The General Catalogue of 33342 Stars for the Epoch 1950

(Boss 1937)

Documentation for the Computer-Readable Version

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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 Cross identifications of the *GC* stars to the HD and DM catalogs have been replaced by data from the *SAO-HD-GC-DM Cross Index* (Roman et al. 1983), including component identifications for multiple SAO entries having identical DM numbers in the SAO Catalog, supplemental Bonner Durchmusterung stars (lowercase letter designations) and codes for multiple HD stars. Additional individual corrections have been incorporated based upon errors found during analyses of other catalogs. Most of these changes had already been incorporated into a previously available version (Roman & Warren 1983); but the probable errors of the positions and proper motions, included in the original published catalog, were not available in machine-readable form until 1992. These were added at that time to produce a new, computer-readable catalog. Finally, in this version decimal points have been aligned for all but a very few of the secular variations and third terms. These quantitites are given with the same precision as in the printed catalog, and the coded spectral types have been omitted.

1 Introduction and Source Reference

1.1 Introduction

The machine-readable version of the *General Catalogue of 33342 Stars for the Epoch 1950* (GC, Boss 1937) includes *Henry Draper Catalogue* (HD, Cannon & 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 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 first machine-readable (1980) version of the GC occurred in either the DM or HD number, these entries were 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 in 1985. A small number of errors have been corrected since. Probable errors for the positions and centennial proper motions have now been included.

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. **A copy of this document should be distributed with any machine-readable version of the catalog.**

1.2 Source Reference

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

2 File 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 the notes to Table 1.

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- 14	—	A4	Spectral type
16- 17	hours	I2	Right ascension, equinox 1950.0
18- 19	min	I2	Right ascension
20- 25	sec	F6.3	Right ascension
26- 29	years	F4.1	Epoch of right ascension observations (see note 4)
30- 36	arcsec	F7.4	Annual variation in R.A. (see note 3)
37- 44	arcsec	A8(F8.4)	Secular variation in R.A. (see note 3)
45- 52	arcsec	A8(F8.3)	Third term in R.A. (see note 3)
53- 58	sec	F6.4	Proper motion in R.A
59	—	A1	Sign of declination, equinox 1950.0

Table 1: File 1 Format

60- 61	deg	I2	Declination
62- 63	arcmin	I2	Declination
64- 68	arcsec	F5.2	Declination
69- 72	years	F4.1	The mean epoch of declination observations (note 4)
73- 79	arcsec	F7.3	Annual variation in declination
80- 86	arcsec	A7(F5.3)	Secular variation in declination
87- 93	arcsec	A7(F4.2)	Third term in declination
94- 99	arcsec	F6.3	Proper motion in declination. The values are based on the Newcomb values of precession
100	—	A1	Remarks (see note 2)
101-102	—	A2	Durchmusterung (DM) identification (BD = Bonner Durchmusterung; CD = Cordoba Durchmusterung; CP = Cape Photographic Durchmusterung). All DM fields are blank if no DM identification is present
103	—	A1	Sign of DM zone
104-105	—	I2 (A2)	DM zone
106-110	—	I5 (A5)	DM number
111-112	—	A2	Component identification if two or more SAO stars have the same DM number. For southern stars components may appear in different catalogs

Table 2: File 1 Format (continued)

General Catalogue of 33342 Stars for the Epoch 1950

Byte(s)	Units	Format	Description
113	—	A1	Lowercase letters for BD supplemental stars (Warren & Kress 1980)
114-120	deg	F7.3	Galactic longitude, l_{II}
121-127	deg	F7.3	Galactic latitude, b_{II}
128-133	—	I6	*Henry Draper Catalogue* number (blank for stars without HD numbers)
134	—	I1	HD code. 0 for single stars or brighter components of doubles with difference in visual magnitude $>$ 0.3 mag. For doubles with difference in visual magnitude $\geq$ 0.3 mag, 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.
135-138	arcsec	F4.3	Probable error in R.A. at epoch. Precision varies for all p.e. fields; where precision is lower, succeeding bytes are blank.
139-142	arcsec	F4.2	Probable error of centennial proper motion in R.A.
143-145	arcsec	F4.3	Probable error in dec. at epoch
147-150	arcsec	F4.2	Probable error of centennial proper

Table 3: File 1 Format (concluded)

Notes to Table 1

2.0.1 Magnitude

All magnitudes are given to two decimal places in the computer-readable version. Magnitudes underlined in the published version of the catalog are not indicated on the computer-readable version.

2.0.2 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

2.0.3 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, +38.907, but -26.814, +103.657. However, the latter is an exception. If the last digit of a seven significant figure value is read as zero, it is almost certainly blank.

The secular variations in right ascension and declination are given to four and three significant digits, respectively, in addition to the sign.

The third term is given to three and two significant figures in right ascension and declination, respectively.

If the last digit of the secular variation or the third term is read as zero, it is almost certainly blank. This can be confirmed by reading the values with an A format.

List of Corrections from Earliest Version		
Field	Format	Value
2 - 6	I5	GC Number
10 - 16	A7	Field
18 - 27	A10	Old value
29 - 41	A13	New value

Table 4: File 2 Format

2.0.4 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.

3 File Characteristics

The information in Table 5 is sufficient for a user to describe the indigenous characteristics of the present version of the GC to a computer.

The General Catalogue of 33342 Stars for the Epoch 1950

File	Subject	Record Length	Format	Number of Records
1	Data file	150	Fixed block	33342
2	Changes since the 1980 catalog	41	Fixed block	1205

Table 5: File Characteristics

4 Remarks and Modifications

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 the 1983 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. The 1983 edition was augmented by the addition of probable errors for the positions and centennial proper motions in 1992. The p.e. data were punched at the Royal Greenwich Observatory under the direction of R. H. D. Swifte. Finally, in the current version, ending zeros in the secular variation and third term have been dropped to preserve the precision in the printed catalog. Decimal points and signs for these values have been aligned except for a few stars for which the values are too large to fit if the decimals are aligned. The coded spectral types have been omitted since alphanumeric computers are now used generally. At some point, the letter subtypes in the spectra were translated to numbers. (E.g. Mb became M3.) These have now been converted back to the way they are given in the printed catalog. However, the types which have been added for spectral type fields containing an asterisk have been retained.

A table of all changes made since the first machine-readable version is included in file 2 except for general changes, such as the addition of the probable errors, changes to lowercase letters when appropriate, and the removal of the coded spectra types.

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. The centennial increment of the proper motion in declination.

3. 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 notes to Table 1.)

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

1. Galactic longitude (degrees)

2. Galactic latitude (degrees)

3. DM numbers

5 Acknowledgment

We thank R. H. D. Swifte of the Royal Greenwich Observatory for providing in machine-readable form the probable errors that have been added to produce the 1985 version of the GC. We also thank Miss Susan Gessner and Mr. Lee Brotzman for calling our attention to some improper characters in the spectrum fields and the extra zeros that had been appended to the secular variations and third terms.

6 References

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