(NASA-TM-84024) ASTRONOMICAL DATA CENTER BULLETIN, VOLUME 1, NUMBER 2 (NASA) 123 p HC A06/MF A01 CSCL 03A

N81-34126

Unclas G3/89 27615

NSSDC WDC-A-R&S

81-09

National Space Science Data Center/
World Data Center A For Rockets and Satellites

Astronomical Data Center Bulletin

Volume 1

Number 2

July 1981

NSSDC/WDC-A-R&S 81-09

ASTRONOMICAL DATA CENTER BULLETIN

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ASTRONOMICAL DATA CENTER BULLETIN

VOL. 1, NO. 2 JULY 1981

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EDITORIAL

This is the second issue of a publication designed to pr le a vehicle for the dissemination of information about work in progress . astronomical catalogues. In addition to progress reports on specific tasks, we intend to include in each issue an updated status list for astronomical catalogues available at the Astronomical Data Center (ADC) 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 catalogues completed or planned, and lists of errors determined for existing catalogues. 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 6.5 inches (165 mm) horizontally by 8.375 inches (213 mm) vertically. The margins should be 1.375 inches (35 mm) at the top, 1 inch (25 mm) at the left and right sides and 1.25 inches (32 mm) on the bottom of each page. Standard 8.5- x 11-inch (216- x 280-mm) paper and a serif type style (Prestige Elite, Courier, Adjutant, etc.) should be used if possible. Two copies of each manuscript should be submitted to:

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

The Editors

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

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ASTRONOMICAL DATA CENTER OPERATIONS*

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ABSTRACT

The operation of an astronomical data center requires that many decisions be made concerning the handling of the astronomical catalogues and data distributed. Should the data center be, as Wilkins (1977) described it, passive, in that catalogues and data are collected and distributed blackbox-wise upon request, or should a data center be active and have experts in various fields to scrutinize, correct, reformat, and document data where necessary? These questions will be addressed and illustrated by describing the current operations and future goals of the Astronomical Data Center at the NASA Goddard Space Flight Center.

1. INTRODUCTION

The large and rapidly growing number of machine-readable astronomical catalogues in many diverse fields of astronomy has made the operation of an astronomical data center much more demanding than it was when only a few computerized data sets were available. Although the primary function of a data center is the collection and distribution of data sets, in order to be of greatest service to its user community, a center should strive to interact with the data as much as possible and to produce not only reliable data sets, but useful supporting data and data products. To create data products most useful to a wide variety of users and compatible with a majority of computer systems, a center should have experts in several astronomical specialties, who are at least familiar with most areas for which data are on deposit, and who have a broad knowledge of the capabilities of various computer systems. It is obviously a great advantage to have a large modern computing facility so that the advanced techniques often required for special processing and efficient storage and retrieval of large numbers of data sets can be developed and utilized.

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* Expanded version of a contribution presented at *IAU Colloquium No. 64, Automated Data Retrieval in Astronomy*, Strasbourg, France, July 7-10, 1981.

Although an astronomical (or any other) data center has the responsibility to disseminate adequately checked and properly identified data, there are clearly practical limitations as to how far toward the ideal of having *completely* reliable, accurately checked and documented data, providing associated software support, search, retrieval, and plot capabilities, and generating microform listings, any one data center can go when faced with these tasks for hundreds of individual data sets. Based on eight years of experience gained in operating the Astronomical Data Center (ADC) at Goddard Space Flight Center, where our emphasis has been toward the development of a large data base of astronomical catalogues, related software and support services, and secondary data products, we would like to discuss developments which we feel increase the efficiency of our operations and provide more reliable and faster service to the astronomical community.

II. DATA SET MODIFICATIONS, ADDITIONS AND PROCESSING

The basic procedures used for verifying and checking data in newly acquired and produced catalogues have been described by Underhill *et al.* (1977) and Hill (1981) and need not be repeated in detail here. Although certain errors can be discovered by the computer checking of data for consistency, many potential problems for data processing and application can only be uncovered by actually working with and having a basic familiarity with the data.

Many older catalogues, which were computerized prior to the development of sophisticated compilers and data processing techniques, were produced with very restricted formats, or certain data fields were omitted because of a necessity (or desire) to confine the data records to 80-column computer card images. For such catalogues, we usually add missing data fields to complete the records as published. We also computerize associated remarks and reference files and add them to the tape. As an example, the N30 catalogue was examined and processed for distribution recently. The published version of the catalogue contains remarks in the form of footnotes on individual pages of the publication. Although the data records included asterisks the footnotes had never been computerized, hence they were added to the tape. We may also independently produce additional data fields to increase computer processing efficiency, e.g. coordinates may be computed in radians and added to the data records to eliminate the necessity for recomputing them each time a trigonometric function is needed.

Catalogues or data compilations are sometimes received in print rather than processing format, i.e. the tape contains data records as they were output to a printer, including blank records, page control characters, and records containing data for many objects arranged in columns. We process such data sets to convert them to formats more appropriate for analysis and plotting, e.g. all data pertaining to one object are ordered and stored in succeeding records so that they can be read into an array. All blank and specialized records are removed and data records rewritten to tape in some logical order such as catalogue number, right ascension, or as they appear in the corresponding publication.

III. ASTRONOMICAL DATA CENTER OPERATIONS

The day-to-day operation of a data center specializing in astronomical catalogues is greatly simplified if adequate computing facilities are available for the automation of copying and verifying procedures for tapes. Until quite recently, our several hundred catalogues were stored on miscellaneous magnetic tapes in various editions, densities and tape formats. As it became increasingly difficult to locate and identify correct versions of specific catalogues as they were requested, we decided to develop a set of master tapes containing catalogues stored at high density (6250 bpi) in large blocks for computer processing efficiency. Information describing each tape catalogue is stored in a disk file and retrieved each time a specific catalogue is requested. This eliminates the necessity to look up a required tape and input file parameters each time a particular catalogue is needed. Using information retrieved from the disk file, an automatic copying program writes the required job control language (JCL) for execution of system utility programs for copying and verifying.

Although a very time consuming task, it is found extremely important to create and maintain records on all facilities required and every product distributed with each requested catalogue. In addition to providing information necessary for cost evaluation and funding purposes, these detailed records are often referred to later as new editions of particular catalogues are received or additional related information becomes available, since all recipients of a catalogue should be notified as new products are introduced. The distribution of catalogues from the National Space Science Data Center is a great advantage in this regard, since existing computer management systems provide maintenance and monitoring for all request activity. Upon receipt of a request for a specific catalogue, a record is entered into the system and the request is monitored until completed. A projected completion date is registered initially and the request is flagged in an independent monthly report if the estimated date is surpassed. At the completion of a request, all computer time used and each product distributed are coded on completion forms and entered into the system. This system also produces annual reports of all request activity and products disseminated. A separate file contains records of all forms of data products associated with each catalogue and all related materials to be distributed with a tape or microform version of a data set, such as information pages, error lists, related papers from the literature, and special documentation. The development of such a system is clearly the only way to relieve astronomers from the handling of routine requests so that they can perform the more specialized activities discussed earlier, and still be assured of distributing properly identified data and complete packages of related supporting materials. This goal is still far from being attained for all catalogues at the ADC, but considerable progress in this area has been made over the past two years.

IV. DOCUMENTATION, STATUS REPORT AND SPECIAL SERVICES

Since the initiation of our work with astronomical catalogues, detailed documentation has been a very important aspect of our activities, and it continues to demand a substantial amount of time. A standard format has been used for all documents with only minor modifications depending upon the catalogue being described. Each document contains five sections designed to present a general description of a catalogue, the record format, the tape characteristics, remarks, modifications and references, and a sample listing of data exactly as they appear on the tape. We consider the section on remarks and modifications to be extremely important and attempt therein to give a complete history of all changes made with respect to the original published catalogue, plus the source of the initial machine-readable version. If a user finds any discrepancies between the published and machine-readable versions, an explanation should be available in the documentation.

We also consider it important to provide our user community with information concerning the status of each catalogue on file. This is accomplished by maintaining a disk file containing current status information on every catalogue, so that users know not only which data sets are in revision and/or are not available at any given time, but also the data quality and reliability of any catalogue that they request. The above data set is used directly to produce periodically updated status reports which are distributed to requesters and published in the *Astronomical Data Center Bulletin*.

We also feel very strongly that, if resources permit, a data center should provide special services to the user community. These services involve mainly the development of software to process various catalogues to generate specialized output. We have developed a variety of services such as computerized searches of data and bibliographic catalogues (Mead *et al.* 1981), preparation of subsets of and specially sorted catalogues, and generation of plotted output or finder charts, identifications and overlays (Nagy *et al.* 1980). The greatest difficulty with providing services requiring software development is the uniqueness of the data and format of each astronomical catalogue. This situation necessitates the writing of specific programs for the processing of each catalogue in each of the various ways for which special output is needed. The design and development of a standard format for a number of catalogues having similar data (since a completely generalized format for all catalogues seems an insurmountable problem at present) would greatly facilitate the use of a single software package for search and retrieval applications for each related catalogue group. Unless techniques are found for easier access to the various data contained in many hundreds of catalogues, the continuation and enhancement of data center software services will be jeopardized by the lack of enough resources and personnel for development of the necessary facilities.

V. SUMMARY

A data center should be active in attempting to improve the quality and homogeneity of data distributed. For the archiving and distribution of astronomical catalogues, this requires the employment of several astronomers expert in the area of data processing and at least basically familiar with most of the data disseminated. Detailed documentation containing a byte-by-byte format description, correction history, and sample listing should be prepared where necessary. Special services for data searches and processing should be provided for users not having those capabilities or who do not want to create independent software for such tasks. The standardization of data structures and formats for groups of related catalogues would greatly facilitate the development of data services and special processing software.

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AUTOMATED ASTRONOMICAL DATA RETRIEVAL AT GSFC*

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ABSTRACT

More than 250 machine-readable catalogs of stars and extended celestial objects are now available at the NASA/Goddard Space Flight Center (GSFC) as the result of over a decade of catalog acquisition, verification and documentation. Retrieval programs are described which permit the user to obtain from a remote terminal bibliographical listings for stars; to find all celestial objects from a given list that are within a defined angular separation from each object in another list; to plot celestial objects on overlays for sky survey plate areas; and to search selected catalogs for objects by criteria of position, identification number, magnitude or spectral type.

INTRODUCTION

There are two major objectives for the development of the astronomical data base and retrieval system at the NASA/Goddard Space Flight Center (GSFC): (1) the acquisition, verification and documentation of all available machine-readable catalogs of stars and extended celestial objects; and (2) the creation of retrieval techniques which will enable a user to utilize these data easily and efficiently from a remote terminal. More than 250 computerized astronomical catalogs are now available at GSFC. Periodically reports are published in the Astronomical Data Center Bulletin giving the status of verification, documentation and hence availability, for each catalog in the data base (Nagy et al. 1981b). Because the output of any retrieval system is only as good as the data base from which it obtains its information, much of our effort continues to be devoted to the improvement of the individual catalogs, as described by Warren et al. (1981).

*Presented at IAU Colloquium 64, Automated Data Retrieval in Astronomy, Strasbourg, France, July 7-10, 1981.

Three groups at Goddard are primarily responsible for the data handled by the Astronomical Data Center (ADC): the National Space Science Data Center (NSSDC); the Infrared Astrophysics Section of the Laboratory for Extraterrestrial Physics; and the Laboratory for Astronomy and Solar Physics, which also includes the newly established International Ultraviolet Explorer (IUE) Regional Data Analysis Facility.

The NSSDC, whose data responsibilities are reviewed by J. Vette (1981), serves as a distribution center for astronomical catalogs. The high-energy astrophysics data sets are described by M. Locke (1981). W. Warren Jr. is responsible for catalog data at longer wavelengths as well as archival and dissemination of observations from the IUE satellite (Warren and Alderman 1981).

The Infrared (IR) Astrophysics Section is committed to producing an IR (1-1000 μm) data base, bibliography and cross index of IR names as described by Schmitz et al. (1981).

The Laboratory for Astronomy and Solar Physics, with which T. Nagy, R. Hill and J. Mead are associated, does much of the verification and documentation of catalogues before they are placed with the NSSDC for distribution. The primary interest of this group is the creation and implementation of computerized retrieval systems described below.

The development of the data base and retrieval tools in a location where there is daily interaction with other astronomers promotes the familiarity of data personnel with the needs of both observers and theoreticians. It also encourages rapid evaluation of data products while providing many consultants on specialized astronomical and data handling topics.

ASTRONOMICAL DATA BASE

Part of the success in acquiring the large number of catalogs in the ADC data base is due to the Cooperative Agreement between NASA and the Centre de Données Stellaires (CDS), which was worked out as a by-product of the IAU Colloquium 35, held at Strasbourg in 1976. This agreement has also yielded the beneficial results of exchanges of error lists, personnel and information about future projects (Mead 1980; Mead et al. 1981).

Not all machine-readable catalogs received by the ADC are ready to be used. The first step in verification is to try to read the catalog as specified in the documentation accompanying it. This procedure quickly exposes most problems--if not in the machine-readable data, then sometimes in the format descriptions. Suggestions for formatting, checking and documenting machine-readable astronomical catalogs are given in detail by Hill (1981).

RETRIEVAL OF DATA

One of the most important aspects of a data base is its capability for efficient retrieval of the data. Six of the most frequently used astronomical data retrieval tools now available at the ADC are described below:

(1) The Interactive Computer Reference Search of the Astronomical Literature 1950-1976 (Nagy et al. 1981a) uses the data and reference files of the 1976 version of the Bibliographical Star Index (BSI) (Ochsenbein and Spite 1977). These data are stored on direct access devices on the GSFC IBM S/360-91 computer. The BSI is a machine-readable data file of stellar identifications and references covering twelve journals from 1950-1972 and more than 30 since then. Updated versions of this compilation are released periodically by the CDS. The machine-readable version available at Goddard contains 9494 references to the astronomical literature for 69,348 stars from 1950 partway through 1976; a later version of the BSI will be utilized as soon as the tape is received from the CDS.

The interactive BSI search program accesses the references by means of a star identifier (Henry Draper (HD) or Durchmusterung (DM) catalog number, or variable star name). The BSI references for the stars having these identifiers are then displayed at the user's computer terminal in a form resembling that of a standard bibliography. One advantage of this method of accessing the BSI lies in the conciseness of the output: only one session at a data terminal is needed to produce a combined, chronologically-ordered listing of references from all the years covered in the BSI. Another advantage lies in the ease of use: one only has to type in the stellar identifications according to instructions displayed on the screen by the program.

A limited amount of computer time has been set aside for a pilot program to utilize the BSI search program. All astronomers have been urged to avail themselves of this opportunity to access the data set from their home institutions by telephone link. Many favorable reports have been received from users.

(2) The MATCH Program (Hill and Nagy 1981) finds all objects in a list within a user-defined angular distance of the positions of a set of target objects. This technique is particularly useful when one wishes to make identifications of objects observed at similar wavelengths or at very different ones, as often occurs when observing in a survey mode. In addition, this program serves as a useful check on catalog identifications which have been made through manual comparisons, and it provides guide star candidates for observing programs where the objects of interest are very faint and/or have poor positions. Catalogs which have been used in MATCH runs include the following combinations: the Two-Micron Sky Survey vs. the SAO Catalog; the General Catalogue of Variable Stars vs. the Equatorial IR Catalogue (EIC 2); and the Dearborn Observatory Catalogue of Faint Red Stars vs. the EIC 2.

(3) The Job Control Language (JCL) Copy Program (Hill and Nagy 1980) facilitates the duplicating of star catalog tapes by supplying all the necessary JCL parameters, such as block size, density, record length, etc., requiring only a four-digit numerical code for the catalog to be entered. Not only is this program time-saving in setting up tape copies, but it also reduces failures in the duplicating of tapes by automatically providing the information needed to copy the tape.

(4) Two search and retrieval programs have been developed (Warren and Sheridan 1981) for the Catalogue of Stellar Identifications (CSI) (Ochsenbein et al. 1977), which contains cross references for star numbers from some 30 different catalogs. Following the preparation of a version of the CSI sorted by increasing right ascension, a program was designed which accepts equatorial coordinate limits and lists all CSI stars located within the specified region. This search mode is useful for selecting possible optical identifications for a list of sources which are detected at other wavelengths or which are variable.

A second search program accepts DM and HD catalog numbers and lists all CSI stars with the specified input identifiers belonging to any of the various catalogs connected to the CSI. Individual data sets are created and stored for each catalog desired, so that each one can be read by a subsequent program to retrieve data from the corresponding source catalog. Ideally, this retrieval system will develop into a tool by which data from any number of source catalogs can be selected in a single run through a link to the CSI.

(5) Five catalogs (SAO Star Catalog, Revised New General Catalogue of Non-Stellar Astronomical Objects, Reference Catalogue of Bright Galaxies, Two-Micron Sky Survey and CSI) have been sorted by Palomar (and ESO/SRC) Sky Survey plate areas, as described by Mead and Nagy (1977). For a given set of coordinates the computer provides all the plate numbers on which this position can be found. These plate areas can be immediately accessed, and listings and plots of any or all of the objects from the five catalogs generated.

(6) Software has been developed to retrieve the full data entry for HD stars from any of the eleven catalogs included in the Goddard Cross Index in a single computer run (Mead and Nagy 1977). Another cross index which has proved to be particularly useful is the HD-DM-SAO Cross Index (Nagy and Mead 1978).

CONCLUSION

The ADC is continuing to provide these and other data retrieval routines to GSFC astronomers and to the astronomical community on a request basis. With an upgraded Goddard computer available later this year, we expect to have more data sets on line, such as the CSI, in order to make interactive retrieval systems readily available to anyone who wishes to access data directly by dialing up the GSFC computer.

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ADC Bull. (July 1981) 1, 62-68

AVAILABILITY OF AN INTERACTIVE COMPUTER REFERENCE SEARCH OF THE ASTRONOMICAL LITERATURE 1950-1976

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INTRODUCTION - BIBLIOGRAPHICAL STAR INDEX

The data and reference sets of the 1976 version of the Bibliographical Star Index (BSI, Cayrel, R., Jung, J. and Valbousquet, A. 1974, CDS Information Bulletin No. 6, p. 24) have been stored on direct access devices of the IBM S/360-91 computer at NASA/GSFC. The BSI is a machine-readable data file of stellar references covering twelve periodicals from 1950-1972 and more than 30 since then. Periodically updated versions of this compilation are released by the Centre de Données Stellaires at Strasbourg. The version available at present at NASA/GSFC contains references partway through 1976. Each record contains a primary identifier and a secondary identifier (129 possible choices for each in the version described herein) if available. The BSI consists of two portions: (1) the primary and secondary numbers linked with a string of coded reference numbers (year plus number within year) and (2) references in standard bibliographical style associated with each coded reference number. The 1976 version of the BSI contains 9494 references to the astronomical literature for 69348 stars. The statistics of the primary and secondary identifiers are given in Tables 1 and 2 and the catalogue code is defined in Table 3.

Version 1.0 of this program, which accepted only Henry Draper (HD) numbers, was presented at the 156th meeting of the American Astronomical Society meeting in June of 1980. Version 2.0 will accept the following types of identifiers: (1) HD numbers and (2) variable-star names with two letters and a constellation, or with "V", a number, and a constellation. New identifier types will be added; the Durchmusterung numbers are the next planned addition.

THE INTERACTIVE BSI SEARCH PROGRAM

The interactive BSI search program accesses by means of a star identifier (HD number, variable star number, etc.) a version of the BSI stored on disk. Of the 69348 stars in the BSI (1976 version) there are 39756 entries (57.3%) with HD as the primary identifier.

The user of the BSI search program logs onto TSO (Time-Sharing Option) on the IBM S/360-91 computer at NASA/GSFC. The program is invoked as a TSO command, and the user is prompted for a list of star identifiers. The BSI references for the stars having these identifiers are then displayed at the user's terminal in a form resembling that of a standard bibliography in a concise output format.

A limited amount of computer time has been set aside for a pilot program to utilize the BSI search program. The detailed procedures for using this interactive procedure are described by Nagy et al. (Nagy, T. A., Hill, R. S. and Mead, J. M. 1981, "Interactive Computer Reference Search of the Astronomical Literature 1950-1976, Version 2.0"). A copy of this document can be obtained from the authors. The document gives very explicit details on how to invoke the procedure and several examples.

Table 1. BSI Primary Identifier Statistics

ID	Counts	%	ID	Counts	%
HD	39756	57.3	GD	90	0.1
V.	4860	7.0	ROSS	119	0.2
ADS	635	0.9	WOLF	97	0.1
AG	51	0.1	FEIG	53	0.1
SAO	385	0.6	MWC	43	0.1
PLX	80	0.1	AS	37	0.1
WIL	33	0.0	MCC	1	0.0
NML	2	0.0	LAL	33	0.0
IRC	1282	1.8	HZ	35	0.1
LS	455	0.7	LKH	84	0.1
PN	1165	1.7	HILT	23	0.0
BD	12328	17.8	HEN	23	0.0
CD	1843	2.7	MR	6	0.0
CP	1413	2.0	WRAY	18	0.0
SVS	50	0.1	WALK	125	0.2
HV	646	0.9	EG	60	0.1
VV	15	0.0	KS	13	0.0
AN	4	0.0	TON	24	0.0
HBV	1	0.0	TONS	7	0.0
SON	352	0.5	SR	1	0.0
CSV	88	0.1	KW	1	0.0
NOVA	185	0.3	COU	29	0.0
SN	347	0.5	KOCH	122	0.2
LFT	653	0.9	ABEL	2	0.0
LTT	716	1.0	PHL	39	0.1
BPM	67	0.1	SS	48	0.1
BSD	472	0.7	LSWR	2	0.0
GL	182	0.3	HHA	2	0.0
G	145	0.2			

Table 2. BSI Secondary Identifier Statistics

ID	Counts	%	ID	Counts	%
HD	18641	26.9	GL	182	0.3
*	2324	3.4	G	145	0.2
V.	6053	8.7	GD	90	0.1
HR	3519	5.1	ROSS	119	0.2
ADS	4276	6.2	WOLF	97	0.1
AG	236	0.3	FEIG	53	0.1
GC	15	0.0	MWC	43	0.1
SAO	385	0.6	AS	37	0.1
PLX	178	0.3	MCC	1	0.0
N30	1	0.0	LAL	33	0.0
WIL	96	0.1	HZ	35	0.1
NML	2	0.0	LKH	84	0.1
IRC	1857	2.7	HILT	23	0.0
LS	567	0.8	HEN	23	0.0
PN	1165	1.7	MR	6	0.0
BD	20258	29.2	WRAY	18	0.0
CD	2571	3.7	WALK	125	0.2
CP	2144	3.1	EG	60	0.1
SVS	50	0.1	KS	13	0.0
HV	646	0.9	TON	24	0.0
VV	15	0.0	TONS	7	0.0
AN	4	0.0	SR	1	0.0
HBV	1	0.0	KW	1	0.0
SON	352	0.5	COU	29	0.0
CSV	88	0.1	KOCH	122	0.2
NOVA	185	0.3	ABEL	2	0.0
SN	347	0.5	PHL	39	0.1
LFT	653	0.9	SS	48	0.1
LTT	716	1.0	LSWR	2	0.0
BPM	67	0.1	HHA	2	0.0
BSD	472	0.7			

Table 3. Catalogue Code References

CODE	BIBLIOGRAPHIC REFERENCES
ABEL	Properties of some old planetary nebulae, Abell 1966.
ADS	New General Catalogue of double stars within 120° of the North Pole, Aitken 1932.
AG	AGK3, Star Catalogue of positions and proper motions north of -2.5° declination, 1975.
AN	Nomenclature of variable stars adopted by the periodical "Astronomische Nachrichten".
AS	Additional stars whose spectra have a bright Hα line, 1950.
BD	Bonner Durchmusterung des Nordlichen Himmels
BPM	Bruce Proper Motion Survey, Luyten 1963.
BSD	Bergedorfer Specktral Durchmusterung
CD	Cordoba Durchmusterung
COU	Nouvelles Etoiles Doubles, IAU Circular, Commission 27.
CP	Cape Photographic Durchmusterung
CSV	Catalogue of Suspected Variable Stars, Kukarkin et al.
EG	Spectra, colors, luminosities and motions of the white dwarfs
FEIG	A search for underluminous hot stars, Feige.
G	Lowell proper motions, Giclas et al.
GC	General Catalogue of 33342 Stars for the Epoch 1950, Boss 1937.
GD	A list of white dwarf suspects, Giclas et al.
GL	Catalogue of nearby stars, editon 1969
HBV	Die Veränderlichen im Süd teil der Cygnus Wolke
HD	Henry Draper Catalogue, Cannon and Pickering 1918-1924
HEN	Southern Planetary Nebulae, Henize 1967
HHA	Reference to LH α objects later quoted in the Chamaeleon T Association, Henize and Mendoza 1973
HILT	Photometric, Polarization and Spectrographic Observations of O and B stars, Hiltner 1956

HR	Catalogue of Bright Stars, 3rd Edition, Hoffleit 1964
HV	"Harvard Variables"
HZ	A Search for Faint Blue Stars, Humanson and Zwicky 1947
IRC	Two-Micron Sky Survey, Neugebauer and Leighton 1969
KOCH	Photographic Photometry in the field of NGC 2264
KS	Photometric and polarimetric observations of the nearby strongly reddened open cluster STOCK 2, Kreminski and Serkowski 1967
KW	The proper motion and the distance of the Praesepe cluster, Klein Wassink 1927
LAL	A catalogue of those stars in the "Histoire Celeste Francaise"
LFT	A catalogue of 1849 stars with proper motions exceeding 0.5" annually, Luyten 1955
LKH	Emission-line stars associated with the nebulous cluster NGC 2264, Herbig
LS	Luminous Stars in the Northern Milky Way I, Hardorp et al. 1959
LSWR	Revised Spectral Classification System and a New Catalogue for Galactic Wolf-Rayet Stars, Smith 1968
LTT	A Catalogue of 9867 Stars with Proper Motion Exceeding 0.2" Annually, Luyten
MCC	Dwarf M Stars Found Spectrophotometrically, Vyssotsky et al.
MR	The Galactic Distribution of the Wolf-Rayet Stars, Roberts 1962
MWC	Mount Wilson Catalogue Supplements, Merrill and Burwell
NML	Observations of extremely cool stars
NOVA	Nomenclature of novae, built with a name of constellation and a year
N30	Catalog of 5268 Standard Stars, 1950.0, based on the Normal System, Morgan 1952
PHL	Faint Blue Stars in the Region Near the South Galactic Pole (Palomar-Haro-Luyten)
PLX	General Catalogue of Trigonometric Stellar Parallaxes, Jenkins 1952
PN	Catalogue of Galactic Planetary Nebulae, Perek and Kohoutek 1967
ROSS	New Proper-motion stars, Ross 1925-1939
SAO	Smithsonian Astrophysical Star Catalog, Positions and Proper Motions of 258997 Stars for the Epoch and Equinox 1950.0
SN	Nomenclature of supernovae, built from a year
SON	Nomenclature of variable stars found in Sonneberg Observatory
SR	Stellar Spectra with Emission Lines in the Obscuring Clouds of Ophiuchus and

	Scorpius, Struve and Rudkjøbing 1949
SS	Low-Dispersion Spectra and Galactic Distribution of Various Interesting Strong-Emission-Line Objects in the Southern Milky Way, Sanduleak and Stephenson 1973
SVS	Successive lists of variables found by Russian astronomers, beginning in 1918, Soviet variable stars
TON	Estrellas Azules en el Casquete Galactico Norte, Tonantzintla Observatory
TONS	Estrellas Azules en el Casquete Galactico Sur, Tonantzintla Observatory
V.	General Catalogue of Variable Stars, Third Edition, Kukarkin et al.
VV	Vatican Variables
WALK	Studies of Extremely Young Clusters, Walker 1956
WIL	General Catalogue of Stellar Radial Velocities, Wilson 1953
WOLF	Katalog von 1053 Starker Bewegten Fixstern, Wolf
WRAY	A Study of H-alpha Emission Objects in the Southern Milky Way, Wray 1966
*	Catalogue of Bright Stars, (Bayer or Flamsteed names)

We would like to thank D. M. Giblin and F. B. Shaffer Jr. for their assistance and encouragement.

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ADC Bull. (July 1981) 1, 69-77

SUGGESTIONS FOR FORMATTING, CHECKING AND DOCUMENTING MACHINE-READABLE ASTRONOMICAL CATALOGUES

R. S. Hill*

I. INTRODUCTION

The purpose of this paper is to describe ADC practice in modifying and documenting machine-readable catalogues in order to provide guidelines for others who make such catalogues. There are good reasons to conform to these guidelines. First, those who send machine-readable catalogues to the ADC will help the ADC to economize on its resources; thus, they will help to make new machine-readable catalogues more quickly available to the astronomical community than at present. Second, common-sense practices to make catalogues more usable by computers will be spread through the astronomical community.

The following sections describe practices followed by the ADC to make machine-readable catalogues transportable to many computers, to insure the integrity of the data in the catalogues, and to make the catalogues easy to use for input to computer programs. Some of the minor points represent prejudices of the author; however, as a whole, this paper may be taken to fairly describe the practices of the ADC. Several topics treated here are also considered in Underhill, et al. (1977).

II. TRANSPORTABILITY

A transportable dataset is one that can be read and used by most computers.

1. Write tapes in character code. That is, use EBCDIC, BCD, or ASCII. Do not write tapes of binary data. Character codes were created for transportability, but binary formats were created for internal use by computers, and are machine-specific.

   (The ADC itself can read several types of tapes: seven-track or nine-track, in EBCDIC, BCD, or ASCII, at densities from 200 bytes per inch [BPI] to 6250 BPI; however, the ADC would prefer, whenever possible, to receive nine-track ASCII or EBCDIC tapes at 1600 BPI or 6250 BPI.)

2. Use Fortran formats to write tapes. Every scientific computing installation has Fortran, even in those cases where it is not the language of choice.

3. In declinations, put plus and minus signs always in the same byte. This rule is an exception to the previous one, since Fortran formatted writes always put the sign just in front of the most

significant digit. Consider these declinations given in degrees, minutes, and seconds (Ø = blank):

+23Ø12Ø56
Ø-0ØØ5Ø42
-11Ø12Ø21

The second line will appear to an IBM computer to say +0° 5' 42" since the IBM 360 has no way of internally coding minus zero. But if the same declinations are given as follows:

+23Ø12Ø56
-Ø0ØØ5Ø42
-11Ø12Ø21

then the sign of declination can be read using the A1 format code, separately from the numerical data, and the declination can then be multiplied by -1 if appropriate.

4. Do not use lower-case letters, and avoid special characters. Not all computer terminals have lower case letters, and the standard keypunch, the IBM 029, certainly does not. If a programmer has no access to a terminal or keypunch with certain characters, he may be unable to write a program that will recognize those characters. How can one, for example, write a program that will recognize the lower-case "e", when that symbol cannot be typed in as part of the program? Only with arcane techniques.

   In fact, it is desirable to use even a smaller character set than that provided by the IBM 029, since not all its characters translate (for example) from nine-track EBCDIC to seven-track BCD, or even from EBCDIC to ASCII.

   To restate the rule in positive terms, stick to capital letters, numerals, and the commonest arithmetic symbols.

III. QUALITY CONTROL

Quality control means following rationally planned procedures to see that machine-readable data are not corrupted by typographical errors or program bugs.

1. Proofread. If the data in a machine-readable catalogue look reasonable and if no errors or contradictions are uncovered in the course of processing, the ADC will not proofread exhaustively. It is, therefore, necessary that the original makers of machine-readable catalogues do so.

2. After writing a tape, try to read it. If properly done, this procedure can go far to assure the integrity of a catalogue tape. The belief that a certain Fortran format statement will read the catalogue correctly should be checked by running a program to actually read every single record in the catalogue with that format. Within the same program, all the data can be checked to see that they fall within appropriate ranges—for example, declinations should be between -90° and +90°, and stellar magnitudes should be between -5.0 and +25.0. Use the constraints appropriate for catalogue: if it contains only objects within 20° of the galactic equator, make sure the galactic latitude of each object, as given in the catalogue tape, reflects this constraint. Count the records to make sure the tape file is complete and free of garbage records. If the records are in an easily defined order—for example, increasing right ascension—make sure, using a program, that this order actually holds.

3. Check the physical attributes of any tape sent elsewhere. Many installations support utility programs that analyse a tape and return the number of tracks, recording density, type of character code, and length and number of physical records. Such a program can be used to verify not only that the recipient is getting the right kind of tape, but that the tape contains the right number of records. File-comparison utilities are also provided with many computer systems, and are intended for the verification of copy operations.

IV. USABILITY

Usability here means two sets of virtues: first, those that make a catalogue useful as a scientific product (e.g., completeness and clarity), and second, those that make a catalogue convenient to use as input to a Fortran program (e.g., consistency of format). Moreover, the documentation of a machine-readable catalogue must be properly done if the catalogue is to display its merit to anyone but its creator. Good documentation is essential to both aspects of usability.

1. Put in all the data. If data from the published book version of a catalogue are not in the machine-readable version, the ADC adds it. Data are often left out of machine-readable versions of catalogues because the maker wanted to use card-images of 80 bytes. This habit should be overcome. If an installation does not support magnetic tape or disk record lengths longer than 80 bytes (this author does not know of any such cases), or if the maker of a catalogue is unwilling to invest the time to learn how to create and use such records, he should use more than one card-image per catalogue entry.

2. Use one record per catalogue entry, but not at the expense of completeness. Like honesty, this is the best policy. Programs that

have to read only one record to get all the data for a single catalogue entry are easier to write than programs that have to read multiple records in different formats. But if you face a choice between complete data and single records, choose complete data: multiple records are better than undernourished single records.

3. Stick to whatever format you use. When you have designed a format for any field, do not deviate from it by one iota. If a field has to be changed to accommodate unforeseen data, go back and change it in every record. Nothing is more annoying than, say, a spectral type that spills over into the literature references.

4. Code spectral types (and similar symbolically expressed data) so that they can be easily searched. For example, put the first dimension of a spectral type always in the same bytes.

5. Eschew blank numerical fields; and do not put alphabetic/symbolic data into numerical fields. Fortran will read blank fields as zero. If there is no data, use some obviously unreal value, such as the maximum number of nines that will fill the field (this tactic is called "nines-filling"). Usually zero is too plausible a value to make "blanks-filling" practical.

   Alphabetic/symbolic data in numerical fields make programming for the use of the catalogue more difficult. Instead, use a separate field, or code an unreal numerical value into the numerical field. Usually, eights-filling and sevens-filling can be used along with nines-filling when different types of "no data" flags are needed.

   The test is Fortran-readability: a numerical field should only have to be read once, and that with a numerical format specification.

6. Document. The most important part of the documentation is a table of what data are in each tape record. All bytes of the record (even blanks) should be accounted for. The Fortran format specification for reading each datum should be supplied. Figure 1 is a sample page from a typical table of this kind as it appears in an ADC catalogue document. Note that material normally appearing in the preface of a catalogue in book form appears in this table. This table does play the role of a preface, and should be able to substitute for the preface of the book version of a catalogue. Do not rely on the recipient to have access to books. Assume that he lives in isolation and cannot obtain books. Tell him what the book would tell him if he had it--but in the form of a byte-by-byte record description.

   The document should have two other sections: a table of the physical characteristics of the tape sent, and a broad description of how the catalogue was made machine-readable. If there is a book version of

the catalogue, the latter section should describe the differences between the machine-readable and book versions, and should include the reference to the book version. This section should also include general remarks not fitting elsewhere. Examples of these two sections are given in Figures 2 and 3, respectively.

V. CONCLUSION

Clearly, a number of judgments need to be made about the right way of making each machine-readable catalogue. Nevertheless, the guidelines in this paper can provide a first approximation of the goal for any such effort, and more important, a norm of quality and usefulness for the final product. Moreover, the ADC is a resource for the entire astronomical community, and that community can serve itself by applying these guidelines to optimize its use of the ADC's available manpower.

VI. REFERENCES

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Tape Contents (1 of 6)

CATALOG OF GALAXY REDSHIFTS

Bytes	Description	Suggested Format
1-4	Sequential number for entries in increasing order of right ascension (#1 - 3981).	I4
5	Blank	1X
6-11	Uppsala General Catalogue of Galaxies (UGC)(Nilson, P.N. 1973. Uppsala Observatory Annals, Volume 6) number when available or the supplement UGC number (AUGC) (Nilson, P.N. 1974. Catalogue of Selected Non-UGC Galaxies, Uppsala Observatory Report #5) from the Fisher and Tully (redshift catalogue submitted to Astrophysical Journal Supplement). The UGC is only available for northern galaxies and the AUGC number has an "A" as the first character. All identifiers are left justified in this field.	6A1
12	Blank	1X
13-20	Other galaxy identification: New General Catalogue (N), Index Catalogue (I) or Anonymous (A) designations from the Reference Catalogue of Bright Galaxies (de Vaucouleurs and de Vaucouleurs, 1964). The Third Cambridge (3C) number or other identification found from the source material (cf. bytes 78-90).	8A1
21	Blank	1X
22-28	Right Ascension (Epoch 1950.0) Equatorial coordinates are from Fisher and Tully, other source or the UGC.	
	22-23 hours	I2
	24 blank	1X
	25-28 minutes (unit = $0^m.1$)	F4.1

Figure 1. Example of a catalogue byte description.

Tape Characteristics
CATALOG OF GALAXY REDSHIFTS

CATALOGUE	RGR
NUMBER OF TRACKS	9
DENSITY (BPI)	1600
NUMBER OF FILES	1
LOGICAL RECORD LENGTH (BYTES)	90
BLOCKSIZE (BYTES)	18000
BLOCKING FACTOR	200
RECORD FORMAT (IBM OS/JCL)	FB
TOTAL NUMBER OF LOGICAL RECORDS	3981
TOTAL NUMBER OF BLOCKS	20
CHARACTER CODE	EBCDIC

Figure 2. Example of magnetic tape specifications.

REMARKS AND MODIFICATIONS

The machine-readable version of the Catalog of Galaxy Redshifts (H.J. Rood, unpublished) was received from Dr. P.J.E. Peebles (Princeton University) in December of 1980. The catalogue was compiled by Dr. Rood to enter the most accurate redshift for each entry in the Uppsala General Catalogue of Galaxies (UGC, Nilson, P.N. 1973, Uppsala Observatory Annals, 6) below 15,000 km/sec, plus some fainter galaxies in fields of rich clusters, plus some southern galaxies (usually those with accurate 21 cm redshifts). The catalogue is 99% complete for declinations north of -2° 30' and blue magnitude (m_p) brighter than 13^m.

Modifications were made to that machine-readable version as follows:

1. The first record initially was IC 5041 which did not have coordinates listed and hence as $\alpha = 0$ and $\delta = 0$ it appeared first on the tape. The coordinates for this object (from machine-readable version of the Master Object List, R.S. Dixon, 1977 in Compilation, Critical Evaluation, and Distribution of Stellar Data, ed. C. Jaschek and G.A. Wilkins, D. Reidel Publishing Company, Dordrecht-Holland, pp. 167ff) are $\alpha = 20^h\,40^m.5$, $\delta = -29°\,53'$ (epoch 1950 given to the same precision as the catalogue). This record was then put in its proper place in the catalogue before the remainder of the modifications were made. We would like to thank Dr. W. Warren for the suggestion to look in Dixon's Master Object List to find the coordinates for IC 5041.

2. A sequential counter was added to each record (#1 - 3981) which represents the order of the catalogue in order of increasing right ascension at epoch 1950.0.

3. For entries which did not have a value of the blue magnitude (m_p) a value of 99.9 was entered.

4. The designations of uncertainty (parentheses "( )") and not newly derived ("-") in the listing of the catalogue as received were not included in the machine-readable version. These have been added but in the form of a single asterisk ("*") or dash ("-") in bytes 56 and 58 (cf. Table 2-1).

5. The redshift relative to the Local Group $V_0 = V + \Delta V$ where $\Delta V = 300 \sin \ell \cos b$ was not included on the machine-readable version. This quantity was subsequently computed by calculating galactic coordinates (ℓ, b) and utilizing the quantity of the redshift (V). Many of these computed values were compared with the list as sent by Rood and

Figure 3. Example of a remarks and modifications section of a catalogue document (1 of 2).

approximately 10% were found to differ by 1 km/sec. This is probably due to differences between the galactic coordinates as computed at GSFC and the coordinates used by Peebles. We have chosen to retain our computed values since this would be consistent with the galactic coordinates given herein.

6. Since the galactic coordinates (ℓ, b) had to be computed to add the value of the redshift relative to the Local Group (V_0), these have been retained in the machine-readable version for convenience.

7. The original logical record length was 80 bytes. A total of 16 blank bytes have been deleted from the original version but 26 bytes of additional data have been added, so that the new logical record length is 90 bytes.

Figure 3. Continued (2 of 2).

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A CATALOGUE OF ULTRAVIOLET, OPTICAL, AND HI DATA FOR 201 VIRGO CLUSTER GALAXIES

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Galactic energy distributions exhibit larger variations with galactic type at middle ultraviolet wavelengths ($2000 < \lambda < 3000$ Å) than at visible wavelengths (Coleman et al. 1980; Welch 1981) because of the effects of hot stars, metallicity, dust and other factors. Consequently middle ultraviolet colors should be sensitive measures of intrinsic galactic characteristics both locally and on cosmological scales.

We have obtained ultraviolet photographic photometry, in magnitudes which we have denoted U_{2421}, of galaxies within the central 11.4 degree diameter region of the Virgo cluster. The bandpass of the photometry is centered (constant energy mean wavelength) at 2421 A with a full width at half maximum of 1150 A. The absolute calibration of the magnitude scale is defined such that the color $U_{2421} - V$ of Vega is zero. On this scale, the brightest observed galaxy has $U_{2421} = 10^{m}.5$, and the faint limit for observation is $U_{2421} \approx 16^{m}.3$. Within these limits and within the field of view, we find 115 single galaxies, 7 unresolved pairs; 79 galaxies are too faint to be observed. The effective angular resolution is ~ 1 - 2 arcminutes.

We have combined the above ultraviolet photometric data with data from de Vaucouleurs et al. (1976) and Fisher and Tully (1981) to produce a reasonably comprehensive data base of magnitudes, colors, galactic types and HI data for these Virgo cluster galaxies. The data are machine-readable and can be obtained from the ADC; all data and other details are presented in Smith and Cornett (1981).

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ADC Bull. (July 1981) 1, 79-80

THE MACHINE-READABLE VERSION OF THE GENERAL CATALOGUE OF VARIABLE STARS, THIRD EDITION

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The machine-readable version of the General Catalogue of Variable Stars (GCVS) was received at NASA/Goddard Space Flight Center (NASA/GSFC) from the Centre de Données Stellaires (CDS) in Strasbourg, France, on September 14, 1976. This version was a hybrid, containing both data from the Second Edition of the GCVS (Kukarkin, et al., 1958), and from the Third Edition of the GCVS (Kukarkin, et al., 1969), as well as from various supplements of each, and was apparently generated by merging and expanding pre-existing machine-readable files. At NASA/GSFC, this file was modified considerably both in contents and in format, as follows:

1. Two groups of stars were treated separately: those represented by entries in the Third Edition of the GCVS, and those introduced in the supplements to the Third Edition of the GCVS. All entries in the first group were edited to conform to the Third Edition. All entries in the second group were left as received, and a flag byte was added to distinguish them from the first group. As a result, the NASA/GSFC version represents the Third Edition for all stars having entries in the Third Edition; and represents the data as received from the CDS for the stars having entries only in the supplements to the Third Edition. No data remains from the Second Edition or the supplements to the Second Edition, except for cross-identifications (see below). About 30,200 separate data had to corrected in the editing of the Third-Edition stars.

2. Cross-identifications from the Second Edition, volume 2, and from the 56th and 57th Nominating Lists, present in packed form on the tape as received, were unpacked into EBCDIC characters. Each type of identifier was put into a separate field.

3. Various non-numerical characters were present in numerical fields on the tape as received. These symbols indicated faint-magnitude limits, multiplicity or ambiguity of period, doubtfulness of data, and so on. All such symbols were put into separate fixed-format fields to enable the numerical fields to be read with numerical Fortran formats. Also, in some cases, standard symbols were substituted for non-standard ones.

4. Several duplicate records were deleted, and about 30 missing records were added.

5. About 200 records were interactively corrected due to special problems and errors discovered in the late stages of processing.

6. By means of a Fortran program, a histogram of variability types was prepared. Inconsistencies in translating the variability-type abbreviations into EBCDIC character strings were resolved.

7. Miscellaneous fields were expanded to accomodate corrected data too long for the original fields. Fields that had been immediately adjacent on the tape as received were separated with blanks.

8. The galactic coordinates on the tape as received appeared to be partly Old Galactic Coordinates (ℓ^{I}, b^{I}), and partly New Galactic Coordinates (ℓ^{II}, b^{II}), and were not given for all the entries. These galactic coordinates were deleted, and ℓ^{II} and b^{II} were newly calculated for all entries.

Grateful acknowledgement is made to Mrs. Susan Ball for hand-coding the 30,200 bulk corrections on Fortran coding forms, for writing most of the bulk-correction software, and for unpacking the cross-identifications. Among the many others who have contributed are Mrs. Priscilla Struthers, Mrs. Susan Rehse, and the keypunching service at NASA/GSFC.

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GALACTIC LATITUDE AND MAGNITUDE DISTRIBUTION OF TWO ASTRONOMICAL CATALOGUES

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The spatial distribution of sources as expressed in galactic coordinates is of common interest to observers and theoreticians alike. As a result of some correlative work for an infrared study, the following tables were prepared. Tables 1 and 2, respectively, represent the galactic latitude distribution in two-degree bins of the entries in the Catalogue of Bright Stars (Hoffleit 1964) with 9091 sources and the Two-Micron Sky Survey (Neugebauer and Leighton 1969) with 5612 sources. Table 3 presents the Yale Bright Star Catalogue sources in five-degree latitude bins as a function of visual magnitude ranges. Matrix data of magnitude versus galactic latitude (five-degree bins) are given for the Two-Micron Sky Survey entries in Tables 4 and 5 where the magnitudes are I and K respectively. In all five tables the lower limit of the latitude range (b_{lower}) is inclusive. Table 3 is for very select magnitude ranges and does not represent the total catalogue, as is evidenced by the totals as given in the table.

The magnitude distribution of sources in the Yale Bright Star Catalogue has been the result of several inquiries. Table 6 presents a breakdown of the visual magnitude (V) from the catalogue in 0.1 magnitude bins together with the running total from brightest to faintest. Similar magnitude distributions for the Two-Micron Sky Survey Catalogue are presented in Table 7 (I magnitude) and in Table 8 (K magnitude). Only magnitudes that were on scale are included in these distributions. Also, included are the questionable I magnitudes since a value is given.

References

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Table 1. Galactic Latitude Distribution of Yale Bright Star Catalogue Sources

b^{o}_{lower}	b^{o}_{upper}	#	b^{o}_{lower}	b^{o}_{upper}	#	b^{o}_{lower}	b^{o}_{upper}	#
-90	-88	1	-18	-16	204	54	56	66
-88	-86	7	-16	-14	198	56	58	67
-86	-84	12	-14	-12	173	58	60	58
-84	-82	6	-12	-10	220	60	62	63
-82	-80	13	-10	- 8	245	62	64	50
-80	-78	24	- 8	- 6	270	64	66	49
-78	-76	23	- 6	- 4	271	66	68	48
-76	-74	23	- 4	- 2	256	68	70	29
-74	-72	34	- 2	0	305	70	72	22
-72	-70	32	0	+ 2	246	72	74	34
-70	-68	37	+ 2	4	238	74	76	28
-68	-66	55	4	6	192	76	78	23
-66	-64	47	6	8	211	78	80	17
-64	-62	56	8	10	164	80	82	20
-62	-60	58	10	12	191	82	84	19
-60	-58	57	12	14	186	84	86	17
-58	-56	58	14	16	185	86	88	4
-56	-54	80	16	18	164	88	90	2
-54	-52	52	18	20	150			
-52	-50	74	20	22	145			
-50	-48	61	22	24	164			
-48	-46	92	24	26	128			
-46	-44	70	26	28	133			
-44	-42	93	28	30	129			
-42	-40	87	30	32	114			
-40	-38	97	32	34	107			
-38	-36	98	34	36	104			
-36	-34	118	36	38	85			
-34	-32	120	38	40	97			
-32	-30	118	40	42	87			
-30	-28	128	42	44	70			
-28	-26	136	44	46	87			
-26	-24	159	46	48	92			
-24	-22	144	48	50	68			
-22	-20	190	50	52	75			
-20	-18	202	52	54	52			

TOTAL 9,091

Table 2. Galactic Latitude Distribution of Two-Micron Sky Survey Catalogue

b^{o}_{lower}	b^{o}_{upper}	#	b^{o}_{lower}	b^{o}_{upper}	#	b^{o}_{lower}	b^{o}_{upper}	#
-90	-88	1	-18	-16	98	54	56	35
-88	-86	2	-16	-14	109	56	58	30
-86	-84	3	-14	-12	122	58	60	24
-84	-82	3	-12	-10	126	60	62	26
-82	-80	13	-10	- 8	159	62	64	26
-80	-78	8	- 8	- 6	165	64	66	29
-78	-76	10	- 6	- 4	212	66	68	31
-76	-74	6	- 4	- 2	228	68	70	28
-74	-72	14	- 2	0	315	70	72	10
-72	-70	18	0	+ 2	277	72	74	24
-70	-68	18	+ 2	4	204	74	76	20
-68	-66	19	4	6	174	76	78	11
-66	-64	34	6	8	174	78	80	12
-64	-62	17	8	10	138	80	82	8
-62	-60	16	10	12	126	82	84	8
-60	-58	20	12	14	121	84	86	9
-58	-56	19	14	16	127	86	88	2
-56	-54	18	16	18	120	88	90	0
-54	-52	17	18	20	104			
-52	-50	23	20	22	93			
-50	-48	29	22	24	96			
-48	-46	32	24	26	76			
-46	-44	30	26	28	84			
-44	-42	31	28	30	70			
-42	-40	45	30	32	65			
-40	-38	40	32	34	84			
-38	-36	47	34	36	56			
-36	-34	44	36	38	38			
-34	-32	50	38	40	69			
-32	-30	49	40	42	62			
-30	-28	50	42	44	54			
-28	-26	48	44	46	68			
-26	-24	73	46	48	56			
-24	-22	79	48	50	41			
-22	-20	70	50	52	45			
-20	-18	89	52	54	39			

TOTAL 5,612

Table 3. Galactic Latitude Versus Visual Magnitude Range of the Yale Bright Star Catalogue Sources

b°_{lower}	b°_{upper}	2.9≤ V ≤4.0	4.0< V ≤5.0	5.0< V ≤6.0	2.9≤ V ≤5.0	2.9≤ V ≤6.0
-90	-85	0	1	4	1	5
-85	-80	0	2	15	2	17
-80	-75	0	5	20	5	25
-75	-70	7	7	32	14	46
-70	-65	6	16	46	22	68
-65	-60	6	23	48	29	77
-60	-55	7	17	70	24	94
-55	-50	3	25	65	28	93
-50	-45	8	28	65	36	101
-45	-40	10	32	92	42	134
-40	-35	8	27	107	35	142
-35	-30	14	22	120	36	156
-30	-25	10	37	127	47	174
-25	-20	30	55	156	85	241
-20	-15	15	73	206	88	294
-15	-10	24	61	176	85	261
-10	- 5	31	73	253	104	357
- 5	0	21	102	275	123	398
0	+ 5	20	69	213	89	302
+ 5	10	16	60	184	76	260
10	15	18	56	165	74	239
15	20	17	38	156	55	211
20	25	13	56	148	69	217
25	30	8	41	117	49	166
30	35	13	24	106	37	143
35	40	8	27	96	35	131
40	45	12	23	89	35	124
45	50	11	28	91	39	130
50	55	7	19	66	26	92
55	60	5	17	60	22	82
60	65	11	19	57	30	87
65	70	5	16	28	21	49
70	75	0	7	27	7	34
75	80	0	8	31	8	39
80	85	0	9	18	9	27
85	90	0	4	1	4	5
TOTALS		364	1127	3530	1491	5021

Table 4. Galactic Latitude Versus I Magnitude Range of the Two-Micron Sky Survey Catalogue Sources.

b° lower	b° upper	2≤I<3	3≤I<4	4≤I<5	5≤I<6	6≤I<7	7≤I<8	8≤I<9	9≤I<12
-90	-85	0	0	3	2	0	0	0	0
-85	-80	0	2	8	3	1	0	1	0
-80	-75	1	0	9	8	1	1	0	0
-75	-70	4	5	9	11	7	0	0	0
-70	-65	4	6	17	15	5	1	0	0
-65	-60	0	6	18	22	6	1	0	0
-60	-55	4	11	11	13	6	0	0	0
-55	-50	1	9	15	10	9	3	0	1
-50	-45	7	8	22	31	9	1	0	0
-45	-40	3	15	28	28	9	2	1	0
-40	-35	5	13	34	32	15	5	0	0
-35	-30	1	14	26	42	23	8	1	1
-30	-25	4	10	28	46	28	8	3	0
-25	-20	5	28	36	55	44	14	1	1
-20	-15	9	15	57	69	49	24	7	3
-15	-10	7	22	62	87	80	25	9	2
-10	- 5	5	39	66	102	119	64	23	2
- 5	0	4	35	66	170	185	123	41	9
0	+ 5	6	21	74	137	139	125	49	12
+ 5	10	8	31	65	93	103	64	19	4
10	15	6	25	64	83	81	33	6	1
15	20	7	31	53	98	66	25	7	0
20	25	9	26	52	62	41	23	5	0
25	30	4	30	49	63	33	8	4	0
30	35	9	8	53	58	28	13	1	0
35	40	6	18	45	45	14	4	0	0
40	45	6	21	45	45	20	4	0	1
45	50	5	18	42	35	17	5	1	0
50	55	5	12	28	37	12	3	1	0
55	60	4	8	26	19	12	0	2	0
60	65	8	10	25	14	6	0	0	0
65	70	7	11	22	20	7	1	0	0
70	75	2	0	16	15	6	0	0	0
75	80	1	5	14	9	5	1	0	0
80	85	1	2	7	6	4	0	0	0
85	90	0	2	1	4	0	0	0	0
TOTALS		158	517	1196	1589	1190	589	182	37

Table 5. Galactic Latitude Versus K Magnitude Range of the Two-Micron Sky Survey Catalogue Sources.

b° lower	b° upper	$-2 \le K < -1$	$-1 \le K < 0$	$0 \le K < 1$	$1 \le K < 2$	$2 \le K < 3$	$3 \le K < 4$
-90	-85	0	0	0	1	4	0
-85	-80	0	2	2	3	10	0
-80	-75	0	0	1	7	11	1
-75	-70	1	1	3	7	23	1
-70	-65	0	2	6	14	26	1
-65	-60	0	2	0	12	41	0
-60	-55	1	2	6	12	26	0
-55	-50	0	0	5	16	26	1
-50	-45	0	2	7	16	53	0
-45	-40	0	3	9	19	56	1
-40	-35	2	5	11	24	61	6
-35	-30	1	3	6	35	74	1
-30	-25	2	2	11	41	74	2
-25	-20	0	7	15	35	127	1
-20	-15	1	6	13	50	166	3
-15	-10	1	4	14	84	195	5
-10	- 5	1	12	31	87	293	9
- 5	0	1	7	34	128	465	9
0	+ 5	1	3	36	129	389	13
+ 5	10	0	5	29	78	275	5
10	15	0	5	24	57	213	5
15	20	1	7	21	59	201	2
20	25	1	4	17	56	140	5
25	30	3	3	15	53	119	2
30	35	0	3	13	31	126	0
35	40	1	1	21	33	80	0
40	45	2	2	19	32	93	2
45	50	2	4	11	33	77	1
50	55	0	4	9	22	64	2
55	60	0	3	4	20	43	1
60	65	0	4	7	16	39	1
65	70	1	5	12	16	37	0
70	75	0	1	5	13	23	0
75	80	0	0	1	7	26	1
80	85	0	1	1	1	16	1
85	90	0	0	1	2	4	0
TOTALS		23	115	420	1249	3696	82

Table 6. Visual Magnitude Distribution of Sources in the Yale Catalogue of Bright Stars

V_{upper}	V_{lower}	Bin Total	Running Total
-1.5	-1.4	1	1
-1.4	-1.3	0	1
-1.3	-1.2	0	1
-1.2	-1.1	0	1
-1.1	-1.0	0	1
-1.0	-0.9	0	1
-0.9	-0.8	0	1
-0.8	-0.7	1	2
-0.7	-0.6	0	2
-0.6	-0.5	0	2
-0.5	-0.4	0	2
-0.4	-0.3	0	2
-0.3	-0.2	0	2
-0.2	-0.1	1	3
-0.1	0.0	0	3
0.0	+0.1	4	7
+0.1	0.2	1	8
0.2	0.3	0	8
0.3	0.4	2	10
0.4	0.5	1	11
0.5	0.6	0	11
0.6	0.7	1	12
0.7	0.8	2	14
0.8	0.9	1	15
0.9	1.0	1	16
1.0	1.1	2	18
1.1	1.2	2	20
1.2	1.3	2	22
1.3	1.4	1	23
1.4	1.5	0	23
1.5	1.6	2	25
1.6	1.7	7	32
1.7	1.8	4	36
1.8	1.9	9	45
1.9	2.0	7	52
2.0	2.1	16	68
2.1	2.2	4	72
2.2	2.3	12	84
2.3	2.4	6	90
2.4	2.5	7	97
2.5	2.6	11	108
2.6	2.7	16	124
2.7	2.8	13	137
2.8	2.9	26	163
2.9	3.0	15	178
3.0	3.1	14	192
3.1	3.2	28	220
3.2	3.3	16	236
3.3	3.4	29	265
3.4	3.5	26	291
3.5	3.6	46	337
3.6	3.7	34	371
3.7	3.8	42	413
3.8	3.9	62	475
3.9	4.0	42	517
4.0	4.1	69	586
4.1	4.2	56	642
4.2	4.3	92	734
4.3	4.4	92	826
4.4	4.5	88	914
4.5	4.6	113	1027
4.6	4.7	124	1151
4.7	4.8	142	1293
4.8	4.9	175	1468
4.9	5.0	148	1616
5.0	5.1	240	1856
5.1	5.2	232	2088
5.2	5.3	258	2346
5.3	5.4	277	2623
5.4	5.5	262	2885
5.5	5.6	421	3306
5.6	5.7	402	3708
5.7	5.8	462	4170
5.8	5.9	450	4620
5.9	6.0	481	5101
6.0	6.1	651	5752
6.1	6.2	702	6454
6.2	6.3	726	7180
6.3	6.4	813	7993
6.4	6.5	518	8511
6.5	6.6	329	8840
6.6	6.7	121	8961
6.7	6.8	55	9016
6.8	6.9	24	9040
6.9	7.0	16	9056
7.0	7.1	14	9070
7.1	7.2	6	9076
7.2	7.3	6	9082
7.3	7.4	5	9087
7.4	7.5	1	9088
7.5	7.6	0	9088
7.6	7.7	1	9089
7.7	7.8	0	9089
7.8	7.9	0	9089
7.9	8.0	0	9089
8.0		2	9091

Table 7. I Magnitude Distribution of Sources in theTwo-Micron Sky Survey Catalogue.

I_{upper}	I_{lower}	Bin Total	Running Total	I_{upper}	I_{lower}	Bin Total	Running Total
2.2	2.3	1	1	6.8	6.9	99	4572
2.3	2.4	6	7	6.9	7.0	78	4650
2.4	2.5	13	20	7.0	7.1	78	4728
2.5	2.6	20	40	7.0	7.2	78	4806
2.6	2.7	17	57	7.2	7.3	90	4896
2.7	2.8	33	90	7.3	7.4	57	4953
2.8	2.9	31	121	7.4	7.5	60	5013
2.9	3.0	37	158	7.5	7.6	54	5067
3.0	3.1	36	194	7.6	7.7	46	5113
3.1	3.2	43	237	7.7	7.8	49	5162
3.2	3.3	39	276	7.8	7.9	44	5206
3.3	3.4	39	315	7.9	8.0	33	5239
3.4	3.5	39	354	8.0	8.1	36	5275
3.5	3.6	62	416	8.1	8.2	26	5301
3.6	3.7	64	480	8.2	8.3	21	5322
3.7	3.8	61	541	8.3	8.4	24	5346
3.8	3.9	72	613	8.4	8.5	17	5363
3.9	4.0	62	675	8.5	8.6	17	5380
4.0	4.1	92	767	8.6	8.7	11	5391
4.1	4.2	93	860	8.7	8.8	14	5405
4.2	4.3	109	969	8.8	8.9	10	5415
4.3	4.4	124	1093	8.9	9.0	6	5421
4.4	4.5	96	1189	9.0	9.1	3	5424
4.5	4.6	123	1312	9.1	9.2	4	5428
4.6	4.7	129	1441	9.2	9.3	5	5433
4.7	4.8	166	1607	9.3	9.4	4	5437
4.8	4.9	128	1735	9.4	9.5	4	5441
4.9	5.0	136	1871	9.5	9.6	6	5447
5.0	5.1	165	2036	9.6	9.7	0	5447
5.1	5.2	165	2201	9.7	9.8	2	5449
5.2	5.3	174	2375	9.8	9.9	2	5451
5.3	5.4	167	2542	9.9	10.0	1	5452
5.4	5.5	150	2692	10.0	10.1	1	5453
5.5	5.6	182	2874	10.1	10.2	1	5454
5.6	5.7	158	3032	10.2	10.3	0	5454
5.7	5.8	147	3179	10.3	10.4	0	5454
5.8	5.9	153	3332	10.4	10.5	0	5454
5.9	6.0	128	3460	10.5	10.6	0	5454
6.0	6.1	166	3626	10.6	10.7	1	5455
6.1	6.2	142	3768	10.7	10.8	2	5457
6.2	6.3	152	3920	10.8	10.9	0	5457
6.3	6.4	115	4035	10.9	11.0	0	5457
6.4	6.5	106	4141	11.0	11.1	0	5457
6.5	6.6	119	4260	11.1	11.2	0	5457
6.6	6.7	105	4365	11.2	11.3	1	5458
6.7	6.8	108	4473				

Table 8. K Magnitude Distribution of Sources in the Two-Micron Sky Survey Catalogue.

K_{upper}	K_{lower}	Bin Total	Running Total
-1.9	-1.8	1	1
-1.8	-1.7	0	1
-1.7	-1.6	1	2
-1.6	-1.5	1	3
-1.5	-1.4	4	7
-1.4	-1.3	1	8
-1.3	-1.2	9	17
-1.2	-1.1	2	19
-1.1	-1.0	4	23
-1.0	-0.9	9	32
-0.9	-0.8	5	37
-0.8	-0.7	10	47
-0.7	-0.6	15	62
-0.6	-0.5	7	69
-0.5	-0.4	9	78
-0.4	-0.3	16	94
-0.3	-0.2	19	113
-0.2	-0.1	15	128
-0.1	0.0	10	138
0.0	+0.1	18	156
+0.1	0.2	37	193
0.2	0.3	28	221
0.3	0.4	38	259
0.4	0.5	26	285
0.5	0.6	48	333
0.6	0.7	45	378
0.7	0.8	62	440
0.8	0.9	65	505

K_{upper}	K_{lower}	Bin Total	Running Total
0.9	1.0	53	558
1.0	1.1	86	644
1.1	1.2	73	717
1.2	1.3	79	796
1.3	1.4	89	885
1.4	1.5	102	987
1.5	1.6	140	1127
1.6	1.7	130	1257
1.7	1.8	184	1441
1.8	1.9	186	1627
1.9	2.0	180	1807
2.0	2.1	239	2046
2.1	2.2	229	2275
2.2	2.3	267	2542
2.3	2.4	307	2849
2.4	2.5	298	3147
2.5	2.6	388	3535
2.6	2.7	450	3985
2.7	2.8	488	4473
2.8	2.9	517	4990
2.9	3.0	513	5503
3.0	3.1	50	5553
3.1	3.2	17	5570
3.2	3.3	8	5578
3.3	3.4	3	5581
3.4	3.5	3	5584
3.5	3.6	1	5585

ADC Bull. (July 1981) 1, 90-93

THE LUND - STRASBOURG CATALOGUE OF OPEN CLUSTER DATA

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I. AIM OF THE CATALOGUE

The intention is to provide a selection of fundamental data values for open clusters. This has entailed and will continue to entail a critical examination of the large volume of available information. However, I have considered it important that such a selection is provided, particularly when specialists of other fields occasionally need data about cluster properties. Thus the best available value for each parameter should be presented together with a reference. Naturally it is important that the catalogue is updated from time to time Updates are planned to be made by an exchange of entries, so as to avoid problems with separate supplements.

II. CONTENTS AND PRINCIPLES FOR INCLUSION

The present edition (April 1980) contains selected angular diameters and selected information about membership of unusual stars. These data have literature references, the list of unusual stars being compiled by Dr. A. Feinstein. In the present edition distances are quoted from three different sources without any priority assigned to the determinations. Cluster ages, masses and radial velocities are quoted from a compilation by Buscombe, while the photometric properties are taken from the Basel catalogues, from Buscombe's compilation and from the Strasbourg - Bochum magnetic tape file. The positions on the Palomar charts are taken from Dixon's (cf. Dixon, 1976) list of non-stellar objects, as are the Trumpler classes. Both the Strasbourg - Bochum file and the open cluster information in Dixon's catalogue are based on the Prague - Budapest catalogue (Alter et al., 1970).

III. NOMENCLATURE

It is an obvious advantage to have a unique notation for each cluster and since the International Astronomical Union has adopted certain principles (IAU, 1980) I have followed those. Accordingly, each cluster in the catalogue has at least two notations the first being the IAU number based on R.A. and Dec. for 1950.0 and the second being the most commonly used of other notations. This is taken to be the proper name or the NGC number whenever available. If, and that goes for most of the clusters, the object also has an OCL number (Alter et al., 1970), this is entered. However, some clusters have several more names, a circumstance that can be very frustating and even lead to unnecessary duplication of work. It must be considered important to have access to a listing of aliases. Such a list will be included in the next edition of the catalogue. In that I shall also enter comments as to whether an entry

should be considered doubtful. A large number of objects referred to as open clusters are not physical systems, a very annoying situation. For some of these, special investigations have shown the lack of main sequence in the colour - magnitude diagram. The alias listing is planned to contain references to such investigations.

IV. VITAL STATISTICS

Table 1 shows how many data values of various kinds are available in the present edition of the catalogue of open cluster data.

Table 1. Contents of catalogue of open cluster data

Parameter	Number clusters	Number entries	Reference	Comment
IAU number	1191		CDS	
Sequence and number	1191		Various	See text about alias list
OCL number	1103		OCL	
Equatorial coordinates	1191		CDS	
Precession	1191		Computed	10 years
Galactic coordinates	1191		Computed	l^{II}, b^{II}
Selected angular diameter	987		GLy	75 references
Angular diameter	994		B-S	
Maximum angular diameter	998		RD	
Distance	380	255	B-S	
		348	WB	
		208	BC	
Unusual stars:	93	315	AF	139 references
Am	31	70		
Ap	23	54		
Marginal Am	4	4		
Marginal Ap	5	9		
Wolf-Rayet	8	10		
Of	14	30		
Be	46	107		
Shell	8	9		
Be + shell	0	0		
He weak	2	2		
He rich	0	0		
Cepheids	6	6		
Plan. nebulae	1	1		
Carbon	3	3		
Long period var.	1	1		

Table 1. Contents of catalogue of open cluster data (continued)

Parameter	Number clusters	Number entries	Reference	Comment
δ Scuti	3	6		
β Ceti	0	0		
R Cor Bor	1	1		
Ba II	1	1		
U Gem	1	1		
Palomar Observatory Sky Survey	726		RD	Chart number Chart coordinates Position on chart
Trumpler class	985		RT RD	
Total magnitude	470	464	B-S	Photographic
		278	WB	
Colour excess, E_{B-V}	361	205	B-S	
		348	WB	
		130	BC	
Earliest spectral class	326	322	B-S	
		130	BC	
Bluest colour class	183		BC	
Magnitude, brightest star	596		B-S	
Radial velocity	98		WB	
Age	216		WB	
Total mass	130		WB	

Key to references:

AF Communication from Dr. A. Feinstein

BC Basel Catalogues:
Becker and Fenkart (1971)
Fenkart and Binggeli (1979)

B-S Bochum - Strasbourg magnetic tape catalogue of open clusters

CDS Centre de Donnees Stellaires, where the cluster numbers are assigned (cf. IAU, 1980)

GLy Selection by present author

OCL Alter et al. (1970)

RD Dixon (1976)

RT Trumpler (1930)

WB Communication from Dr. W. Buscombe

V. AVAILABILITY

Listings of the catalogue are available from the CDS in Strasbourg under reference number 7022. The medium may be paper, microfiche or magnetic tape. In Lund the working file is stored on a magnetic disc, from which smaller excerpts may be made in exceptional cases. The system of tracers described earlier (Lyngå and Lundström, 1980) is implemented on the Lund file, so that listings can be made in order of right ascension (1950.0), galactic longitude, distance, angular diameter or number in sequence.

VI. ACKNOWLEDGEMENTS

I gratefully acknowledge the permission to include extensive series of data provided by Dr. R.S. Dixon, Dr. A. Feinstein and Dr. W. Buscombe. During the laborious first stage of construction of the catalogue, Dr. I. Lundström, Mr J. Nyman and Miss E. Jurlander of Lund Observatory have been of great help. Also, the very good cooperation with Prof. C. Jaschek and his staff at Centre de Données Stellaires in Strasbourg is acknowledged.

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ADC Bull. (July 1981) 1, 94-104

Infrared Astronomical Data Base and Catalog of Infrared Observations†

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Abstract

A computer data base of infrared astronomical observations has been established at NASA/Goddard Space Flight Center. It contains a summary of all infrared (1μm-1000μm) observations of celestial sources outside the solar system, published in the major scientific journals since 1960, as well as the contents of infrared surveys and catalogs. A Catalog of Infrared Observations (CIO) has been developed from the data base in prirted and magnetic tape versions. A bibliographic Guide to the Infrared Astronomical Literature, and an Atlas of Infrared Source Names and Positions will be published in conjunction with the catalog. Future plans include development of an interactive data system at Goddard which will give a user direct access to the computerized data.

Introduction

The field of infrared astronomy has grown rapidly in the past two decades. Thousands of new infrared sources and source names have been introduced into the scientific literature. The profusion of observations has resulted in a mass of information of great importance which is not readily accessible because it is distributed throughout the literature and in dozens of specialized catalogs. Infrared surveys have clarified this situation somewhat by providing a homogeneous data set, and by attempting to identify near infrared sources with stellar objects. However, the majority of published infrared measurements, especially at longer infrared wavelengths, are not easily accessible and are rarely available in machine-readable form.

With preparation underway for space missions such as the Infrared Astronomical Satellite (IRAS) and Cosmic Background Explorer (COBE), the need has arisen for a summary of all infrared published observations in a single data set which can be accessed efficiently by source name, position, wavelength, or other parameters. The development of expanded infrared observatory facilities, including the NASA Infrared Telescope Facility (IRTF) at Mauna Kea, stimulates similar requirement for ground-based astronomers. The Infrared Astronomical Data Base

†Presented at the Society of Photo-Optical Instrumentation Engineers Technical Symposium East '81, April 20-24, 1981, Washington, D.C.

and its principal data product, the Catalog of Infrared Observations (CIO), are designed to assemble in one machine-readable data file all infrared observations in the astronomical literature, so that the researcher can easily determine the extent of current infrared observations, the position and strength of a source at a particular wavelength, where the observations have been published, and by whom. To clarify the nomenclature problem, an Atlas of Infrared Source Names and Positions has been developed, and a complete bibliographic Guide to the Infrared Astronomical Literature is provided to help the user focus his library search.

Infrared Data Base and Literature Search

The Infrared Astronomical Data Base is located at NASA/Goddard Space Flight Center (GSFC). It represents a machine-readable library of infrared (1μm to 1000μm) observational data published in the relevant scientific literature for celestial sources outside the solar system. Catalogs derived from the data base will be published periodically for distribution to interested researchers. To date, over 1100 journal articles and 10 major survey catalogs have been included in this data set, which contains about 70,000 individual observations of 10,000 different infrared sources. Of these, about 8,000 sources have been identified with visible objects and 2,000 do not have known visual counterparts.

The Infrared Astronomical Data Base has been constructed through an extensive search of the appropriate scientific journals and published infrared survey catalogs. This material has been cross-checked with the NASA/GSFC library RECON computer system and the Astronomy and Astrophysics Abstracts under applicable keywords. Table 1 shows the current status of the infrared literature search, which presently covers 20 scientific journals for the years 1976-1979 and for several of the most popular journals from 1979-1966. It is expected that completion of the literature search for the present journals as far back as 1960 will increase the number of observations in the data base by about 15%. The data base uses the NASA/GSFC IBM S-360/75 and S-360/91 computers. A magnetic tape library contains all of the observational data, bibliographic reference information, object name aliases, and star catalog listings (for supplementary position determinations). FORTRAN language programs needed to access and process the data are stored on disk. Computer printouts and a file of photocopies of journal articles are also part of the data base. A flow diagram of the operational configuration of the data base is shown in Figure 1. The format of the current data base is designed to facilitate the data acquisition and verification process, and provides a vehicle for development of future improvements, such as on-line queries of the data.

TABLE 1. Number of Journal Articles/Year in the Present Data Base

	Ap.J.	Ap.J. (Letters)	A.J.	M.N.R.A.S.	A.&Ap.	P.A.S.P.	Sov. Ast.	Other Publications	Yearly Totals
1979	61	30	19	19	20	6	4	19	178
1978	59	34	16	16	12	8	0	25	170
1977	40	22	9	14	10	13	3	23	134
1976	44	30	12	15	15	10	2	15	143
1975	24	22	6	14			2	4	72
1974	37	26	9	17			2	5	96
1973	30	31	3	18			2	2	86
1972	14	21	2	0			1	3	41
1971	15	15	3				1	3	37
1970	16	21	2				0	2	41
1969	9	21	0				2	6	38
1968	12	10	6					2	30
1967	12	8	0					1	21
1966	13	-						1	14
1965		-						4	4
1964		-						0	0
1963		-						1	1
1962		-						2	2
Total:	386	291	87	113	57	37	19	118	1108

Note: Blank years have not yet been searched, but will eventually b completed. A dash indicates that the journal was not published. "Other Publications" include 13 additional journals and a variety of survey catalogs. Completion of the literature search will increase the total number of observations in the data base by about 15%.

Ap.J. = Astrophysical Journal
Ap.J. (Letters) = Astrophysical Journal Letters
A.J. = Astronomical Journal
M.N.R.A.S. = Monthly Notices of the Royal Astronomical Society
A.&Ap. = Astronomy and Astrophysics
P.A.S.P. = Publications of the Astronomical Society of the Pacific
Sov.Ast. = Soviet Astronomy

The primary data structure is the "master entry", which consists of an ordered set of data fields. These include the "object position" field (which is the primary key for data searches), the "bibliographic reference number" field (which may be common to several master entries), and the "object name" field (which acts as a key to locate a corresponding "atlas" entry). The "atlas" entry contains the position corresponding to each object name, as well as a list of alternate names or aliases. When no position information is available for an object name, the atlas indexes the name to another catalog object name or alias entry where the position can be found.

In the current system, two access modes are available. First, a request for a particular position can be used to locate a particular "master entry". Second, a request for an "object name" can be used to locate the atlas entry which contains position information necessary for retrieval of the master entry. Therefore, the atlas entries can be used as an inverted index to the master entries. It should be noted that the data base scheme allows redundant information to exist. This redundancy is permitted so that the data can be analyzed and selected as appropriate for each data product.

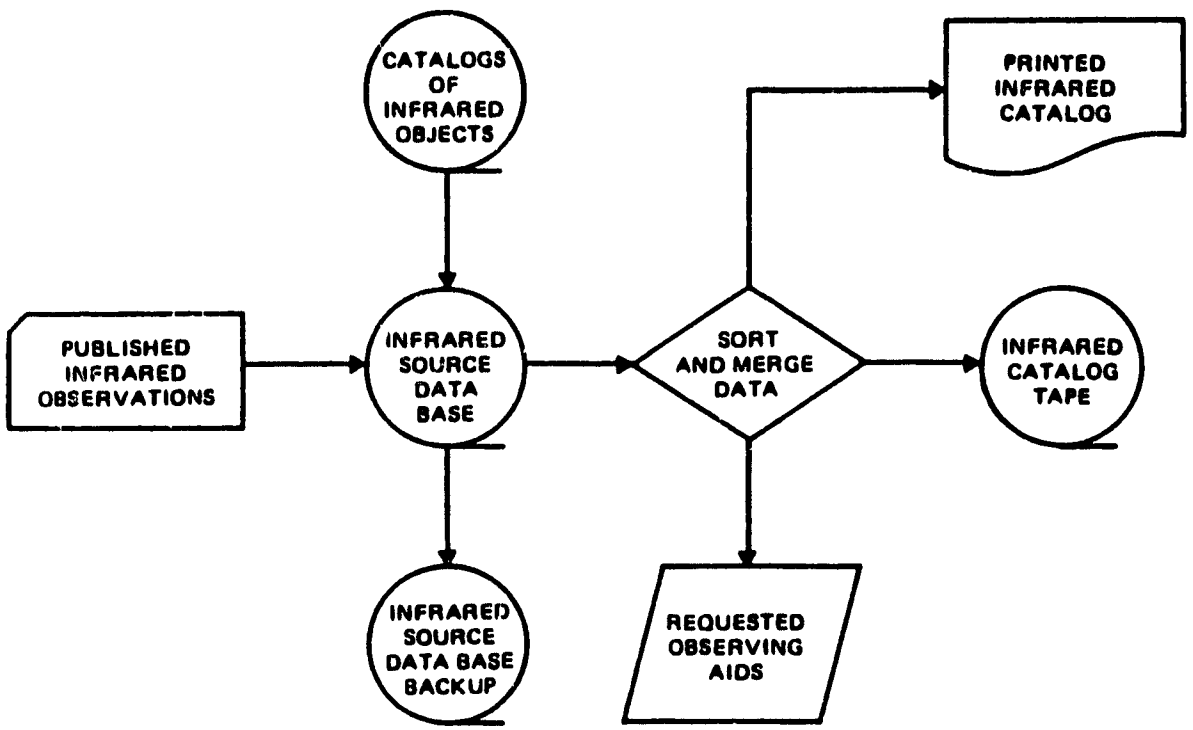

Figure 1. Flow chart of Infrared Catalog and Data Base

Catalog of Infrared Observations

The first product of the infrared data base was the Merged Infrared Catalogue (MIRC) (Schmitz et al. 1978), a compilation of five other infrared catalogs (Two-Micron Sky Survey (Neugebauer and Leighton 1969), Observations of Infrared Radiation from Cool Stars (Gillett et al. 1971), Air Force Geophysics Laboratory Four Color Infrared Sky Survey (Price and Walker 1976) and AFGL Supplemental Catalog (Price 1977), and a Catalog of 10μm Celestial Objects (Hall 1974)). The 13,588 observations in the MIRC from 2.2μm to 27.4μm are listed in both magnitude and flux units. The next catalog produced will be the Catalog of Infrared Observations (CIO), which contains all of the observational infrared data published in the astronomical literature, in addition to the contents of the MIRC. The CIO (Figure 2) contains the following information, as given in the original published reference:

SOURCE NAME
SOURCE POSITION (right ascension and declination at epoch 1950.0)
BEAM SIZE (or aperture)
WAVELENGTH OF OBSERVATION (microns)
INFRARED FLUX (units given in the original reference)
BIBLIOGRAPHIC REFERENCE NUMBER (of the original reference)
POSITION REFERENCE NUMBER (if source position was not given in original reference)
COMMENTS (observational details and object identifications)

If the position of the infrared source is not explicitly given in the original reference, the position was obtained by the editors from other references. Most supplemental stellar positions were obtained from the 1976 version of the Catalogue of Stellar Identifications (CSI) (Jung and Bischoff 1971). Other major catalogs used for obtaining supplemental positions include the Revised New General Catalogue (RNGC) (Sulentic and Tifft 1973), the General Catalogue of Variable Stars (GCVS) (Kukarkin et al. 1969), the Master List of Radio Sources (RA42)(Dixon 1976), the Two Micron Sky Survey (IRC), the Catalogue of Galactic Planetary Nebulae (P-K) (Perek and Kohoutek 1967), and the Index Catalogue (IC) (Dreyer 1895). If the position was determined by the editors, the positional reference column of the CIO contains the term "ED". This column is left blank if the position was given in the original reference. When the position was obtained from another publication contained in the infrared data base, the six-digit bibliographic reference number is given. Positions in the CIO are given at epoch 1950.0. The beam size (or aperture) is presented as given in the original reference in degrees (D), arc minutes (M), or arc seconds (S). The beam size column of the CIO contains a dash if no aperture information is given in the

OBJECT	R.A. (1950.0)	DEC.	BEAM	BIBLIO. REF. NUMBER	1-5 MICRON WAVE LENGTH	1-5 MICRON FLUX	5-35 MICRON WAVE LENGTH	5-35 MICRON FLUX	>35 MICRON WAVE LENGTH	>35 MICRON FLUX	POSITION REFERENCE	COMMENTS
[illegible]	02 23 00.3	[illegible]	[illegible]	731202	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	CS1	[illegible]
[illegible]	02 23 00.5	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	CS1	[illegible]
[illegible]	02 23 13	[illegible]	[illegible]	750001	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		
[illegible]	02 23 30.7	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]
[illegible]	02 23 10.3	[illegible]	[illegible]	[illegible]			[illegible]	[illegible]	[illegible]	[illegible]		[illegible]
[illegible]	02 23 17	[illegible]	[illegible]	[illegible]			[illegible]	[illegible]				
[illegible]	02 23 19	[illegible]	[illegible]	751202			[illegible]	[illegible]				
[illegible]	02 23 21.4	[illegible]	[illegible]	[illegible]								
[illegible]	02 23 22	[illegible]	[illegible]	[illegible]					[illegible]	[illegible]		[illegible]
[illegible]	02 23 24	[illegible]	[illegible]	750001	[illegible]	[illegible]					CS1	[illegible]
[illegible]	02 23 26	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]					CS1	[illegible]
[illegible]	02 23 28.3	[illegible]	[illegible]	720002	[illegible]	[illegible]	[illegible]	[illegible]				
[illegible]	02 23 26	[illegible]	[illegible]	770707					[illegible]	[illegible]		
[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]					CS1	
[illegible]	02 23 33.2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]						

690001 NEUGEBAUER,G.,LEIGHTON,R.B. <NASA SP-3047>
TWO-MICRON SKY SURVEY-A PRELIMINARY CATALOG.

690101 STEIN,W.A.,GAUSTAD,J.E.,GILLETT,F.C.,KNACKE,R.F. <AP.J.(LETTERS),155,L3>
CIRCUMSTELLAR INFRARED EMISSION FROM TWO PECULIAR OBJECTS-R AQUARII AND R CORONAE BOREALIS.

690102 HOFFMANN,W.F.,FREDERICK,C.L. <AP.J.(LETTERS),155,L9>
FAR-INFRARED OBSERVATION OF THE GALACTIC-CENTER REGION AT 100 MICRONS.

690201 MITCHELL,R.I.,JOHNSON,H.L. <COMM. LUNAR AND PLANETARY LAB.,8,1>
THIRTEEN-COLOR NARROW-BAND PHOTOMETRY OF ONE THOUSAND BRIGHT STARS.

690202 KODAIRA,K.,GREENSTEIN,J.L.,OKE,J.B. <AP.J.,155,525>
ABUNDANCES IN TWO HORIZONTAL-BRANCH A STARS.

690203 GILLETT,F.C.,STEIN,W.A. <AP.J.(LETTERS),155,L97>
DETECTION OF THE 12.8-MICRON NE+ EMISSION LINE FROM THE PLANETARY NEBULA IC 418.

690301 VISVANATHAN,N. <AP.J.(LETTERS),155,L133>
THE CONTINUUM OF BL LAC.

690302 STEIN,W.A.,GAUSTAD,J.E.,GILLETT,F.C.,KNACKE,R.F. <AP.J.(LETTERS),155,L177>
THE SPECTRUM OF NML CYGNUS FROM 7.8 TO 14 MICRONS.

690303 WOOLF,N.J.,NEY,E.P. <AP.J.(LETTERS),155,L181>
CIRCUMSTELLAR INFRARED EMISSION FROM COOL STARS.

FIGURE 2 (Top): Excerpt from the Catalog of Infrared Observations (CIO).

FIGURE 3 (Bottom): Excerpt from the Bibliographic Guide to the Infrared Astronomical Literature.

original reference. The beam size is useful in conjunction with observations listed, as an indication of positional accuracy, and as an aid in determining positional coincidences with other sources. The CIO lists the wavelength of each observation in microns, followed in parentheses by the observed flux at that wavelength in units as given in the original reference. To preserve the integrity of the data, no attempt has been made to convert the different systems into a standard set of intensity units.

The CIO contains additional comments on observational data including spectroscopic information, indicated by the starting and ending wavelengths of the spectrum. A catalog entry which only contains spectroscopic data has the letter "S" in the "units of flux" field. A similar scheme is used for source diameter measurements. For polarimetry, only the wavelengths of observation are given, not the angles or magnitudes of the polarization. Upper limit measurements are indicated by the letter "U" in the "units of flux" field, with the units of flux specified in the comment field. Source diameters, detector, and telescope data are not included in the present version of the CIO. This information must be obtained by the user from the original references using the bibliographic reference number and the Guide to the Infrared Astronomical Literature.

Bibliographic Guide and Atlas of Names and Positions

The Guide to the Infrared Astronomical Literature (Figure 3), included as an appendix to the CIO, indexes the catalog entries to the original references and provides a complete bibliography of the published infrared astronomical literature. The 1,100 infrared journal articles and catalogs are listed in this appendix, with 49 additional references used for position determinations or other data. The bibliographic Guide is arranged chronologically by reference number (which contains the year and month of publication) followed by the authors' last names and initials, journal name or document number, volume, page number, and full title of the reference. The bibliography is also listed alphabetically by author.

The Atlas of Infrared Source Names and Positions (Figure 4) is a cross-index of object names, positions, name aliases, and identifications made in the literature or other catalogs. The Atlas is used for locating a source in the CIO by name rather than position, and for identifying observations of the same source which are listed in the catalog under different names. The Atlas is sorted alphabetically by all of the infrared source names in the CIO. The major catalogs included in the Atlas are the Two-Micron Sky Survey (IRC), the Air Force Geophysics

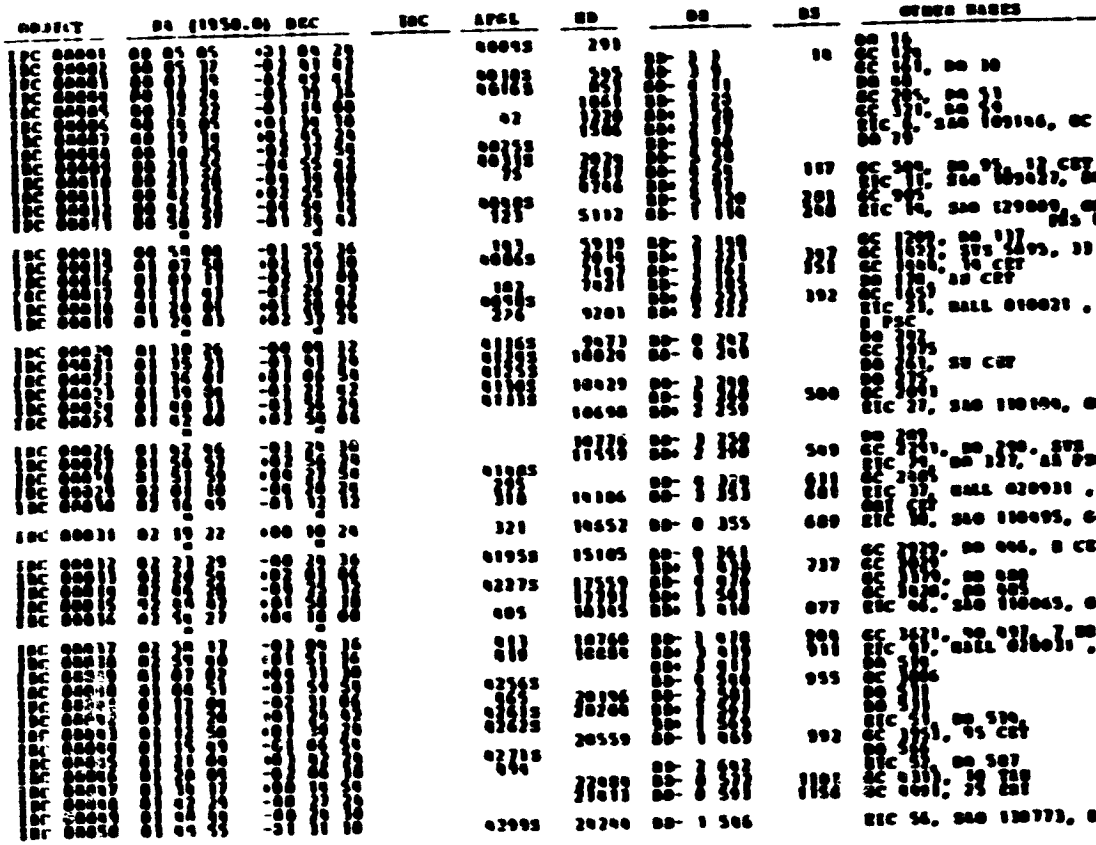

FIGURE 4: Excerpt from the Atlas of Infrared Source Names and Positions. As an example, the source IRC 00032 in the CIO (Figure 2) has a number of other names and its position listed in the Atlas. Thus, the catalog entry for IRC 00032 may be located using its position from the Atlas, and other observations of the same source may be identified by checking nearby catalog entries for alias names. In this case, the source has been identified by other references as AFGL 61955 and S CET (S Cet1). These observations appear under different names at slightly different positions in the CIO . The bibliographic reference number for IRC 00032 in the CIO is 690001, refering to the listing in the Guide to the Infrared Astronomical Literature (Figure 3). The number is made up of the year and month of publication, and an identifier (780214 = 1978 February #14).

Laboratory Four Color Infrared Sky Survey (AFGL) and Supplement (AFGL), the Henry Draper (HD) (Cannon and Pickering 1918) catalog, the Durchmusterung (DM) catalogs, including the Bonner (BD) (Argelander 1859), Cordoba (CD) (Thome 1892), and Cape Photographic Durchmusterung (CPD) (Gill and Kapteyn 1896), and the Yale Bright Star Catalogue (BS) (Hoffleit 1964). Entries from over 100 catalogs are contained in the Atlas of Infrared Source Names and Positions.

Development of the Data Base and Catalogs

Concurrent with the completion of the literature search as far back as 1960 and the expansion of the data base, several improvements in the data base development program are planned. A positional coincidence analysis will be performed to determine which of the observations overlap in the sky. Two-dimensional graphical displays of the infrared data will be generated as overlays for photographic sky surveys. An attempt may be made to reduce the infrared fluxes to a standard system of units. A user-interactive data terminal system will be implemented at Goddard Space Flight Center to give individuals direct access to the computer data base. Results of these efforts may be combined to produce a homogeneous infrared sky catalog of standard source names, positions, and intensities.

Acknowledgments

This work developed out of an infrared catalog program started by Larry Brown in the Laboratory for Extraterrestrial Physics at Goddard, which produced the Merged Infrared Catalog (MIRC). We are grateful to Dr. M. Mumma and Dr. M. Hauser for their continuing support of our infrared catalog and data base research. Dr. P. Baker has contributed significantly to the successful development of the program. We would like to thank Dr. T. Nagy and Dr. W. Warren, Jr. for their help in obtaining positional data to supplement the results of the literature search and for useful discussions regarding data base management procedures. This work is supported by NASA/Goddard Space Flight Center and by NASA contract NAS 5-24360.

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ADC Bull. (July 1981) 1, 105-107

THREE SHORT NOTES ON THE AIR FORCE GEOPHYSICS LABORATORY (AFGL) CATALOGUE

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The following notes refer to data in or related to the AFGL Four-Color Infrared Sky Survey (S.D. Price and R.G. Walker 1976, AFGL-TR-76-0208).

Saturated AFGL sources: Several of the sources in the AFGL are in saturation, which means that all of the individual measurements in the given band were saturated. For these sources the given values represent lower limit magnitudes. There are 11, 5 and 6 saturated sources in the 4-, 11- and 20-micron bands, respectively. A summary table of these saturated magnitudes (only) is given in Table 1 along with the identifiers from the AFGL, the Two-Micron Sky Survey (G. Neugebauer and R.B. Leighton 1969, NASA SP-3047) and the Catalogue of Bright Stars (YBS - D. Hoffleit 1964, Third Revised Edition, Yale University Observatory, New Haven, Connecticut). An "X" in the extended-object (EO) column identifies the object as having "significant annular extent with respect to the subtense of the detector".

Duplicate identifiers: Two of the AFGL sources (#1355 and #4094) are identified with the same two-micron source (#+40206). The great circle arc distances between these sources are as follows:

IR Pair	Great Circle Arc Distance (arc seconds)
+40206-1355	98
+40206-4094	423
1355-4094	363

Neither AFGL 1355 nor 4094 sources are designated as extended objects in the catalogue.

Other identifier correlations: The AFGL catalogue lists the two-micron (2μ) identification (ID) correlation with the AFGL sources. The 2μ Catalogue gives the Yale Bright Star Catalogue (YBS) number. For the merge of these two data sets, Table 2 presents the correlation matrix for these three identifiers. With three possible identifications there are eight possible combinations. Table 2 is an explicit breakdown of these eight combinations. An "X" in a column means that the identification is present and a dash ("-") means that it is not. For example, 2942 entries have only a 2μ ID but 1058 have both 2μ and AFGL IDs but not a YBS ID. The total for the 2μ is 5613 because of the duplicate identifier problem mentioned above.

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Table 1. Saturated AFGL Sources

AFGL #	WAVELENGTH (microns) 4	11	20	2μ #	YBS #	OTHER #	EO
186			-5.0	70021	--	DO 24161	--
4015	0.6			--	--	--	--
318	-3.9			00030	681	o Cet	--
779		-5.1	-7.3	-10093	--	M42	X
836	-3.6			10100	2061	α Ori	--
1071	0.8			--	--	--	--
1109	1.4			50178	--	DO 31504	--
1150	0.1			30190	2905	ν Gem	--
1381		-6.1	-8.6	10216	--	CW Leo	X
4107			-8.0	--	--	RCW 49	X
4114		-6.9	-8.2	--	4210	η Car	X
4126			-8.2	--	--	NGC 3603	--
1650	-3.9			-30207	--	W Hya	--
1863	-3.6			-30265	6134	α Sco	--
1874	1.1			-10344	--	GC 22375	--
1947	-3.7			10324	6406	α^1 Her	--
2077		-0.9		40312	--	V529 He	--
2124		-5.7		-20466	--	M17	X
2192	1.3			--	--	--	--

Table 2. Cross Correlation Identifier Matrix

	Identification			
	2μ	AFGL	YBS	Counts
	-	-	-	0
	X	-	-	2942
	-	X	-	685
	X	X	-	1058
	-	-	X	0
	X	-	X	1027
	-	X	X	34
	X	X	X	586
Totals	5613	2363	1647	6332

ADC Bull. (July 1981) 1, 108-112

REVISED MAGNETIC TAPE OF THE N30 CATALOG OF 5,268 STANDARD STARS

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A revised magnetic tape of the N30 catalog (Morgan 1952) has been prepared at the Astronomical Data Center. The machine-readable version of the catalog was received from the Centre de Donnees Stellaires, Strasbourg but was punched originally at the U.S. Naval Observatory, Washington, DC. The modifications were undertaken in order to make the data records more compatible with those of other similar catalogs and to computerize and add a remarks file containing the footnotes included in the published catalog. The following modifications were made:

1. All leading zeroes in the data fields were eliminated (replaced by blanks).

2. All northern Durchmusterung designations, which contained zeroes for the zone sign, were changed to include the plus sign. Since the minus signs were already present for the southern zones, all DM numbers are now uniform in format.

3. The GC numbers and secular variations in α and δ, given as zeroes if not present, were converted to blank fields.

4. Changes were made to certain spectral-type fields to eliminate the need for special codes and to clarify the types:

   (*a*) Peculiar and emission symbols (p, e) were changed to lower case letters to conform to standard usage and to the capabilities of current alphanumeric processors.

   (*b*) Composite spectra are indicated by two spectral types which run together in the 4-byte field. Types of the form K0A were changed to the form K0+A.

   (*c*) Peculiar HD O-star types were decoded by replacing O1 with Ob, O3 with Od, O4 with Oe5 and O0P with OaP.

5. Plus signs were added to the first byte of each positive declination field to make all fields uniform.

The notes file was created by keying the footnotes directly to a disk data set and transferring to magnetic tape after verification. Checks were made to ensure that all records containing a notes flag have corresponding notes and vice versa.

A sample listing of data records exactly as they appear on the tape files is given in Figure 1.

REFERENCE

Morgan, H.R. (1952). *Catalog of 5,268 Standard Stars for the Equinox and Epoch 1950.0 Based on the Normal System N30, Astron. Papers Amer. Ephemeris* 13, Part III.

L I S T I N G   O F   R E C O R D S   F R O M   T A P E   F I L E

```
              TAPE FILE NAME: N30 CAT 5280 STD. STARS
                     RECORDS        1 TO    20
                   TAPE FILE       13
               RECORD LENGTH       80 BYTES
                INPUT VOLSER      WTS001

C O L U M N                                                                                                            1111111111111111
H E A D I N G          111111111122222222223333333333444444444455555555556666666666777777777788888888889999999999000000000011111
I N D E X         1234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345

RECORD      1    1+03 4926      016F0  000106388     1  -13      208 21+03374347  -2   -6   208 21
RECORD      2    2-10 6417   23 462A0  000110772     1   19      325 91-17365139  -2   -3   328 91
RECORD      3    3+13 5201   26 726F0  000121065     1   54      325 23+14060289  -2  -17   313 25
RECORD      4    4-72 2000   42 86489  000210299    14   83    -2332 17-71425477  -2  -17   332 17
RECORD      5    5+22 4950      787G5  000220739     1  279      202  5+22582925  -2    2   202  5
RECORD      6    6+28 4744   40 657G5  000226561     1   61      311 21+27234787  -2    3   302 24
RECORD      7    7+44 4550   54 651A0  000234999     2  -27      292 17+44570304  -2  -11   287 10
RECORD      8    8-06 6357   59 460K0  000248543     1   -6      349 53-05591409  -2   91   335 40
RECORD      9    9-10 6227   69 711F5  000257334     1   61      331 15-09534135  -2  -60   331 15
RECORD     10   10+30 5219   87 871G5  000320358     2    6      ..3 15+40082500  -2    3   206 10
RECORD     11   11-4014337   92 577G0  000344214     3  607    -6313 14-49211106  -2  -36   313 14
RECORD     12   12+20 4704   95 820K0  000400697     1  282     2290 22+20444455  -2 -174   290 22
RECORD     13   13-23    4   98 606F0  000416660     1   70      383 36-23230701  -2  -44   354 30
RECORD     14   14-03    2  114 633B0  000510365     1   21      314 30-02493720  -2    5   305 40
RECORD     15   15-03    3  124 632K0  000530400     1    1      327 30-02433375  -2   -0   321 40
RECORD     16   16+20    4  127 215A0p 000547843     1  100     1312107+20405206  -2 -161   320 96
RECORD     17   17+50    3  147 242F5  000620754     5  676    11333 00+50522666  -2 -170   342 74
RECORD     18   18-54   19  148 634G0  000631526     4   70    -1317 12-84164963  -2   20   317 12+
RECORD     19   19+04    3  152 702K0  000637001     6  212     5349  0+04473201  -2   33   340  0
RECORD     20   20+18    3  154 717G0  000644037     1   -1      311 25+17152706  -2 -120   314 25
```

Figure 1. Sample listing of groups of records at beginnings and ends of N30 catalog tape files.

```
L I S T I N G   O F   R E C O R D S   F R O M   T A P E   F I L E

            TAPE FILE NAME: N30 CAT 5268 STD. STARS

                  RECORDS   5249 TO   5268

                TAPE FILE     13

             RECORD LENGTH     80 BYTES

              INPUT VOLSER   WTS001

C O L U M N                                                                                                     111111111111111
H E A D I N G          11111111112222222222333333333344444444445555555555666666666677777777778888888888999999999900000000001111111
I N D E X     1234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345

RECORD   5249  5249+24 406533230 475M0  235512362      1  -32       343 44+24514066   -2  -29   340 47
RECORD   5250  5250-12 6592        790G5  235542375      1  -47       329 10-11441079   -2  -40   329 10
RECORD   5251  5251-18 639433242 640K2  235546933      1   50       326 32-16073315   -2  -10   324 33
RECORD   5252  5252+34 503933243 671A3  235547080      2    7       290 22+34440401   -2   10   291 25+
RECORD   5253  5253-571030933246 670G0  235555938      5   38     -1314  0-57333270   -2  -19   314  8
RECORD   5254  5254-04 599633240 507K0  235606704      1  -34       320 60-03500041   -2  -72   330 58+
RECORD   5255  5255-531056133258 514K0  235620816      4   71     -1318 12-53013044   -2   00   318 12
RECORD   5256  5256+54 308233257 49382  235627608      4    2       322 20+55283635   -2    7   315 24+
RECORD   5257  5257+06 522733262 403F5  235644490      1   89       315109+06351136   -2 -110   332100
RECORD   5258  5258-08 633533273 677G5  235708717      1   24       327 33-06101433   -2  -49   321 32
RECORD   5259  5259-60 301033280 47100  235719983      8   94     -2309 13-65511804   -2  -15   309 13
RECORD   5260  5260+05 5245        708K0  235720455      1   11       277 17+05404306   -2  -38   277 17
RECORD   5261  5261-00 4603        810K6  235005220      1   27       305 21-00031026   -2   13   305 21
RECORD   5262  5262-401431633305 560K0  235830847      3   -6       330 11-49051765   -2   -2   336 11
RECORD   5263  5263+40 430033311 636K0  235845374      3   -1       330 12+49421200   -2   -4   338 12
RECORD   5264  5264-77 150633321 473K0  235903675     30  -80      3226 10-77203027   -2 -175   240 10
RECORD   5265  5265-401531133323 682F5  235907860      2   44       334 12-40253682   -2   -7   334 12
RECORD   5266  5266-371548033328 703K0  235921780      2  -11       336 12-37302815   -2  -46   336 12
RECORD   5267  5267-06 634533330 466M1  235923729      1   34       332 56-06173007   -2  -34   329 57
RECORD   5268  5268+07 612133241 578F0  235958196      1  -67       310 32+00122794   -2  -42   302 32
```

Figure 1. (continued)

```
L I S T I N G   O F   R E C O R D S   F R O M   T A P E   F I L E

           TAPE FILE NAME: N30 CAT NOTES FILE

                 RECORDS      1 TO     20

               TAPE FILE     14

           RECORD LENGTH     80 BYTES

            INPUT VOLSER   UTS001

                                                                                                                     1111111111111111
C O L U M N
H E A D I N G           1111111111222222222233333333334444444444555555555566666666667777777777888888888899999999990000000000111111
I N D E X      1234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345

RECORD     1    16. 6.4:6.5, 0.6°, 274°.

RECORD     2    29. 9.9, 1.6°, 285°.

RECORD     3    70. 5.5:8.0, binary.

RECORD     4   107. 8.8, 5.9°, 186°.

RECORD     5   112. 5.7:6.5, 0.3°, binary.

RECORD     6   124. 6.5:6.5, 0.5°, binary.

RECORD     7   133. Variable, 2.1 to 2.6 mag.

RECORD     8   144. 6.8:7.0, 0.7°, 346°.

RECORD     9   152. Variable, 5.7 to 6.1 mag.

RECORD    10   180. GC proper motion in R.A. is doubtful.

RECORD    11   183. 3.7:7.3; c. of g.

RECORD    12   194. 7.5:8.7, 0.6°, 333°.

RECORD    13   199. 7.6:7.6, 6.2°,  10°.

RECORD    14   208. 7.0:10.0, 1.4°, 246°.

RECORD    15   218. 4.2:4.2, 1.4°, 6°.

RECORD    16   259. Variable 6.0 to 8.1 mag.

RECORD    17   261. Preceding.

RECORD    18   262. Following.

RECORD    19   268. 9.4, 2.6°, 337°.

RECORD    20   276. 7.4:7.9, 0.3°, 60°.
```

Figure 1. (continued)

L I S T I N G   O F   R E C O R D S   F R O M   T A P E   F I L E

```
TAPE FILE NAME: N30 CAT NOTES FILE
       RECORDS    258 TO    277
     TAPE FILE     14
 RECORD LENGTH     80 BYTES
  INPUT VOLSER    WTS001

C O L U M N                                                                                                              1111111111111111
H E A D I N G            111111111122222222223333333333444444444455555555556666666666777777777788888888889999999999000000000011111
I N D E X       1234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345

RECORD   258  S057. 6.0:7.5, 0.9°, 240°.
RECORD   259  S064. B5 + A2p.
RECORD   260  S075. 6.3:6.3, 0.2°, binary.
RECORD   261  S077. 7.0 mag, 1.0°,  44°; QC gives mean.
RECORD   262  S078. 5.6:9.1, 1.2°, 213°.
RECORD   263  S087. 6.7:7.2, 0.2°, 310°.
RECORD   264  S089. 8.0:8.5, 0.3°, 143°.
RECORD   265  S116. 7.0:8.4, 0.3°, 214°.
RECORD   266  S121. 9.7 mag, 1.0°, 174°.
RECORD   267  S123. 7.6 mag, 3.0°, binary; QC gives mean.
RECORD   268  S137. 5.7:5.7, 0.3°, 320°.
RECORD   269  S140. 7.4:7.6, 0.3°, 130°.
RECORD   270  S162. 6.5 mag, 1.2°, 344°; variable, 4.9 to 5.0 mag.
RECORD   271  S165. 7.3:7.9, 0.2°, 150°.
RECORD   272  S187. 6.2:7.1, 0.6°, 333°.
RECORD   273  S236. Variable, 4.4 to 5.1 mag.
RECORD   274  S242. Variable, 6.2 to 7.0 mag.
RECORD   275  S252. 9.2 mag, 3.5°,  20°.
RECORD   276  S254. 9.0 mag, 1.5°, 200°.
RECORD   277  S260. 7.0 mag, 3.1°, 320°.
```

Figure 1. (continued)

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POSITIONAL CORRELATION OF THE TWO-MICRON SKY SURVEY AND SMITHSONIAN ASTROPHYSICAL OBSERVATORY CATALOGUE SOURCES

T. A. Nagy* and R. S. Hill*

The positional correlation of two lists of astronomical sources, done either manually or by computer, can be a very time-consuming process if efficient search techniques are not utilized. Since this is a recognized problem for a number of applications, a method has been designed and coded to rapidly process even large lists. The MATCH Program (Hill and Nagy 1981) is written mainly in the Fortran language but the efficiency of the program relies on some installation-specific utilities and software available on the NASA/GSFC computers.

The MATCH Progam has been utilized to identify the closest Smithsonian Astrophysical Observatory (SAO, Haramundanis 1966) star to each Two-Micron Sky Survey (Neugebauer and Leighton 1969) object. The resultant data set consists of the full entry from each of the two original catalogues. Two by-products of this data set are in preparation. The first will consist of an identifier cross index and the other will be a list of possible errata from each of the two lists. This latter list was generated as a result of comparing a common datum in the two input catalogues, i.e., the Durchmusterung number. The resolution of the discrepant entries (Hill 1981) may result in the correction of one or both of the subject catalogues.

REFERENCES

Haramundanis, K. L. 1966, "Smithsonian Astrophysical Observatory Catalog", Smithsonian Institution, Washington, D. C.

Hill, R. S. 1981, "Questionable Durchmusterung Identifications in the Two-Micron Sky Survey", in preparation.

Hill, R. S. and Nagy, T. A. 1981,"Documentation and User's Guide for the MATCH Program", SASC #EAC-T-5294-0031.

Nagy, T. A., Hill, R. S. and Mead, J. M. 1981, "Two-Micron Sky Survey/SAO Cross Index: Closest Star", in preparation.

Neugebauer, G. and Leighton, R. B. 1969, "The Two-Micron Sky Survey", California Institute of Technology, NASA SP-3047.

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ADC Bull. (July 1981) 1, 114-120

SEARCH CAPABILITIES FOR THE *CATALOG OF STELLAR IDENTIFICATIONS*, EDITION 1979

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I. INTRODUCTION

The *Catalog of Stellar Identifications (CSI)* provides cross references for star numbers in approximately 30 different catalogs and is the fundamental file of the stellar data base at the Centre de Données Stellaires, Strasbourg (Ochsenbein *et al.* 1981 and references therein). The current version of the CSI contains 434,928 stars and is the largest reliable machine-readable catalog. The data contained in the catalog allow not only searches for optical objects in a given region of the celestial sphere, but also make retrieval of specific data from any included catalog possible via individual data fields containing original catalog numbers. Specific data retrieval is accomplished by selecting, for each input star, only those records containing data in previously specified catalogs. The corresponding required data are then retrieved by using each newly created data set as input to a program to search the appropriate source catalogs.

Three versions of the CSI are currently available at the Astronomical Data Center: (1) a binary version containing a uniform format and unique data fields for each catalog connected to the CSI; (2) a character coded version containing identical basic data such as Durchmusterung (DM) and Henry Draper (HD) numbers, magnitudes, spectral types, and equatorial and Galactic coordinates, but with decoded catalog cross-identification numbers for only the catalogs including a given star, and; (3) a character coded version sorted by right ascension (the original catalog order is by zones as in the DM and AGK3 catalogs).

Computer programs have been developed to search the right ascension ordered, character coded version by position and the binary zone ordered version by DM number. This paper describes the two search procedures and gives examples of the output obtained. The positional search is discussed in section II; section III describes the search of the uniformly formatted tape by DM number, plus the creation of individual data sets for further searching of the source catalogs. Future developments are discussed in section IV.

II. THE SEARCH BY POSITION

A frequent and useful application of machine-readable astronomical catalogs is to locate all objects within given positional boundaries on the celestial sphere. This search mode is often used to select possible optical

identifications for objects detected at ultraviolet, infrared or radio wavelengths, or to select stars in the region of a cluster. The search program for the CSI accepts as input lower and upper boundaries in right ascension and declination and retrieves all catalog objects within the defined area. In addition to printing all catalog information for the stars selected, a description of the data, plus definitions and bibliographical information for all CSI abbreviations used are printed on two header pages. Multiple regions can be processed simultaneou. ·. but their right ascension boundaries cannot overlap because the program cu. ·ly operates in a sequential search mode using the right ascension ordered data Processing time is minimized by giving the program a starting record number for the search to begin if the first region starts at greater than 0 hours RA. The program also provides punched, tape or disk output if further searching of source catalogs is desired.

Sample output from the positional search program is shown in Figure 1 for small regions near the α Persei and Pleiades clusters.

III. THE SEARCH BY CATALOG NUMBER AND SOURCE DATA RETRIEVAL

The most important application of computerized astronomical catalogs is the automatic retrieval of cross identifications and various kinds of data for specific objects. This problem is complicated by the fact that different source catalogs list objects by various designations and numbering systems, or order their entries by coordinates with only free field (non-uniform) object identifications. The CSI solves the problem in principle by providing the cross references necessary to enter the source catalogs for data retrieval, although the complete solution remains far from trivial since it is still necessary to order the source catalogs correctly and to actually search them for the data desired. The ideal software retrieval system would allow the user to specify any designation for an object and be able to retrieve all corresponding identifications plus source data from any catalog specified. The second search program described here partially solves the source data retrieval problem by using a CSI search by certain designations to retrieve alternate and source-catalog identifications for the same objects. This search is conducted with the binary version of the CSI, since a uniform format is necessary to examine the defined fields of specified catalogs for object inclusion. Two programs allow searches by either DM or HD number and retrieve all other CSI data for the objects found. The main program (DM search) also accepts a coded list of source catalogs from which data are desired. As each object is located in the CSI, all designated source-catalog identifiers are examined for inclusion. If a particular object is present in one or more of the preselected catalogs, a corresponding entry containing the source catalogs, DM and HD designations is written to a disk file for that catalog. In other words, each source catalog specified results in the creation of a separate d. ·: file. Only records having an entry (non-zero field) for a designated source catalog are written to that catalog's disk file. The individual data sets can then be used by subsequent programs to retrieve the data desired.

Even limiting oneself to DM and HD numbers, a complication arose due to the possibility of multiple DM numbers for stars in the -1° to -2° zones and south of -18° declination, where the same star may have BD (*Bonner Durchmusterung*), SD (*Southern DM*), CD (*Cordoba DM*), and/or CPD (*Cape Photographic DM*) designations, depending on the zones involved. Fortunately, this difficulty was foreseen and

C S I C A T A L O G U E S E A R C H

ASTRONOMICAL DATA CENTER
NASA GODDARD SPACE FLIGHT CENTER

CATALOGUE EXPLANATION AND ABBREVIATIONS: CATALOGUE OF STELLAR IDENTIFICATIONS, EDITION 1979

DATA:

DM1 DURCHMUSTERUNG IDENTIFICATION CONSISTING OF ZONE, NUMBER IN ZONE, AND CODE IDENTIFYING DM AS BD (-19), CD (20-39), AND
DM2 CPD (40-59). A NEGATIVE DM NUMBER IS GIVEN FOR DM2 IF STAR BELONGS TO NO DM CATALOGUE, IN WHICH CASE THE NUMBER IS CODED
WITH 1950 RIGHT ASCENSION IN HOURS, MINUTES, AND TENTHS OF A MINUTE.

HD NUMBER IN THE HENRY DRAPER CATALOGUE OR ITS EXTENSION.

Mb HOMOGENIZED B MAG (SEE OCHSENBEIN, F. 1978, ASTRON. ASTROPHYS. SUPPL. 15, 215). A "V" INDICATES VARIABILITY.

Mv HOMOGENIZED V MAG. LOWER PRECISION (NON-HOMOGENIZATION) IS INDICATED BY A : FOLLOWING "V".

SP ONE DIMENSIONAL (HD OR PSEUDO-HD) SPECTRAL TYPE.

RA EQUATORIAL COORDINATES HAVING A PRECISION OF ABOUT 1.5M. A : FOLLOWING RA INDICATES ONLY ABOUT 1° ACCURACY.
DEC

LII GALACTIC COORDINATES GIVEN IN DEGREES.
BII

FOLLOWING THESE DATA ARE GIVEN IDENTIFICATIONS FOR A STAR IN ALL OTHER CATALOGUES CONNECTED TO THE CSI WHICH CONTAIN THE STAR. IN SOME CASES ONLY THE CATALOGUE ABBREVIATION IS GIVEN AS AN INCLUSION FLAG (E.G. ABT, DM). THE ABBREVIATIONS USED ARE IDENTIFIED IN THE TABLE ON THE FOLLOWING PAGE.

THE TABLE BELOW PROVIDES "AMAS" IDENTIFICATIONS, WHICH GIVE DESIGNATIONS IN CLUSTERS NOT POSSESSING NGC OR IC NUMBERS. EACH DESIGNATION CONSISTS OF 3 NUMBERS: THE FIRST IDENTIFIES DISCOVERER, THE SECOND GIVES CLUSTER NUMBER, AND THE THIRD GIVES STAR NUMBER WITHIN THE CLUSTER, ACCORDING TO THE BIBLIOGRAPHY GIVEN BY J.-C. MERMILLIOD (1979, CDS INF. BULL. 16, 32).

1:	ABELL	15:	FRINSTEIN	29:	SHER	100:	BERKELEY
2:	ALTER	16:	GINGERICH	30:	STEPHENSON	101:	COLLINDER
3:	APRIAMASHVILI	17:	GRAFF	31:	STOCK	102:	MELOTTE
4:	ARP	18:	HAPPENER	32:	SAHLBAJAN	103:	RUPRECHT
5:	BAADE	19:	HARVARD	33:	TERZAN	104:	van den BERGH - HAGEN
6:	BARKHATOVA	20:	HAUTE PROVENCE	34:	TOMBAUGH		
7:	BASEL	21:	HOGG	35:	TRUMPLER		
8:	BIURAKAN	22:	IZMIRZDAJAN	36:	UPGREN		
9:	BLANCO	23:	KING	37:	van den BERGH		
10:	CZERNIK	24:	LYNGA	38:	WESTERLUND		
11:	DEJE	25:	MARKARJAN	39:	ZWICKY		
12:	DOLIOZE	26:	PALOMAR	40:	HOCHOV		
13:	DOLIOZE - DZIM	27:	PISMIS				
14:	DUFAY	28:	ROSLUND				

CROSS IDENTIFICATIONS:

NGC	869	h	PER
NGC	884	Chi	PER
NGC	2632	PRAESEPE	
AMAS	9	1 ZETA	SCL
AMAS	102	20 ALPHA PER	
AMAS	102	24 PLEIADES	
AMAS	102	25 HYADES	
AMAS	102	111 COMA CLUSTER	

Figure 1. Sample output from the positional search of the CSI. Pages 1 and 2 contain a catalog description and bibliography, respectively. The third page shows stars selected from small regions near the α Persei and Pleiades clusters.

Catalogue abbreviations:

* Payer or Flamsteed name of star.
•V Variable star name (Kukarkin, B.V., Kholopov, P.N., Eskovsky, Yu.P., Efremov, Yu.N., Kukarkina, N.P., Kurochkin, N.E., Medvedeva, G.I., Perova, N.B., Polyakova, V.P., and Frolov, M.S. (1971). General Catalogue of Variable Stars, 3rd Edition (Publishing House of the Academy of Sciences of the U.S.S.R., Moscow).
ABT Abt, H.A. and Biggs, E.S. (1972). Bibliography of Stellar Radial Velocities (Kitt Peak National Observatory). (Data from Abt and Biggs are found under GCRV)
ADS Aitken, R.G. (1932). New General Catalogue of Double Stars within 120 Deg of the North Pole (Carnegie Inst. Washington).
AG Lacroute, P. and Valbousquet, A. (1973). I.A.U. Colloq. 7 on Proper Motions, Ed. W.J. Luyten (U. Minnesota, Minneapolis).
AMAS Clusters without NGC or IC designations (see preceding page).
BPS Sackeriing, L.R. (1970). Catalogue of Early-Type Stars whose Spectra Have Shown Emission Lines, Mem. R.A.S. 73, 151.
CPL Davis, R.J., Deutschman, W.A. and Taramundanis, K.T. (1973). Celescope Catalog of Ultraviolet Stellar Observations, SAO Special Report 350.
CP Spencer, J.H. and Jackson, J. (1939). Catalogue of 20,556 Faint Stars in the Cape Astrographic Zone -80 to -52 Deg for the Equinox of 1900.0 (H.M. Stationery Office, London).
CPC Cape Photographic Catalogue for 1950.0 (Annals Cape Observatory, Vol. 17-22).
FK4 Fricke, W. and Kopff, A. (1963). Fourth Fundamental Catalogue and Supplement (Veroff. Astron. Rechen-Inst. Heidelberg).
GC Boss, A. (1936). General Catalogue of 33342 Stars for the Epoch 1950 (Carnegie Inst. Washington).
GCRV General Catalogue of Radial Velocities. A merge of: Wilson, O.C. (1963). General Catalogue of Stellar Radial Velocities (Carnegie Inst. Washington); Evans, D.S. (1967). I.A.U. Symposium 30 (Ed. R.H. Batten and J.F. Heard); Abt, H.A. and Biggs, E.S. (see above); Barbier, M. (1975). CDS Inf. Bull. No. 8, 12.
GEN Rufener, F. (1976). Second Catalogue of Stars Measured in the Geneva Observatory Photometric System, Astron. Astrophys. Suppl. 26, 275.
GI Gliese, W. (1969). Catalogue of Nearby Stars (Veroff. Astron. Rechen-Inst. Heidelberg).
HPD2 Hertz, H. (1906,1907). Sterncatalog fur die Zone -6 bis -10 Deg (Math. Abh. Akad. Berlin).
HGAP Crampton, D., Leir, A. and Voinjet, T. (1973). A Catalogue of H-Gamma Measures by P.M. Petrie, Publ. Dominion Astrophys. Obs. 14, 151.
HP Hoffleit, D. (1964). Catalogue of Bright Stars, 3rd Edition (Yale University Obs.).
IC Dreyer, J.L.E. (1895,1910). Index Catalogue of Nebulae and Clusters of Stars, Mem. R.A.S. 51, 185; 59, 105.
IDS Jeffers, H.M., van den Bos, W.H. and Greeby, F.M. (1963). Index Catalogue of Visual Double Stars, Publ. Lick Obs. 21.
IRC Neugebauer, G. and Leighton, R.B. (1969). Two-Micron Sky Survey, NASA Special Publ. 3047.
JP11 Morel, M. and Magnenat, P. (1978). UBV RJKLSNH Photoelectric Catalogue, Astron. Astrophys. Suppl. 34, 477.
LS Hardorp, J., Stock, J., Wassau, J.J., Stephenson, C.B., Theile, I., Voigt, H.H., Pohlfs, K., Slettebak, A. and MacConnell, D.J. (1959-1965). Luminous Stars of the Northern Milky Way (Hamburg-Bergedorf and Warner and Swasey Obs.). Stephenson, C.B. and Sanduleak, N. (1971). Luminous Stars of the Southern Milky Way, Publ. Warner and Swasey Obs. 1, No. 1.
MKJ MK Classifications. A merge of: Jaschek, C., Conde, H. and de Sierra, A. (1964). Catalogue of Stellar Spectra Classified in the Morgan-Keenan System, Publ. La Plata Obs. 28; Kennedy, P.M. (1978). MKP (see below); Jaschek, M. (1978). Catalog of Selected Spectral Types in the MK System, CDS Inf. Bull. No. 15, 121.
MKP Kennedy, P.M. (1978). MK Classification Extension (Mount Stromlo Obs.). (Data from Kennedy are found under MKJ.)
MSS Houk, N. and Cowley, A.P. (1975). Michigan Catalogue of 2-Dimensional Spectral Types for the HD Stars, Vol. 1 (U. Michigan). Houk, N. (1978). Michigan Catalogue of 2-Dimensional Spectral Types for the HD Stars, Vol. 2 (U. Michigan).
NGC Dreyer, J.L.E. (1888). A New General Catalogue of Nebulae and Clusters of Stars, Mem. R.A.S. 49.
NJO Morgan, W.R. (1952). Catalog of 5268 Standard Stars Based on the Normal System MJO, Astron. Papers Amer. Ephemeris 13, III.
PLX Jenkins, L.F. (1952,1963). General Catalogue of Trigonometric Stellar Parallaxes and Supplement (Yale University Obs.).
ROT Rotational Velocities. A merge of: Uesugi, A. and Fukuda, I. (1970). Catalogue of Rotational Velocities of the Stars, Contr. Inst. Astrophys. and Kwasan Obs., Univ. of Kyoto, No. 149; Bernacca, P.L. and Perinotto, M. (1970-1971). A Catalogue of Stellar Rotational Velocities, Contr. Oss. Astrofis. Asiago, Nos. 239, 250, 298.
RY Star occurs in two different volumes of the Yale Zone Catalogues.
SAO Smithsonian Astrophysical Observatory (1966). Star Catalog, Smithsonian Publ. 4853.
SB Batten, A.H. (1967). Sixth Catalogue of the Orbital Elements of Spectroscopic Binary Systems, Publ. Dominion Astrophys. Obs. 13, 119.
UBV Nicolet, B. (1978). Catalogue of Homogeneous Data in the UBV Photoelectric Photometric System, Astron. Astrophys. Suppl. 34, 1.
UM Mermilliod, J.-C. and Nicolet, B. (1977). A General Catalogue of UBV Photoelectric Photometry, Astron. Astrophys. Suppl. 29, 259.
UVBY Rauck, B. and Mermilliod, M. (1975). uvby-Beta Photoelectric Photometric Catalogue, Astron. Astrophys. Suppl. 22, 215.
YZ Schlesinger, F., Barney, I., Hoffleit, D., Jones, P.B. (1919-1959). Yale Zone Catalogues, Trans. Yale Univ. Obs. 11-27.

Figure 1 (continued)

[illegible] CATALOG OF SEARCH

[illegible] RECORDS: START = 49968, END = 57382, PUNCH = 0

REGION 1, ALOW = 3.2833333, AHIGH = 3.3166667, DLOW = 49.0000000, DHIGH = 51.0000000

3 16 59.0 3 19 0.0 49 0 0.0 51 0 0.0

DM1	C	DM2	C	HD	MB	MV	SP	RA (1950) h m s	DEC d ' "	l II d	b II d	CATALOGUE IDENTIFICATIONS
+50 742	1			23277M	9.1	8.3:	F8	3 17 23.4	+50 48 49	145.50	- 5.21	AG +50 358;AMAS 102 20 363;SAO 23968;YZ 50 1452;
+49 908	0				10.6	9.4:	K0	3 17 25.7	+49 47 57	146.05	- 6.06	AG +49 382;AMAS 102 20 461;
+49 905	0	+49-03176	0		10.3	10.4	G0	3 17 26.0	+49 33 31	146.19	- 6.26	AG +49 383;AMAS 102 20 462;OBV 21515;
					10.7	10.7:	A0	3 17 37.4	+49 33 55	146.21	- 6.24	AG +49 384;
+49 890	0				10.0	9.4:	A2	3 17 59.6	+49 12 11	146.46	- 6.51	AG +49 385;AMAS 102 20 483;
+49 905	0				10.3	9.1:	K0	3 18 22.7	+49 49 52	146.17	- 5.95	AG +49 386;AMAS 102 20 500;
+50 740	0			20699	9.1	9.0	A0	3 18 23.1	+50 55 26	145.57	- 5.03	AG +50 359;AMAS 102 20 506;SAO 23988;YZ 50 1462;
+49 898	0					9.1	A5	3 18 25.5	+49 2 10	146.61	- 6.61	ADT;AG +49 387;AMAS 102 20 501;GCRV 20058;GPM 4158;MKJ 13790 E;RKK;POT 37; SAO 38758;OBV 21502;OMAY 0226;
+49 895	0					: F5		3 18 42.3:	+49 0 48	146.58	- 6.49	MKJ 13791 K;RKK;

END OF REGION 1, 9 STARS SELECTED

REGION 2, ALOW = 3.7333000, AHIGH = 3.7361111, DLOW = 23.0000000, DHIGH = 25.0000000

3 43 59.9 3 44 10.0 23 0 0.0 25 0 0.0

DM1	C	DM2	C	HD	MB	MV	SP	RA (1950) h m s	DEC d ' "	l II d	b II d	CATALOGUE IDENTIFICATIONS
+24 562	0			23568	6.8	6.4	B9	3 44 0.2	+24 21 58	166.27	-23.22	ABT;AG +24 381;AMAS 102 22 1234;CPL 333;GC 4531;GCRV 2124;GFE 4258;HGAM 272; JP11 4660;MKJ 2330;POT 3772;SAO 76183;OBV 3628;YZ 24 1165;
+24 563	0			23567	8.6	7.1	A2	3 44 8.0	+24 39 57	166.07	-22.99	ABT;AUS 2760 AB;AG +24 382;AMAS 102 22 1266;CPL 334;GCRV 2125;GFE 4255; JP11 4662;MKJ 2329;POT 3773; 76184;OBV 3623;YZ 24 1161;
		+24-03441	0		15.:	14.4		3 44 8.7:	+24 0 15	166.55	-23.48	AMAS 102 22 1280;OBV 21079
+23 528	0			23535	9.7	9.4	A2	3 44 5.7	+23 50 29	166.67	-23.60	ABT;AG +23 318;AMAS 102 22 [illegible];CPL 335;GCRV 2126;GEM 4256;JP11 4663; MKJ 2334;PLK A10;POT 3774; 76185;OBV 3626; YZ 23 1167;

END OF REGION 2, 4 STARS SELECTED

END OF INPUT REGION CARDS - [illegible] RECORDS, [illegible] OBJECTS SEARCHED

Figure 1 (concluded)

largely accounted for by the presence of an alternate DM field in the CSI format (although there is still a problem in the -22° and -23° zones where it is possible to have three DM numbers corresponding to the same object). To avoid missing objects for which an alternate DM number has been specified, both primary and alternate DM fields are examined.

Printed output from the search currently consists of complete records for all objects found (including the zero fields for catalogs not containing an object), but we intend to eventually eliminate zero fields from the output. Also included are all components of multiple systems having the same DM number. Of course, the more important output consists of the individual data sets created for specified source catalogs, as described above.

A sample listing of the printed output is shown in Figure 2.

IV. FUTURE WORK

As mentioned briefly in Section III, the ultimate goal of our retrieval software is the extraction of all source data for specified objects identified by any of their various designations. At present, the retrieval programs described here perform sequential searches using data files resident on magnetic tape. As a first step toward the above goal, we intend to create a compressed binary file residing on a direct access device so that searches can be performed via remote terminals. Such a system is currently operative for the Bibliographical Star Index (Ochsenbein and Spite 1979 and references therein) on the S/360 computers at GSFC (Mead *et al.* 1980, 1981). Further developments include the creation of an on-line inverted file of the CSI in order to provide access to all cross designations, and additional programs to use extracted designations to retrieve source data from the catalogs connected to the CSI.

ACKNOWLEDGMENTS

We wish to express our appreciation to our colleagues at the Centre de Donnees Stellaires for their many years of work on production, additions and improvements to the CSI. We feel that we can speak for many astronomers the world over in displaying our gratitude for the steps that they have taken toward solving the nomenclature and cross-identification problems in astronomy.

REFERENCES

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Ochsenbein, F. and Spite F. 1979, *Bull. Inform. CDS* 17, 19.

Ochsenbein, F., Bischoff, M. and Egret, D. 1981, *Astron. Astrophys. Suppl.* 95, 395.

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                                        C S I  C A T A L O G U E  S E A R C H
                                              ASTRONOMICAL DATA CENTER
                                           NASA GODDARD SPACE FLIGHT CENTER

            NUMBER OF REQUESTED DISK FILES =  4

  DM1        DM2      MAG.B    VISUAL MAG FLAGS COD   SP      RA          DEC        GAL.LON.    GAL.LAT.      HD         AG/CPC
 FZ7CP      GC        IDS       IDS     MULT  VAR.NAME     ARAS    RR STARS   CELESCOPE   PE         PK4         GCRV
 GENEVA     GLIESE    UGAB      YBS     IC CLUSTER    IRC    JOHN II    LUMINOUS *   HKJ        HSS          BGC          B30
 GOT_O-05   TRIG.PLX  POLARIZATN ROT.VEL.  SAO       BATTEN    OBV       UVBY       FLAG_CODES

 80    487  0   0        0  0         78            69           0    F2  235.57805   80.141388   118.82082  38.331589    1816520      8003530
         0      21163            9769      9999 AB               0                0           0           0          0         0      9083
         0          0               0         0                0          0        0           0           0        0                 0       0
         0      35820               0         0          2588         0        0           0   100000000

 -1    881  0   0        0  0         83            86           0    B8  78.46999   -1.696111   203.12646  -21.805378    383878       9105310
 9101254                   3857      9999 AB               0                0           0           0          0         0         0
         0          0               0         0                0          0        0           0   11002601       0         G           0
         0          0               0         0        131929          0        0           0   10000000

 -2   1326  1   0        0  0         35            37           0    B0  84.05832   -2.626944   206.81587  -17.335968    376680       0
         0       7031            4241      9999 AB               0                0           890                  0                3488
      1031          0             463      1931                0          0     1205   9200016     3478              0         0         1211
         0      12930               0       896        132406          0     5696      1349   1110100000

 -2   1326  2   0        0  0         64            66           0    B0  84.06166   -2.626666   206.81723  -17.332981     0       0        0        0
         0       7032            4241      9999 D                0                0           0           0          0         0
         0          0               0         0                0          0        0   9200026           0          0         0         0
         0          0               0         0                0          0     5695         0           0

 -2   1326  3   0        0  0         88            88           0          84.05583   -2.628611   206.81619  -17.338959     0       0        0        0
         0          0            4241      9999 C                0                0           0           0          0         0
         0          0               0         0                0          0        0           0           0          0         0         0
         0          0               0         0                0          0     5697         0           0

 -2   1326  4   0        0  0         35            37           0    O9  84.05693   -2.627500   206.81570  -17.337463     0       0        0        0
         0          0            4241      9999 ABC              0                0           0           0          0         0
         0          0               0         0                0          0        0           0           0          0         0         0
         0          0               0         0                0          0     5698         0           0

 -2   1326  5   0        0  0         40           -20       10011  O9  84.05804   -2.626666   206.81549  -17.336090     0       0        0        0
         0          0            4241      9999 A                0                0           0           0          0         0
         0          0               0         0                0          0        0           0   11028318           0          0         0
         0          0               0         0                0          0        0           0   10000000

 -2   1326  6   0        0  0         60           -20       10011  B0  84.05804   -2.626666   206.81549  -17.336090     0       0        0        0
         0          0            4241      9999 B                0                0           0           0          0         0
         0          0               0         0                0          0        0           0   11028319           0          0         0
         0          0               0         0                0          0        0           0   10000000

 -22  12617 20 -22   4584  0          99            89           0    K2  271.54639  -22.191666   8.50795    -1.211417    1658930      0        0
 11212516              18032     -2212 AB               0                0           0           0           0          0
         0          0               0         0                0          0        0           0           0          0         0         0
         0          0               0         0        186363          0  13022652         0      100000

 -46  10474 40 -46  18497 20          83            77           0    G5  343.93180  -45.707766   346.07031  -61.027786   2170840      520209
         0          0           22528     -4603 AB               0                0           0           0          0         0
         0          0               0         0                0          0        0           0           0   2170840         0         0
         0          0               0         0        231374          0  13026738         0      100000
```

Figure 2. Sample output from the DM search of the CSI binary file for five DM numbers. All other catalog numbers are printed, although only four catalogs were selected for creation of disk files for subsequent searches of source catalogs.

ADC Bull. (July 1981) 1, 121-138

CSI STATISTICS: BLUE MAGNITUDE VERSUS SPECTRAL TYPE

T. A. Nagy*, R. S. Hill* and J. M. Mead+

The Catalogue of Stellar Identifications (CSI), which is a major effort in the realm of the cross identification of star catalogue information, has been described in detail by the principal contributors to this effort (Ochsenbein et al. 1977). The CSI has been released in updated form several times over the past years. The data in this paper have been prepared from the version that was released in 1976 and contains a total of 430,824 records.

The CSI is commonly considered as the most complete data set of stellar sources. As such, the distribution of these sources as a function of their basic astrophysical parameters, such as spectral type and magnitude, is then of general interest to potential users of the catalogue. In addition, this type of information can be used to identify regions of sparse data and to compare versions of the CSI.

A two-dimensional distribution (blue magnitude (m_B) vs. spectral type) of CSI sources is given in Table 1. The first (brightest) blue magnitude bin is for all sources brighter than 0.5 magnitudes and the last bin is for all sources fainter than 14.5 magnitudes. Initially, the m_B data field was blank because no value was available; therefore blank fields were replaced with 99.9 when the binary data tape was converted to an EBCDIC version at GSFC. Thus, all of the entries with a value of 99.9 are included in the last (faintest) m_B bin.

We acknowledge the very exacting and careful work on Table 1 by Mrs. Priscilla Struthers in the computation of the totals, and the precise typing by Mrs. Margaret Smith.

REFERENCE

Ochsenbein, F., Egret, D. and Bischoff, M. 1977, Proceedings of IAU Colloquium 35, in Compilation, Critical Evaluation, and Distribution of Stellar Data, eds. C. Jaschek and G. A. Wilkins (Dordrecht: Reidel), p. 31.

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Table 1. Blue Magnitude Versus Spectral Type Distribution of the Catalogue of Stellar Identifications. The spectral types are in alphabetical/numerical order. The first three columns represent three different spectral type codes from the machine-readable version which are printed as blanks. There are 16 pages to the matrix. The column totals are given at the botttom of each column, and the complete row and column totals are given on the last page.

m_B RANGE \ SP				0	&&	A	A	A&	A	A0	A1
< 0.5	0	0	49	0	0	0	0	0	0	2	0
0.5 - 1.0	0	0	1	0	0	0	0	0	0	2	0
1.0 - 1.5	0	0	0	0	0	0	0	0	0	0	0
1.5 - 2.0	0	0	0	0	0	0	0	0	0	8	0
2.0 - 2.5	0	0	2	0	0	0	0	0	0	7	0
2.5 - 3.0	0	0	1	0	0	0	0	0	0	5	0
3.0 - 3.5	0	0	0	0	0	0	0	0	0	8	0
3.5 - 4.0	0	0	3	0	0	0	0	0	0	20	0
4.0 - 4.5	0	0	5	0	0	0	0	0	0	29	1
4.5 - 5.0	0	0	12	0	0	0	0	0	0	52	0
5.0 - 5.5	0	0	24	0	0	1	0	0	0	102	3
5.5 - 6.0	0	0	27	0	0	0	0	1	0	229	1
6.0 - 6.5	0	0	39	0	0	1	0	0	0	396	2
6.5 - 7.0	0	0	41	0	0	0	0	0	0	532	0
7.0 - 7.5	0	0	29	0	0	7	0	0	0	912	0
7.5 - 8.0	1	0	21	0	0	13	0	0	0	1635	0
8.0 - 8.5	0	0	50	0	0	71	0	0	0	2987	3
8.5 - 9.0	2	0	134	0	0	300	2	0	1	4297	6
9.0 - 9.5	1	0	362	0	0	572	2	0	0	5949	6
9.5 - 10.0	7	0	745	0	0	776	2	0	1	6648	17
10.0 - 10.5	61	3	1843	0	1	726	26	2	8	6563	42
10.5 - 11.0	124	3	1790	0	0	477	4	0	3	3313	65
11.0 - 11.5	96	9	2289	0	0	261	18	0	0	1364	30
11.5 - 12.0	46	2	1261	0	0	73	0	0	0	321	16
12.0 - 12.5	7	1	985	1	0	24	0	0	0	131	10
12.5 - 13.0	4	0	684	0	0	8	0	0	0	73	6
13.0 - 13.5	0	0	629	0	0	9	0	0	0	33	0
13.5 - 14.0	0	0	388	0	0	11	0	0	0	18	1
14.0 - 14.5	0	0	297	0	0	9	0	0	0	10	0
>14.5(includes 99.9)	1	4171	17703	0	12	259	2	3	3	821	40
TOTALS	350	4189	29414	1	13	3598	56	6	16	36467	249

m_B RANGE \ SP	A2	A3	A4	A5	A6	A7	A8	A9	B	B.	B+
< 0.5	1	0	0	0	0	0	0	0	0	0	0
0.5 - 1.0	0	0	0	0	0	0	0	0	0	0	0
1.0 - 1.5	1	1	0	1	0	0	0	0	1	0	0
1.5 - 2.0	0	0	0	0	0	0	0	0	0	0	0
2.0 - 2.5	3	0	0	1	0	0	0	0	0	0	0
2.5 - 3.0	3	3	0	3	0	0	0	0	0	0	0
3.0 - 3.5	5	2	0	3	0	0	0	1	0	0	0
3.5 - 4.0	20	2	0	4	0	0	0	0	0	0	0
4.0 - 4.5	12	9	0	8	0	0	0	0	0	0	0
4.5 - 5.0	39	15	0	28	0	0	1	0	0	0	0
5.0 - 5.5	82	35	0	32	0	1	1	1	3	0	0
5.5 - 6.0	120	47	0	50	1	1	0	1	0	0	0
6.0 - 6.5	190	108	1	71	0	0	1	0	3	0	1
6.5 - 7.0	284	133	0	111	1	2	0	1	6	0	0
7.0 - 7.5	490	204	0	182	0	2	3	0	5	0	0
7.5 - 8.0	800	392	1	244	1	1	0	0	16	0	1
8.0 - 8.5	1448	599	0	504	0	2	2	1	23	0	5
8.5 - 9.0	2256	984	0	913	0	16	4	0	46	2	3
9.0 - 9.5	3317	1272	2	1341	0	57	2	1	84	0	11
9.5 - 10.0	3935	1338	5	1924	3	148	17	2	179	0	21
10.0 - 10.5	4130	1534	17	2131	6	326	65	6	303	0	52
10.5 - 11.0	2126	640	25	1132	9	103	59	4	474	4	85
11.0 - 11.5	859	278	11	533	1	68	23	4	658	1	125
11.5 - 12.0	185	56	3	127	3	13	9	1	731	0	104
12.0 - 12.5	59	13	2	37	0	5	6	4	635	0	112
12.5 - 13.0	31	9	1	7	0	2	0	0	371	2	80
13.0 - 13.5	12	2	0	6	0	1	0	0	144	3	20
13.5 - 14.0	3	5	0	3	0	1	0	0	33	0	6
14.0 - 14.5	2	0	0	1	0	1	0	0	8	0	3
>14.5(includes 99.9)	392	205	18	294	13	86	35	14	43	0	0
TOTALS	20805	7886	86	9691	38	836	228	41	3766	12	629

m_B RANGE \ SP	B&	B-	BE	B0	B1	B2	B3	B4	B5	B6	B7
< 0.5	0	0	0	1	1	0	0	0	1	0	0
0.5 - 1.0	0	0	0	0	1	0	0	0	0	0	0
1.0 - 1.5	0	1	0	0	2	2	0	0	0	0	0
1.5 - 2.0	0	0	0	3	2	0	3	0	1	0	0
2.0 - 2.5	0	0	0	3	2	5	2	0	1	0	0
2.5 - 3.0	0	0	0	3	4	2	11	0	3	0	0
3.0 - 3.5	0	0	0	0	5	4	11	0	3	0	0
3.5 - 4.0	0	0	0	4	2	5	17	0	14	1	0
4.0 - 4.5	0	0	0	4	4	7	33	0	31	0	0
4.5 - 5.0	0	0	0	3	8	12	60	0	26	1	0
5.0 - 5.5	0	0	0	2	5	14	77	0	57	0	0
5.5 - 6.0	0	0	0	11	9	16	79	1	50	0	1
6.0 - 6.5	0	0	0	23	11	10	121	0	92	0	0
6.5 - 7.0	0	1	0	26	5	29	101	0	94	1	1
7.0 - 7.5	0	5	0	38	8	25	105	0	126	0	1
7.5 - 8.0	0	2	0	45	11	55	102	1	147	0	1
8.0 - 8.5	0	6	0	63	12	68	93	0	211	2	6
8.5 - 9.0	1	21	0	79	27	73	124	3	202	6	7
9.0 - 9.5	0	51	1	103	28	118	134	0	285	5	10
9.5 - 10.0	1	121	0	141	49	182	104	0	385	7	8
10.0 - 10.5	10	276	0	109	76	152	120	3	254	14	25
10.5 - 11.0	11	388	0	73	49	110	46	5	124	17	20
11.0 - 11.5	34	597	0	39	61	44	34	12	82	21	19
11.5 - 12.0	44	631	0	25	34	30	20	1	29	12	26
12.0 - 12.5	37	583	0	20	18	15	14	2	31	11	22
12.5 - 13.0	13	342	0	16	7	8	7	4	19	6	19
13.0 - 13.5	4	109	0	13	10	9	2	0	6	3	2
13.5 - 14.0	0	16	0	5	1	1	0	0	2	1	0
14.0 - 14.5	0	1	0	0	0	0	0	0	0	0	0
>14.5(includes 99.9)	0	1	0	32	29	23	57	7	86	18	30
TOTALS	155	3152	1	884	481	1019	1477	39	2362	126	198

m_B RANGE \ SP	B8	B9	C	CD	CE	CO	C1	C2	C3	C4	C5
< 0.5	1	1	0	0	0	0	0	0	0	0	0
0.5 - 1.0	0	0	0	0	0	0	0	0	0	0	0
1.0 - 1.5	1	0	0	0	0	0	0	0	0	0	0
1.5 - 2.0	1	0	0	0	0	0	0	0	0	0	0
2.0 - 2.5	1	0	0	0	0	0	0	0	0	0	0
2.5 - 3.0	4	0	0	0	0	0	0	0	0	0	0
3.0 - 3.5	6	3	0	0	0	0	0	0	0	0	0
3.5 - 4.0	11	3	0	0	0	0	0	0	0	0	0
4.0 - 4.5	12	9	0	0	0	0	0	0	0	0	0
4.5 - 5.0	30	17	0	0	0	0	0	0	0	0	0
5.0 - 5.5	68	44	0	0	0	0	0	0	0	0	0
5.5 - 6.0	102	103	0	0	0	0	0	0	0	0	0
6.0 - 6.5	119	195	0	0	0	0	0	0	0	0	0
6.5 - 7.0	199	317	0	0	0	0	0	0	0	0	0
7.0 - 7.5	332	558	0	0	0	0	0	0	0	0	1
7.5 - 8.0	425	828	0	0	0	0	0	0	0	0	1
8.0 - 8.5	568	1175	0	0	0	1	0	1	0	0	5
8.5 - 9.0	780	1379	0	1	0	0	0	0	1	0	6
9.0 - 9.5	1068	1676	0	0	0	1	0	0	0	0	1
9.5 - 10.0	1132	1379	0	0	0	0	1	0	0	0	3
10.0 - 10.5	968	1239	0	0	0	0	0	1	0	0	2
10.5 - 11.0	381	518	0	0	0	0	0	0	0	1	6
11.0 - 11.5	191	221	0	0	1	0	0	0	1	2	4
11.5 - 12.0	88	94	0	0	2	0	0	0	2	1	3
12.0 - 12.5	34	41	0	0	0	0	0	0	0	2	3
12.5 - 13.0	20	14	0	0	0	0	0	0	0	1	0
13.0 - 13.5	12	4	1	0	0	0	0	0	0	1	0
13.5 - 14.0	1	1	1	0	0	0	0	0	0	0	0
14.0 - 14.5	0	0	1	0	0	0	0	0	0	0	0
>14.5(includes 99.9)	151	157	11	0	2	0	1	1	0	0	8
TOTALS	6706	9976	14	1	5	2	2	3	4	8	43

m_B RANGE \ SP	C6	C7	C8	DA	F	F.	F&	F-	FG	FO	F1
< 0.5	0	0	0	0	0	0	0	0	0	1	0
0.5 - 1.0	0	0	0	0	0	0	0	0	0	0	0
1.0 - 1.5	0	0	0	0	0	0	0	0	0	0	0
1.5 - 2.0	0	0	0	0	0	0	0	0	0	0	0
2.0 - 2.5	0	0	0	0	0	0	0	0	0	2	0
2.5 - 3.0	0	0	0	0	0	0	0	0	0	1	0
3.0 - 3.5	0	0	0	0	0	0	0	0	0	7	0
3.5 - 4.0	0	0	0	0	0	0	1	0	0	5	0
4.0 - 4.5	0	0	0	0	0	0	0	0	0	12	0
4.5 - 5.0	0	0	0	0	0	0	0	0	0	20	0
5.0 - 5.5	0	0	0	0	0	0	0	0	0	39	0
5.5 - 6.0	0	0	0	0	0	0	0	0	0	75	0
6.0 - 6.5	0	0	0	0	0	0	0	0	0	120	1
6.5 - 7.0	0	0	0	0	0	0	0	0	0	180	1
7.0 - 7.5	0	1	0	0	0	0	0	0	0	344	1
7.5 - 8.0	0	0	0	0	1	0	0	0	0	649	0
8.0 - 8.5	2	0	0	0	8	0	0	0	0	1073	1
8.5 - 9.0	0	0	0	0	48	0	0	0	0	1627	1
9.0 - 9.5	2	2	0	0	131	0	0	0	0	2209	0
9.5 - 10.0	2	1	0	0	228	0	0	0	0	2937	4
10.0 - 10.5	1	1	0	0	166	9	0	0	1	2906	24
10.5 - 11.0	2	0	0	0	113	0	0	1	0	1763	14
11.0 - 11.5	1	0	0	0	103	8	0	0	0	873	8
11.5 - 12.0	4	1	1	0	34	0	0	0	0	222	1
12.0 - 12.5	0	0	0	0	24	0	0	0	0	64	2
12.5 - 13.0	4	0	2	0	5	0	0	0	0	11	0
13.0 - 13.5	2	0	0	1	2	0	0	0	0	7	0
13.5 - 14.0	2	0	1	0	1	0	0	0	0	4	0
14.0 - 14.5	0	0	0	0	0	0	0	0	0	0	0
>14.5(includes 99.9)	8	4	3	0	77	0	9	0	0	477	7
TOTALS	28	10	7	1	341	17	10	1	1	15628	65

m_B RANGE \ SP	F2	F3	F4	F5	F6	F7	F8	F9	G	G.	G&
< 0.5	0	0	0	0	0	0	0	0	0	0	0
0.5 - 1.0	0	0	0	1	0	0	0	0	0	0	0
1.0 - 1.5	0	0	0	0	0	0	1	0	0	0	0
1.5 - 2.0	0	0	0	0	0	0	0	0	0	0	0
2.0 - 2.5	0	0	0	1	0	0	0	0	0	0	0
2.5 - 3.0	0	0	0	1	0	0	3	0	0	0	0
3.0 - 3.5	1	0	0	1	0	0	0	0	0	0	0
3.5 - 4.0	1	0	0	6	0	0	2	0	0	0	0
4.0 - 4.5	6	0	0	12	1	0	6	0	0	0	0
4.5 - 5.0	2	1	0	17	0	1	16	0	0	0	0
5.0 - 5.5	2	2	0	39	3	2	12	0	0	0	0
5.5 - 6.0	33	0	1	53	1	2	18	0	1	0	0
6.0 - 6.5	52	3	0	102	2	1	31	1	0	0	0
6.5 - 7.0	123	2	2	184	2	1	80	0	2	0	0
7.0 - 7.5	226	1	2	353	1	6	177	3	1	0	0
7.5 - 8.0	417	2	1	619	4	2	385	3	2	0	0
8.0 - 8.5	753	2	1	1210	3	1	854	0	3	0	0
8.5 - 9.0	1005	2	0	2070	4	2	1631	2	70	0	0
9.0 - 9.5	1608	1	3	3010	5	3	3046	4	223	1	1
9.5 - 10.0	2345	10	4	4506	15	5	5142	6	511	0	0
10.0 - 10.5	2760	33	15	5346	36	19	6851	25	562	9	0
10.5 - 11.0	1464	39	20	3189	64	35	5813	38	403	2	0
11.0 - 11.5	665	14	8	1671	42	14	3382	27	389	15	0
11.5 - 12.0	123	8	10	342	24	1	1283	6	337	0	0
12.0 - 12.5	43	3	5	73	6	3	318	0	172	0	0
12.5 - 13.0	11	0	1	14	1	0	36	0	40	1	0
13.0 - 13.5	4	0	0	7	0	2	9	0	10	0	0
13.5 - 14.0	1	0	0	0	0	0	2	0	0	0	0
14.0 - 14.5	0	0	0	0	0	0	1	0	1	0	0
>14.5(includes 99.9)	415	16	19	956	54	22	1161	10	258	0	31
TOTALS	12060	139	92	23783	268	122	30260	125	2985	28	32

m_B RANGE \ SP	G-	GK	G0	G0	G1	G2	G3	G4	G5	G6	G7
< 0.5	0	0	0	2	0	0	0	0	0	0	0
0.5 - 1.0	0	0	0	2	0	0	0	0	0	0	0
1.0 - 1.5	0	0	0	0	0	0	0	0	0	0	0
1.5 - 2.0	0	0	0	0	0	0	0	0	0	0	0
2.0 - 2.5	0	0	0	0	0	0	0	0	0	0	0
2.5 - 3.0	0	0	0	0	0	0	0	0	0	0	0
3.0 - 3.5	0	0	0	2	0	0	0	0	0	0	0
3.5 - 4.0	0	0	0	7	0	0	0	0	4	0	0
4.0 - 4.5	0	0	0	4	0	0	0	0	4	0	0
4.5 - 5.0	0	0	0	8	0	0	0	0	15	0	0
5.0 - 5.5	0	0	0	28	0	0	0	0	25	0	1
5.5 - 6.0	0	0	0	42	0	0	2	2	44	0	0
6.0 - 6.5	0	0	0	65	0	0	1	1	108	0	0
6.5 - 7.0	0	0	0	89	1	1	2	1	150	1	0
7.0 - 7.5	0	0	0	226	2	4	1	0	348	0	1
7.5 - 8.0	0	0	0	415	0	0	0	1	650	0	1
8.0 - 8.5	0	0	0	739	3	9	2	2	1291	0	0
8.5 - 9.0	0	0	0	1533	4	3	1	3	2261	1	1
9.0 - 9.5	0	0	0	2785	3	9	3	1	3861	1	1
9.5 - 10.0	1	0	1	5174	4	18	6	3	5940	3	0
10.0 - 10.5	2	0	0	7451	9	129	57	18	8379	17	10
10.5 - 11.0	1	0	0	6104	14	302	115	18	7340	31	21
11.0 - 11.5	1	1	0	3909	14	207	65	13	4829	18	10
11.5 - 12.0	0	0	0	1765	3	61	9	4	2206	7	4
12.0 - 12.5	0	0	0	544	0	20	4	1	635	1	1
12.5 - 13.0	0	0	0	101	0	3	0	0	131	1	2
13.0 - 13.5	0	0	0	16	0	0	0	1	26	0	1
13.5 - 14.0	0	0	0	1	0	0	0	0	2	0	0
14.0 - 14.5	0	0	0	0	0	0	0	0	0	0	0
>14.5(includes 99.9)	1	0	0	1633	11	131	23	23	1763	39	44
TOTALS	6	1	1	32645	68	897	291	92	40012	120	98

m_B RANGE \ SP	G8	G9	K	K.	K&	K-	K0	K1	K2	K3	K4
< 0.5	0	0	1	0	0	0	1	0	0	0	0
0.5 - 1.0	0	0	0	0	0	0	0	0	0	0	0
1.0 - 1.5	0	0	0	0	0	0	1	0	0	0	0
1.5 - 2.0	0	0	0	0	0	0	0	0	0	0	0
2.0 - 2.5	0	0	0	0	0	0	1	0	0	0	0
2.5 - 3.0	0	0	0	0	0	0	1	0	0	0	0
3.0 - 3.5	0	0	0	0	0	0	7	0	3	1	0
3.5 - 4.0	0	0	0	0	1	0	10	0	0	0	0
4.0 - 4.5	0	0	0	0	0	0	24	0	6	0	0
4.5 - 5.0	0	0	0	0	0	0	55	0	2	0	0
5.0 - 5.5	1	0	0	0	0	0	70	0	4	0	0
5.5 - 6.0	2	0	0	0	0	0	120	0	16	0	0
6.0 - 6.5	1	0	1	0	1	0	225	0	16	0	0
6.5 - 7.0	1	1	0	0	0	0	416	0	53	0	0
7.0 - 7.5	3	0	0	0	0	0	777	0	126	3	0
7.5 - 8.0	0	1	0	0	0	0	1365	0	240	0	0
8.0 - 8.5	2	2	6	0	0	0	2233	0	560	3	1
8.5 - 9.0	7	2	26	0	0	0	3129	2	1043	0	1
9.0 - 9.5	14	5	111	0	0	0	5836	6	2367	2	1
9.5 - 10.0	22	0	233	0	0	0	8838	10	3561	3	2
10.0 - 10.5	90	4	329	2	0	2	12735	32	5073	7	4
10.5 - 11.0	318	16	399	0	0	5	11553	112	5254	19	6
11.0 - 11.5	200	20	352	4	0	1	7093	62	3502	12	6
11.5 - 12.0	128	17	359	0	1	0	3713	26	2085	15	12
12.0 - 12.5	77	5	255	0	0	2	1163	9	538	18	2
12.5 - 13.0	28	5	72	0	0	0	255	5	106	10	0
13.0 - 13.5	3	3	21	0	0	0	39	2	23	2	0
13.5 - 14.0	0	0	4	0	0	0	6	0	0	0	0
14.0 - 14.5	0	0	0	0	0	0	4	0	2	0	1
>14.5(includes 99.9)	339	38	393	0	34	2	3149	43	1358	103	27
TOTALS	1236	119	2562	6	37	12	62819	309	25938	198	63

m_B RANGE \ SP	K5	K6	K7	K8	K9	M	M.	M&	M-	MA	MB
< 0.5	0	0	0	0	0	0	0	0	0	2	4
0.5 - 1.0	0	0	0	0	0	0	0	0	0	0	0
1.0 - 1.5	0	0	0	0	0	0	0	0	0	0	0
1.5 - 2.0	0	0	0	0	0	0	0	0	0	0	0
2.0 - 2.5	1	0	0	0	0	0	0	0	0	0	0
2.5 - 3.0	1	0	0	0	0	0	0	0	0	2	0
3.0 - 3.5	0	0	0	0	0	0	0	0	0	0	1
3.5 - 4.0	3	0	0	0	0	0	0	0	0	1	1
4.0 - 4.5	2	0	0	0	0	0	0	0	0	3	0
4.5 - 5.0	9	0	0	0	0	0	0	0	0	4	2
5.0 - 5.5	11	0	0	0	0	0	0	0	0	2	3
5.5 - 6.0	13	0	0	0	0	0	0	0	0	9	4
6.0 - 6.5	38	0	0	0	0	0	0	0	0	26	12
6.5 - 7.0	50	0	0	0	0	0	0	0	0	50	16
7.0 - 7.5	100	0	0	0	0	0	0	0	0	49	33
7.5 - 8.0	171	0	1	0	0	0	0	0	0	91	45
8.0 - 8.5	311	0	3	0	0	1	0	0	0	151	57
8.5 - 9.0	534	0	4	1	0	2	0	0	0	222	84
9.0 - 9.5	1283	0	15	1	0	3	0	0	0	379	127
9.5 - 10.0	2303	0	59	11	0	3	0	0	0	484	124
10.0 - 10.5	3864	1	243	22	0	17	1	0	0	504	157
10.5 - 11.0	4261	4	368	36	1	32	0	0	1	376	200
11.0 - 11.5	2569	0	310	32	1	71	0	0	0	233	121
11.5 - 12.0	1166	0	115	13	0	80	0	0	1	101	66
12.0 - 12.5	359	0	30	4	0	49	0	0	0	41	21
12.5 - 13.0	66	0	9	1	0	16	0	0	0	4	10
13.0 - 13.5	19	0	4	0	0	4	0	0	0	2	1
13.5 - 14.0	2	2	0	0	0	4	0	0	0	0	1
14.0 - 14.5	1	0	0	0	0	0	0	0	0	0	0
>14.5(includes 99.9)	1267	17	503	29	0	126	0	8	4	50	64
TOTALS	18404	24	1664	150	2	408	1	8	6	2786	1154

m_B RANGE \ SP	MC	MD	ME	MF	MO	M1	M2	M3	M4	M5	M6
< 0.5	0	1	0	0	0	0	0	0	0	1	0
0.5 - 1.0	0	0	0	0	0	0	0	0	0	0	0
1.0 - 1.5	0	0	0	0	0	0	0	0	0	0	0
1.5 - 2.0	0	0	0	0	0	0	0	0	0	0	0
2.0 - 2.5	0	0	0	0	0	0	1	0	0	0	0
2.5 - 3.0	0	0	0	0	0	0	0	0	0	0	0
3.0 - 3.5	0	0	0	0	0	0	0	0	0	0	0
3.5 - 4.0	0	0	0	0	0	0	0	0	0	0	0
4.0 - 4.5	0	0	0	0	0	0	0	0	0	0	0
4.5 - 5.0	0	0	0	0	0	0	0	0	0	1	0
5.0 - 5.5	0	0	0	0	0	0	0	0	0	0	0
5.5 - 6.0	0	0	0	0	0	0	0	0	0	0	0
6.0 - 6.5	0	0	0	0	0	0	0	0	0	0	0
6.5 - 7.0	1	2	0	0	0	0	1	0	0	0	0
7.0 - 7.5	2	0	0	0	0	0	0	1	0	0	0
7.5 - 8.0	3	0	0	0	0	0	0	0	0	0	0
8.0 - 8.5	0	0	0	2	0	0	0	1	0	0	0
8.5 - 9.0	8	4	0	0	4	2	2	1	0	0	1
9.0 - 9.5	8	5	0	1	22	2	4	0	0	2	1
9.5 - 10.0	14	5	0	1	129	4	15	4	4	5	3
10.0 - 10.5	22	7	0	4	513	20	80	18	3	20	6
10.5 - 11.0	41	8	0	5	929	26	168	23	10	73	7
11.0 - 11.5	20	12	0	4	776	34	215	28	10	72	3
11.5 - 12.0	12	14	0	0	468	22	150	11	11	49	5
12.0 - 12.5	3	11	0	0	178	6	73	10	4	23	4
12.5 - 13.0	2	7	0	0	39	4	25	5	5	9	3
13.0 - 13.5	1	0	0	0	13	3	3	3	4	2	4
13.5 - 14.0	0	1	0	0	2	1	1	0	3	2	0
14.0 - 14.5	0	0	0	0	2	1	0	1	1	3	0
>14.5 (includes 99.9)	53	272	1	0	437	70	91	45	39	59	27
TOTALS	190	349	1	17	3512	195	829	151	94	321	64

m_B RANGE \ SP	M7	M8	M9	N	NB	NE	NO	N1	N2	N3	N5
< 0.5	0	0	0	0	0	0	0	0	0	0	0
0.5 - 1.0	0	0	0	0	0	0	0	0	0	0	0
1.0 - 1.5	0	0	0	0	0	0	0	0	0	0	0
1.5 - 2.0	0	0	0	0	0	0	0	0	0	0	0
2.0 - 2.5	0	0	0	0	0	0	0	0	0	0	0
2.5 - 3.0	0	0	0	0	0	0	0	0	0	0	0
3.0 - 3.5	0	0	0	0	0	0	0	0	0	0	0
3.5 - 4.0	0	0	0	0	0	0	0	0	0	0	0
4.0 - 4.5	0	0	0	0	0	0	0	0	0	0	0
4.5 - 5.0	0	0	0	0	0	0	0	0	0	0	0
5.0 - 5.5	0	0	0	0	0	0	0	0	0	0	0
5.5 - 6.0	0	0	0	0	0	0	0	0	0	0	0
6.0 - 6.5	0	0	0	0	0	0	0	0	0	0	0
6.5 - 7.0	0	0	0	0	0	0	0	0	0	0	0
7.0 - 7.5	0	0	0	0	0	0	0	0	0	0	0
7.5 - 8.0	0	0	0	0	0	0	0	0	0	0	0
8.0 - 8.5	1	0	1	0	0	0	0	0	0	0	0
8.5 - 9.0	0	0	0	0	0	0	0	0	0	0	0
9.0 - 9.5	3	0	0	2	0	0	0	1	2	1	1
9.5 - 10.0	2	1	2	4	0	0	0	1	0	0	0
10.0 - 10.5	9	6	9	1	0	0	0	0	3	0	0
10.5 - 11.0	3	16	10	1	0	0	0	0	1	0	0
11.0 - 11.5	4	22	12	0	0	0	0	2	2	0	0
11.5 - 12.0	1	18	11	1	0	0	0	0	5	0	1
12.0 - 12.5	1	14	5	3	0	0	0	0	5	1	1
12.5 - 13.0	0	4	4	2	0	0	0	1	0	0	0
13.0 - 13.5	1	3	2	1	0	0	0	0	0	0	0
13.5 - 14.0	0	1	0	0	0	0	0	0	0	0	0
14.0 - 14.5	0	0	0	0	0	0	0	0	0	0	0
>14.5(includes 99.9)	11	8	2	91	2	2	1	3	29	1	4
TOTALS	36	93	58	106	2	2	1	8	47	3	7

m_B RANGE \ SP	N6	N7	N8	O	O.	OA	OB	OC	OD	OE	O2
< 0.5	0	0	0	0	0	0	0	0	0	2	0
0.5 - 1.0	0	0	0	0	0	0	0	0	0	0	0
1.0 - 1.5	0	0	0	0	0	0	0	0	0	0	0
1.5 - 2.0	0	0	0	0	0	1	0	0	0	0	0
2.0 - 2.5	0	0	0	0	0	0	0	0	1	0	0
2.5 - 3.0	0	0	0	0	0	0	0	0	0	1	0
3.0 - 3.5	0	0	0	0	0	0	0	0	0	2	0
3.5 - 4.0	0	0	0	0	0	0	0	0	0	0	0
4.0 - 4.5	0	0	0	0	0	0	0	0	0	3	0
4.5 - 5.0	0	0	0	0	0	0	0	0	0	2	0
5.0 - 5.5	0	0	0	0	0	0	0	0	1	7	0
5.5 - 6.0	0	0	0	0	0	1	0	0	0	3	0
6.0 - 6.5	0	0	0	0	0	0	0	1	0	6	0
6.5 - 7.0	0	0	0	0	0	0	1	2	1	7	0
7.0 - 7.5	0	0	0	0	0	3	0	0	0	5	0
7.5 - 8.0	0	0	0	0	0	1	1	1	0	5	0
8.0 - 8.5	0	0	0	0	0	3	1	1	0	9	0
8.5 - 9.0	0	0	0	0	0	0	1	2	0	5	0
9.0 - 9.5	0	1	0	0	0	3	3	0	0	4	0
9.5 - 10.0	0	0	0	1	0	2	1	1	0	7	0
10.0 - 10.5	0	2	0	2	1	5	2	0	0	0	0
10.5 - 11.0	0	1	0	0	0	9	1	4	0	1	0
11.0 - 11.5	0	1	0	0	0	4	2	2	0	0	0
11.5 - 12.0	0	1	0	1	0	5	0	2	0	0	0
12.0 - 12.5	0	1	1	1	0	2	0	0	0	0	0
12.5 - 13.0	0	0	0	0	0	2	0	0	0	0	0
13.0 - 13.5	0	0	0	0	0	2	0	0	0	0	0
13.5 - 14.0	1	0	0	1	0	0	0	0	0	0	0
14.0 - 14.5	0	0	0	0	0	0	0	0	0	0	0
>14.5(includes 99.9)	1	6	2	11	0	15	1	3	0	0	1
TOTALS	2	13	3	17	1	58	14	19	3	69	1

m_B RANGE \ SP	O3	O4	O5	O6	O7	O8	O9	P	P0	P2	P3
< 0.5	0	0	0	0	0	0	0	0	0	0	0
0.5 - 1.0	0	0	0	0	0	0	0	1	0	0	0
1.0 - 1.5	0	0	0	0	0	0	0	0	0	0	0
1.5 - 2.0	0	0	0	0	0	0	1	0	0	0	0
2.0 - 2.5	0	0	0	0	0	0	0	0	0	0	0
2.5 - 3.0	0	0	0	0	0	0	0	0	0	0	0
3.0 - 3.5	0	0	0	0	0	0	0	0	0	0	0
3.5 - 4.0	0	0	0	0	0	0	1	0	0	0	0
4.0 - 4.5	0	0	0	0	0	0	0	0	0	0	0
4.5 - 5.0	0	0	0	0	0	0	0	0	0	0	0
5.0 - 5.5	0	0	0	0	0	0	0	1	0	0	0
5.5 - 6.0	0	0	0	0	1	0	0	0	0	0	0
6.0 - 6.5	0	0	1	0	1	0	2	1	0	0	0
6.5 - 7.0	1	0	0	1	0	0	0	2	0	0	0
7.0 - 7.5	0	0	1	0	1	1	0	0	0	0	0
7.5 - 8.0	1	0	0	2	0	1	1	0	0	0	0
8.0 - 8.5	1	1	0	1	2	1	6	0	0	0	0
8.5 - 9.0	0	0	5	1	3	4	7	4	0	0	1
9.0 - 9.5	0	0	3	6	3	6	7	0	0	0	0
9.5 - 10.0	0	0	0	2	6	3	10	0	0	0	0
10.0 - 10.5	0	0	3	5	9	10	19	0	1	0	0
10.5 - 11.0	0	0	3	0	10	5	18	0	0	0	0
11.0 - 11.5	0	0	3	2	7	7	20	1	0	0	1
11.5 - 12.0	1	0	0	1	3	4	11	0	0	0	0
12.0 - 12.5	0	0	2	5	1	3	5	0	0	0	0
12.5 - 13.0	0	0	2	0	0	0	4	0	0	0	0
13.0 - 13.5	0	0	0	0	0	0	2	0	0	0	0
13.5 - 14.0	0	0	0	0	0	0	1	0	0	0	0
14.0 - 14.5	0	0	0	0	0	0	0	0	0	0	0
>14.5(includes 99.9)	0	0	1	4	1	3	11	10	0	6	16
TOTALS	4	1	24	30	48	48	126	20	1	6	18

m_B RANGE \ SP	P4	P5	P6	P7	R	R0	R1	R2	R3	R4	R5
< 0.5	0	0	0	1	0	0	0	0	0	0	0
0.5 - 1.0	0	0	0	0	0	0	0	0	0	0	0
1.0 - 1.5	0	0	0	0	0	0	0	0	0	0	0
1.5 - 2.0	0	0	0	0	0	0	0	0	0	0	0
2.0 - 2.5	0	0	0	0	0	0	0	0	0	0	0
2.5 - 3.0	0	0	0	0	0	0	0	0	0	0	0
3.0 - 3.5	0	0	0	0	0	0	0	0	0	0	0
3.5 - 4.0	0	0	0	0	0	0	0	0	0	0	0
4.0 - 4.5	0	0	0	0	0	0	0	0	0	0	0
4.5 - 5.0	0	0	0	0	0	0	0	0	0	0	0
5.0 - 5.5	0	0	0	0	0	0	0	0	0	0	0
5.5 - 6.0	0	0	0	0	0	0	0	0	0	0	0
6.0 - 6.5	0	0	0	0	0	0	0	0	0	0	0
6.5 - 7.0	0	0	0	2	0	0	0	0	0	0	0
7.0 - 7.5	0	0	0	1	0	0	0	0	0	0	0
7.5 - 8.0	0	0	0	0	0	0	0	0	0	0	0
8.0 - 8.5	0	0	0	1	0	0	0	0	0	0	0
8.5 - 9.0	0	0	0	2	0	1	0	0	0	0	0
9.0 - 9.5	1	2	0	6	0	2	0	0	0	0	0
9.5 - 10.0	1	0	0	3	0	2	1	2	1	0	1
10.0 - 10.5	0	1	0	5	0	14	0	1	1	1	3
10.5 - 11.0	2	0	0	8	1	10	3	1	2	0	5
11.0 - 11.5	0	0	0	9	1	6	0	3	1	0	2
11.5 - 12.0	1	0	1	6	2	5	1	8	1	1	5
12.0 - 12.5	0	1	0	4	1	2	0	0	2	0	5
12.5 - 13.0	0	0	0	1	1	0	0	0	1	2	0
13.0 - 13.5	0	0	0	0	2	0	0	0	0	0	0
13.5 - 14.0	0	0	0	1	1	0	0	0	0	0	0
14.0 - 14.5	0	0	0	0	0	0	0	0	0	0	0
>14.5 (includes 99.9)	50	16	4	94	20	9	1	4	4	8	7
TOTALS	55	20	5	144	29	51	6	19	13	12	28

m_B RANGE \ SP	R6	R7	R8	S	SE	S4	S5	S6	S7	S8	W
< 0.5	0	0	0	0	0	0	0	0	0	0	0
0.5 - 1.0	0	0	0	0	0	0	0	0	0	0	0
1.0 - 1.5	0	0	0	0	0	0	0	0	0	0	0
1.5 - 2.0	0	0	0	0	0	0	0	0	0	0	0
2.0 - 2.5	0	0	0	0	0	0	0	0	0	0	0
2.5 - 3.0	0	0	0	0	0	0	0	0	0	0	0
3.0 - 3.5	0	0	0	0	0	0	0	0	0	0	0
3.5 - 4.0	0	0	0	0	0	0	0	0	0	0	0
4.0 - 4.5	0	0	0	0	0	0	0	0	0	0	0
4.5 - 5.0	0	0	0	0	0	0	0	0	0	0	0
5.0 - 5.5	0	0	0	0	0	0	0	0	0	0	0
5.5 - 6.0	0	0	0	0	0	0	0	0	0	0	0
6.0 - 6.5	0	0	0	0	0	0	0	0	0	0	0
6.5 - 7.0	0	0	0	0	0	0	0	0	0	0	1
7.0 - 7.5	0	0	0	0	0	0	0	0	0	0	0
7.5 - 8.0	0	0	0	0	0	0	0	0	0	0	0
8.0 - 8.5	0	0	0	0	0	0	0	0	0	0	0
8.5 - 9.0	0	0	0	0	0	0	0	0	0	0	0
9.0 - 9.5	0	0	1	0	0	0	0	0	0	0	0
9.5 - 10.0	0	0	1	0	0	0	0	0	0	0	0
10.0 - 10.5	0	0	1	0	0	0	0	0	0	0	0
10.5 - 11.0	0	0	1	1	0	0	0	0	0	0	0
11.0 - 11.5	3	0	0	1	0	1	0	0	0	1	1
11.5 - 12.0	0	0	0	0	0	0	1	2	0	0	2
12.0 - 12.5	0	0	0	0	0	0	0	0	0	0	2
12.5 - 13.0	0	0	0	0	0	0	0	0	0	0	1
13.0 - 13.5	0	0	0	0	0	0	0	0	0	0	4
13.5 - 14.0	0	0	0	0	0	0	0	0	0	0	2
14.0 - 14.5	1	0	0	0	0	0	0	0	0	0	1
>14.5(includes 99.9)	1	1	4	2	2	1	1	1	1	0	11
TOTALS	5	1	8	4	2	2	2	3	1	1	25

m_B RANGE \ SP	WR										Totals
< 0.5	0										73
0.5 - 1.0	0										8
1.0 - 1.5	0										12
1.5 - 2.0	0										20
2.0 - 2.5	0										34
2.5 - 3.0	0										52
3.0 - 3.5	0										76
3.5 - 4.0	0										149
4.0 - 4.5	0										247
4.5 - 5.0	0										459
5.0 - 5.5	0										805
5.5 - 6.0	0										1293
6.0 - 6.5	0										2204
6.5 - 7.0	0										3316
7.0 - 7.5	0										5837
7.5 - 8.0	0										9826
8.0 - 8.5	0										17223
8.5 - 9.0	0										27060
9.0 - 9.5	0										43626
9.5 - 10.0	0										62039
10.0 - 10.5	0										79824
10.5 - 11.0	0										63463
11.0 - 11.5	0										40162
11.5 - 12.0	0										19191
12.0 - 12.5	1										7738
12.5 - 13.0	0										2829
13.0 - 13.5	0										1296
13.5 - 14.0	0										549
14.0 - 14.5	0										353
>14.5(includes 99.9)	0										41060
16 of 16 TOTALS	1										430824

ADC Bull. (July 1981) 1, 139-145

NEW AND REVISED CATALOGUES AVAILABLE FROM THE ASTRONOMICAL DATA CENTER (ADC)

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Astronomical catalogues and data sets recently received and/or modified are described briefly. The code numbers given below are those given in the Status Report in this volume of the ADC Bulletin. The first page of the Status Report explains the categories (numbers 1-8 given as Roman numbers I-VIII). This numbering system is based on the scheme initiated by the Centre de Données Stellaires (CDS) in Strasbourg, France.

1/713/ Catalog of 5,268 Standard Stars for the Equinox and Epoch 1950.0 Based on the Normal System N30 (H. R. Morgan 1952, Astron. Papers Amer. Ephemeris 13, Part III)

The catalogue has been modified and the footnotes in the published version have been computerized on a separate file. The revised version is available on microfiche also.

1/861/ AGK3 Catalogue (Heidelberg 1975)

The catalogue has been updated with the correction of several recently discovered errors. It is also available in a version sorted by right ascension (1/913/).

1/911/ Jet Propulsion Laboratory Long Ephemeris Tape of Planetary and Lunar Ephemerides for the Years 1410 BC to 3003 AD (X. X. Newhall 1976, Jet Propulsion Laboratory)

The tape contains Chebyshev polynomial expansion data for the computation of ephemerides. The ADC tape is a 6250 bpi, IBM binary VBS formatted tape and must be converted for use on other systems. A program is available for reading the tape and interpolating to obtain ephemerides for desired times.

1/912/ AGK3R Catalogue: Observational Catalogue of 21499 Northern Reference Stars; Mean Positions and Proper Motions for 20194 AGK3R Stars (Scott and Smith 1967, Conf. on Photographic and Astrometric Techniques, Ed. H. Eichhorn, Univ. South Florida, Tampa, p. 181).

The tape was kindly supplied by Dr. T. E. Corbin. Logical records were modified by removing blank-filled fields only. The machine-readable catalogue is in good shape, but has not been documented yet.

2/707/ The UBVRIJKLMNH Photoelectric Photometric Catalogue (Morel, M. and Magnenat, P. 1978, Astonomy and Astrophysics Supplement, 34, 477)

The initial tape was received from the CDS and a few modifications were made to facilitate use of the catalogue: blank fields were nines filled, the number of measurements field was converted to an all numerical field, and some statistics as a function of source catalogue were computed and are described in the document that has been prepared.

2/752/ 13-Color Photometry of 1380 Bright Stars (H. L. Johnson and R. I. Mitchell 1975, Rev. Mex. Astron. Astrof., 1, 299)

Catalogue has been modified by updating and homogenizing the spectral types. It is also available on microfiche.

2/859/ The Catalogue of Stellar Ultraviolet Fluxes (Thompson, G. I., Nandy, K., Jamar, C., Monfils, A., Houziaux, L., Carnochan, D. J., and Wilson, R., The Science Research Council, 1978)

The catalogue as received from Dr. Thompson was modified to change the five standard-error values which were initially asterisk-filled with a value of 99.99. In addition, statistics for the entries which have no valid data for the star and those that have small negative flux values are presented as a function of wavelength in the document which has been prepared.

2/901/ Photoelectric uvby Photometry for 1217 Stars Brighter than V = 6.5 Magnitudes (Stromgren, B. and Perry, C. 1962, unpublished, Institute for Advanced Study, Princeton, New Jersey)

This catalogue was made machine readable at NASA/GSFC in the early 1970s, and some additonal information from the Yale Bright Star Catalogue has been added to the initial information. The document describing this version of the machine-readable catalogue is now available.

2/902/ OAO-2 Ultraviolet Photometry (Code, A. D. and Meade, M. R. 1978, Ap. J. Suppl. 39, 195; Meade, M. R. and Code, A. D. 1980, Ap. J. Suppl. 42, 283)

The tape was kindly supplied by the authors. It has been converted from print to catalogue form to facilitate computer usage.

2/903/ The Catalog of Non-Solar X-Ray Measurements (Arens, J. and Rothschild, R. 1975 NASA/GSFC X-661-75-230)

The catalogue as received from Dr. Rothschild required a large core program in order to process the data as stored in coded, compressed card images. This initial data set has been modified so that each quantity has its own set of bytes for ease of data retrieval. A document which describes this version of the catalogue has now been prepared.

2/905/ The Interim Equatorial Infrared Catalogue, Number 1 (Sweeney, L. H., Heinsheimer, T. F., Yates, F. F., Maran, S. P., Lesh, J. R. and Nagy, T. A. 1978, Aerospace Report No. TR-0078 (3409-20)-1)

This catalogue was received from Mr. L. Sweeney of the Aerospace Corporation who prepared the catalogue from processing of data from a USAF satellite at 2.7 microns. The document which describes this catalogue has now been prepared.

2/906/ Far Infrared List is a summary list of published University College London (UCL) 40-350 microns observations, excluding the galactic center and upper limits. The list was compiled by Dr. J. Emerson (Queen Mary College, University of London) as part of his Ph. D. Thesis. Dr. Emerson has provided us with the list but has asked that we do not distribute it. A document which descirbes the list has been prepared.

2/911/ Table 1 from the Catalogue of Stars Suspected of Variability (Kukarkin, B. V., Kholopov, P. N., Efremov, Y. N. and Kurochkin, N. E. 1951, Astronon ical Council of the Academy of Sciences in the USSR) and from the Second Catalogue of Stars Suspected of Variability (1965, ibid.)

The data in this catalogue were received from the CDS on two files of a magnetic tape. A great deal of manipulation of these data was done to present the catalogue as described in the document which is now available.

2/912/ Table 2 from the same sources as described for 2/911/ above

3/817/ Catalogue of Early-Type Stars Whose Spectra Have Shown Emission Lines (Wackerling, L. R. 1970, Memoirs of the Royal Astronomical Society, 73, 153)

This catalogue was received from the author in the early 1970s. Details of the modifications (as a function of format conversions from the initial 7-track version to the current 9-track tape version), and the corrections to the catalogue are described in the document which is now available.

3/736/ General Catalogue of Cool Carbon Stars (Stephenson, C. B. 1973, Publications of the Warner and Swasey Observatory, 1, No. 4)

The magnetic tape version of this catalogue was received from the CDS in 1979. A number of modifications were made to this version such as reformatting the data to incorporate data on the continuation records (83 of these) into the main data record so that there is only one record per star in the new version of the catalogue. Some of the data not included in the CDS version have been added to make the catalogue as complete as possible. A full description of the modifications to the initial magnetic-tape version is given in the documentation which is now available.

3/739/ Ultraviolet Bright Star Spectrophotometric Catalogue (Jamar, C., Macau-Hercot D., Monfils, A., Thompson, G. I., Houziaux, L. and Wilson, R. 1976, ESA SR-27)

The initial machine-readable version of this catalogue was received from the CDS in 1979. This version has been modified in quite a few areas. Each data record had each of the 61 wavelengths explicitly; these have been removed since they are easily reproduced and shorten the logical record length by 244 bytes. Another 183 bytes were removed by changing the flux unit that was used so that the exponential power need not be retained on the tape. The major modification to the tape was the addition of the entire set of primary data from the published catalogue. This addition is important for the users of this catalogue since this information ties the catalogue to other catalogue information on the given stars. All of the changes to the tape are described in detail in the document which is now available.

3/848/ Catalog of Spectrophotometric Scans of Stars (Breger, M. 1976, Ap. J. Supp., 32, 7)

The original data for this catalogue were received from Dr. S. Parsons (Univ. of Texas) in 1976. In addition, the analysis program was sent by Dr. Parsons. The analysis program was modified to run on the NASA/GSFC computer and the catalogue was generated from the computer output. Two indices were prepared for this catalogue to aid the user to identify a given entry easily. These indices and a description of the modifications to the analysis program and the resultant catalogue are given in the document which is now available.

3/851/ Michigan Catalogue of Two-Dimensional Spectral Types for the HD Stars, Volume 2 (zones -52° to -40°) (Houk, N. 1978, University Michigan)

The record format has been modified slightly to render it more uniform for computer processing. The remarks file has been changed to contain one remark per logical record.

3/905/ White Dwarfs (Luyten, W. J. 1970, Minneapolis: University of Minnesota) and White Dwarfs II (Luyten, W. J. 1977, Minneapolis: University of Minnesota)

All of the data in both of the white dwarf catalogues by Luyten have been keypunched at NASA/GSFC. The format was designed so that this catalogue is then the right ascension merge of the two catalogues. A byte has been reserved with the value of one or two so that either catalogue can be extracted easily. A detailed description of this catalogue is available in the document for the machine-readable catalogue.

3/914/ Absolute Calibration of Stellar Spectrophotometry (Johnson, H. L. 1980,

Rev. Mex. Astron. Astrof., 5, 25)

The catalogue was prepared at the ADC, but has not been documented yet.

3/916/ A Catalog of 0.2-A Resolution Far-Ultraviolet Stellar Spectra Measured with COPERNICUS (Snow, T. P. and Jenkins, E. B. 1977, Ap. J. Suppl., 33, 269)

The catalogue was kindly supplied by Dr. E. B. Jenkins in a print format tape. It has been converted to a catalog-type format at the ADC.

5/903/ SKYMAP Catalogue of 248727 Stars, Version 3.0, D. M. Gottlieb and S. F. McLaughlin (Gottlieb, D. M. 1978, Ap. J. Suppl, 38, 287)

The catalogue is a compendium of data from many different source catalogues and used the SAO as a seed. A binary version (IBM) is available with 540-byte records and a character coded version containing 593-byte records has been prepared and documented at the ADC. A subset of the catalogue is available on microfiche. A software package is available for data management and processing of the binary version. The catalogue is expected to be replaced by an updated and corrected version in September 1981.

5/905/ Stellar Catalog for Attitude Determination in Space, Version II.I (Stein, W. L. 1980, Naval Surface Weapons Center, Dahlgren, Virginia)

The catalogue was graciously supplied by Dr. Stein and contains accurate positions, photometry and other data for stars brighter than seventh magnitude. It is expected that the tape will be replaced by a slightly revised version in the near future.

6/903/ A Finding List for Observers of Interacting Binary Systems, 5th Edition (Wood, F. B., Oliver, J. P., Florkowski, D. R. and Koch R. H. 1980, Publ. Department of Asron., University of Florida, Volume I; Publ. Univ. Pennsylvania, Aston. Ser. Volume XII)

The catalogue is contained on five tape files, but has not been thoroughly checked or documented yet.

7/903/ Globule List (Wesselius, P. 1980, unpublished [illegible] the combination of seven published lists of globules)

This catalogue was received from Dr. P. Wesselius in 1980. A sequential number and galactic coordinates were added to each record. A document which describes the machine-readable version is now available.

7/904/ Lists of Seyfert Galaxies (Weedman, D. W. 1977, Annual Reviews of Astronomy and Astrophysics, 15, 69; Weedman, D. W. 1978, Monthly

Notices of the Royal Astonomical Society, 184, 11P)

The two lists of Seyfert galaxies by Weedman were made machine readable at NASA/GSFC. The two data tables were made to conform to a uniform format so that the two lists could be merged. The bibliographies are also combined and the precision of the equatorial coordinates is indicated by numerical codes.

7/905/ Second Reference Catalogue of Bright Galaxies (de Vaucouleurs, G., de Vaucouleurs, A. and Corwin, H. G. 1976, University of Texas Press, Austin)

The machine-readable version of this catalogue was purchased by NASA/GSFC from the University of Texas in 1980. The only manipulation of this data set has been to move the sign of the declination to a single byte (rather than one of two before). A document has been prepared which describes the machine-readable version of this catalogue and is available. However, we are not authorized to distribute the catalogue itself.

7/906/ List of X-Ray Positions (compiled by Dr. J. Dolan)
This list contains positions of all x-ray sources known more accurately than those given in the Fourth Uhuru or the Second Ariel catalogues.

This machine-readable list of x-ray positions was received from Dr. J. Dolan (NASA/GSFC) in 1980. Some minor modifications to the data set were made and galactic coordinates were computed and added to each record. A document which describes this data set is available.

7/907/ Catalog of Galaxy Redshifts (Rood, H. J. unpublished)

The machine-readable version of this catalogue was received from Dr. P. J. E. Peebles (Princeton University) in 1980. The first record did not contain equatorial coordinates so they were added and the record moved to the proper postion in the right ascension-ordered catalogue. Some additional data which were indicated on the printout of the data as received from Dr. Rood were added. The value of the redshift relative to the Local Group (V) was included on the printout but not on the tape so we computed the value and added it to the tape. Approximately 10% of the entries were found to have a difference of one or two km/sec between the printout and our computed values. A description of the modifications to the tape and a description of the final version of the catalogue is now available.

7/911/ Master Specialty Catalogue (Nagy, T. A. 1977 unpublished)

The Master Specialty Catalogue is the combination of the Revised New General Catalogue of Non-Stellar Objects (Sulentic, J. W. and Tifft, W. G. 1973, University of Arizona Press), the Reference Catalogue of Bright Galaxies (de Vaucouleurs, G. and de Vaucouleurs, A. 1964,

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University of Texas Press) and the Two-Micron Sky Survey (Neugebauer, G. and Leighton, R. B. 1969, California Institute of Technology, NASA SP-3047) which have all been processed by the Palomar Plate Assignment Program. The output of the program is a multifile magnetic tape where each file represents all of the objects which are to be found on one of the Palomar Sky Survey plate areas (including the Whiteoak Extension). The tape consists of 1037 files and each file has as the first record a header record which defines plate specifications as well as the number of each of the individual catalogue entries for that plate.

7/912/ Plate Centers of the Emission-Line Survey of the Milky Way

A machine-readable version of the equatorial coordinates which define the plate centers of the Emission-Line Survey of the Milky Way has been prepared. These data are used to process catalogue data as a function of plate area.

7/913/ SAO Catalog Sorted by Emission-Line Survey Plate Areas

The Palomar Plate Assignment Program was modified to process the Smithsonian Astrophysical Observatory (SAO) Catalog as a function of the Emisssion-Line Survey plate areas. The individual files (each one represents a plate area) are also sorted by magnitude (brightest to faintest) so that one could choose to plot only the brightest (e. g., 50) stars.

7/914/ SAO Catalog Sorted by European Southern Observatory Blue (J) Plate Areas

The Southern Sky Survey Plate Assignment Program was utilized to process the Smithsonian Astrophysical Observatory (SAO) Catalog as a function of the European Southern Observatory Blue (J) plate areas. The 606 individual files (each one represents a plate area) have a header record followed by the individual catalogue data entries.

7/915/ CSI Catalogue Sorted by European Southern Observatory Blue (J) Plate Areas

The Southern Sky Survey Plate Assignment Program was utilized to process the Catalogue of Stellar Identifications (1976 version, 430824 records) as a function of the European Southern Observatory Blue (J) plate areas. The 606 individual files (each one represents a plate area) have a header record followed by the individual catalogue data entries.

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NASA/GSFC Code 601
Greenbelt, Maryland 20771

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ADC Bull. (July 1981) 1, 146-169

STATUS REPORT ON MACHINE-READABLE ASTRONOMICAL CATALOGUES

ASTRONOMICAL DATA CENTER

NASA-GODDARD SPACE FLIGHT CENTER

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

1 JULY 1981

Catalogues are grouped and numbered in terms of the Strasbourg Stellar Data Center's numbering system where applicable. Additional bibliographical information can be found in the CDS catalogue list.

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
B - 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
D - Catalogue in preparation, revision, or update (temporarily unavailable)
E - 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
R - 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, repectively.

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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STATUS REPORT ON MACHINE-READABLE ASTRONOMICAL CATALOGUES
1 JULY 1981

I. ASTROMETRIC DATA:

801 -	SMITHSONIAN ASTROPHYSICAL OBSERVATORY CATALOG (WITH HD AND GC NUMBERS ADDED - CHARACTER VERSION) (HARAMUNDANIS 1966) (258997 RECORDS)	D M T
3 -	YALE ZONE CATALOGUES (YZ) (TRANS. YALE ASTRON. OBS. 11-27,30-31) (209872 RECORDS)	B
4 -	CAPE PHOTOGRAPHIC CATALOGUE (CPC) (ANN. CAPE OBS., VOL. 17-22) (68467 RECORDS)	B
5 -	CAPE ZONE CATALOGUE, PROPER MOTIONS OF STARS IN ZONE CATALOGUE OF 20847 STARS 1900 (SPENCER AND JACKSON) (C	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, HMSO, London)	B
808 -	GENERAL CATALOGUE OF 33342 STARS FOR THE EPOCH 1950.0 (GC) (BOSS 1936, Carnegie Inst. of Washington) (33342 RECORDS)	A M T
9 -	GESCHICHTE DES FIXSTERNHIMMELS (ZONES 0 DEG TO +50 DEG) (OBSERVED POSITIONS NOT INCLUDED) (169000 RECORDS)	E
810 -	YALE CATALOGUE OF TRIGONOMETRIC PARALLAXES (TP) (JENKINS 1952, 1963, Yale Univ. Obs.) (7330 RECORDS)	A G
11 -	CATALOGUE OF PROPER MOTIONS OF 8790 STARS WITH REFERENCE TO GALAXIES (KLEMOLA et al. 1971, Publ. Lick Obs. XXII, Part II) (12492 RECORDS)	B
12 -	STERN-KATALOG FUR DIE ZONE VON -6 DEG. BIS -10 DEG. SUDLICHER DEKLINATION FUR DAS AEQUINOKTIUM 1890, ERSTE UND ZWEITE ABTHEILUNG (HERZ 1906,1907, Math. Abh. nicht zur Akad. gehor. Gelehrter, Berlin. 1906. I.; 1907. I.) (10251 RECORDS)	B F
713 -	CATALOG OF 5,268 STANDARD STARS BASED ON THE NORMAL SYSTEM N30 (H. R. MORGAN 1952, Astron. Papers Amer. Ephemeris 13, Part III) (5268 RECORDS) (N30)	A F T
14 -	PROPER MOTIONS OF 1160 LATE-TYPE STARS (FOGH OLSON 1970, A&A Suppl. 2, 69) (1160 RECORDS)	C
15 -	FOURTH FUNDAMENTAL KATALOG AND SUPPLEMENT (FRICKE AND KOPFF 1963, Veroff. Astron. Rechen-Inst., Heidelberg, No. 10,11)	B
16 -	KATALOG VON 3356 SCHWACHEN STERNEN FUR DAS AEQUINOKTIUM 1950 (ZONES -5 DEG TO +89 DEG) (LARINK 1955, Hamburg-Bergedorf Verlag der Sternwarte)	C

STATUS REPORT ON MACHINE-READABLE ASTRONOMICAL CATALOGUES
1 JULY 1981

I. ASTROMETRIC DATA:

21 - CARTE DU CIEL CATALOGUE (LACROUTE AND VALBOUSQUET 1974, CDS Bull. 6, 38) (AC) (OXFORD, TOULOUSE, BORDEAUX, ALGIERS ZONES) C

22 - CARTE DU CIEL CATALOGUE (LACROUTE AND VALBOUSQUET 1974, CDS Bull. 6, 38) (AC) (PARIS ZONE) C

23 - CATALOGUE OF PROPER MOTIONS FOR 437 A STARS (FOGH OLSON 1970, A&A Suppl. 1, 189) C

26 - CATALOGUE DE 8803 ETOILES ENTRE 31 ET 40 DECLINAISON NORD (PRAGER 1923, Veroff. Berlin-Babelsberg 4) E

28 - BONN 10; KATALOG VON 10663 STERNEN (KUSTNER 1908, Veroff. der Koniql. Sternwarte zu Bonn, No. 10) C

31 - BUCHAREST CATALOGUE: CATALOGUE KSZ D'ETOILES FAIBLES POUR 1950.0 (1972) ZONES -11 DEG TO +11 DEG (3940 RECORDS) B

32 - GREENWICH CATALOG OF STARS FOR 1910.0 (LONDON, H. M. STATIONERY OFFICE 1920) ZONES +24 DEG TO +32 DEG (12368 RECORDS) E

33 - FIRST GREENWICH CATALOG OF STARS FOR 1925.0 (LONDON 1924) (2643 RECORDS) C

34 - SECOND GREENWICH CATALOG OF STARS FOR 1925.0 (2111 FUNDAMENTAL STARS) (LONDON 1935) ZONES +32 DEG TO +64 DEG (10587 STARS) C

35 - SECOND NINE-YEAR CATALOG OF STARS FOR 1900: ASTROGRAPHIC REFERENCE STARS (LONDON 1909) (10127 RECORDS) C

36 - CATALOGUE DE 964 ETOILES, ZONES +5 DEG TO +15 DEG (FAYET, Cercle Meridien Ann. Bur. Long. XIII) C

37 - PARIS 50: CATALOGUE OF 3997 STARS (UNPUBLISHED) ZONES +33 DEG TO +35 DEG E

38 - TOKYO MITAKA CATALOGUE OF EQUATORIAL STARS 1950.0 (TME) (TUZI 1962, Ann. Tokyo Astron. Obs. (2) 8, 1) (4135 RECORDS) C

41 - LOWELL PROPER MOTION SURVEY 8991 STARS WITH m > 8, PM > 0.26"/YEAR IN THE NORTHERN HEMISPHERE (GICLAS 1971, Lowell Obs., Flagstaff, AZ) (10384 RECORDS) B

43 - FIRST CATALOGUE OF FUNDAMENTAL STARS SANTIAGO-PULKOVO (SPF-1) (1126 RECORDS) (TO BE PUBLISHED) C

44 - SECOND CATALOGUE OF FUNDAMENTAL STARS SANTIAGO-PULKOVO (SPF-2) (326 + 280 + 62 RECORDS) (TO BE PUBLISHED) C

STATUS REPORT ON MACHINE-READABLE ASTRONOMICAL CATALOGUES
1 JULY 1981

I. ASTROMETRIC DATA:

49	- CATALOGUE MERIDIEN DE STRASBOURG 1972 (MELCHIOR AND DEJAIFFE, UNPUBLISHED) (2832 RECORDS)	C		
54	- A CATALOGUE OF 1849 STARS WITH PROPER MOTIONS EXCEEDING 0.5" ANNUALLY (LUYTEN 1955, Lund Press, Minneapolis)	B		
55	- 3eme CATALOGUE DE TOULOUSE, ZONES +3 TO +12 (PALOQUE 1937, Toulouse Ann. 13) (10070 RECORDS)	C		
57	- CATALOGUE DE 14263 ETOILES: CATALOGUE D'ABBADIA (HENDAYE 1915) ZONES +15 DEG TO +24 DEG	C		
59	- CATALOGUE OF PROPER MOTIONS OF 12590 FAINT STARS IN THE +25 TO -20 DECLINATION ZONE (GOREL 1972, Trudy Glav. Astron. Obs. Pulkovo, Ser. 2, 80, 5) (6295 RECORDS)	C		
860	- DATA ON TRIGONOMETRIC PARALLAXES WHICH HAVE BEEN USED IN THE YALE CATALOGUE (RIGHT-HAND PAGES OF TRIG. PAR. CAT.) (JENKINS 1963, Yale Univ. Obs.) (10215 RECORDS)	B		
861	- AGK3 CATALOGUE (FROM HEIDELBERG; 1975, Hamburg-Bergedorf; SEE ALSO WARREN 1978, CDS Bull. 15, 116) (183145 RECORDS) (SEE ALSO I/913/)	A	F	T
862	- PERTH 70, POSITIONS OF 24900 STARS (P70) (HOG AND VON DER HEIDE 1976, Abh. der Hamburger Sternwarte IX) (24978 RECORDS)	A		T
901	- CORDOBA DURCHMUSTERUNG (CD) (THOME 1892-1932, Resultados del Obs. Nac. Argentino 16,17,21) (613951 RECORDS)	D	G	
902	- ACCURATE POSITIONS OF 502 STARS IN REGION OF PLEYADES (EICHHORN et al. 1970, Mem. RAS 73, 125) (502 RECORDS)	A		T
903	- CATALOGUE OF STARS IN REGION OF HYADES CLUSTER (WARREN AND DUNHAM 1978)	D		
904	- SMITHSONIAN ASTROPHYSICAL OBSERVATORY CATALOG (HARAMUNDANIS 1966) (WITH HD AND GC NUMBERS ADDED) (DINARY VERSION) (SAO-BINARY)	A		T
905	- CATALOG OF SUPPLEMENTAL STARS TO THE BONNER DURCHMUSTERUNG (WARREN AND KRESS 1980, ADC Bull. 1, 19) (838 RECORDS)	A		T
906	- BONNER DURCHMUSTERUNG (BD) ZONES - 1 TO +19	D	G	
907	- BONNER DURCHMUSTERUNG (BD) ZONES +20 TO +40		G	
908	- BONNER DURCHMUSTERUNG (BD) ZONES +41 TO +89		G	
909	- CAPE PHOTOGRAPHIC DURCHMUSTERUNG (CPD) (GILL AND KAPTEYN 1895-1900, Cape Ann. 3-5)		G	

STATUS REPORT ON MACHINE-READABLE ASTRONOMICAL CATALOGUES
1 JULY 1981

I. ASTROMETRIC DATA:

910 - SOUTHERN DURCHMUSTERUNG (BD SOUTH) ZONES - 2 TO -23 G
(SCHONFELD 1886, Astron. Beob. 8, Part IV)

911 - JET PROPULSION LABORATORY LONG EPHEMERIS TAPE OF A
PLANETARY AND LUNAR EPHEMERIDES FOR THE YEARS 1410 BC
TO 3003 AD
(NEWHALL 1976, JET PROPULSION LAB)

912 - AGK3R CATALOGUE: OBSERVATIONAL CATALOGUE OF 21499 B
NORTHERN REFERENCE STARS (SEE SCOTT AND SMITH 1967,
Cont. on Photographic Astrometric Technique, p. 181,
Ed. H. RICHHORN, U. South Florida, Tampa); MEAN
POSITIONS AND PROPER MOTIONS FOR 20194 AGK3R STARS
(PREPARED BY T.E. CORBIN, USNO) (21499 + 20194 RECORDS)

913 - AGK3 CATALOGUE (FROM HEIDELBERG; 1975, Hamburg-Bergedorf; A T
SEE ALSO WARREN 1978, CDS Bull. 15, 116)
(183145 RECORDS SORTED BY RIGHT ASCENSION)

STATUS REPORT ON MACHINE-READABLE ASTRONOMICAL CATALOGUES
1 JULY 1981

II. PHOTOMETRIC DATA:

1 -	CATALOGUE OF STARS MEASURED IN THE GENEVA OBSERVATORY PHOTOMETRIC SYSTEM (RUFENER 1976, A&A Suppl. 26, 275) (4795 RECORDS)	B
802 -	TWO-MICRON SKY SURVEY (TMSS) (NEUGEBAUER AND LEIGHTON 1969) (5612 RECORDS)	A R T
703 -	A CATALOGUE OF uvby, BETA MEASUREMENTS: A COLLECTION OF PUBLISHED DATA; A CATALOGUE OF WEIGHTED MEANS (HAUCK AND MERMILLIOD 1975, A&A Suppl. 22, 239)	A M
4 -	PHOTOELECTRIC CATALOGUE: MAGNITUDES AND COLORS OF STARS IN THE UBV AND UcBV SYSTEMS (OCHSENBEIN 1974, A&A Suppl. 15, 215) (34807 RECORDS) (IMPROVED VERSION OF II/910/ BELOW) (UBVS)	A M
5 -	UBV PHOTOMETRY OF BRIGHT STARS (JOHNSON et al. 1966, Commun. LPL 4, 99, Table 9)	B
6 -	CELESCOPE CATALOGUE OF ULTRAVIOLET MAGNITUDES (DAVIS et al. 1973, SAO Spec. Report 350) (5761 RECORDS)	C P
707 -	UBVRIJKLMNH PHOTOELECTRIC PHOTOMETRIC CATALOGUE (MOREL AND MAGNENAT 1978, A&A Suppl. 34, 477) (5943 DATA RECORDS + 88 REF. RECORDS)	A R T
8 -	CATALOGUE OF UVBGRI MEASUREMENTS: CATALOGUE OF PUBLISHED DATA; CATALOGUE OF WEIGHTED MEANS (NICOLLIER AND HAUCK 1978, A&A Suppl. 31, 437) (1702 + 1297 RECORDS)	B
10 -	GENERAL CATALOGUE OF VARIABLE STARS, 2ND ED. (GCVS) (KUKARKIN et al. 1958, (17945 RECORDS) (SUPERSEDED BY 811 BELOW)	B M
811 -	GENERAL CATALOGUE OF VARIABLE STARS, PARTIAL 3RD ED. (KUKARKIN et al.) (PREPARED BY GUILDAUT) (GCVS-S) (22649 RECORDS) (UPDATES & REVISIONS IN PROGRESS AT ADC)	D
14 -	VBLUW PHOTOELECTRIC PHOTOMETRIC CATALOGUE, SYSTEM OF WALRAVEN (PUBLISHED DATA AND HOMOGENEOUS MEANS) (PYTHON 1979, A&A Suppl. 38, 463) (3132 + 2687 RECORDS)	C
15 -	CATALOGUE OF PHOTOMETRIC MEASUREMENTS IN THE UBVr 20 SYSTEM (PUBLISHED DATA AND WEIGHTED MEANS) (MAGNENAT 1973, CDS Internal Report No. 6) (418 + 366 RECORDS)	C
16 -	CATALOGUE DES MESURES PHOTOMETRIQUES DANS LE SYSTEME DE L'OBSERVATOIRE DE VILNIUS: CATALOGUE OF INDIVIDUAL MEASURES; CATALOGUE OF AVERAGES; REFERENCES (MAGNENAT 1974, CDS Internal Report No. 8) (3105 RECORDS)	C
17 -	CATALOGUE DES MESURES PHOTOMETRIQUES DANS LE SYSTEME DE DAVID DUNLAP OBSERVATORY: CATALOGUE OF INDIVIDUAL MEASURES; CATALOGUE OF AVERAGES (MAGNENAT 1974, CDS Internal Report No. 9) (1884 RECORDS)	C

STATUS REPORT ON MACHINE-READABLE ASTRONOMICAL CATALOGUES
1 JULY 1981
II. PHOTOMETRIC DATA:

18 - CATALOGUE DES MESURES PHOTOMETRIQUES DANS LE SYSTEME (102, 65, 62) DE EGGEN: CATALOGUE OF INDIVIDUAL MEASURES; CATALOGUE OF AVERAGES (MAGNENAT 1974, CDS Internal Report No. 7) (1585 RECORDS) C

19 - THEORETICAL COLOURS FOR F AND G DWARFS (BELL 1971, MNRAS 154, 343) C

20 - THE SPATIAL DISTRIBUTION OF YOUNG STARS IN VELA (POSITIONAL, PHOTOELECTRIC UBV, REDDENING, DISTANCES DATA, 381 RECORDS, 358 STARS) (DENOYELLE 1977, A&A Suppl. 27, 343) C

21 - NARROW-BAND PHOTOMETRY OF LATE-TYPE STARS (HAGGKVIST AND OJA 1970, A&A Suppl. 1, 199) (629 STARS) C

22 - H-ALPHA PHOTOMETRY OF LATE-TYPE STARS II. F AND G DWARFS SOUTH OF THE EQUATOR (PEAT 1966, MNRAS 131, 467) (172 RECORDS) C

24 - H-ALPHA PHOTOMETRY OF LATE-TYPE STARS 1. F-, G- AND K-TYPE STARS NORTH OF THE EQUATOR (PEAT 1964, MNRAS 128, 435) (594 RECORDS) C

25 - PHOTOMETRY OF ORANGE-RED Ca-I TRIPLET IN LATE-TYPE STARS. TABLE I (PEAT 1964, MNRAS 128, 475) (296 RECORDS) C

26 - CATALOGUE OF EARLY-TYPE STARS MEASURED IN A NARROW-BAND PHOTOMETRIC SYSTEM (MORGULEFF AND GEREALDI 1975, A&A Suppl. 19, 389) (1482 RECORDS) C

27 - CATALOGUE OF PHOTOELECTRIC PHOTOMETRIC MEASUREMENTS IN THE UCBV SYSTEM (PUBLISHED DATA AND WEIGHTED MEANS) (NICOLET 1975, A&A Suppl. 22, 239) (8080 < 7146 RECORDS) B

29 - CATALOGUE OF UBV PHOTOMETRY AND MK SPECTRAL TYPES IN OPEN CLUSTERS (MERMILLIOD 1976, A&A Suppl. 24, 159; CDS Bull. 11, 16) (13358 RECORDS) B

32 - O STARS CATALOGUE, 3RD EDITION (GOY 1976, A&A Suppl. 26, 273) (3118 RECORDS, 951 ENTRIES) B

33 - uvby, BETA PHOTOMETRY FOR BRIGHT O- TO G0-TYPE STARS SOUTH OF DECLINATION +10 DEGREES (2828 RECORDS) (MERGED EDITION OF II/30/ AND II/31/) (GRONBECH AND OLSEN 1976, 1977, A&A Suppl. 25, 213; 27, 443) B

34 - POLARIZATION CATALOGUE (MATHEWSON,FORD/KLARE,NECKEL AND KRAUTTER COMBINED, SEE CDS Bull. 14, 115) (7503 RECORDS) B R

35 - A GENERAL CATALOGUE OF UBV PHOTOELECTRIC PHOTOMETRY (MERMILLIOD AND NICOLET 1977, A&A Suppl. 29, 259) (MN-UBV) (73091 RECORDS) A M

36 - CATALOGUE OF INDIVIDUAL UBV AND uvby-BETA OBSERVATIONS IN THE REGION OF THE ORION OB 1 ASSOCIATION (WARREN AND HESSER 1977, Ap.J. Suppl. 34, 115) (1976 RECORDS, 106 UBV STARS, 508 uvby-Beta STARS) B

STATUS REPORT ON MACHINE-READABLE ASTRONOMICAL CATALOGUES
1 JULY 1981

II. PHOTOMETRIC DATA:

37 - CATALOGUE OF UBV HR DIAGRAMS OF GLOBULAR CLUSTERS B
(PHILIP et al. 1976, Dudley Obs. Report No. 11)
(40824 RECORDS)

38 - CATALOGUE MINIPHOTE (13 DATA FILES, 2 REF. FILES) B
(MAGNENAT 1975, CDS Bull. 8, 20)

39 - CATALOGUE OF STARS PHOTOMETRICALLY MEASURED B
(MAGNENAT 1976, CDS Bull. 11, 17) (ABOUT 60800 STARS)

40 - PHOTOELECTRIC MEASURES OF HYDROGEN-LINE ABSORPTION IN C
EARLY-TYPE STARS
(BAPPU, CHANDRA, SANVAL AND SINVHAL 1962, MNRAS 123,
521) (177 RECORDS)

41 - PHOTOELECTRIC MEASUREMENTS OF THE 4200-A CN BAND AND THE C
G BAND IN G8-K5 SPECTRA
(GRIFFIN AND REDMAN 1960, MNRAS 120, 287) (712 RECORDS)

42 - K-LINE PHOTOMETRY OF A STARS (HENRY 1969, Ap.J. Suppl. C
18, 47) (292 RECORDS, 146 ENTRIES)

43 - K-LINE PHOTOMETRY OF SOUTHERN A STARS, TABLE I: SUMMARY C
OF DATA ON SOUTHERN A STARS (HENRY AND HESSER 1971, Ap.
J. Suppl. 23, 421) (738 RECORDS, 369 ENTRIES)

44 - K-LINE PHOTOMETRY OF STARS IN POPULATION I CLUSTERS, C
TABLES 3 TO 6 (PLEIADES, IC 2391, IC 2602, HYADES)
(HESSER AND HENRY 1971, Ap.J. Suppl. 23, 453)
(112 ENTRIES)

45 - STRONG CYANOGEN STARS, TABLE 2: PHOTOMETRIC DATA C
(JANES AND McCLURE 1971, Ap.J. 165, 561) (185 RECORDS)

46 - A PHOTOMETRIC INVESTIGATION OF THE STRONG CYANOGEN STARS, C
TABLE 1: BRIGHT CALIBRATION STARS; TABLE 4: STRONG
CYANOGEN STARS (McCLURE 1970, AJ 75, 41) (183 RECORDS)

47 - SCANNER ABUNDANCE STUDIES I. AN INVESTIGATION OF SUPER- C
METALLICITY IN LATE-TYPE EVOLVED STARS, TABLES 5, 6, 7
(SPINRAD AND TAYLOR 1969, Ap.J. 157, 1279) (229 ENTRIES)

48 - A REFERENCE LIST FOR THE UBV SYSTEM C
(NICOLET 1976, CDS Bull. 11, 20) (13425 RECORDS)

49 - CATALOGUE OF Am STARS WITH KNOWN SPECTRAL TYPES B
(HAUCK 1973, A&A Suppl. 10, 385) (418 ENTRIES,
645 RECORDS)

50 - PHOTOMETRIC STANDARD STARS, TABLE II: MAGNITUDES AND C
COLOURS OF BRIGHT SOUTHERN STARS; TABLE IV: MAGNITUDES
AND COLOURS OF STARS IN EQUATORIAL ZONE
(COUSINS 1971, Royal Obs. Ann. 7) (900 RECORDS)

51 - PHOTOELECTRIC PHOTOMETRIC CATALOGUE OF HOMOGENEOUS A
MEASUREMENTS IN THE UBV SYSTEM (NUBV)
(NICOLET 1978, A&A Suppl. 34, 1) (58845 RECORDS)

STATUS REPORT ON MACHINE-READABLE ASTRONOMICAL CATALOGUES
1 JULY 1981
II. PHOTOMETRIC DATA:

752 - 13-COLOR PHOTOMETRY OF 1380 BRIGHT STARS (JOHNSON AND MITCHELL 1975, Rev. Mex. Astron. Astrof. 1, 299) (FORMAT OF SPECTRAL TYPES HOMOGENIZED AND UPDATED AT ADC, 1981) (1380 RECORDS) — A P T

53 - A CATALOGUE OF 10-MICRON CELESTIAL OBJECTS (10MU) (HALL 1974, Aerospace Corp. Report SAMSO-TR-74-212) (647 RECORDS) — A T

54 - AIR FORCE GEOPHYSICS LABORATORY 4-COLOR INFRARED (PRICE AND WALKER 1976, AFGL Report TR-76-0208) (2363 RECORDS) — A S T

55 - FLARE STARS GERSHBERG (FS) (SHAKHOVSKAYA 1971, IAU Colloq. 15, Kl. Veroff. Bamberg 9, 159) (53 RECORDS) — A T

56 - 100-MICRON SURVEY OF THE GALACTIC PLANE (100MU) (HOFFMANN, FREDERICK AND EMERY 1971, Ap.J. 170, L89) (72 RECORDS) — A T

57 - A CATALOGUE OF uvby, BETA MEASUREMENTS: A COLLECTION OF PUBLISHED DATA. A CATALOGUE OF WEIGHTED MEANS (HAUCK AND MERMILLIOD 1980, A&A Suppl. 40, 1) (31000 + 19884 RECORDS) — R

58 - VILNIUS PHOTOMETRIC CATALOGUE (NORTH 1980, SEE CDS Bull. 19, 92) (2095 RECORDS, 1879 STARS) — E

859 - CATALOGUE OF STELLAR ULTRAVIOLET FLUXES. RESULTS OF THE THE SKYSCAN EXPERIMENT AND TD-1 (THOMPSON et al. 1978, Science Research Council, UK) (31215 RECORDS) — A T

61 - CATALOGUE OF STELLAR DIAMETERS (FRACASSINI AND PASINETTI 1979, CDS Bull. 16, 49) (6313 RECORDS, 4266 STARS) — E

62 - CATALOG OF EXTINCTION DATA (NECKEL,KLARE AND SARCANDER 1980, CDS Bull. 19, 61) — E

901 - STROMGREN-PERRY uvby COLORS (UNPUBLISHED 1965) (SP) (1217 RECORDS) — A S T

902 - OAO 2 ULTRAVIOLET PHOTOMETRY (CODE AND MEADE 1978, Ap. J. Suppl. 39, 195; Meade and Code 1980, Ap.J. Suppl. 42, 283) (3 FILES: 2132,1188,340 RECORDS; 164,132,34 STARS) — A T

903 - NON-SOLAR X-RAY MEASUREMENTS (XRY) (ARENS AND ROTHSCHILD 1975, NASA/GSFC X-661-75-230) (1301 RECORDS) — A T

904 - DEARBORN OBSERVATORY CATALOGUE OF FAINT RED STARS (DO) (NAGY 1979, Systems & Appl. Sci. Corp. R-SAW-8/79-01) (44076 RECORDS) — A T

905 - INTERIM EQUATORIAL INFRARED CATALOGUE (EIC 1) (SWEENEY,HEINSHEIMER,YATES,MARAN,LESH,NAGY 1978, Aerospace Report TR-0078(3409-20)-1) (896 RECORDS) — A T

STATUS REPORT ON MACHINE-READABLE ASTRONOMICAL CATALOGUES
1 JULY 1981
II. PHOTOMETRIC DATA:

906 -	FAR INFRARED LIST (>40 MICRONS, EMERSON)	R	T
907 -	INTERIM EQUATORIAL INFRARED CATALOGUE (EIC 2) (SWEENEY, REINSHEIMER, YATES, MARAN, LESH, NAGY 1979) (1278 RECORDS)	D	
908 -	MERGED INFRARED CATALOGUE (MIRC) (SCHMITZ, BROWN, MEAD AND NAGY 1978, NASA TM 79683) (11201 RECORDS)	R R	T
909 -	UBVRIJKL PHOTOMETRY OF BRIGHT STARS (JOHNSON et al.) (FORMERLY II/ 7/, SUPERSEDED BY PRESENT II/ 7/)	B	
910 -	PHOTOELECTRIC CATALOGUE: MAGNITUDES AND COLORS OF STARS IN THE UBV AND UcBV SYSTEMS (BLANCO et al. 1968)	B	
911 -	CATALOGUE OF STARS SUSPECTED OF VARIABILITY: TABLE I (KUKARKIN et al. 1951, 1965, Astron. Counsil Acad. Sci. USSR) (CSV-T1) (8904 RECORDS)	A 3	T
912 -	CATALOGUE OF STARS SUSPECTED OF VARIABILITY: TABLE II (KUKARKIN et al. 1951, 1965, Astron. Council Acad. Sci. USSR) (CSV-T2) (3137 RECORDS)	A	T

III. SPECTROSCOPIC DATA:

801 - HENRY DRAPER CATALOGUE AND EXTENSION (HD) (CANNON AND PICKERING 1918-1936, Harv. Ann. 91-100) (225300 + 46872 RECORDS) — D M

2 - PRELIMINARY GENERAL CATALOGUE OF EARLY-TYPE EMISSION STARS (BERTIAU AND McCARTHY 1969, Ric. Astron. 7, 523) (3216 RECORDS) — B

3 - REVISED CATALOGUE OF STELLAR ROTATIONAL VELOCITIES (UESUGI 1979, U. Tokyo) (6253 RECORDS) — C

803 - CATALOGUE OF ROTATIONAL VELOCITIES OF THE STARS (UFRV) (UESUGI AND FUKUDA 1970, Contrib. Inst. Astrophys. Kwasan Obs. Kyoto 33, 205) (3941 RECORDS) (SUPERSEDED BY III/37) — A M T

4 - BIBLIOGRAPHY OF STELLAR RADIAL VELOCITIES (ABT AND BIGGS 1972, Kitt Peak National Obs., Tucson) (44133 RECORDS) — B R

5 - CATALOGUE OF FAINT OB STARS BETWEEN CARINA AND CENTAURUS (LYNGA 1968, Medd. Lund, Ser. I, No. 238) (285 RECORDS) — C

6 - STUDIES OF THE MILKY WAY FROM CENTAURUS TO NORMA III. OB STARS (LYNGA 1964, Medd. Lund, Ser. II, No. 141) (484 RECORDS) — C

7 - A SURVEY OF FAINT OB STARS IN CARINA (GRAHAM AND LYNGA 1965, Mem. Mt. Stromlo Obs. 18) (454 RECORDS) — C

8 - LUMINOUS STARS IN THE SOUTHERN MILKY WAY (LSS) (STEPHENSON AND SANDULEAK 1971, Publ. Warner & Swasey Obs. 1, No. 1) (5132 RECORDS) — B

9 - F8-G2 STARS IN THE NORTH GALACTIC POLE REGION (UPGREN 1963, AJ 68, 194) (1127 RECORDS) — C

10 - G5 AND LATER STARS IN THE NORTH GALACTIC POLE REGION (UPGREN 1962, AJ 67, 37) (4027 RECORDS) — E

11 - F2 AND EARLIER STARS IN S.A. 28, 54, 106, 107 (UPGREN AND STARON 1969, Ap.J. 157, 327) (454 RECORDS) — C

12 - F5 AND LATER STARS IN S.A. 28, 54, 106, 107 (UPGREN AND STARON 1970, Ap.J. Suppl. 19, 367) (2068 RECORDS) — C

13 - VYSSOTSKY'S CATALOGUES 1950.0 (VYSSOTSKY et al. 1943, 1946, 1952, 1956, 1958, Ap.J. 97, 381; 104, 234; 116, 117; AJ 61, 201; 63, 211) (895 RECORDS) — E

14 - STARS F2 AND EARLIER IN NORTH GALACTIC POLE REGION (SLETTEBAK AND STOCK 1959, Hamburger Sternwarte No. 5) (601 RECORDS) — B

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III. SPECTROSCOPIC DATA:

15 -	LUMINOUS STARS IN THE NORTHERN MILKY WAY (LSN) (HARDORP et al. 1959-1965, Hamburg-Bergedorf, Vol. I-VI) (7389 RECORDS)	B R
16 -	SEVENTH CATALOGUE OF THE ORBITAL ELEMENTS OF SPECTROSCOPIC BINARY SYSTEMS (BAT7) (BATTEN, FLETCHER AND MANN 1978, Publ. Dom. Astrophys. Obs. 15, 121) (978 RECORDS)	E
817 -	CATALOGUE OF EARLY-TYPE STARS WHOSE SPECTRA HAVE SHOWN EMISSION LINES (WACKERLING 1970, Mem. RAS 73, 153) (WEL) (10652 RECORDS)	A T
818 -	CATALOGUE OF STELLAR SPECTRA CLASSIFIED IN THE MORGAN-KEENAN SYSTEM (C. JASCHEK,CONDE,DE SIERRA 1964, Publ. La Plata Obs.) (20849 RECORDS)	A G T
19 -	MK CLASSIFICATION EXTENSION (KENNEDY 1978, Mt. Stromlo Obs.) (30551 DATA + 351 REF. RECORDS)	B F
21 -	GENERAL CATALOGUE OF STELLAR RADIAL VELOCITIES (WRV) (WILSON 1953, Carnegie Inst. Washington Publ. 601) (15106 RECORDS)	A J T
22 -	ROTATION OF EVOLVING A AND F STARS (DANZIGER AND FABER 1972, A&A 18, 428) (580 RECORDS)	B
23 -	MK CLASSIFICATION FOR OB STARS (LESH 1968, Ap.J. Suppl. 17, 371) (458 RECORDS)	B
25 -	ABUNDANCES OF SODIUM, MAGNESIUM AND CALCIUM IN K-TYPE GIANT STARS. TABLE I (PEAT AND PEMBERTON 1968, MNRAS 140, 21) (311 RECORDS)	E
26 -	ABUNDANCES OF SODIUM, MAGNESIUM AND CALCIUM IN K-TYPE GIANT STARS. TABLE II (PEAT AND PEMBERTON 1968, MNRAS 140, 21) (85 RECORDS)	C
27 -	SCANNER ABUNDANCE STUDIES II. LATE G AND K DWARFS IN THE SOLAR NEIGHBORHOOD, TABLE 5: RAW DATA (TAYLOR 1970, Ap.J. Suppl. 22, 177) (849 RECORDS, 283 STARS)	C
28 -	SCANNER ABUNDANCE STUDIES II. LATE G AND K DWARFS IN THE SOLAR NEIGHBORHOOD, TABLE 5: BLOCKING FRACTIONS (TAYLOR 1970, Ap.J. Suppl. 22, 177) (283 RECORDS)	E
829 -	A CATALOGUE OF H GAMMA MEASURES OF R. M. PETRIE (HGAMMA) (CRAMPTON, LEIR AND YOUNGER 1973, Publ. Dom. Astrophys. Obs. 14, 151) (1171 RECORDS)	A G
730 -	A CATALOGUE OF STELLAR ROTATIONAL VELOCITIES (BERNACCA AND PERINOTTO 1970-1973, Contrib. Oss. Asiago No. 239, 250, 294) (3099 RECORDS)	A G T
851 -	MICHIGAN CATALOGUE OF 2-DIMENSIONAL SPECTRAL TYPES FOR THE HD STARS, VOL. 1 (ZONES -89 TO -53) (MHD1) (HOUK AND A. COWLEY 1975, U. Michigan) (36382 DATA + 4636 NOTES RECORDS)	A T

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III. SPECTROSCOPIC DATA:

32 -	DETERMINATION OF [FE/H] VALUES (MOREL et al. 1975, IAU Symp. 72) (896 RECORDS) (SUPERSEDED BY III/54/)	B
33 -	A SPECTRAL SURVEY OF THE SOUTHERN MILKY WAY I (SUNDMAN, LODEN AND NORDSTROM 1974, A&A Suppl. 15, 445) (2951 RECORDS)	B
34 -	A SPECTRAL SURVEY OF THE SOUTHERN MILKY WAY II (NORDSTROM 1975, A&A Suppl. 21, 193) (562 RECORDS)	B
35 -	A SPECTRAL SURVEY OF THE SOUTHERN MILKY WAY III (LODEN, L. O. et al. 1976, A&A Suppl. 23, 283) (ABOUT 10000 RECORDS)	B
736 -	A GENERAL CATALOGUE OF COOL CARBON STARS (STEPHENSON 1973, Publ. Warner & Swasey Obs. 1, No. 4) (3219 RECORDS)	A T
37 -	THE MERRILL-BURWELL CATALOGUES OF STARS EXHIBITING BRIGHT HYDROGEN LINES (MERRILL AND BURWELL 1933, 1948, 1949, 1950, Ap.J. 78, 87; 98, 153; 110, 387; 112, 72) (1607 RECORDS)	E
38 -	BIBLIOGRAPHIC CATALOG OF RADIAL VELOCITIES (BARBIER, Marseilles Obs.) (SUPPLEMENT TO ABT AND BIGGS 1972)	E R
739 -	ULTRAVIOLET BRIGHT STAR SPECTROPHOTOMETRIC CATALOGUE (JAMAR et al. 1976, ESA SR-27) (1356 ENTRIES)	A T
40 -	A UNIFORM EDITION OF THE STOCKHOLM SOUTHERN MILKY WAY SURVEY (CONTAINS CATALOGS III/33,34,35/) (ANDERSEN 1977, A&A Suppl. 29, 257)	C
41 -	IDENTIFICATION LIST OF LINES IN STELLAR SPECTRA (FINDING LIST FROM MOORE 1959, NBS Tech. Note 36 "A Multiplet Table of Astrophysical Interest") TAPE VERSION BY L. GRATTON AND F. QUERCI (14634 RECORDS)	B
42 -	CATALOGUE OF SELECTED SPECTRAL TYPES IN THE MK SYSTEM (M. JASCHEK 1978, CDS Bull. 15, 121) (MKS) (30361 DATA + 1029 REF. RECORDS)	A F
43 -	CATALOGUE OF LUMINOUS STARS IN THE SOUTHERN MILKY WAY (STEPHENSON AND SANDULEAK 1971, Publ. Warner & Swasey Obs. 1, No. 1; UPDATED VERSION OF III/ 8/ BY BISCHOFF 1978, CDS Bull. 14, 15) (5132 RECORDS)	B
44 -	AN ATLAS OF STELLAR SPECTRA (JOHNSON 1977, Rev. Mex. Astron. Astrof. 2, 71)	C
45 -	INFRARED SPECTRA FOR 32 STARS (JOHNSON AND MENDEZ 1970, AJ 75, 785)	C
46 -	CATALOGUE OF Ap AND Am STARS (BERTAUD AND FLOQUET 1974, A&A Suppl. 16, 71; RIDELMAN AND MacCONNELL 1973, AJ 78 667)	B

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III. SPECTROSCOPIC DATA:

747 -	CATALOGUE OF STELLAR RADIAL VELOCITIES (EVANS 1967, IAU Symp. 30, 57) (0 - 20 HOURS RA ONLY) (7823 RECORDS)	B	R
848 -	SPECTROPHOTOMETRIC SCANS (BSP) (BREGER 1976, Ap.J. Suppl. 32, 7) (937 RECORDS)	A	T
49 -	WHITE DWARFS (LUYTEN 1970, Univ. of Minnesota Press) (PREPARED BY G. SHARE, SELECTED DATA ONLY) (3035 RECORDS) (COMPLETE DATA CONTAINED IN III/905/ BELOW)	A	T
50 -	SOUTHERN MILKY WAY SPECTRAL SURVEY FOR STARS EARLIER THAN A5 (GEYER 1978, IAU Symp. 50, 82) (30810 RECORDS)	C	
851 -	MICHIGAN CATALOGUE OF 2-DIMENSIONAL SPECTRAL TYPES FOR THE HD STARS, VOL. 2 (ZONES -52 TO -40) (HOUK 1978, U. Michigan) (30400 + 4950 RECORDS)	A	T
52 -	MK SPECTRAL CLASSIFICATIONS, 3RD GENERAL CATALOGUE (BUSCOMBE 1977, Northwestern Univ.) (36339 + 177 RECORDS)	B	
53 -	CATALOG OF STARS CLASSIFIED FROM THE ULTRAVIOLET LINE FEATURES OF THE S2/68 EXPERIMENT (CUCCHIARO, JASCHEK AND JASCHEK 1979, CDS Bull. 17, 93) (1900 STARS)	E	
54 -	A CATALOG OF [FE/H] DETERMINATIONS (CAYREL et al. 1980, A&A Suppl. 41, 405) (628 STARS, 1109 DETERMINATIONS)	E	
55 -	RADIAL VELOCITIES IN OPEN CLUSTERS (MERMILLIOD, J.C. 1979, CDS Bull. 16, 2)	E	
56 -	SECOND CATALOG OF Am STARS WITH KNOWN SPECTRAL TYPES (CURCHOD AND HAUCK 1979, A&A Suppl. 38, 449)	E	
57 -	CATALOG OF PHYSICAL PARAMETERS OF SPECTROSCOPIC BINARY STARS (KRAICHEVA, POPOVA, TUTUKOV AND YUNGELSON 1980, CDS Bull. 19, 71)	E	
901 -	ROTATIONAL VELOCITIES (BKRV) (BOYARCHUK AND KOPYLOV 1964, Publ. Crimean Astrophys. Obs. 31, 44) (TAPE PREPARED BY NAGY AND SAWYER 1979, ADC/GSFC) (2559 RECORDS)	A	G T
902 -	GENERAL CATALOGUE OF S STARS (SS) (STEPHENSON 1976, Publ. Warner & Swasey Obs. 2, No. 2) (741 RECORDS)	A	T
904 -	CATALOGUE OF GALACTIC WOLF-RAYET STARS OF POPULATION I (VAN DER HUCHT et al. 1980)	D	
905 -	WHITE DWARFS 1,2 (LWDC) (LUYTEN 1970, 1977, U. of Minnesota Press, Minneapolis) (PREPARED AT GSFC 1978, COMPLETE COMBINED DATA) (6546 DATA + 548 REMARKS RECORDS)	A	T
908 -	SIXTH CATALOGUE OF THE ORBITAL ELEMENTS OF SPECTROSCOPIC BINARY SYSTEMS (BATTEN 1967, Publ. Dom. Astrophys. Obs. 13, 119) (BAT6) (737 RECORDS)	A	

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III. SPECTROSCOPIC DATA:

909 - MK CLASSIFICATION EXTENSION (KENNEDY 1976, Mt. Stromlo Obs.) (27201 + 301 RECORDS) — A M

910 - CATALOG OF FAR-ULTRAVIOLET OBJECTIVE-PRISM SPECTRO-PHOTOMETRY: SKYLAB EXPERIMENT S-019, ULTRAVIOLET STELLAR ASTRONOMY (HENIZE, WRAY, PARSONS AND BENEDICT 1979, NASA Ref. Publ. 1031) — C

911 - MK SPECTRAL CLASSIFICATIONS, 4TH GENERAL CATALOGUE (BOSCOMBE 1980, Northwestern Univ.) (18540 RECORDS) — B

913 - DISCOVERIES ON SOUTHERN, RED-SENSITIVE OBJECTIVE-PRISM PLATES III: NEW STARS HAVING H-ALPHA IN EMISSION (CATALOGUE OF 771 NEWLY DISCOVERED EMISSION STARS, MacCONNELL 1980) — C

914 - ABSOLUTE CALIBRATION OF STELLAR SPECTROPHOTOMETRY (H. L. JOHNSON 1980, Rev. Mex. Astron. Astrof. 5, 25) (16 STARS, 176 RECORDS) — B

916 - A CATALOG OF 0.2-A RESOLUTION FAR-ULTRAVIOLET STELLAR SPECTRA MEASURED WITH COPERNICUS (Snow and Jenkins 1977, Ap.J. Suppl. 33, 269) (60 STARS, 9060 RECORDS) — A

IV. CROSS IDENTIFICATIONS:

1	A COMPILATION OF TRANSIT TABLES FOR STAR NUMBERINGS IN OPEN CLUSTERS (MERMILLIOD 1979, A&A Suppl. 36, 163) (DATA FOR 50 OPEN CLUSTERS)	E
2	CATALOGUE OF HD, HDE AND DM IDENTIFICATIONS FOR STARS IN OPEN CLUSTERS (MERMILLIOD 1976, A&A Suppl. 26, 419) (7196 RECORDS)	B
3	GENERAL CATALOGUE OF STELLAR IDENTIFICATIONS (CSI) (JUNG AND BISCHOFF 1977, SEE CDS Bull. 4, 27 AND IAU Colloq. 35, 31) (BINARY PACKED) (430824 RECORDS)	A
703	CSI EBCDIC, 143-BYTE RECORDS, COMPLETELY UNPACKED WITH SOME FLAGS MISSING (430824 RECORDS) (CHARACTER VERSION OF IV/ 3/ PREPARED AT GSFC)	A M T
4	TABLE OF CORRESPONDENCES SAO/HD/DM/GC (MORIN 1973, Obs. de Meudon) (258997 RECORDS)	A T
5	TABLE OF CORRESPONDENCES BD/CD/CPD (JUNG AND BISCHOFF 1971, CDS Bull. 2, 7) (48403 RECORDS)	B
6	CATALOGUE OF CORRESPONDENCES CSI/ADS/IDS (JUNG, BISCHOFF AND OCHSENBEIN 1973, CDS Bull. 4, 27) (45135 RECORDS)	B
7	TABLE OF CORRESPONDENCES GICLAS/BD (MERMILLIOD UNPUB) (NORTHERN HEMISPHERE ONLY) (1727 RECORDS)	B
8	CROSS-IDENTIFICATIONS OF HDE STARS (HDEB) (BONNET 1978, CDS Bull. 14, 114; 15, 115) (48781 + 4740 RECORDS)	B
9	CATALOGUE OF STELLAR IDENTIFICATIONS, EDITION 1979 (OCHSENBEIN, BISCHOFF AND EGRET 1979, SEE CDS Bull. 17, 88) (BINARY OR CHARACTER FORMAT, 434928 OBJECTS) (434928 BINARY RECORDS OR 451885 CHARACTER RECORDS)	B R
901	HD-DM (MEAD UNPUBLISHED)	D
902	DM-HD (MEAD UNPUBLISHED)	D
903	HD-YBS (NAGY UNPUBLISHED) (9091 RECORDS)	A T
904	YBS-HD (NAGY UNPUBLISHED) (9110 RECORDS)	A T
905	VARIABLE STAR CATALOG: TABLE I - NOMENCLATURE (GCVS-T1) (13076 RECORDS)	A G T
906	TABLE VI - CORRESPONDENCES BD/CD/CPD (GCVS-T6) (5180 RECORDS)	A M T

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IV. CROSS IDENTIFICATIONS:

907 - GODDARD CROSS INDEX (NAGY AND MEAD UNPUBLISHED) D

908 - HD-DM-ADS-IDS-BA FOR HD STARS (NAGY AND MEAD UNPUB.) D

909 - HD-SAO-DM-GC CROSS INDEX (NAGY AND MEAD 1978, NASA TM 79564) (180411 RECORDS) A P T

911 - CSI SORTED BY SPECTRAL TYPE AND Mv BRIGHTEST TO FAINTEST (PREPARED AT GSFC, SAME VERSION AS IV/703/) (430824 RECORDS) A

912 - CSI SORTED BY SPECTRAL TYPE AND Mb BRIGHTEST TO FAINTEST (PREPARED AT GSFC, SAME VERSION AS IV/703/) (430824 RECORDS) A

913 - CSI EBCDIC, 80-BYTE RECORDS, ALL FLAGS IN 1 32-BIT WORD (CHARACTER VERSION OF IV/703/ PREPARED AT GSFC) (430824 RECORDS) A

914 - AGK3-BD (WARREN 1978, CDS Bull. 15, 116) (183145 RECORDS) A

915 - BD-AGK3, NON-BD STARS OMITTED (WARREN 1978, CDS Bull. 15, 116) (179438 RECORDS) A

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V. COMBINED DATA:

1 -	CATALOGUE OF NEARBY STARS (GL) (GLIESE 1969, Veroff. Astron. Rechen-Inst. Heidelberg, No. 32) (1890 RECORDS)	B	
801 -	CATALOGUE OF NEARBY STARS (GL) (GLIESE 1969, Veroff. Astron. Rechen-Inst. Heidelberg, No. 32) (1890 RECORDS) (SELECTED DATA BY G. SHARE/NRL: ID, RA, DEC, X-RAY INTENSITY, COMMENTS)	A	T
802 -	YALE CATALOGUE OF BRIGHT STARS, 3RD ED. (YBS) (HOFFLEIT 1964, Yale Univ. Obs.) (9110 RECORDS)	A	T
3 -	DATA FOR FK4/FK4 SUPP. STARS (MORIN 1973, CDS Bull. 4, 4) (3522 RECORDS)	B	
4 -	CATALOGUE OF STARS WITHIN 25 PARSECS OF THE SUN (WOOLLEY et al. 1970, Royal Obs. Ann. 5) (2150 RECORDS)	B	
5 -	COLOURS, LUMINOSITIES AND MOTIONS OF THE NEARER GIANTS OF TYPES K AND M (EGGEN 1966, Royal Obs. Bull. No. 125) (1008 RECORDS)	C	
6 -	KINEMATIC STUDIES OF EARLY-TYPE STARS (TABLES 1 AND 2) (RUBIN AND BURLEY 1962, AJ 67, 491) (1440 + 898 RECORDS)	B	
7 -	SPACE VELOCITIES OF G AND K GIANTS (TABLES 2 AND 5) (YOSS AND T. E. LUTZ 1971, Mem. RAS 75, 21) (161 + 631 RECORDS)	C	
8 -	SPACE VELOCITY CATALOGUE (EGGEN 1962, Royal Obs. Bull. No. 51) (3483 RECORDS)	C	
9 -	NEW KINEMATIC DATA FOR BRIGHT SOUTHERN OB STARS TABLE 2: KINEMATIC DATA (LESH 1972, A&A Suppl. 5, 129) (440 ENTRIES)	C	
10 -	NEW KINEMATIC DATA FOR BRIGHT SOUTHERN OB STARS TABLE 4: COMBINED PROPER MOTIONS (LESH 1972, A&A Suppl. 5, 129) (440 ENTRIES)	E	
11 -	CATALOGUE OF HIGH VELOCITY STARS (EGGEN 1964-65, Royal Obs. Bull., Ser. E, 111) (656 ENTRIES)	B	
12 -	CATALOGUE OF REDUCED uvby, BETA PHOTOMETRY (PHILIP, MILLER AND RELYEA 1976, Dudley Obs. Report No. 12) (5183 RECORDS)	B	
13 -	PROBABLE MEMBERS OF THE SMALL MAGELLANIC CLOUD (NEW VERSION, UPDATED OCT 1978) (AZZOPARDI AND VIGNEAU 1975, A&A Suppl. 22, 285) (REMARKS NOT AVAILABLE IN MACHINE-READABLE FORM) (524 MEMBERS + 124 FOREROUND STARS)	C	
14 -	uvby ESTIMATED ASTROPHYSICAL PARAMETERS (PHILIP AND EGRET 1980, A&A Suppl. 40, 199) (9604 RECORDS)	B	R

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V. COMBINED DATA:

15	SAO AND SUPPLEMENTARY DATA (OCHSENBEIN 1980, CDS Bull. 19, 74) (258997 RECORDS)	E
17	SUPERGIANT STARS (EGRET 1980, CDS Bull. 18, 22) (5000 STARS)	E
18	CATALOG OF LATE-TYPE STARS WITH CH, HHO OR SiO MASER EMISSION (ENGLES 1979, A&A Suppl. 36, 337) (331 OBJECTS)	E
19	CATALOG OF MASSES AND AGES OF STARS IN 68 OPEN CLUSTERS (PISKUNOV 1980, CDS Bull. 19, 67)	E
902	YALE BRIGHT STAR CATALOGUE COMBINED WITH BOSS GENERAL CATALOGUE DATA (NAGY 1979) (9110 RECORDS)	A M
903	SKYMAP CATALOGUE OF 248727 STARS, VERSION 3.0 (GOTTLIEB AND McLAUGHLIN 1980, SEE Ap.J. Suppl. 38, 287, 1978)	A F T
904	COMBINED STAR CATALOGUE (EWALD 1979)	B F
905	STELLAR CATALOG FOR ATTITUDE DETERMINATION IN SPACE, VERSION II.I (STEIN 1980, NSWC, Dahlgren, VA) (43099 STARS)	C

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VI. MISCELLANEOUS:

1 -	CATALOGUE OF PHOTOMETRIC SEQUENCES (ARGUE AND ROK 1973, Univ. Arizona Mimeograph) (412 RECORDS)	B
2 -	BIBLIOGRAPHICAL STAR INDEX (1950-75) (BSI) (SPITE, OCHSENBEIN, KIRCHNER AND LAHMEK 1980, CDS Bull. 18, 89) (ABOUT 80000 STARS, ABOUT 11000 TITLES) (TAPE IS PACKED IBM BINARY FORMAT)	B R
5 -	SENSITIVITY FUNCTIONS OF PHOTOMETRIC SYSTEMS (HAUCK AND MERMILLIOD 1976, CDS Bull. 10, 28) (607 RECORDS, 30 TABLES)	B
8 -	BIBLIOGRAPHICAL CATALOGUE OF FIELD RR LYRAE STARS (HECK AND LAKAYE 1977, A&A Suppl. 30, 397) (6607 RECORDS)	B R
9 -	BIBLIOGRAPHICAL INDEX FOR PLANETARY NEBULAE FOR 1965-1976 (ACKER, MARCOUT AND OCHSENBEIN 1977, A&A Suppl. 30, 217)	E R
10 -	A TABLE OF SEMIEMPIRICAL gf VALUES (KURUCZ AND PEYTREMANN 1975, SAO Spec. Report No. 362) (106 RECORDS)	B
11 -	FINDING LIST FOR MULTIPLET TABLE OF NSRDS-NBS 3, SECTIONS 1-7 (ADELMAN, ADELMAN AND FISCHEL 1977, NASA/ GSFC X-685-77-287) (8916 RECORDS)	A
13 -	A CATALOG OF RADIAL VELOCITIES IN THE LARGE MAGELLANIC CLOUD (FEITZINGER AND WEISS 1979, A&A Suppl. 37, 575)	E
14 -	BIBLIOGRAPHICAL INDEX FOR PLANETARY NEBULAE FOR THE PERIOD 1965-1979 (ACKER, MARCOUT AND OCHSENBEIN 1980, CDS Bull. 18, 84)	E R
15 -	BIDELMAN-PARSONS SPECTROSCOPIC AND BIBLIOGRAPHICAL CATALOG (PARSONS, DUTA, BIDELMAN 1980, CDS Bull. 18, 86) (45855 RECORDS, 40312 OBJECTS)	A T
901 -	BIBLIOGRAPHICAL STAR INDEX (1950-72) (CAYREL et al.) (BSI)	B R
902 -	INDEX CATALOGUE OF VISUAL DOUBLE STARS 1976.5 (WORLEY 1976, U. S. Naval Obs., Washington)	D N
903 -	A MAILING LIST FOR OBSERVERS OF INTERACTING BINARY SYSTEMS, 5th ED. (WOOD, OLIVER, FLORKOWSKI, KOCH 1980, Publ. Department of Astron., Univ. of Florida, Vol. I; Publ. Univ. Pennsylvana, Astron. Ser., Vol. XII)	C
904 -	BIBLIOGRAPHICAL STAR INDEX (1973-1977) (BSI) (SPITE, OCHSENBEIN, KIRCHNER, LAHMEK 1980, CDS Bull. 18, 89).	R

VII. NON-STELLAR OBJECTS

801 - REVISED NEW GENERAL CATALOGUE OF NON-STELLAR OBJECTS (RNGC) (SULENTIC AND TIFFT 1974, Univ. of Arizona Press) (7 FILES, 8163+65+525+37+39+104+28 RECORDS) — A

802 - A MASTER LIST OF NON-STELLAR OBJECTS (DNSM) (DIXON 1976, IAU Colloq. 35, 167) (182973 RECORDS) — R M

3 - CATALOGUE OF QUASI-STELLAR OBJECTS (BARBIERI, CAPACCIOLI AND ZAMBON, NOV. 1976, Inst. of Astron., Univ. of Padova) (3354 ref) — 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.) (21179 RECORDS) — B

6 - CATALOGUE OF POLARIZATION MEASUREMENTS AND RELATED DATA OF EXTRAGALACTIC RADIO SOURCES (EICHENDORF AND REINHARDT 1979, Astrophys. Sp. Sci. 61, 153) — C

7 - DARK NEBULAE (B.T. LYNDS 1962 Ap.J. Suppl. 7, 1) (LDN) (UPDATED, 1791 RECORDS) — A G T

8 - PULSARS (SEIRADAKIS UNPUBLISHED) (PUL) (149 RECORDS) — A T

9 - BRIGHT NEBULAE (LBN) (B.T. LYNDS 1965, Ap.J. Suppl. 12, 163) (1125 RECORDS) — A T

10 - 3RD CAMBRIDGE RADIO CATALOG (REVISED) (3CR) (BENNETT 1961, Mem. RAS 68, 163) (328 Records) — A T

11 - KITT PEAK QUASAR CATALOG (QKP) (DEVENY, OSBORN AND JANES 1971, PASP 83, 611) (261 RECORDS) — A T

12 - 3RD UHURU X-RAY CATALOG (3U) (GIACONNI et al. 1974, Ap.J. Suppl. 27, 37) (161 RECORDS) — A T

13 - GLOBULAR-CLUSTER CATALOG (ARP 1965, Stars and Stellar Systems, Vol. 5) (119 RECORDS) — A T

14 - GALACTIC SUPERNOVA REMNANTS CATALOGUE (SNCC) (CLARK AND CASWELL 1976, MNRAS 174, 267) (97 + 23 Records) — A T

15 - GALACTIC SUPERNOVA REMNANTS CATALOGUE (SNIL) (ILOVAISKY AND LEQUEUX 1972, A&A 18, 169) (116 RECORDS) — A T

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16	REFERENCE CATALOGUE OF BRIGHT GALAXIES (de VAUCOULEURS AND de VAUCOULEURS 1964, Univ. of Texas Press, Austin) (2597 RECORDS) (VGC)	A	T
17	QUASARS (QB) (G.R. BURBIDGE et al. 1977, Ap.J. Suppl. 33, 113) (637 RECORDS)	A	T
18	FOURTH UHURU X-RAY CATALOGUE (4U) (FORMAN et al. 1978, Ap.J. Suppl. 38, 357) (339 RECORDS)	A	T
19	SECOND ARIEL X-RAY CATALOGUE (2A) (COOKE et al. 1978, MNRAS 182, 489) (107 RECORDS)	A	T
20	H II REGIONS (SHII) (SHARPLESS 1959, Ap.J. Suppl. 4, 257) (313 RECORDS)	A	T
21	CATALOGUE OF REFLECTION NEBULAE (VDB) (van den BERGH 1966, AJ 71, 990) (158 RECORDS)	A	T
22	CATALOGUE OF OPEN CLUSTERS (LYNGA 1980; SEE LYNGA AND LUNDSTROM 1980, IAU Symp. 85, 123) (DATA FILE AND "ALIBI" FILE)	A	F
23	A CATALOGUE OF ABSORPTION LINES IN QSO SPECTRA (ELLIS 1978, MNRAS 185, 613) (1108 OBJECTS)	C	
24	STRASBOURG CATALOG OF GALACTIC PLANETARY NEBULAE (ACKER, MARCOUT AND OCHSENBEIN 1980, CDS Bull. 18, 84) (1446 OBJECTS)	F	R
901	SOUTHERN GROUPS AND CLUSTERS OF GALAXIES (DN) (DUUS AND NEWELL 1977, Ap.J. Suppl. 35, 209) (960 RECORDS)	A	T
902	AN OPTICAL CATALOGUE OF RADIO GALAXIES (G. BURBIDGE AND CROWNE 1978, Ap.J. Suppl. 40, 583)	B	
903	LIST OF GLOBULES BASED ON 7 LISTS BY WESSELIUS (COMPILED BY WESSELIUS 1979) (821 RECORDS)	A	T
904	SEYFERT GALAXIES (WEEDMAN 1977, Annu. Rev. Astron. Astrophys. 15, 69; 1978, MNRAS 184, 11P) (121 DATA + 230 REFERENCE RECORDS)	A	T
905	SECOND REFERENCE CATALOGUE OF BRIGHT GALAXIES (VGC2) (de VAUCOULEURS, de VAUCOULEURS AND CORWIN 1976, Univ. of Texas Press, Austin) (4364 RECORDS)	R	T
906	LIST OF POSITIONS OF ALL X-RAY SOURCES WITH POSITIONS KNOWN MORE ACCURATELY THAN THOSE GIVEN IN THE 4U OR 2A CATALOGUES (DOLAN 1979, NASA/GSFC) (266 DATA + 396 NOTES RECORDS)	A	T
907	A CATALOG OF GALAXY REDSHIFTS (ROOD 1980, unpublished) (3981 RECORDS)	A	T

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908 - CATALOGUE OF ULTRAVIOLET, OPTICAL AND H I DATA FOR 201 D
VIRGO CLUSTER GALAXIES (CORNETT AND SMITH 1981, ADC Bull.
No. 2; SMITH AND CORNETT 1981, Ap.J., In press)
(201 RECORDS)

VIII. CATALOGUES SORTED BY PLATE AREAS

901 - PLATE CENTERS OF PALOMAR 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 PALOMAR 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 (SEE 4/703/)	A	
910 - CSI SORTED BY LICK PLATE AREAS (NAGY 1976)	A	
911 - MASTER SPECIALTY CATALOGUE (NAGY 1977) (CONCATENATION OF VIII/906/,/907/,/908/, 1037 FILES)	A	T
- 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	
- CATALOGUES SORTED BY EUROPEAN SOUTHERN O. BLUE PLATE AREAS WITH X AND Y COORDINATES GIVEN IN MM (606 FIELDS)		
914 - SAO	A	
915 - CSI (SEE 4/703/)	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.

Data will be provided to any individual or organization resident in the United States through the National Space Science Data Center (NSSDC) or to scientists outside the United States through the World Data Center A (WDC-A) for Rockets and Satellites. Normally, charges will be waived for modest amounts of data to be used for scientific studies and/or for specific educational purposes and when they are requested by an individual affiliated with: NASA installations, NASA contractors, or NASA grantees; other U.S. government agencies, their contractors, or their grantees; universities and colleges; state and local governments; and non-profit organizations. When immoderate requests are made, one may expect to be charged for reproduction and processing services, in which case the requester will be notified in advance and payment must be received prior to processing.

A sample order form is included on the following page. Uncertainties regarding number of tapes required, tape parameters, or special requests should be clarified by telephone [(301) 344-8310 or 8105] or letter before requests are submitted.