# NGC 2000.0

## (Edited by R.W. Sinnott 1988)

Documentation for the Computer-Readable Version

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**Abstract**

The machine-readable version of the catalog, as it is currently being distributed from the Astronomical Data Center, is described. *NGC 2000.0* is a modern version of the NGC and IC catalogs compiled by J. L. E. Dreyer in the late nineteenth and early twentieth centuries. Errata compiled by Dreyer and by subsequent workers have been incorporated into the new version and the object types have been updated with information from modern astronomy; the descriptions given are those of Dreyer. The order of the new catalog is strictly by right ascension, the NGC and IC objects being merged into one machine-readable file.

# 1 Introduction

## 1.1 Description

*NGC 2000.0* is a modern compilation of the *New General Catalogue of Nebulae and Clusters of Stars* (NGC), the *Index Catalogue* (IC), and the *Second Index Catalogue* compiled by J. L. E. Dreyer (1888, 1895, 1908). The new compilation of these classical catalogs is intended to meet the needs of present-day observers by reporting positions at equinox 2000.0 and by incorporating the corrections reported by Dreyer himself and by a host of other astronomers who have worked with the data and compiled lists of errata. The object types given are those known to modern astronomy.

This document describes the machine-readable version of *NGC 2000.0* as it is currently being distributed from the Astronomical Data Center (ADC). It includes descriptions of the data and format of the computerized version so that users of the file can process the data without problems and guesswork. It is, however, not intended to replace the source reference, which gives much more complete information regarding the compilation of the modern version, sources of the corrections incorporated into the file, information about the object descriptions used and their abbreviations, nomenclature, and statistics of object locations according to constellation.

**All users of the machine version are urged to acquire a copy of the published book in order to have complete information at their disposal. However, a copy of this document should be transmitted to any recipient of the machine-readable catalog.**

***archiving and dissemination to astronomers for scientific research purposes only. The data should not be used for commercial purposes without the explicit permission of Sky Publishing Corporation.***

### 1.2 Source Reference

- *NGC 2000.0, The Complete New General Catalogue and Index Catalogue of Nebulae and Star Clusters by J. L. E. Dreyer*, ed. R. W. Sinnott 1988 (Sky Publishing Corporation and Cambridge University Press).

## 2 Structure

### 2.1 File Summary

The machine version of *NGC 2000.0* consists of two files. The first file contains only a brief statement concerning the fact that the catalog is copyrighted. The second file contains all of the data in the catalog. Table 1 gives the machine-independent file attributes. All logical records are of fixed length, and if the catalog is received on magnetic tape, it will contain blocks of fixed length (as noted below) except that the last block of the data file may be short. (The text file consists of a single 320-byte block.)

| NGC 2000.0 (Sinnott 1988) | | | | |
|---|---|---|---|---|
| File | Contents | Record Format | Record Length | Number of Records |
| 1 | Text | Fixed | 80 | 4 |
| 2 | Data | Fixed | 100 | 13226 |

Table 1: Summary Description of Catalog Files

The information contained in the above table is sufficient for a user to describe the indigenous characteristics of the machine-readable version of *NGC 2000.0* 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, density, number of tracks and character coding (ASCII, EBCDIC) for tapes, is not included, but should always accompany secondary copies if any are supplied to other users or installations.

## 2.2 Text File (File 1 of 2)

This file contains only a brief statement concerning copyright in a Fortran A80 format. A single line of text with a copyright statement was originally included as the first record in the data file, but this was moved to a separate file and supplemented with additional text at the ADC.

## 2.3 Catalog (File 2 of 2)

This file contains the complete catalog almost exactly as it appears on pages 1-241 of the source reference. The file is composed of a single logical record per object and the textual fields of the records contain upper and lower case characters as in the book.

Table 2 gives a byte-by-byte description of the contents of the data file. A suggested Fortran format specification for reading each data field is included and can be modified depending upon individual programming and processing requirements (Fortran 77 character string-type formats are used); however, caution is advised when substituting format specifications because some data fields contain character data and others are blank when data are absent. For such numerical fields, primary real format specifications are given to indicate decimal-point locations, while alternate A-type formats are specified in parentheses. The numerical fields that can be empty are the size and magnitude data and these cannot have valid zero values in this catalog, so the data can be read with the primary format and tested for zero to detect missing data. Default (null) values are always blanks in data fields for which primary suggested formats are given as A. Null values are not specified for numerical fields that always contain valid data.

**Object ID** Object number in the form "NGC nnnn" for NGC objects, and "IC nnnn" for IC objects, where "nnnn" indicates the sequential number of the object.

**Object type** An object classification according to modern astronomy. The field is coded according to the following abbreviations:

**Gx** Galaxy

**OC** Open star cluster

**Gb** Globular star cluster, usually in the Milky Way Galaxy

**Nb** Bright emission or reflection nebula

| Bytes | Units | Suggested Format | Default Value | Data |
|---|---|---|---|---|
| 1-8 | — | A8 | — | Object identification |
| 9 | — | 1X | — | Blank |
| 10-12 | — | A3 | — | Object type |
| 13 | — | 1X | — | Blank |
| 14-15 | hours | I2 | — | Right ascension |
| 16 | — | 1X | — | Blank |
| 17-20 | min | F4.1 | — | R.A. |
| 21-22 | — | 2X | — | Blank |
| 23 | — | A1 | — | Sign of declination |
| 24-25 | deg | I2 | — | Declination |
| 26 | — | 1X | — | Blank |
| 27-28 | arcmin | I2 | — | Dec. |
| 29 | — | 1X | — | Blank |
| 30 | — | A1 | — | Modern data source code |
| 31-32 | — | 2X | — | Blank |
| 33-35 | — | A3 | — | Constellation |
| 36 | — | A1 | — | Upper limit character (<) |
| 37-41 | arcmin | F5.1 (A5) | blank | Object size |
| 42-43 | — | 2X | — | Blank |
| 44-47 | mag | F4.1 (A4) | blank | Magnitude |
| 48 | — | A1 | — | Magnitude code |
| 49 | — | 1X | — | Blank |
| 50-99 | — | A50 | — | Description |
| 100 | — | 1X | — | Blank |

Table 2: Data File Record Format

**Pl** Planetary nebula

**C+N** Cluster associated with nebulosity

**Ast** Asterism or group of a few stars

**Kt** Knot or nebulous region in an external galaxy

******* Triple star

**D*** Double star

***** Single star

**?** Uncertain type or may not exist

**blank** Unidentified at the place given, or type unknown

– Object called nonexistent in the RNGC (Sulentic and Tifft 1973)

**PD** Photographic plate defect

**Equatorial coordinates** Equinox 2000.

**Data source code** A letter code to indicate the source of modern data about the object. These citations will be found in the source reference, pages XXIII-XXIV, along with additional information. "Modern" data may include type, position, size, and magnitude, but not descriptions, which are always those of Dreyer.

**Constellation** Constellation in which the object is located.

**Upper limit character** The character "<" is present if object size is an upper limit.

**Object size** Angular size, as measured along the greatest dimension. The precision varies, so byte 41 can be blank, as can the whole field if size is not reported.

**Magnitude** Integrated (total) magnitude of the type indicated by the code in the following field. The precision varies as in the size field.

**Magnitude code** Blank if the integrated magnitude is visual, "p" if it is a photographic (blue) magnitude.

**Description** A description of the object, as given by Dreyer or corrected by him, in a coded or abbreviated form. For an NGC object, the description is always a visual impression, while the IC descriptions are often based on photographic appearance. A full list of the abbreviations will be found in Table II of the introduction to the published catalog (the source reference).

# 3 History

## 3.1 Remarks and Modifications

It is important, even for users of the machine-readable catalog and this documentation, to also have a copy of the published book. In addition to the tables and reference sources mentioned in this document, the book provides an introductory section with a brief history of the NGC and IC catalogs, a count of objects by constellation, information on Dreyer's descriptions, a table cross index of Messier and NGC/IC designations, and a table of common names for NGC objects. The book also contains a table of right ascensions for NGC and IC objects.

A magnetic tape containing NGC 2000.0 was received from William E. Shawcross of Sky Publishing Corporation on August 14, 1989. According to Mr. Shawcross, the file supplied to the ADC was an unmodified version of the one used to produce the book, and it still contained the TEX commands employed to produce the special symbols present in the printed version. As received, the file also contained a single copyright text record at its beginning. The text record was removed to an added first file in the archived version and supplemented with a small amount of additional information. The TEX in the data file was replaced by standard characters to represent the information. Special symbols, such as $\Delta$, $\bigcirc$, etc., were changed to their spelled-out equivalents.

The size field was modified to add decimal points to integer numbers and to align all values properly so that the field can be processed with a single format specification. The magnitude field was modified by moving the "p" code for photographic magnitude to its own byte in order to remove it from the numerical field. Decimal points were added to all integer numbers in this field also.

The catalog data file was run through the ADC General Verification Program, which checks data ranges and for various other problems that can be detected in a systematic way.

# 4 Acknowledgments and References

## 4.1 Acknowledgments

Appreciation is expressed to William E. Shawcross for responding to a request from the ADC to make *NGC 2000.0* available to the scientific com-

munity in machine-readable form. Mr. Shawcross also arranged for a copy of the machine-readable TEX file to be created for deposit in the archives of the data centers. I am grateful to both Mr. Shawcross and to Roger W. Sinnott for reviewing a draft copy of this document and making comments. The comments resulted in the finding and elimination of a few TEX symbols that were missed during the initial work.

## 4.2 References


- Dreyer, J. L. E. 1888, *New General Catalogue of Nebulae and Clusters of Stars*, *Mem. Roy. Astron. Soc.* **49**, Part I (reprinted 1953, London: Royal Astronomical Society).

- Dreyer, J. L. E. 1895, *Index Catalogue of Nebulae Found in the Years 1888 to 1894, with Notes and Corrections to the New General Catalogue*, *Mem. Roy. Astron. Soc.* **51**, 185 (reprinted 1953, London: Royal Astronomical Society).

- Dreyer, J. L. E. 1908, *Second Index Catalogue of Nebulae Found in the Years 1895 to 1907; with Notes and Corrections to the New General Catalogue and to the Index Catalogue for 1888 to 1894*, *Mem. Roy. Astron. Soc.* **59**, Part 2, 105 (reprinted 1953, London: Royal Astronomical Society).

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