <|\cos \beta(v)|> dv. \quad (17)$$

Here the average angle and the maximum angle depend on the spatial peculiar velocity

$$<|\cos \beta(v)|> = [1 + \cos \beta_{max}(v)]/2 \quad (18)$$

where

$$\cos \beta_{max}(v) = v_{min}/v\,. \quad (19)$$

From equations (17) to (19)

$$<|v_{pr}|> = \int_{v_{min}}^{\infty} v\, f(v)\,(1 + v_{min}/v)\, dv \quad (20)$$

and solving these equations we have

$$<v> = 2<|v_{pr}|> - v_{min}\,. \quad (21)$$

Finally, the ratio N_{rad}/N_{sp} is given by

$$\frac{N_{rad}}{N_{sp}} = \int_{v_{min}}^{\infty} [1 - \cos \beta_{max}(v)]\, f(v)\, dv =$$
$$= 1 - v_{min} <v^{-1}> \geq 1 - v_{min}/<v>\,. \quad (22)$$

From relation (22) it is clear that the total number, N_{sp}, derived from equation (16) by Vitrichenko *et al.*, is only an upper limit to the true number of stars with spatial peculiar velocity larger than v_{min}.

In Table 12 we present the statistical properties of the high velocity sample of Table 10. Column 2 shows the total number of stars in the high velocity sample with $|v_{pr}| \geq v_{min}$ and column 3 the mean value of $|v_{pr}|$. Stars with $|z| > 400$ pc were not considered. Column 4 presents the value of $\cos \beta_{max}$ for each case, as given by equation (14). The next column shows the estimate of the mean value of the space velocity of the sample, as given by equation (21). Column 6 is N_{sp}, the estimate of the total number of stars with spatial peculiar velocity $v > v_{min}$, as given by equation (15). The final column shows the fraction of runaway stars in the total sample. To compute this fraction we used the total number of O stars from Table 1 for which we have available the radial component of the peculiar velocity and that have $|z| \leq 400$, namely 361 objects.

As we showed before, this fraction is only an upper limit to the true value. Moreover, errors in the radial component of the peculiar velocity tend to increase the estimated number of runaway candidates, over the true value.

V. CONCLUSIONS

We have determined the luminosity function of the O stars in the solar neighborhood. From the fraction of O stars outside dense H II regions we find that they can maintain an average ionization in the galactic plane $<N_e^2>_0 = 0.053$ cm^{-6} and an emission measure from the Sun in the direction of the galactic pole of 5.5 cm^{-6} pc. These results

TABLE 12
STATISTICAL PROPERTIES OF THE HIGH VELOCITY SAMPLE*

v_{min} (km s^{-1})	N_{rad}	$\langle \lvert v_{pr} \rvert \rangle$ (km s^{-1})	$\cos \beta_{max}$	$\langle v \rangle$ (km s^{-1})	N_{sp}	Fraction of Runaway stars (%)
30	67	47.3	.464	64.6	125	35
36	48	54.6	.492	73.2	94	26
40	37	58.2	.524	76.4	78	22

* Stars with $|z| > 400$ pc have not been included.

are in good agreement with those presented in Paper I, and imply that O stars might be responsible for most of the ionization of the LDIM. It should be mentioned that these values were derived by assuming that all the ionizing photons were absorbed in the galaxy and consequently correspond to upper limits.

The $<|z|>$ values for O stars inside and outside H II regions are 54 and 108 pc, respectively. The $<|v_{pr}|>$ for objects inside H II regions is 14.6 km s^{-1} while for those outside, it is 22.9 km s^{-1}. These results imply that the main reason for a substantial fraction of the O stars being outside dense H II regions is the velocities of the O stars and not the expansion of the H II regions nor the formation of O stars in low density regions. Moreover, it is reasonable to identify statistically the runaway candidates with the O stars outside H II regions since their $<|z|>$ value is identical and, of the proposed runaway stars, only 33% are inside H II regions, while for the whole sample 53% are inside.

It is interesting to note that $<|v_{pr}(d)|>$ averaged over 1 kpc distance intervals remains practically uniform up to distances of 6 kpc, which implies that the radial component of the peculiar velocities given in Table 1 are statistically reliable up to that distance.

Out of 386 objects for which we have available the radial component of the velocity, 72 of them have $|v_{pr}| \geq 30$ km s^{-1} and we have proposed them as runaway candidates. It is estimated that 20 to 30% of all the O stars are runaways, with an average spatial peculiar velocity around 70 km s^{-1}.

We do not find a preference for Of stars being runaways. There is a small tendency for the Of stars to have negative radial components of the peculiar velocity: $<v_{pr}>$ is equal to -4 kms s^{-1} for the 90 O stars with Of characteristics and -7 km s^{-1} for the 44 O stars with extreme Of characteristics. The eight runaway candidates with extreme Of characteristics have negative v_{pr}. Without considering these eight stars the tendency for negative v_{pr} values dissapears in the Of sample.

We have divided the runaway candidates in two groups: those that have a higher probability of being runaways (reliability index "A") and those more uncertain (reliability index "B"). Of the first group, only 12% show signs of multiplicity while for the non-runaway candidates the fraction is about 33%. Moreover it is found that only 2 of the runaway candidates (3%) are spectroscopic binaries, probable spectroscopic binaries or visual binaries while the fraction in the total sample is 12%. These are statistical arguments in favor of the single nature of runaway stars.

Our catalogue is mainly aimed at observers and we suggest that at least the following projects should be undertaken:

a) To determine luminosity types and radial velocities where these values are still undetermined.

b) To study the emission measure around those objects outside dense H II regions with detectors sensitive to an emission measure lower than 50 cm^{-6} pc.

c) To verify the runaway nature of those objects with $v_{pr} \geq 30$ km s^{-1}. In particular, to study the importance of possible P Cygni effects in the radial velocity determination for some of them.

d) To establish whether or not those runaway candidates which seem to have variable velocity are indeed runaways. This observational program might provide clues for the study of the runaway mechanism. Consideration should be given to the suggestion (cf. Bekenstein and Bowers 1974) that some of their companions might be black holes.

We intend to revise the Catalogue of Galactic O Stars (Table 1) every six months. We would appreciate any data from observers relevant to Table 1. The updated version of the CGO will be available on request.

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REFERENCES

Abt, H. A. 1973, *Ap. J. Suppl.*, **26**, 365.
Abt, H. A. and Biggs, E. S. 1972, *Bibliography of Stellar Radial Velocities* (Tucson: Kitt Peak National Obs.).
Abt, H. A., Levy, S. G. and Gandet, T. L. 1972, *A. J.*, **77**, 138.
Allen, C. W. 1973, *Astrophysical Quantities*, (London: The Athlone Press), p. 254.
Ambartsumian, V. A. 1955, *The Observatory*, **75**, 72.
Andrews, P. J. 1968, *M.N.R.A.S.*, **72**, 35.

Batten, A. H. 1967, *Publ. Dom. Ap. Obs.*, **13**, 119.
Bekenstein, J. D. and Bowers, R. L. 1974, *Ap J.*, **190**, 653.
Bigay, J. H., Garnier, R., Georgelin, Y. P. and Georgelin, Y. M. 1972, *Astron. Asthophys.*, **18**, 301.
Blaauw, A. 1961, *B.A.N.*, **15**, 265.
Blanco, V. M., Demers, S., Douglass, G. G. and Fitzgerald, M. P. 1968, *Publ. U. S. Naval Obs.*, Second Series, Vol. **21**.
Burgess, A. and Seaton, M. J. 1960, *M.N.R.A.S.*, **121**, 471.
Burton, W. B. 1971, *Astron. Astrophys.*, **10**, 76.
Conti, P. S. 1973*a*, *Ap. J.*, **179**, 161.
Conti, P. S. 1973*b*, *Ap. J.*, **179**, 181.
Conti, P. S. 1974, *Ap. J.*, **187**, 539.
Conti, P. S. and Alschuler, W. R. 1971, *Ap. J.*, **170**, 325.
Crampton, D. 1971, *A. J.*, **76**, 260.
Crompton, D. 1972, *M.N.R.A.S.*, **158**, 85.
Crampton, D. Leir, A. and Younger, F. 1973, *Pub. Dom. Ap. Obs.*, **14**, 151.
Crawford, D. L., Barnes, J. V. and Golson, J. C. 1971*a*, *A. J.*, **76**, 621.
Crawford, D. L., Barnes, J. V. and Golson, J. C. 1971*b*, *A. J.*, **75**, 1058.
Crawford, D. L., Barnes, J. V., Hill, G. and Perry, C. L. 1971, *A. J.*, **76**, 1048.
Crawford, D. L., Barnes, J. V. and Warren, W. H. Jr. 1974, *A. J.*, **79**, 623.
Downes, D. 1971, *A. J.*, **76**, 305.
Drilling, J. S. 1972, *A. J.*, **77**, 463.
Feast, M. W. 1964, *M.N.R.A.S.*, **127**, 195.
Feast, M. W. and Shuttleworth, M. 1965, *M.N.R.A.S.*, **130**, 245.
Feinstein, A., Marraco, H. G. and Muzzio, J. C. 1973, *Astron. Asthophys. Suppl.*, **12**, 331.
Garmany, C. D. 1973, *A. J.*, **78**, 185.
Georgelin, Y. P. and Georgelin, Y. M. 1970, *Astron. Astrophys.*, **6**, 439.
Georgelin, Y. M., Georgelin, Y. P. and Roux, S. 1973, *Astron. Astrophys.*, **25**, 337.
Glaspey, J. W. 1971, *A. J.*, **76**, 1041.
Gould, N. L., Herbig, G. H. and Morgan, W. W. 1957, *Pub. A.S.P.*, **69**, 242.
Goy, G. 1973, *Astron. Astrophys. Suppl.*, **12**, 277.
Graham, J. A. 1970, *A. J.*, **75**, 703.
Havlén, R. J. 1972, *Astron. Astrophys.*, **17**, 413.
Hill, P. W. 1971, *Mem. R.A.S.*, **75**, 1.
Hiltner, W. A. and Johnson, H. L. 1956, *Ap. J.*, **124**, 367.
Humphreys, R. M. 1970, *A. J.*, **75**, 602.
Humphreys, R. M. 1973, *Astron. Astrophys. Suppl.*, **9**, 85.
Hutchings, J. B. 1968, *M.N.R.A.S.*, **141**, 219.
Hutchings, J. B. 1970, *M.N.R.A.S.*, **147**, 161.
Jaschek, C., Conde, H. and Sierra, A. C. 1964, *Catalogue of Stellar Epectra Classified in the Morgan-Keenan System*, (La Plata, Argentina: Observatorio Astronómico).
Landolt, A. U. 1970, *A. J.*, **75**, 337.
Lesh, J. R. 1968, *Ap. J. Suppl.*, **16**, 371.
Lesh, J. R. 1972, *Astron. Astrophys. Suppl.*, **5**, 129.
Lutz, J. H. and Lutz, T. E. 1972, *A. J.*, **77**, 376.
Lynga, G. 1970, *The Spiral Structure of our Galaxy, Proc. IAU Symp. No. 38*, ed. W. Becker and G. Contopoulos (Dordrecht: D. Reidel Publishing Co.), p. 270.
Mac Rae, D. A., Fleischer, R. and Weston, E. B. 1951, *Ap. J.*, **113**, 432.
Marsalková, P. 1974, *Astrophys. Space Sci.*, **27**, 3.
Martin, N. 1967, *Pub. Obs. Haute-Provence*, **9**, No. 13.
McCuskey, S. W., Pesch, P. and Snyder, G. A. 1974, *A. J.*, **79**, 597.
Mihalas, D. 1972, *NCAR Technical Notes No. NCAR-TN/STR-76*, (Boulder: National Center for Atmospheric Research).
Miller, E. W. 1972, *Ap. J.*, **77**, 216.
Moffat, A. F. J. and Vogt, N. 1973, *Astron. Astrophys. Suppl.*, **10**, 135.
Morton, D. C. 1969, *Ap. J.*, **158**, 629.
Neubauer, F. J. 1943, *Ap. J.*, **93**, 300.
Pédoussaut, A. and Ginestet, N. 1971, *Astron. Astrophys. Suppl.*, **4**, 253.
Pédoussaut, A. and Carquillat, J. M. 1973, *Astron. Astrophys Suppl.*, **10**, 105.
Perek, L. and Kohoutek, L. 1967, *Catalogue of Galactic Planetary Nebulae*, (Prague: Academia).
Petrie, R. M. 1950, *Publ. Dom. Ap. Obs.*, **13**, 119.
Pişmiş, P. 1974, *Rev. Mex. Astron. Astrof.*, **1**, 45.
Poveda, A., Ruiz, J. and Allen, C. 1967, *Bol. Obs. Tonantzintla y Tacubaya*, **4**, 86.
Roslund, C. 1968, *Arkiv för Astr.*, **5**, 209.
Särg, K. and Wramdemark, S. 1970, *Astron. Astrophys. Suppl.*, **2**, 251.
Schild, R. E., Hiltner, W. A. and Sanduleak, N. 1969, *Ap. J.*, **156**, 609.
Schild, R., Neugebauer, G. and Westphal, J. A. 1971, *A. J.*, **76**, 237.
Sharpless, S. 1959, *Ap. J. Suppl.*, **4**, 257.
Smith, L. F. 1968, *M.N.R.A.S.*, **138**, 109.
Struve, O. 1944, *Ap. J.*, **100**, 189.
Thackeray, A. D. 1970, *M.N.R.A.S.*, **150**, 215.
Thackeray, A. D., Tritton, S. B. and Walker, E. N. 1973, *Mem. R.A.S.*, **77**, 199.
Torres Peimbert, S., Lazcano-Araujo, A. and Peimbert, M. 1974, *Ap. J.*, **191**, 401 (Paper I).
Vitrichenko, E. A., Gershberg, R. E. and Metik, L. P. 1965, *Izv. Krymsk. Astrofiz. Obs.*, **34**, 193.
Walborn, N. R. 1971, *Ap. J. Suppl.*, **23**, 257.
Walborn, N. R. 1972, *A. J.*, **77**, 312.
Walborn, N. R. 1973*a*, *A. J.*, **78**, 1067.
Walborn, N. R. 1973*b*, *Ap. J.*, **179**, 517.
Walker, M.F. 1961, *Ap. J.*, **133**, 438.
Weaver, H. and Ebert, A. 1964, *Pub. A.S.P.*, **76**, 6.
Wilson, R. E. 1953, *General Catalogue of Radial Velocities* "Publications of the Carnegie Institution of Washington", No. 601 (Washington: Carnegie Institution of Washington).
Woolley, R., Epps, E. A., Penston, M. J. and Pocock, S. B. 1970, *Royal Obs. Ann.*, No. 5.
Wramdemark, S. 1973, *Astron. Astrophys. Suppl.*, **11**, 365.
Zwicky, F. 1957, *Morphological Astronomy*, (Berlin: Springer Verlag).