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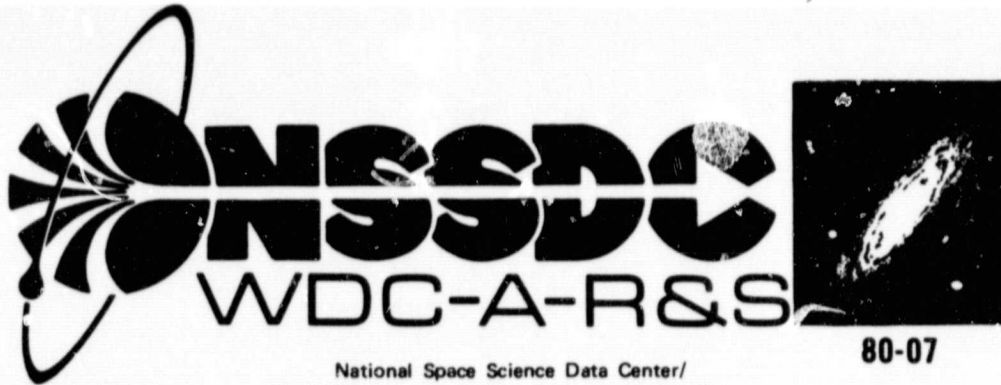
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ASTRONOMICAL DATA CENTER BULLETIN

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## EDITORIAL

We initiate herewith a new publication designed to provide a vehicle for the dissemination of information about work in progress on astronomical catalogs. In addition to progress reports on specific tasks, we intend to include in each issue an updated status list for astronomical catalogs available at the Astronomical Data Center at NASA Goddard Space Flight Center. Contributed papers from observatories and individuals involved with astronomical data are welcome. We wish to encourage communications describing ongoing projects, new catalogs completed or planned, and lists of errors determined for existing catalogs. In this way, we hope to avoid redundant efforts and to increase the efficiency with which astronomical data are being compiled and distributed.

In order to maintain a reasonably uniform format and decrease editing time, we ask that authors submit camera-ready copy for articles to be published in this bulletin. Papers should be single spaced and typed in an area approximately 6 1/2 inches (165 mm) horizontally by 8 3/8 inches (213 mm) vertically. The margins should be 1 3/8 inches (35 mm) at the top, 1 inch (25 mm) at the left and right sides and 1 1/4 inches (32 mm) on the bottom of each page. Standard 8 1/2- x 11 -inch paper and a serif type style (Prestige Elite, Courier, etc.) should be used if possible. Two copies of each manuscript should be submitted to:

Dr. Wayne H. Warren Jr.  
Code 601  
NASA Goddard Space Flight Center  
Greenbelt, Md. 20771

It is hoped that there will be sufficient interest and response to warrant semi-annual publication of the Astronomical Data Center Bulletin. Comments, criticisms and suggestions from the astronomical community will be enthusiastically welcomed.

The Editors

W. H. Warren Jr.  
T. A. Nagy  
J. M. Mead

ADC Bull. (July 1980) 1, 2

NASA-CDS Cooperative Agreement

Jaylee M. Mead

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In 1977 NASA and the Centre de Données Stellaires (CDS) of the Institut National d'Astronomie et de Géophysique (INAG) of the Centre National de la Recherche Scientifique (CNRS) entered into a cooperative agreement in order to coordinate their activities in the area of machine-readable astronomical catalogues. This collaboration has resulted in the realization of the following goals: exchange of catalogue tapes from the data bases at the Goddard Space Flight Center and at CDS; communication of information about errors identified in original sources, in key-punching, or otherwise in the development of the catalogues; notification of plans to key-punch or compile catalogues, including progress reports on the implementation of these plans; joint meetings of personnel from both centers for detailed discussions of common data problems, including exchange of ideas and experience with regard to data retrieval systems and techniques; and personnel exchanges for limited periods. Because the collaboration to date has been very fruitful, arrangements have now been made to renew this cooperative agreement for another two-year period.

THE ASTRONOMICAL DATA CENTER AT GODDARD SPACE FLIGHT CENTER

Theresa A. Nagy, Systems and Applied Sciences Corporation  
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Wayne H. Warren, Jr., National Space Science Data Center/GSFC

I. INTRODUCTION AND STATUS REPORT

The Astronomical Data Center (ADC) at Goddard is a cooperative effort between the Laboratory for Astronomy and Solar Physics (LASP) and the National Space Science Data Center (NSSDC)/World Data Center A for Rockets and Satellites (WDC-A R&S). The LASP has been acquiring, checking, documenting, maintaining and distributing machine-readable astronomical catalogues of non-solar system objects for more than six years, while the NSSDC/WDC-A had dealt mainly with archiving and dissemination of space science data. The initiation two years ago of an Astronomy Data Group at NSSDC/WDC-A to perform tasks similar to those mentioned above has now led to a close cooperation between the LASP and NSSDC groups, and our recent agreement with the Centre de Données Stellaires, Strasbourg, has resulted in the establishment of a data base containing more than 200 astronomical catalogues.

A status report listing all catalogues currently available at the Astronomical Data Center is updated approximately semi-annually and will be published in each issue of this bulletin. The status codes associated with each catalogue are intended to indicate availability, present condition with respect to completeness and accuracy, existence of detailed documentation, and forms in which the catalogue may be obtained. The status code of A implies that efforts have been made to check that the contents of the machine-readable and the published catalogues either agree or the differences are known and documented. We are generally willing to release any catalogue not coded R, provided that the requester understands the assigned status of the catalogue. Status code R is usually assigned when either a catalogue is preliminary and we have been requested not to distribute it or when a compiler wishes to distribute a catalogue himself. In these cases, we can provide information about a catalogue and how it can be obtained.

II. THE DATA BASE

A data base consists of data sets. We accept from all sources the data (astronomical catalogues) and then proceed to check the contents of the machine-readable form with respect to the published data. At this point, documentation is prepared or modified and dissemination of the data plus documentation is then possible.

The current version of the Status Report (Warren, Nagy and Mead 1980, Astronomical Data Center Bulletin 1, p.32) defines data sets. For those data sets with a status code of T (documentation completed), the information available is as follows:

- 1) a byte-by-byte description of the contents of the catalogue on magnetic tape;

- 2) a summary of the data with respect to the physical properties of the tape version (e.g., density, number of tracks, character code, block size, number of blocks, number of records, etc.);
- 3) a Remarks and Modifications section which defines the source of the machine-readable catalogue, the published reference and all changes to the initial version;
- 4) a sample listing of the tape for reference.

Preparation of this documentation can be quite time consuming but the users of the data sets find that it saves them considerable time. Ultimately all data sets in the Status Report will have a status code of T.

Due to the almost continuous updating of many catalogues and because ADC documentation attempts to provide information summaries regarding the origin, evolution and prior modifications of each data set, we strongly recommend that members of the astronomical community refer potential requesters to us rather than make copies themselves for secondary distribution. Although it is permissible to copy an ADC catalogue for a colleague if ADC documentation is supplied along with it, an important consequence is that we have no record that the person has a copy of the catalogue involved. Therefore, when the catalogue is updated and/or revised and we alert recipients, the anonymous user remains unaware of the new developments. Since the ADC normally provides data at no charge, it is to the best interests of all users and to the ADC that the latter disseminate all copies. Another advantage of this procedure is that the statistical information on requests filled is used to document the activities of the ADC for future funding considerations.

Microfilm and/or microfiche copies of the data sets are prepared from the machine-readable catalogues (in the order of user interest); this format is useful in those cases where data for only a few objects are needed. These data sets have a status code of M (Microfilm), F (Microfiche), or G (both). Microfilm and/or microfiche versions are also being prepared of some original catalogues (primarily older publications which are no longer readily available, e.g., Durchmusterungen).

### III. DATA BASE RETRIEVAL SYSTEM AND THE GODDARD CROSS INDEX

The Goddard Cross Index (GXI) currently consists of a merging of the following 11 catalogues:

- 1) Smithsonian Astrophysical Observatory (SAO)
- 2) Henry Draper (HD)
- 3) Boss General Catalogue (GC)
- 4) Jenkins Trigonometric Parallax



- 5) Blanco et al. UBV
- 6) Yale Bright Star (YBS)
- 7) Strömngren-Perry uvby
- 8) Wackerling Emission Line
- 9) Batten Spectroscopic Binary (BAT) (6th edition)
- 10) Jaschek et al. MK Classifications
- 11) Wilson Radial Velocity

The data retained are equatorial coordinates, the above identifiers explicitly (plus a few others such as Bayer and Flamsteed numbers), proper motion, magnitude, spectral type and the source catalogue for each datum. A description of this catalogue is given in the paper by Mead and Nagy (in Compilation, Critical Evaluation and Distribution of Stellar Data, 1976, Proc. of IAU Colloq. 35, eds. C. Jaschek and G.A. Wilkins, pp. 161-166).

A Data Base Retrieval System (DBRS) has been developed for rapid recall of data from the HD subset of the GXI. The input to the DBRS is a list of HD numbers (in any order, duplicates permitted). The output is a printout of the GXI data entry with in-stream documentation for each unique HD star. In addition, the user receives the entire catalogue entry from each of the individual catalogues (currently the GC, UBV, YBS and BAT) together with in-stream documentation for each. The major objective of this system is maximum data retrieval with minimum user input or programming requirements.

#### IV. PLATE ASSIGNMENT PROGRAM AND OVERLAY PLOTS

A frequent use of the data base is for the correlation of a given position with other catalogue sources and a possible optical counterpart on a photographic plate/print. We have developed a program which will accept any astronomical list and generate a list of objects as a function of a sky survey plate/print area. This technique is described in detail in a paper by Nagy (1980 Astronomical Data Center Bulletin, 1, p. 28).

The output data from the plate assignment program can then be plotted with computer graphics to the same scale as the requested sky survey. An additional category in our status report (category VIII) represents catalogues sorted by plate areas.

To date the following catalogues have been processed by the plate assignment program and sorted to the following sky survey plate areas:

Catalogue	Sky Survey			
	Palomar (+Whiteoak)	Lick	European Southern Observatory	Emission-Line Survey of the Milky Way
Smithsonian Astro- physical Observatory Catalog (SAO)	•		•	•
Catalogue of Stellar Identifications (CSI)	•	•		
Revised New General Catalogue of Non-Stellar Objects (RNGC)	•			
Two-Micron Sky Survey (TMSS)	•			
Reference Catalogue of Bright Galaxies (VGC)	•			

The output of the plate assignment program (multifile tape where one file corresponds to one plate/print area) is then in a convenient form to be plotted. The majority of the requests for these overlay plots are for positions with respect to the Palomar Sky Survey. The utility of these plots is twofold:

- 1) direct imagery comparisons to correlate position with an optical counterpart and
- 2) correlation with other catalogue data plotted with the given position.

A program has been developed to generate the overlays with the following options:

- 1) Plot any combination of the four categories or catalogues:  
Stellar: SAO or CSI (not both)  
Specialized: RNGC, TMSS, VGC
- 2) Input equatorial coordinates other than 1950.0 epoch
- 3) Generation of one or more target circles on a given overlay plot to size desired (radius given in arc minutes)

- 4) Magnitude filter to plot only objects brighter than a designated cutoff magnitude.

A sample of such a plot is given in Figure 1. Here the options were SAO, RNGC and TMSS sources as input, one target circle 15' in radius and no magnitude filter. The TMSS sources are plotted as diamonds and the RNGC sources are plotted as hexagons. The SAO stars are plotted as asterisks to the rough magnitude scale as given on the plot. (The reduction of the actual plot, which is 20 inches by 14 inches, in the attached figure leaves out a great deal of detail). The actual plots are made (other scales available) to the same scale as the survey so that a direct overlay of the photographic plate/print can be performed. Each object is plotted with a sequential number to the upper right of the symbol. An associated printout gives the catalogue data for each source.

#### V. REQUEST ACTIVITY

Requests for astronomical data from the ADC have increased over the past six (6) years. A summary of the request activity since 1974 is given in Table 1.

TABLE 1.

#### NASA/GSFC Data Base Activity

<u>CATEGORY</u> \ <u>YEAR</u>	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>
Direct Copies of Machine-readable Catalogues	8	29	10	98	173	232
Overlay Plots	2	1	30	277	149	242
Data Base Retrieval System (#requestors/ #objects requested)	0	0	2 194	6 552	4 100	5 48
Special Searches (#requestors/ #objects found from search)	0	1 5	7 210	16 3090	9 9581	34 14112
Information	0	0	0	0	0	19
Microfiche, microfilm and hardcopies of catalogues	0	0	0	0	5	75
BSI searches (#requestors/ #objects searched)	0	0	0	0	0	1 1

RIGHT ASCENSION OF CENTER 11790.1 PSS PRINT = 1338  
 (1950, EPOCH) MLP PRINT = .71  
 DECLINATION OF CENTER 47°47'08" SAO STARS 154 TARGET RADIUS = 15'



1:0 2:0 3:0 4:0 5:0 6:0 7:0 8:0 9:0 10:0 MAGNITUDE CUTOFF  
 \* \* \* \* \* \* \* \* \* \* 10:0

26 VOC = □ 2 TMSS = ⊙ 32 RNOC = ⊙ NOC4051

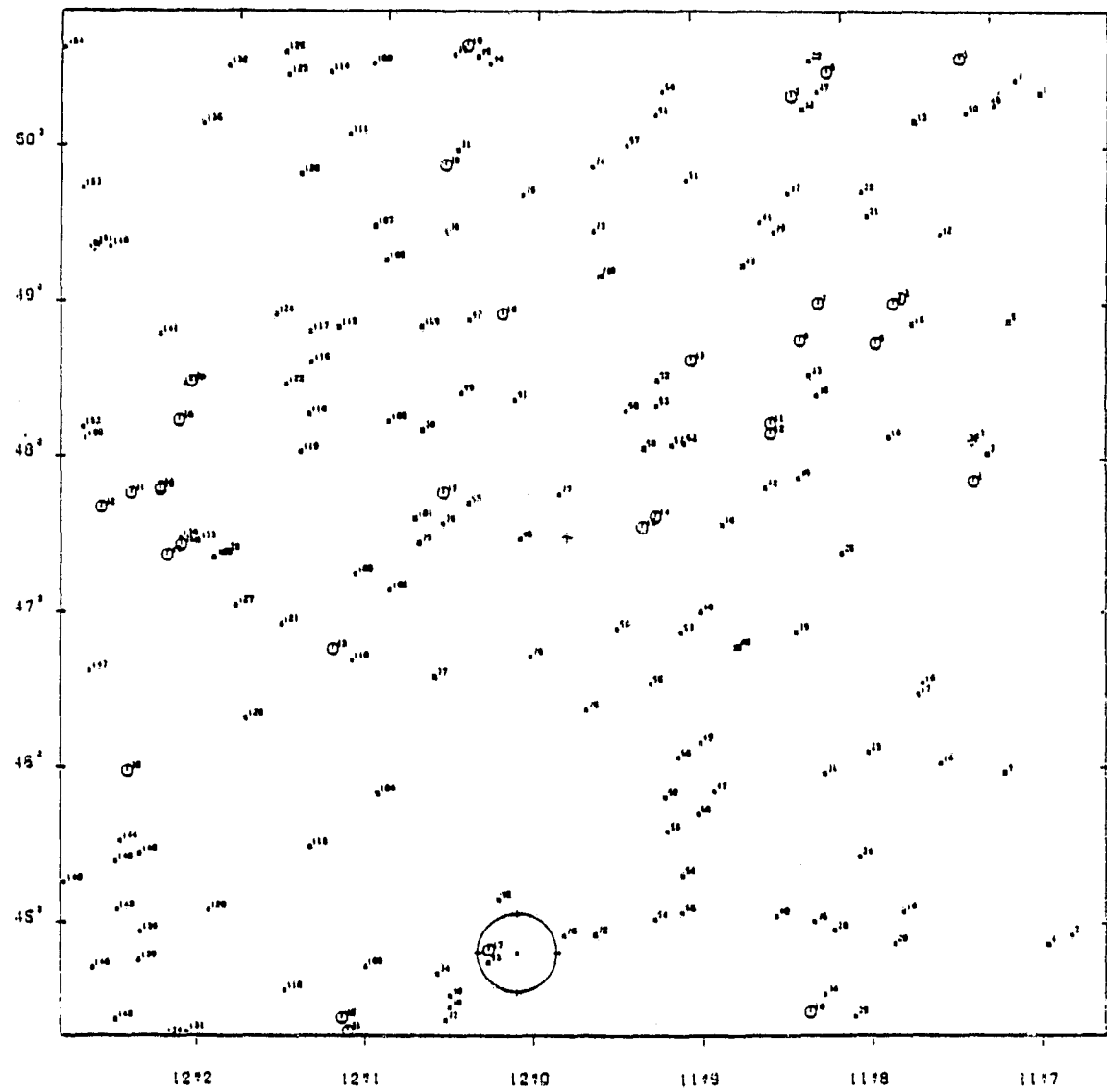


Figure 1. Sample overlay plot with SAO stars, RNGC and TMSS sources plotted to Palomar Sky Survey scale (reduced for publication).

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## VI. CURRENT MAJOR PROJECTS

The Astronomical Data Center is currently involved in several projects which are described briefly below.

- 1) The entire Bibliographic Star Index (BSI, Cayrel, R., Jung, J. and Valbousquet, A. 1974, CDS Information Bulletin No. 6, p. 24) data and reference sets are now on direct access disks at NASA/GSFC. A first generation retrieval program has been implemented to cull reference information on HD stars in real time. This capability will be expanded so that other identifiers may be used as input option keys.
- 2) An HD-DM-ADS-IDS-Right Ascension (1900) Cross Index is nearly completed. Two problem areas remain: multiple HD numbers for a single ADS or IDS number must be included; incorrect DM tags in the ADS must be corrected. This cross index will then be distributed as a NASA publication and by magnetic tape.
- 3) A set of empirical rules will be determined for right ascensions  $0^h$  -  $20^h$  of the Evans Catalogue of Radial Velocities. These will be transmitted to the IAU Commission on Radial Velocities for approval and/or updating. The rules accepted by the Commission will then be applied to the generation of the remaining hours of the catalogue ( $21^h$  -  $23^h$ ) which have not yet been compiled.
- 4) A major improvement of the machine-readable version of the General Catalogue of Variable Stars is in progress.
- 5) The entire Cordoba and one volume ( $-1^\circ$  to  $+19^\circ$ ) of the Bonner Durchmusterungen have been keypunched and transferred to magnetic tape. The data are presently being proofread, after which we hope to continue the work with the Cape Photographic and Schönfeld Southern Durchmusterungen.
- 6) Work is in progress on a combined uniform Astrographic Catalogue of the Oxford, Paris, Bordeaux and Toulouse zones of the Carte du Ciel. The machine-readable astrographic catalogues, as prepared at the Centre de Données Stellaires, are currently being checked by computer for data consistency. Duplicate entries from overlapping plates are being deleted for the merged version (although the original version having all entries will be retained).
- 7) The Smithsonian Astrophysical Observatory Star Catalog (SAO) is being updated with several hundred corrections found by various workers over the last several years. In addition, component identifications from the Index Catalogue of Visual Double Stars are being assigned where two or more existing SAO records have the same DM number. This includes identifications having lower case letters from supplementary BD entries. The resulting SAO will therefore have unique DM identifications for all entries.

8) The notes section of the Index Catalogue of Visual Double Stars is being made machine readable. A separate file will be created for distribution with the IDS data file currently being updated by C.E. Worley of the U.S. Naval Observatory.

9) We are also preparing an updated version of the Henry Draper Catalogue by incorporating all errors found in recent years by various workers. New cross-identification files between HD-DM and DM-HD will be derived from the corrected version, after which the HDE-DM cross identification file of Bonnet (Bonnet, R. 1978, CDS Information Bulletin No. 15, p. 115) will be added.

## VII. CONCLUSION

With the advent of space-borne instruments, the coverage of the observed spectrum has broadened from the limited optical window available to ground-based telescopes to the expanded space view in the gamma-ray, x-ray, infrared, millimeter and radio regions. The influx of these data has resulted in the preparation of many new catalogues, often on magnetic tape.

Along with access to more observational wavelengths has come the discovery of additional classes of objects, such as quasars, pulsars and gamma-ray and x-ray bursters. The desire to identify the optical counterparts of these objects has been a strong driver for computerized data bases.

Computerization of data from the time they are obtained, either with ground-based telescopes or from space, has increased greatly in recent years and thus contributed to expanding the amount of data available. Satellites and balloons are making automated sky surveys which yield large volumes of data--a mode of operation which had not been possible from the ground in such an efficient manner.

No longer does one hear the debate over whether or not the field of astronomy should have a computerized data base. As more and more users recognize the value of this resource in providing data files designed to fit their specifications, whether it be a well-known catalogue which they can access and rearrange as they wish, or whether it is a data file created to fit their particular requirements of position, magnitude and/or spectral type, the users recognize the two big advantages for them: (1) saving of time by having the data machine readable and thus computer accessible; (2) broadening of their data resources through the opportunity to have their own specially designed subset culled from a much larger data file, which itself has been produced by combining many machine-readable catalogues.

The increase in computerized data in recent years is probably only a small indication of the flood of such data which will be obtained from the Space Telescope, the Infrared Astronomy Satellite, and instruments on the Space Shuttle. A convenient computerized system is needed by astronomers who use observational data in order to provide an adequate framework for handling the new data in conjunction with the old. The creation of and easy access to such a computerized data system is the goal of the Astronomical Data Center at Goddard.

ASTRONOMICAL INFRARED DATA BASE

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and

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NASA/Goddard Space Flight Center

The Infrared and Radio Astronomy Branch and the Laboratory for Astronomy and Solar Physics at NASA/GSFC are jointly producing a computerized data base of astronomical infrared (IR) sources. Measurements of sources outside the solar system in the wavelength range from 1-1000  $\mu\text{m}$  are included in the data base. The data are obtained from existing catalogues and an extensive literature search beginning with 1960. The data are retained in both the original form and in a uniform system for convenient reference. Details about the data base are described by Schmitz (1978).

The data base presently includes about 900 references. Data in over one-third of these references have been made machine-readable and have been proofread against the original published report. Discrepancies found through inter-catalogue comparisons have been flagged and referred to the original authors for comment. A list of errata and questions about data is being retained and regularly updated.

Periodically, we expect to publish catalogues containing information from the current machine-readable data base. The first, the Merged Infrared Catalogue (MIRC) (Schmitz et al. 1978), contains 11,201 entries compiled from the Two-Micron Sky Survey (Neugebauer and Leighton 1969), the AFGL Four-Color Infrared Sky Survey (Price and Walker 1976) and Supplemental Catalog, (Price 1977), A Catalog of 10- $\mu\text{m}$  Celestial Objects (Hall 1974), and Observations of Infrared Radiation from Cool Stars (Gillett, Merrill and Stein 1971). The MIRC is a merged version of selected data from the above catalogues. Each catalogue contains an object identification number and apparent magnitude at one or more infrared wavelengths. Additional information includes the equatorial coordinates of the observed source, the spectral or galaxy type of the optical candidate for the source, and the flux at a given wavelength. The MIRC contains all the above information and is sorted by increasing right ascension. Fluxes are in units of  $10^{-16}$  watts  $\text{cm}^{-2}$   $\mu\text{m}^{-1}$  and were computed by Schmitz et al. from the magnitude when the flux was not given. The catalogue is available from the authors in magnetic tape and microfiche form.

The next catalogue to be published will contain the entries in the MIRC plus data obtained through the literature search. The publication will list the IR source name, position, bibliographic reference, aperture size, wavelength, and IR flux, as well as relevant comments for each observation. The literature search for 1977 and 1978 has yielded about 300 journal articles from which over 3000 catalogue entries have been obtained. The catalogue will also contain a comprehensive bibliography keyed to a numerical code in the main catalogue. All identifications for IR objects which have been made in the literature will be contained in an Atlas of IR Source Names to be included as an appendix to the catalogue.



We would like to thank Drs. T. Nagy and W. Warren for their help in obtaining the machine-readable data required for this project and also for discussions about data base management procedures.

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DEARBORN OBSERVATORY CATALOGUE OF FAINT RED STARS

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The Dearborn Observatory Catalogue of Faint Red Stars (Lee et al. 1943, 1944 and 1947) has been made machine-readable at the Goddard Space Flight Center and Wellesley College (Mrs. Sawyer, Whitin Observatory). The published version of this catalogue gives the following data:

- 1) Dearborn number (sequential 1-44076).
- 2) Right ascension (epoch 1900, hours, minutes, and tenths of minutes).
- 3) Declination (epoch 1900, degrees and minutes of arc).
- 4) Magnitude - obtained through comparison on red-sensitive emulsion with the International Polar sequence: "... should be fairly reliable to 0.2 magnitude". If a star were known to be variable by the compilers of the catalogue, the magnitude is given as "99.9" in the machine-readable version. (The quote is from the preface to the published catalogue).
- 5) Dearborn spectral type obtained from objective-prism plates with red-sensitive emulsion.
- 6) Henry Draper spectral type, which only is given for 5764 (13%) of the stars. The introduction to the published version of the catalogue does not define the criteria for correlation of Dearborn and Henry Draper entries.

All of the above data in this catalogue have been keypunched, proofread and transferred to magnetic tape. In addition, the equatorial coordinates have been added to each record in decimal hours and degrees to facilitate computing applications. Some of the entries in this catalogue which should be noted are as follows:

<u>Dearborn Number</u>	<u>Note</u>
1841	Has no Dearborn Spectrum, but does have an HD spectrum of Md.
4261	The listed declination is $-5^{\circ} 5'$ even though the range of the catalogue is supposed to go no further south than $-4^{\circ} 5'$ . This is the only star with a listed position south of $-5^{\circ}$ .
6751	The magnitude column is blank in the published version; will read as $\emptyset.\emptyset$ in the machine-readable version with format F4.1.
14712	Has the footnote symbol '#' in the published version, but there is only a note referring to 15712. In the version of

the published notes below, the note is given as referring to Dearborn number 14712, because the spectral type of this star is peculiar.

- 15550 Has the footnote symbol '#' in the published version, though in the published version there is in fact no footnote. The '#' does not appear in the machine-readable version.
- 28724 Same note as for Dearborn number 15550.

There are 80 records with an additional note which are not machine-readable at this time: however, they are given in the technical memo which has been written (Nagy 1979) to accompany the machine-readable version of this catalogue.

A two-dimensional counts matrix (red magnitude versus spectral type) has been prepared for this catalogue and is given in Figure 1. The magnitude range is for half-magnitude bins with the last bin ( $>14.5$ ) including all variables since this magnitude is given as "99.9". There are 27 different spectral types given and one star with no Dearborn spectral type given (#1841). As one would expect, the majority of stars in this catalogue is of late spectral type (K5/35%, M0/23% and M1/11%) and most have red magnitudes fainter than 9.0.

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MACHINE-READABLE DURCHMUSTERUNG CATALOGUES

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Machine-readable versions of the entire Cordoba (CD, Thome et al. 1892-1932) and zones  $-1^{\circ}$  to  $+19^{\circ}$  of the Bonner (BD, Küstner 1903) Durchmusterung catalogues have been prepared. At present, only one volume of the CD has been independently proofread (zones  $-22^{\circ}$  to  $-31^{\circ}$ ). It is planned that the remainder of the Durchmusterung data be proofread, but no target date has been set.

The paper "Zone Statistics for the Durchmusterung Catalogues" (Warren, Nagy and Hill 1980) contains the statistics of all Durchmusterungen (DM) as a function of declination zone. The entire CD contains 613,951 entries of which 179,798 (29%) have been proofread, and the BD ( $-1^{\circ}$  to  $+19^{\circ}$ ) contains 110,984 entries (24% of the entire BD). All DM data have been made machine readable except for the reference codes (occasional data which refer to five other previous works). The information included is as follows: DM number (zone plus sequential number within given zone), equatorial coordinates explicitly as given in catalogue and magnitude as given in catalogue.

The object of this note is to inform the astronomical community of the existence of the above data in machine-readable form. We do not plan to release the data until they have been proofread or checked. If anyone knows of zones that have been made machine readable independent of this effort, this would provide a convenient method for cross checking. We are also planning to extend this work by making the Cape Photographic (CPD, Gill and Kapteyn 1895-1900) and the Southern Durchmusterung (SD, Schönfeld 1886) machine readable. The BD zones ( $-1^{\circ}$  to  $+19^{\circ}$ ) were made machine readable as part of a cooperative effort with European observatories.

We are indebted to the director of the National Space Science Data Center, Dr. J. Vette, for providing the personnel and equipment necessary for the project. Also, we would like to thank the many people who have participated in the work: R. Post, S. Ball, M. Röpko, M. Goodwin, C. Perry, E. Scarzafava, B. Alexander and C. Bergstrom.

## References

- Gill, D. and Kapteyn, J.C. Cape Photographic Durchmusterung, Annals of the Cape Observatory (1895), 3 (Part I; zones  $-18^{\circ}$  to  $-37^{\circ}$ ), (1897), 4 (Part II, zones  $-38^{\circ}$  to  $-52^{\circ}$ ), (1900) 5 (Part III; zones  $-53^{\circ}$  to  $-89^{\circ}$ ).
- Küstner, F. (1903), Bonner Durchmusterung des Nördlichen Himmels, zweite berichtigte Auflage, Bonn Universitäts Sternwarte.
- Schönfeld, E. (1886), Bonner Durchmusterung (South), Astronomische Beobachtungen, 8 (Part IV; zones  $-2^{\circ}$  to  $-23^{\circ}$ ).
- Thome, J.M. Cordoba Durchmusterung, Resultados del Observatorio Nacional Argentino, (1892), 16 (Part I; zones  $-22^{\circ}$  to  $-32^{\circ}$ ), (1894), 17 (Part II; zones  $-32^{\circ}$  to  $-52^{\circ}$ ), (1914), 21 (Part III, zones  $-52^{\circ}$  to  $-62^{\circ}$ ), (1932), 21 (Part IV, zones  $-62^{\circ}$  to  $-90^{\circ}$ ).
- Warren, W.H. Jr., Nagy, T.A. and Hill, R.S. (1980), Astron. Data Center Bull. 1, p. 21.

CATALOG OF SUPPLEMENTAL BONNER DURCHMUSTERUNG STARS

W. H. Warren Jr. and K. Kress

National Space Science Data Center / GSFC

The *Bonner Durchmusterung* catalogs (Argelander 1859-62, Küstner 1903),  $\delta$  zones  $+89^\circ$  to  $-1^\circ$ , contain supplemental stars added as footnotes to the original catalogs and designated by lower case letters following the BD numbers after which they have been inserted. Many problems of identification have arisen over the years because the supplemental stars have been included in machine-readable catalogs without their letter designations, thus making it impossible for a computer to distinguish between a BD star and its insert(s). The need for a machine-readable list of the supplemental stars arose in connection with identifying stars in other catalogs in order to add the letter designations to them. As a specific example, Warren and Schofield (in preparation) have found that the SAO Catalog contains 49 supplemental stars, most of which have equivalent main BD-catalog entries also. The omission of the letter designations for the supplemental stars in the SAO therefore resulted in duplicate BD numbers for stars which should not have them (as opposed to some members of multiple-star systems which should). The SAO stars found to be supplemental BD stars will be listed in a forthcoming paper concerning a new updated version of the machine-readable SAO Catalog. *To avoid this problem in future machine-readable catalogs containing BD numbers, it is strongly recommended that catalog compilers always retain letter designations for supplemental BD stars, even at the expense of adding an extra byte to each data record.*

The initial catalog of supplemental stars was prepared from the second edition of the BD (Küstner 1903), but proofreading and checking were accomplished by using the reprinted edition (Bonn Universitäts Sternwarte 1968) which incorporated all errata known at that time. In that way, it was possible to simultaneously derive tables of supplemental stars added, deleted or modified for the reprinted edition. The tables are included in the documentation for the catalog, which is supplied with every tape copy distributed.

The final catalog contains 838 supplemental stars. Data included in the machine-readable version are: identification (BD number and letter designation),  $\alpha$  (1855)  $\delta$ , and BD magnitude. The catalog is ordered by decreasing declination zone and increasing BD number within each zone.

References

Argelander, F. (1859-62). *Bonner Sternverzeichniß. Erste bis dritte Sektion*, Astronomischen Beobachtungen auf der Sternwarte der Königlichen Rhein. Friedrich-Wilhelms-Universitäts zu Bonn, Bands 3-5.

References (continued)

Bonn Universitäts Sternwarte (1968). *Bonner Durchmusterung, Nördlichen Teil, Deklinations-Zonen  $-1^{\circ}$  bis  $+89^{\circ}$  Sternverzeichnis*, Vierte Auflage herausgegeben von der Universitäts-Sternwarte Bonn.

Küstner, F. (1903). *Bonner Durchmusterung des Nördlichen Himmels, zweite berichtigte Auflage*, Bonn Universitäts Sternwarte.



ADC Bull. (July 1980) 1, 21-24

ZONE STATISTICS FOR THE DURCHMUSTERUNG CATALOGUES

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and

T. A. Nagy and R. S. Hill  
Systems and Applied Sciences Corporation, Riverdale, MD

During our work with star catalogues, we have often needed to know the numbers of stars present in various zones of the Durchmusterung catalogues. This has always required procurement of the original catalogues to look up the data, since, to our knowledge, no statistical summary has heretofore been available (although approximate numbers of stars in the BD, SD, CD, and CPD are given by van Biesbroeck 1963).

In connection with the *Astronomical Data Center* project of punching the *Cordoba, Cape Photographic*, and part of the *Bonner Durchmusterungen* (Nagy, Mead and Warren 1980) we required for checking purposes an itemized list of the numbers of DM stars by zone, hence we decided to complete the counts for all Durchmusterung zones and publish summary tables of the results. We hope that the following tables will be useful to other astronomers working with star catalogues.

References

Nagy, T. A., Mead, J. M., and Warren, W. H. Jr. (1980). *Astron. Data Center Bull.* 1, p. 17.

van Biesbroeck, G. (1965). in *Basic Astronomical Data*, ed. K. Aa. Strand (U. Chicago Press, Chicago), p. 471.



CÓRDOBA DURCHMUSTERUNG STATISTICS

Hardcopy Volume	Number of Hardcopy		Number of Stars		Number of Hardcopy		Number of Stars		Number of Hardcopy		Number of Stars		Number of Hardcopy		Number of Stars	
	Zone	Volume	Zone	Volume	Zone	Volume	Zone	Volume	Zone	Volume	Zone	Volume	Zone	Volume	Zone	Volume
1	-22°	16573	2	32°	17812	3	42°	16590	4	52°	10585	5	62°	1476		
	-23	18138		-33	16844		-43	15587		-53	9494		-63	1635		
	-24	17980		-34	16298		-44	15458		-54	9696		-64	1451		
	-25	16794		-35	16069		-45	15245		-55	9450		-65	2966		
	-26	16910		-36	16170		-46	14860		-56	8926		-66	2666		
	-27	16541		-37	15509		-47	14794		-57	8950		-67	2626		
	-28	18457		-38	15732		-48	14691		-58	8685		-68	2380		
	-29	18965		-39	15254		-49	14337		-59	8264		-69	2126		
	-30	19841		-40	15327		-50	14119		-60	8168		-70	1960		
	-31	19599		-41	15400		-51	13766		-61	6922		-71	1821		
		<u>179798</u>			<u>160415</u>			<u>149447</u>			<u>89140</u>			<u>35151</u>		

Total Number of stars in CD = 613951

CAPE PHOTOGRAPHIC DURCHMUSTERUNG STATISTICS

Hardcopy Volume	Zone	Number of Stars	Hardcopy Volume	Zone	Number of Stars	Hardcopy Volume	Zone	Number of Stars
1	-18°	491	2	-38°	8603	3	-53°	10591
	-19	8448		-39	9318		-54	10431
	-20	8559		-40	9912		-55	10161
	-21	8323		-41	10007		-56	10225
	-22	8432		-42	9663		-57	10427
	-23	8376		-43	9815		-58	8131
	-24	7513		-44	10406		-59	7957
	-25	7616		-45	10518		-60	7717
	-26	7545		-46	10625		-61	6795
	-27	7607		-47	10081		-62	6468
	-28	7750		-48	11012		-63	4949
	-29	6927		-49	11858		-64	4404
	-30	6857		-50	11905		-65	4199
	-31	6897		-51	12075		-66	3825
	-32	6721		-52	12255		-67	4000
	-33	6441					-68	3599
	-34	9339					-69	3349
	-35	9481					-70	3038
	-36	9838					-71	2787
	-37	9437					-72	2803
							-73	2349
							-74	2136
							-75	1830
							-76	1639
							-77	1600
							-78	1484
							-79	1250
							-80	1083
							-81	1050
							-82	908
							-83	761
							-84	661
							-85	560
							-86	426
							-87	349
							-88	213
							-89	62
								<u>144217</u>
		<u>152598</u>			<u>158053</u>			

Total Number of stars in CPD = 454868

ADC Bull. (July 1980) 1, 25-27

A REVISED MAGNETIC TAPE OF THE BOSS

GENERAL CATALOGUE OF 33342 STARS FOR THE EPOCH 1950

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and

J.M. Mead, NASA Goddard Space Flight Center, Greenbelt, MD 20771

A revised machine-readable version of the Boss General Catalogue of 33342 Stars for the Epoch 1950 has been prepared. The initial machine-readable version of this catalogue was obtained from the U.S. Naval Observatory (Washington, D.C.). The revisions to this original tape are listed below.

1. All 'VAR' designations in the magnitude field have been replaced with the numerical value of 99.9. This will allow reading the magnitude with a FORTRAN F-format.
2. The numerical codes used for spectral types have been decoded and both the coded and literal presentations of the spectral types (e.g. G2) are retained.
3. Overpunches in the following quantities have been removed and an explicit decimal point has been added so that the information is now readily retrieved with a FORTRAN F-format.
  - a. Epoch of right ascension.
  - b. Annual variation in right ascension.
  - c. Secular variation in right ascension.
  - d. Third term in right ascension.
  - e. Annual variation in declination.
  - f. Secular variation in declination.
  - g. Third term in declination.
  - h. Proper motion in declination.
4. The following changes were made based on visual comparison with the published version of the catalogue.
  - a. A double overpunch (12-11-0 punch) was converted to a zero.
  - b. The pair of bytes with a "+" and a 12-11-8 punch were converted to "-0".
5. The sign of the declination was moved so that it always appears in byte 64. Only the minus is explicit; positive values have a blank in the declination sign byte.

The following quantities were not included (and still are not included) in the machine-readable version of the catalogue but are in the published version of the catalogue:

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 103 which indicates whether or not a remark is given. Also, this code indicates the type of information which is contained in the remark if there is one. (cf. tape description).

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

- a. Galactic longitude (degrees).
- b. Galactic latitude (degrees).
- c. Durchmusterung numbers.

The tape is written in EBCDIC characters. The following table provides all the magnetic tape parameter information.

TAPE CHARACTERISTICS

Catalogue .....	GC
Number of Tracks .....	9
Density (BPI) .....	1600
Number of Files .....	1
Logical Record Length (Bytes) .....	131
Blocksize (Bytes) .....	13100
Blocking Factor .....	100
Record Format (IBM OS/JCL) .....	FB
Total Number of Logical Records .....	33342
Total Number of Blocks .....	334

Table 1 is a printout (with header columns read vertically from 1-132) of the last 42 records of the tape which represents the last physical block of the tape with the above characteristics.



AUTOMATED PLATE ASSIGNMENT

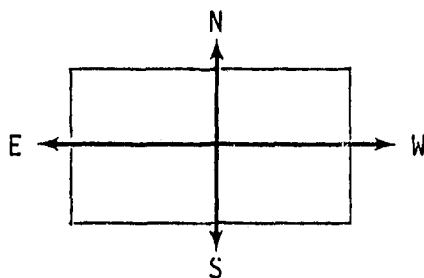
T. A. Nagy

Systems and Applied Sciences Corporation, Riverdale, MD 20840

The assignment of astronomical catalogue entries to the limits of a photographic survey plate/print area is a convenient means for construction of a data set for rapid retrieval of data. For example, stars in the Smithsonian Astrophysical Observatory (SAO) Star Catalog (Haramundanis 1966) have been assigned to 1037 rectangular boxes corresponding to the 937 Palomar Sky Survey (PSS) and 100 Whiteoak Extension plate areas. The preparation of digital finder fields is then facilitated by the need to compare a position of interest with only  $\sim 250$  (on the average) stellar positions rather than the entire source catalogue.

Several authors have dealt with the problem in the past and in particular Lund and Dixon (1973) and Lund (1972). The work started by these authors has been expanded (and in some cases corrected) to provide some software programs and data sets which provide an efficient (computer-wise) means for retrieval of data. The Palomar Plate Assignment (PPA) Program (Nagy and Schmitz 1978) inputs an astronomical data set and outputs a multifile tape (1037 files) where each file corresponds to a Palomar plate/print region. The southern declination limit of the Whiteoak Sky Survey is  $\sim -46^\circ$ . The right ascension limits ( $\alpha_{\min}$  and  $\alpha_{\max}$ ) for each plate/print area are computed by solving the corner equations for each plate.

For a typical print oriented as shown below,



the right ascension limits are defined by the right ascensions of the corners and are a function of the sign of the declination of the center of the plate.

	Plate with Central Declination	
	positive	negative
$\alpha_{\min}$	NW	SW
$\alpha_{\max}$	NE	SE



The corner equations have been derived and given by Lund (1972) and Lund and Dixon (1973). However, sign errors in the latter publication and an error in the southern equations of the former publication may cause problems. It is the intention of this paper to have in one place a set of all equations necessary to assign a source to a rectangular section of the celestial sphere.

For  $\delta_0 < 0^\circ$  (Lund 1972)

$$\text{let } Q = (1 - \sin^2 P \sin^2 \delta_0)^{1/2} \cos [\tan^{-1} (\tan P \cos \delta_0)]$$

where  $\delta_0$  = declination of the center of the plate/print and  $P$  = half plate size ( $\approx 30.22$  for PSS)

$$\alpha_{SW} = \tan^{-1} [\sin P \sin \delta_0 \tan (\delta_0 - P)/Q - \tan P \cos \delta_0] + \alpha_0$$

and

$$\alpha_{SE} = \tan^{-1} [-\sin P \sin \delta_0 \tan (\delta_0 - P)/Q + \tan P \cos \delta_0] + \alpha_0$$

Data for the adjacent Whiteoak prints 7992 and 7993 were input to these equations and the result was:

Print	$\alpha_0$ (1950.0) $\delta_0$	$\alpha_{min}$ (radians)	$\alpha_{max}$
7992	4 <sup>h</sup> 15 <sup>m</sup> 17 <sup>s</sup> -35 <sup>o</sup> 47'.0	1.095	1.133
7993	4 <sup>h</sup> 43 <sup>m</sup> 12 <sup>s</sup> -35 <sup>o</sup> 50'.3	1.211	1.260

These two plate areas are adjacent to each other in the sky and should overlap but the above results show that instead of overlap, there were "holes" between plates where  $\delta_0 < 0^\circ$ . Actual measurements on the prints themselves give  $\sim 4.2$  cm overlap with  $\sim 67''/44$ /mm as the print scale yields at least a 0.014 radian overlap.

The equations for the plate edges as given by Lund and Dixon (1973) are correct except for a missing sign in two of the equations. The correct edge equations are as follows:

$$\text{North Side: } \tan \delta = \cos(\alpha - \alpha_0) \tan (\delta_0 + P)$$

$$\text{South Side: } \tan \delta = \cos(\alpha - \alpha_0) \tan (\delta_0 - P)$$

$$\text{East Side: } \tan \delta = \pm \sin \left[ \alpha - \alpha_0 - \tan^{-1} (\tan P \cos \delta_0) \right] \cdot \tan \left[ \cos^{-1} (-\sin P \sin \delta_0) \right]$$

$$\text{West Side: } \tan \delta = \mp \sin \left[ \alpha - \alpha_0 - \tan^{-1} (\tan P \cos \delta_0) \right] \cdot \tan \left[ \cos^{-1} (-\sin P \sin \delta_0) \right]$$

where  $\alpha_0$  and  $\delta_0$  are the equatorial coordinates of the plate center, P is the half-plate size, and where the top sign applies if  $\delta_0 \geq 0^\circ$  and the bottom sign is used if  $\delta_0 < 0^\circ$ . To compute a corner equation for the SW corner, one simply equates the south to the west side:

$$\text{let } A = \cos [\tan^{-1} (\tan P \cos \delta_0)]$$

$$R = \tan [\cos^{-1} (-\sin P \sin \delta_0)]$$

for  $\delta_0 < 0^\circ$

$$\alpha_{SW} = \tan^{-1} [\tan(\delta_0 - P)/(A \cdot R) - \tan P \cos \delta_0] + \alpha_0$$

and

$$\alpha_{SE} = \tan^{-1} [-\tan(\delta_0 - P)/(A \cdot R) + \tan P \cos \delta_0] + \alpha_0$$

Now when the data for the two adjacent Whiteoak plates are input to the above equations, the results are:

Print	$\alpha_0$ (1950.0) $\delta_0$	$\alpha_{min}$ (radians)	$\alpha_{max}$
7992	4 <sup>h</sup> 15 <sup>m</sup> 17 <sup>s</sup> -35 <sup>o</sup> 47'.0	1.042	1.186
7993	4 <sup>h</sup> 43 <sup>m</sup> 12 <sup>s</sup> -35 <sup>o</sup> 50'.3	1.169	1.302

Note that now there is indeed an overlap of the approximately correct amount between the plate areas.

The basic tests in the PPA Program require that the values of  $\alpha_{min}$  and  $\alpha_{max}$  be correct. If "cracks" in the southern hemisphere are tolerated, then the plate assignment program will allow stars to fail the assignment when they should not fail.

This program has been used to process the following five major catalogues:

Catalogue	Number of Objects	Reference
Smithsonian Astrophysical Observatory Star Catalog	258997	Haramundanis (1966)
Revised New General Catalogue of Non-Stellar Objects	7840	Sulentic and Tifft (1973)
Reference Catalogue of Bright Galaxies	2597	de Vaucouleurs and de Vaucouleurs (1964)
Two-Micron Sky Survey	5612	Neugebauer and Leighton (1969)
Catalogue of Stellar Identifications	430824	Jung, Bischoff and Ochsenbein (1973)

In addition, the appropriate scale factors and constants have been modified to process the latter catalogue with respect to the Lick Sky Survey plus Southern extension.

### References

- de Vaucouleurs, G. and de Vaucouleurs, A. (1964). Reference Catalogue of Bright Galaxies, University of Texas Press.
- Haramundanis, K.L. (1966). Smithsonian Astrophysical Observatory Star Catalog, The Smithsonian Institution, Washington, D.C.
- Jung, J., Bischoff, M. and Ochsenbein, F. (1973). Centre de Données Stellaires, Inform. Bull. No. 4, p. 27.
- Lund, J.M. (1972). M.S. Thesis, Ohio State University.
- Lund, J.M. and Dixon, R. (1973). Publ. Astron. Soc. Pac., 85, 230.
- Nagy, T.A. and Schmitz, M. (1978). Palomar Plate Assignment Program, Computer Sciences Corp., CSC/TM-78/6187.
- Neugebauer, G. and Leighton, R.B. (1969). Two-Micron Sky Survey, California Institute of Technology, NASA SP-3047.
- Sulentic, J.W. and Tifft, W.G. (1973). Revised New General Catalogue of Nonstellar Astronomical Objects, University of Arizona Press.

STATUS REPORT ON MACHINE-READABLE ASTRONOMICAL CATALOGUES

ASTRONOMICAL DATA CENTER

NASA-GODDARD SPACE FLIGHT CENTER

W. H. WARREN JR., T. A. NAGY, J. M. MEAD

10 JUNE 1980

Catalogues are grouped and numbered in terms of the Strasbourg Stellar Data Center's numbering system where applicable.

Catalogues numbered in 700s have been received from the CDS, but modified, updated with corrections, or supplemented with additional data. If the CDS assigns a number to the GSFC version or decides to distribute it in place of its own, then the CDS number will be reassigned to the GSFC version.

Catalogues numbered in 800s are distinct from the CDS versions in that they originate from independent sources and/or they have been redone or extensively modified.

Catalogues numbered in 900s have not yet or are not expected to be assigned numbers by the Strasbourg Data Center.

Status Codes for Catalogues:

- A - Available for distribution
- E - Basically checked out on computer, but documentation not yet completed or some questions remain
- C - Catalogue on hand, but not yet checked out by computer
- I - Data in catalogue are being keypunched
- R - Catalogue has been requested, but not yet received
- F - Available in microfiche version
- G - Available in both microfiche and microfilm versions
- M - Available in microfilm version only
- D - Catalogue on hand, but we are not authorized to distribute
- T - Full documentation available

Status codes for magnetic tape, microform, and documentation are given in first, second and third columns, respectively.

NOTE: The machine-readable catalogues on this list have been obtained from many different sources and, in some cases, have been modified (reformatted, reblocked, corrections added, etc.) at GSFC. In no case, however, has a catalogue been changed internally with regard to data content. Individual sources are identified in the documentation pertaining to each catalogue.

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Wayne H. Warren Jr., National Space Science Data Center (NSSDC) /  
World Data Center A for Rockets and Satellites (WDC-A R&S), Code 601,  
NASA - Goddard Space Flight Center, Greenbelt, Maryland 20771  
Telephone: (301) 344-8310 or 8105; FTS 344-8310 or 8105; TELEX 89675.

STATUS REPORT ON MACHINE-READABLE ASTRONOMICAL CATALOGUES  
10 JUNE 1980

I. ASTROMETRIC DATA:

801 - SMITHSONIAN ASTROPHYSICAL OBSERVATORY CATALOG (HARMUNDANIS 1966) (WITH HD AND GC NUMBERS ADDED) (EBCDIC VERSION) (SAO-EBCDIC)	A M T
3 - YALE ZONE CATALOGUES (YZ)	B
4 - CAPE PHOTOGRAPHIC CATALOGUE (CPC)	B
5 - CAPE ZONE CATALOGUE (SPENCER AND JACKSON 1900) (CZ)	B
6 - CATALOGUE OF 20554 FAINT STARS IN THE ASTROGRAPHIC ZONE -40 DEG. TO -52 DEG. FOR THE EQUINOX OF 1900.0 (CF) (SPENCER & JACKSON 1939)	B
808 - GENERAL CATALOGUE OF 33342 STARS FOR THE EPOCH 1950.0 (GC) (BOSS 1937)	A T
9 - GESCHICHTE DES FIXSTERNHIMMELS (ZONES 0 DEG TO +50 DEG) (OBSERVED POSITIONS NOT INCLUDED ON TAPE)	E
810 - YALE CATALOGUE OF TRIGONOMETRIC PARALLAXES (JENKINS) (TP)	A G
11 - CATALOGUE OF PROPER MOTIONS OF 8790 STARS WITH REFERENCE TO GALAXIES (KIEMOLA et al. 1971)	B
12 - STERN-KATALOG FUR DIE ZONE VON -6 DEG. BIS -10 DEG. SUDLICHER DEKLINATION FUR DAS AEQUINOXTIUM 1890, ERSTE UND ZWEITE ABSTELLUNG (HERZ 1907)	B F
13 - CATALOGUE OF 5268 STANDARD STARS BASED ON THE NORMAL SYSTEM N30 (H. R. MORGAN 1952) (N30)	B
14 - PROPER MOTIONS OF 1160 LATE-TYPE STARS (FOGH OLSON 1970)	E
15 - FOURTH FUNDAMENTAL KATALOG AND SUPPLEMENT (FRICKE AND KOPFF 1963) (FK4)	B
16 - KATALOG VON 3356 SCHWACHEN STERNEN FUR DAS AEQUINOXTIUM 1950 (LARINK 1955) (ZONES -5 DEG TO +89 DEG)	E
21 - CARTE DU CIEL CATALOGUE (LACROUTE AND VALBOUSQUET 1974) (AC) (OXFORD, TOULOUSE, BORDEAUX, ALGIERS ZONES)	C
22 - CARTE DU CIEL CATALOGUE (LACROUTE AND VALBOUSQUET 1974) (AC) (PARIS ZONE)	C
23 - CATALOGUE OF PROPER MOTIONS FOR 437 A STARS (FOGH OLSON 1970)	E
26 - CATALOGUE DE 8803 ETILES ENTRE 31 ET 40 DECLINAISON NORD (PRAGER 1923)	E

STATUS REPORT ON MACHINE-READABLE ASTRONOMICAL CATALOGUES  
10 JUNE 1980

- 28 - BCNN 10: KATALOG VON 10663 STERNEN (KUSTNER 1908) E
- 31 - BUCHAREST CATALOGUE: CATALOGUE KSZ D'ETOILES FAIBLES  
POUR 1950.0 (1972) ZONES -11 DEG TO +11 DEG B
- 32 - GREENWICH CATALOG OF STARS FOR 1910.0 (LONDON, H. M.  
STATIONERY OFFICE 1920) ZONES +24 DEG TO +32 DEG E
- 33 - FIRST GREENWICH CATALOG OF STARS FOR 1925.0 (LONDON 1924) E
- 34 - SECOND GREENWICH CATALOG OF STARS FOR 1925.0 (2111  
FUNDAMENTAL STARS) (LONDON 1935) ZONES +32 DEG TO +64 DEG E
- 35 - SECOND NINE-YEAR CATALOG OF STARS FOR 1900: ASTROGRAPHIC  
REFERENCE STARS (LONDON 1909) E
- 36 - CATALOGUE DE 964 ETOILES (FAYET) ZONES +5 DEG TO +15 DEG E
- 38 - TOKYO MITAKA CATALOGUE OF EQUATORIAL STARS 1950.0 (TME)  
(IUZI 1962) E
- 41 - LOWELL PROPER MOTION SURVEY 8991 STARS WITH  $m > 8$ ,  
 $PM > 0.26''/\text{YEAR}$  IN THE NORTHERN HEMISPHERE (GICLAS 1971) E
- 49 - CATALOGUE MERIDIEN DE STRASBOURG 1972 (MELCHIOR AND  
LEJAIFFE) E
- 54 - A CATALOGUE OF 1849 STARS WITH PROPER MOTIONS EXCEEDING  
0.5" ANNUALLY (LUYTEN 1955) E
- 55 - 3eme CATALOGUE DE TOULOUSE (PALOQUE 1937) ZONES +3 TO +12 E
- 57 - CATALOGUE DE 14263 ETOILES: CATALOGUE D'ABBADIA  
(HENDAYE 1915) ZONES +16 DEG TO +24 DEG E
- 59 - CATALOGUE OF PROPER MOTIONS OF 12590 FAINT STARS IN THE  
+25 TO -20 DECLINATION ZONE (GOREL) E
- 860 - DATA ON TRIGONOMETRIC PARALLAXES WHICH HAVE BEEN USED IN  
THE YALE CATALOGUE (RIGHT-HAND PAGES OF TRIG. PAR. CAT.)  
(JENKINS 1963) B
- 861 - AGK3 CATALOGUE (HEIDELBERG, FINAL VERSION) (AGK3) A M T
- 862 - PERTH 70, POSITIONS OF 24900 STARS (P70)  
(HOG AND VON DER HEIDE 1976) A T
- 901 - CORDOBA DURCHMUSTERUNG (CD) C G
- 902 - ACCURATE POSITIONS OF 502 STARS IN REGION OF PLEIADES  
(EICHBOEN et al. 1970) A T
- 903 - CATALOGUE OF STARS IN REGION OF HYADES CLUSTER  
(WARREN AND LUNHAM 1978) B

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904 - SMITHSONIAN ASTROPHYSICAL OBSERVATORY CATALOG (HARAMUNDANIS 1966) (WITH HD AND GC NUMBERS ADDED) (BINARY VERSION) (SAC-BINARY)	A	T
905 - CATALOG OF SUPPLEMENTAL STARS TO THE BONNER DURCHMUSTERUNG (WARREN AND KRESS 1979)	A	T
906 - BONNER DURCHMUSTERUNG (BI) ZONES - 1 TO +19	C	G
907 - BONNER DURCHMUSTERUNG (BD) ZONES +20 TO +40		G
908 - BONNER DURCHMUSTERUNG (BI) ZONES +41 TO +89		G
909 - CAPE PHOTOGRAPHIC DURCHMUSTERUNG (CPD)		G

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II. PHOTOMETRIC DATA:

- |   |       |
|---|-------|
| 1 - CATALOGUE OF STARS MEASURED IN THE GENEVA OBSERVATORY<br>PHOTOMETRIC SYSTEM (RUFENER 1976)  | B     |
| 802 - TWO-MICRON SKY SURVEY (NEUGEHAUER AND LEIGHTON) (TMSS)  | A R T |
| 703 - A CATALOGUE OF uvby, BETA MEASUREMENTS:<br>A COLLECTION OF PUBLISHED DATA; A CATALOGUE OF WEIGHTED<br>MEANS (HAUCK AND MERRILLIOT) (1975 VERSION) | A M   |
| 4 - PHOTOELECTRIC CATALOGUE: MAGNITUDES AND COLOURS OF STARS<br>IN THE UBV AND UCBV SYSTEMS (OCHSENBEIN)<br>(IMPROVED VERSION OF II/910/ BELOW) (UBVS)  | A M   |
| 5 - UBV PHOTOMETRY OF BRIGHT STARS (JOHNSON et al. 1966)  | B     |
| 6 - TELESCOPE CATALOGUE OF ULTRAVIOLET MAGNITUDES<br>(DAVIS et al. 1973)  | C R   |
| 7 - UBVR IJKLMNH PHOTOELECTRIC PHOTOMETRIC CATALOGUE<br>(MOREL AND MAGNENAT 1978)   | B R   |
| 8 - CATALOGUE OF UVBGR I MEASUREMENTS: CATALOGUE OF<br>PUBLISHED DATA; CATALOGUE OF WEIGHTED MEANS<br>(STEEBINS, KRON, WHITFORD) (1975 CDS VERSION)     | B     |
| 10 - GENERAL CATALOGUE OF VARIABLE STARS, 2ND ED. (GCVS)<br>(KUKARKIN et al. 1958)  | B M   |
| 811 - GENERAL CATALOGUE OF VARIABLE STARS, PARTIAL 3RD ED.<br>(KUKARKIN et al.) (PREPARED BY GUILBAUT) (GCVS-S)   | B     |
| 14 - VBLW PHOTOELECTRIC PHOTOMETRIC CATALOGUE, SYSTEM OF<br>WALRAVEN (PUBLISHED DATA AND HOMOGENEOUS MEANS)<br>(PYTHON 1979)                            | E     |
| 15 - CATALOGUE OF PHOTOMETRIC MEASUREMENTS IN THE UBVR 20<br>SYSTEM (MAGNENAT 1973)   | E     |
| 16 - CATALOGUE DES MESURES PHOTOMETRIQUES DANS LE SYSTEME<br>DE L'OBSERVATOIRE DE VILNIUS (MAGNENAT 1974)   | E     |
| 17 - CATALOGUE DES MESURES PHOTOMETRIQUES DANS LE SYSTEME<br>DE DAVID DUNIAP OBSERVATORY (MAGNENAT 1974)  | E     |
| 18 - CATALOGUE DES MESURES PHOTOMETRIQUES DANS LE SYSTEME<br>(102, 65, 62) DE EGGEN (MAGNENAT 1974)   | E     |
| 19 - THEORETICAL COLOURS FOR F AND G DWARFS (BELL 1971)   | E     |
| 20 - MAGNITUDES AND COLOURS OF O AND B STARS IN THE VELA<br>REGION (DENOYELLE 1974)   | E     |



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- 21 - NARROW-BAND PHOTOMETRY OF LATE-TYPE STARS (HAGGKVIST AND OJA 1970) E
- 22 - H-ALPHA PHOTOMETRY OF LATE-TYPE STARS II. F AND G DWARFS SOUTH OF THE EQUATOR (PEAT 1966) E
- 24 - H-ALPHA PHOTOMETRY OF LATE-TYPE STARS I. F-, G- AND K-TYPE STARS NORTH OF THE EQUATOR (PEAT 1964) E
- 25 - PHOTOMETRY OF ORANGE-RED Ca-I TRIPLET IN LATE-TYPE STARS. TABLE I (PEAT 1964) E
- 26 - CATALOGUE OF EARLY-TYPE STARS MEASURED IN A NARROW-BAND PHOTOMETRIC SYSTEM (MORGULEFF AND GERBALDI 1975) E
- 27 - CATALOGUE OF PHOTOELECTRIC PHOTOMETRIC MEASUREMENTS IN THE UCBV SYSTEM (PUBLISHED DATA AND WEIGHTED MEANS) (NICOLET 1975) B
- 29 - CATALOGUE OF UBV PHOTOMETRY AND MK SPECTRAL TYPES IN OPEN CLUSTERS (MERMILLIOD) (1974 VERSION) B
- 32 - O STARS CATALOGUE, 3RD EDITION (GOY 1976) B
- 33 - uvby, BETA PHOTOMETRY FOR BRIGHT G- TO G0-TYPE STARS SOUTH OF DECLINATION +10 DEGREES (GRONBECH AND OLSEN) (MERGED EDITION OF II/30/ AND II/31/) B
- 34 - POLARIZATION CATALOGUE (MATHWSON, FORD/KLARE, NECKEL AND KRAUTER COMBINED) B R
- 35 - A GENERAL CATALOGUE OF UBV PHOTOELECTRIC PHOTOMETRY (MERMILLIOD AND NICOLET 1977) (MN-UBV) A M
- 36 - CATALOGUE OF INDIVIDUAL UBV AND uvby-BETA OBSERVATIONS IN THE REGION OF THE ORION OB 1 ASSOCIATION (WARREN AND BESSER 1977) B
- 37 - CATALOGUE OF UBV HR DIAGRAMS OF GLOBULAR CLUSTERS (PHILIP et al. 1976) B
- 38 - CATALOGUE MINIPHOTE (15 FILES, MAGNENAT 1975) B
- 39 - CATALOGUE OF STARS PHOTOMETRICALLY MEASURED (MAGNENAT 1976) B
- 40 - PHOTOELECTRIC MEASURES OF HYDROGEN-LINE ABSORPTION IN EARLY-TYPE STARS, TABLE II: GAMMA VALUES E
- 41 - PHOTOELECTRIC MEASUREMENTS OF THE 4200-A CN BAND AND THE G BAND IN G8-K5 SPECTRA, TABLE I (GRIFFIN AND REDMAN 1960) E
- 42 - K-LINE PHOTOMETRY OF A STARS, TABLE I (HENRY 1969) E

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- 43 - K-LINE PHOTOMETRY OF SOUTHERN A STARS, TABLE I: SUMMARY OF DATA ON SOUTHERN A STARS (HENRY AND HESSER 1971) E
- 44 - K-LINE PHOTOMETRY OF STARS IN POPULATION I CLUSTERS, TABLES 3 TO 6 (PLEIADES, IC 2391, IC 2602, HYADES) (HESSER AND HENRY 1971) E
- 45 - STRONG CYANOGEN STARS, TABLE 2: PHOTOMETRIC DATA (JANES AND McCLURE 1971) E
- 46 - A PHOTOMETRIC INVESTIGATION OF THE STRONG CYANOGEN STARS, TABLE 1: BRIGHT CALIBRATION STARS; TABLE 4: STRONG CYANOGEN STARS (McCLURE 1970) E
- 47 - SCANNER ABUNDANCE STUDIES I. AN INVESTIGATION OF SUPER-METALLICITY IN LATE-TYPE EVOLVED STARS, TABLES 5, 6, 7 (SPINRAD AND TAYLOR 1969) E
- 48 - A REFERENCE LIST FOR THE UBV SYSTEM (NICOLET 1976) E
- 49 - CATALOGUE OF Am STARS WITH KNOWN SPECTRAL TYPES (HAUCK 1973) E
- 50 - PHOTOMETRIC STANDARD STARS, TABLE II: MAGNITUDES AND COLOURS OF BRIGHT SOUTHERN STARS; TABLE IV: MAGNITUDES AND COLOURS OF STARS IN EQUATORIAL ZONE (COUSINS 1971) E
- 51 - PHOTOELECTRIC PHOTOMETRIC CATALOGUE OF HOMOGENEOUS MEASUREMENTS IN THE UBV SYSTEM (NICOLET 1978) (NUBV) A
- 52 - 13-COLOR PHOTOMETRY OF 1380 BRIGHT STARS (JOHNSON AND MITCHELL 1975) C
- 53 - A CATALOGUE OF 10-MICRON CELESTIAL OBJECTS (HALL) (10MU) A T
- 54 - AIR FORCE GEOPHYSICS LABORATORY 4-COLOR INFRARED (FRICE AND WALKER 1976) (AFGL) A M T
- 55 - FLARE STARS (GERSHBERG) (FS) A T
- 56 - 100-MICRON SURVEY OF THE GALACTIC PLANE (100MU) (HOFFMANN, FREDERICK AND EMERY 1971) A T
- 57 - A CATALOGUE OF uvby BETA MEASUREMENTS: A COLLECTION OF PUBLISHED DATA; A CATALOGUE OF WEIGHTED MEANS (HAUCK AND MERMILLIOD) (1979 VEFSTION) R
- 901 - SIEGMUND-PERRY uvby COLORS (SP) A G
- 902 - CAO-2 WISCONSIN EXPERIMENT PACKAGE (CODE et al.) C
- 903 - NON-SOLAR X-RAY MEASUREMENTS (ARENS AND ROTHSCHILD) (XRY) A
- 904 - DEARBORN OBSERVATORY CATALOGUE OF FAINT RED STARS (DO) A T

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| 905 - INTERIM EQUATORIAL INFRARED CATALOGUE (EIC 1)<br>(SWEENEY, HEINSHEIMER, YATES, MARAN, LESH, NAGY 1978)      | A     |
| 906 - FAR INFRARED LIST (>40 MICRONS, EMERSON)  | R     |
| 907 - INTERIM EQUATORIAL INFRARED CATALOGUE (EIC 2)<br>(SWEENEY, HEINSHEIMER, YATES, MARAN, LESH, NAGY 1979)      | B     |
| 908 - MERGED INFRARED CATALOGUE (MIRC)<br>(SCHMITZ, BROWN, MEAD AND NAGY 1978)                                    | R F T |
| 909 - UBVR IJKL PHOTOMETRY OF BRIGHT STARS (JOHNSON et al.)<br>(FORMERLY II/ 7/, SUPERCEDED BY PRESENT II/ 7/)    | E     |
| 910 - PHOTOELECTRIC CATALOGUE: MAGNITUDES AND COLORS OF STARS<br>IN THE UBV AND UCBV SYSTEMS (BLANCO et al. 1968) | B     |
| 911 - CATALOGUE OF STARS SUSPECTED OF VARIABILITY: TABLE I<br>(KUKARKIN et al.) (CSV-T1)                          | A G   |
| 912 - CATALOGUE OF STARS SUSPECTED OF VARIABILITY: TABLE II<br>(KUKARKIN AND KOPYLOV) (CSV-T2)                    | A     |

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III. SPECTROSCOPIC DATA:

801	- HENRY DRAPER CATALOGUE AND EXTENSION (HD)	B M
2	- PRELIMINARY GENERAL CATALOGUE OF EARLY-TYPE EMISSION STARS (BERTIAU AND MCCARTHY 1969)	B
703	- CATALOGUE OF ROTATIONAL VELOCITIES OF THE STARS (UESUGI AND FUKUDA 1970) (UFRV)	A M T
4	- BIBLIOGRAPHY OF STELLAR RADIAL VELOCITIES (ABT AND BIGGS 1972)	B R
5	- CATALOGUE OF FAINT OB STARS BETWEEN CARINA AND CENTAURUS (LYNGA 1968)	E
6	- STUDIES OF THE MILKY WAY FROM CENTAURUS TO NORMA III. OB STARS (LYNGA 1964)	E
7	- A SURVEY OF FAINT OB STARS IN CARINA (GRAHAM AND LYNGA 1965)	E
8	- LUMINOUS STARS IN THE SOUTHERN MILKY WAY (ISS) (STEPHENSON AND SANDULEAK 1971)	B
9	- F8-G2 STARS IN THE NORTH GALACTIC POLE REGION (UPGREN 1963)	E
10	- G5 AND LATER STARS IN THE NORTH GALACTIC POLE REGION (UPGREN 1962)	E
11	- F2 AND EARLIER STARS IN S.A. 28, 54, 106, 107 (UPGREN AND STABON 1969)	E
12	- F5 AND LATER STARS IN S.A. 28, 54, 106, 107 (UPGREN AND STABON 1970)	E
13	- VYSSOTSKY'S CATALOGUES 1950.0 (VYSSOTSKY 1943, 1946, 1952, 1956, 1958)	E
14	- STARS F2 AND EARLIER IN NORTH GALACTIC POLE REGION (SLETTEBAK AND STOCK 1959)	B
15	- LUMINOUS STARS IN THE NORTHERN MILKY WAY (LSN) (HARDORP et al.)	B R
16	- SEVENTH CATALOGUE OF THE ORBITAL ELEMENTS OF SPECTROSCOPIC BINARY SYSTEMS (BAT7) (BATTEN, FLETCHER AND MANN 1978)	E
817	- CATALOGUE OF EARLY-TYPE STARS WHOSE SPECTRA HAVE SHOWN EMISSION LINES (WACKERLING 1970) (WEL)	A

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| 818 - CATALOGUE OF STELLAR SPECTRA CLASSIFIED IN THE MORGAN-KEENAN SYSTEM (C. JASCHEK et al. 1964) (JAS)                    | A M T |
| 19 - MK CLASSIFICATION EXTENSION (KENNEDY 1978)   | E R   |
| 21 - GENERAL CATALOGUE OF STELLAR RADIAL VELOCITIES (WILSON 1953) (WRV)   | A G T |
| 22 - ROTATION OF EVOLVING A AND F STARS (LANZIGER AND FABER 1972)   | E     |
| 23 - MK CLASSIFICATION FOR OB STARS (LESH 1968)   | B     |
| 25 - ABUNDANCES OF SODIUM, MAGNESIUM AND CALCIUM IN K-TYPE GIANT STARS. TABLE I (PEAT AND PEMBERTON 1968)                   | E     |
| 26 - ABUNDANCES OF SODIUM, MAGNESIUM AND CALCIUM IN K-TYPE GIANT STARS. TABLE II  | E     |
| 27 - SCANNER ABUNDANCE STUDIES II. LATE G AND K DWARFS IN THE SOLAR NEIGHBORHOOD, TABLE 5: RAW DATA (TAYLOR 1970)           | E     |
| 28 - SCANNER ABUNDANCE STUDIES II. LATE G AND K DWARFS IN THE SOLAR NEIGHBORHOOD, TABLE 5: BLOCKING FRACTIONS (TAYLOR 1970) | E     |
| 829 - A CATALOGUE OF H GAMMA MEASURES OF R. M. PETRIE (CRAMPTON, LEIR AND YOUNGER 1973) (HGAMMA)                            | A G   |
| 730 - A CATALOGUE OF STELLAR ROTATIONAL VELOCITIES (BERNACCA AND PERINOTTO 1970 - 1973) (BPRV)                              | A G T |
| 831 - V. 1 OF MICHIGAN CATALOGUE OF 2-DIMEN. SPECTRAL TYPES FOR HD STARS (HOUK AND COWLEY 1975) (MHD 1)                     | A T   |
| 32 - DETERMINATION OF FE/H VALUES (MOREL et al. 1975)   | B     |
| 33 - A SPECTRAL SURVEY OF THE SOUTHERN MILKY WAY I (SUNDMAN, LODEN AND NORDSTROM 1974)                                      | B     |
| 34 - A SPECTRAL SURVEY OF THE SOUTHERN MILKY WAY II (NORDSTROM 1975)  | E     |
| 35 - A SPECTRAL SURVEY OF THE SOUTHERN MILKY WAY III (LODEN, L. O. et al. 1976)   | B     |
| 36 - A GENERAL CATALOGUE OF COOL CARBON STARS (STEPHENSON 1973)   | B     |
| 37 - THE MERRILL-BURWELL CATALOGUES OF STARS EXHIBITING EIGHT HYDROGEN LINES (MERRILL AND BURWELL 1933, 1948, 1949, 1950)   | E     |
| 38 - BIBLIOGRAPHIC CATALOG OF RADIAL VELOCITIES (BARBIER) (SUPPLEMENT TO ABT AND BIGGS 1972)                                | E R   |

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- 39 - ULTRAVIOLET BRIGHT STAR SPECTROPHOTOMETRIC CATALOGUE (JAMAR et al. 1976) B
- 40 - A UNIFORM EDITION OF THE STOCKHOLM SOUTHERN MILKY WAY SURVEY (CONTAINS CATALOGS III/33,34,35/) (ANDERSEN 1977) E
- 41 - IDENTIFICATION LIST OF LINES IN STELLAR SPECTRA (MOORE MULTIPLY TAPED ON TAPE BY GRATTON AND QUERCI) B
- 42 - CATALOGUE OF SELECTED SPECTRAL TYPES IN THE MK SYSTEM (M. JASCHER 1978) (MKS) A R
- 43 - CATALOGUE OF LUMINOUS STARS IN THE SOUTHERN MILKY WAY (STEPHENSON AND SANDULEAK 1971; UPDATED VERSION OF III/ 8/ BY BISCHOFF 1978) B
- 44 - AN ATLAS OF STELLAR SPECTRA (JOHNSON 1977) C
- 45 - INFRARED SPECTRA FOR 32 STARS (JOHNSON AND MENDEZ 1970) C
- 46 - CATALOGUE OF Ap AND Am STARS (BERTAUD AND FLOQUET 1974; BIDELMAN AND MacCONNELL 1973) B
- 747 - CATALOGUE OF STELLAR RADIAL VELOCITIES (EVANS 1967, 0 - 20 HOURS RA ONLY) B R
- 848 - SPECTROPHOTOMETRIC SCANS (BREGER) (BSP) A
- 49 - WHITE DWARFS (LUYTEN 1970) (LWD) (PREPARED BY G. SHARE, SELECTED DATA ONLY) (COMPLETE DATA CONTAINED IN III/905/ BELOW) A T
- 50 - SOUTHERN MILKY WAY SPECTRAL SURVEY FOR STARS EARLIER THAN A5 (GEYER 1978) E
- 51 - V. 2 OF MICHIGAN CATALOGUE OF 2-DIMEN. SPECTRAL TYPES FOR HD STARS (HOUK 1978) (MHD2) B
- 52 - MK SPECTRAL CLASSIFICATIONS, 3RD GENERAL CATALOGUE (BUSCOMBE 1977) B
- 901 - ROTATIONAL VELOCITIES (BOYARCHUK AND KOPYLOV 1964 BKR) A G T
- 902 - GENERAL CATALOGUE OF S STARS (STEPHENSON 1976) (SS) A T
- 904 - CATALOGUE OF GALACTIC WOLF-RAYET STARS OF POPULATION I (VAN DER HUHT et al. 1980) B
- 905 - WHITE DWARFS 1,2 (LUYTEN 1970,1977) (LWDC) (PREPARED AT GSFC 1978, COMPLETE COMBINED DATA) A T
- 907 - BIDELMAN-PARSONS SPECTROSCOPIC AND BIBLIOGRAPHICAL CATALOG (PARSONS, BUTA, BIDELMAN 1980) A T

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- 908 - SIXTH CATALOGUE OF THE ORBITAL ELEMENTS OF SPECTROSCOPIC BINARY SYSTEMS (BATTEN 1967) (BAT6) A
- 909 - MK CLASSIFICATION EXTENSION (KENNEDY 1976) A M
- 910 - CATALOG OF FAR-ULTRAVIOLET OBJECTIVE-PRISM SPECTROPHOTOMETRY: SKYLAB EXPERIMENT S-019, ULTRAVIOLET STELLAR ASTRONOMY (HENIZE, WRAY, PARSONS AND BENEDICT 1979) C
- 911 - 1980 CATALOGUE OF GALACTIC WOLF-RAYET STARS (van der HUHT et al. 1980) A
- 912 - CATALOGUE OF STELLAR ULTRAVIOLET FLUXES. RESULTS OF THE THE SKYSCAN EXPERIMENT AND TD-1 (THOMPSON et al. 1978) B

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IV. CROSS IDENTIFICATIONS:

1 - A COMPILATION OF TRANSIT TABLES FOR STAR NUMBERINGS IN OPEN CLUSTERS (MERMILLIOD 1979)	E
2 - CATALOGUE OF HD, HDE AND DM IDENTIFICATIONS FOR STARS IN OPEN CLUSTERS (MERMILLIOD 1976)	B
703 - GENERAL CATALOGUE OF STELLAR IDENTIFICATIONS (CSI) (JUNG AND BISCHOFF) (1977 VERSION, 430824 RECORDS) (IBM S/360 PACKED BINARY, 31 FLAG BITS, SEE BELOW FOR OTHER AVAILABLE VERSIONS)	A M T
4 - TABLE OF CORRESPONDENCES SAO/HD/DM/GC (MORIN 1973)	A T
5 - TABLE OF CORRESPONDENCES BD/CD/CPD (JUNG AND BISCHOFF)	B
6 - CATALOGUE OF CORRESPONDENCES CSI/ADS/IDS (JUNG, BISCHOFF AND OCHSENBEIN 1973)	B
7 - TABLE OF CORRESPONDENCES GICLAS/BD (MERMILLIOD)	B
8 - CROSS-IDENTIFICATIONS OF HDE STARS (EONNET 1978)	B
9 - CATALOGUE OF STELLAR IDENTIFICATIONS, EDITION 1979 (OCHSENBEIN, BISCHOFF AND EGRET 1979)	E R
901 - HD-DM (MEAD)	B
902 - DM-HD (MEAD)	B
903 - HD-YBS (NAGY)	A T
904 - YBS-HD (NAGY)	A T
905 - VARIABLE STAR CATALOG: TABLE I - NOMENCLATURE (GCVS-T1)	A G T
906 - TABLE VI - CORRESPONDENCES BD/CD/CPD (GCVS-T6)	A M T
907 - GOLDARD CROSS INDEX	B
908 - HD-DM-ADS-IDS-RA FOR HD STARS (GSFC-NAGY/MEAD)	B
909 - HD-SAO-DM-GC CROSS INDEX (NAGY AND MEAD 1978)	A T
910 - CSI EBCDIC, 143-BYTE RECORDS, COMPLETELY UNPACKED WITH SOME FLAGS MISSING (CHARACTER VERSION OF IV/ 3/ PREPARED AT GSFC)	A T
911 - CSI SORTED BY SPECTRAL TYPE AND M(V) BRIGHTEST TO FAINTEST (PREPARED AT GSFC, SAME VERSION AS IV/ 3/)	A



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- 912 - CSI SORTED BY SPECTRAL TYPE AND M(B) BRIGHTEST TO  
FAINTEST (PREPARED AT GSFC, SAME VERSION AS IV/ 3/) A
- 913 - CSI EBCDIC, 80-BYTE RECORDS, ALL FLAGS IN 1 32-BIT WORD  
(CHARACTER VERSION OF IV/ 3/ PREPARED AT GSFC) A
- 914 - AGK3-BD (WARREN 1978) A
- 915 - ED-AGK3, NON-BD STARS OMITTED (WARREN 1978) A
- 916 - TRANSIT TABLES FOR STAR NUMBERINGS IN OPEN CLUSTERS  
(HEMILLIOT 1973) B

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V. COMBINED DATA:

801 - CATALOGUE OF NEARBY STARS (GLIESE 1969) (GL)	A	T
802 - YALE CATALOGUE OF BRIGHT STARS, 3RD ED. (HOFFLEIT 1964) (YBS)	A	T
3 - DATA FOR FK4/FK4 SUPE. STARS (MORIN 1973)	E	
4 - CATALOGUE OF STARS WITHIN 25 PARSECS OF THE SUN (WOOLLEY et al. 1970)	B	
5 - COLOURS, LUMINOSITIES AND MOTIONS OF THE NEARER GIANTS OF TYPES K AND M (EGGEN 1966)	E	
6 - KINEMATIC STUDIES OF EARLY-TYPE STARS (TABLES 1 AND 2) (RUBIN AND FURLEY 1962)	B	
7 - SPACE VELOCITIES OF G AND K GIANTS (YOSS AND T. E. LUTZ 1971)	E	
8 - SPACE VELOCITY CATALOGUE (EGGEN 1962)	E	
9 - NEW KINEMATIC DATA FOR BRIGHT SOUTHERN OB STARS TABLE 2: KINEMATIC DATA (LESH 1972)	E	
10 - NEW KINEMATIC DATA FOR BRIGHT SOUTHERN OB STARS TABLE 4: COMBINED PROPER MOTIONS (LESH 1972)	E	
11 - CATALOGUE OF HIGH VELOCITY STARS (EGGEN 1964-65)	B	
12 - CATALOGUE OF REDUCED uvby, BETA PHOTOMETRY (PHILIP, MILLER AND RELYEA 1976)	B	
13 - PROBABLE MEMBERS OF THE SMALL MAGELLANIC CLOUD (NEW VERSION) (AZZOPARDI AND VIGNEAU 1975) UPDATED OCT 1978 (REMARKS NOT AVAILABLE IN MACHINE-READABLE FORM)	E	
14 - uvby ESTIMATED ASTROPHYSICAL PARAMETERS (PHILIP AND EGRET 1979)	B	
901 - EXTENDED BRIGHT STAR CATALOG (DAVIS - 5/24/76)	C	
902 - YALE BRIGHT STAR CATALOGUE COMBINED WITH BCSS GENERAL CATALOGUE DATA	A	M
903 - SKYMAP CATALOGUE OF 248727 STARS, VERSION 3.0 (GOTTLIEB)	A	F T
904 - COMBINED STAR CATALOGUE (ZWALD 1979)	R	R

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VI. MISCELLANEOUS:

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| 1 - CATALOGUE OF PHOTOMETRIC SEQUENCES (ARGUE AND BOK 1973)  | B   |
| 2 - BIBLIOGRAPHICAL STAR INDEX (1950-75) (BSI)<br>(SPITE, OCHSENBEIN, KIRCHNER AND LAHMEK 1980)          | E R |
| 5 - SENSITIVITY FUNCTIONS OF PHOTOMETRIC SYSTEMS<br>(HAUCK AND MERMILLIOT 1976)                          | E   |
| 8 - BIBLIOGRAPHICAL CATALOGUE OF FIELD RR LYRAE STARS<br>(HECK AND LAKAYE 1977)                          | B R |
| 9 - BIBLIOGRAPHICAL INDEX FOR PLANETARY NEBULAE FOR<br>1965 - 1976 (ACKER, MARCOUT AND OCHSENBEIN 1977)  | R   |
| 10 - A TABLE OF SEMIEMPIRICAL $q$ VALUES<br>(KURUCZ AND PEYTREHANN 1975)                                 | B   |
| 11 - FINDING LIST FOR MULTIPLY TABLE OF NSRDS-NBS 3,<br>SECTIONS 1-7 (ADELMAN, ADELMAN AND FISCHEL 1977) | A   |
| 901 - BIBLIOGRAPHICAL STAR INDEX (1950-72)<br>(CAYREL et al.) (BSI)                                      | A R |
| 902 - INDEX CATALOGUE OF VISUAL DOUBLE STARS 1976.5 (WORLEY)   | B M |

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VII. NON-STELLAR OBJECTS

801 - REVISED NEW GENERAL CATALOGUE OF NON-STELLAR OBJECTS (RNGC) (SOLENTIC AND TIFFT 1974)	A
802 - A MASTER LIST OF NON-STELLAR OBJECTS (DIXON 1976) (DNSM)	A M
3 - CATALOGUE OF QUASI-STELLAR OBJECTS (BARBIERI, CAPACCICLI AND ZAMBON, NOV. 1976)	B
4 - CATALOGUE OF ABELL AND ZWICKY CLUSTERS OF GALAXIES (ABELL 1958; CORWIN 1974; KALINKOV, STAVREV AND KANEVA 1975; ZWICKY, HERZOG, WILD, KARPOWICZ AND KOWAL 1961-1968) (PREPARED BY BULGARIAN ACAD. OF SCIENCE ASTRON. DEPT.)	B
6 - CATALOGUE OF POLARIZATION MEASUREMENTS AND RELATED DATA OF EXTRAGALACTIC RADIO SOURCES (EICHENDORF AND REINHARDT 1978, 1978a)	C
7 - DARK NEBULAE (LYNDS) (LDN)	A G T
8 - PULSARS (SEIRADAKIS) (PUL)	A T
9 - BRIGHT NEBULAE (LYNDS) (LBN)	A M T
10 - 3RD CAMBRIDGE RADIO CATALOG (REVISED) (3CR)	A T
11 - DEVENY KITT PEAK QUASAR CATALOG (QKP)	A T
12 - 3RD UHURU X-RAY CATALOG (3U)	A T
13 - ARP'S GLOBULAR CLUSTER CATALOG (GCL)	A T
14 - GALACTIC SUPERNOVA REMNANTS CATALOGUE (SNCC) (CLARK AND CASWELL 1976)	A T
15 - GALACTIC SUPERNOVA REMNANTS CATALOGUE (SNIL) (ILOVAISKY AND IEQUEUX 1972)	A T
16 - REFERENCE CATALOGUE OF BRIGHT GALAXIES (de VAUCOULEURS AND de VAUCOULEURS) (VGC)	A T
17 - QUASARS (BURBIDGE et al. 1977) (QB)	A T
18 - FOURTH UHURU (FCRMAN et al. 1977) (4U)	A T
19 - SECOND ARIEL (COOKE et al. 1977) (2A)	A T
20 - H II REGIONS (SHARPLESS) (SHII)	A T

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| 21 - CATALOGUE OF REFLECTION NEBULAE (VAN DEN BEFGH) (VDB)   | A | T |
| 22 - CATALOGUE OF OPEN CLUSTERS (LYNGA 1978)   | E |   |
| 23 - A CATALOGUE OF ABSORPTION LINES IN QSO SPECTRA<br>(ELLIS 1978)  | E |   |
| 901 - SCUTHEEN GROUPS AND CLUSTERS OF GALAXIES<br>(DUUS AND NEWELL 1977) (LN)  | A | T |
| 902 - AN OPTICAL CATALOGUE OF RADIO GALAXIES<br>(G. BUREIDGE AND CROWNE 1978)  | B |   |
| 903 - LIST OF GLOBULES BASED ON 7 LISTS BY WESSELIUS<br>(COMPILED BY WESSELIUS 1979)   | E |   |
| 904 - SEYFERT GALAXIES (WEEDMAN 1977, 1978)  | A |   |
| 905 - SECOND REFERENCE CATALOGUE OF BRIGHT GALAXIES (VGC2)<br>(de VAUCOULEURS, de VAUCCULEURS AND CORWIN 1976)                                   | B |   |
| 906 - LIST OF POSITIONS OF ALL X-RAY SOURCES WITH POSITIONS<br>KNOWN MORE ACCURATELY THAN THOSE GIVEN IN THE 4U OR<br>2A CATALOGUES (DOLAN 1979) | A |   |

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VIII. CATALOGUES SORTED BY PLATE AREAS

- 901 - PLATE CENTERS OF PALCMAR SKY SURVEY A
- 902 - PLATE CENTERS OF WHITEOAK EXTENSION OF POSS A
- 903 - PLATE CENTERS OF EUROPEAN SOUTH. O. SKY SURVEY A
- 904 - PLATE CENTERS OF LICK OBSERVATORY SKY SURVEY A
- CATALOGUES SORTED BY PALCMAR PLATE AREAS WITH X- AND Y-  
COORDINATES GIVEN IN MM (NAGY)
  - 905 - SAO A T
  - 906 - TWO-MICRON SKY SURVEY A
  - 907 - RNGC A
  - 908 - REFERENCE CATALOGUE OF BRIGHT GALAXIES A
  - 909 - CSI A
- 910 - CSI SORTED BY LICK PLATE AREAS (NAGY 1978) A
- 911 - MASTER SPECIALTY CATALOGUE (NAGY 1977) A T  
(CONCATENATION OF VIII/906//,907//,908/)
- AN EMISSION-LINE SURVEY OF THE MILKY WAY  
(PARKER, GULL AND KIRSHNER (1979))
  - 912 - PLATE CENTERS (NAGY 1979) A
  - 913 - SAO CATALOG SORTED BY PLATE AREAS WITH X- AND  
Y-COORDINATES GIVEN IN MM (NAGY 1979) A

## HOW TO OBTAIN DATA FROM THE ASTRONOMICAL DATA CENTER

Catalogs of astronomical data listed in the *Status Report on Machine-Readable Astronomical Catalogues* (Warren, Nagy and Mead, this Bulletin) may be obtained from the Astronomical Data Center, NASA Goddard Space Flight Center if their respective codes indicate availability for distribution. For catalogs not having a distribution code of A, documentation is sparse or non-existent, and a requester will often need to examine the data carefully for potential problems and inconsistencies. A tape description will always be provided along with a sample listing or brief format description of the data. Requesters of catalogs on magnetic tape will generally be expected to supply a sufficient quantity of standard 2400-foot magnetic tapes to hold the requested data. (Magnetic tapes should be either new or certified as non-defective, and should be provided as unlabeled tapes.) Requesters' tapes will be used directly to output the desired catalogs.

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1

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