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A COMPILATION OF REDSHIFTS AND

VELOCITY DISPERSIONS FOR

ABELL CLUSTERS

(Struble and Rood 1987)

Documentation for the Machine-Readable Version
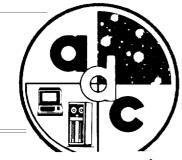
January 1989

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Documentation for the Machine-Readable Version

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January 1989

Abstract

The machine-readable version of the compilation, as it is currently being distributed from the Astronomical Data Center, is described. The catalog contains redshifts and velocity dispersions for all Abell clusters for which these data had been published up to 1986 July. Also included are 1950 equatorial coordinates for the centers of the listed clusters, numbers of observations used to determine the redshifts, and bibliographical references citing the data sources.

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List of Tables

1.0   Introduction

1.1   Description

The present compilation was undertaken in connection with the authors' statistical studies of the morphological and structural properties of Abell clusters (Struble and Rood 1982, 1984, 1987b, 1987c). The list contains redshift data for 578 Abell clusters and velocity-dispersion data for 77. It supersedes previous compilations of Fetisova (1982) and Sarazin, Struble, and Rood (1982). A separate file contains a list of 16 Abell clusters having published redshifts that are probably measurements of foreground or background galaxies in the line of sight toward each referenced Abell cluster.

This document describes the machine-readable version of *A Compilation of Redshifts and Velocity Dispersions for Abell Clusters* 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 paper cited below. The machine-readable tables in this catalog essentially follow the formats of the published tables except for minor changes to effect uniformity. **A copy of this document should be transmitted to any recipient of the machine-readable catalog originating from the ADC.**

1.2   Source Reference

Struble, M. F. and Rood, H. J. 1987, *Astrophys. J. Suppl.* **63**, 543.

2.0 Structure

2.1 File Summary

The machine version of *A Compilation of Redshifts and Velocity Dispersions for Abell Clusters* consists of four files. Table 1 gives the machine-independent file attributes. All logical records are of fixed length; 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 first file contains the basic data of the compilation, while the second and third files contain textual information providing notes and bibliographical references for the main table. The fourth file is very short and contains data for the 16 clusters mentioned in Section 1.1.

A Compilation of Redshifts and Velocity Dispersions for Abell Clusters (Struble and Rood 1987)				
File	Contents	Record Format	Logical Record Length	Total Number of Logical Records
1	Data	FB	88	588
2	Notes	FB	80	78
3	References	FB	80	108
4	Data	FB	37	16

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 *A Compilation of Redshifts and Velocity Dispersions for Abell Clusters* 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 Main Catalog (File 1 of 4)

This file contains the compilation of basic data for the Abell clusters included in the catalog. As noted in the source reference, the redshift, z, derived from a given N_{new} and/or N_{adt} is usually, but not always, for the number of separate galaxies in a cluster. This occurs because the position of each galaxy is not always given in the original references listed in the table (bytes 63-70). In other words, it is possible for z_{new} to be based on, say, three values and for two of those to be for the same galaxy. The authors state, however, that they have taken care to ensure that the numbers used in determining the velocity dispersions, σ, are really based on z values of separate galaxies. The notes to the table (file 2) give details for a few clusters where z_{new} and σ are determined from different numbers of galaxies because of the above-mentioned ambiguities. There are also a few cases where the N used to determine σ_{new} is greater than N_{new} -- these occurrences are explained in the notes.

Table 2 gives a byte-by-byte description of the contents of the main 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 some data fields contain character data and others are blank when data are absent. In particular, except for Abell cluster number, equatorial coordinates, and z_{adt}, any data field can be blank. The field for N_{adt} can be zero (always accompanied by a " > " character in byte 80) or blank. Data fields containing valid numerical data, but where blank fields can exist, are specified with primary numerical formats to give the decimal-point locations, while alternate formats are included in parentheses. For the above reason and because the reported precision may vary within such fields, it is safest to buffer in records in an unformatted mode or read them with character (A) formats and test for blanks before with numerical formats for calculations and/or search purposes. Default (null) values are always blanks in data fields for which primary suggested formats are given as A.

Byte(s)	Units	Suggested Format	Default Value	Data
1-4	---	I4	---	Abell cluster number
5	---	1X	---	Blank
6	---	A1	---	Component
7	---	1X	---	Blank
8-9	hours	I2	---	Right ascension, α
10	---	1X	---	Blank
11-14	min	F4.1	---	α
15	---	1X	---	Blank
16-18	°	I3	---	Declination, δ
19	---	1X	---	Blank
20-21	′	I2	---	δ
22	---	1X	---	Blank
23-28	---	F6.4 (A6)	blank	Redshift, z_{SRS}
29	---	1X	---	Blank
30-32	---	I3 (A3)	blank	Number of redshifts, N_{SRS}
33	---	1X	---	Blank
34-39	---	F6.4 (A6)	blank	Redshift, z_{Fet}
40	---	1X	---	Blank
41	---	A1	---	Lower limit indicator (" > ")
42-44	---	I3 (A3)	blank	Number of redshifts, N_{Fet}
45	---	1X	---	Blank
46-51	---	F6.4 (A6)	blank	Redshift, z_{new}
52	---	1X	---	Blank
53	---	A1	---	Lower limit indicator (" > ")
54-56	---	I3	---	Number of redshifts, N_{new}
57	---	1X	---	Blank
58-61	km s⁻¹	I4 (A4)	blank	Velocity dispersion, σ
62	---	1X	---	Blank
63-70	---	A8	---	Reference codes
71	---	A1	---	Note code
72	---	1X	---	Blank
73-78	---	F6.4 (A6)	---	Redshift, z_{adt}
79	---	1X	---	Blank
80	---	A1	---	Lower limit indicator (" > ")
81-83	---	I3 (A3)	blank	Number of redshifts, N_{adt}
84	---	1X	---	Blank
85-88	km s⁻¹	I4 (A4)	blank	Velocity dispersion, σ_{adt}

Table 2.   Data File Record Format

Abell number	Cluster designation in Abell's (1958) catalog.
Component	Letter designations (N, S, E, W) to indicate that the data refer to northern, southern, eastern, or western components of clusters with two concentrations of galaxies that are assumed to be at the same distance. z values are often available for only one component. A letter "B" or "C" denotes reference to a second or third cluster superimposed on the cluster taken to be the Abell cluster, which has a blank (implicitly an "A") suffix. According to the compilers, "reasonably secure redshifts were adopted for 578 Abell clusters, of which one has two components (A98), and nine have two or three listings for B and C designations."
Equatorial coordinates	Equinox 1950.
Redshift, z_{SRS}	The redshift, z, compiled by Sarazin, Rood, and Struble (SRS, 1982).
N_{SRS}	Number of redshifts used to determine z_{SRS}.

Redshift, z_{Fet}	The redshift, z, compiled by Fetisova (Fet, 1982).
N_{Fet}	Number of redshifts used to determine z_{Fet}. A lower limit indicator (" > ") in byte 41 reflects an ambiguity in the number of redshifts used to determine z_{Fet} from some of the original references.
Redshift, z_{new}	The redshift, z, compiled from a source more recent than either SRS or Fet.
N_{new}	Number of redshifts used to determine z_{new}. A lower limit indicator (" > ") in byte 53 has the same meaning as for byte 41. Some cluster redshifts are determined from redshifts of cluster members contained in two or three references, as indicated in bytes 63-70.
Velocity dispersion, σ	σ determined from references in SRS, Fct, or new. Many are determined from redshifts of cluster members contained in two or three references.
Reference codes	Code(s) for reference sources of the data for z_{new}, N_{new}, and σ. References are given in file 3.
Note code	Lower case letter codes for notes. The letter codes have the following meanings:

a note in SRS

b note in Fet

c note given in file 2

d a, b, and c

e a and b

f a and c

g b and c

Redshift, z_{adt}	The adopted redshift.
N_{adt}	Number of cluster member galaxies used to determine z_{adt}.
Velocity dispersion, σ_{adt}	The adopted velocity dispersion, based on N_{new} or its lower limit, not on N_{adt}, except for a few cases explained in the notes.

2.3 Notes (File 2 of 4)

This file contains the notes for clusters flagged by the code "c" in byte 71 of the data file.

Byte(s)	Fortran Format	Data
1	A1	The letter "A"
2-5	A4 (I4)	Abell cluster number
6-7	2X	Blank
8-80	A73	Notes

Table 3.   Notes File Record Format

Abell number   Cluster designation in Abell's (1958) catalog.

Notes   Notes in free text (mixed case) form. When bytes 2-5 are blank, this record continues the remarks for the previous cluster.

2.4 References (File 3 of 4)

This file contains the bibliographical references ordered by the codes used in the data file.

Byte(s)	Fortran Format	Data
1-3	A3 (I3)	Reference code
4	A1	A period (".")
5-6	2X	Blank
7-80	A74	Reference

Table 4.   References File Record Format

Reference code   Number of reference coded in bytes 63-70 of the data file.

Reference   Reference in free text (mixed case) form. Second and subsequent lines of a reference are indented, so, if byte 8 is blank, the line is a continuation of the current reference.

2.5   Table 2 (File 4 of 4)

This file contains a listing of redshifts previously incorrectly assigned to Abell clusters. The assigned redshifts are probably for foreground and background galaxies superposed on the listed Abell cluster, as ascertained either in the cited reference or by the authors' inspection of the redshift data and the distance classes of the clusters.

Byte(s)	Units	Suggested Format	Default Value	Data
1-4	---	I4	---	Abell cluster number
5	---	1X	---	Blank
6	---	A1	---	Component
7	---	1X	---	Blank
8-9	hours	I2	---	Right ascension, α
10	---	1X	---	Blank
11-14	min	F4.1	---	α
15	---	1X	---	Blank
16-18	°	I3	---	Declination, δ
19	---	1X	---	Blank
20-21	′	I2	---	δ
22-23	---	2X	---	Blank
24-29	---	F6.4	---	Redshift, z_{new}
30	---	1X	---	Blank
31	---	A1	---	Lower limit indicator (" > ")
32-33	---	I2 (A2)	blank	Number of redshifts, N_{new}
34	---	1X	---	Blank
35-37	---	A3	---	Reference code

Table 5.   Data File Record Format

Abell number   Cluster designation in Abell's (1958) catalog.

Component   Same description as for main catalog file.

Equatorial coordinates   Equinox 1950.

Redshift, z_{new}   The redshift, z, taken from the cited source.

N_{new}   Number of redshifts used to determine z_{new}. A lower limit indicator (" > ") in byte 31 reflects ambiguity in the number of redshifts used to determine z_{new} from some of the original sources. A blank indicates that the information is not given in the cited reference.

Reference code   A code for the reference source of the data for z_{new} and N_{new}, either given in file 3 (numerical code) or to denote the source as SRS or Fet.

3.0   History

3.1   Remarks and Modifications

The machine-readable data files of *A Compilation of Redshifts and Velocity Dispersions for Abell Clusters* were received on magnetic tape by the Astronomical Data Center (ADC) from Dr. Herbert J. Rood on July 13, 1987. The tape files were written in VAX VMS backup format and, therefore, were loaded to the VAX 8650 computer of the National Space Science Data Center (NSSDC), from which they were transferred via a local area network to the IBM 3081 computer of the NASA Space and Earth Sciences Computing Center (NSESCC) at the Goddard Space Flight Center. As received, the files of the machine version essentially duplicated Tables 1 and 2 of the source reference. They were reformatted at the ADC to eliminate unnecessary spaces and to homogenize the format and data presentation; *e.g.*, preceding zeros were added to z values and plus signs were added to all positive declination values. The notes and references were computerized at the ADC and added to the machine version. Listings of the files were then sent to Dr. Rood for comments and suggestions. This resulted in the removal of one column of data in Table 1 (the main catalog) that contained some cross identifications to Zwicky cluster numbers. The Zwicky cross identifications do not appear in the published table and were stated by Dr. Rood to be possibly incomplete and not fully checked. Following the reformatting of Table 1, the catalog was considered ready for archiving and distribution.

4.0 Acknowledgments and References

4.1 Acknowledgments

We express appreciation to Dr. Rood for supplying the machine-readable data files, for examining and commenting on the preliminary completed machine version, and for reviewing a draft copy of this document before its final preparation for distribution with the machine-readable catalog. Transfer of the tape files to the NSSDC VAX and to the IBM 3081 was done by Dr. Young Woon Kang, formerly of the Astronomical Data Center.

4.2 References

Abell, G. O. 1958, *Astrophys. J. Suppl.* **3**, 211.

Fetisova, T. S. 1982, *Soviet Astron. AJ* **25**, 647 (Fet).

Sarazin, C., Rood, H. J., and Struble, M. F. 1982, *Astron. Astrophys.* **108**, L7 (SRS).

Struble, M. F. and Rood, H. J. 1982, *Astron. J.* **87**, 7.

Struble, M. F. and Rood, H. J. 1984, *Astron. J.* **89**, 1487.

Struble, M. F. and Rood, H. J. 1987a, *Astrophys. J. Suppl.* **63**, 543.

Struble, M. F. and Rood, H. J. 1987b, *Astrophys. J. Suppl.* **63**, 555.

Struble, M. F. and Rood, H. J. 1987c, *Astron. J.* **93**, 1035.

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).

LISTING OF RECORDS FROM DATA FILE

Data File Name: Abell Clusters Table 1

Records   1 To 20
Data File   208
Record Length 88 bytes
Input VOLSER   ADC007

```
COLUMN
HEADING             1111111111222222222233333333334444444444555555555566666666667777777777888888888899999999990000000000111111111
INDEX      1234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345
```

#	Rec												
Record 1	1	0	5.0 +16 14	0.1249	1				0.1249	1
Record 2	7	0	9.1 +32 8			0.1073	1	19	0.1073	1
Record 3	14	0	12.7 -24 10	0.064	2	0.064 >	1		0.0640	2
Record 4	15	0	12.7 -26 18	0.121	1	0.121	1		0.121	1
Record 5	16	0	14.2 + 6 28			0.0838 >	0	35	0.0838 >	0
Record 6	21	0	17.9 +28 21	0.0948	1	0.0948	1		0.0948	1
Record 7	22	0	18.2 -25 59			0.1432	2	26	0.1432	2
Record 8	23	0	19.2 - 1 10			0.1052 >	0	35	0.1052 >	0
Record 9	24	0	19.9 +23 1	0.1338	1	0.1330	1		b 0.1338	1
Record 10	31	0	24.5 +22 21	0.1596	2	0.1595	2		0.1596	2
Record 11	41	0	26.2 + 7 34	0.275	1	0.279	1		0.275	1
Record 12	42	0	26.1 -23 55			0.1087	1	26	0.1087	1
Record 13	43	0	26.3 +17 18			0.1114	1	26	0.1114	1
Record 14	44	0	27.0 +11 45			0.0559 >	0	35	0.0559 >	0
Record 15	46	0	27.7 -13 9	0.150	2	0.140	2	21	0.150	2
Record 16	71	0	35.1 +29 19			0.0724	2	10	0.0724	2
Record 17	75	0	37.2 +20 59			0.0626	4	10,40	0.0626	4
Record 18	76	0	37.2 + 6 30	0.0377	1	0.0416	4	14	b 0.0416	4
Record 19	77	0	37.9 +29 15			0.0719	1	26	0.0719	1
Record 20	79	0	38.0 +17 52	0.0927	1				0.0927	1

14

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: Abell Clusters Table 1

Records	569 To 588
Data File	208
Record Length	88 bytes
Input VOLSER	ADC007

COLUMN HEADING INDEX

```
          1111111111222222222233333333334444444444555555555566666666667777777777888888888899999999990000000000111111111
1234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345
```

```
Record 569 2622 23 32.4 +27  9 0.0615  1 0.0621  1       26 0.0621  1
Record 570 2623 23 32.5 +  5 20 0.1784  1 0.1784  1
Record 571 2625 23 33.8 +20 15 0.0609  3 0.0609  3
Record 572 2626 23 34.0 +20 53 0.0562  1 0.0573  4  681  9  681  4 0.0573 b 681
Record 573 2630 23 35.0 +15 33 0.0675  2 0.0675  2
Record 574 2632 23 35.2 -  9 30 0.1860  2 0.186   2 0.186   2
Record 575 2634 23 35.8 +26 45 0.0322 16 0.0316 16  899 63  899 17 0.0312 b 899 17
Record 576 2638 23 37.9 -11 59 0.0825  1 0.0825  2 0.0825 a    1
Record 577 2645 23 38.8 -  9 19 0.246   1 0.246   1 0.246  e    1
Record 578 2646 23 38.8 -10 17 0.193   1 0.193   1 0.193       1
Record 579 2657 23 42.3 +  8 52 0.0414  2 0.0414  2  667  8  667 12 0.0414 c 667 12
Record 580 2658 23 42.4 -12 35 0.185     0.185   1 0.185       1
Record 581 2665 23 48.2 +  5 50 0.0556 > 3 10,35,40 0.0556 > 3
Record 582 2666 23 48.4 +26 52 0.0273 15 0.0275 16  261  3  261 15 0.0265 b 261 15
Record 583 2670 23 51.6 -10 41 0.0749 10 0.0749 10 1070 64 1070 10 0.0745 b 1070 10
Record 584 2675 23 53.0 +11  9 0.0726  1 0.0726    0.0726      1
Record 585 2686 23 56.8 -21  5          0.1124    0.1124  1   26 0.1124  1
Record 586 2694 23 60.0 +  8  9          0.0958    0.0958  1   26 0.0958  1
Record 587 2700  0  1.3 +  1 47 0.0978  1 0.0978    0.0978      1
Record 588 2703  0  2.8 +15 49 0.1144  2 0.1164  1 0.1144      2
```

LISTING OF RECORDS FROM DATA FILE

Data File Name: Abell Clusters Notes

Records   1 To   20

Data File   209

Record Length   80 bytes

Input VOLSER   ADC007

Record   1 A 133   Ref. 47 cautions that z(new) is based primarily on faint galaxies in the

Record   2   cluster core.

Record   3 A 140   Values of z for cluster members were determined from an objective-prism

Record   4   survey, and the error in the z of an individual galaxy is about 500 km/s;

Record   5   sigma given in ref. 15 is 2700 km/s, but four galaxies are probably in

Record   6   the foreground/background of the cluster.

Record   7 A 158   Fetisova's z value for the cluster is derived from galaxy redshifts that

Record   8   include two probable foreground galaxies superposed on the cluster.

Record   9 A 171   The value of sigma is derived from the redshifts of four galaxies in

Record   10   ref. 9.

Record   11 A 186 Ref. 31 also lists z = 0.1538 (N = 1).

Record   12 A 204 Ref. 31 also lists z = 0.1870 (N = 1).

Record   13 A 232 Ref. 31 also lists z = 0.1329 (N = 2).

Record   14 A 439 The value of z given in ref. 69 (0.1027) is a typographical error.

Record   15 A 539 Two z values given in ref. 17 are probably foreground (M. Kowalski 1986,

Record   16   private communication), so z(adt) is z(SRS) and z(Fet).

Record   17 A 644 Ref. 47 cautions that z(new) is based primarily on faint galaxies in the

Record   18   cluster core.

Record   19 A1126 Ref. 47 cautions that z(new) is based primarily on faint galaxies in the

Record   20   cluster core.

16

Data File Name: Abell Clusters Notes

Records   59 To   78

Data File   209

Record Length   80 bytes

Input VOLSER   ADC007

```
COLUMN                   111111111122222222223333333333444444444455555555556666666666777777777788888888889999999999000000000011111111112222
HEADING
INDEX       123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123
```

Record   59   reference.

Record   60 A2142   A finding chart for galaxies with redshifts in ref. 51 is given in

Record   61   ref. 3.

Record   62 A2197   Ref. 67 has miscomputed sigma for their subsamples R < 0.6 degrees.,

Record   63   R < 0.876 degrees and delta > 40.25 degrees, based on the data given

Record   64   in their Table 2; since we find that all three are statistically

Record   65   identical, we give the value for the last sample, which is based on the

Record   66   largest number of galaxies.

Record   67 A2199   Ref. 67 includes one galaxy that is very probably foreground (NGC 6131)

Record   68   in the mean for their subsample delta > 40.25 degrees, which we do not

Record   69   include in our calculation; ref. 67 also has miscomputed sigma for their

Record   70   subsamples R < 0.6 degrees, R < 0.825 degrees and delta > 40.25 degrees,

Record   71   based on the data given in their Table 2; since we find that the latter

Record   72   two are statistically identical, we give the value for the last sample,

Record   73   which is based on the largest number of galaxies.

Record   74 A2319   Ref. 58 also gives z = 0.0529 and sigma = 873 km/s derived from redshifts

Record   75   for 21 cluster galaxies; four background galaxies with z approximately

Record   76   0.038 are excluded from both our and ref. 58's calculations.

Record   77 A2534   Ref. 31 also lists z = 0.1698 (N = 1).

Record   78 A2657   Ref. 8 also lists sigma = 189 km/s (N = 8).

Data File Name: Abell Clusters Refs.

Records   1 To   20

Data File   210

Record Length   80 bytes

Input VOLSER   ADC007

```
            111111111122222222223333333333444444444455555555556666666666777777777788888888889999999999 1111111111
   1234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345
```

COLUMN HEADING INDEX		

	Record #	
Record	1	0. Sarazin, C., Rood, H. J., and Struble, M. F. 1982, Astron. Astrophys.
Record	2	108, L 7 (SRS).
Record	3	1. Ciardullo, R., Ford, H., Bartko, F., and Harms, R. 1983, Astrophys.
Record	4	J. 273, 24.
Record	5	2. Denisyuk, E. K., Lipovetskii, V. A., and Afanas'ev, V. L. 1976,
Record	6	Astrofizika 12, 442 (Mkn 586 = A309; Mkn 668 = A1861).
Record	7	3. Hintzen, P. 1980, Astron. J. 85, 626.
Record	8	4. Warner, P. J., Riley, J. M., Eales, S. A., Downes, A., and Baldwin,
Record	9	J. E. 1983, Mon. Not. R. Astron. Soc. 204, 1279 (1227+11 = A1552).
Record	10	5. Jones, C., Forman, W., and Huchra, J. 1983, private communication.
Record	11	6. Couch, W. J., Ellis, R. S., Godwin, J., and Carter, D. 1983, Mon.
Record	12	Not. R. Astron. Soc. 205, 1287.
Record	13	7. Schneider, D. P. and Gunn, J. E. 1982, Astrophys. J. 263, 14.
Record	14	8. Jones, C. and Forman, W. 1984, Astrophys. J. 276, 38.
Record	15	9. Karachentsev, I. D. and Kopylov, A. I. 1981, Soviet Astron. Letters 7,
Record	16	285.
Record	17	10. Klipin, A. A. and Kopylov, A. I. 1983, Soviet Astron. Letters 9, 41.
Record	18	11. Geller, M. J., Beers, T. C., Bothun, G. D., and Huchra, J. P. 1984,
Record	19	Astron. J. 89, 319.
Record	20	12. Steiner, J. E., Grindlay, J., and Maccacaro, T. 1982, Astrophys. J. 259,

LISTING OF RECORDS FROM DATA FILE

Data File Name: Abell Clusters Refs.

Records   89 To   108

Data File   210

Record Length 80 bytes

Input VOLSER   ADC007

```
           1111111111222222222233333333334444444444555555555566666666667777777777888888888899999999991111111111
  1234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345
```

Record 89 56. Burns, J. and Balonek, T. 1982, Astrophys. J. 263, 546.

Record 90 57. Hill, J., Angel, R., Scott, J. S., Lindley, P., and Hintzen, P. 1980,

Record 91   Astrophys. J. (Letters) 242, L69.

Record 92 58. Faber, S. and Dressler, A. 1977, Astron. J. 82, 187.

Record 93 59. Tarenghi, M., Tifft, W., Chincarini, G., Rood, H. J., and Thompson, L.

Record 94   1979, Astrophys. J. 234, 793.

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. 19

LISTING OF RECORDS FROM DATA FILE

Data File Name: Abell Clusters Table 2

Records	1 To 16
Data File	211
Record Length	37 bytes
Input VOLSER	ADC007

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Record 1	34	0	24.7	- 9	5	0.0410		1 26
Record 2	256	1	45.1	- 4	6	0.0425	>	0 35
Record 3	295	1	59.9	- 1	19	0.0428	>	0 35
Record 4	309	2	5.7	+ 2	46	0.1565		1 2
Record 5	326	2	11.2	- 7	21	0.0558		2 26
Record 6	480	4	12.5	+ 0	52	0.0473		1 SRS
Record 7	864	9	45.6	+71	26	0.185		21
Record 8	908	9	56.8	+22	39	0.390		21
Record 9	913 B	9	59.8	+20	43	0.366		1 21
Record 10	994	10	20.1	+19	35	0.0390		1 14
Record 11	1155	11	1.8	+35	28	0.0738		1 26
Record 12	1461	12	2.1	+42	48	0.0538		1 26
Record 13	1861	14	5.2	+28	3	0.079		1 2
Record 14	2360	21	34.4	-15	17	0.0683		1 42
Record 15	2506	22	54.1	+13	4	0.0331		1 Fet
Record 16	2592	23	21.8	+17	52	0.0462	>	0 35

20