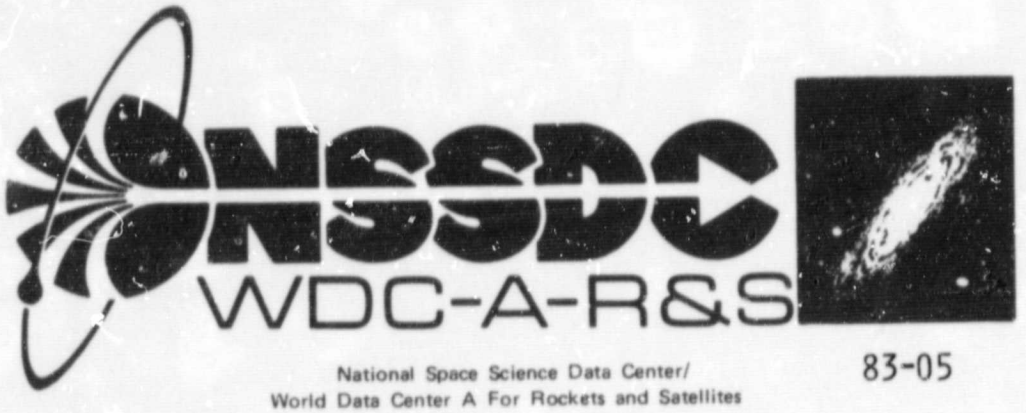

National Space Science Data Center/
World Data Center A For Rockets and Satellites

83-05

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Documentation for the Machine-Readable Version of the Lowell Proper Motion Survey, Northern Hemisphere The G Numbered Stars

June 1987

NSSDC/WDC-A-R&S 83-05

DOCUMENTATION FOR THE MACHINE-READABLE VERSION

OF THE

LOWELL PROPER MOTION SURVEY

Northern Hemisphere

THE G NUMBERED STARS

Wayne H. Warren Jr.

June 1983

National Space Science Data Center (NSSDC)/
World Data Center A for Rockets and Satellites (WDC-A-R&S)
National Aeronautics and Space Administration
Goddard Space Flight Center
Greenbelt, Maryland 20771

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LIST OF TABLES

Table

SECTION 1 - INTRODUCTION

This *Lowell Proper Motion Survey* catalog contains a summary of many individual papers published in the *Lowell Observatory Bulletins* in the years 1958 to 1970. The data in the machine-readable version include observed positions, proper motions, estimated photographic magnitudes and colors, and references to identifications in other catalogs. Photoelectric data on the *UBV* system are included for many stars, but no attempt was made to find all existing photometry. The machine version contains all data of the published catalog, except the Lowell Bulletin numbers where finding charts can be found. A separate file contains the notes published in the original catalog.

This document describes the machine-readable catalog available from the Astronomical Data Center. It is intended to enable users to read and process the data without problems and guesswork. For additional details concerning the observing program the source reference and original Lowell Bulletins should be consulted. This document should be distributed with any machine-readable copy of the catalog.

SOURCE REFERENCE

Giclas, H. L., Burnham, R. Jr., and Thomas, N. G. 1971, *Lowell Proper Motion Survey, Northern Hemisphere, The G Numbered Stars* (Flagstaff: Lowell Observatory).

SECTION 2 - TAPE CONTENTS

A byte-by-byte description of the contents of the *Lowell Proper Motion Survey* catalog is given in Table 1. The suggested format specifications apply to FORTRAN formatted reads and can be modified depending upon individual programming and processing requirements. Since data fields are blank where values are missing, care must be exercised when processing data which have valid zero values, e.g. color indices. It is suggested that these fields be read initially with character (A) format specifications and checked for blanks if they are to be used for calculations or search purposes. Although decimal points are omitted from the data records for many real numbers, real format specifications are given in the table to indicate the locations of the decimal points. Alternate format specifications are given in parentheses.

Table 1. Tape Contents. *Lowell Proper Motion Survey, Northern Hemisphere.* Data File

Byte(s)	Units	Suggested Format	Description
1- 8	---	A8	Original G number assigned to the star on the plate region where it was first found. Stars which were subsequently found on later plates were assigned new G numbers; however, in this catalog all duplicate observations have been combined and averaged with the original G numbers retained. Byte 1 of the field always contains a "G" and byte 5 always contains a "-". The number in bytes 2-4 is the plate number, while that in bytes 6-8 is the star number on the plate.
9-10	hours	I2	Right ascension, α, equinox 1950. Epochs are given for plate regions in the original Lowell Bulletin numbers reported in the CHT column of the published catalog. These references are not included in the machine-readable version.
11-12	min	I2	α
13-14	sec	I2	α
15-17	°	I3 (A1,I2)	Declination, δ, equinox 1950.
18-20	'	F3.1	δ
21-24	"	F4.2	Annual proper motion μ.

Table 1. (continued)

Byte(s)	Units	Suggested Format	Description
25-27	°	I3	The position angle of μ, measured in the normal way from North through East.
28-30	mag	F3.1	m_{pg}, the estimated photographic magnitude.
31-32	---	I2	Estimated color class on a scale of -1 (bluest) to +4 (reddest). Almost all stars having color class -1 have subsequently been classified as white dwarfs. An approximate relationship between estimated color and *UBV* colors is given in the published catalog.
33-34	---	I2	Number of observations from different plate regions contained in the mean. A value of unity denotes a single observation from one plate pair. Actually, there are never as many as ten observations, so byte 33 is always blank.
35	---	1X	Blank
36-70	---	35A1	or equivalent. References for other sources containing information and/or data about the star. References are separated by blank characters and consist mainly of designations in other catalogs. A symbol "+" following the last reference indicates additional references in the notes to the catalog. The reference key is given in Table 2.
71	---	1X	Blank
72	---	A1	An asterisk (*) indicates that there is a note in the published catalog which gives additional information about the star. See Table 5 for a description of the machine-readable notes.
73	---	A1	A code indicating if the star is on the parallax program of some observatory, thus denoting the possibility that a trigonometric parallax may eventually be available. The following codes are employed: A (Allegheny Obs.), L (Lick), M (Leander McCormick), N (U.S. Naval),

Table 1. (continued)

Byte(s)	Units	Suggested Format	Description
			S (Sproul), V (Van Vleck), Y (Yerkes). A digit of > 2 (= *n*) indicates the star to be on the working lists of *n* observatories. The codes for the *n* observatories are listed in Table 3.
74	---	1X	Blank
75-79	mag	F5.2	Photoelectric *V* magnitude obtained from the source given in bytes 95-97. *UBV* data are given for reference purposes only and no attempt for completeness has been made. Blank if no data reported.
80	---	1X	Blank
81-85	mag	F5.2	*B-V* color (blank if no data). Sign always in byte 81, except for 0.00 values.
86	---	1X	Blank
87-91	mag	F5.2	*U-B* color (blank if no data). Sign always in byte 87, except for 0.00 values.
92-94	---	3X	Blank
95-97	---	A3	Reference code for the magnitude source. The reference key is given in Table 4. A digit > 2 denotes multiple references (given in the notes). Note: the appended minus signs on some codes are not explained in the published catalog.
98	---	1X	Blank

Table 2. *Lowell Proper Motion Survey, Northern Hemisphere.* Key to Reference Abbreviations.

AVK	Alden, H L. and van de Kamp, P. 1924, *Astron. J.* 35, 165.
BD	number with asterisk, *Bergedorf Eigenbewegungs-Lexicon* 1936, Hamburger Sternwarte in Bergedorf or the continuation (Heidi, V. J. 1950, *Astron. Nach.* 279, 273).
BD	number with (L). Luyten, W. J. 1942, *Publ. Astron. Obs., Univ. of Minnesota* II, No. 12; 1944, III, No. 4.
BPM	Luyten, W. J. 1963, *Bruce Proper Motion Survey: The General Catalogue,* Vols. I and II (Minneapolis: Univ. of Minnesota).
CI	Porter, J. G., Yowell, E. I. and Smith, E. 1915, *Publ. Cincinnati Obs.* 18; 1930, 30.
E	Ebbighausen, E. G. 1938, *Astron. J.* 47, 112.
FI, FII, FIII	Furuhjelm, R. 1916, *Acta. Soc. Sci. Fennicae* 48, No. 1; 1926, 50, No. 7; 1947, Ser. A, 3, No. 12.
GL	Gliese, W. 1969, *Catalogue of Nearby Stars, Veröff. Astron. Rechen-Inst. Heidelberg,* No. 22.
GOYAL	Goyal, A. N. 1962, *Astron. Nach.* 286, 196.
GRN	Van Rhijn, P. J. and Plaut, L. 1955, *Publ. Kapteyn Astron. Lab., Groningen,* No. 56.
H	Hertzsprung, E. 1918, *Astron. Nach.* 207, 171.
HL	Haro, G. and Luyten, W. J. 1960, *Bull. Tonantzintla y Tacubaya,* No. 19, 16.
HUB	Hubble, E. P. 1916, *Astron J.* 29, 168.
HYD	Contained in one of the lists published by the Hyderabad observers in *Astron. Nach., Mon. Not.,* or *Astron. Nach. B.Z.*
JO	Contained in one of the many lists of proper motion stars in the Astrographic zones published in *J. des Observateurs,* principally by the Nizamiah and Bordeaux Observatories.
K1	Karpov, B. G. 1937, *Publ. Astron. Soc. Pacific* 49, 146.
K2	Karpov, B. G. 1937, *Astron. J.* 46, 201.
KONIG	König, A. 1953, *Astron. Nach.* 281, 107.

Table 2. (continued)

KOPAL	Kopal, Z. 1939, *Harvard Bull.* No. 911, p. 28.
L	Luyten, W. J. 1942, *Publ. Astron. Obs., Univ. of Minnesota* II, No. 12; 1944, III, No. 4.
LE	Luyten, W. J. and Ebbighaüsen, E. G. 1937, *Astron. J.* 45, 188.
LFT	Luyten, W. J. 1955, *A Catalogue of 1849 Stars With Proper Motions Exceeding 0".5 Annually* (Minneapolis: Lund Press.)
LP	Luyten, W. J. 1961-1967, *Publ. Astron. Obs. Univ. Minnesota* III, Nos. 8, 10, 11, 13-18, 20; 1963-1970, *Proper Motion Survey with the Forty-eight Inch Schmidt Telescope* (Minneapolis: University of Minnesota).
LPM	Luyten, W. J. 1941, *Publ. Astron. Obs., Univ. of Minnesota* III, No. 1.
LTT	Luyten, W. J. 1957, *A Catalogue of 9867 Stars in the Southern Hemisphere with Proper Motions Exceeding 0".2 Annually* (Minneapolis: Lund Press).
	Luyten, W. J. 1961, *A Catalogue of 7127 Stars in the Northern Hemisphere with Proper Motions Exceeding 0".2 Annually* (LTT 10001-17027) (Minneapolis: Lund Press).
	Luyten, W. J. 1962, *First Supplement to the LTT Catalogues* (LTT 17028-18635) (Minneapolis: Lund Press).
MC	1937, *Publ. Leander McCormick Obs., Univ. of Virginia* VII.
ML	McLead, N. W. 1939, *Pop. Astronomy* 47, 455.
OST	Oosterhoff, P. Th. 1936, *Astrophys. J.* 83, 340.
PUL	Deutsch, A. N. 1940, *Publ. de l'Obs. Central a Poulkovo, Serie II,* LV.
R	Ross, F. E. 1925-1939, *Astron. J.* 36-48.
RAD	1934, *Radcliffe Catalogue of Proper Motions in the Selected Areas 1 to 115* (London).
S	Strand, K. Aa., Lenham, A. and Owen, T. 1958, *Astron J.* 63, 337.
T	1955, *Ann. de l'Obs. Astron. Toulouse* XXIII.
VM	Van Maanen, A. 1915, *Astrophys. J.* 41, 187.

Table 2. (continued)

VM1	Van Maanen, A. 1938, *Astrophys. J.* 88, 27 (Table 1).
VM2	Van Maanen, A. 1938, *Astrophys. J.* 88, 27 (Table 2).
VMW	Van Maanen, A. and Willis, H. C. 1930, *Contrib. Mt. Wilson Obs.*, No. 412.
W	Wolf, M. 1919, *Veröff Sternwarte zu Heidelberg* 7, No. 10; 1919-1929, *Astron. Nach.* 209-236.
Y	Schlesinger, F. and Barney, I. 1939-1959, *Yale Zone Catalogues, Trans. Astron. Obs., Yale Univ.* 11-14, 16-27.

Table 3. *Lowell Proper Motion Survey Northern Hemisphere.* Supplementary Parallax Codes

G001-027	L,S	G063-052	S,A	G141-004	N,Y,S
G003-033	L,S,Y	G063-053	S,A	G142-052	L,N,Y
G005-028	L,Y	G066-032	L,A	G144-025	N,Y
G006-030	L,A	G067-037	S,A	G146-058	L,A,N
G006-042	S,A	G068-024	S,A	G149-081	L,Y
G007-017	L,Y,N	G069-047	Y,N,L	G150-041	S,A
G008-008	N,A	G074-007	A,Y	G164-064	S,A
G008-055	Y,S	G077-031	L,N	G164-065	S,A
G010-050	S,A	G087-007	N,A,L,S	G164-071	S,A
G012-021	L,A	G087-008	Y,L	G166-053	S,A
G012-043	S,A	G087-012	S,A	G170-012	Y,A
G013-026	L,A	G087-028	N,L	G170-055	S,A
G013-035	L,A	G087-029	N,L	G171-010	L,A,S
G018-016	S,A	G087-043	S,A	G171-019	S,A
G019-020	L,A	G089-019	S,A	G171-040	S,A
G019-024	S,A	G093-048	N,A	G171-048	S,A
G021-015	L,N	G095-059	L,Y	G173-053	S,A
G022-018	S,A	G097-005	N,A	G175-034	Y,A
G022-022	S,A	G097-042	S,A	G176-011	S,A
G024-010	L,N	G097-047	S,L	G182-036	L,Y
G024-023	S,A	G099-010	Y,N	G185-018	L,Y
G025-022	N,A	G099-017	L,A	G185-037	L,S,A
G026-009	Y,A	G099-033	L,N,Y	G186-031	L,S
G026-010	Y,A,L,N	G099-047	L,A	G191-051	S,A
G028-043	A,N	G102-022	S,A	G195-017	S,A
G029-038	L,N,S	G104-037	S,A	G195-018	S,A
G033-049	A,N	G104-049	S,A	G195-019	L,A
G034-015	Y,N,L	G105-023	N,Y	G200-016	S,A
G035-029	L,N	G107-070	L,Y	G202-045	S,A
G036-031	S,A	G116-052	L,N	G203-051	S,A
G044-040	S,A	G119-052	A,S	G204-027	S,A
G045-020	S,A	G120-045	L,A,N	G205-030	S,A
G046-001	S,A	G120-068	S,A	G210-048	S,A
G049-033	L,A	G121-027	N,A	G216-016	S,A
G050-004	S,A	G125-029	S,A	G217-007	S,A
G051-015	L,Y	G126-004	S,A	G221-005	Y,A
G054-023	S,A	G126-027	N,A	G225-067	A,Y,L
G055-024	S,A	G128-007	Y,A	G230-026	S,A
G057-029	L,A	G130-005	S,A	G231-019	S,A
G060-032	S,A	G130-006	S,A	G231-043	L,A
G060-054	L,Y	G130-043	Y,N	G235-036	S,A
G061-021	L,N	G136-103	N,S	G235-049	S,A
G062-015	L,Y	G137-078	S,A,N,L	G238-044	L,A
G062-053	L,N,S,A	G138-025	Y,N	G259-021	Y,L,N
G063-034	S,A	G139-039	Y,N		
G063-036	S,A	G140-024	S,A		

Table 4. *Lowell Proper Motion Survey, Northern Hemisphere.*
Magnitude Source Reference Key

E1	Eggen, O. J. 1963, *Astron. J.* 68. 483.
E2	Eggen, O. J. 1966, *Royal Obs. Bull.* No. 120.
E3	Eggen, O. J. 1968, *Astrophys. J. Suppl.* 16, 97 (No. 143).
E4	Eggen, O. J. 1969, *Astrophys. J. Suppl.* 19, 31 (No. 168).
E5	Eggen, O. J. 1968, *Astrophys. J.* 153, 195.
EG1	Eggen, O. J. and Greenstein, J. L. 1965, *Astrophys. J.* 141, 83.
EG2	Eggen, O. J. and Greenstein, J. L. 1965, *Astrophys. J.* 142, 925.
EG3	Eggen, O. J. and Greenstein, J. L. 1967, *Astrophys. J.* 150, 927.
ES	Eggen, O. J. and Sandage, A. 1967, *Astrophys. J.* 148, 911.
G1	Greenstein, J. L. 1969, *Astrophys. J.* 158, 281.
S1	Sandage, A. 1964, *Astrophys. J.* 139, 442.
S2	Sandage, A. 1969, *Astrophys. J.* 158, 1115.
SK	Sandage, A. and Kowal, C. 1962, private communications.
WG	Gliese W. 1969, *Catalogue of Nearby Stars, Veröff. Astron. Rechen-Inst. Heidelberg,* No. 22.
WA	Wanner, J. F. 1964, Ph.D. Thesis, Harvard University.

Table 5. Tape Contents. *Lowell Proper Motion Survey, Northern Hemisphere* Notes File

Byte(s)	Description
1-10	Star number as described for bytes 1-8 in Table 1. If more than one consecutive G number is referred to, a slash (/) appears in byte 9 and the final digit of the second G number is given in byte 10. If more than two consecutive G numbers are included, a hyphen appears in byte 9 and the final digit of the last number in byte 10. A comma is given in byte 9 if two non-consecutive G numbers are referenced. Bytes 9 and 10 may also contain component identifications for double stars having the same G number, e.g. "AB".
11-12	Integer used to sequentially number remarks for the same star(s). Can be used as a secondary sort field to reorder the notes properly if they become disorganized.
13-80	Remarks in upper and lower case characters.

SECTION 3 - TAPE CHARACTERISTICS

The information contained in Table 5 is sufficient for a user to describe the indigenous characteristics of the machine-readable *Lowell Proper Motion Survey* file to a computer. Information easily varied from installation to installation, such as block size (physical record length), blocking factor (number of logical records per physical record), total number of blocks, tape density, number of tracks, and internal coding (EBCDIC, ASCII, etc.) is not included. This information should always be supplied if secondary copies are transmitted to other users or installations. Parameters relating to the two files of the catalog are separated by commas.

Table 6. Tape Characteristics. *Lowell Proper Motion Survey, Northern Hemisphere.*

NUMBER OF FILES	2
LOGICAL RECORD LENGTH (BYTES)	98, 80
RECORD FORMAT	FB*
TOTAL NUMBER OF LOGICAL RECORDS	8989, 2429

* Fixed block length (last block may be short)

SECTION 4 - REMARKS, MODIFICATIONS AND REFERENCES

The machine-readable version of the *Lowell Proper Motion Survey, Northern Hemisphere* was received on magnetic tape from the Centre de Donnees Stellaires, Strasbourg. As received, the catalog consisted of 80-byte logical records with multiple records for stars having photoelectric data. The following modifications were made to assure easier data processing and greater uniformity with other computerized catalogs:

1. The first record, containing only the word "MUCAT", was deleted.

2. Multiple 80-byte records were combined while deleting a test digit in byte 80 indicating an additional record, and redundant G numbers on multiple records were removed. The restructuring resulted in the current 98-byte record.

3. The machine-readable catalog contains 8989 records. A count of the stars in the published catalog (113 full pages with 75 stars per page and 68 stars on last page) gives 8993; however, stars are missing on pages 28, 29 and 42, resulting in 8989 stars total.

4. Preceding zeroes were added to the G numbers to match the published catalog.

5. There was no distinction between blank and 0.00 color indices. Initially, all zeroes were converted to blanks for *B-V* and *U-B*, then the published catalog was scanned for valid 0.00 values and the values were added for the appropriate stars.

6. Plus signs were added to the declinations (byte 15), the color class positive values, and to all positive color indices.

7. The following miscellaneous corrections to the published catalog were made to the machine file:

G066-036	photoelectric data deleted as per published version
G213-017	δ° corrected from +39 to +37
G128-032	added BD+32 4584-5

8. The notes file was prepared by keying the published remarks directly to disk and adding to the catalog as a second file.

REFERENCES

Giclas, H. L. 1958, *Lowell Obs. Bull.* 4, 1 (No. 89).

Giclas, H. L., Burnham, R. Jr. and Thomas, N. G. 1961, *Lowell Obs. Bull.* 5, 61 (No. 112).

REFERENCES (continued)

Giclas, H. L., Burnham, R. Jr. and Thomas, N. G. 1963, *Lowell Obs. Bull.* 6, 1 (No. 120).

Giclas, H. L., Burnham, R. Jr. and Thomas, N. G. 1964, *Lowell Obs. Bull.* 6, 103 (No. 122).

Giclas, H. L., Burnham, R. Jr. and Thomas, N. G. 1964, *Lowell Obs. Bull.* 6, 135 (No. 124).

Giclas, H. L., Burnham, R. Jr. and Thomas, N. G. 1965, *Lowell Obs. Bull.* 6, 197 (No. 129).

Giclas, H. L., Burnham, R. Jr. and Thomas, N. G. 1966, *Lowell Obs. Bull.* 6, 233 (No. 132).

Giclas, H. L., Burnham, R. Jr. and Thomas, N. G. 1966, *Lowell Obs. Bull.* 6, 271 (No. 136).

Giclas, H. L., Burnham, R. Jr. and Thomas, N. G. 1967, *Lowell Obs. Bull.* 7, 1 (No. 138).

Giclas, H. L., Burnham, R. Jr. and Thomas, N. G. 1967, *Lowell Obs. Bull.* 7, 31 (No. 140).

Giclas, H. L., Burnham, R. Jr. and Thomas, N. G. 1968, *Lowell Obs. Bull.* 7, 67 (No. 144).

Giclas, H. L., Burnham, R. Jr. and Thomas, N. G. 1969, *Lowell Obs. Bull.* 7, 129 (No. 150).

Giclas, H. L., Burnham, R. Jr. and Thomas, N. G. 1970, *Lowell Obs. Bull.* 7, 149 (No. 151).

Giclas, H. L., Burnham, R. Jr. and Thomas, N. G. 1970, *Lowell Obs. Bull.* 7, 165, (No. 152).

Giclas, H. L., Burnham, R. Jr. and Thomas, N. G. 1971, *Lowell Proper Motion Survey, Northern Hemisphere, The G Numbered Stars* (Flagstaff: Lowell Observatory).

Giclas, H. L., Slaughter, C. D. and Burnham, R. Jr 1959, *Lowell Obs. Bull.* 4, 136 (No. 102).

SECTION 5 - SAMPLE LISTING

The sample listing given on the following pages contains logical data records exactly as they are recorded on the tape. Groups of records from the beginning and end of each file of the catalog are illustrated. The beginning of each record and bytes within the record are indicated by the column heading index across the top of each page (digits read vertically).

L I S T I N G   O F   R E C O R D S   F R O M   T A P E   F I L E

```
TAPE FILE NAME: LOWELL PROPER MOTION SUR
       RECORDS      1 TO     30
     TAPE FILE     27
 RECORD LENGTH     98 BYTES
  INPUT VOLSER    ADC001

C O L U M N                                                                                                         1111111111111111
H E A D I N G           111111111122222222223333333333444444444455555555556666666666777777777788888888889999999999000000000011111
I N D E X      1234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345

RECORD    1  G130-037 0 0 5+24139   31100150+2 2 LTT 10001
RECORD    2  G171-038 0 018+37444   27174145+2 1
RECORD    3  G217-029 0 028+56273   27 84104+1 1 +55 3074
RECORD    4  G030-038 0 033+ 6  3   59145168+2 2
RECORD    5  G130-038 0 059+36 10   29 94164+3 1
RECORD    6  G130-039 0 144+28504   27 76156+2 2 LTT 10008
RECORD    7  G030-039 0 147+12407   34 69 93+1 1 LTT 10007 Y19-9539 CI18-3160+        *  8.62 +0.64 +0.17   SK
RECORD    8  G030-040 0 147+14 82   30212127+1 1 LTT 10004                              11.19 +0.96 +0.68   SK
RECORD    9  G217-030 0 150+57474   43 99112+1 2 LTT 10005 R309 CI20-1                 *
RECORD   10  G130-040 0 221+22595   35 93 91+2 2 LTT 10010 Y25-9203 +22 4950*
RECORD   11  G171-039 0 233+45306   85 98122+2 1 LFT 6 CI20-4 GL2 +44 4548*            *S
RECORD   12  G130-041 0 3 2+28542   27162144+1 1                                       * 13.23 +0.81 +0.33   SK
RECORD   13  G171-040 0 3 3+45321   85 98 97+2 1 LFT 8,9 CI20-6 GL4AB +45 4408*        *2
RECORD   14  G030-041 0 3 8+ 7 33   27201154+3 1
RECORD   15  G030-042 0 322+17480   29220106+2 1 LTT 10020,1 CI18-4 +17 5036*          *  8.53 +0.93 +0.66   SK
RECORD   15  G243-013 0 339+58 95   31 89 84+2 1 LTT 10022 Y27-14675 GL4.1AB+          *
RECORD   17  G171-041 0 345+43253   29 90165+3 1
RECORD   18  G131-019 0 348+17437   62144165 0 1                                       *
RECORD   19  G031-025 0 357+ 5328   27 76127+1 1 LTT 10024 Y5                             10.97 +1.02 +0.90   SK
RECORD   20  G030-043 0 359+10 85   31 63139+2 1 LTT 10025 K2-1                           12.41 +1.24 +1.14   SK
RECORD   21  G131-020 0 4 4+25355   30 67157+3 1
RECORD   22  G243-014 0 411+65223   28105165+2 1
RECORD   23  G131-021 0 419+19327   46122157+3 1
RECORD   24  G130-042 0 423+27572   27 81117+2 2 LTT 10028 +27 4677                       10.25 +0.74 +0.28   SK
RECORD   25  G217-031 0 442+52248   28 95138+3 1
RECORD   26  G131-023 0 444+20413   29193112+2 1 LTT 10030 Y25-4 +20 5430                  9.14 +0.74 +0.28   SK
RECORD   27  G030-044 0 448+10341   33 81150+2 1 LTT 10032
RECORD   28  G130-043 0 448+28585  193127157+3 2                                       *2
RECORD   29  G217-032 0 5 4+60 61   33 96153+2 2
RECORD   30  G030-045 0 526+ 7439   63221148+4 1 LFT 20                                L
```

ORIGINAL PAGE IS
OF POOR QUALITY

L I S T I N G O F R E C O R D S F R O M T A P E F I L E

TAPE FILE NAME: LOWELL PROPER MOTION SUR
RECORDS 8960 TO 8989
TAPE FILE 27
RECORD LENGTH 98 BYTES
INPUT VOLSER ADC001

```
COLUMN                  1111111111222222222233333333334444444444555555555566666666677777777778888888889999999999000000000011111
HEADING       12345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123
INDEX
RECORD   8960 G030-034235613+ 8579  41112103+1 1 LTT 17068 M1052 Y22-11835 CI18-3144+*  9.20 +0.67 +0.13  SK
RECORD   8961 G130-029235616+33279  30126 85+1 1 LTT 17069 JO +32 4748*                  7.82 +0.64 +0.15  SK
RECORD   8962 G129-051235626+20350  28114143+2 2
RECORD   8963 G171-030235630+40114  32224150+2 1
RECORD   8964 G130-030235644+23515  43158156+2 2
RECORD   8965 G130-031235647+32249  33221161+3 1
RECORD   8966 G171-031235655+44193  35 67108+2 1 LTT 17072 R2 PUL43-S3 +43 4596*     *
RECORD   8967 G171-0322357 0+42391  49111156+3 1
RECORD   8968 G031-0212357 7+ 2161  34143142+2 1                                      12.40 +1.48 +1.20  SK
RECORD   8969 G171-033235711+38239  69135158+3 1
RECORD   8970 G217-025235713+49500  48 85112+2 1 LFT 1843 R252 CI20-1470 +49 4301*
RECORD   8971 G130-032235731+33547  29260 94+1 1 LTT 17076 JO +33 4813                  8.50 +0.65 +0.10  SK
RECORD   8972 G129-052235732+19456  33227112+2 2 LTT 17077 Y18-9750 CI18-3148+       *
RECORD   8973 G171-034235741+38461  27 71125+2 1 +38 5109
RECORD   8974 G130-033235747+31329  29 92159+3 1
RECORD   8975 G171-035235748+37414  30 92168+3 1
RECORD   8976 G217-026235752+57372  49 56154+1 1
RECORD   8977 G241-075235756+64478  29106164+2 2
RECORD   8978 G030-0352358 2+17414  33 95219+1 3 LFT 1845 R675                        10.57 +1.03 +0.90  SK
RECORD   8979 G171-0362358 3+41504  27 74161+2 1
RECORD   8980 G129-0542358 5+18125  35 55124+2 2
RECORD   8981 G030-036235815+16428  35191103+2 3 LTT 17080 Y18-9754 CI18-3150+       *  8.82 +0.94 +0.72  SK
RECORD   8982 G030-037235817+14173  33 98149+2 2
RECORD   8983 G217-027235839+57168  34146162+3 1
RECORD   8984 G130-034235849+34  3  27 96130+3 1 LTT 17084 JO
RECORD   8985 G217-028235850+52135  27 80163+3 1
RECORD   8986 G130-035235851+31  7  28150151+2 1 LTT 17085
RECORD   8987 G129-057235915+21110  27 44120+2 2 LTT 17086
RECORD   8988 G130-036235922+25439  73210127+2 2 LFT 1847 R679 CI20-1472              11.28 +0.92 +0.52  SK
RECORD   8989 G171-037235959+43264  35 76159+1 1
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L I S T I N G O F R E C O R D S F R O M T A P E F I L E

TAPE FILE NAME: LOWELL SURVEY, NOTES
RECORDS 1 TO 30
TAPE FILE 30
RECORD LENGTH 80 BYTES
INPUT VOLSER ADC001

COLUMN HEADING INDEX

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         1         2         3         4         5         6         7         8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
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RECORD      1  G001-005    1This star forms a common proper motion pair with G032-021; separ-
RECORD      2  G001-005    2ation about 17" in PA 210°. Both objects are shown on the G001-005
RECORD      3  G001-005    3chart.
RECORD      4  G001-007    1This is L1011-71, a known white dwarf, spectrum DA6 according to
RECORD      5  G001-007    2Luyten.
RECORD      6  G001-020    1VM-21, GL 31.4, and BD+01 131*.
RECORD      7  G001-021    1This star forms a common proper motion pair with G070-009; separ-
RECORD      8  G001-021    2ation about 19" in PA 242°. Both objects are shown on the G001-021
RECORD      9  G001-021    3chart.
RECORD     10  G001-027    1This is "Van Maanen's Star", a well known white dwarf of late spec-
RECORD     11  G001-027    2tral type. With the exception of the faint companions to Sirius and
RECORD     12  G001-027    3Procyon, this is probably the nearest white dwarf to the Solar
RECORD     13  G001-027    4System; distance about 3.9 pc, spectral class DG. Catalog measure-
RECORD     14  G001-027    5ments according to SK; additional measurements from EG1 are V=12.36,
RECORD     15  G001-027    6B-V=+0.56, U-B=+0.04.
RECORD     16  G001-038/9  1Although the measured motions are not precisely identical, these
RECORD     17  G001-038/9  2two stars may form a wide moving pair: separation 19.6".
RECORD     18  G001-043    1ED+04 158*.
RECORD     19  G001-045    1Suspected white dwarf, now confirmed, spectrum DA.
RECORD     20  G001-051    1This is ADS 972, but an optical system only as the 12th magnitude
RECORD     21  G001-051    2companion does not share the proper motion. The separation was 41"
RECORD     22  G001-051    3in 1925 and steadily increasing. The pair is also known as h634,
RECORD     23  G001-051    4the primary is BD+08 183*.
RECORD     24  G002-027    1This star forms a common proper motion pair with G070-044; separ-
RECORD     25  G002-027    2ation about 63" in PA 146°. Both objects are shown on the G002-027
RECORD     26  G002-027    3chart.
RECORD     27  G002-036    1BD+12 168*.
RECORD     28  G002-040    1Suspected white dwarf.
RECORD     29  G002-047    1Luyten finds an 18th magnitude companion to this star, designated
RECORD     30  G002-047    2LE528-50. Separation 14" in PA 201°.
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L I S T I N G O F R E C O R D S F R O M T A P E F I L E

TAPE FILE NAME: LOWELL SURVEY, NOTES
RECORDS 2400 TO 2429
TAPE FILE 30
RECORD LENGTH 80 BYTES
INPUT VOLSER ADC001

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COLUMN                1111111111222222222233333333334444444444555555555566666666667777777778888888899999999900000000011111111
HEADING      12345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345
INDEX
RECORD   2400  G260-006   3system is about 150 years, orbit seen nearly edge-on.
RECORD   2401  G260-015   1This is the white dwarf Grw(or AC)+70 8247; the spectrum is pecul-
RECORD   2402  G260-015   2iar for the presence of an as yet unidentified band at 4135 Ang.
RECORD   2403  G260-024/5 1A common proper motion pair, separation about 19" in PA 213°. This
RECORD   2404  G260-024/5 2pair is also known as LDS 1910.
RECORD   2405  G261-013   1This is LP25-593. Luyten reports a companion of magnitude 17.8,
RECORD   2406  G261-013   2designated LP25-594, at 56" in PA 90°. This pair is also known as
RECORD   2407  G261-013   3LDS 1920.
RECORD   2408  G261-015/6 1A common proper motion pair, separation about 17" in PA 225°. This
RECORD   2409  G261-015/6 2pair is also known as LDS 1922.
RECORD   2410  G261-019   1BD+76 765*.
RECORD   2411  G261-028   1This is VW Cephei, a short period eclipsing binary of the W UMa
RECORD   2412  G261-028   2type. The star is also VW 452 and PUL 7-S4. The BD number of this
RECORD   2413  G261-028   3object is +75 752*, but is erroneously given as +75 751 in the
RECORD   2414  G261-028   4Cincinnati 20 catalog.
RECORD   2415  G261-029   1BD+74 889*.
RECORD   2416  G261-031   1This is the close pair LP26-66 and LP26-67, separation 2.5" in
RECORD   2417  G261-031   2PA 332°. This pair is also known as LDS 1942.
RECORD   2418  G261-038   1BD+73 925*.
RECORD   2419  G261-043   1This is the known white dwarf Grw(AC)+73 8031, spectral type DA.
RECORD   2420  G261-045   1This is the known white dwarf Grw(AC)+82 3818*, spectrum DA.
RECORD   2421  G262-021/2 1These form a common proper motion pair with a separation of about
RECORD   2422  G262-021/2 232" in PA 122°. The color and magnitude contrast for this pair makes
RECORD   2423  G262-021/2 3it possible to consider both stars as white dwarf suspects.
RECORD   2424  G263-007   1This is LP47-285, possibly a degenerate star of late spectral type.
RECORD   2425  G263-007   2Luyten's color class is "k-m".
RECORD   2426  G265-038   1This is the double star IDS 1935. According to Luyten, the com-
RECORD   2427  G265-038   2panion is magnitude 19.4, separation 10" in PA 121°.
RECORD   2428  G265-043   1This is the double star IDS 1959. Luyten gives the magnitudes as
RECORD   2429  G265-043   211.7 and 12.4, separation 3" in PA 209°.
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