National Space Science Data Center/
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DOCUMENTATION FOR THE MACHINE-READABLE VERSION

OF THE

UPPSALA GENERAL CATALOGUE OF GALAXIES

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Wayne H. Warren Jr.

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DOCUMENTATION FOR THE MACHINE-READABLE VERSION OF THE *UPPSALA GENERAL CATALOGUE OF GALAXIES*

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ABSTRACT

A detailed description of the machine-readable version of the catalogue as it is currently being distributed from the Astronomical Data Center is given. In addition to the correction of several errors discovered in a previous computerized version, a few duplicate records have been removed and the record structure has been revised slightly to accommodate a large data value and to remove superfluous blanks.

SECTION 1 - INTRODUCTION AND SOURCE REFERENCE

The *Uppsala General Catalogue of Galaxies (UGC)* is an essentially complete catalogue of galaxies to a limiting diameter of 1!0 and/or to a limiting apparent magnitude of 14.5 on the blue prints of the Palomar Observatory Sky Survey (POSS). Coverage is limited to the sky north of $\delta = -02°30'$. Galaxies smaller than 1!0 in diameter but brighter than $14^{m}.5$ may be included from the *Catalogue of Galaxies and of Clusters of Galaxies* (CGCG, Zwicky *et al.* 1961-1968); all such galaxies in the CGCG are included in the UGC. The galaxies are ordered by 1950 right ascension.

The catalogue contains descriptions of the galaxies and their surrounding areas, plus conventional system classifications and position angles for flattened galaxies. Galaxy diameters on both the blue and red POSS prints are included and the classifications and descriptions are given in such a way as to provide as accurate an account as possible of the appearance of the galaxies on the prints. Only the data portion of the published UGC is included in the machine-readable version.

This document describes the machine-readable version of the UGC as distributed by the Astronomical Data Center. It is intended to enable users to read and process the data without problems or guesswork. For additional details regarding the classifications, measurement of apparent magnitudes, and data content, the source reference should be consulted. A copy of this document should accompany any machine-readable copy of the catalogue

SOURCE REFERENCE

Nilson, P. 1973, *Uppsala General Catalogue of Galaxies, Uppsala Astron. Obs. Ann.* 6.

SECTION 2 - TAPE CONTENTS

A byte-by-byte description of the contents of the *Uppsala General Catalogue of Galaxies* data file is given in Table 1. The suggested format specifications are for FORTRAN formatted read statements and can be modified depending upon individual programming and processing requirements. Since data fields contain blanks when data are absent, care must be exercised when processing the catalogue for search or computational purposes, particularly for data which can have valid zero values. In this case, it is safest to buffer the data in or to read them with a character (A) format and check for blanks before processing. Alternate format specifications are given in parentheses.

Table 1. Tape Contents. *Uppsala General Catalogue of Galaxies.*

Byte(s)	Units	Suggested Format	Description
1	---	A1	"U"
2- 6	---	I5	UGC number
7	---	A1	"A" if the galaxy is from the Addenda list of the published catalogue; otherwise blank.
8- 9	hours	I2	Right ascension (α) 1950.0
10-13	min	F4.1	α
14-16	°	I3 (A1,I2)	Declination (δ) 1950.0 (sign always in byte 14).
17-18	'	I2	δ
19-27	---	9A1 (A5,A4)	Number in the *Morphological Catalogue of Galaxies* (MCG) (Vorontsov-Velyaminov *et al.* 1962, 1963, 1964, 1968). The first number of the designation is the Palomar Observatory Sky Survey (POSS) 6° zone, from the equator +00 to the north celestial pole +15; the second number is the POSS field along the zone, while the third number is the galaxy in this field in the MCG. Non-MCG galaxies are assigned the number 000 in the third position, but the first and second values are given correctly.

Table 1. (continued)

Byte(s)	Units	Suggested Format	Description
28-31	---	I4	Number of the POSS field in which the galaxy is best visible.
32-37	'	F6.2	Major axis of the galaxy as measured on the POSS blue print. The precision to which diameters are recorded matches the published catalogue; additional decimal places are blank, but colons, brackets and parentheses are not included in the computerized catalogue.
38-42	'	F5.2	Minor axis of the galaxy as measured on the POSS blue print.
43-45	°	I3	Position angle measured in the conventional manner from north through east. Colons, parentheses and brackets in the published catalogue are not included here. Blank if data not present.
46-52	---	A7	Classification in the Hubble system or remarks, in a free field format, including lower case designations.
53	---	1X	Blank
54-57	mag	F4.1	Photographic magnitude m_{pg}, recorded to precision given in published catalogue; i.e., if tenths not reported, byte 57 is blank.
58-62	km s^{-1}	I5	Radial velocity corrected for Solar motion relative to the Local Group according to $V_o = 300 \cos A$, where A is the distance to the conventional Solar apex at $\ell^I = 55°$, $b^I = 0°$ or $\ell^{II} = 87°$, $b^{II} = +1°$. If the uncertainties in the measurements were considered too large to make corrections meaningful, usually only the uncorrected value is given.
63-68	'	F6.2	Major axis of the galaxy as measured on the POSS red print. See comments for bytes 32-37. Blank if no data present.

Table 1. (concluded)

Byte(s)	Units	Suggested Format	Description
69-73	'	F5.2	Minor axis of the galaxy as measured on the POSS red print.
74	---	I1	Inclination to the line of sight for spirals, as measured on a scale from 1 (face-on) to 7 (edge-on). For galaxies of high inclination, a value is calculated from the Hubble formula $n = 10(a-b)/a$ [a = major axis, b = minor axis]. The value 7 denotes objects inclined not more than a few degrees to the line of sight.

SECTION 3 - TAPE CHARACTERISTICS

The information contained in Table 2 is sufficient for a user to describe the indigeneous characteristics of the machine-readable *Uppsala General Catalogue of Galaxies* 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.

Table 2. Tape Characteristics. *Uppsala General Catalogue of Galaxies.*

NUMBER OF FILES	1
LOGICAL RECORD LENGTH (BYTES)	74
RECORD FORMAT	FB*
TOTAL NUMBER OF LOGICAL RECORDS	12940

* Fixed block length (last block may be short)

SECTION 4 - REMARKS, MODIFICATIONS, ACKNOWLEDGMENTS AND REFERENCES

This magnetic tape version of the *Uppsala General Catalogue of Galaxies* was received from Dr. Robert S. Dixon of the Ohio State University Radio Observatory on 7 December 1981. As received, the catalogue consisted of 12,942 logical records of length 90 bytes. Each logical record contained a sequential counter on bytes 85-90, while bytes 81-84 and single columns thoughout the records were not used. There was also only a five-byte allowance for the major axis of the galaxy as measured on the red POSS print, a field too small to accommodate U00454 (M31), which has a major axis of 200:' (in order to fit the 200' value, the radial velocity had been moved left one byte, thus making it read -2990 km s^{-1} instead of the correct value of -299 km s^{-1}). The following modifications were made to the catalogue to fix the above items, correct several errors, and to maximize storage efficiency.

1. The published edition contains 12,921 objects in the main catalogue and 19 addenda; hence, with 12,942 records on the tape there were obviously a few duplicates. The records for U03944 and U06063A were found to be repeated and the duplicates were deleted.

2. A check for the addenda objects resulted in the discovery of a missing A for U07399A--this was added.

3. Upon examination of the original tape version of the catalogue supplied to him, Mr. Marion Schmitz discovered the misnumbering of U12417 and U12418 as U12447 and U12448--these errors were corrected.

4. The data record for U00253 was found to have a hexidecimal code "AA" character (equivalent to + in the classification field (bytes 46-52) in place of a lower case "b" (Sb/SB+ instead of Sb/SBb)--this was corrected.

5. The data field for the major axis as measured on the red POSS print was expanded to six bytes and the record for U00454 (discussed above) corrected.

6. All superfluous blanks were removed to decrease the logical record length from 90 bytes to 74 bytes (counting also the removal of the sequential numbers originally in bytes 85-90).

The order of the records is strictly by UGC number; i.e., the Addenda records follow their main catalogue counterparts in the file. The colons (indicating uncertainty) and various other codes (parentheses, brackets) are not included in the machine-readable version of the catalogue. Several possible improvements to the catalogue might consist of adding codes corresponding to the published version, a second file containing abbreviations and terminology and a third file with the extensive notes. It would also be important to add an asterisk or some other code to data records having a note in the third file.

ACKNOWLEDGMENTS

Appreciation is expressed to Dr. R. S. Dixon for supplying the original tape version of the UGC, and to Mr. M. Schmitz for pointing out the errors that he discovered in the UGC numbers (point 3 above).

REFERENCES

Nilson, P. 1973, *Uppsala General Catalogue of Galaxies, Uppsala Astron. Obs. Ann.* 6.

Vorontsov-Velyaminov, B. A., Krasnogorskaya, A. and Arhipova, V. P. 1962-1968, *Morphological Catalogue of Galaxies,* 4 Volumes (Moscow: Sternberg Institute 32, 33, 34, 38).

Zwicky, F. *et al.* 1961-1968, *Catalogue of Galaxies and of Clusters of Galaxies,* I-VI (Pasadena: California Institute of Technology).

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 the catalogue are illustrated. The beginning of each record and bytes within the record are indicated by column heading index across the top of each page (digits read vertically).

LISTING OF RECORDS FROM TAPE FILE

TAPE FILE NAME: UPPSALA CAT GALAXIES

RECORDS 1 TO 30

TAPE FILE

RECORD LENGTH [illegible] BYTES

INPUT VOLSER ADC007

```
COLUMN                                                                                                      1111111111111111
HEADING           11111111112222222222333333333344444444445555555555666666666677777777778888888888999999999900000000001111111
INDEX    1234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345
```

RECORD	1	000001 0000.0+162203-01-0151195	1.5	1.3	DBL SYS	14.9			
RECORD	2	000002 0000.0+443907-01-0001243	1.1	0.2	120	17.	1.0	0.2	7
RECORD	3	000003 0000.2+183703-01-0181195	2.0	1.0	90SBa	14.8	1.8	0.8	5
RECORD	4	000004 0000.5+035601-01-0141465	1.3	0.8	155Sb-c	15.5	1.1	0.7	4
RECORD	5	000005 0000.6-021100-01-0210319	1.3	0.8	45SBb/Sc	14.3	1.4	0.9	4
RECORD	6	000006 0000.6+214204-01-0130779	1.0	0.7	105PECULR	14.4+6900	1.0	0.7	
RECORD	7	000007 0000.7+154203-01-0191195	1.5	0.4	54PECULR	14.9	1.5	0.4	6
RECORD	8	000008 0000.7+155203-01-0201195	6.5	2.7	135Sa-b	12.0+1047	6.3	2.7	7
RECORD	9	000009 0000.8+042101-01-0001465	1.3	1.2		16.5	1.3	1.2	
RECORD	10	000010 0000.8+082001-01-0151465	1.9	1.7	Sc	15.4	2.	2.	1
RECORD	11	000011 0000.8+215004-01-0140779	1.1	0.8	55	16.0	0.9	0.6	
RECORD	12	000012 0000.8+253105-01-0281257	1.1	0.9	100Sc	15.7	0.7	0.6	2
RECORD	13	000013 0000.9+270504-01-0150779	1.1	1.0	SB0/a	15.0	1.0	1.0	1
RECORD	14	000014 0001.0+225604-01-0170779	1.9	1.0	32Sc	14.0	2.0	1.0	5
RECORD	15	000015 0001.2+040001-01-0171465	1.5	0.3	63Sa-b	16.0	1.2	0.2	6
RECORD	16	000016 0001.2+071101-01-0181465	2.0	2.0	Sb/Sc	14.0	2.1	2.1	1
RECORD	17	000017 0001.3+145602-01-0170010	3.	2.	DWARF	17.	3.	2.	
RECORD	18	000018 0001.4+103502-01-0000010	[illegible]	0.9	COMPACT	15.7	1.1	1.0	
RECORD	19	000019 0001.4+202803-01-0211195	4.0	1.1	45Sb/Sc	12.7	3.8	1.0	6
RECORD	20	000020 0001.5+800113-01-0041213	2.2	1.4	5	16.6	1.2	1.1	
RECORD	21	000021 0001.6+070501-01-0191465	1.1	1.1	Sc	15.1	1.1	1.1	1
RECORD	22	000022 0001.7+100202-01-0180010	1.3	0.8	25S0	16.0	1.3	0.8	4
RECORD	23	000023 0001.7+103002-01-0130010	1.3	0.9	20SBb	15.2	1.2	0.8	3
RECORD	24	000024 0001.7+221904-01-0180779	1.2	0.8	50SBc	15.4	0.9	0.7	
RECORD	25	000025 0001.8+055301-01-0201465	1.1	0.3	123Sc	16.0	1.1	0.3	6
RECORD	26	000026 0001.8+311205-01-0291257	2.0	1.8	SBb	14.3	1.9	1.7	1
RECORD	27	000027 0001.9+053401-01-0211465	2.2	1.2	135Sc	15.3	2.1	1.1	4
RECORD	28	000028 0002.0+045501-01-0221465	1.6	0.7	165S0-a	13.9	1.6	0.7	6
RECORD	29	000029 0002.0+280205-01-0301257	1.3	1.2	E	15.2	1.3	1.2	
RECORD	30	000030 0002.0+331705-01-0001257	1.2	0.151265		16.0	0.9	0.127	

LISTING OF RECORDS FROM TAPE FILE

```
TAPE FILE NAME: UPPSALA CAT GALAXIES
      RECORDS  12911 TO  12940
    TAPE FILE      44
 RECORD LENGTH     74 BYTES
  INPUT VOLSER   ADC007
```

```
C O L U M N                                                                                                            1111111111111111
H E A D I N G            11111111112222222222333333333344444444445555555555666666666677777777778888888888999999999900000000001111111
I N D E X       1234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345

RECORD  12911  U12892 2357.9+073401-01-0071465  1.0  0.6     SBa-b    15.7          1.0  0.9 1
RECORD  12912  U12893 2357.9+165703-01-0111195  2.0  1.8              15.3          2.0  2.0 1
RECORD  12913  U12894 2357.9+391406-01-0001247  1.   1.      DWRF IR  17.           1.   1.
RECORD  12914  U12895 2358.0+194703-01-0001195  1.2  0.9 100          16.5          0.5  0.5
RECORD  12915  U12896 2358.0+360304-01-0080205  1.0  0.9     S        14.7          1.0  0.9
RECORD  12916  U12897 2358.0+280705-01-0201257  1.2  0.35 11Sa-b      14.9          1.1  0.356
RECORD  12917  U12898 2358.1+332005-01-0001257  1.0  0.4  10Sc        16.5          0.9  0.3 6
RECORD  12918  U12899 2358.2+280805-01-0221257  0.7  0.7     COMPACT  14.4          0.8  0.8
RECORD  12919  U12900 2358.4+200403-01-0121195  2.0  0.15111Sc        15.7          1.8  0.157
RECORD  12920  U12901 2358.4+283905-01-0231257  1.8  0.7  48Sab       14.8          1.5  0.5 6
RECORD  12921  U12902 2358.5+055701-01-0081465  1.0  0.5  52S0        14.7          1.1  0.5 5
RECORD  12922  U12903 2358.7+060301-01-0111465  1.1  0.2 155Sb-c      15.7          1.1  0.2 6
RECORD  12923  U12904 2358.7+342406-01-0051247  1.0  0.7  40SBa-b     15.4          1.1  0.7 3
RECORD  12924  U12905 2358.7+802313-01-0091213  1.2  0.12 55Sc        16.5          1.1  0.127
RECORD  12925  U12906 2358.8+125002-01-0110010  1.0  0.7  85S0-a      13.8          1.0  0.6 4
RECORD  12926  U12907 2358.8+175503-01-0001195  1.1  0.5 132DBL SYS   17.
RECORD  12927  U12908 2358.8+310905-01-0241257  1.0  0.7              14.3          1.1  1.0
RECORD  12928  U12909 2358.8+341506-32-0071247  2.1  0.4   4Sa-b      14.7          1.8  0.5 6
RECORD  12929  U12910 2358.9+050501-01-0001465  1.1  1.1              17.           1.   1.  1
RECORD  12930  U12911 2358.9+311005-01-0251257  1.1  0.8  20S         14.4          1.3  0.8
RECORD  12931  U12912 2359.0+084401-01-0001465  1.0  0.8     S        15.6          0.4  0.4
RECORD  12932  U12913 2359.1+031400-01-0180319  1.4  0.2   5Sc        16.0          1.2  0.2 7
RECORD  12933  U12914 2359.1+231304-01-0100205  2.7  1.3 160S         13.2          2.7  1.3
RECORD  12934  U12915 2359.2+231804-01-0110205  1.6  0.5 137          13.9          1.6  0.4
RECORD  12935  U12916 2359.4+171703-01-0001195  1.1  0.7 170          16.5          0.8  0.6
RECORD  12936  U12917 2359.4+400307-01-0001243  1.2  0.9  95SBb       16.0          1.1  0.8 2
RECORD  12937  U12918 2359.5+161903-01-0131195  1.3  0.7     IBR      15.6          0.9  0.6
RECORD  12938  U12919 2359.8+124102-01-0150010  1.0  0.7  80S0        14.3          1.0  0.7 3
RECORD  12939  U12920 2359.8+265604-01-0120205  1.3  0.2  47Sb-c      15.5          1.2  0.2 7
RECORD  12940  U12921 2359.9+765913-01-0031213  1.6  1.4              15.6          1.7  1.4
```

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