DATE OVERRIDE

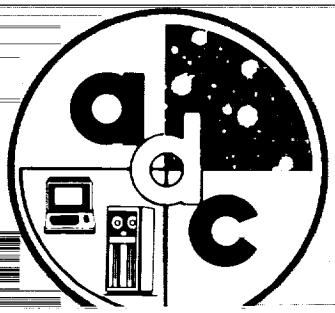
32998

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

SECOND CATALOG OF INTERFEROMETRIC MEASUREMENTS OF BINARY STARS

(McAlister and Hartkopf 1988)

Documentation for the Machine-Readable Version



June 1989

NSSDC/WDC-A-R&S 89-09

SECOND CATALOG OF INTERFEROMETRIC MEASUREMENTS OF BINARY STARS

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Documentation for the Machine-Readable Version

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June 1989

National Space Science Data Center (NSSDC)/
World Data Center A for Rockets and Satellites (WDC-A-R&S)
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Goddard Space Flight Center
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Abstract

The machine-readable version of the catalog, as it is currently being distributed from the Astronomical Data Center, is described. The catalog is a compilation of measurements of binary- and multiple-star systems obtained by speckle interferometric techniques; this version supersedes a previous edition of the catalog published in 1985. Stars that have been examined for multiplicity with negative results are included, in which case upper limits for the separations are given. The second version is expanded from the first in that a file of newly resolved systems and six cross-index files of alternate designations are included. The data file contains alternate identifications for the observed systems, epochs of observation, reported errors in position angles and separations, and bibliographical references.

Table of Contents

List of Tables

1.0 Introduction

1.1 Description

The *Second Catalog of Interferometric Measurements of Binary Stars* (McAlister and Hartkopf 1988) is an updated and expanded version of the first edition of the catalog (McAlister and Hartkopf 1985). It contains all measurements (known to the compilers) of binary- and multiple-star systems obtained by speckle interferometric techniques and in print or in press before October 1988. In addition to actual separation and position-angle measurements, the compilers include stars that have been examined for multiplicity with negative results, in which case upper limits for separation are given if they were included in a publication.

Although the primary data of the catalog are observed separations and position angles, their errors, epochs of measurement, and bibliographical references, ancillary data such as alternate identifications, notes, a list of systems first resolved by interferometry, and a set of cross-index files arranged by various major catalog designations, are included. The main data file uses designations from the *Washington Catalog of Visual Double Stars* that is maintained at the U. S. Naval Observatory by Charles E. Worley.

This document describes the machine-readable version of the *Second Catalog of Interferometric Measurements of Binary Stars* as it is currently being distributed from the Astronomical Data Center (ADC). It is intended to enable users to read and process the computerized catalog without problems and guesswork and it should be used only to supplement the information contained in the published catalog and the introduction to the machine version. Since there are several important formatting differences between the published and machine-readable tables, users of the machine version are encouraged to carefully study the data descriptions in the following sections of this document before using and interpreting the data. **A copy of this document should be transmitted to any recipient of the machine-readable catalog originating from the ADC.**

1.2 Source Reference

McAlister, H. A. and Hartkopf, W. I. 1988, *Second Catalog of Interferometric Measurements of Binary Stars*, Version 1988 October (see Center for High Angular Resolution Astronomy, Georgia State University, *CHARA Contribution* No. 2).

2.0 Structure

2.1 File Summary

The machine version of the *Second Catalog of Interferometric Measurements of Binary Stars* consists of 11 files. Table 1 gives the machine-independent file attributes. All logical records are of fixed length, and, if the catalog is received on magnetic tape, it will contain blocks of fixed length (as noted below), except that the last block of each file may be short. The second file contains the basic data of the catalog, while succeeding ones contain textual information and cross-index tables to facilitate the use of the catalog data. The data file is in a multiple-record format per object in order to allow all known observations of a star to be reported. However, all records are uniform in that they contain the same ancillary information and differ only by the primary data of multiple observations. Thus, the records can be sorted fully by any of the data fields.

Second Catalog of Interferometric Measurements of Binary Stars (McAlister and Hartkopf 1988)

File	Contents	Record Format	Logical Record Length	Total Number of Logical Records
1	Introduction	FB	80	222
2	Data	FB	98	12326
3	Newly Resolved	FB	105	290
4	Notes	FB	80	968
5	Bibliography	FB	80	119
6	HR-HD-WDS	FB	22	1778
7	DM-HD-WDS	FB	33	3152
8	SAO-HD-WDS	FB	26	3076
9	ADS-HD-WDS	FB	25	1191
10	Const-HD-WDS	FB	33	876
11	Disc-HD-WDS	FB	33	1710

Table 1. Summary Description of Catalog Files: FB = Fixed length blocks (last may be short)

The information contained in the above table is sufficient for a user to describe the indigenous characteristics of the machine-readable version of the *Second Catalog of Interferometric Measurements of Binary Stars* to a computer. Information easily varied from installation to installation, such as block size (physical record length), blocking factor (number of logical records per physical record), total number of blocks, density, number of tracks, and character coding (ASCII, EBCDIC) for tapes is not included, but should always accompany secondary copies if any are supplied to other users or installations.

2.2 *Introduction (File 1 of 11)*

This file is composed of straight text and contains the introduction to the published catalog. Statistics of the catalog and a basic description of the data are given, but neither column-by-column nor byte-by-byte descriptions of the various tables are included in the authors' introduction; thus, they are given in this document.

Byte(s)	Fortran Format	Data
1-80	A80	Mixed case text

Table 2. Introductory File Record Format

2.3 *Catalog (File 2 of 11)*

This file contains the compilation of observational data for the double and multiple systems included in the catalog.

As mentioned in "File Summary" on page 3, the data file may contain more than one logical record per object if multiple values of reported data exist. When a particular observation produced a negative result (undetected duplicity), only an upper limit is reported. In these cases, the position angle (PA) field is blank. These cases can always be detected by looking for an upper limit character (<) before the separation. It is important to do this if the PA field is being read with a real format specification, since it is possible for a measured PA to be zero.

Table 3 gives a byte-by-byte description of the contents of the data file. A suggested Fortran format specification for reading each data field is included and can be modified depending upon individual programming and processing requirements (Fortran 77 character string-type formats are used); however, caution is advised when substituting format specifications, since many data fields contain character data and others are blank when data are absent. As mentioned above, particular care is required for the PA field, where valid zero values can exist, but where fields are blank for nonexistent data. It is safest to buffer in records in an unformatted mode or read them with character (A) formats and test for blank data fields before processing with numerical formats for calculations and/or searching purposes. For such fields, primary numerical format specifications are given to indicate decimal-point locations, while alternate A-type formats are specified in parentheses. Default (null) values are always blanks in data fields for which primary suggested formats are given as A. Also note that extra spaces have been left in certain fields to allow for increased measurement accuracy (and thus greater precision) in future editions of the catalog.

Byte(s)	Units	Suggested Format	Default Value	Data
1-10	---	A10	---	WDS designation
11-12	---	2X	---	Blank
13-26	---	A14	---	Alternate identifier
27	---	1X	---	Blank
28-41	---	A14	---	Alternate identifier
42	---	1X	---	Blank
43-48	---	I6 (A6)	blank	HD number
49-51	---	A3	---	HD suffix
52	---	1X	---	Blank
53-61	years	F9.4	---	Epoch of observation
62-64	---	3X	---	Blank
65-69	°	F5.1 (A5)	blank	Position angle (PA)
70	---	1X	---	Blank
71	---	A1	---	PA uncertainty flag (:)
72	---	A1	---	Lower limit character (>) for PA error
73-75	°	F3.1 (A3)	blank	Error in PA
76-78	---	3X	---	Blank
79	---	A1	---	Upper limit character (<) for separation
80-84	″	F5.3	---	Separation
85	---	1X	---	Blank
86	---	A1	---	Separation uncertainty flag (: or ?)
87	---	A1	---	Lower limit character (>) for separation error
88-92	″	F5.3 (A5)	blank	Error in separation
93-94	---	2X	---	Blank
95-97	---	A3	---	Bibliographical code
98	---	1X	---	Blank

Table 3. Data File Record Format

WDS designation — System designation in the *Washington Catalog of Visual Double Stars* of C. E. Worley.

Alternate identifier — Identifier in a major catalog (HR, DM, ADS).

Alternate identifier — Identifier in a secondary catalog or list, or star name in some cases.

HD number — Numerical designation in *The Henry Draper Catalogue* (Cannon and Pickering 1918-24) or in one of the HD extensions (Cannon 1924-36, Cannon and Walton Mayall 1949).

HD suffix — The inclusion of a second HD star in the system is indicated by a hyphen followed by the last digit of the adjacent HD star.

Epoch of observation — The reported epoch varies in precision depending upon the accuracy to which it was reported; thus, bytes following the decimal point may be blank.

Position angle — The reported position angle of the components (measured in the normal way, north through east) at the epoch of observation. Note that precision can vary (byte 69 may be blank).

PA uncertainty code — A colon (:) denotes an uncertain value.

Lower limit character (PA error) — The character " > " is present if the PA error following was reported as a lower limit.

Error in PA — The error is generally given to one decimal place, but the precision varies (byte 75 can be blank).

Upper limit character (sep) — The character " < " is present if the angular separation following was reported as an upper limit, *i.e.*, a negative result above a reported threshold was given in the reference cited.

Separation — The reported angular separation between the components at the epoch of observation, or an upper limit to the separation. The precision can vary, with lower accuracy indicated by trailing blanks in the field.

Separation uncertainty flag — The following codes are used:

: The observation is uncertain.

? The observation is questionable (very uncertain).

Lower limit character (sep error) — The character " > " is present if the separation error following was reported as a lower limit.

Error in separation — The error is generally given to three decimal places, but the precision can vary (trailing bytes blank).

Bibliographical code — A two- or three-character identification code for the reference cited in the bibliography file (5).

2.4 *Newly Resolved Systems (File 3 of 11)*

This file contains a listing of 280 newly resolved binaries. The content of the table is described in Section III (last paragraph) of the introductory file and need not be repeated here. Although the table is reasonably uniform in format, it has the nature of a free text file (with table captions and column headings) and, therefore, will not be described in detail in this document. Rather, a brief column description is given below to alert the user as to the contents of the table, since such a description is not given in the Introduction.

Column	Information Content
1	Discovery designation or bibliographical reference code.
2	*Bright Star Catalogue* (Hoffleit 1982) or DM number.
3	Name of star or binary system.
4	HD number.
5	SAO (SAO Staff 1966) number.
6	ADS (Aitken 1932) number.
7	Right ascension and declination (2000) (equivalent to WDS designation).
8	Visual magnitude.
9	Spectral classification.
10	Discovery separation (seconds of arc).
11	Binary type.

Table 4. Contents of Newly Resolved Systems File

2.5 *Notes (File 4 of 11)*

This file contains miscellaneous notes and additional information for the systems included in the catalog. Not all systems have corresponding notes, but no flags are included in the data file for those that do, so users should check for notes on all systems in which they are interested. This file also has a free text structure precluding a byte-by-byte description. The first record of a note group for a system contains the WDS designation in bytes 1-10, followed by an alternate designation

(name). Records for individual observations contain the reference epoch in bytes 6-14 and text in bytes 17-80. A general note is indicated by hyphens in bytes 6-14. Blank records separate system groups.

2.6 *Bibliography (File 5 of 11)*

This file contains the references cited by the codes in bytes 95-97 of the data file. Although the file contains a table caption and blank records, the format is uniform enough to be described in the following table. Columns not described are blank and continuation lines are indicated by blanks in bytes 1-7.

Byte(s)	Fortran Format	Data
2-4	A3	Reference code
6	A1	An equal (=) sign
8-80	A73	Reference in free text (upper and lower case) form

Table 5. Bibliography File Record Format

2.7 *HR-HD-WDS Cross Index (File 6 of 11)*

This file contains a cross index for designations in *The Bright Star Catalogue* (Hoffleit 1982), *The Henry Draper Catalogue* (Cannon and Pickering 1918-24, Cannon 1924-36, Cannon and Walton Mayall 1949), and the WDS. The file is ordered by HR = BS number and is uniform in format, as described in the following table.

Byte(s)	Fortran Format	Data
1-4	I4	HR = BS number
5	1X	Blank
6-11	I6	HD number
12	1X	Blank
13-22	A10	WDS designation

Table 6. HR-HD-WDS Cross Index Format

2.8 *DM-HD-WDS Cross Index (File 7 of 11)*

The file is a cross index of identifications from the *Durchmusterungen* (*Bonner* [Argelander 1859-62, Küstner 1903], *Southern* [Schönfeld 1886], *Córdoba* [Thome 1892-1932], or *Cape Photographic* [Gill and Kapteyn 1895-1900]), the HD, and the WDS. The file is ordered north to south by DM zone and in increasing right ascension within each zone. DM catalogs are identified by their two-letter abbreviations.

Byte(s)	Fortran Format	Data
1-2	A2	DM identifier (BD, SD, CD, CP)
3-5	I3 (A3)	DM zone
6	1X	Blank
7-11	I5 (A5)	DM number
12-14	3X	Blank
15-20	I6 (A6)	HD number
21-22	A2	HD suffix
23	1X	Blank
24-33	A10	WDS designation

Table 7. DM-HD-WDS Cross Index Format

2.9 SAO-HD-WDS Cross Index (File 8 of 11)

This file is a cross index of identifications from the *Smithsonian Astrophysical Observatory Star Catalog* (SAO Staff 1966), the HD, and the WDS. It is ordered by SAO number.

Byte(s)	Fortran Format	Data
1-6	I6	SAO number
7	1X	Blank
8-13	I6 (A6)	HD number
14-15	A2	HD suffix
16	1X	Blank
17-26	A10	WDS designation

Table 8. SAO-HD-WDS Cross Index Format

2.10 ADS-HD-WDS Cross Index (File 9 of 11)

This file is a cross index of identifications from the Aitken double-star catalog (ADS, Aitken 1932), the HD, and the WDS. It is ordered by increasing ADS number. In this and subsequent cross-index tables, the HD suffix occupies three bytes instead of two to accommodate one case where the HD numbers of two stars in a binary system are not consecutive (see item 4 in Section 3.1).

Byte(s)	Fortran Format	Data
1-5	I5	ADS number
6	1X	Blank
7-12	I6 (A6)	HD number
13-15	A3	HD suffix
16-25	A10	WDS designation

Table 9. ADS-HD-WDS Cross Index Format

2.11 *Constellation-HD-WDS Cross Index (File 10 of 11)*

The file contains a cross index of commonly used star names (constellation identifiers) and their HD and WDS equivalents. Constellation designations include Greek letters (Bayer designations) and Arabic numerals (Flamsteed numbers), with the Bayer designation taking priority (most bright northern stars have both). Variable-star names are also included. The file is ordered by constellation abbreviation and by Greek letter and Flamsteed number order within each constellation.

Byte(s)	Fortran Format	Data
1-9	A9	Star name
10	1X	Blank
11-13	A3	Constellation abbreviation
14	1X	Blank
15-20	I6 (A6)	HD number
21-23	A3	HD suffix
24-33	A10	WDS designation

Table 10. Constellation-HD-WDS Cross Index Format

2.12 *Discoverer-HD-WDS Cross Index (File 11 of 11)*

This file cross indexes the HD and WDS identifiers with discoverer designations, including various multiple-star identifiers, names from miscellaneous observers' lists, CHARA discovery numbers, etc. Most of these identifications can be found in the *First Dictionary of the Nomenclature of Celestial Objects* or its *Supplement* (Fernandez, Lortet, and Spite 1983; Lortet and Spite 1986).

Byte(s)	Fortran Format	Data
1-13	A13	Miscellaneous identifier
14	1X	Blank
15-20	I6 (A6)	HD number
21-23	A3	HD suffix
24-33	A10	WDS designation

Table 11. Discoverer-HD-WDS Cross Index Format

3.0 History

3.1 Remarks and Modifications

The machine-readable version of the *Second Catalog of Interferometric Measurements of Binary Stars* was received on magnetic tape from Drs. H. A. McAlister and W. I. Hartkopf of Georgia State University on November 8, 1988. Since the tape was in an ANSI labeled multifile format, the individual files were loaded onto the VAX 8650 computer of the National Space Science Data Center, then transferred via a local area network to the IBM 3081K machine of the NASA Space and Earth Sciences Computing Center at Goddard Space Flight Center, where the ADC archive is located, and where the expanded memory and powerful editing facilities of the IBM computer could be employed.

Following completion of the work on the previous edition of the catalog (McAlister and Hartkopf 1985), which was received as a single text file formatted for printing, close collaboration between the ADC and Dr. Hartkopf resulted in a list of suggestions for the structuring and formatting of the second (present) edition. Dr. Hartkopf followed these suggestions and produced the new catalog in a format that was very easy to work with and to prepare for distribution. The following minor modifications were made to the files indicated in order to make them easier to process by machine and to facilitate the use of the cross indexes:

1. Certain fields in the data file contained hyphens as fill characters where data were missing. These were replaced with blanks.

2. Durchmusterung identifier abbreviations (BD, SD, CD, CP) were added to the DM designations in the DM cross index file. This addition is important in the southern hemisphere, where CD and CP stars are mixed and it is laborious to identify the correct DM catalog without the abbreviations.

3. Blank records between constellation groups in the constellation cross index were removed in order that the file can be sorted properly by any identifier present, and to decrease storage.

4. There is one system (65 UMa) in some of the cross-index tables where the adjacent HD suffix notation does not work. This is because the bright components of 65 UMa are designated HD 103483 and HD 103498. Where these components were designated as a single entry in a cross indexed catalog, the higher designation was omitted. By using the notation "/98" as the HD suffix in the ADS, constellation, and discoverer cross indexes, it was possible to include the second designation in those tables.

4.0 Acknowledgments and References

4.1 Acknowledgments

Appreciation is expressed to Drs. Hal McAlister and Bill Hartkopf for supplying the magnetic tape of the *Second Catalog of Interferometric Measurements of Binary Stars*. Dr. Hartkopf supplied annotated sample listings of the files and prepared the second edition of the catalog with great care. His work is sincerely appreciated because it saved the ADC a great amount of time in preparing the final catalog for archiving and dissemination. Drs. McAlister and Hartkopf also kindly reviewed a draft copy of this document and responded with their comments in a timely manner.

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Thome, J. M. 1892-1932, *Córdoba Durchmusterung, Resultados del Observatorio Nacional Argentino* **16** (1892, Part I: −22° to −32°); **17** (1894, Part II: −32° to −42°); **18** (1900, Part III: −42° to −52°); **21** (Part I) (1914, Part IV, −52° to −62°); **21** (Part II) (1932, Part V: −62° to −90°).

Appendix A. Sample Listing

The sample listing given on the following pages shows logical records exactly as they are recorded in the machine-readable version of the catalog. Groups of records from the beginning and end of each file are illustrated. The beginning of each record and the bytes within the record are indicated by the column heading index across the top of each page (digits read vertically).

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

Data File Name: Int. Meas. Bin., Intro.

Records 1 To 20

Data File 50

Record Length 80 bytes

Input VOLSER ADC006

```
C O L U M N
H E A D I N G          1111111111222222222233333333334444444444555555555566666666667777777777888888888899999999990000000000111111
I N D E X      12345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345
```

```
Record      1      SECOND CATALOG OF INTERFEROMETRIC MEASUREMENTS OF BINARY STARS
Record      2               Harold A. McAlister and William I. Hartkopf
Record      3               Center for High Angular Resolution Astronomy
Record      4                     Georgia State University
Record      5                  Atlanta, Georgia 30303 U.S.A.
Record      6                   CHARA Contribution No. 2
Record      7                        October 1988
Record      8 I. INTRODUCTION
Record      9      This catalog presents all "modern" interferometric measurements of binary
Record     10 stars known to the compilers to be in print or in press before the end of
Record     11 September 1988.  As with the First Catalog ( CHARA Contribution No. 1, issued
Record     12 in January 1984), we also include only the visual interferometry results from
Record     13 the pioneering efforts on Mt. Wilson of Anderson and Merrill.  The technique of
Record     14 speckle interferometry has contributed the great majority of the catalog
Record     15 material, and speckle methods are now well established.  Most measurements have
Record     16 been made at large aperture telescopes by groups in France, the Soviet Union,
Record     17 and the United States.  Also of promising potential are programs of binary star
Record     18 interferometry carried out at telescopes of moderate and even small aperture.
Record     19 Measurements from the southern hemisphere continue to be rare, an irony when
Record     20 one considers the decades of productive measurements of southern visual
```

LISTING OF RECORDS FROM DATA FILE

Data File Name: Int. Meas. Bin., Intro.

Records 203 To 222

Data File 50

Record Length 80 bytes

Input VOLSER ADC006

```
COLUMN
HEADING          1111111111222222222233333333334444444444555555555566666666667777777777888888888899999999990000000001111111
INDEX      12345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123
```

```
Record    203 Table IX.  SAO-HD-WDS Cross Index - These number were taken from either the
Record    204            HD-SAO-DM Cross Index (Nagy and Mead, NASA Tech. Mem. No. 79564,
Record    205            1978) or from the SAO Catalog.
Record    206 Table X.   Discover Designations (and miscellaneous names)-HD-WDS Cross Index
Record    207            - A variety of sources were used in compiling these names, including
Record    208            the WDS, the Catalogue of Stars Within Twenty-five Parsecs of the
Record    209            Sun (Woolley et al., Royal Obs. Annals No. 5, 1970), the Henry
Record    210            Draper Extension (HDE), and the references listed in the primary
Record    211            sources of the observations themselves.
Record    212 V.  ACKNOWLEDGMENTS
Record    213       We thank our colleagues in the various observing groups for ensuring that
Record    214 we were aware of all their observational results.  Dr. Wayne Warren and the
Record    215 staff of the Astronomical Data Center at the NASA Goddard Space Flight Center
Record    216 kindly provided us with magnetic tape versions of many of the above listed
Record    217 catalogues. Without these resources, production of the cross indices, and
Record    218 indeed the main Catalog itself, would have been extremely difficult.  We also
Record    219 express our gratitude to Charles Worley of the U.S. Naval Observatory for his
Record    220 advice and critical comments. Production of this Catalog was made possible in
Record    221 part from support of the National Science Foundation and of the College of Arts
Record    222 and Sciences, Georgia State University.
```

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

Data File Name: Int. Meas. Bin., Data

Records 1 To 20

Data File 51

Record Length 98 bytes

Input VOLSER ADC006

```
COLUMN
HEADING          1111111111222222222233333333334444444444555555555566666666667777777777888888888899999999990000000000111111111111111
INDEX      12345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345
```

Record 1	00004+2655	HR 9078	+26 4727	224758	1986.8967			<0.030		C4
Record 2	00005+5934	HR 9079	+58 2685	224784	1986.8967			<0.030		C4
Record 3	00007+4515	HR 9080	+44 4538	224801	1986.8967			<0.030		C4
Record 4	00013+4959	HR 9083	+49 4309	224870	1986.8967			<0.030		C4
Record 5	00016+6113	HR 9085	+60 2657	224893	1986.8967			<0.030		C4
Record 6	00017+4222	HR 9086	+41 4920	224906	1986.8967			<0.030		C4
Record 7	00020+2706	ADS 17175	Bu 733 AB	224930	1973.789	184.5	0.3	0.77	0.005	P2
Record 8	00020+2706	ADS 17175	Bu 733 AB	224930	1974.650	194.0	0.3	0.737	0.009	P3
Record 9	00020+2706	ADS 17175	Bu 733 AB	224930	1976.6138	213.8		0.777		A6
Record 10	00020+2706	ADS 17175	Bu 733 AB	224930	1976.6165	219.9		0.764		A6
Record 11	00020+2706	ADS 17175	Bu 733 AB	224930	1976.8596	218.9	0.3	0.780	0.005	A2
Record 12	00020+2706	ADS 17175	Bu 733 AB	224930	1977.6350	225.3		0.772		A6
Record 13	00020-0246	-03 5750		224945	1981.703			<0.030		M3
Record 14	00021-0250	-03 5751		224959	1985.4985			<0.030		C3
Record 15	00024+0857	HR 9092	31 Psc	224995	1986.8966			<0.030		C4
Record 16	00025+0829	HR 9093	32 Psc	225003	1986.8966			<0.030		C4
Record 17	00034+6339	HR 9097	CHARA 121	225094	1986.8967	34.4		0.196		C4
Record 18	00042+6217	HR 9100	9 Cas	225180	1986.8967			<0.030		C4
Record 19	00046+3416	ADS 32	STF 3056 AB	225220	1977.797	143.	1.	0.73	0.01	G2
Record 20	00046+3416	ADS 32	STF 3056 AB	225220	1983.7104	144.1		0.718		C2

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

Data File Name: Int. Meas. Bin., Data

Records 12307 To 12326

Data File 51

Record Length 98 bytes

Input VOLSER ADC006

```
COLUMN
HEADING          1111111111222222222233333333334444444444555555555566666666667777777777888888888899999999990000000000111111
INDEX      12345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345
```

Record	12307	23574+7251	ADS 17118	A 900	224395	1985.8429	128.2	0.342	C2
Record	12308	23575-8210	HR 9061	Gamma 2 Oct	224362	1978.7366		<0.035	F7
Record	12309	23578+2508	HR 9064	McA 76	224427	1980.7287	54.1	0.191	A8
Record	12310	23578+2508	HR 9064	McA 76	224427	1983.9362		<0.07	F10
Record	12311	23578+2508	HR 9064	McA 76	224427	1984.8454		<0.022	R15
Record	12312	23578+2508	HR 9064	McA 76	224427	1984.9303		<0.058	F11
Record	12313	23578+5943	+58 2676		224424	1985.4984		<0.030	C3
Record	12314	23578+5943	+58 2676		224424	1985.8428		<0.030	C3
Record	12315	23586-1408	-14 6588	Rst 4136 AB	224512	1983.7158	28.7	0.155	C2
Record	12316	23586-1408	-14 6588	Rst 4136 AB	224512	1985.8428	23.9	0.177	C2
Record	12317	23586-1408	-14 6588	Rst 4136 AB	224512	1986.8912	22.3	0.178	C4
Record	12318	23589+5545	HR 9071	Sigma Cas B	224572	1978.615		<0.030	N3
Record	12319	23589+5545	HR 9071	Sigma Cas B	224572	1979.773		<0.030	N3
Record	12320	23589+5545	HR 9071	Sigma Cas B	224572	1980.718		<0.030	N3
Record	12321	23594+5441	ADS 17151	A 1498	224646-7	1983.7104	84.2	0.390	C2
Record	12322	23594+5441	ADS 17151	A 1498	224646-7	1984.0574	84.8	0.393	C2
Record	12323	23594+5441	ADS 17151	A 1498	224646-7	1985.8428	84.1	0.390	C2
Record	12324	23594+5441	ADS 17151	A 1498	224646-7	1986.8914	83.9	0.388	C4
Record	12325	23594+5441	ADS 17151	A 1498	224646-7	1987.7540	84.3	0.389	C4
Record	12326	23597-0554	-06 6335		224661	1981.703		<0.030	M3

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

Data File Name: Int. Meas. Bin., New Res

Records 1 To 20

Data File 52

Record Length 105 bytes

Input VOLSER ADC006

```
COLUMN
HEADING      1111111111222222222233333333334444444444555555555566666666667777777777888888888899999999990000000000111111
INDEX        1234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345
```

Record 1 TABLE III. Binary Stars First Resolved by Interferometry

Record 2

Record	Disc. Number	HR/DM Number	Name	HD Number	SAO Number	ADS Number	RA,Dec (2000)	V Mag	Spectral Classif.	Disc. Sep.	Binary Type
3											
4											
5											
6	CHARA 121	HR 9097		225094	10942		00034+6339	6.2	B3Iae	0.196	BS
7	CHARA 122 Aa	HR 9105		225218	36037	30	00046+4206	6.0	B9III	0.110	BS
8	CHARA 1 Aa	+52 0019		761	21202	148	00122+5337	7.0	F0	0.403	
9	CHARA 123	HR 63	Theta And	1280	53777		00171+3841	4.6	A2V	0.057	BS
10	McA 1 Aa	HR 132	51 Psc	2913	109262	449	00323+0657	5.7	B9.5V	0.271	Occn
11	McA 2	HR 233		4775	11424		00507+6415	5.4	B9.5V+GOIII-	0.045	Spm,SB
12	CHARA 2	+83 0020		5621	171		01037+8436	6.7	F5V	0.139	Spm
13	CHARA 3	+67 0131		9015	11787		01308+6722	9.2	K0	0.247	
14	McA 3	HR 439		9352	22389		01334+5820	5.7	K0Ib+B9V	0.133	Spm
15	CHARA 4 Aa	HR 526		11031	37536	1438	01492+4754	5.8	A3V	0.141	SB
16	F7	HR 539	Zeta Cet	11353	148059		01514-1020	3.7	K0III	0.055	SB
17	McA 4	+08 0316		12483	110295		02026+0905	7.8	G5IV	0.224	Occn
18	McA 5	HR 649	Xi 1 Cet	13611	110408		02130-0851	4.4	G6II-IIICN	0.056	SB,Occn
19	CHARA 5	HR 643	60 And	13520	37867		02132+4414	4.8	K3.5IIIBa0.5	0.187	SB
20	F8	HR 645	6 Per	13530	23047		02134-5106	5.3	G8III	0.040	SB

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

Data File Name: Int. Meas. Bin., New Res

Records 271 To 290

Data File 52

Record Length 105 bytes

Input VOLSER ADC006

```
COLUMN
HEADING          1111111111222222222233333333334444444444555555555566666666667777777777888888888899999999990000000001111111111
INDEX      12345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345
```

Record	271	CHARA 114	HR 8617		214558	52211		22383+4511	6.4	G2III+A4V	0.114 BS
Record	272	McA 72	+80 0731		215319	3769		22394+8123	6.9	F8+A5V	0.170 Spm
Record	273	F3	HR 8650	Eta Per	215182	90734		22430+3013	2.9	G2II+FOV	0.052 SB
Record	274	B6	-12 6343		215555	165283		22461-1210	8.3	KO	0.262
Record	275	CHARA 115	HR 8690	14 Lac	216200	52412		22504+4157	5.9	B3IV:e	0.965 BS
Record	276	McA 73	HR 8704	74 Aqr	216494	165359		22535-1137	5.8	B9III	0.071 Occn,SB
Record	277	CHARA 116	HR 8734		217107	146412		22583-0224	6.2	G8IV	0.457 Occn
Record	278	McA 77 AB	HR 8762	Omicron And	217675	52609		23019+4219	3.6	B6IIIpe+A2p	0.352 Spm
Record	279	F3	HR 8762	Omicron And	217675	52609		23019+4219	3.6	B6III+A2	0.046 Spm
Record	280	CHARA 141	+00 4982		219420	128069		23157+0119	6.8	F5	0.061 Occ.
Record	281	McA 74 Aa	HR 8866	94 Aqr	219834	165624	16672	23191-1327	5.1	G5IV	0.212 SB
Record	282	CHARA 120 Aa	+57 2787		222794	35706		23434+5804	7.1	GO	0.057 Halo
Record	283	McA 75 Aab	HR 9003	Psi And	223047	53355		23460+4625	4.9	G5Ib+A0V	0.265 Spm
Record	284	McA 75 Aac	HR 9003	Psi And	223047	53355		23460+4625	4.9	G5Ib+A0V	0.145 Spm
Record	285	McA 76	HR 9064	Psi Peg	224427	91611		23578+2508	4.7	M3III	0.191
Record	286										
Record	287	Binary Type:	Astm	= astrometric binary			Occn	= occultation binary			
Record	288		BS	= bright star survey object			Pleiad	= Pleiades cluster member			
Record	289		Halo	= halo population system			SB	= spectroscopic binary			
Record	290		Hyad	= Hyades cluster member			Spm	= spectrum binary			

LISTING OF RECORDS FROM DATA FILE

Data File Name: Int. Meas. Bin., Notes

Records 1 To 20

Data File 53

Record Length 80 bytes

Input VOLSER ADC006

```
COLUMN
HEADING          1111111111222222222233333333334444444444555555555566666666667777777777888888888899999999990000000001111111111
INDEX      12345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890
```

```
Record      1 Notes to the Second Catalog of Interferometric Measurements of Binary Stars
Record      2 (Notes from other papers are followed by the paper code in parentheses.)
Record      3
Record      4 00122+5337 = ADS 148
Record      5      1976.885   The quoted value of rho is a vector separation along the given
Record      6                 position angle.
Record      7
Record      8 00173+0852 = ADS 238
Record      9      ---------  The measure reported in A6 for 1976.6220 is spurious and has
Record     10                 been deleted from this catalog.
Record     11      1985.745   Large and irregular residuals preclude the correction of an
Record     12                 orbit.  (R16)
Record     13
Record     14 00283-2020 = HR 108
Record     15      1979.7730  This measure was omitted in A7.
Record     16      1982.7657  This autocorrelogram was remeasured; the new results are listed
Record     17                 here.
Record     18
Record     19 00352-0336 = ADS 490
Record     20      1979.5326  This measure was incorrectly attributed to ADS 2200 in A7.
```

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

Data File Name: Int. Meas. Bin., Notes

Records 949 To 968

Data File 53

Record Length 80 bytes

Input VOLSER ADC006

```
COLUMN
HEADING          1111111111222222222233333333334444444444555555555566666666667777777777888888888899999999990000000001111111
INDEX      12345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345
```

```
Record     949                  McAlister and Hartkopf (1982 P.A.S.P. 94, 832).
Record     950       1977.6350  This epoch was incorrectly given as 1977.6359 in A6.
Record     951
Record     952 23305+3050 = ADS 16800
Record     953       ---------  Fekel (1986 private communication) reports that he has now
Record     954                  detected four components in the spectrum of this star.
Record     955
Record     956 23340+3120 = ADS 16836
Record     957       1975.953   Elements published for this long-period system differ: Costa
Record     958                  (1966 Urania, Barcelona 51, 73) quotes P = 198.6 yr, while
Record     959                  Tel'nyuk-Adamchuk (1966 Visn. Kiev Univ., 7, Ser. Astr. 129)
Record     960                  gives P = 425 yr.  The observed theta and rho are in reasonable
Record     961                  agreement with either uncertain orbit.  (B1)
Record     962
Record     963 23460+4625 = McA 75 Aab
Record     964       1977.9135  This measure was omitted in A6.
Record     965
Record     966 23460+4625 = McA 75 Aac
Record     967       ---------  It is not established whether this third component belongs to
Record     968                  Aa or Ab.
```

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

Data File Name: Int. Meas. Bin., Refs

Records 1 To 20

Data File 54

Record Length 80 bytes

Input VOLSER ADC006

```
COLUMN
HEADING          1111111111222222222233333333334444444444555555555566666666667777777777888888888899999999990000000000111111
INDEX      12345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345
```

```
Record      1 TABLE II.  Bibliographic References
Record      2
Record      3  A1  = McAlister, H.A. 1977, Astrophys. J. 215, 159.
Record      4  A2  = McAlister, H.A. 1978, Astrophys. J. 225, 932.
Record      5  A3  = McAlister, H.A. and DeGioia, K.A. 1979, Astrophys. J. 228, 493.
Record      6  A4  = McAlister, H.A. 1979, Astrophys. J. 230, 497.
Record      7  A5  = McAlister, H.A. and Fekel, F.C. 1980, Astrophys. J. Suppl. 43, 327.
Record      8  A6  = McAlister, H.A. and Hendry, E.M. 1982, Astrophys. J. Suppl. 48,273.
Record      9  A7  = McAlister, H.A. and Hendry, E.M. 1982, Astrophys. J. Suppl. 49,267.
Record     10  A8  = McAlister, H.A., Hendry, E.M., Hartkopf, W.I., Campbell, B.G., and
Record     11        Fekel, F.C. 1983, Astrophys. J. Suppl. 51, 309.
Record     12  A9  = McAlister, H.A., Hartkopf, W.I., Hendry, E.M., Gaston, B.J., and Fekel,
Record     13        F.C. 1984, Astrophys. J. Suppl. 54, 251.
Record     14  A10 = McAlister, H.A. and Hartkopf, W.I. 1984, Catalog of Interferometric
Record     15        Measurements of Binary Stars, CHARA Contribution No. 1 (previously
Record     16        unpublished KPNO 2.1-m observations).
Record     17  A11 = McAlister, H.A. 1978, Astrophys. J. 223, 526.
Record     18
Record     19  B1  = Morgan, B.L., Beddoes, D.R., Scaddan, R.J. and Dainty, J.C. 1978,
Record     20        M.N.R.A.S. 183, 701.
```

LISTING OF RECORDS FROM DATA FILE

Data File Name: Int. Meas. Bin., Refs

Records 100 To 119

Data File 54

Record Length 80 bytes

Input VOLSER ADC006

```
COLUMN
HEADING          1111111111222222222233333333334444444444555555555566666666667777777777888888888899999999990000000000111111
INDEX      12345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890
```

Record 100 R12 = Tokovinin, A.A. 1985, Astron. Astrophys. Suppl. 61, 483.

Record 101 R13 = Dudinov, V.M., Kuz'menkov, S.G., Konichek, V.V., Tsvetkova, V.S., Rylov,

Record 102 V.S., and Erokhin, V.M. 1986, Soviet Astron. 30, 359.

Record 103 R14 = Balega, Yu.Yu. 1988, private communication.

Record 104 R15 = Balega, I.I. and Balega, Yu.Yu. 1987, Soviet Astron. Lett. 13, no. 3.

Record 105 R16 = Tokovinin, A.A. and Ismailov, R.M. 1988, Astron. Astrophys. Suppl. 72,

Record 106 563.

Record 107

Record 108 S1 = Schmidt, G.D., Angel, J.R.P., and Harms, R. 1977, Pub. A.S.P. 89, 410.

Record 109 S2 = Cocke, W.J., Hege, E.K., Hubbard, E.N., Strittmatter, P.A., and Worden,

Record 110 S.P. 1981, I.A.U. Colloquium No. 62: Current Techniques in Double and

Record 111 Multiple Star Research, R.S. Harrington and O.G. Franz, eds. Lowell

Record 112 Observatory Bulletin No. 167, Vol. 9, No. 1, p. 159.

Record 113 S3 = Hege, E.K., Hubbard, E.N., Cocke, W.J., Strittmatter, P.A., Worden,

Record 114 S.P., and Radick, R.R. 1981, I.A.U. Colloquium No. 62: Current Techniques

Record 115 in Double and Multiple Star Research, R.S. Harrington and O.G. Franz,

Record 116 eds. Lowell Observatory Bulletin No. 167, Vol. 9, No. 1, p. 185.

Record 117

Record 118 W1 = Anderson, J.A. 1920, Astrophys. J. 51, 263.

Record 119 W2 = Merrill, P.W. 1922, Astrophys. J. 56, 43.

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

Data File Name: Int. Meas. Bin., HR CI

Records 1 To 20

Data File 55

Record Length 22 bytes

Input VOLSER ADC006

```
COLUMN
HEADING          1111111111222222222233333333334444444444555555555566666666667777777777888888888899999999990000000000111111
INDEX      12345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345
```

Record	1	1	3	00052+4514
Record	2	4	87	00057+1324
Record	3	5	123	00062+5826
Record	4	7	144	00064+6412
Record	5	8	166	00066+2901
Record	6	15	358	00084+2905
Record	7	17	400	00087+3638
Record	8	19	417	00089+2528
Record	9	20	431	00091+7943
Record	10	21	432	00092+5909
Record	11	26	560	00100+1109
Record	12	27	571	00103+4604
Record	13	28	584	00105+5710
Record	14	32	661	00106-7314
Record	15	36	743	00120+4809
Record	16	38	829	00128+3742
Record	17	39	886	00132+1511
Record	18	40	895	00134+2659
Record	19	41	905	00135+4102
Record	20	44	952	00140+3312

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

Data File Name: Int. Meas. Bin., HR CI

Records 1759 To 1778

Data File 55

Record Length 22 bytes

Input VOLSER ADC006

```
C O L U M N
H E A D I N G          1111111111222222222233333333334444444444555555555566666666667777777777888888888899999999990000000001111111
I N D E X     12345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345
```

Record 1759 9032 223647 23521-8201

Record 1760 9038 223778 23523+7533

Record 1761 9041 223825 23529-0313

Record 1762 9061 224362 23575-8210

Record 1763 9064 224427 23578+2508

Record 1764 9071 224572 23589+5545

Record 1765 9078 224758 00004+2655

Record 1766 9079 224784 00005+5934

Record 1767 9080 224801 00007+4515

Record 1768 9083 224870 00013+4959

Record 1769 9085 224893 00016+6113

Record 1770 9086 224906 00017+4222

Record 1771 9088 224930 00020+2706

Record 1772 9092 224995 00024+0857

Record 1773 9093 225003 00025+0829

Record 1774 9097 225094 00034+6339

Record 1775 9100 225180 00042+6217

Record 1776 9105 225218 00046+4206

Record 1777 9109 225276 00049+2639

Record 1778 9110 225289 00051+6119

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

Data File Name: Int. Meas. Bin., DM CI

Records 1 To 20

Data File 56

Record Length 33 bytes

Input VOLSER ADC006

```
COLUMN
HEADING          1111111111222222222233333333334444444444555555555566666666667777777777888888888899999999990000000001111111
INDEX      123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234
```

Record	1	BD+88	8	8890	02316+8916
Record	2	BD+85	332	187216	19243+8522
Record	3	BD+85	337	191079	19418+8552
Record	4	BD+85	412	245	00085+8647
Record	5	BD+84	59	20084	03323+8455
Record	6	BD+84	234	89571	10297+8415
Record	7	BD+84	348	140625	15254+8431
Record	8	BD+83	20	5621	01037+8436
Record	9	BD+83	297	90089	10311+8234
Record	10	BD+83	431	133002	14503+8231
Record	11	BD+83	527	167101	17530+8354
Record	12	BD+81	343	91075	10360+8030
Record	13	BD+81	767	210979	22062+8240
Record	14	BD+80	125	25007-8	04101+8042
Record	15	BD+80	448	129245	14336+7940
Record	16	BD+80	731	215319	22394+8123
Record	17	BD+79	75	15416	02361+7944
Record	18	BD+79	212	46588	06462+7934
Record	19	BD+79	761	217992	23013+8046
Record	20	BD+78	1	431	00091+7943

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

Data File Name: Int. Meas. Bin., DM CI

Records 3133 To 3152

Data File 56

Record Length 33 bytes

Input VOLSER ADC006

```
COLUMN
HEADING          1111111111222222222233333333334444444444555555555566666666667777777777888888888899999999990000000000111111
INDEX      12345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123
```

Record	3133	CP-57	10015	209100	22034-5647
Record	3134	CP-59	1032	71129	08225-5931
Record	3135	CP-59	4815	114529	13123-5955
Record	3136	CP-60	7561	211416	22185-6016
Record	3137	CP-61	6140	168339	18232-6130
Record	3138	CP-62	265	20807	03178-6231
Record	3139	CP-63	50	2885	00316-6258
Record	3140	CP-63	217	20766	03178-6235
Record	3141	CP-63	4536		19396-6342
Record	3142	CP-64	3998	184356	19382-6355
Record	3143	CP-65	263	23817	03442-6448
Record	3144	CP-66	737	63406	07440-6712
Record	3145	CP-66	3417	179366	19172-6640
Record	3146	CP-67	799	62964	07416-6741
Record	3147	CP-73	4	661-2	00106-7314
Record	3148	CP-75	391	48386	06348-7513
Record	3149	CP-76	1149	145308	16189-7709
Record	3150	CP-77	1510	205478	21415-7723
Record	3151	CP-82	905	223647	23521-8201
Record	3152	CP-82	907	224362	23575-8210

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

Data File Name: Int. Meas. Bin., SAO CI

Records 1 To 20

Data File 57

Record Length 26 bytes

Input VOLSER ADC006

```
COLUMN
HEADING          1111111111222222222233333333334444444444555555555566666666667777777777888888888899999999990000000000111111
INDEX      12345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456
```

Record	1	22	245	00085+8647
Record	2	171	5621	01037+8436
Record	3	308	8890	02316+8916
Record	4	550	20084	03323+8455
Record	5	650	25007-8	04101+8042
Record	6	1701	89571	10297+8415
Record	7	1714	90089	10311+8234
Record	8	1735	91075	10360+8030
Record	9	2459	133002	14503+8231
Record	10	2559	140625	15254+8431
Record	11	2975	167101	17530+8354
Record	12	3243	187216	19243+8522
Record	13	3294	191079	19418+8552
Record	14	3694	210979	22062+8240
Record	15	3769	215319	22394+8123
Record	16	3830	217992	23013+8046
Record	17	4048	431	00091+7943
Record	18	4071	1141	00163+7657
Record	19	4079	1360	00182+7256
Record	20	4127	2520	00300+7515

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

Data File Name: Int. Meas. Bin., SAO CI

Records 3057 To 3076

Data File 57

Record Length 26 bytes

Input VOLSER ADC006

```
COLUMN
HEADING          1111111111222222222233333333334444444444555555555566666666667777777777888888888899999999990000000001111111111111111
INDEX      12345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345
```

Record	3057	246929	202103	21158-5316
Record	3058	247244	208450	21579-5500
Record	3059	247287	209100	22034-5647
Record	3060	247593	215789	22486-5119
Record	3061	248202	2885	00316-6258
Record	3062	248770	20766	03178-6235
Record	3063	248774	20807	03178-6231
Record	3064	248877	23817	03442-6448
Record	3065	249926	62964	07416-6741
Record	3066	249941	63406	07440-6712
Record	3067	254226	168339	18232-6130
Record	3068	254515	179366	19172-6640
Record	3069	254609	184356	19382-6355
Record	3070	255193	211416	22185-6016
Record	3071	255642	661-2	00106-7314
Record	3072	256316	48386	06348-7513
Record	3073	257377	145308	16189-7709
Record	3074	257948	205478	21415-7723
Record	3075	258989	223647	23521-8201
Record	3076	258996	224362	23575-8210

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

Data File Name: Int. Meas. Bin., ADS CI

Records 1 To 20

Data File 58

Record Length 25 bytes

Input VOLSER ADC006

```
COLUMN
HEADING
INDEX      1111111111222222222233333333334444444444555555555566666666667777777777888888888899999999990000000000111111
      12345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345
```

Record	1	30	225218	00046+4206
Record	2	32	225220	00046+3416
Record	3	42	225276	00049+2639
Record	4	46	3	00052+4514
Record	5	61	123	00062+5826
Record	6	69	166	00066+2901
Record	7	94	358	00084+2905
Record	8	102	431	00091+7943
Record	9	107	432	00092+5909
Record	10	122	560	00100+1109
Record	11	124	570	00104+5831
Record	12	143	709	00116+5558
Record	13	147	744	00119+2825
Record	14	148	761	00122+5337
Record	15	161	895	00134+2659
Record	16	191	1061	00150+0849
Record	17	197	1082	00152+4406
Record	18	207	1141	00163+7657
Record	19	215	1185	00164+4336
Record	20	222	1239	00170+6132

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

Data File Name: Int. Meas. Bin., ADS CI

Records 1172 To 1191

Data File 58

Record Length 25 bytes

Input VOLSER ADC006

```
COLUMN                  1111111111222222222233333333334444444444555555555566666666667777777777888888888899999999990000000000111111111111111
HEADING       1234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345
INDEX
```

Record	1172	16858	221925	23363-0707
Record	1173	16873	222068	23374+0737
Record	1174	16877	222109	23375+4426
Record	1175	16904	222326	23392+4543
Record	1176	16928	222529	23413+3234
Record	1177	16995	223139	23470+0515
Record	1178	17019	223331	23485+3617
Record	1179	17020	223358	23486+6453
Record	1180	17030	223486	23498+2740
Record	1181	17036		23505+4703
Record	1182	17039		23506+4705
Record	1183	17050	223672	23516+4205
Record	1184	17052	223688	23517-0637
Record	1185	17062	223778	23523+7533
Record	1186	17104	224219	23561+2327
Record	1187	17111	224315	23568+0443
Record	1188	17118	224395	23574+7251
Record	1189	17140	224572	23589+5545
Record	1190	17151	224646-7	23594+5441
Record	1191	17175	224930	00020+2706

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

Data File Name: Int. Meas. Bin., Con CI

Records 1 To 20

Data File 59

Record Length 33 bytes

Input VOLSER ADC006

```
C O L U M N
H E A D I N G          1111111111222222222233333333334444444444555555555566666666667777777777888888888899999999990000000001111111
I N D E X      123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234
```

Record	1	Alpha		And	358	00084+2905
Record	2	Beta		And	6860	01097+3537
Record	3	Gamma	1	And	12533	02039+4220
Record	4	Gamma	2	And	12534	02035+4223
Record	5	Delta		And	3627	00393+3052
Record	6	Epsilon		And	3546	00386+2919
Record	7	Zeta		And	4502	00473+2416
Record	8	Eta		And	5516	00573+2326
Record	9	Theta		And	1280	00171+3841
Record	10	Lambda		And	222107	23375+4628
Record	11	Omicron		And	217675	23019+4219
Record	12	Pi		And	3369	00368+3343
Record	13	Rho		And	1671	00211+3758
Record	14	Upsilon		And	9826	01369+4125
Record	15	Phi		And	6811	01093+4715
Record	16	Chi		And	10072	01393+4423
Record	17	Psi		And	223047	23460+4625
Record	18	2		And	217782	23026+4245
Record	19	7		And	219080	23125+4924
Record	20	22		And	571	00103+4604

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

Data File Name: Int. Meas. Bin., Con CI

Records 857 To 876

Data File 59

Record Length 33 bytes

Input VOLSER ADC006

```
COLUMN
HEADING
INDEX      1111111111222222222233333333334444444444555555555566666666667777777777888888888899999999990000000001111111111
           12345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123
```

Record	857	73	Vir	117661	13320-1844
Record	858	96	Vir	123630	14090-1020
Record	859	109	Vir	130109	14462+0154
Record	860	CS	Vir	125248	14186-1843
Record	861	DL	Vir	120901	13526-1843
Record	862	Alpha	Vul	183439	19286+2439
Record	863	5	Vul	182919	19262+2006
Record	864	13	Vul	188260	19534+2405
Record	865	15	Vul	189849	20011+2745
Record	866	16	Vul	190004	20018+2456
Record	867	17	Vul	190993	20069+2337
Record	868	18	Vul	191747	20106+2654
Record	869	20	Vul	192044	20120+2629
Record	870	21	Vul	192518	20142+2842
Record	871	23	Vul	192806	20158+2749
Record	872	24	Vul	192944	20168+2440
Record	873	27	Vul	196504	20371+2628
Record	874	30	Vul	197752	20449+2516
Record	875	35	Vul	204414	21277+2737
Record	876	BW	Vul	199140	20544+2831

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

Data File Name: Int. Meas. Bin., Dsc CI

Records 1 To 20

Data File 60

Record Length 33 bytes

Input VOLSER ADC006

```
C O L U M N
H E A D I N G          1111111111222222222233333333334444444444555555555566666666667777777777888888888899999999990000000001111111
I N D E X      12345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345
```

Record	1	A	1	10508	01424-0646
Record	2	A	2		04466-0437
Record	3	A	54	42033	06098+2914
Record	4	A	55	42395	06117+2846
Record	5	A	78	108320	12267-0535
Record	6	A	88	172088	18384-0312
Record	7	A	95	179002	19110-0725
Record	8	A	108	186847	19471-0810
Record	9	A	111	2880	00321-0511
Record	10	A	117	38068	05436+1259
Record	11	A	119	40628	06013+2927
Record	12	A	122	48591	06455+2922
Record	13	A	148	126126	14220+5107
Record	14	A	160	183458	19288+2304
Record	15	A	162	184739	19351+2328
Record	16	A	183		22059+4522
Record	17	A	185		22201+4625
Record	18	A	192		22589+4617
Record	19	A	194	217712	23020+4800
Record	20	A	196	218196	23055+4643

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

Data File Name: Int. Meas. Bin., Dsc CI

Records 1691 To 1710

Data File 60

Record Length 33 bytes

Input VOLSER ADC006

```
C O L U M N
H E A D I N G          1111111111222222222233333333334444444444555555555566666666667777777777888888888899999999990000000001111111
I N D E X     123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345
```

Record	1691	WRH 15	63208	07486+2309
Record	1692	WRH 16	78515	09093+2203
Record	1693	WRH 17	78715	09103+2200
Record	1694	WRH 18	87737	10073+1646
Record	1695	WRH 19	91316	10328+0918
Record	1696	WRH 20	138905	15355-1447
Record	1697	WRH 21	145849	16119+3626
Record	1698	WRH 23	185268	19372+2920
Record	1699	Wolf 424		12332+0901
Record	1700	Wolf 629		16554-0819
Record	1701	Wolf 922		21313-0947
Record	1702	Wor 2		02287+3215
Record	1703	Wor 4		03241+2348
Record	1704	Wor 6		06323+5225
Record	1705	Wor 9		20302+2651
Record	1706	Wor 13		23060+4220
Record	1707	Wor 22		12101+0526
Record	1708	Wor 23		13048+5555
Record	1709	Wor 24		13320+3109
Record	1710	X 4974		03257-0815