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

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DOCUMENTATION FOR THE MACHINE-READABLE VERSION

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UPPSALA GENERAL CATALOGUE OF GALAXIES

Wayne H. Warren Jr.

November 1982

National Space Science Data Center (NSSDC)/
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DOCUMENTATION FOR THE MACHINE-READABLE VERSION OF THE
UPPSALA GENERAL CATALOGUE OF GALAXIES

Wayne H. Warren Jr.

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.

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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 $\delta = -02^{\circ}30'$. Galaxies smaller than 1:0 in diameter but brighter than 14^m5 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 <i>Morphological Catalogue of Galaxies</i> (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.

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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 $l^I = 55^\circ$, $b^I = 0^\circ$ or $l^{II} = 87^\circ$, $b^{II} = +1^\circ$. 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.

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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 indigenous 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 throughout 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 hexadecimal 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 1 BYTES

INPUT VOLSER ADC007

C O L U M N N O 11111111222222223333333344444444555555556666666677777777888888889999999900000000111111
 L E A D I N G 12345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345

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
RECORD	3	000003	0000.2+183703-01-0181195	2.0	1.0	90SBA	14.8	1.8	0.8
RECORD	4	000004	0000.5+035601-01-0141465	1.3	0.8	155Sb-c	15.5	1.1	0.7
RECORD	5	000005	0000.6+021100-01-0210319	1.3	0.8	45SBB/Sc	14.3	1.4	0.9
RECORD	6	000006	0000.6+214204-01-0130779	1.0	0.7	1052ECLUR	14.4+6900	1.0	0.7
RECORD	7	000007	0000.7+154203-01-0191195	1.5	0.4	542ECLUR	14.9	1.5	0.4
RECORD	8	000008	0000.7+155203-01-0201195	6.5	2.7	135Sa-b	12.0+1047	6.3	2.7
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.
RECORD	11	000011	0000.8+215004-01-0140779	1.1	0.8	55	16.0	0.9	0.6
RECORD	12	000012	0000.8+293105-01-0281257	1.1	0.9	100Sc	15.7	0.7	0.6
RECORD	13	000013	0000.9+270504-01-0150779	1.1	1.0	SP0/A	15.0	1.0	1.0
RECORD	14	000014	0001.0+225604-01-0170779	1.9	1.0	32Sc	14.0	2.0	1.0
RECORD	15	000015	0001.2+040001-01-0171465	1.5	0.3	63Sa-b	16.0	1.2	0.2
RECORD	16	000016	0001.2+071101-01-0181465	2.0	2.0	Sb/Sc	14.0	2.1	2.1
RECORD	17	000017	0001.3+145602-01-0170010	3.	2.	DWARF	17.	3.	2.
RECORD	18	000018	0001.4+103502-01-0000010	1.0	0.9	COMPACT	15.7	1.1	1.0
RECORD	19	000019	0001.4+202403-01-0211195	4.0	1.1	45Sb/Sc	12.7	3.8	1.0
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
RECORD	22	000022	0001.7+100202-01-0180010	1.3	0.8	25S0	16.0	1.3	0.8
RECORD	23	000023	0001.7+103002-01-0130010	1.3	0.9	20SBB	15.2	1.2	0.8
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
RECORD	26	000026	0001.8+311205-01-0291257	2.0	1.8	SBB	14.3	1.9	1.7
RECORD	27	000027	0001.9+053401-01-0211465	2.2	1.2	135Sc	15.3	2.1	1.1
RECORD	28	000028	0002.0+045501-01-0221465	1.6	0.7	165S0-a	13.9	1.6	0.7
RECORD	29	000029	0002.0+200203-01-0301257	1.3	1.2	E	15.2	1.3	1.2
RECORD	30	000030	0002.0+331705-01-0001257	1.2	0.15	126S	16.0	0.9	0.127

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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
H E A D I N G
I M D E A 11111111222222222222222222223333333333444444444455555555556666666666777777777788888888889999999999000000000111111111111
12345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345

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.	DWRP 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+280705-01-0101257	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	0.15	11Sc	15.7	1.8	0.157	
RECORD	12920	U12901	2358.4+283905-01-0231257	1.8	0.7	48Ssb	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+802313-01-0101213	1.2	0.12	55Sc	16.5	1.1	0.127	
RECORD	12925	U12906	2358.8+125002-01-0110010	1.0	0.7	8500-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+341506-02-0071247	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	2930	U12911	2358.9+311005-01-0251257	1.1	0.8	20S	14.4	1.3	0.8	
RECORD	2931	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+231404-01-0110205	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	18k	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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