National Space Science Data Center/
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Documentation for the Machine-Readable Version

of the

General Catalogue of 33342 Stars for the Epoch 1950

(Boss 1937)

December 1983

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(BOSS 1937)

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ABSTRACT

A revised and corrected version of the machine-readable catalog has been prepared. Cross identifications of the GC stars to the HD and DM catalogs have been replaced by data from the new *SAO-HD-GC-DM Cross Index* (Roman, Warren and Schofield 1983), including component identifications for multiple SAO entries having identical DM numbers in the SAO Catalog, supplemental *Bonner Durchmusterung* stars (lower case letter designations) and codes for multiple HD stars. Additional individual corrections have been incorporated based upon errors found during analyses of other catalogs.

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SECTION 1 - INTRODUCTION AND SOURCE REFERENCE

The machine-readable version of the *General Catalogue of 33342 Stars for the Epoch 1950* (GC, Boss 1937) includes *Henry Draper Catalogue* (HD, Cannon and Pickering 1918-1924) and Durchmusterung (DM) numbers for all stars, although the published version gives only one or the other. The Astronomical Data Center has recently produced a new version of the cross index among *Smithsonian Astrophysical Observatory Catalog* (SAO, Smithsonian Astrophysical Observatory Staff 1966), HD, GC and DM catalog numbers. Since most of the errors of which we are aware in the current version of the GC tape occurred in either the DM or HD number, these entries have been completely replaced on the basis of the revised cross index. The cross index also identifies components of multiple stars, provides small letter designations for supplemental stars in the *Bonner Durchmusterung*, and includes a code to indicate that the spectrum is likely to be blended and, if so, whether the entry is for the brighter or fainter component. A total of 1186 changes was made to 1091 data records.

This document describes the machine-readable version of the corrected and edited GC as it is currently being distributed by the Astronomical Data Center. It is intended to enable users to read and process the data without the common problems and guesswork often associated with such a task. This document should be distributed with any machine-readable version of the catalog.

SOURCE REFERENCE

Boss, B. 1937, *General Catalogue of 33342 Stars for the Epoch 1950*, Carnegie Institution of Washington Pub. 468 (Washington: Carnegie Institution of Washington).

SECTION 2 - TAPE CONTENTS

A byte-by-byte description of the contents of the machine-readable Boss *General Catalogue* is given in Table 1. A suggested FORTRAN format specification for reading each datum is given and can be modified depending upon usage. Caution is advised when substituting format specifications, since some data fields contain character data and others are blank when data are absent. Alternate format specifications are given in parentheses. Additional information and remarks are given in Table 2.

Table 1. Tape Contents. *General Catalogue of 33342 Stars for the Epoch 1950.*

Byte(s)	Units	Suggested Format	Description
1- 5	---	I5	GC number.
6- 10	mag	F5.2	Magnitude ("VAR" given as 9999; see note 1).
11- 13	---	3I1	Spectral type numerical code (see note 2).
14- 19	---	6A1	Spectral type decoded. All byte 12 values translated to the first numerical choice (see note 2).
20- 21	hours	I2	Right ascension, α, equinox 1950.0.
22- 23	min	I2	α
24- 29	sec	F6.3	α
30- 33	years	F4.1	Epoch of α observations (see note 5).
34- 40	"	F7.4	Annual variation in α (see note 4).
41- 46	"	F6.4	Secular variation in α (see note 4).
47- 52	"	F6.3	Third term in α (see note 4).
53- 58	sec	F6.4	Proper motion in α.
59	---	A1	Sign of declination, δ, equinox 1950.0.
60- 61	°	I2	δ
62- 63	'	I2	δ
64- 68	"	F5.2	δ

Table 1. (continued)

Byte(s)	Units	Suggested Format	Description
69- 72	years	F4.1	The mean epoch of δ observatons (note 5).
73- 79	"	F7.3	Annual variation in δ.
80- 84	"	F5.3	Secular variation δ.
85- 88	"	F4.2	Third term in δ.
89- 94	"	F6.3	Proper motion in δ. The values are based on the Newcomb values of precession.
95	---	A1	Remarks (see note 3).
96- 97	---	2A1	Durchmusterung (DM) identification (BD = *Bonner Durchmusterung;* CD = *Cordoba Durchmusterung;* CP = *Cape Photographic Durchmusterung*). All DM fields are blank if no DM identification is present.
98	---	A1	Sign of DM zone
99-100	---	I2 (A2)	DM Zone
101-105	---	I5 (A5)	DM Number
106-107	---	A2	Component identification if two or more SAO stars have the same DM number. For southern stars, components may appear in different catalogs.
108	---	A1	Lower case letters for BD supplemental stars (Warren and Kress 1980).
109-115	°	F7.3	Galactic longitude l^{II}.
116-122	°	F7.3	Galactic latitude b^{II}.
123-128	---	I6	*Henry Draper Catalogue* number (blank for stars with no HD numbers).
129	---	I1	HD code. (0 for single stars or brighter components of doubles with $\Delta m_v > 0^m3$. For doubles with $\Delta m_v < 0^m3$, 1 designates the brighter component, not necessarily A, and 2 the fainter one. 9 indicates that two successive HD numbers (HD and HD+1) refer to the same SAO star.

Notes to Table 1

1. Magnitude. All magnitudes are given to two decimal places in the magnetic tape version. Magnitudes which are underlined in the published version of the catalog are not indicated on the magnetic tape version.

2. Codes for Spectral Types

Byte 12	Byte 13	Byte 14
R = 0	0 or a = 0	c = 0
0e5 = 1	1 or b = 1	v = 1
O = 2	2 or c = 2	e = 2
B = 3	3 or d = 3	* = 3
A = 4	4 or e = 4	n = 4
F = 5	5 = 5	Note = 5
G = 6	6 = 6	*p = 6
K = 7	7 = 7	ep = 7
M = 8	8 = 8	cp = 8
N = 9	9 = 9	cv = 9
S = x		p = -

Except for Mb, Mc, Nb, where b=3 and c=8.

A value of 5 in byte 14 has been used to identify the following exceptions:

GC # 89 Type Md is punched as 8y5
GC # 7178 Type N? is punched as 9y5
GC #14298 Type Pe is punched as yy5

where x = '-' and y = '+'

3. Remarks

0 = No remark given
1 = Spectrum given
2 = Aitken or Innes number given
3 = Aitken or Innes number given with each component having a separate GC number
4 = Other information given
5 = 1+2
6 = 1+3
7 = 1+4
8 = 2+4
9 = 3+4
~ = 1+2+4
+ = 1+3+4

4. Annual Variation

The annual variations in right ascension and declination are given to six significant figures of which a minus sign is one. If more than one digit and a minus sign precede the decimal, the corresponding number of digits is dropped at the end of the number.

e.g.: 3.0588, -1.1487, 38.9070, but -26.814, 103.657

The third term is given to five significant figures including minus sign.

5. Epoch

The first two digits of the year are omitted. Thus 98.8 should be read 1898.8 and 05.3 should be read 1905.3.

SECTION 3 - TAPE CHARACTERISTICS

The information in Table 2 is sufficient for a user to describe the indigenous characteristics of the magnetic tape of the present version of the GC 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. *General Catalogue of 33342 Stars for the Epoch 1950.*

NUMBER OF FILES	1
LOGICAL RECORD LENGTH (BYTES)	129
RECORD FORMAT	FB*
TOTAL NUMBER OF LOGICAL RECORDS	33342

* Fixed block length (last block may be short)

SECTION 4 - REMARKS, MODIFICATIONS AND REFERENCES

The 1983 edition of the tape version of the GC is based on a machine-readable version obtained from the U.S. Naval Observatory and modified by Theresa A. Nagy in 1980. The primary changes to this version are reformatting, to eliminate most of the blank fields, and the substitution of HD numbers, duplicity codes for the HD numbers, and DM numbers from the *SAO-HD-GC-DM Cross Index*. The latter includes both the DM designations and letters to indicate binary components and supplemental stars in the BD. DM designations have also been added for the few stars not included in the SAO. HD numbers in the cross index were compared with those originally in the GC, discrepancies were checked and both catalogs corrected appropriately.

Table 3 lists additional errors which have been corrected. A table of all changes made to produce this version of the catalog is included on the microfiche inside the back cover of this document.

The following quantities were not included (and have not been added) in the machine-readable version of the catalog, but are in the published version:

1. The centennial increment of the proper motion in right ascension.

2. Probable error of:

    a. Right ascension at epoch
    b. Centennial proper motion
    c. Right ascension for 1950.0

3. The centennial increment of the proper motion in declination.

4. Probable error of:

    a. Declination at epoch
    b. Centennial proper motion
    c. Declination for 1950.0

5. Remarks. However, there is a numerical code in byte 95 that indicates the presence of a remark. This code also indicates the type of information contained in the remark if there is one (see Table 1).

The following quantities have been added to the machine-readable version of the catalog but are not contained in the published version:

a. Galactic longitude (degrees)
b. Galactic latitude (degrees)
c. DM numbers

Table 3. Changes Since the Last Edition (other than those from Cross Index)

GC	Item	For	Read	Source of Correction
15001	δ"	28.27	18.27	SAO error analysis
19049	Spectrum	F2	G2	CSI*
19051	Spectrum	blank	F2	SAO error analysis
26879	δ"	34.38	24.38	SAO error analysis
30799	δ"	52.70	49.88	error noted in N30†
30799	Epoch	04.4	31.5	error noted in N30

* Ochsenbein, Bischoff and Egret 1981
† Morgan 1952

REFERENCES

Boss, B. 1937, *General Catalogue of 33342 Stars for the Epoch 1950*, Carnegie Institution of Washington Pub. 468 (Washington: Carnegie Institution of Washington).

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

Morgan, H. R. 1952, *Catalog of 5,268 Standard Stars for the Equinox and Epoch 1950.0 Based on the Normal System N30*, *Astron. Papers Amer. Ephemeris* 13, Part III.

Nagy, T. A. 1980, Documentation for the Machine-Readable Version of the *General Catalogue of 33342 Stars for the Epoch 1950*[*.0*], Systems and Applied Sciences Corporation R-SAW-4/80-08.

Ochsenbein, F., Bischoff, M. and Egret, D. 1981, *Astron. Astrophys. Suppl.* 43, 259.

Smithsonian Astrophysical Observatory Staff 1966, *Star Catalog. Positions and Proper Motions of 258,997 Stars for the Epoch and Equinox of 1950.0*, Pub. of the Smithsonian Institution of Washington, D. C. No. 4652 (Washington: Smithsonian Institution).

Warren, W. H. Jr. and Kress, K. 1980, *Astron. Data Center Bull.* 1, 19.

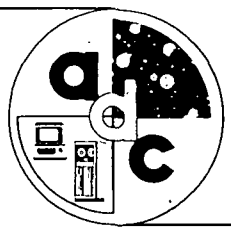
SECTION 5 - SAMPLE LISTING

The sample listing given on the following pages presents logical data records exactly as they are recorded on the tape. Groups of records from the beginning and end of the file 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).

```
LISTING OF RECORDS FROM TAPE FILE

  TAPE FILE NAME: GC Version ADC 1983
         RECORDS       1 TO      15
       TAPE FILE       5
   RECORD LENGTH     129 BYTES
    INPUT VOLSER     WH034

C O L U M N                                                                                                         111111111111111
H E A D I N G        1111111111222222222233333333334444444444555555555566666666667777777777888888888899999999990000000000111111
I N D E X   123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345

RECORD    1    1 60260  G0   0 0 1.42896.6 3.0752 .0085  .081 .0017 654914.3097.7 20.047-.009-.17 0.0046BD+65 1987   118.006
            3.6952250090
RECORD    2    2 74742  A2   0 0 3.74994.4 3.0749 .0685  .081 .0008 654918.7296.4 20.033-.009-.17-0.0103BD+65 1988   118.010
            3.6962250100
RECORD    3    3 72040  A0   0 0 5.13085.1 3.0690 .2344  .391-.0083 824141.7787.1 20.043-.009-.17 0.0000BD+82  748   121.355
           20.2512250190
RECORD    4    4 76952  F2   0 0 9.64795.9 3.1002 .1743  .484 .0216 80 013.7192.2 20.066-.009-.17 0.0238BD+79  799   120.793
           17.6132250200
RECORD    5    5 86570  K0   0 0 9.98208.2 3.0652-.0455  .047-.0065-575443.5507.1 20.018-.009-.17-0.0250CP-58 8126   315.346
          -58.3052250330
RECORD    6    6 73240  A0   0 011.62804.8 3.0741 .0232  .017 .0000 353213.9003.2 20.038-.009-.17-0.0042BD+35 5159   111.967
          -26.0182250230
RECORD    7    7 82070  K0   0 020.60398.2 3.0782 .0893  .133-.0010 71 449.3089.1 20.038-.009-.17-0.0050BD+70 1342   119.035
            6.8552250440
RECORD    8    8 62758  F8   0 023.56194.3 3.0801-.0092  .012 .0076-201932.3291.7 20.117-.009-.17 0.0750BD-20 6703    62.896
          -70.8392250450
RECORD    9    9 78870  K0   0 027.97705.7 3.0683-.0518  .057 .0000-605813.2405.5 20.040-.009-.17-0.0030CP-61 6792   313.360
          -55.4452250620
RECORD   10   10 83050  F0   0 030.64293.0 3.0714 .0061  .010-.0023  75934.2685.5 19.988-.010-.17-0.0340BD+07 5123A  102.920
          -52.7112250570
RECORD   11   11 67242  A2   0 033.95798.5 3.0798 .0233  .022 .0035 422810.6193.5 20.041-.010-.17-0.0020BD+41 4925   113.567
          -19.2442250680
RECORD   12   12 65465  G5   0 034.01496.6 3.0744-.0117  .013 .0026-242525.2893.6 20.044-.010-.17 0.0020CD-2417960    45.574
          -78.7152250690
RECORD   13   13 80550  F0   0 036.99299.8 3.0750-.0120  .013 .0034-2452 1.6397.2 20.043-.010-.17 0.0004CD-2516766    43.409
          -78.8552250760
RECORD   14   14 66670  K0   0 039.18399.2 3.0790 .0112  .011 .0045 171628.7597.9 19.993-.010-.17-0.0500BD+16 5034   106.913
          -43.6142250730
RECORD   15   15 96050  F0   0 043.01802.3 3.0706-.0418  .041 .0034-5541 1.5497.4 20.051-.010-.17 0.0080CP-5610210   316.811
          -60.4062250910
```

LISTING OF RECORDS FROM TAPE FILE

```
          TAPE FILE NAME: GC Version ADC 1983
                 RECORDS    33327 TO   33342
               TAPE FILE       5
           RECORD LENGTH     129 BYTES
            INPUT VOLSER    WHW034

COLUMN                                                                                                          1111111111111111
HEADING                   1111111111222222222233333333334444444444555555555566666666667777777777888888888899999999990000000000111111
INDEX            1234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345

RECORD    33327 33327  51538   B8  235915.60292.9 3.0742 .0001  .010 .0007- 31820.8490.5 20.038-.007-.17-0.0044BD-03 5749    94.592
                -63.1362249260
RECORD    33328 33328  70370   K0  235921.64907.5 3.0725-.0211  .018-.0036-373027.9805.2 20.000-.007-.17-0.0424CD-3715469   345.810
                -75.4722249360
RECORD    33329 33329  78252   F2  235922.32199.8 3.0839-.0252  .022 .0074-415331.9895.9 20.008-.007-.17-0.0348CD-4216567   334.771
                -72.3162249370
RECORD    33330 33330  46683   MJ  235923.70802.8 3.0768-.0015  .010 .0032- 61730.8601.6 20.009-.007-.17-0.0337BD-06 6345    91.582
                -65.8272249350
RECORD    33331 33331  73039   B9  235924.37102.4 3.0632 .0690  .083-.0022 66 935.2102.6 20.048-.007-.17 0.0050BD+65 1985   118.009
                  4.0402249380
RECORD    33332 33332  70470   K0  235926.00098.8 3.0850-.0218  .019 .0091-381047.9797.8 20.003-.007-.17-0.0400CD-3815713   343.794
                -75.0372249490
RECORD    33333 33333  68543   AJ  235928.67895.0 3.0751 .0002  .010 .0016- 3 240.6892.8 20.038-.007-.17-0.0050BD-03 5750    94.943
                -62.9222249450
RECORD    33334 33334  58560   G0  235933.18088.6 3.1344 .0175  .013 .0625 2649 2.7889.2 19.055-.008-.17-0.968-BD+26 4734   109.596
                -34.4552249300
RECORD    33335 33335  70358   F8  235942.14198.0 3.0926-.0055  .010 .0189-134110.7794.0 20.086-.008-.17 0.0430BD-14 6603    80.556
                -72.1042249740
RECORD    33336 33336  70480   B0  235943.46001.2 3.0685 .0543  .054-.0019 602529.9193.8 20.033-.008-.17-0.0100BD+59 2816   116.953
                  -1.5972249800
RECORD    33337 33337  49935   B5  235946.26001.8 3.0748-.0154  .015 .0008-295957.0799.9 20.047-.008-.17 0.004-CD-3013790    16.549
                -78.9032249900
RECORD    33338 33338  83258   F8  235947.77904.9 3.0668 .0074  .010-.0062 103031.3104.3 19.935-.008-.17-0.1070BD+05 5313   103.873
                -56.2602249840
RECORD    33339 33339  73740   A0  235947.87304.0 3.0697 .0376  .030-.0022 501317.2798.0 20.044-.008-.17 0.0020BD+49 4314   115.001
                -11.6152249930
RECORD    33340 33340  63445   A5  235950.37497.8 3.0730 .0064  .010-.0001  84042.5492.2 20.043-.008-.17 0.0017BD+08 5164   103.010
                -52.0682249950
RECORD    33341 33341  57850   F0  235950.17905.2 3.0664 .0062  .010-.0060  81227.7204.8 19.997-.008-.17-0.0467BD+07 5121   102.811
                -52.4632250030
RECORD    33342 33342  71940   A0  235956.46499.0 3.0702 .0104  .011-.0031 155841.5797.5 20.057-.008-.17 0.0150BD+15 4925   106.218
                -45.0222250010
```



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