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DOCUMENTATION FOR THE MACHINE-READABLE VERSION

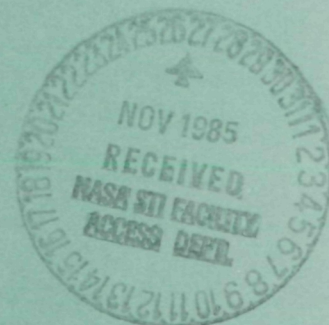
OF

THE HENRY DRAPER CATALOGUE

(EDITION 1985)



FEBRUARY 1985



DOCUMENTATION FOR THE MACHINE-READABLE VERSION

OF

*THE HENRY DRAPER CATALOGUE*

(EDITION 1985)

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ABSTRACT

An updated, corrected and extended machine-readable version of the catalog is described. Published and unpublished errors discovered in the previous version have been corrected; letters indicating supplemental stars in the *BD* have been moved to a new byte to distinguish them from double-star components; and the machine-readable portion of *The Henry Draper Extension (HDE) (HA 100)* has been converted to the same format as the main catalog, with additional data added as necessary.

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## SECTION 1 - INTRODUCTION AND SOURCE REFERENCES

Early in this century, Miss Cannon undertook to classify all stars to the faintest possible magnitude limits on the objective-prism plates available to her. Although the faint limit varies from plate to plate and the southern plates were superior to the northern ones (Hoffleit 1985, private communication) a realistic value appears to be approximately  $m_{pg} = 9$ . The resulting spectral types were published in *The Henry Draper Catalogue* (HD, Cannon and Pickering 1918-1924). Later, she classified somewhat fainter stars in a number of regions of the sky. This work was completed by Mrs. Mayall and published as *The Henry Draper Extension* (HDE, Cannon 1925-1936; Cannon and Walton Mayall 1949). A machine version of the HD and of the first volume of HDE was originally prepared under the supervision of D. Hoffleit at the Yale University Observatory some years ago (Hoffleit 1967; Gottlieb and Hoffleit 1969), and was subsequently updated with known errors (including some in the printed catalog) at the Astronomical Data Center (ADC) in 1976. The current version of the HD contains the corrections for all errata known to us and/or published up to the date of this version (February 1985), various errors forwarded to us by colleagues, and errors discovered at the ADC during the course of this work. In addition, the regions of the HDE (1925-1936) for the declination zones  $+50^\circ$  to  $+59^\circ$  and for the Magellanic Clouds have been changed to the same format as the basic catalog. Right ascensions and declinations have replaced the X,Y coordinates in the Magellanic-Cloud region. This version of the machine-readable HD/HDE does not contain the last volume of the HDE (1949) because no positions are currently available in machine form for stars in the range HDE 272151-359083.

This machine version of the HD catalog has intentionally been prepared to conform as closely as possible to the original published catalog, i.e., the data have not been updated with more modern positions, magnitudes, or spectral types, since those data can be found in other machine-readable catalogs. The intent was to prepare and archive the catalog in essentially original form, except for the correction of major errors and the identification of duplicate entries (where the same star has been assigned more than one HD number). For ease of use and to make possible the addition of numbers from the *Cape Photographic Durchmusterung* in the zones  $-18^\circ$  to  $-52^\circ$  and the *Córdoba Durchmusterung* in the zones  $-53^\circ$  to  $-89^\circ$  when no other DM numbers exist (not allowed for in the original HD, nor in the previous machine catalog) the *Durchmusterung* numbers have been expanded to their full representation and the correct prefixes added (BD, CD, CP); thus, codes for DM numbers in *italics* have been removed and the correct zones inserted.

This document describes the new version of the machine-readable *Henry Draper Catalogue*. It outlines the procedures used to correct and extend the previous version; it is intended to enable users to read and process the data without problems and guesswork. For more detailed descriptions of the history of the HD, the Harvard spectral classification system, and other data contained in the original published catalog, the source references and their bibliographies (given in the texts only) should be consulted. A copy of this document should accompany any machine version of the catalog originating from the Astronomical Data Center.

SOURCE REFERENCES

Cannon, A.J. 1925-1936, *The Henry Draper Extension*, *Ann. Astron. Obs. Harvard College* 100.

Cannon, A. J. and Pickering, E. C. 1918-1924, *The Henry Draper Catalogue*, *Ann. Astron. Obs. Harvard College* 91-99.

## SECTION 2 - TAPE CONTENTS

A byte-by-byte description of the contents of the machine-readable *Henry Draper Catalogue* is given in Table 1. A suggested Fortran 77-type format specification for reading each data field is included, but these can be modified depending upon individual programming and processing requirements. Data are present for all stars in the catalog, including some which have been effectively deleted because they are duplicate entries. These have been flagged by a "D" in byte 46 and are listed in Table 5, but the records and data have been left in the machine version in order not to change the star counts and numerical sequencing, so that stars appear in their correct locations if the catalog is sorted by declination, so that data can be retrieved for those stars if the HD numbers have been used elsewhere in the literature or in other catalogs, and in the event that it is decided at a later time that a wrong star has been suppressed. Although there are not many of these stars, the user should check byte 46 before using the HD numbers or data in other compilations or in publications, and before using the data to prepare finding charts, etc. All data fields having primary A-format specifications are blank for missing data, so the alternate numerical formats used for machine searches will produce zero values. Data are always present in fields for which primary numerical format specifications are given, except for magnitude data, where the fields are left blank if no values are present in the published catalog (see the tabular descriptions for bytes 30-33 and 36-39). The data file is ordered strictly by HD number, although in certain cases, stars are now not in right ascension order (see Table 6) because of corrections made to their equatorial coordinates.

Table 1. Tape Contents. *The Henry Draper Catalogue* (Machine Version 1985).

Byte(s)	Units	Suggested Format	Description
1-6	---	I6	HD number.
7-8	---	A2	Durchmusterung (DM) identification (BD, CD, CP) or the letters "AG" (see below).
9	---	A1	Sign of DM zone.
10-11	---	A2 (I2)	DM zone. For AG stars (zones +50° to +59°) not in the BD, bytes 7-8 read "AG" and bytes 10-11 give the lowest declination zone in the appropriate AG catalog (50 or 55).
12-16	---	A5 (I5)	DM or AG number.

Table 1 (continued)

Byte(s)	Units	Suggested Format	Description
17	---	A1	Component identification if there are two or more HD stars with the same DM number. For multiple systems included in the <i>Washington Catalog of Visual Double Stars</i> (WDS, Worley 1984) the same designations are given.
18	---	A1	Lower case letter identification for BD supplemental stars (Warren and Kress 1980).
19-20	hours	I2	Right ascension, $\alpha$ , equinox 1900.
21-23	min	F3.1	$\alpha$
24	---	A1	Sign of declination, $\delta$ , equinox 1900.
25-26	°	I2	$\delta$
27-28	'	I2	$\delta$
29	---	I1	Photovisual magnitude code: 0 measured value 1 value inferred from $m_{pg}$ and spectral type
30-33	mag	F4.2	Photovisual magnitude, $m_v$ , except for the following codes for fictitious magnitudes: 20.0 nebula (Neb in published catalog) 30.0 variable (var. in published catalog) 40.0 nova (Nov. in published catalog) 50.0 cluster (Cl. in published catalog) blank no value in published catalog
34	---	A1	"C" denotes that $m_v$ is the combined value for this and the following or preceding entry.
35	---	I1	Photographic magnitude code (see byte 29).
36-39	mag	F4.2	Photographic magnitude, $m_{pg}$ (see bytes 30-33)
40	---	A1	"C" denotes that $m_{pg}$ is a combined value for this and the following or preceding entry.
41-43	---	A3	Spectral type. Contains upper and lower case characters as in published catalog.



Table 1 (concluded)

Byte(s)	Units	Suggested Format	Description
44-45	---	A2 (I2)	Photographic intensity of the spectrum estimated by Miss Cannon. The faintest spectra which could be classified with certainty were assigned a value of 1, while the densest are given as 10. For stars having two intensities in the published catalog, only the first is given in the machine version.
46	---	A1	<p>Remarks. The following codes are used:</p> <p>D Entry deleted because it is a duplicate or does not refer to a real star (see Table 4)</p> <p>E Image is at edge of plate</p> <p>G Position and BD number taken directly from AGK and precessed to 1900</p> <p>M Multiple images used. Only one intensity is included (both are in the published catalog, however)</p> <p>R There is a remark for this star in the published catalog</p> <p>* Spectral type refers to a cluster, nebula or nebulous star. (Occurs in the Magellanic-Cloud fields only.)</p>

### SECTION 3 - TAPE CHARACTERISTICS

The information in Table 2 is sufficient for a user to describe the indigenous characteristics of the machine-readable *Henry Draper Catalogue* to a computer. Not included is 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.). These parameters should always be transmitted if secondary copies of the catalog are supplied to other users or installations.

Table 2. Tape Characteristics. *The Henry Draper Catalogue* (Machine Version 1985).

---

NUMBER OF FILES .....	1
LOGICAL RECORD LENGTH (BYTES) .....	46
RECORD FORMAT .....	FB*
TOTAL NUMBER OF LOGICAL RECORDS .....	272150

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\* Fixed block length (last block may be short).

#### SECTION 4 - REMARKS, MODIFICATIONS, ACKNOWLEDGMENTS AND REFERENCES

The original machine-readable *Henry Draper Catalogue* was obtained on magnetic tape from the U. S. Naval Observatory in the mid 1970's. Although some corrections were incorporated into the tape version at the ADC in 1976, no major revision to the format (as described below) had been made prior to this version. The changes described here were made to improve the quality of the machine version and to make the catalog generally easier to use. This is especially significant in the case of the AG zones, where no positions are given in the published version, and in the Magellanic-Cloud regions where only X and Y rectangular coordinates were reported.

Two sections of *The Henry Draper Extension* (HDE, Cannon 1924-1936) which include stars between  $+50^\circ$  and  $+55^\circ$  and between  $+55^\circ$  and  $+60^\circ$  (HDE 232101-240500) identify stars only by their AG numbers. For the stars in the *Yale Zone Catalogues* for these zones (Barney *et al.* 1959), BD numbers and positions were extracted from those catalogs and the positions precessed to 1900. For the relatively few stars not in the Yale catalogs, these data were obtained directly from the *Astronomische Gesellschaft Katalog* (AGK, Krüger 1890; Rogers 1892). AG numbers are given only for those stars with no BD numbers. For most of the stars in the Magellanic Clouds (HDE 268601-270500) only X,Y coordinates are given in the HDE. However, CPD numbers are included for 133 stars. The CPD identifications were used to locate these stars in the *Yale Zone Catalogues* for  $-60^\circ$  to  $-70^\circ$  (Fallon 1983) and  $-70^\circ$  to  $-90^\circ$  (Lü 1971). The positions in the latter catalogs were used in a least squares solution to obtain the transformation from X,Y to equatorial coordinates. This transformation was then applied to all stars in this section of the catalog to obtain the right ascensions and declinations. (The X,Y coordinates are *not* included.) These modifications effected a uniform format for the entire catalog, as well as making the AG and MC sections more readily usable.

All letters which are lower case in the printed version of the HD can be read as lower case letters here. Missing data are blank in the corresponding records, but numerical codes are retained in the magnitude bytes for nebulae, novae, clusters, and variable stars so that these may continue to be read with an F format. Double-star-component identifications were changed to agree with the component identifications in the *Washington Catalog of Visual Double Stars* (WDS, Worley 1984 update of Jeffers *et al.* 1963 *Index Catalogue of Visual Double Stars*); for stars not in the WDS, components were labeled according to visual magnitude. For pairs not in the IDS with identical or combined magnitudes, the designation denoting the western component as "A" was retained. Supplemental (footnoted) BD stars (Warren and Kress 1980) are denoted by lower case letters in a byte separate from that used for double-star components. For AG stars not included in the BD, the lowest declination for the AG zone and the AG number are given. Uncertain spectral types have been designated by a colon in byte 43 instead of by "Q" as in the previous version. The DM numbers are now given in their full representation, including the catalog designation. This eliminates the difficulty experienced in the printed version for stars not contained in the proper catalogs for their declinations, as well as the need to indicate stars which changed declination zones between 1855 or 1875 and 1900.

The previous machine version contained the serious problem of the HDE stars 231301 to 240500 being shown as having  $m_{pg}$  data, whereas they are in fact, unlike the rest of the HDE,  $m_v$  data. They have therefore been moved to the  $m_v$  field in the new version. Plus signs (byte 24) for all positive declinations have been added in this version.

Errata were checked as thoroughly as possible and appropriate corrections entered into the catalog. The positions, magnitudes, and spectral types were then compared approximately with the values given for each HD star in the *Strasbourg Catalog of Stellar Identifications* (CSI, Ochsenbein *et al.* 1981). DM numbers were compared with those in both the CSI and the new *SAO-HD-GC-DM Cross Index* (Roman *et al.* 1983). All discrepancies were checked and corrections made as necessary. A version of the HD sorted by DM number was checked for duplicate entries and component identifications were added as described above. This check also uncovered a number of errors, including the omission of many supplemental BD designations.

Changes to the original machine version of *The Henry Draper Catalogue* are listed in Table 4. The column "S" denotes the source of a change by the following code:

- 1 - Hoffleit 1976
- 2 - ADC 1976 (included in a previous machine version; these corrections were carefully tabulated and a typed list prepared, but they were not published. Published errata included in the tabulation were lists by Jung and Bischoff 1971 and the Hoffleit 1976 list which has subsequently been separated to become Source 1. Some corrections in the former lists were further corrected in the latter)
- 3 - S. F. McLaughlin, private communication
- 4 - ADC 1985 (changes made since 1976)

Notes on changes for individual stars are given in Table 4. Stars which should be deleted, together with the number of the duplicate entry which should be retained, if any, are listed in Table 5. As a result of changes in the right ascensions of a few stars, their entries are now out of time order. These stars are listed in Table 6.

After the new machine catalog and listing of changes had been prepared, several additional errors were found. These errors are given in Table 7; the changes for HD 45075, 58881 and 61898 were discovered by E. D. Hoffleit in the course of reviewing this document. The remaining ones were detected at the ADC while working on other catalogs. The errors in Table 7 will be corrected in some future version of the machine catalog.

Table 3. Explanatory Notes to Individual Changes.

HD	Remarks
45075	Hoffleit (1976) states that the position given refers to CD-38°2619, whereas the spectral type refers to -38°2621. The positions have been changed to those for -38°2621.
55363	This star is identified as -0°1641 in the HD, but in the second HDE (Cannon and Walton Mayall 1949) the star numbered HD 55363, spectral type A2, is -0°1642. W. Stein recommended changing the identification in the SAO to -0°1641. It seems likely that the HD star is the northern, slightly fainter star of the pair, or -0°1641. The SAO star may or may not be the HD star.
61898	Hoffleit (1976) states that the position given refers to CD-36°3788, whereas the spectral type refers to -36°3787. The declination has been changed to that for -36°3787.
89880	The printed catalog lists this star at $\delta = -79^{\circ}45'$ with the DM number in italics (i.e., referring to the adjacent declination zone). The star appears to be CPD-78°536 at $\delta = -78^{\circ}45'$ .
168235	According to Hoffleit (1976), the magnitudes and position correspond to CD-32°14019, whereas the spectral type refers to -32°14027. The DM number, magnitudes, and positions have been changed to those for -32°14027.

Table 5. Stars Deleted from the Catalog.

<u>Delete</u>	<u>Retain</u>
62122	206487
82990	82967
87124	87107
91169	109005
93428	93470
132017	131999
164863	164883
217507	217490
240507	240515
240750	240762
243090	
252214	41909
266439	266474

Table 4. Corrections to HD (Part 1)

HD NO	Item	For	Read	S
90	DM NO	19035	18135	4
147	DM NO	15758	5758	2
661	DM NO	4A	4B	4
662	DM NO	4B	4A	4
681	DM ZONE	-7	-8	4
791	DM NO	11	10	2
855	DM NO	0	33	4
1326	RA	124	0127	2
1407	RA	131	0130	4
1407	DEC	+1831	+1851	2
2672	MAG PG	05	105	2
2672	SPEC	/3	K0	4
2885	DM NO	50B	50C	4
3540	DM NO	0	197	4
3977	DM NO	0	219	4
4397	DM NO	0	248	4
4757	DM NO	131A	131B	4
4758	DM NO	131B	131A	4
5013	DM NO	0	160	4
5223	MAG PG		999	4
5334	DEC	+4636	+4651	2
5788	DM NO	193A	193B	4
5789	DM NO	193B	193A	4
5846	DM NO	53A	53B	4
5847	DM NO	53B	53A	4
6640	DM NO	0	391	4
6695	MAG PG	1569	569	2
7544	DM NO	0	437	4
7713	DM NO	194	206	4
8181	DM NO	337A	337B	4
8182	DM NO	337B	337A	4
8896	DM NO	0	503	2
8974	DM NO	0	508	4
9273	DM NO	0	521	4

Table 4. Corrections to HD (Part 2)

HD NO	Item	For	Read	S
10644	DM NO	0	575	4
11031	RA	1433	1431	1
11143	DM NO	0	606	4
11502	DM NO	243A	243B	4
11503	DM NO	243B	243A	4
12446	DM NO	317A	317B	4
12447	DM NO	317B	317A	4
13904	DEC	+1118	+1018	2
14411	RA	2145	2144	1
14716	RA	2173	2153	2
16199	RA	2309	2289	2
16798	DEC	+6336	+6316	2
17351	DM NO	1055A	290	4
17352	DM NO	1055B	291	4
18281	DM NO	607A	607B	4
18282	DM NO	607B	607A	4
18701	RA	2553	2563	2
18949	DM NO	0	354	4
19091	DM NO	628A	628B	4
19092	DM NO	628B	628A	4
19527	DM NO	0	1072	4
19705	DEC	+5448	+5458	2
20309	DM NO	0	1124	4
20610	DM NO	0	1146	2
20776	DEC	-3433	-3423	2
21760	DM NO	0	1214	2
23943	DM NO	0	696	4
24071	DM NO	1297A	1297B	4
24072	DM NO	1297B	1297A	4
24102	DM NO	0	706	4
24121	DM NO	0	396	4
24523	RA	3490	3500	2
24523	DEC	+6533	+6535	4

Table 4. Corrections to HD (Part 3)

HD NO	Item	For	Read	S
24554	DM NO	631A	631B	1
24554	SPEC	A2	A	4
24555	DM NO	631B	631A	4
24796	DM NO	0	1398	4
25763	DM NO	0	842	4
26138	RA	4 31	4 36	2
26949	DM NO	1399	1395	2
27067	DEC	-3427	-3437	2
27538	DM NO	0	1579	4
28186	DM NO	0	1628	4
30748	DEC	-4348	-4338	2
31156	DM NO	1052	1053	4
31229	DM NO	1463	1563	1
31837	DM NO	0	1917	4
32503	DM NO	0	1960	2
33535	DM NO	0	2042	4
33869	DEC	- 9 4	- 857	1
37020	DM NO	0A		4
37023	DM NO	0D		4
37581	DM NO	0	2363	4
37790	DEC	- 540	- 5 4	2
37893	DM NO	1871A	1871B	4
37894	DM NO	1872B	1872A	4
38026	DM NO	335	3335	4
38198	DM NO	1302A	1302 b	4
38282	SPEC	/A	OA	2
39275	DM NO	1027B	1027C	4
39547	DM NO	791A	791B	4
39548	DM NO	791B	791A	4
40294	DEC	-6040	-6044	2
40369	DM NO	968A	968B	4
40370	DM NO	968B	968A	4
42126	DM NO	1352A	1352B	4

Table 4. Corrections to HD (Part 4)

HD NO	Item	For	Read	S
42127	DM NO	1352B	1352A	4
44137	DEC	-6737	-6757	2
44214	DM NO	0	1198B	4
45075	RA	6202	6203	4
45075	DEC	-3814	-3816	4
45330	DM NO	2633	2636	4
45330	SPEC	A0	M2	1
46407	SPEC	K0+	K0p	4
48061	DM NO	1524B	1524C	4
48710	RA	6396	6386	2
48766	DM NO	1122A	1122B	4
48767	DM NO	1122B	1122A	4
48915	MAG V	158	-158	4
48915	MAG PG	158	-158	4
49868	DM NO	0	1686	4
50206	DEC	+ 831	+ 8 1	2
51035	DM NO	0	1753	4
51888	DM NO	1350A	1350	4
52973	SPEC	G0P	G0p	4
53279	DEC	-58 3	-57 3	1
53439	DEC	-3020	-3027	2
53726	DM NO	0	1924	4
53817	DM NO	1495A	1495B	4
53818	DM NO	1495B	1495A	4
55864	DM NO	600A	600B	4
55865	DM NO	600B	600A	4
56451	DM NO	2839	3839	1
57062	DM NO	3697	3679	4
57832	DM NO	3133A	3133B	4
57833	DM NO	3133B	3133A	4
58308	DM NO	0	1220	4
58634	DM NO	3549A	3549B	4
58635	DM NO	3549B	3549A	4
58881	SPEC	S	Rp	4

Table 4. Corrections to HD (Part 5)

HD NO	Item	For	Read	S
59123	DM NO	0	1238	4
60178	DM NO	1581A	1581B	4
60179	DM NO	1581B	1581A	4
61161	DM NO	0	2616	4
61555	DM NO	4707A	4707B	4
61556	DM NO	4707B	4707A	4
61592	DM NO	0	4877	4
61618	DM NO	0	4881	4
61639	DM NO	0	1433	4
61873	DM NO	5900	2581	4
61898	DEC	-3656	-3652	1
62122	STAR DELETED			4
62172	DM NO	0	4965	4
62222	DM NO	0	2609	4
62223	DM NO	0	2606	4
62470	DM NO	0	5016	4
62774	DM NO	0	5062	4
62791	DM NO	201	2001	4
63443	DM NO	0	5157	4
63596	DM NO	0	5182	4
64856	DM NO	0	5354	4
65310	DM NO	0	5416	4
66543	DM NO	2803	3803	4
68022	DM NO	5599A	5599B	4
68023	DM NO	5599B	5599A	4
68098	DEC	+7119	+1719	4
68257	DM NO	0	1867A	4
68341	DM NO	0	1982	4
68643	DEC	+1011	+1041	2
68943	DM NO	0	2049	4
69085	DM NO	0	2328	4
69164	DM NO	4003A	4003B	4
69165	DM NO	4003B	4003A	4

Table 4. Corrections to HD (Part 6)

HD NO	Item	For	Read	S
70601	DM NO	0	2243	
71217	DEC	-4145	-4154	
71382	DEC	-3720	-3730	
71488	DM NO	4462B	4462C	
71672	DM NO	0	2238	
71762	DEC	+2835	+2825	
71885	DEC	- 026	- 044	
72600	RA	8286	8296	
72737	DM NO	1517A	1517B	
72738	DM NO	1517B	1517A	
73016	RA	8309	8303	
73323	DM NO	4658A	4658B	
73324	DM NO	4658B	4658A	
73803	DM NO	0	230	
75425	DEC	-4149	-4139	
76369	DM NO	2661A	2661B	
76370	DM NO	2661B	2661A	
80606	DM NO	1500A	1500B	
80607	DM NO	1500B	1500A	
81108	DEC	+1249	+1349	
81482	DM NO	5181-	5181	
81488	DEC	+3231	+3330	
82178	RA	9253	9263	
82383	DM NO	7355A	7355B	
82384	DM NO	7355B	7355A	
82705	DEC	+ 658	+ 558	
82990	STAR DELETED			1
83231	DM NO	7704A	7704B	4
83232	DM NO	7704B	7704A	4
83831	DM NO	0	2484	4
85674	DEC	+2043	+20 3	2
87124	STAR DELETED			1
87775	DEC	+1547	+1647	2



Table 4. Corrections to HD (Part 7)

HD NO	Item	For	Read	S
89880	DM ZONE	-80	-78	4
89880	DEC	-79451	-78451	4
91169	STAR DELETED			1
91269	MAG V	79	67	4
91592	RA	10294	10299	2
91750	DEC	+5850	+5750	2
92658	DM NO	0	4775	4
93160	DM NO	2631A	2631C	4
93161	DM NO	2631B	2631A	4
93428	STAR DELETED			1
93569	DEC	+ 349	+ 249	2
93584	RA	10431	10441	2
93953	DM NO	4079	5079	2
94713	DM NO	0	3755	4
95013	DM NO	0	4068	4
95853	DM NO	0	4846	4
96812	RA	11 38	11 28	2
96881	DM NO	1381	3181	4
97899	MAG V	000	1000	2
97981	DM ZONE	-51	-49	2
97981	DEC	-5045	-4945	4
98230	DM NO	2132A	2132B	4
98231	DM NO	2132B	2132A	4
98913	DM ZONE	-76	-74	2
98913	DEC	-7554	-7454	4
99059	DM NO	0	8867	4
99103	DM NO	1657A	1657B	4
99104	DM NO	1657B	1657A	4
99257	DM NO	0	8883	4
100286	DM NO	8928A	8928B	4
100287	DM NO	8928B	8928A	4
100976	DM NO	0	4551	4
101570	RA	11361	11362	1
103134	DEC	-3525	-3515	2

Table 4. Corrections to HD (Part 8)

HD NO	Item	For	Read	S
104294	DM NO	0	5004	4
104602	DEC	+3712	+3722	2
104829	DM NO	2566A	2566B	4
104830	DM NO	2566B	2566A	4
105439	DM NO	8881	881	4
106512	DM NO	2394A	2394B	4
106513	DM NO	2394B	2394A	4
108776	DM NO	0	2618 a	4
109005	DM NO	3486	3487	2
109005	MAG V	81	746	4
109005	MAG PG	81	760	4
109005	SPEC	AA	A5	4
109510	DM NO	2584A	2584B	4
109511	DM NO	2584B	2584A	4
110217	DM NO	0	4317	4
110317	DM NO	3676A	3676B	4
110318	DM NO	3676B	3676A	4
112091	DM NO	5487A	5487B	4
112092	DM NO	5487B	5487A	4
112412	DM NO	2580A	2580B	4
112413	DM NO	2580B	2580A	4
114500	RA	13 58	13 68	2
114501	RA	13 58	13 68	2
115342	DM NO	0	5926	4
116072	DM NO	0	4639	4
116087	DM NO	0	4640	4
116658	MAG PG	102	102	2
116658	SPEC	I	B2	2
118254	DM NO	0	6102	4
118476	RA	13320	13325	1
119658	DM ZONE	-50	-48	2
119658	DEC	-4935	-4835	2
120141	DM NO	8753A	8753B	4
120142	DM NO	8753B	8753A	4
120641	DM NO	6787A	6787B	4

Table 4. Corrections to HD (Part 9)

HD NO	Item	For	Read	S
120642	DM NO	6787B	6787A	4
120793	DM NO	3757A	3757B	4
120794	DM NO	3757B	3757A	4
120965	DEC	+7019	+70 9	2
121088	DM NO	0	6341	4
123548	DM NO	0	6653	4
124674	DM NO	1782A	1782B	4
124675	DM NO	1782B	1782A	4
126295	DM NO	0	3625	4
127642	DM NO	0	5735	4
129246	DM NO	2770A	2770B	4
129247	DM NO	2770B	2770A	4
129988	DM NO	2417A	2417B	4
129989	DM NO	2417B	2417A	4
130057	DM NO	0	6428	4
130444	RA	14432	14422	2
130444	DEC	+6935	+6934	2
130990	MAG V	96	96	2
132017	STAR DELETED			1
132418	DM NO	0	5413	4
134613	DM NO	10658A	10658B	4
134614	DM NO	10658B	10658A	4
136685	DM NO	0	6019	4
137231	DM NO	0	6494	4
137810	RA	15230	15240	2
137810	DEC	-1124	-1123	2
138483	DEC	+1625	+1635	2
138917	DM NO	2821A	2821B	4
138918	DM NO	2821B	2821A	4
139245	DM ZONE	11	12	2
139709	MAG PG	048	1048	4
139891	DM NO	2665A	2665B	4
139892	DM NO	2665B	2665A	4
140522	DM NO	0	8556	4

Table 4. Corrections to HD (Part 10)

HD NO	Item	For	Read	S
140535	RA	15390	15400	2
141156	DEC	+4754	+4654	2
141167	DM NO	245	10245	4
141354	DEC	+1327	+1337	2
142063	DM NO	0	8772	4
143834	DM NO	3161	2161	4
145822	DEC	+5447	+5457	2
145979	DEC	+ 745	+ 145	1
146172	DM ZONE	2	-2	2
146172	DEC	+ 235	- 235	2
146173	DEC	+ 7 6	- 7 6	2
146174	DEC	+1530	-1530	2
146175	DEC	+2234	-2234	2
146176	DM ZONE	29	-29	2
146176	DEC	+2947	-2947	2
146177	DEC	+3022	-3022	2
146178	DEC	+3540	-3540	2
146179	DEC	+3630	-3630	4
146180	DEC	+3758	-3758	2
146181	DEC	+3829	-3829	2
146182	DEC	+4458	-4458	2
146183	DEC	+47 0	-47 0	2
146184	DEC	+5037	-5037	2
146185	DEC	+51 1	-51 1	2
146186	DEC	+57 0	-57 0	2
146187	DEC	+5748	-5748	2
146188	DEC	+5843	-5843	2
146189	DEC	+6732	-6732	2
146190	DEC	+7544	-7544	4
147103	DM NO	4361A	4361C	4
147104	DM NO	4361B	4361A	4
147275	DM NO	2689A	2689B	4
147276	DM NO	2689B	2689A	4
147429	MAG PG	047	1047	4

Table 4. Corrections to HD (Part 11)

HD NO	Item	For	Read	S
147722	DM NO	12513A	12513B	4
147723	DM NO	12513B	12513A	4
148873	DM NO	10357	11357	4
149427	DM NO	0	6825	4
149661	DM ZONE	-1	-2	4
149661	DM NO	3220	4211	4
149683	DM NO	0	732 a	4
150017	RA	16332	16342	2
150082	DM NO	0	8073	4
150135	DM NO	11070A	11069	4
150136	DM NO	11070B	11070	4
151695	DM NO	0	7011	4
152017	DM NO	0	5503	4
152457	DM NO	10933B	10933A	4
152627	DM NO	0	6642	4
153043	DM NO	0	4539	4
153853	DM NO	0	5508	4
154457	DM NO	14448	11448	4
154905	DEC	-5436	+5436	3
154906	DEC	-5436	+5436	2
154907	DEC	- 151	+ 151	2
154952	DM NO	0	7079	4
155170	DM NO	0	6705	4
155332	MAG PG	994	994	2
155337	DM NO	0	4244	4
155474	DM NO	1841	11841	4
155517	DM NO	2934	12934	4
155885	DM NO	12026A	12026B	4
155886	DM NO	12026B	12026A	4
156737	DM NO	0	4357	4
157038	DM NO	11507A	11507B	4
157039	DM NO	11507B	11507A	4
157207	DM NO	0	7359	4

Table 4. Corrections to HD (Part 12)

HD NO	Item	For	Read	S
157778	DM NO	2878A	2878B	4
157779	DM NO	2878B	2878A	4
157800	DEC	-5733	-5753	2
157852	DEC	-43 5	+43 5	2
158601	MAG V	84	84	2
158640	MAG V	855	855	2
158640	MAG PG	933	933	2
158674	MAG V	88	888	2
158674	MAG PG	894	894	2
158686	MAG V	905	905	2
159000	DM NO	0	2722B	4
160134	DEC	+6325	+6225	1
161066	DM NO	14781	11781	2
162498	DM ZONE	-55	-53	2
162498	DEC	-5453	-5353	2
162714	SPEC	G/P	G0p	4
163958	DM NO	0	7765	4
164170	DM NO	0	12416	4
164668	DM NO	3280A	3280B	4
164669	DM NO	3280B	3280A	4
164863	STAR DELETED			i
166106	DM NO	0	6513	4
166718	DM NO	0	6869	4
167035	DM NO	0	6893	4
167170	DM NO	0	6671	4
167171	DM NO	0	6670	4
167399	DM NO	0	6942	4
167569	DM NO	0	6733	4
167749	DM NO	0	6748	4
168117	DM NO	0	6764	4
168188	DM NO	0	6768	4
168235	RA	18136	18138	1
168235	DEC	-3245	-3243	1
168235	MAG V	93	90	1
168235	MAG PG	105	93	1
168330	DM NO	0	6773	4

Table 4. Corrections to HD (Part 13)

HD NO	Item	For	Read	S
168353	DM NO	0	410	4
168539	MAG V	789	789	2
168643	DM NO	0	6791	4
168644	DM NO	0	6792	4
168677	DM NO	0	6796	4
168784	DM NO	0	411	4
168827	DEC	-4157	+4157	2
168938	DM NO	0	6803	4
169518	DM NO	0	12959	4
170162	DM NO	0	6847	4
171510	DM NO	0	6956	4
171556	DM NO	0	6959	4
172436	DEC	-1336	-1326	2
172496	DEC	-72 6	-7216	2
172820	SPEC	K5	K2	4
173060	DM NO	14673A	14673B	4
173061	DM NO	14673B	14673A	4
173442	DM NO	0	7175	4
174170	DM NO	371	13325	4
174491	DM NO	0	7232	4
174706	DM NO	0	7267	4
174772	MAG V	103	103	3
174850	DEC	-5559	-5459	2
174946	DM NO	0	7304	4
175143	DM NO	2993	12993	2
175475	DM NO	0	7135	4
175875	DM NO	0	7358	4
176125	DM NO	0	7238	4
176382	DM NO	0	13522	4
176485	DM NO	3750A	3750B	4
176486	DM NO	3750B	3750A	4
176536	DM NO	0	13528	4
176570	DM NO	0	7252	4

Table 4. Corrections to HD (Part 14)

HD NO	Item	For	Read	S
176701	DM NO	0	7388	4
176750	DM NO	0	7392	4
177070	DM NO	0	7404	4
177245	MAG V	101	101	3
177465	DEC	-1224	-1234	2
177639	DM NO	0	7196	4
177732	DM NO	0	13612	4
177800	DM NO	0	13615	4
177868	DM NO	0	5883	4
178078	DM NO	13953A	13953B	4
178079	DM NO	13953B	13953A	4
178196	DM NO	0	7428	4
178416	DM NO	0	7318	4
178465	DM NO	0	7319	4
178520	DM NO	0	7324	4
178671	DM NO	0	13670	4
179248	DM NO	0	7472	4
179450	DM NO	0	7260	4
179546	DM NO	0	13732	4
179607	DM NO	0	7263	4
179636	DM NO	0	7265	4
179660	DM NO	0	7266	4
179661	DM NO	0	7267	4
179693	DM NO	0	7268	4
179827	DM NO	0	7271	4
179957	DM NO	2959A	2959	4
179958	DM NO	2959B	2959 a	4
180202	DM NO	0	13774	4
181580	DM NO	0	7339	4
181757	DM NO	0	4103B	4
181810	DM NO	0	7349	4
182219	DM NO	4085A	4085B	4
182220	DM NO	4085B	4085A	4

Table 4. Corrections to HD (Part 15)

HD NO	Item	For	Read	S
182289	DM NO	0	7176	4
182824	DM NO	0	7187	4
183580	DM NO	0	7200	4
183659	RA	19255	19245	2
183810	DM NO	0	7204	4
183857	DM NO	0	14037	4
183862	DM NO	0	7205	4
184271	DM NO	0	7484	4
185385	REMARK		R	4
185535	DM NO	0	14148	4
186916	DM NO	0	9196	4
186921	DM NO	1348	1848	4
187452	DM NO	0	14286	4
187805	DEC	-4158	-4058	2
187908	DM NO	5560A	5560B	4
187909	DM NO	5560B	5560A	4
188178	DM NO	0	14345	4
188978	DM NO	0	14385	4
189439	DM NO	0	14412	4
190350	DM NO	0	14472	4
190526	REMARK		R	4
191133	SPEC	50	K0	2
191566	DM NO	3994A	3994B	4
191567	DM NO	3994B	3994A	4
191992	DM NO	0	9424	4
193045	DM NO	19366	9366	2
193370	MAG PG	560	560	2
193662	DM NO	0	7427	4
194308	DM NO	0	14704	4
194332	DM NO	0	6394	4
194348	DM NO	0	14707	4
194359	DM NO	4004A	4004B	4
194360	DM NO	4004B	4004A	4

Table 4. Corrections to HD (Part 16)

HD NO	Item	For	Read
194440	DM NO	0	7458
194563	DM NO	0	14716
194734	DM NO	0	7475
194735	DM NO	0	7464
194804	DM NO	0	7478
195043	DM NO	0	7484
195144	DM NO	0	7490
195412	DM NO	15753	5753
195482	DM NO	4307A	4307B
195482	DEC	+1057	+1055
195483	DM NO	4307B	4307A
195483	DEC	+1057	+1055
196173	DM NO	0	7499
196704	DM NO	0	7534
196803	DM NO	0	7517
197242	DM NO	0	6470
197324	RA	20378	20388
197568	DM NO	0	6474
197633	DM NO	0	6475
197893	DEC	-7053	-7653
197963	DM NO	4255A	4255B
197964	DM NO	4255B	4255A
198508	DM NO	0	7893
199866	DM NO	0	7624
199930	DM NO	0	9355
200496	DM NO	5664A	5664B
200497	DM NO	5664B	5664A
200551	DM NO	0	15182
201171	DM NO	0	7657
201474	DM NO	0	15233
202064	DM NO	0	7662
202361	DM NO	0	7669
202488	DM NO	0	7674
202764	DM NO	0	7697

Table 4. Corrections to HD (Part 17)

HD NO	Item	For	Read	S
203060	DM NO	0	7691	4
203128	DM NO	0	7694	4
203312	DM NO	0	15347	4
203597	DM NO	0	15360	4
203943	DM NO	4671A	4671B	4
203944	DM NO	4671B	4671A	4
203983	DM NO	0	15382	4
204075	DM NO	0	15388	4
204688	REMARK		R	4
205017	DM NO	0	8064	4
205227	DM NO	0	15463	4
205633	DEC	- 951	- 851	2
205758	DEC	+7220	+7230	2
206516	DM NO	0	15536	4
206784	DM NO	0	8209	4
207037	DM NO	0	7987	4
207064	DM NO	0	7988	4
207819	DM NO	0	15616	4
208302	DM NO	14694A	14694B	4
208303	DM NO	14694B	14694A	4
208371	DM NO	13125A	13125B	4
208372	DM NO	13125B	13125A	4
208762	DEC	+4159	+4059	2
208991	DM NO	0	8139	4
210432	DM NO	2395A	2395B	4
210433	DM NO	2395B	2395A	4
211547	DM NO	0	15834	4
213051	DM NO	4365A	4365B	4
213052	DM NO	4365B	4365A	4
213325	DM ZONE	-1		4
213325	DM NO	4621		4
213488	DM NO	0	15939	4
214051	DEC	-6519	+6519	2

Table 4. Corrections to HD (Part 18)

HD NO	Item	For	Read
214052	DEC	-4642	+4642
214053	DEC	-4348	+4348
214054	DEC	-4326	+4326
214055	DEC	-3725	+3725
214056	DEC	-2530	+2530
214057	DEC	- 950	+ 950
214058	DEC	- 543	+ 543
214059	DEC	- 451	+ 451
214167	DM NO	4808A	4808B
214168	DM NO	4808B	4808A
215048	DM NO	0	16019
215703	DM NO	9991	991
216749	DEC	-2318	-23 8
216834	DEC	+ 7 5	- 7 5
216835	DEC	+1027	-1027
216836	DEC	+1456	-1456
216837	DEC	+3337	-3337
216838	DEC	+7418	-7418
216876	DM NO	3933	3932
217431	DM NO	0	16154
217507	STAR DELETED		
217894	DM NO	0	16168
218215	DM NO	0	16188
218280	DM NO	0	16192
218475	DM NO	3030	6030
218888	DM NO	0	16232
219316	DM NO	0	16251
219390	DM NO	0	16258
219534	MAG V	105	105
219861	DEC	-56 0	-5610
220022	DM NO	0	16291
220294	DM NO	0	16298
220636	DM NO	915A	915B

Table 4. Corrections to HD (Part 19)

HD NO	Item	For	Read	S
220637	DM NO	915B	915A	4
220746	DEC	-7658	-7558	2
221256	DM NO	0	16343	4
221426	DEC	-1047	-1057	2
221525	DM NO	3444	344	4
222140	DM NO	0	8173	4
222244	DEC	+ 929	- 929	4
222788	DEC	+1844	+1834	2
223182	DM NO	0	16450	4
223207	DM NO	4767	14767	2
223418	DM NO	0	16463	4
223440	DM NO	0	16466	4
223546	DM NO	0	16472	4
223838	DM NO	5068A	5068B	4
223839	DM NO	5068B	5068A	4
223895	DEC	+1231	-1231	2
223896	DEC	+1849	-1849	2
223897	DEC	+3513	-3513	2
223898	DEC	+6217	-6217	2
223947	DM NO	0	16496	4
224302	DEC	-3541	+3541	2
224303	DEC	-22 5	+22 5	2
224304	DEC	-1215	+1215	2
224305	DEC	- 311	+ 311	2
224565	DM NO	19004	18104	4
224595	DM NO	19005	18105	4
224688	DM NO	4873	4872	2
224693	DM NO	19008	18108	4
224728	DM NO	19012	18112	4
224797	DM NO	19013	18113	4
224830	DM NO	19014	18114	4
224962	DM NO	19020	18120	4
224963	DM NO	19021	18121	4

Table 4. Corrections to HD (Part 20)

HD NO	Item	For	Read
225109	DM NO	19027	18127
225141	DM NO	19029	18129
225165	DM NO	19032	18132
225199	DM NO	19033	18133
230492	DM NO	3666A	3666B
230493	DM NO	3666B	3666A
231571	DM NO	3858A	3858B
231572	DM NO	3858B	3858A
240507	STAR DELETED		
240579	DM NO	828A	828B
240580	DM NO	828B	828A
240750	STAR DELETED		
241961	DM NO	897A	897B
241962	DM NO	897B	897A
242760	DM NO	898A	898 a
243090	STAR DELETED		
243302	DM NO	881A	881B
243303	DM NO	881B	881A
243741	DM NO	1048A	1048 a
244077	DM NO	913A	913 a
245816	DM NO	885A	885B
245817	DM NO	885B	885A
245969	DM NO	1045A	1045B
245970	DM NO	1045B	1045A
246502	DM NO	928A	928B
246503	DM NO	928B	928A
247817	DM NO	906A	906B
247818	DM NO	906B	906A
247943	DM NO	1005A	1005B
247944	DM NO	1005B	1005A
248196	DM NO	885A	885B
248197	DM NO	885B	885A
248256	DM NO	1040A	1040B

Table 4. Corrections to HD (Part 21)

HD NO	Item	For	Read	S
248257	DM NO	1040B	1040A	4
249284	DM NO	1173A	1173B	4
249285	DM NO	1173B	1173A	4
249622	DM NO	939A	939 a	4
249736	DM NO	0	1151A	4
250795	SPEC	ME	Me	4
252214	STAR DELETED			1
252797	DM NO	1211	1121	4
254852	DM NO	1096A	1096 a	4
255282	DM NO	2313	1313	4
257414	DM NO	1334A	1334	4
259597	SPEC	OE5	Oe5	4
259787	DM NO	1393A	1393C	4
259788	DM NO	1393B	1393A	4
259866	DM NO	1324A	1324B	4
259867	DM NO	1324B	1324A	4
260005	DM ZONE	24	25	4
260379	DM NO	1211A	1211 a	4
260797	DM NO	1328A	1328 a	4
260850	DM NO	1324A	1324 a	4
261308	DM NO	1381A	1381B	4
261309	DM NO	1381B	1381A	4
263369	DM NO	1259B	1259	4
264260	DM ZONE	17	18	4
264720	DM NO	1302A	1302B	4
264721	DM NO	1302B	1302A	4
264754	DM NO	1336A	1336 a	4
266439	STAR DELETED			1
266611	DM NO	1367A	1367 a	4
267647	DM NO	0	1294A	4
268054	DM NO	1438A	1438 a	4
268398	DM NO	1942	1492	4
268405	DM NO	1444A	1444B	4

Table 4. Corrections to HD (Part 22)

HD NO	Item	For	Read
268406	DM NO	1444B	1444A
268413	DM NO	1589A	1589 a



Table 6. Records Now out of Right Ascension Order.

FIRST RECORD					NEXT RECORD								
1326	BD+43	44	0	12.7	+43	27	1327	BD+36	25	0	12.4	+36	59
1406	BD+29	39	0	13.1	+29	49	1407	BD+18	27	0	13.0	+18	51
4936	BD+ 9	99	0	46.9	+10	4	4937	BD+ 0	130	0	46.3	+ 0	23
11030	CD-36	675	1	43.2	-36	22	11031	BD+47	508	1	43.1	+47	24
11292	BD+37	389	1	45.8	+37	42	11293	BD+34	321	1	45.7	+35	11
14410	BD+15	327	2	14.5	+15	47	14411	BD- 3	355	2	14.4	- 3	25
14715	CP-52	294	2	17.3	-52	14	14716	CP-74	186	2	15.3	-74	18
16198	BD+22	372	2	30.9	+22	37	16199	BD+ 8	396	2	28.9	+ 8	33
18701	BD+10	402	2	56.3	+10	27	18702	BD+ 5	435	2	55.3	+ 5	35
24523	BD+65	382	3	50.0	+65	35	24524	BD+45	844	3	49.0	+45	11
26138	BD+60	784	4	3.6	+60	58	26139	BD+42	904	4	3.1	+42	20
33463	BD+29	833	5	5.3	+29	48	33464	BD+23	872	5	4.9	+23	6
40687	BD-15	1238	5	55.3	-15	49	40688	BD-22	2643	5	55.1	-23	0
44715	BD+ 2	1210	6	18.1	+ 2	48	44716	BD+ 1	1313	6	17.4	+ 1	14
45075	CD-38	2621	6	20.3	-38	16	45076	CD-43	2430	6	20.2	-43	56
45824	BD+26	1254	6	24.6	+26	43	45825	BD+20	1450	6	24.5	+20	51
48011	BD+14	1395	6	36.2	+14	19	48012	BD+10	1219	6	35.4	+10	8
48709	CD-48	2455	6	39.5	-48	29	48710	BD+49	1544	6	38.6	+49	29
49382	BD+14	1453	6	43.5	+14	24	49383	BD+12	1300	6	43.1	+12	40
50458	BD+ 1	1576	6	48.4	+ 1	38	50459	BD- 4	1710	6	48.3	- 4	11
50509	BD+19	1525	6	48.5	+19	43	50510	BD+11	1349	6	48.4	+11	48
50587			6	49.0	- 5	29	50588	BD- 6	1799	6	48.8	- 6	51
52181	BD+20	1668	6	55.5	+20	15	52182	BD+14	1527	6	55.1	+13	58
66975	CP-63	873	8	0.7	-63	14	66976			8	0.6	+58	7
71955	BD+ 3	1992	8	25.2	+ 3	10	71956	BD- 9	2539	8	25.1	-10	8
72600	CD-36	4763	8	29.6	-36	19	72601	CD-47	4056	8	28.6	-47	28
73015	CP-65	963	8	30.8	-65	19	73016	BD+75	346	8	30.3	+75	3
81129	CD-26	6998	9	19.0	-26	54	81130	CD-28	7192	9	18.7	-28	17
82178	BD-14	2872	9	26.3	-14	23	82179	BD-18	2693	9	25.3	-19	4
88460	BD+26	2057	10	8.0	+26	39	88461	BD-20	3123	10	7.0	-20	30
89159	CP-56	3043	10	11.9	-56	37	89160	CP-58	2031	10	11.8	-58	16
91592	CD-48	5735	10	29.9	-48	50	91593	CP-54	3797	10	29.4	-54	52
93584	BD+13	2310	10	44.1	+13	22	93585	BD+ 8	2416	10	43.1	+ 8	18
96811	CP-60	2544	11	3.8	-61	8	96812	CP-67	1647	11	2.8	-67	23
101570	CP-61	2514	11	36.2	-61	32	101571	CP-67	1787	11	36.1	-67	36
114501	CP-70	1575	13	6.8	-70	30	114502	CP-71	1437	13	5.8	-71	32
118476	CP-72	1428	13	32.5	-73	3	118477	CP-73	1177	13	32.0	-73	34
130443	CP-71	1652	14	43.1	-72	3	130444	BD+69	767	14	42.2	+69	34
136579	BD+47	2218	15	17.3	+47	17	136580	BD+41	2592	15	16.4	+41	20
137810	BD-11	3952	15	24.0	-11	23	137811	BD-14	4212	15	23.0	-14	56
140535	CP-77	1168	15	40.0	-77	51	140536	BD+ 8	3073	15	39.1	+ 7	55
150017	BD- 7	4337	16	34.2	- 7	19	150018	BD-18	4304	16	33.2	-18	20
150092	CD-40	10597	16	33.9	-40	14	150093	CD-40	10594	16	33.7	-40	55
166817	CP-67	3507	18	7.2	-67	54	166818	BD+84	404	18	6.3	+84	43
167201	BD-22	4634	18	9.0	-22	38	167202	BD-22	4632	18	8.8	-22	38
168235	CD-32	14027	18	13.8	-32	43	168236	CD-35	12500	18	13.6	-35	29
183658	BD- 6	5170	19	25.5	- 6	43	183659	BD- 8	5003	19	24.5	- 8	28
187141	BD+41	3485	19	43.3	+41	29	187142	BD+28	3473	19	42.3	+28	23
197324	CP-75	1657	20	38.8	-75	25	197325	CP-76	1446	20	37.8	-76	12
203152	CP-71	2603	21	15.3	-71	7	203153	CP-83	715	21	14.3	-83	28
220615	BD+76	914	23	20.3	+76	32	220616	BD+52	3435	23	20.1	+52	52
225300	CP-71	2787	23	59.9	-71	3	225301	BD+41	3429	19	35.4	+41	15
227158	BD+34	3841	19	57.8	+34	36	227159			19	51.8	+33	40
229300	BD+41	3749	20	23.0	+41	30	229301	BD+17	3699	18	38.8	+17	22
230801	BD+12	3828	19	5.2	+13	1	230802	BD+19	3924	19	4.3	+19	14
231544	BD+19	4041	19	25.4	+19	25	231545			19	24.4	+17	27
232100	BD+13	4090	19	33.9	+13	28	240501			4	57.6	+13	40
261500			6	34.5	+ 3	3	261501			6	34.2	+34	15
261530			6	34.5	+ 3	7	261531	BD+32	1368A	6	34.3	+32	5
268600	BD+31	1489	6	59.8	+31	15	270501	CP-73	260	4	26.9	-73	21

Table 7. Additional Errors Still Present in This Machine Version.

HD	Item	For	Read
45075	DEC	-38 16	-38 14
58881	SPEC	Rp	S
61898	DEC	-36 52	-36 56
173607	DM	3510A	3510C
173608	DM	3510B	3510D
192604	DM	4031A	4031 a

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## SECTION 5 - SAMPLE LISTING

The sample listing given on the following pages contains logical data records exactly as they are recorded on the tape. Sample records for stars at the beginning and the end of the data file are listed. 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).







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