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

Documentation for the Machine-Readable Character Coded Version of the SKYMAP Catalogue

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DOCUMENTATION FOR THE MACHINE-READABLE CHARACTER CODED VERSION OF THE SKYMAP CATALOGUE

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National Space Science Data Center (NSSDC)/
World Data Center A for Rockets and Satellites (WDC-A-R&S)
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SECTION 1 - INTRODUCTION

The SKYMAP catalogue is a compilation of astronomical data prepared primarily for purposes of attitude guidance for satellites. The original catalogue was compiled by I. M. Gottlieb of Computer Sciences Corporation (CSC) under contract to the Goddard Space Flight Center. The original version has since been improved and updated with corrections by S. F. McLaughlin of CSC, who currently maintains the data base and issues SKYMAP error reports for the purpose of alerting users to the existence of data discrepancies and probable corrections to future versions. The compilation and statistics of the catalogue are described by Gottlieb (1978), while the SKYMAP system description (Gottlieb 1979*a*) describes the generation and utilization of the data base.

In addition to the SKYMAP Master Catalogue data base, a software package of data base management and utility programs is available. While the software package is specifically tailored to an IBM S/360 computer, it may be useful to certain users with compatible computer systems and to those who wish to convert the programs for use on their own computers. The software programs are primarily for use in updating the data base and preparing sub-catalogues for specific applications; they are described by McLaughlin (1980*a*).

The tape version of the SKYMAP Catalogue, as received by the Astronomical Data Center (ADC), contains logical records consisting of a combination of binary and EBCDIC data. Certain character coded data in each record are redundant in that the same data are present in binary form. The redundancy was effected to make at least some data available to users without the necessity for translating the binary data by other than IBM-compatible computer systems.

To facilitate wider use of all SKYMAP data by the astronomical community, a formatted (character) version was prepared at the ADC by eliminating all redundant character data and converting all binary data to character form. It is the character version of the catalogue which is described in this document. (The binary version is described in a CSC format description document extracted from the SKYMAP system description referenced above: McLaughlin 1980*b*.) The document is intended to fully describe the formatted tape so that users can process the data without problems and guess work; it should be distributed with any character version of the catalogue.

SECTION 2 - TAPE CONTENTS

A byte-by-byte description of the contents of the character version of the SKYMAP catalogue is given in Table 1. For a more complete description of the data, refer to the CSC System Description document (Gottl 1979*a*) or the abbreviated version thereof (McLaughlin 1980*b*). The suggested format can be modified depending upon usage, but care must always be exercised when changing character formats to integer or real. It should also be kept in mind that default values for most A formatted data are blanks and numerically formatted WRITE or PRINT statements will produce zero values.

Table 1. Tape contents. SKYMAP Catalogue, character version

Byte(s)	Datum	Suggested Format
1- 6	HD number	I6
7- 14	SKYMAP number	I8
15- 20	SAO number	I6
21- 28	DM number	
	21 Sign	A1
	22-23 Zone	I2(or A2)
	24-28 Number	I5(or A5)
29- 32	HR (= BS) number	I4
33- 37	ADS number	I5
38- 42	GCVS number	I5
43- 54	Star name	3A4
55- 62	Variable name	2A4
63- 70	α standard epoch (degrees)	F8.4
71- 78	δ standard epoch (degrees)	F8.4
79- 84	Error in standard epoch position	F6.2
85- 92	b^{II} (degrees)	F8.4
93-100	ℓ^{II} (degrees)	F8.4
101-108	G. I. unit vector $\hat{x}$, standard epoch	F8.5
109-116	G. I. unit vector $\hat{y}$, standard epoch	F8.5
117-124	G. I. unit vector $\hat{z}$, standard epoch	F8.5
125-132	α 1950.0 (degrees)	F8.4
133-140	δ 1950.0 (degrees)	F8.4
141-147	α 1900.0 (degrees)	F7.3
148-154	δ 1900.0 (degrees)	F7.3
155-163	μ_α (degrees/year)	F9.7
164-172	μ_δ (degrees/year)	F9.7
173-181	Precession in α	F9.4
182-189	Precession in δ	F8.4
190-198	Sum of precession and proper motion in α	F9.4
199-206	Sum of precession and proper motion in δ	F8.4
207-212	*U* magnitude, best value	F6.3
213	*U* magnitude derivation flag	I1
214-219	*B* magnitude, best value	F6.3
220-225	*V* magnitude, best value	F6.3
226-227	*B*-, *V*-magnitude derivation flag	2I1

Table 1. (continued)

Byte(s)	Datum	Suggested Format
228-233	Photovisual magnitude, Ptv	F6.3
234-239	Photographic magnitude, Pt_{ij}	F6.3
240	Ptv, Pt_{ij} presence flag	I1
241-246	V observed	F6.3
247-252	B-V observed	F6.3
253-258	U-B observed	F6.3
259-262	Spectral class, coded, best value	I4
263-265	Luminosity class, coded, best value	I3
266-267	Peculiarity code, best value	I2
268	Spectral type source flag	I1
269-272	HD spectral type, coded	I4
273-276	MK spectral class, observed, coded	I4
277-279	MK luminosity class, observed, coded	I3
280-281	MK peculiarity code, observed	I2
282	MK spectral type source flag	I1
283-291	π_{trig} (-999.9988 if absent)	F9.4
292-300	π_{trig} probable error (-999.9988 if absent)	F9.4
301-307	π_{trig} distance (parsecs)	F7.1
308-314	π_{trig} distance error (parsecs)	F7.1
315-321	π_{trig} minimum distance (parsecs)	F7.1
322-329	M_V	F8.3
330-336	Spectroscopic distance (parsecs)	F7.1
337-343	Spectroscopic distance error (parsecs)	F7.1
344-351	Radial velocity (km s^{-1})	F8.3
352-359	O component of space motion (km s^{-1})	F8.3
360-367	Π component of space motion (km s^{-1})	F8.3
368-375	Z component of space motion (km s^{-1})	F8.3
376-382	Maximum distance based on space motion (parsecs)	F7.1
383-389	Best distance (parsecs)	F7.1
390-396	Error in best distance (parsecs)	F7.1
397	Distance derivation flag	I1
398-403	Interstellar absorption A_V (magnitudes)	F6.3
404-409	E_{B-V} (magnitudes)	F6.3

Table 1. (continued)

Byte(s)	Datum	Suggested Format
410	Source flag for A_V	I1
411-413	Variability type code	I3
414	Questionable variability flag	I1
415-422	Difference between brightest and faintest magnitudes (mag)	F8.3
423	Variable magnitude type flag	I1
424-433	Epoch of variation (days)	F10.3
434-442	Period of variation (days)	F9.3
443-448	Separation of two brightest components of physical multiple star (arcsec)	F6.2
449-454	Brightness difference between two brightest comp. (mag)	F6.3
455-458	Year of observation	I4
459-464	Distance to nearest neighbor in master catalogue (deg)	F6.3
465-470	Distance to nearest neighbor > 2"	F6.3
471-476	> 5"	F6.3
477-482	> 15"	F6.3
483-488	> 40"	F6.3
489-494	>120"	F6.3
495-500	>300"	F6.3
501-506	Distance to nearest neighbor in master catalogue no more than 2 mag fainter than this star	F6.3
507-512	Distance to nearest neighbor no more than 2 mag fainter and > 5" distant	F6.3
513-518	> 40"	F6.3
519-524	>300"	F6.3
525-526	Source of position flag	I2
527-528	Source of radial velocity flag	I2
529-536	Multiple-star flag	I8
538-541	Systematic error in α (arcsec)	F5.1
542-546	Systematic error in δ (arcsec)	F5.1
547-554	SKYMAP number of previous SKYMAP star if merged with this star to eliminate duplicate entry (0 if not present)	I8
555-558	Source of catalogue position	A4
559	Source of U magnitude	A1
560	Source of B, V magnitudes	A1

Table 1. (concluded)

Byte(s)	Datum	Suggested Format
561-576	Spectral type	4A4
577	Source of spectral type	A1
578-581	Source of distance	A4
582-585	Source of interstellar absorption A_V	A4
586-593	Variability type	2A4

SECTION 3 - TAPE CHARACTERISTICS

The information reported in Table 2 is sufficient for a user to read the machine version of the catalogue. Tape characteristics which are usually varied among computer installations, such as block (physical record) size, blocking factor (logical records/physical record), total number of blocks, tape density, and coding (EBCDIC, ASCII, BCD, etc.), are not listed here, but should always be transmitted with tape copies of the catalogue.

Table 3. Tape characteristics, SKYMAP 3.0 Character Version

NUMBER OF TRACKS	9
NUMBER OF FILES	4
LOGICAL RECORD LENGTH (BYTES)	593
RECORD FORMAT	FB
NUMBER OF LOGICAL RECORDS, FILE 1	53,419
NUMBER OF LOGICAL RECORDS, FILE 2	70,357
NUMBER OF LOGICAL RECORDS, FILE 3	54,581
NUMBER OF LOGICAL RECORDS, FILE 4	70,370
TOTAL NUMBER OF LOGICAL RECORDS	248,727

The number of files (4) given above is for a high-density (6250 bpi) tape. At 1600 bpi, the catalogue requires four tapes, each of which contains a single file.

SECTION 4 - REMARKS AND REFERENCES

The original binary tape of SKYMAP 3.0 was received by the Astronomical Data Center in April 1980. When it became apparent that many external users would have difficulty converting the IBM binary data for processing on their computers, a character format was designed with knowledge of possible data range boundaries and by consultation with D. M. Gottlieb and S. F. McLaughlin of Computer Sciences Corporation. A conversion program was designed to produce the character version while simultaneously correcting a few errors found up to that time. Following the discovery of several overflowed data fields, programs were written to print records from the binary and character tapes, and to check certain fields throughout the entire catalogue for data boundary inconsistencies. The subsequent analysis resulted in a redesign of the character format and detection of additional errors. During reconversion to produce the present character version, the additional errors were corrected with the software.

Table 3 summarizes all specific corrections made during character conversion and gives references where more detailed discussion may be consulted (see Appendix).

Table 3. Summary of Corrections Made During Tape Conversion

	SKYMAP #	Correction(s)
Vol. 1	20053	UBV, $(B-V)_{obs}$, $(U-B)_{obs}$, A_V, E_{B-V} set to default values of -9.999. Ptv -Ptg presence flag (word 38) set to 4 (See Recipients Notice 8 July 1980)
	3540143	SKYMAP merged number (word 95) set to 0 (See Recipients Notice 1 March 1981 and Error Report No. 17)
Vol. 2	10490067	α_{1900} changed from 1161.025 to 160^{s}.775 (See Recipients Notice 1 March 1981)
Vol. 3	13410136	Radial velocity (word 59) changed from 149.000 to 49.000. Space-motion components set to -999.999 (See Recipients Notice 1 March 1981)
	15270150	UBV, $(B-V)_{obs}$, $(U-B)_{obs}$, A_V, E_{B-V} set to default values of -9.999. Ptv - Ptg presence flag (word 38) set to 5 (See Recipients Notice 8 July 1980 and Error Report No. 10)
Vol. 4	21240006	V, $B-V$, $U-B$ corrected to 10^{m}.12, +0^{m}.24, +0^{m}.10 $(V,B,U)_{best}$ corrected to 10^{m}.12, 10^{m}.36, 10^{m}.46 (See Recipients Notice 11 July 1980 and Error Report No. 13)
	21240018	V, $B-V$, $U-B$ corrected to 10^{m}.23, +0^{m}.29, +0^{m}.18 $(V,B,U)_{best}$ corrected to 10^{m}.23, 10^{m}.52, 10^{m}.70 (See Recipients Notice 11 July 1980 and Error Report No. 13)
	23010026	CPD-89° 38. Standard epoch position (δ = +89.9457) and associated data incorrect. (Errors have not been corrected here.)

The standard systems used for catalogue data in SKYMAP are: position (SAO), magnitudes and colors (UBV) and spectral types (MK) when these data were available. Homogeneous photoelectric data from the catalogue of Nicolet (1978) were inserted into the catalogue for Version 3.0 (see Gottlieb 1979*b*, available on request from the ADC). Although positions in the SAO Catalog are reported to 0^{s}.001 and 0".01, the desire to store all data in SKYMAP as single precision numbers limits the accuracy of recorded positions to 0".36 (0^{s}.024). (It has been proposed that full accuracy be retained for future versions of the catalogue.)

REFERENCES

Gottlieb, D. M. (1978). *SKYMAP: A New Catalog of Stellar Data, Astrophys. J. Suppl.* 38, 287.

Gottlieb, D. M. (1979a). *SKYMAP System Description: Star Catalog Data Base Generation and Utilization,* CSC/SD-76/6041UD2.

Gottlieb, D. M. (179b). *Comparison of SKYMAP and Nicolet Star Magnitudes,* CSC/TM-79/6172.

McLaughlin, S. F. (1980a). *SKYMAP System User's Guide,* CSC/SD-80/6035.

McLaughlin, S. F. (1980b). *SKYMAP System Description: Star Catalog Data Base Generation and Utilization,* Section 4 only (revised August 1980).

Nicolet, B. (1978). *Catalogue of Homogeneous Data in the UBV Photoelectric Photometric System, Astron. Astrophys. Suppl.* 34, 1.

SECTION 5 - SAMPLE LISTING

The sample listing given on the following pages shows logical records exactly as they are recorded on the tape. Full sets of records for several stars at the beginning and end of each data file are listed. The start of each record and bytes within the record are indicated by the column heading index (reading vertically) across the top of each page.

Since the SKYMAP records are longer than 115 bytes, the rows 1-6 of each record contain, respectively, bytes 1-115, 116-230, 231-345, 346-460, 461-575, and 576-593.

```
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: SKYMAP 3.0 EBCDIC, V. 1
                 RECORDS       1 TO       5
               TAPE FILE       1
           RECORD LENGTH      593 BYTES
            INPUT VOLSER     P09419

C O L U M N                                                                                                           111111111111111
H E A D I N G          1111111111222222222233333333334444444444555555555566666666667777777777888888888899999999990000000000111111
I N D E X       123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345

RECORD     1  224733        1128522+ 0 5377   0    0    0                          0.0003  1.0899  0.28-59.1911 97.1892 0.99982 0.0000
              1 0.03900359.3601  0.8106359.725  0.533-.0000015-.0000024    1.2808  0.5567   1.2806  0.5564 9.8982 9.979 9.399 4 9.
              300 9.7002-9.999-9.999-9.999 350 50 04 350    0  0 00-999.9988-999.9988     0.0     0.0     0.0   3.400  158.4   62.5
               0.141 -15.947  12.383   1.830     0.0  158.4    62.52 0.0    0.0  3  00-959.9990      0.0       0.0    0.0 -9.9991000 0
              .145 0.145 0.145 0.145 0.145 0.145 0.145 0.145 0.145 0.145 0.145 1 0       0  0.0  0.0       0 SAO*CPS  V
               BS    *
RECORD     2  224690        2165998-20 6688   0    0    0                          0.0044-19.4994  0.33-75.9597 63.1940 0.94264 0.0000
              7-0.33360359.3604-19.7774358.700-20.0500.0000632-.0000067    1.2822  0.5567   1.2885  0.556011.809210.577 9.113 3 9.
              100 10.5001-9.999-9.999-9.999 500 30 04 500    0  0 00-999.9988-999.9988     0.0     0.0     0.0   0.200  319.2  161.7
               2.453-999.999-999.999-999.999    98.6    98.6    98.65 1.393 0.4641  00-999.9990      0.0       0.0    0.0 -9.9991000 0
              .092 0.092 0.092 0.092 0.092 0.092 0.092 0.092 0.092 0.092 0.092 1 0       0  0.0  0.0       0 SAO*CKO  III
               BEAK ST
RECORD     3      0         3 73663+30 5055   0    0    0                          0.0030  31.5322  0.26-30.0770110.2779 0.85235 0.0000
              5 0.52298359.3633 31.2533  0.0     0.0  0.00000650.0000006    1.2793  0.5567   1.2800  0.5567-9.9990 9.838 8.399 6 9.
              398 9.8981-9.999-9.999-9.999    0  0 00   0    0  0 00-999.9988-999.9988     0.0     0.0    0.0-999.999     0.0    0.0
              -3.223-999.999-999.999-999.999     0.0     0.0     0.00-9.999-9.9990  00-959.9990      0.0       0.0    0.0 -9.9991000 0
              .264 0.264 0.264 0.264 0.264 0.264 0.264 0.264 0.264 0.264 0.264 1 0       0  0.0  0.0       0 SAO H

RECORD     4  224737        4248095-5212237   0    0    0                          0.0072-51.8939  0.71-63.4088320.7838 0.61712 0.0000
              0-0.70067359.3640-52.1722358.725-52.4500.0000181-.0000011    1.2847  0.5567   1.2865  0.5566 7.9412 7.963 8.163 3 8.
              100 7.9001-9.999-9.999-9.999 300 50 04 300    0  0 00-999.9988-999.9988     0.0     0.0     0.0   2.600  129.6   53.1
               5.357  -1.515 -13.279   7.063  403.0   129.6    53.12 0.0    0.0  1  00-959.9990      0.0       0.0    0.0 -9.9991000 0
              .278 0.278 0.278 0.278 0.278 0.278 0.278 0.278 0.278 0.278 0.278 1 0       0  0.0  0.0       0 SAO*CPO  V
               BS   PV
RECORD     5  224706        5231892-4619611   0    0    0                          0.0078-45.7617  0.62-68.7474328.2759 0.69764 0.0081
              0-0.71645359.3652-46.0403358.725-46.3330.0000131-.0000043    1.2842  0.5567   1.2855  0.557111.833210.680 9.319 3 9.
              30010.6001-9.999-9.999-9.999 500 30 04 500    0  0 00-999.9988-959.9988     0.0     0.0     0.0   0.200  175.6   89.0
               4.914  13.674  -9.541   2.894     0.0  175.6    89.02 1.082 0.3611  00-959.9990      0.0       0.0    0.0 -9.9991000 0
              .360 0.360 0.360 0.360 0.360 0.360 0.360 0.360 0.360 0.360 0.360 1 0       0 -1.0  5.1      10 SAO*CKO  III
               BS   BV
```

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LISTING OF RECORDS FROM TAPE FILE

```
              TAPE FILE NAME: SKYMAP 3.0 EBCDIC, V. 1
                    RECORDS  53415 TO  53419
                   TAPE FILE      1
               RECORD LENGTH    593 BYTES
                INPUT VOLSER   PG0839

                                                                                                                       11111111111111111
COLUMN               1111111111222222222233333333334444444444555555555566666666667777777777888888888899999999990000000000111111111122222
HEADING    1234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345
INDEX

RECORD  53415  40731 5590201151007-18 1262    0    0    0                          89.9906-18.4981  0.33-19.4293224.3163 0.00015 0.9483
               3-0.31727 89.4437-18.4997 88.900-18.500-.0000066-.0000051   1.0945  0.0027   1.0938  0.0033 9.5752 9.563 9.193 4 9.
               100 9.4002-9.999-9.999-9.999 320 50 04 320   C  0 00-999.9988-999.9988    0.0     0.0     0.0   3.000  173.2   64.2
               15.316  -1.287  33.515  -9.669     0.0  173.2   64.22 0.0   0.0  3  00-999.9990     0.0       0.0    0.0 -9.9991000 0
               .274 0.274 0.274 0.274 0.274 0.274 0.274 0.274 0.274 0.274 0.274 1 0       0  0.0  0.0       0 SAO*CP2  V
                HS   *
RECORD  53416  25C147 5590202 95C97+15 1316    0    0    0                         89.9917 15.6100  0.19 -3.9127192.1761 0.00014 0.9631
               2 0.26909 89.2737 15.6085 88.550 15.617-.0000041-.0000051   1.4362  0.0036   1.4358  0.003111.0432 9.963 8.823 5 8.
               898 9.9005-9.959-9.959-9.999 520 30 04 520   0  0 00-999.9988-999.9988    0.0     0.0     0.0  -0.100  566.6  246.7
               11.654 -34.361  13.093 -51.873     0.0  566.6  246.72 0.157 0.0523  00-999.9990     0.0       0.0    0.0 -9.9991000 0
               .258 0.258 0.258 0.258 0.258 0.258 0.258 0.258 0.258 0.258 0.258 1 0       0  0.0  0.0       0 SAO*CK2  III
                HS   *
RECORD  53417      0 5590203 40769+41 1324    0    0    0                         89.9530 41.6412  0.41  8.9055170.4494 0.00039 0.7473
               2 0.66446 89.1048 41.6394  0.0     0.0  0.0000378-.0000080   1.7756  0.0044   1.7764  0.0036-9.999310.203 8.682 5 8.
               60210.2031-9.959-9.959-9.995   0  0 00   0   0  0 00-999.9988-999.9988    0.0     0.0   0.0-999.999     0.0    0.0
                6.036-999.959-999.999-999.999     0.0     0.0    0.00-9.999-9.9990  00-999.9990     0.0       0.0    0.0 -9.9931000 0
               .015 0.015 0.015 0.015 0.015 0.296 0.296 0.015 0.015 0.015 0.296 1 0       0  0.0  0.0       0 SAO M

RECORD  53418  40142 5590204 25510+52 1023    0    0    0                         89.9934 52.3433  0.14 13.8773160.7778 0.00007 0.6109
               3 0.79169 88.9921 52.3411 88.000 52.3330.0000067-.0000062   2.0020  0.0049   2.0027  0.0043 9.0682 9.048 8.678 4 8.
               600 8.9002-9.959-9.999-9.999 330 50 04 330   C  0 00-999.9988-999.9988    0.0     0.0     0.0   2.600  164.3   61.2
                3.295 -27.599  20.235   3.221     0.0  164.3   61.22 0.0   0.0  3  00-999.9990     0.0       0.0    0.0 -9.9991000 0
               .056 0.056 0.056 0.056 0.056 0.056 0.122 0.056 0.056 0.056 0.122 1 0       0  0.0  0.0       0 SAO*CP0  V
                HS   *
RECORD  53419      0 5590205217662-46  676    0    0    0                         89.9937-46.6078  0.65-27.8686253.6821 0.00037 0.6869
               9-0.72667 89.6475-46.6086  0.0     0.0  0.0000354-.0000014   0.6919  0.0017   0.6924  0.0016 9.5152 9.429 9.020 3 8.
               898 9.2031-9.959-9.999-9.999 300 50 05 300   0  0 00-999.9988-999.9988    0.0     0.0     0.0   2.600  165.5   56.9
               14.373 -27.097  10.132   7.642     0.0  165.5   56.92 0.326 0.1091  00-999.9990     0.0       0.0    0.0 -9.9991000 0
               .363 0.363 0.363 0.363 0.363 0.363 0.363 0.363 0.363 0.363 0.363 1 0       0  0.0  0.0       0 SAO*CP0  V
                 S   EV
```

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LISTING OF RECORDS FROM TAPE FILE

```
              TAPE FILE NAME: SKYMAP 3.0 EBCDIC, V. 2
                     RECORDS      1 TO      5
                   TAPE FILE      2
               RECORD LENGTH    593 BYTES
                INPUT VOLSER    FO3439

COLUMN                                                                                            1111111111111111
HEADING          1111111111222222222233333333334444444444555555555566666666667777777777888888888899999999990000000000111111
INDEX   1234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345

RECORD     1       0 E000031 40762481 1325   0    0    0                      90.0002 41.6549  0.41  9.9168170.8398-0.00000 0.7871
            0 0.66464 89.1122 41.6531  0.0     0.0  -.0000006-.0000074   1.7759  0.0083   1.7758  0.0036-9.9993 9.703 8.692 6 8.
            032 9.7031-9.959-9.999-9.999   0  0 00   0   0  0 00-999.9988-999.9988    0.0     0.0    0.0-999.999    0.0    0.0
             0.033-999.999-999.999-999.999    0.0     0.0    0.00-9.999-9.9990  00-999.9990     0.0      0.0     0.0 -9.9991000 0
            .015 0.015 0.015 0.015 0.015 0.285 0.285 0.015 0.015 0.015 0.285 1 0       0  0.0  0.0        0 SAO N

RECORD     2   40762 E000002171119-21 1321   0    0    0                      90.0006-21.4140  0.24-20.5403227.1851-0.00001 0.9339
            7-0.36510 89.4697-21.4153 38.950-21.417-.00000740.0000010   1.0624  0.0026   1.0617  0.0027 8.5492 9.631 8.186 3 8.
            200 8.6001-9.999-9.999-9.999 500 30 04 500   0  0 00-999.9988-999.9988    0.0     0.0     0.0   0.200  395.5  395.5
            15.365   7.207  28.634 -37.611    0.0  395.5  395.52 0.0   0.0  1  00-999.9990     0.0      0.0     0.0 -9.9991000 0
            .328 0.328 0.328 0.328 0.328 0.328 0.328 0.328 0.328 0.328 0.328 1 0       0  0.0  0.0        0 SAO*CKO  III
             HS   BV
RECORD     3       0 E000023 40757446 1077   0    0    0                      90.0011 46.7161  0.48 11.3973165.9379-0.00001 0.6856
            1 0.72797 89.0654 46.7144  0.0     0.0  -.0000029-.0000113   1.8717  0.0045   1.8715  0.0038-9.9993 9.500 8.898 6 8.
            890 9.5001-9.959-9.999-9.999   0  0 00   0   0  0 00-999.9988-999.9988    0.0     0.0    0.0-999.999    0.0    0.0
             4.757-999.999-999.999-999.999    0.0     0.0    0.00-9.999-9.9990  00-999.9990     0.0      0.0     0.0 -9.9991000 0
            .112 0.112 0.112 0.112 0.112 0.112 0.112 0.112 0.112 0.112 0.112 1 0       0  0.0  0.0        0 SAO N

RECORD     4   40732 E000034151009-13 1323   0    0    0                      90.0013-19.8486  0.25-19.9444225.6023-0.00002 0.9895
            9-0.33354 89.4616-19.8496 98.900-19.867-.0000037-.0000058   1.0798  0.0026   1.0794  0.0020 8.9792 8.988 8.966 3 8.
            880 8.9001-9.959-9.999-9.999 320 50 04 320   0  0 00-999.9988-999.9988    0.0     0.0     0.0   3.000  156.1   53.3
            15.355 -23.166  11.359 -12.517    0.0  156.1   53.32 0.0   0.0  1  00-999.9990     0.0      0.0     0.0 -9.9991000 0
            .165 0.165 0.165 0.165 0.165 0.165 0.165 0.165 0.165 0.165 0.165 1 0       0  0.0  0.0        0 SAO*CP2  V
             HS   BV
RECORD     5   40672 E000035132734- 8 1278   0    0    0                      90.0046 -8.1081  0.68-15.0910214.4262-0.00000 0.9985
            0-0.14104 89.4040 -8.1093 88.800 -8.117-.0000018-.0000066   1.2014  0.0029   1.2012  0.0022 9.1732 8.038 6.898 4 6.
            950 7.9502-9.399-9.999-9.999 500 30 04 500   0  0 00-999.9988-999.9988    0.0     0.0     0.0   0.200  218.6  115.5
            14.734 -30.267   8.348 -14.118    0.0  218.6  115.52 0.0   0.0  3  00-999.9990     0.0      0.0     0.0 -9.9991000 0
            .107 0.107 0.107 0.107 0.107 0.107 0.107 0.107 0.107 0.107 0.107 1 0       0  0.0  0.0        0 SAO*CKO  III
             HS   *
```

```
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: SKYMAP 3.0 EBCDIC, V. 2
                 RECORDS  70353 TO  70357
               TAPE FILE      2
            RECORD LENGTH    593 BYTES
             INPUT VOLSER   P00439

C C I U M N                                                                                                       1111111111111111
H E A D I N G      11111111112222222222333333333344444444445555555555666666666677777777778888888888999999999900000000001111111
I N D E X  123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345

RECORD  70353      011590142     0+64  874   0    0    0                           179.9968 64.0066  0.50 52.1914132.0901-0.83827 0.0000
           2 0.89884179.3536 64.2351  0.0    0.0   -.0000077-.0000036    1.2872 -0.5567    1.2865 -0.5570 9.8532 9.831 9.291 9-9.
           355 9.6065-9.999-9.999-9.999 380 50 05 380   0  0 00-999.9988-999.9988    0.0     0.0     0.0   4.300  114.3   67.9
           -6.346 -14.265   0.930   6.616    0.0  114.3   67.92 0.0   0.0  3  00-999.9990      0.0       0.0    0.0 -9.9991000 0
           .478 0.478 0.478 0.478 0.478 0.478 0.478 0.478 0.478 0.478 0.478 8 0       0  0.0  0.0       0A3K3* P8  V
            S   *
RECORD  70354      011590143 23217+52 1601   0    0    0                           179.9953 51.7714  0.14 63.5158140.9251-0.61880 0.0000
           0 0.78555179.3537 52.0497  0.0    0.0   -.00001500.0000016    1.2848 -0.5567    1.2833 -0.556510.2742 9.614 8.580 3 9.
           560 9.3911-9.999-9.999-9.999 450 40 05 450   0  0 00-999.9988-999.9988    0.0     0.0     0.0   3.200   82.8   51.7
           -5.347  -2.744  -1.530   2.908    0.0   82.6   51.72 0.791 0.2641  00-999.9990      0.0       0.0    0.0 -9.9991000 0
           .156 0.156 0.156 0.156 0.156 0.156 0.156 0.156 0.156 0.156 0.156 1 0       0  0.0  0.0       0 SAO*CG5  IV
            S   BV
RECORD  70355  10410511590144239562-54 4897   0    0    0                           179.9929-55.5860  0.19  6.5618295.6587-0.56517 0.0000
           7-0.32496179.3551-55.3176178.725-55.317-.0000063-.0000017    1.2761 -0.5567    1.2755 -0.5568 8.6672 8.701 9.090 7 9.
           000 8.6601-9.999-9.999-9.999 200 50 04 200   0  0 00-999.9988-999.9988    0.0     0.0     0.0   0.600  498.9  266.6
            5.293  -0.403 -21.153  -1.530    0.0  498.9  266.62 0.0   0.0  1  00-999.9990      0.0       0.0    0.0 -9.9991000 0
           .144 0.144 0.144 0.144 0.144 0.144 0.144 0.144 0.144 0.144 0.144 1 0       0  0.0  0.0       0 SAO*CA0  V
            BS   BV
RECORD  70356  10418211590145119157+ 2 2501   0    0    0                           179.9957   1.2114  0.22 61.2980275.3281-0.99978 0.0000
           7 0.02114179.3555   1.3902178.700   1.783-.0000042-.0000094    1.2809 -0.5567    1.2804 -0.557610.1312 9.730 9.080 4 9.
           000 9.6302-9.999-9.999-9.999 400 50 04 400   0  0 00-999.9988-999.9988    0.0     0.0     0.0   4.800   86.3   35.6
           -0.404 -16.623  -1.090   0.770    0.0   86.3   35.62 0.0   0.0  3  00-999.9990      0.0       0.0    0.0 -9.9991030-0
           .500-0.500-0.500-0.500-0.500-0.500-0.500-0.500-0.500-0.500-0.500 1 0       0  0.0  0.0       0 SAO*CG0  V
            BS   *
RECORD  70357  10419611590146223160-41 5666   0    0    0                           179.9962-42.0934  0.65 19.7710292.8269-0.74205 0.0000
           5-0.67034179.3565-41.8144178.725-41.5330.0000170-.0000136    1.2779 -0.5567    1.2796 -0.5580 9.8702 9.758 9.110 3 9.
           000 9.7061-9.999-9.999-9.999 380 50 04 380   0  0 00-999.9988-999.9988    0.0     0.0     0.0   4.000   34.9   13.3
            4.226 -17.619  13.402  -1.527  332.9   34.9   13.32 0.383 0.1261  00-999.9990      0.0       0.0    0.0 -9.9991000 0
           .302 0.302 0.302 0.302 0.302 0.302 0.302 0.302 0.302 0.302 0.302 1 0       0 -2.9 -7.112000001 SAO*CP8  V
            BS   BV
```

LISTING OF RECORDS FROM TAPE FILE

```
     TAPE FILE NAME: SKYMAP 3.1 EBCDIC, V. 3
          RECORDS      1 TO      5
         TAPE FILE      3
     RECORD LENGTH    593 BYTES
      INPUT VOLSERS   FC0433

COLUMN                                                                                                    111111111111111
HEADING      1111111111222222222233333333334444444444555555555566666666667777777777888888888899999999990000000000111111
INDEX    1234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345

RECORD   1  1041761600002 43987+44 2145    0     0     0                    180.0043 43.3438  0.39 73.7280152.2850-0.72725-0.0030
            0 0.68057179.3637 43.6222179.700 43.905-.0000024-.0000019   1.2836 -0.5567   1.2834 -0.556910.6332 5.650 8.520 1 8.
            200 9.2061 8.520 1.130-9.999 500 30 01 500 500 30 01-999.9988-999.9988   0.0    0.0    0.0   0.200  385.5  385.5
            -4.723 -15.402  -5.324   7.092    0.0  385.5  385.52 0.390 0.1301  00-959.9990     0.0      0.0    0.0 -9.9991000 0
            .412 0.412 0.412 0.412 0.412 0.412 0.412 0.412 0.412 0.412 0.412 1 0       0  0.0  0.0       0 SAO* 50  III
              5   LV
RECORD   2     012000003      1- 1 2603    0     0     0                    180.0110 -2.2432  0.50 59.1278278.0532-0.99923-0.0001
            9-0.63914179.3704 -1.3654  0.0     0.0  0.00000720.0000106   1.2806 -0.5567   1.2813 -0.555610.563210.162 9.512 9-9.
            395 9.9005-9.959-9.959-9.999 400 50 25 400   0  0 00-999.9988-999.9988   0.0    0.0    0.0   4.400  135.3   62.8
            -0.010  -3.968  31.482  12.713    0.0  135.3   62.82 0.0    0.0  3  00-959.9990     0.0      0.0    0.0 -9.9991000 0
            .346 0.346 0.346 0.346 0.346 0.346 0.346 0.346 0.346 0.346 0.346 8 0       0  0.0  0.0      0AGK3* G0  V
              5   *
RECORD   3     012000004 43938+43 2130    0     0     0                    180.0160 48.8841  0.34 66.0766144.0535-0.65758-0.0001
            4 0.75558179.3743 49.1625  0.0     0.0  -.0000056-.0000009   1.2841 -0.5567   1.2835 -0.5568-9.999010.000 9.102 6 9.
            1.210.0001-5.559-9.959-9.999   0  0 00   0   0  0 00-999.9988-999.9988   0.0    0.0    0.0-999.999    0.0    0.0
            -5.148-999.999-999.959-999.999    0.0     0.0    0.00-9.999-9.9990  00-959 9990     0.0      0.0    0.0 -9.9991000 0
            .020 0.020 0.020 0.020 0.020 0.295 0.295 0.020 0.020 0.020 0.295 1 0       0  0.0  0.0       0 SAO N

RECORD   4  1041761600005  7475+75  465    0     0     0                    180.0232 74.2186  0.22 42.4326127.6292-0.27197-0.0001
            1 0.56231179.3776 74.4371178.700 74.7839.0000023-.0000019   1.2911 -0.5567   1.2913 -0.556910.0022 9.980 9.440 4 9.
            320 9.6202-9.999-9.993-9.939 380 50 04 380   0  0 00-999.9988-999.9988   0.0    0.0    0.0   4.000  122.4   50.0
            -6.423 -16.069   4.533   4.264    0.0  122.4   50.02 0.0    0.0  3  00-959.9990     0.0      0.0    0.0 -9.9991000 0
            .461 0.461 0.461 0.461 0.461 0.461 0.461 0.461 0.461 0.461 0.461 1 0       0  0.0  0.0       0 SAO*CFB  V
              HS   *
RECORD   5  104212120000962231E1-46 7569    0     0     0                    180.0135-46.7841  0.89 15.1851293.9608-0.68475-0.0001
            6-0.72876179.3765-46.5045178.750-46.217-.0000769-.0000259   1.2776 -0.5567   1.2699 -0.5593 9.2501 9.040 8.380 1 8.
            500 8.3001 8.380 0.660 3.210 450  0 03 450 450  0 03-999.9988-959.9988   0.0    0.0    0.0-999.999    0.0    0.0
             4.623-999.939-999.999-999.999    0.0     0.0    0.00 0.0    0.0  2  00-959.9990     0.0      0.0    0.0 -9.9991000 0
            .171 0.171 0.171 0.171 0.171 0.171 0.171 0.171 0.171 0.171 0.171 1 0       0  0.0  0.0       0 SAO  G5
                 DEV
```

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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: SKYMAP 3.0 EBCDIC, V. 3
                RECORDS  54577 TO  54581
                 TAPE FILE      3
             RECORD LENGTH    593 BYTES
              INPUT VOLSERS   ?00439

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

RECORD  54577     017590211 85620+24 3298   0    0    0                     269.9968 24.9107  0.18 21.7874 53.5732-0.00005-0.9077
           0 C.41962269.4651 24.9120  C.0    0.0  C.0000012-.0000017   1.0234 -0.0025   1.0235 -0.002711.0752 9.940 8.88010 8.
           602 9.5231 8.800-9.999-9.939 500 30 05 500   0  0 00-999.9988-999.9988    0.0    0.0    0.0   0.200  524.8  246.2 -
           15.424 -22.746  8.462 -12.595    0.0  524.8  246.22 0.0   0.0  3  00-999.9990     0.0      0.0    0.30 0.0  ?966-0
           .000 0.185 0.185 0.185 0.185 0.185 0.185-0.000 0.195 0.195 0.195 1 0      1  0.0  0.0      0 SAO**KO  III
            S   *
RECORD  54578     1635811759021218696 7-2512544    0    0    0              269.9988-25.0868  0.29 -0.7947  4.9855-0.00002-0.9056
           7-0.42395269.2288-25.0347268.450-25.067-.0000081-.0000047   1.5413 -0.0038   1.5405 -0.0042 8.0731 8.270 8.190 1 8.
           250 7.6001 8.190 0.080-0.200 185 50 04 180   0  0 00-999.9988-999.9988    0.0    0.0    0.0   0.0    354.7  158.8
           -9.631 -56.505  16.414  30.405    0.0  354.7  158.42 0.441 0.1472  00-999.9990     0.0      0.0   0.0 -9.9991000 0
           .078 0.078 0.078 0.078 0.078 0.078 0.286 0.078 0.078 0.078 0.286 1 0      0  0.0  0.0      0 SAO  38.5V
            BS   DEV
RECORD  54579     1636351759021324516 1-5210948    0    0    0              269.9978-52.4398  0.18-13.9230380.6902-0.00002-0.6595
           9-0.79271268.9571-52.4359268.000-52.417-.0000296-.0000303   2.0046 -0.0049   2.0016 -0.0079 8.3852 8.373 8.678 3 8.
           600 8.3001-9.999-9.999-9.999 320 50 04 320   0  0 00-999.9988-999.9988    0.0    0.0    0.0   3.000  136.6   86.7
           -3.270-999.999-999.999-999.999   75.3   75.3   75.35 0.0   0.0  1  00-999.9990     0.0      0.0   0.0 -9.9991000 0
           .034 0.034 0.034 0.034 0.034 0.034 0.185 0.034 0.034 0.034 0.185 1 0      0  0.0  0.0      0 SAO*CP2  V
            BEAX BV
RECORD  54580     1640281759021418637 0-20 4948673 4    0    0              269.9998-20.3392  0.31  1.5638  9.3664-0.00003-0.9376
           5-0.34758269.2563-20.3372268.525-20.3330.0000014-.0000022   1.4871 -0.0036   1.4872 -0.0038 7.9832 7.299 6.414 3 6.
           480 7.3001-9.999-9.999-9.999 500 25 01 500 500 25 01-999.9988-999.9988    0.0    0.0    0.0  -9.950  297.1  134.0 -
           10.781 -17.098  20.304  -5.776    0.0  297.1  104.02 0.0   0.0  1  00-999.9990     0.0      0.0   0.0 -9.9991000 0
           .320 0.320 0.320 0.320 0.320 0.320 0.320 0.353 0.353 0.353 0.353 1 0      0  0.0  0.0      0 SAO*CKO  II-III
            S   EV
RECORD  54581     1645051759021S 66545+34 3097   0    0    0               269.9995 34.2392  0.25 24.8526 63.2862-0.00001-0.8267
           0 0.56265269.5469 34.2409269.100 34.233-.0000000-.0000117   0.9018 -0.0022   0.9018 -0.0034 9.1792 9.177 8.977 4 8.
           900 9.0002-9.999-9.999-9.999 250 50 04 250   0  0 00-999.9988-999.9988    0.0    0.0    0.0   2.100  237.4   94.6 -
           15.238 -34.530 -24.576 -12.959    0.0  237.4   94.62 0.0   0.0  3  00-999.9990     0.0      0.0   0.0 -9.9991000 0
           .059 0.059 0.059 0.059 0.059 0.059 0.254 0.059 0.059 0.059 0.254 1 0      0  0.0  0.0      0 SAO*CAS  V
            BS   *
```

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LISTING OF RECORDS FROM TAPE FILE

        TAPE FILE NAME: SKYMAP 3.3 EBCDIC, V. 4
              RECORDS      1 TO      5
             TAPE FILE       4
          RECORD LENGTH     593 BYTES
           INPUT VOLSER    F03439

COLUMN                                                                                                          1111111111111111
HEADING           1111111111222222222233333333334444444444555555555566666666667777777777888888888899999999990000000000111111
INDEX   123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345

RECORD   1  163820180C00001228611-40 831C    C     0     0                    270.0024-40.8555  0.84 -8.5355351.1536 0.00003-0.7563
            6-0.65415269.1208-40.8533268.250-40.8500.0000105-.0000019    1.7621 -0.0043    1.7632 -0.0044 8.4972 8.496 8.372 3 8.
            400 8.4001-9.999-9.999-9.999 233 50 04 230    0  0 00-999.9988-999.9988     0.0     0.0     0.0   1.790  226.2   85.2
            -6.230    3.806  23.301 -23.310     0.0  226.2    85.22 0.0    0.0  1  00-959.9990      0.0        0.0      0.0 -9.9991000 0
            .154 0.154 0.154 0.154 0.154 0.154 0.154 0.154 0.154 0.154 0.154 1 0        0  1.0-13.618000C10 SAO*CA3  V
            HS    BV
RECORD   2       018C00002186069-2212401    C     0     0                    270.0029-22.5476  0.38  0.4641  7.1539 0.00005-0.9235
            6-0.38345269.2471-22.5463  0.0      0.0  0.00000340.0000117    1.5118 -0.0036    1.5122 -0.0325 6.9772 7.473 7.483 4 7.
            500-9.9994-9.999-9.999-9.999 155 50 05 150    0  0 00-999.9988-999.9988     0.0     0.0     0.0  -7.030  412.7  165.2 -
            16.348  71.414  31.655  27.868     0.0  412.7  165.22 0.402 0.1343  00-999.9990      0.0        0.0      0.0 -9.9991000 0
            .099 0.099 0.399 0.099 0.399 0.399 0.099 0.099 0.099 0.099 0.099 1 0        0  0.0   0.C        0 SAO*CB5.5V
              S   *
RECORD   3  16425618C00003122399+ 9 3531    C     0     0                    270.0027  9.6968  0.22 15.7844 35.9390 0.00035-0.9857
            1 0.16843269.4104  9.6984268.800  9.700-.0000066-.0000022    1.1856 -0.0029    1.1849 -0.003111.691210.121 9.681 4 8.
            700 9.9002-9.999-9.999-9.999 550 30 04 550    0  0 00-999.9988-959.9988     0.0     0.0     0.0  -9.309  555.9  286.3 -
            14.855 -62.453    6.136  48.347     0.0  555.9  286.32 0.260 0.0873  00-959.5990      0.0        0.0      0.0 -9.9991000 0
            .222 0.222 0.222 0.222 0.222 0.222 0.222 0.222 0.222 0.222 0.222 1 0        0  0.0   0.0        0 SAO*CK5  III
            HS    =
RECORD   4       016000004 85619+23 3632    0     0     0                    270.0039 20.9066  0.18 20.3459 46.6849 0.00007-0.9341
            6 0.35685269.4702 20.9077  0.0      0.0  -.00000240.0000351    1.0681 -0.0026    1.0678 -0.002011.196210.236 9.889 3 9.
            00C10.0001-9.999-9.999-9.999 500 30 05 503    0  0 00-999.9983-999.9988     0.0     0.0     0.0   0.200  501.6  255.1 -
            15.379  -5.328  53.357  32.919     0.0  501.6  255.12 0.378 0.1261  00-959.9990      0.0        0.0      0.0 -9.9991000 0
            .071 0.071 0.071 0.071 0.071 0.071 0.166 0.071 0.071 0.071 0.166 1 0        0  0.0   0.0        0 SAO*CK0  III
              S   BV
RECORD   5  163E0418000005228639-4212707    0     0     0                    270.0059-42.1994  0.73 -9.1805349.9573 0.00000-0.7408
            1-0.67171269.1130-42.1973268.225-42.1833.00000230.0000013    1.7854 -0.0043    1.7857 -0.0042 9.2302 9.213 9.193 3 9.
            100 9.1001-9.999-9.999-9.999 200 50 04 200    0  0 00-999.9988-959.9988     0.0     0.0     0.0   0.639  495.1  258.3
            -5.896   8.236  15.110  -0.684     0.0  495.1  258.32 0.120 0.0401  00-999.9990      0.0        0.0      0.0 -9.9991000 0
            .230 0.230 0.230 0.230 0.230 0.230 0.230 0.230 0.230 0.230 0.230 1 0        0  0.0   0.C        0 SAO*CA0  V
            HS    BV
```

```
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: SKYMAP 3.0 EBCDIC, V. 4
                RECORDS  70366 TO  70370
              TAPE FILE      4
           RECORD LENGTH    593 BYTES
            INPUT VOLSER   F03439

C O L U M N                                                                                                1111111111111111
H E A D I N G       111111111122222222223333333333444444444455555555556666666666777777777788888888889999999999000000000011111
I N D E X  123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345

RECORD  70366       023590158     0           0   0   0                 359.9839 11.2561  0.50-49.6378103.2166 0.98076-0.0032
          7 C.19515359.3482 13.9778  0.0    0.0  -.0000340-.0000025   1.2801  0.5567   1.2797  C.556411.013210.454 9.634 9-9.
          99510.2005-9.999-9.999-9.999 450 40 05 450   0  0 00-999.9988-999.9988    0.0     0.0     0.0    3.200  193.9  150.8
          -1.031 -20.470  18.128  -0.744     0.0  193.9  150.92 0.0    0.0  3  00-999.9990      0.0      0.0    0.0 -9.9991000 0
          .039 0.039 0.039 0.039 0.039 0.039 0.115 0.039 0.039 0.039 0.115 8 0      0  0.0  0.0       0AGK3* G5  IV
           S   *
RECORD  70367  224698235S0159 10925+71 1244   0    0    0                 359.9807 72.6155  0.35 10.1276119.0569 0.29878-0.0001
          0 C.95432359.3469 72.3377358.725 72.067-.0000258-.0000134   1.2704  0.5567   1.2678  C.555610.1632 9.120 7.980 4 8.
          000 9.0002-9.999-9.999-9.999 500 30 04 500   0  0 00-999.9988-999.9988    0.0     0.0     0.0    3.200  319.0  169.1
          -6.218 -18.906  39.415 -58.196  383.7  319.0  169.12 0.266 0.0893  00-999.9990     0.0      0.0    0.0 -9.9991000 0
          .114 0.114 0.114 0.114 0.114 0.114 0.114 0.114 0.114 0.114 0.114 1 0      0  0.0  0.0       0 SAO*CK0  III
           BS   *
RECORD  70368  22469423590160192303-2818429    0    0    0                 359.9895-27.7062  0.31-78.5636 27.0468 0.88534-0.0001
          6-C.46494359.3479-27.9343358.700-28.2670.0000093-.0000049   1.2824  0.5567   1.2834  C.5562 12.215210.577 8.598 3 8.
          60010.5001-9.999-9.999-9.999 500 30 04 500   0  0 00-999.9988-999.9988    0.0     0.0     0.0    3.200  123.6   62.9
           3.300 -10.243  -9.511    6.238     0.0  123.6   62.92 2.938 0.9791  00-999.9990     0.0      0.0    0.0 -9.9991000 0
          .259 0.259 0.259 0.259 0.259 0.259 0.259 0.259 0.259 0.259 0.259 1 0      0  0.0  0.0       0 SAO*CK0  III
           BS   BV
RECORD  70369  224701235901611 47021- 6 6337    0    0    0                 359.9993 -5.4944  0.25-65.1430 91.1323 0.99541-0.0000
          1-C.09575359.3589 -5.7726358.725 -6.0500.0000021-.0000026   1.2810  0.5567   1.2812  C.556410.1572 9.691 8.751 4 8.
          700 9.5002-9.999-9.999-9.999 450 40 04 450   0  0 00-999.9988-999.9988    0.0     0.0     0.0    3.200  128.9   82.9
           0.896 -11.049   4.149    4.001     0.0  128.9   82.92 0.0    0.0  3  00-999.9990      0.0      0.0    0.0 -9.9991000 0
          .407 0.407 0.407 0.407 0.407 0.407 0.407 0.407 0.407 0.407 0.407 1 0      0  0.0  0.0       0 SAO*CG5  IV
           BS   *
RECORD  70370       023590162     0+26 4723    0    0    0                 359.9983 27.2096  0.50-34.2794109.0769 0.88935-0.0000
          2 C.45723359.3594 26.9305  0.0    0.0  -.0000118-.0000033   1.2791  0.5567   1.2779  C.556310.89121C.06910.329 9-9.
          99510.6005-9.999-9.999-9.999 380 50 05 380   0  0 00-999.9988-999.9986    0.0     0.0     0.0    4.000  188.4  109.5
          -2.780 -30.526  34.956  -7.423     0.0  188.4  109.52 0.0    0.0  3  00-999.9990      0.0      0.0    0.0 -9.9991000 0
          .167 0.167 0.167 0.167 0.167 0.167 0.167 0.167 0.167 0.167 0.167 8 0      0  0.0  0.0       0AGK3* F8  V
           S   *
```

APPENDIX

The following pages contain SKYMAP Error Reports and Recipient Notices published since version 3.0 was introduced, or pertaining directly to version 3.0. The booklet discussed in Error Report Number 8 is not included here, but a copy can be obtained by request to the Astronomical Data Center. If any additional Error Reports or Recipient Notices are issued subsequent to the publication of this document, they will be distributed to all recipients if they are considered crucial to the data contents or processing of the catalogue.

COMPUTER SCIENCES CORPORATION
SYSTEM SCIENCES DIVISION (301) 589-1545
8728 COLESVILLE ROAD • SILVER SPRING, MARYLAND 20910

February 15, 1980

National Aeronautics and Space Administration
Goddard Space Flight Center
Greenbelt, Maryland 20771

Attention: Mr. T. Stengle
Code 581.2
Bldg. 23, Room S-411

Subject: Contract NAS 5-24300
Task Assignment 40011
Attitude System and Sensor Study
Subtask - SKYMAP Maintenance

Dear Mr. Stengle:

Please find enclosed SKYMAP Error Report Number 8. This report summarizes all changes made in the observed data in the Master Catalog prior to producing Version 3.0. Additionally, it also summarizes and discusses all errors in the Master Catalog which are still known to exist as of the above date.

Yours truly,

Steven F. McLaughlin

Steven F. McLaughlin
SKYMAP Task Leader
Attitude Analysis Department

SFM/cb

cc:

GSFC	CSC
R. Werking	D. Sood
	B. Gambhir
	D. Gottlieb
	M. Baker

SKYMAP Error Report Number 8

This report reflects the changes in SKYMAP which were made in the process of compiling Version 3.0 of the Master Catalog. The changes discussed below are primarily a result of the effort to identify and remove duplicate entries from SKYMAP. This report addresses errors reported in SKYMAP Error Report Number 5, and supercedes that report. Rectification of SKYMAP Error Reports 3 and 2.2 are also incorporated below. Additionally, the known remaining errors are discussed.

The classes of changes are as follows:

1. Merged duplicate entries - The accompanying booklet lists 6726 pairs of stars by SKYMAP number whose data were merged into a single entry. Data provided in the booklet includes a running index of pairs, the SKYMAP number which was retained for the merged data, and the SKYMAP number of the deleted member of the pair.

2. Deletions - Table 1 lists 63 stars which were found to be spurious entries, and were deleted.

3. Changes of 100 arc-seconds in binary separations - Table 2 lists the SKYMAP number of 365 stars whose binary separation distance (Master Catalog word 76) was increased by 100 arc-seconds.

4. Additional binary separations - Table 3 lists 27 stars whose binary separation distance was increased by a multiple of 100 arc-seconds, together with the individual amount of change.

5. Data word alterations - Table 4 lists the changes made to 245 observed data words. The format used is the SKYMAP number, the Master Catalog word, and the value substituted. The majority of these alterations are to stars that have been determined to be SAO stars, and for which the SAO data is being added to that star.

As of the writing of this report, parts 1, 3, and 4 of SKYMAP Error Report Number 2 remain unresolved. Since 2.2 has been resolved, it is of value here to discuss the ramifications involved with parts 1 and 4.

The hundreds value of the binary separation distance has been corrected in all cases for all stars; however, due to the problems discussed in Report 2.1 this correct hundreds value is added in some cases to an incorrect remainder. This fact must be kept in mind when and if Report 2.1 is acted on.

For the stars listed in Table 5, a value of 100 arc-seconds was indicated as being required to add on to the remainder. However, no action was taken because the remainder was 0.0 arc-seconds. Further investigation is required for these stars because several possiblities exist:

a) the separation is exactly 100.0
b) this is a well-observed star as discussed in Report 2.4 and should be maintained at 0.0 for conformity
c) a mismatch still exists in the hundreds

TABLE 1 : DELETED STARS

3100140	17450031
3170045	18130178
4330146	18130179
5310010	18230187
6[illegible]00002	18340063
6420224	19100089
6560170	20150083
70[illegible]00	20380084
8310115	21060044
8390005	21060045
8390006	21280154
8390007	21350144
8390008	22380101
8393009	
8400041	
8420[illegible]83	
8440136	
8450318	
8450319	
8480148	
8490127	
9550[illegible]46	
10309[illegible]55	
10360093	
10430165	
10410[illegible]	
1140[illegible]28	
12030[illegible]40	
12060[illegible]61	
12210[illegible]37	
12300[illegible]24	
12450[illegible]98	
12530[illegible]01	
13430[illegible]13	
14070[illegible]14	
14070[illegible]99	
14420[illegible]31	
15230[illegible]90	
15540[illegible]99	
15560[illegible]19	
16010[illegible]28	
16300[illegible]29	
16410[illegible]45	
16450[illegible]95	
16500[illegible]33	
17020[illegible]82	
17050[illegible]54	
17150[illegible]65	
17150[illegible]66	
17410172	

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TABLE 2 : BINARY STARS WITH 100" ADDED TO SEPARATION DISTANCE

60065	80007	130041		180105	210108	220109	300098
320015	400007	480054	480093	490047	530011	540067	540103
570024	1030009	1100120	1110010	1140123	1160082	1190004	1230064
1250122	1250123	1270086	1290119		1300029	1350014	1360124
1430107	1490087	1510066	1560027	1590022	2100058	2160133	2190027
2350110	2350138	2360001	2510102	2560065	2590026	3050063	3050100
3070068	3080121	3100131	3110043	3200003	3240048	3440087	3470072
3500030	4000109	4040102	4050044	4080004	4090068	4110042	4150124
4150139	4180064	4180144	4200060	4220123	4240016	4250036	4250047
4250085	4260035	4260040	4280002	4280099	4290058	4300113	4300119
4320101	4330057	4380019	4420119	4510077	4510128	4520018	4540152
4590100	5050038	5060029	5070111	5070146	5070170	5110161	5120006
5230074	5250008	5250033	5270018	5280098	5310065	5310098	5350094
5360046	5450140	5590108	5590113	6060033	6140027	6140066	6150168
6170058		6220015	6220154	6220217	6250128	6280250	6300190
6320199	6370196	6370197	6410002	6430263	6440058	6530017	6540025
6580022	7010105	7070092	7080003	7130084	7180152	7210164	7240025
7240045	7250102	7260010	7290232	7380137	7430070	7470169	7490134
8080124	8160027	8240132	8260089	8390196	8400025	8400099	8400122
8430063	8520021	9010159	9110159	9150045	9170031	9200195	
9290061	9330100	10020020	10080053	10080091	10110083	10180138	10260027
10290168	10300097	10300117	10330126	10360032	10530084	10530086	10590066
11020163	11070052	11080074	11110127	11120085	11140018	11140075	11360147
11410009	11470139	12070035	12120067	12150059	12200054	12280122	12300010
12350017	12390040		12410110	12460037	12460075	12470035	12480132
12490112		12550105	13000109	13000109	13010119	13060023	13070074
13090125	13130074	13130085	13180135	13180143	13220090		13250028
13540114		14030018	14130056		14190035	14260028	14320065
14460040	14490158	14560087	14560124	15070046	15140021	15150072	15200020
15200025	15240090	15310129	15320069	15360015	15360015	15380050	15410071
15410071	15410137	15510039	15550029	16000067	16040144	16140151	16180055
16200091	16220014	16240059	16300130	16350083	16360034	16360093	16420137
16450064	16460145	16470073	16470121	16510010	16560037	17050026	17200002
17270013	17310193	17390030	17390095	17400101	17420103	17420111	17460122
17470146	17530092	17570142	18010120		18060209	18070064	18160008
18160122	18200216		18210079	18300141	18320176	18370196	18420147
18470200	18530177	18560086	18590133	19150115	19150186	19190171	
19200134	19240223	19250121	19260081	19270213	19290107	19300040	19310015
19310023	19350195	19420150	19420152	19460060	19470121	19500140	19500184
19580061	20000029	20010134	20020187	20060059	20090119	20090208	20110029
20110029	20110078	20110143	20130091	20140141	20200269	20280039	20330230
20370131	20370139	20390116	20390182	20400155	20490093	20490169	20530206
20560146	20560173	20580098	20580102	20580178	20580178	20590172	21050079
21060025	21090031	21120031	21140078	21170026	21180003	21220007	
21320033	21340074	21390111	21430046	21430083	21430175		21590039
22050131	22090037	22140179	22240014	22250038	22460010	22490081	22580079
22580079	23130016		23130125	23160106	23200148	23260134	23320041
23380094	23410110	23470147	23540132				

TABLE 3 : BINARY STARS WITH MULTIPLES OF 100" ADDED TO SEPARATION DISTANCE

500119	200.0 "
5010200	200.0 "
5160131	400.0 "
5280056	200.0 "
5560013	200.0 "
7290032	200.0 "
7450077	200.0 "
9010088	200.0 "
9200090	200.0 "
10240033	200.0 "
10480120	200.0 "
12040014	300.0 "
12080016	300.0 "
13000107	200.0 "
13100014	200.0 "
13160085	200.0 "
13190005	300.0 "
14500102	200.0 "
14560141	200.0 "
16510165	300.0 "
16520069	300.0 "
17200119	200.0 "
20130063	300.0 "
20210001	200.0 "
20280233	200.0 "
21180124	200.0 "
23030107	200.0 "

TABLE 4 : * STARS WITH ALTERED DATA

4500053	1	0
4500053	36	8.6000004
4500053	37	9.1000004
4500053	38	1
4500053	46	350
5310006	1	36620
5310006	23	81.9750061
5310006	24	-41.7166595
5310006	36	9.0000000
5310006	37	9.1000004
5310006	46	200
5310006	95	5310010
5310006	93	-0.3000000
5310006	94	9.0000000
6480145	1	172384
6480145	21	101.890411
6480145	22	-24.0771790
6480145	25	0.0000058
6480145	26	-0.0000011
6480145	15	0.2000000
6480145	90	1
6480146	1	49868
6480146	36	7.6999998
6480146	37	7.8000002
6480146	38	1
6480146	46	220
7180139	3	197833
7180139	21	109.180704
7180139	22	-36.6786205
7180139	25	0.0000104
7180139	26	0.0000086
7180139	15	0.2000000
7180139	90	1
8150056	1	69115
8150056	23	122.600006
8150056	38	1
8150056	24	-8.7132998
8150056	36	9.5000000
8150056	37	9.8999996
8150056	46	350
8290176	1	72177
8290176	23	126.574997
8290176	24	-41.5832977
8290176	36	8.3999996
8290176	37	9.3999996
8290176	46	190
8290176	38	1
8380195	3	220235
8380195	21	129.328278
8380195	22	-46.0496826
8380195	25	-0.0000017
8380195	26	0.0000042
8380195	15	0.6700000
8380195	90	1
8420195	1	74580
8420195	23	129.859994
8420195	24	-47.7666626
8420195	36	9.1999998
8420195	37	8.1000004
8420195	39	8.6400003
8420195	40	-0.0600000
8420195	41	-0.5200000
8420195	93	-4.1000004
8420195	94	-7.3000002
8480151	1	75550
8480151	23	131.375000
8480151	24	-49.3666534
8480151	36	8.8000002
8480151	37	8.6000004
8480151	95	8480148
8480151	93	-4.1000004
8480151	94	7.3000002
8490134	1	75642
8490134	23	131.500000
8490134	24	-41.3833313
8490134	36	9.3000002
8490134	37	8.5000000
8490134	95	8490127
8490134	93	-4.1000004
8490134	94	7.3000002
10300093	1	91269
10300093	4	3901944
10300093	46	190
10300111	76	0.0
10300111	77	-9.9989996
10300111	78	1000
10300111	92	0
10340167	77	1.0000004
10340167	76	25.0000000
10340167	3	251022
10340167	21	158.305237
10340167	22	-63.8750610
10340167	25	0.0000058
10340167	26	0.0000014
10340167	15	0.5400000
10340167	90	1
10350127	92	10000341
10410092	4	10002694
10440024	1	93161
10440024	76	12.6000004
10440024	77	0.6000000
12030037	1	104681
12030037	93	-2.8999995
12030037	94	-7.1000004
12030037	36	8.0000004
12030037	37	9.0000000
12030037	23	179.524994
12030037	24	-48.6333313
12030037	46	180
12390025	1	11027
13450110	2	18170212
13450110	3	0
13450110	22	0.0
13450110	21	0.0
13450110	36	-0.0000002
13450110	37	-0.0000064
13450110	15	35.0000000
13450110	90	2
13450112	2	18060246
13450112	21	0.0
13450112	22	0.0
13450112	3	0
13450112	36	-0.0000002
13450112	37	-0.0000096
13450112	15	35.0000000
13450112	90	2
14070074	1	123201
14070074	23	210.274994
14070074	24	-47.6333277
14070074	36	9.1999998
14070074	37	8.8000002
14070074	38	1
14070074	46	200
14070091	1	123226
14070091	23	210.234985
14070091	24	-46.0000000
14070091	36	9.5000000
14070091	37	9.1000004
14070091	95	14070089
14070091	93	-2.8999996
14070091	94	-7.1000004
14490057	77	0.0
14490057	76	0.1000000
14490057	3	242035
14490057	21	221.05[illegible]
14490057	22	-52.[illegible]
14490057	25	-0.0000059
14490057	26	-0.0000069
14490057	15	0.4700000
14490057	90	1

16040118	1	143794	18120173	3	228803	
16040118	23	239.324997	18120173	21	272.254639	
16040118	24	-48.5166931	18120173	22	-45.7164001	
16040118	36	9.8999996	18120173	25	-0.0000304	
16040118	37	9.3999996	18120173	26	-0.0000289	
16040118	38	1	18120173	15	0.6500000	
16040118	46	200	18120173	90	1	
16410655	76	9.6000004	18230157	1	168788	
16410655	77	1.1999998	18230157	46	450	
16410655	78	1938	18230157	36	8.5999996	
16460079	3	227187	18230157	37	9.6999998	
16460079	21	250.726761	18230157	38	1	
16460079	22	-46.9965057	18230190	1	168821	
16460079	25	0.0000125	18230190	46	500	
16460079	26	0.0000025	18230190	36	8.1000004	
16460079	15	0.6600000	18230190	37	9.1999998	
16460079	90	1	18230190	38	1	
16460103	3	227184	19120220	4	9604513	
16460103	21	250.707001	19160175	3	246010	
16460103	22	-45.3076172	19160175	21	288.239014	
16460103	25	0.0000050	19160175	22	-50.0726166	
16460103	26	-0.0000011	19160175	25	0.0000196	
16460103	15	0.7100000	19160175	26	-0.0000061	
16460103	90	1	19160175	15	0.6900000	
16540022	3	227379	19160175	4	4911021	
16540022	4	5407718	19180084	1	180283	
16540022	21	252.623018	19180084	23	287.699351	
16540022	22	-41.7093964	19180084	24	-49.8499908	
16540022	25	0.0000092	19180084	36	9.1999998	
16540022	26	-0.0000017	19180084	37	10.0000000	
16540022	15	0.7300000	19180084	95	19180089	
16540022	90	1	19180084	93	1.0000000	
17050364	76	28.7200012	19180084	94	-13.6000004	
17050364	77	0.9000000	21230130	1	203494	
17050364	92	17050054	21230130	23	319.350098	
17090369	3	227673	21230130	24	-40.2500000	
17090369	21	256.443219	21230130	36	9.5000000	
17090369	22	-45.4776154	21230130	37	9.6000004	
17090369	25	0.0000017	21230130	38	1	
17090369	26	-0.0000081	21230130	46	380	
17090369	15	0.6800000	21350148	76	54.6000061	
17090369	90	1	21350148	77	2.5000000	
17410153	1	160306	21350148	78	1534	
17410153	23	263.500000	21350148	92	1	
17410153	24	-50.6999969	23260092	4	1860344	
17410153	36	8.6000003				
17410153	37	9.3000002				
17410153	95	17410172				
17410153	93	1.5000000				
17410153	94	-12.8999996				

Table 5: Stars Requiring Investigation of Binary Separation Data

SKYMAP	DM	V
160005	12500023	9.339
1290137	11300222	8.797
6200075	6903038	3.020
9210019	16101116	8.703
12390093	12002751	8.907
12550057	12002774	9.000
13220138	13202344	9.377
13570002	12502706	9.230
14170089	17100683	9.000
18060110	10903560	8.650
18160008	16800986	10.110
18210039	15901892	9.500
19190179	18600298	9.297
21300161	14703439	8.297
21450167	11004622	9.585
23130054	17301020	9.102

COMPUTER SCIENCES CORPORATION
SYSTEM SCIENCES DIVISION (301) [illegible]
8728 COLESVILLE ROAD • SILVER SPRING, MARYLAND 20910

March 24, 1980

National Aeronautics and Space Administration
Goddard Space Flight Center
Greenbelt, Maryland 20771

Attention: Mr. T. Stengle
Code 581.2
Bldg. 23, Room S-411

Subject: Contract NAS 5-24300
Task Assignment 40011
Attitude System and Sensor Study
Subtask - SKYMAP Maintenance

Dear Mr. Stengle:

Enclosed please find SKYMAP Error Report Number 9. This report serves as a minor supplement to the comprehensive Report Number 8 you have already received.

Yours truly,

Steven F. McLaughlin

Steven F. McLaughlin
Attitude Analysis Department
SKYMAP Task Leader

SFM/rld

cc GSFC
R. Werking

CSC
D. Sood
D. Gottlieb
C. Sturch

SKYMAP Error Report Number 9

During the recent process of running program UPDATE for the newly generated Master Catalog, several minor problems were encountered.

UPDATE delivers a warning message for some of the standard process calculations if the calculations result in unreasonable data. A few of these messages during an execution of UPDATE are not indicative of any abnormal condition. Internal FORMAT statements in UPDATE were inadequate to output required diagnostic information. The UPDATE code has been modified to correct this minor error.

Additionally, a small number (4 or 5) of data problems (overflow, underflow) were encountered while running UPDATE. Some of the problems arise because of the nature of computations and were anticipated. These problems do not appear to have affected the overall quality of the new Master Catalog data. For SKYMAP star 30008, the photovisual-photographic magnitude flag was found to be incorrect. It was set to a correct value of 5. In general, it is believed that these errors are a result of isolated incorrect data words, or a result of an improper initialization of some parameter in UPDATE.

In SKYMAP Error Report Number 8, it should have been noted that three bright stars were found to be grossly misplaced in the Master Catalog. The SKYMAP numbers of these stars were changed as shown below. Their sequential positions in the catalog were also changed according to their new numbers.

from	to
6420224	3540143
13450110	18060246
13450112	18170212

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March 12, 1980

National Aeronautics and Space Administration
Goddard Space Flight Center
Greenbelt, Maryland 20771

Attention: Mr. T. Stengle
Code 581.2
Bldg. 23, Room S-411

Subject: Contract NAS 5-24300
Task Assignment 40011
Attitude System and Sensor Study
Subtask - SKYMAP Maintenance

Dear Mr. Stengle:

Enclosed please find a copy of the results of a brief statisical survey done to check the completeness of the duplicates-removal process. This survey did a check of the distance separation between the two members of a duplicate pair.

The horizontal heading is separation distance in arc-seconds. This has been divided into bins of 10 arc-second width. The vertical headings list each class of duplicates (JBINnn) and a class for all duplicates (JBIN). At the bottom are the total duplicates found in each class in the same order as the vertical headings. As an additional check, all duplicate separations were also grouped in 5 arc-second bins (KBIN).

The results of the statistical survey are essentially the same as were expected and are summarized below.

1. Class 12 duplicates comprised 95 percent of all duplicates.
2. Almost 98 percent of the duplicate separations were less than 100 arc-seconds.
3. Extrapolation of the distance distributions beyond the 250 arc-second limit radius used to locate duplicates implies that some duplicates were probably missed. It is likely, however, that the number missed is less than 20.

4. Most of the duplicates missed are a result of data from the Multiple Star Catalog.

Yours truly,

Steven F. McLaughlin

Steven F. McLaughlin
Attitude Analysis Department

SFM/rld

Enclosure

cc:

GSFC	CSC
R. Werking	D. Socd
	D. Gottlieb
	C. Sturch

SUMMARY OF RESULTS N = 6839

	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200	210	220	230	240	250
JBIN =	369	998	1297	1338	1147	796	473	183	55	36	27	19	16	12	16	10	6	4	8	3	8	7	2	8	1
JBIN12 =	361	973	1281	1317	1119	780	457	174	49	15	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0
JBIN13 =	0	0	0	2	8	8	8	5	2	3	1	2	0	0	1	0	0	0	0	0	0	0	0	1	0
JBIN14 =	0	0	0	1	2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
JBIN15 =	2	18	12	12	9	5	7	1	1	13	13	12	11	9	15	9	5	4	8	3	5	7	2	7	1
JBIN18 =	4	2	1	0	0	0	0	0	1	0	1	2	1	2	0	0	0	0	0	0	1	0	0	0	0
JBIN19 =	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
JBIN25 =	0	0	0	0	0	0	0	2	1	3	1	3	3	1	0	1	1	0	0	0	1	0	0	0	0
JBIN28 =	0	0	0	2	3	0	0	1	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
JBIN29 =	1	4	2	2	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
JBIN58 =	0	1	1	2	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
KBIN =	1048	2655	4587	5408	6076	6903	6927	6463	6073	5404	4460	3504	2804	1930	1023	813	355	204	213	150	182	94	104	90	81

RESPECTIVE SUMS OF BINS

6839	6535	41	4	191	15	2	17	10	15	9

SKYMAP 3.0 RECIPIENTS

In a previously distributed character version of SKYMAP 2.2, F. Rufener of Geneva Observatory discovered asterisks in certain data fields of SKYMAP star 20053 (record number 351 of Volume 1). This problem was independently discovered by S. F. McLaughlin when producing the current version of SKYMAP 3.0 (see SKYMAP Error Report Number 12). Upon receipt of the binary version of SKYMAP 3.0, a program was written at the Astronomical Data Center to check the entire catalogue for similar problems, which arose because of bad data in the binary version which overflowed the conversion format specifications. The checking program was coded to flag unreasonable data in words 31 (*U* mag best), 33 (*B* mag best), 34 (*V* mag best), 36 (Ptv mag), 37 (Ptg mag), 39 (*V* mag observed), 40 (*B-V* mag observed), 41 (*U-B* mag observed), 67 (A_V), and 68 (E_{B-V}). A run through the entire catalogue produced bad values for star #20053 and star #15270150 [*V* mag best (also previously discovered by S. McLaughlin - Error Report Number 10)].

To remove these undesirable data from the character version of SKYMAP 3.0, the conversion program was appropriately modified to change words 31, 33, 37, 67, and 68 to default values of -9.999 (the other data appear correct) and to set the Ptv-Ptg presence flag in word 38 (byte 231 in character version) to 4. For star #15270150, which has a *V* mag best of -11.139 in the binary version, word 34 was reset to -9.999 (neither of the above stars has existing *UBV* photometry) and word 38 to 5.

Note that the binary version of the catalogue retains the above errors.

Wayne H. Warren Jr.
Astronomical Data Center
8 July 1980

COMPUTER SCIENCES CORPORATION
SYSTEM SCIENCES DIVISION (301) 589-1545
8728 COLESVILLE ROAD · SILVER SPRING, MARYLAND 20910

June 16, 1980

National Aeronautics and Space Administration
Goddard Space Flight Center
Greenbelt, Maryland 20771

Attention: Dr. Wayne Warren
National Space Science Data Center
Code 601
Bldg. 26, Room 101

Subject: Contract NAS 5-24300
Task Assignment 40011
SKYMAP Errors

Dear Dr. Warren:

Please find enclosed copies of SKYMAP Error Reports Numbers 10, 11, and 12. The reports address the star magnitude errors in Version 3.0 of the SKYMAP data base which you independently discovered and brought to our attention. The reports describe the errors, manner in which they were discovered, and the recommended action for correcting them. Additionally, Report 11 discusses a "duplicates" error which was not known prior to generation of the Version 3.0 Master Catalog.

Yours truly,

Steven F. McLaughlin

Steven F. McLaughlin
Attitude Analysis Department

SFM/rld

cc

GSFC	CSC
R. Werking	D. Sood
T. Stengle	R. Byrne
	G. Neal
	C. Sturch

SKYMAP Error Report Number 10

A minor error was discovered in the SKYMAP version 3.0 data base during the recent efforts to produce a microfiche version of the Multi-Mission Run Catalog.

The criterion for including Master Catalog stars in the Multi-mission Run Catalog is based upon a limiting magnitude. While performing the selection, a star was discovered that had no valid B or V magnitude. This is an abnormal condition for SKYMAP.

Further investigation using existing utility MCDUMP showed that for SKYMAP star 15270150 the photovisual-photographic magnitude flag (word 38) was incorrect. The correct value should be 5. We recommend that this parameter be changed when the next version of SKYMAP is generated.

This minor error appears to have existed in previous versions of SKYMAP, and was propagated into version 3.0. A check of the data base changes that were made while creating version 3.0 shows that this star was not affected. A very similar error was reported in SKYMAP Error Report Number 9. It is possible that the error noted in this report is of the type which was discussed in some detail in Report 9.

SKYMAP Error Report Number 11

A minor error was discovered in the SKYMAP Version 3.0 data base during the recent efforts to quality assure the completed microfiche version of the Multi-Mission Run Catalog.

A chance discovery was made that SKYMAP stars 19180114 and 19180180 are duplicate entries. The separation of these entries is 366.8 arc-seconds. This duplicate pair was not removed in the recent undertaking to remove duplicates because that task looked only to maximum separations of 250.0 arc-seconds. The visual magnitude of this star is 6.7.

It is our recommendation that the data in this pair be merged into a single stellar entry in the next version of SKYMAP. This process can be done manually for one pair with ease. Since it was realized that a few duplicates with separations greater than 250.0 arc-seconds did exist, the discovery noted above is not considered to have a significant impact on the integrity of the current data base.

SKYMAP ERROR REPORT NUMBER 12

A minor error was discovered in the SKYMAP Version 3.0 data base during a recent examination of data manipulations done in connection with the writing of the SKYMAP User's Guide.

A chance discovery was made that for SKYMAP star 20053 the photographic magnitude (word 37) is an unphysical value.. This error appears to have existed in previous versions of SKYMAP, and was propagated into version 3.0. This problem can be corrected by setting word 37 to -9.999 and word 38 to 4.

It is our recommendation that these changes be made in the next version of the SKYMAP Master Catalog. By running program UPDATE, the additional errors caused by this erroneous data will also be corrected.

In this report, we would like to note that this is the third individual incidence of an error in the data base involving the photovisual and photographic magnitudes and their validity flag (words 36, 37, 38) that has been detected since the beginning of the effort to generate version 3.0. Peculiar execution problems which probably involve this error were reported in Error Report 9 for program UPDATE. We feel that when time and resources permit, it would be well-advised to run a systematic check on this data for all of SKYMAP. This quality assurance effort would not be extensive, and should be run before any future versions of SKYMAP are produced.

SKYMAP 3.0 RECIPIENTS

From a computer checkout run on magnitudes in SKYMAP 3.0 before converting the binary version to character code, 2 stars (SKYMAP #21240006, 21240018) were found with *UBV* values discordant with their photovisual and photographic magnitudes. (These errors were also found by S. F. McLaughlin and are discussed in the attached SKYMAP Error Report No. 13.) A check of the HD Catalogue (HD203546, HD203554) revealed the ptg and ptv mags in SKYMAP to be correct as taken from the HD. The stars were quickly located in the catalogues of Nicolet (1978, *Astron. Astrophys. Suppl.* 34, 1) and Mermilliod and Nicolet (1977, *Astron. Astrophys. Suppl.* 29, 259) which contain erroneous values of V of 0.12 and 0.23, respectively; the Nicolet catalogue (from which the SKYMAP values were taken) also contains incorrect values of U-B. [The reference publication (Drilling, J. S. 1971, *Astron. J.* 76, 1072) reports values of 10.12, +0.24, +0.10 for V, B-V, U-B for HD203546 (CD-41° 14498) and 10.23, +0.29, +0.18 for HD203554 (CD-40° 14329).

To avoid these errors in the character version, the correct values were inserted for the above stars during conversion. Both values for (V, B-V, U-B)$_{obs}$ and (V, B, U)$_{best}$ were changed accordingly (the photometry yields V_{best} = 10.12, 10.23; B_{best} = 10.36, 10.52; U_{best} = 10.46, 10.70, respectively). No other data have been recomputed for the stars.

Note that these errors still exist in the binary version.

Wayne H. Warren Jr.
Astronomical Data Center
11 July 1980

COMPUTER SCIENCES CORPORATION
SYSTEM SCIENCES DIVISION (301) 589-1545
8728 COLESVILLE ROAD · SILVER SPRING, MARYLAND 20910

July 10, 1980

National Aeronautics and Space Administration
Goddard Space Flight Center
Greenbelt, Maryland 20771

Attention: Mr. T. Stengle
Code 581.2
Bldg. 23, Room S-411

Subject: Contract NAS 5-24300
Task Assignment 40011
Attitude System and Sensor Study
SKYMAP Maintenance

Dear Mr. Stengle:

Please find enclosed a copy of SKYMAP Error Report Number 13. This error was discovered while compiling statistics about the Master Catalog required to make recommendations for future SKYMAP work.

Yours truly,

Steven F. McLaughlin

Steven F. McLaughlin
Task Leader
Attitude Analysis Department

SFM/mcp
Enclosure
cc:

GSFC	CSC
R. Werking	D. Sood
W. Warren	R. Byrne
	C. Sturch
	G. Neal

July 10, 1980

SKYMAP Error Report Number 13

In order to fulfill a request from the ATR for recommendations concerning future SKYMAP enhancements, a small statistical survey was run on the Master Catalog. As a byproduct of this study, an error was discovered in the best available UBV magnitudes for two stars.

For SKYMAP stars 21240006 and 21240018 the best available V magnitudes are given respectively as $0^{m}.12$ and $0^{m}.23$, making them among the brightest stars in the sky. Investigation of available data revealed that the best V magnitude is identical to the photoelectrically observed V magnitude, but that the photovisual magnitudes are both $10^{m}.1$. A check of the SAO catalog revealed no stars with zero-level magnitudes near the noted SKYMAP stars. A check of SKYMAP Version 2.3 revealed that stars 21240006 and 21240018 were previously listed as magnitude 10 stars. A check of the Nicolet Catalog of Stellar Magnitudes revealed photoelectric magnitudes identical to those now in SKYMAP. It is extremely probable that when the Nicolet Catalog was merged with SKYMAP, the errors in the Nicolet source catalog were propagated into SKYMAP.

It is not felt that the existence of two extremely bright false stars will impact the use of Run Catalogs originating from SKYMAP 3.0 for any current missions. In the next version of SKYMAP, the errors can be corrected by adding 10.0 to Master Catalog data words 34 and 39 for stars 21240006 and 21240018.

COMPUTER SCIENCES CORPORATION
SYSTEM SCIENCES DIVISION (301) 589-1545
8728 COLESVILLE ROAD · SILVER SPRING, MARYLAND 20910

October 27, 1980

National Aeronautics and Space Administration
Goddard Space Flight Center
Greenbelt, Maryland 20771

Attention: Mr. T. Stengle
Code 581.2
Bldg. 23, Room S-411

Subject: Contract NAS 5-24300
Task Assignment 41503
Attitude System and Sensor Study
Subtask - SKYMAP Quality Assurance

Dear Mr. Stengle:

Please find enclosed the SKYMAP Error Report Number 14. It addresses the anomaly found in SKYMAP by SMM personnel. The possible reasons for this anomaly and some suggestions to resolve it are included in the report.

Yours truly,

G Nair for S McLaughlin

Steven F. McLaughlin
Attitude Analysis Department

G Nair

Dr. G. Nair
Task Leader
Attitude Analysis Department

SFM/GN:cp
Enclosure
copies: GSFC
R. Werking

CSC
M. Plett
D. Sood
C. Sturch
R. McCutcheon
D. Levitt

SKYMAP Error Report Number 14

In response to a report from SMM analysts, SKYMAP personnel investigated the apparent anomalous occurrence of two double stars at nearly identical coordinates. The two stars investigated were SKYMAP numbers 12020012 and 12020014.

The true physical picture that was found is of a four-component multiple star system. Components A and B are bright and unquestionably identifiable stars, having respective visual magnitudes of 5.13 and 6.64. Though no magnitude data is available in the Multiple Star Catalog concerning the C and D components, positional data implies that the C and D components are synonymous with SKYMAP stars 12020041 and 12010079, having magnitudes of 8.38 and 8.83. The AB separation distance is about 300 arc-seconds. All other distance separations between component members are 200 arc-seconds or greater. Proper motions taken together with distance separations suggest the possibility that the components of this system might not be gravitationally bound.

The root of the problems concerning this star system is in the fundamental manner in which SKYMAP handles multiple stars. SKYMAP is compiled from several source catalogs, and cross-matching the required identification members, positions, magnitudes, and separation distances is often difficult and sometimes impossible. Inadequate data is sometimes the problem; however, even when data is sufficient, SKYMAP simply does not have the internal mechanisms to store and process the required information. Simple binaries are in principle not a problem; yet it is not unique to find a case where component B is listed as a separate SKYMAP entry, magnitude difference is not given, separation distance is not given, or the occurrence of some combination of the above.

No distinction is made between gravitationally bound and optical multiple star systems. For stars with determined orbits even though a magnitude difference is supplied, no separation distances are found in SKYMAP. When three or more component systems are considered, these problems are compounded.

In the case of SKYMAP stars 12020012 and 12020014, other errors in addition to the inadequate cross-matching of data have caused problems. A previously discovered error concerned multiple stars with separation distances greater than 100 arc-seconds. The Multiple Star Catalog directly stores the part of the distance less than 100, and stores the multiples of hundreds indirectly. Past efforts had supposedly merged the multiples of hundreds into SKYMAP. However, for both of the stars in question, apparently the data merge was not done. Neither star has exactly the correct UBV magnitudes as should have been drawn from the Nicolet Catalog. The error for the fainter star can be explained as due to inadequate cross-referencing; however, the problem with the star 12020014 cannot be easily explained.

Providing that no changes are made in the techniques that SKYMAP uses to handle multiple stars, our recommendation is that the four stars be treated as an optical multiple in the next version of SKYMAP. This implies that stars 12020012, 12020014, 12020041, and 12010079 be maintained as separate SKYMAP stars, but that all data concerning multiplicity of these 4 individual entries be deleted. A significant amount of enhancing data can be added, as listed below. The nearest neighbors parameters in this isolated region will need to be recalculated. Because no general explanation can be offered for other errors, we can only recommend that spot checks be performed as part of the current quality assurance efforts. SKYMAP techniques for storing multiple star data have been discussed elsewhere.

SKYMAP Number	Data
	Cross-Reference Catalog
12020012	HD = 104556, SAO = 44005
	• SAO Catalog
12020012	RA(1950) = $11^h59^m57^s.034$
	DEC(1950) = $+43^\circ22'10''.18$
	$\mu_{RA} = -.0329$
	$\mu_{DEC} = -.515$
	• Nicolet Catalog
12020012	$V = 6^m.64$, $(B-V) = 0^m.86$, $(U-B) = 0^m.48$
12020014	$V = 5^m.13$, $(B-V) = 0^m.26$
	• Jaschek Spectral Catalog
12020012	G8 V WK1
12020014	A7 M

COMPUTER SCIENCES CORPORATION
SYSTEM SCIENCES DIVISION (301) 589-1545
8728 COLESVILLE ROAD · SILVER SPRING, MARYLAND 20910

December 3, 1980

National Aeronautics and Space Administration
Goddard Space Flight Center
Greenbelt, Maryland 20771

Attention: Mr. T. Stengle
Code 581.2
Bldg. 23, Room S-411

Subject: Contract NAS 5-24300
Task Assignment 41503
Attitude System and Sensor Study
Subtask - SKYMAP Quality Assurance

Dear Mr. Stengle:

Please find enclosed SKYMAP Error Report Number 15. This report addresses the inadequacies in Section 4 of the SKYMAP System User's Guide concerning program SWITCH, as per our recent telephone conversation.

Yours truly,

Steven F. McLaughlin

Steven F. McLaughlin
Attitude Analysis Department

SFM/rld

Enclosures

copies

GSFC	CSC
R. Werking	D. Sood
	R. Byrne
	G. Nair
	G. Neal
	C. Sturch
	R. McCutcheon

SKYMAP ERROR REPORT NUMBER 15

Section 4 of the SKYMAP System User's Guide documents the use of program SWITCH. This program has the capability to be operated under TSO, and has a specific file allocated for TSO terminal status messages. The User's Guide suggests that the TSO option is "not fully implemented", and only briefly mentions this program capability. This approach to the SWITCH TSO option is incorrect and inadequate. SWITCH can be operated interactively without making any changes to the program. The purpose of this error report is to provide an abbreviated user's guide for the SWITCH TSO option. It is intended to be used in conjunction with the User's Guide, and will assume familiarity of the reader with Section 4 of the Guide and with TSO operation.

Before the program can be run interactively, a load module data set must be created. A job similar to that shown in Figure 1 can be utilized to create a temporary data set. Typical turn around time for this job on the IBM 360/95 is under 20 minutes. A load module 14 tracks in size is created.

If the output Run Catalog is to be a direct access, rather than sequential, data set, then it must also be created and initialized before running SWITCH. A job similar to that seen in Figure 2 will create a temporary direct access Run Catalog. Typical turn around time on the IBM 360/95 is under 30 minutes; however, this is somewhat dependent on the number of tracks of space required in the Run Catalog (see line 130 of Figure 2).

The NAMELIST/SWITIN/ input can be contained in a data set, or can be input directly to the terminal by not allocating file 5 and allowing file 5 to be defaulted to the terminal. For the examples provided (Figures 3A and 3B), data sets were created utilizing the QED command. The NAMELIST input

```
//ZBSFM313 JOB (3HB003311K,T,600606,H00001),FFF THISDATE SWITTSO          00000010
//*FORMAT PR,CONAME=,DEST=CSC                                            00000020
//FORT     EXEC FORTRANH,REGION=300K                                     00000030
//SYSIN    DD  DSN=ATTIT.SKYMAP.STRCAT.FORT(SWITCH),DISP=SHR             00000040
//LINK     EXEC LINK,REGION=350K                                         00000050
//SYSLMOD  DD  DSN=ZBSFM.SWITCH.LOAD,DISP=(NEW,CATLG),                  00000060
//             UNIT=DISK,SPACE=(3072,(&NBLK,40,1))                       00000070
//                                                                       00000080
```

Figure 1

```
//ZBSFMINI JOB (GH8003311K,T,G00606,H00001),FFF THISDATE INITIAL        00000010
//*FORMAT PR,DDNAME=,DEST=CSC                                          00000020
//INITDA  PROC USEDS=DS.USEDISP='(NEW,CATLG)',USEUNIT=2314,            00000030
//             USERECL=RECL,USEBLK=BLK,USETRK=TRK                      00000040
//INIT    EXEC  PGM=INITDA,REGION=80K,COND=(4,LT)                      00000050
//STEPLIB DD  DSN=ATTIT.ATTMAIN.LOAD,DISP=SHR                          00000060
//SYSUT1  DD  DSN=&USEDS,DISP=&USEDISP,UNIT=&USEUNIT,                  00000070
//            SPACE=(TRK,&USETRK),                                     00000080
//            DCB=(DSORG=DA,RECFM=FB,LRECL=&USERECL,BLKSIZE=&USEBLK)   00000090
//       PEND                                                          00000100
//*                                                                    00000110
//DA1     EXEC INITDA,USEDS='ZBSFM.SWITCH.DIRECTA',USERECL=1640,       00000120
//        USEBLK=1640,USETRK=100                                       00000130
//                                                                     00000140
```

Figure 2

utilized for examples A and B discussed is shown respectively in Figures 3A and 3B.

An execution of SWITCH corresponding to the NAMELIST shown in Figure 3A would be preceded by the command strings:

```
ATTR WWW RECFM(F B) LRECL(100) BLKSIZE(300)
ATTR QQQ RECFM(F B) LRECL(1640) BLKSIZE(6560)
ALLOC DA(SWITCH.OUT) F(FT41F001) SPACE(50) T USING(QQQ)
ALLOC DA('ATTIT.SKYMAP.RUNCAT') F(FT40F001)
ALLOC DA(SWITCH.NAME1) F(FT05F001)
ALLOC DA(*) F(FT26F001)
ALLOC F(FT06F001) SYSOUT
ALLOC DA(SWITCH.SCRATCH) F(FT25F001) SPACE(5) T USING(WWW)
CALL SWITCH.LOAD
```

This example transfers a few selected zones from a direct access Run Catalog to a sequential output Run Catalog. The TSO output consists of a few elementary trace messages and a listing similar to Figure 4-1 from the Guide. File 6 output is exactly as discussed in the Guide. The zones sorted into the output Run Catalog are depicted by the map in Figure 4. A typical real-time duration for this execution of SWITCH would be about 10 minutes.

An execution of SWITCH corresponding to the NAMELIST shown in Figure 3B would be preceded by the command strings:

```
ATTR WWW RECFM (F B) LRECL(100) BLKSIZE(300)
ALLOC DA(SWITCH.DIRECTA) F(FT41F001)
ALLO  DA('ATTIT.SKYMAP.RUNCAT') F(FT40F001)
ALLOC DA(SWITCH.NAME2) F(FT05F001)
ALLOC DA(*) F(FT16F001)
ALLOC F(FT06F001) SYSOUT
ALLOC DA(SWITCH.SCRATCH) F(FT25F001) SPACE(5) T USING(WWW)
CALL SWITCH.LOAD
```

This example transfers all zones falling in the path swept out by the field of view of two star sensors from a direct access Run Catalog to a smaller direct access Run Catalog. The zones sorted into the output Run Catalog are depicted by the map in Figure 5.

```
&SWITIN
  IMODE=3,  IFSLCT=1,  IFTSO=1,  IZONES(5)=1,IZONES(6)=1,IZONES(40)=1,
  ISLFLG=6=1,
&END
```

Figure 3A

```
&SWITIN
  IMODE=4,  IFSLCT=1,  IFTSO=1,  NCAM=2,
  ISLFLG(1)=2   FOV(1)=1.0,  SPINAL(1)=0.0,  SPINDL(1)=0.0,
  ISLFLG(2)=2,  FOV(2)=2.0,  SPINAL(1)=90.0, SPINDL(2)=30.0,
  COELEV(1)=45.0,  COELEV(2)=25.0,
&END
```

Figure 3B

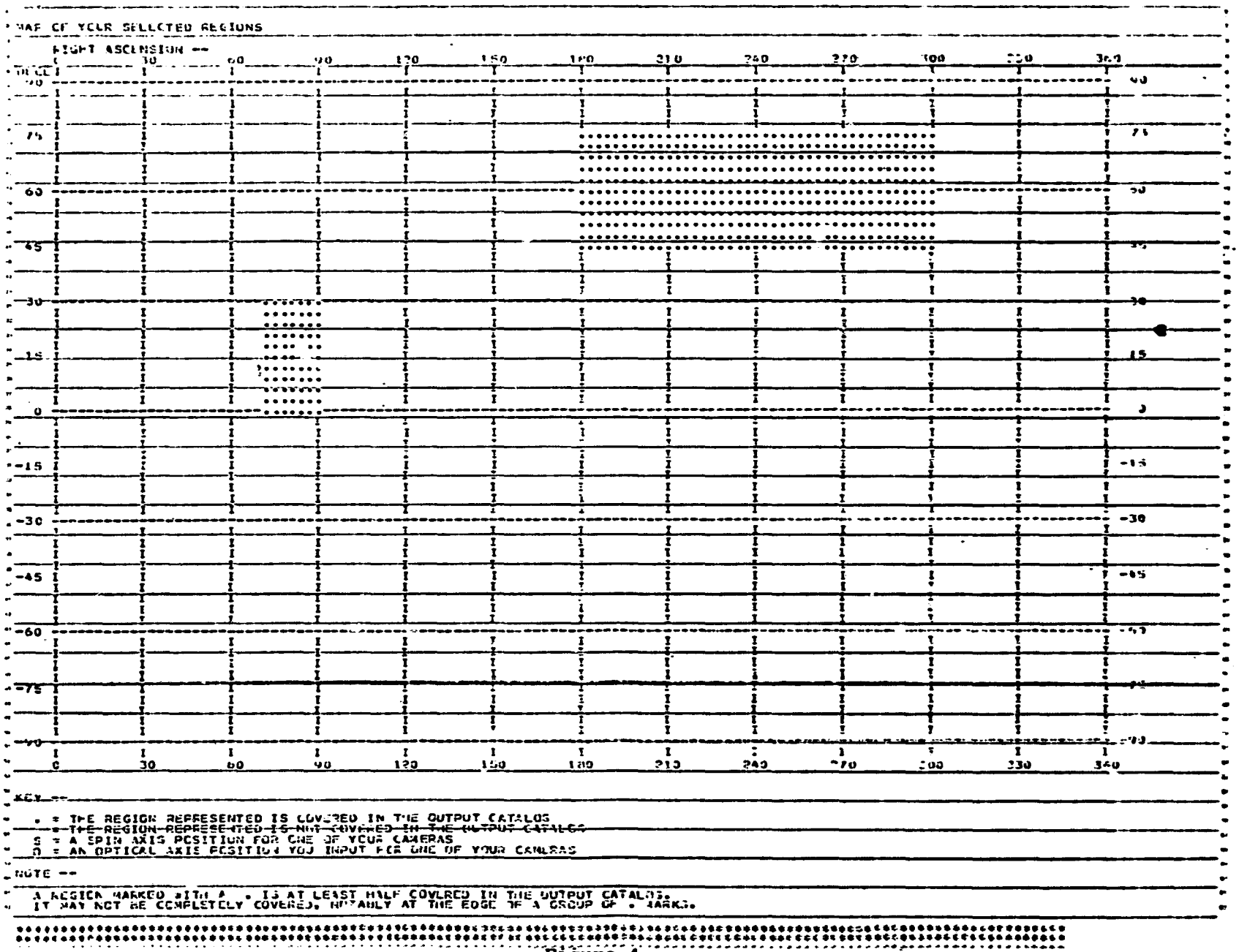

Figure 4

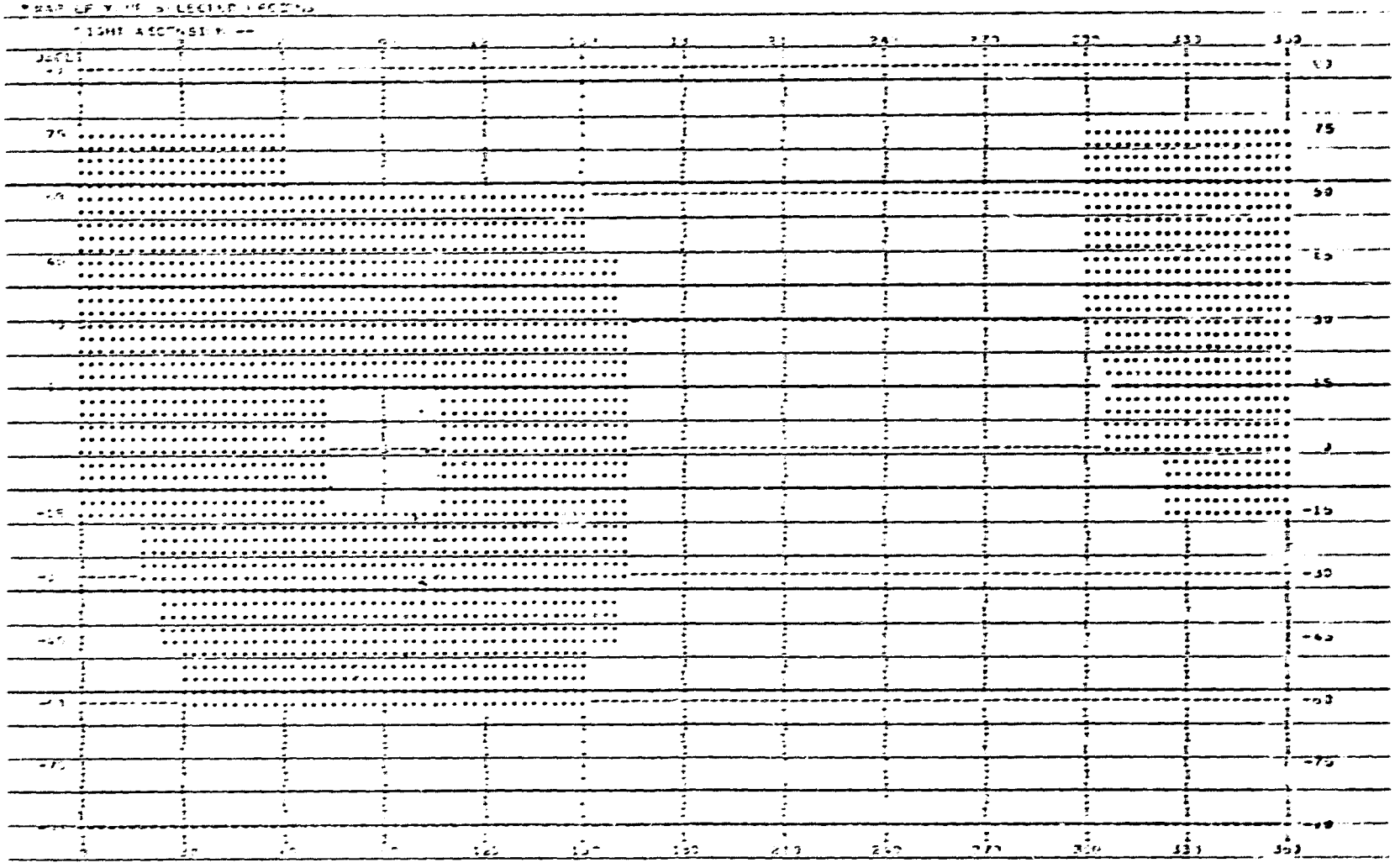

Figure 5

The TSO option of SWITCH has the general disadvantage in that it cannot use magnetic tape I/O. However, it is much faster than batch executions, and is a useful data management tool. This option could also become a valuable analytic tool if at some future time it became plausible to put a Run Catalog on permanent disk storage containing all SKYMAP stars.

COMPUTER SCIENCES CORPORATION
SYSTEM SCIENCES DIVISION (301) 589 1545
8728 COLESVILLE ROAD • SILVER SPRING MARYLAND 20910

February 9, 1981

National Aeronautics and Space Administration
Goddard Space Flight Center
Greenbelt, Maryland 20771

Attention: Mr. T. Stengle
Code 581.2
Bldg. 23, Room S-411

Subject: Contract NAS 5-24300
Task Assignment 41503
Attitude System and Sensor Study
Subtask - SKYMAP Quality Assurance
(B61-I-41503-20)

Dear Mr. Stengle:

Please find enclosed SKYMAP Error Report Number 16. This report addresses the magnitude error in SKYMAP star 12450105, which was reported to us by you. This is an excellent example of the kind of feedback required to maintain the quality of the SKYMAP data base.

Yours truly,

Steven F. McLaughlin

Steven F. McLaughlin
Attitude Analysis Department

SFM.mcm
Enclosure
copies:

GSFC
R. Werking
✓W. Warren

CSC
D. Scod
W. Myers
G. Nair
C. Sturch
R. McCutcheon

17 FEB 1981

SKYMAP ERROR REPORT NUMBER 16

It was recently reported by the ATR that SKYMAP star 12450105 had an erroneous visual magnitude. SKYMAP lists this star as being a $3^{m}.76$ star; however, satellite attitude observations indicated that its magnitude was approximately 8.0.

Investigation revealed that the correct V, (B-V), and (U-B) values for this star are 7.53, 0.98, and 0.76, respectively. Available source catalogs indicate that all information for this star is correct in SKYMAP, with the exception of the observed magnitudes. The magnitudes in the current Version 3.0 of SKYMAP are the same as those in Version 2.2, implying that this error was propagated from the earlier versions. When the Nicolet Catalog of stellar magnitudes was merged with SKYMAP, this error should have been corrected. No explanation can be offered for this omission.

It is our recommendation that when the next version of SKYMAP is compiled, the correct information should be substituted for the observed V, (B-V), and (U-B) values for SKYMAP star 12450105.

COMPUTER SCIENCES CORPORATION
SYSTEM SCIENCES DIVISION (301) 589-1545
8728 COLESVILLE ROAD · SILVER SPRING, MARYLAND 20910

February 12, 1981

National Aeronautics and Space Administration
Goddard Space Flight Center
Greenbelt, Maryland 20771

Attention: Mr. T. Stengle
Code 581.2
Bldg. 23, Room S-411

Subject: Contract NAS 5-24300
Task Assignment 41503
Attitude System and Sensor Study
Subtask - SKYMAP - Quality Assurance

Dear Mr. Stengle:

Please find enclosed SKYMAP Error Report Number 17. This report discusses an error in Master Catalog word number 95, which stores the deleted SKYMAP number when two duplicate entries have been merged. It is my feeling that this report adds emphasis to the current policy of issuing detailed documentation of all Master Catalog changes.

Yours truly,

Steven F. McLaughlin

Steven F. McLaughlin
Attitude Analysis Department

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copies:

GSFC	CSC
R. Werking	D. Sood
W. Warren	W. Myers
	G. Nair
	C. Sturch
	R. McCutcheon

17 FEB 1981
NWW

SKYMAP Error Report Number 17

Dr. Wayne H. Warren, Jr. of the National Space Science Data Center at GSFC is responsible for the distribution of SKYMAP to the astronomical community at large. The Master Catalog is supplied to him by CSC via the ATR in binary form only; however, Dr. Warren distributes the catalog in both binary and EBCDIC formats.

In the process of transforming from binary to EBCDIC, Dr. Warren found an entry whose Master Catalog word 95 exceeded the maximum acceptable value for a SKYMAP number. Word 95 is the SKYMAP number of the deleted star when two entries are merged. Investigation of past SKYMAP Error Reports by Dr. Warren revealed that for SKYMAP star 3540143 word 95 was meaningless information. In the next version of the Master Catalog, this value should be set to the default value of zero because this star is not a merged entry.

After CSC was informed of the above problem, a check was made to see if any other SKYMAP stars have spurious word 95 entries. The results were somewhat surprising. All word 95 entries set when the duplicate entries were merged during the creation of SKYMAP Master Catalog Version 3.0 were correct; however, an additional 1600 stars had non-zero values for word 95. A check of Version 2.2 shows that these non-zero entries existed in that version, and were propagated to Version 3.0. About 2400 non-zero word 95 entries existed in Version 2.2, and some were overwritten in the creation of Version 3.0.

It is surprising that any non-zero word 95 entries exist in Version 2.2, because all past SKYMAP documentation shows word 95 to be a spare word. All values of word 95 in

Version 2.2 should have been the default value of integer zero. It is apparent that in some past version, information was stored in word 95 by mistake or information was stored and not documented.

The Version 2.2 information in word 95 is not nonsense data. Most entries appear to be SKYMAP numbers, but there is no obvious relation between the SKYMAP number in word 95 and the SKYMAP entry with which it is associated.

It is our recommendation that the word 95 values propagated from Version 2.2 be deleted in the next version of the Master Catalog. This can be done by automatically setting word 95 to zero for all stars satisfying the following criteria:

1. Word 95 is not equal to zero
2. Word 90 is equal to 2
3. Word 2 is not equal to any of the SKYMAP numbers below:

1250042	13010134
1360106	13370080
2210073	14020127
3470097	15040138
3490019	15150065
5100152	15300104
5420149	15510031
6190084	15580098
7030253	16000157
7570154	16010049
8380195	16130066
10390054	18130158
11020173	19440140
11420119	19500069
12050120	22390084
12330032	22450014

The above criteria are established by noting that all Version 2.2 stars with non-zero word 95 entries originated in the HD catalog (word 90 equals 2). With the exceptions in the above list of 32 stars, no Version 3.0 stars should

have a source of position as the HD Catalog and be a merged entry. (See SKYMAP Error Report Number 8 and "Removal of SKYMAP Duplicates: Program NODUPS User's Guide" CSC/TM-80/6071)

SKYMAP 3.0 RECIPIENTS

During computer checking of the EBCDIC version of SKYMAP 3.0 by Dr. W. L. Stein of the NSWC, Dahlgren, Virginia, overflow problems were detected in some fields containing positional systematic errors, precession and Σ (precession and proper motion) in α and δ, and the G. I. unit vectors. An error was also discovered in the 1900 right ascension of SKYMAP star # 10490067 (HD 93584), plus an overflow was found in the SKYMAP merged number field for SKYMAP star # 3540143. Using a program written at the Astronomical Data Center, the entire catalogue was checked for data values which would overflow the formats provided for the above data. The analysis showed that revised format specifications were needed for certain data fields and that it was necessary to correct some additional erroneous data. The appropriate format modifications were made and the conversion program modified to correct most of the errors discovered, after which the entire binary catalogue was reconverted to character format.

The newly discovered problems with associated remarks are contained in the following table:

SKYMAP #	Dat(um/a)	Remarks
3540143	SKYMAP MERGED #	The number 1077952576 was found in the field (word 95 in binary version) when the SKYMAP number can be up to 8 digits maximum. The star was found not to be a merged entry, so this datum has been set to 0. Additional errors in this number have been discovered since by S. F. McLaughlin (see SKYMAP Error Report No. 17).
10490067	α_{1900}	Replace 1161.025 by 160.775
13410136	Θ,Π,Z	Replace -1098.437, -1273.365, -257.219 temporarily by -999.999. These values should by recomputed for the next version because they resulted from an incorrect radial velocity from the Wilson Radial Velocity Catalogue tape (+149 instead of +49 km s^{-1}) A check of the GCRV tape showed similar cases (RV 100 km s^{-1} too large) for the following stars: HD 118957, 118942, 119035, 119054, 119055, 119081, 119124, 118991, 119213, 119126, 118978, 119228, 119090, 119149 and 119159. There may be more of these cases, but the stars above follow each other in the catalogue, so the punching error for the first star in the group was undoubtedly propagated down the column for 14 additional stars.
23010026	Positions	The standard epoch position is incorrect, and many associated data should be checked. This star lies very near the south equatorial pole and its δ was unknowingly converted to positive. The error has not been corrected on the formatted tape because the correct data cannot be easily obtained.

Note that the above errors have been corrected during conversion of the binary tape to character format; therefore, they are still present in the binary version.

We wish to thank Dr. Stein for bringing these errors to our attention. We would appreciate communication of any additional errors found in the SKYMAP Catalogue to the Astronomical Data Center.

Wayne H. Warren Jr.
Astronomical Data Center
1 March 1981

COMPUTER SCIENCES CORPORATION
SYSTEM SCIENCES DIVISION (301) 589 1545
8728 COLESVILLE ROAD · SILVER SPRING MARYLAND 20910

May 19, 1981

National Aeronautics and Space Administration
Goddard Space Flight Center
Greenbelt, Maryland 20771

Attention: Mr. T. Stengle
Code 581.2
Bldg. 23, Room S-411

Subject: Contract NAS 5-24300
Task Assignment 41503
SKYMAP Error Report Number 18
Delivery: B61-I-41503-31

Dear Mr. Stengle:

Attached is one copy of SKYMAP Error Report Number 18. This report was generated as a by-product of the analysis done in preparing the document, Investigation of Smithsonian Astrophysical Observatory (SAO) Magnitudes in SKYMAP, which is soon to be delivered as CSC/TM-81/6110. The attached error report discusses 1) two stars which have been found to be missing from the SKYMAP Master Catalog, 2) some new photoelectric photometry data, and 3) some errors found in a few bright stars in SKYMAP.

Yours truly,

Steven F. McLaughlin

Steven F. McLaughlin
Attitude Analysis Department

SFM/rld
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copies:

GSFC	CSC
R. Werking	D. Sood
G. Repass	W. Myers
W. Warren	C. Sturch

23 MAY 1981 601
W. Warren, J...

SKYMAP ERROR REPORT NUMBER 18

In Reference 1, a spot check comparison was presented of SKYMAP Version 3.0 versus stars found in the article "VRI Photometry of Selected SAO Stars," from Publications of the Astronomical Society of the Pacific (PASP), December 1980. This error report was generated as a by-product of the above comparison. Three types of information are presented below for correction.

1. Two Missing Stars

Two stars have been located which belong in SKYMAP, but which are not there. These stars are relatively faint; however, they are well within the defined limiting magnitude of 9.0 in B or V for SKYMAP. It is recommended that the next version of the SKYMAP Master Catalog should contain these two stars.

The required information for adding the two stars is supplied in Table 1. The SKYMAP number selected for each star is the next highest unused entry for the year 2000 coordinate zone into which the star falls. The remaining Master Catalog data words should be generated by running program UPDATE, which is usually done for any new Master Catalog.

2. New Photoelectric Photometry Data

The second correction concerns photoelectric magnitudes gained from the PASP article. As discussed in Reference 1, a significant number of SKYMAP stars have no photoelectric data. Because photoelectric data is the highest quality magnitude data available, it is desirable to utilize any valid photoelectric observations. For the 169 stars listed in Table 2, a new or improved photoelectric V magnitude has been obtained. It is recommended that the V magnitude shown be substituted for word 39 in the next version of the SKYMAP Master Catalog.

Table 1. Descriptive Data for Two Missing Stars (1 of 2)

Data	MC Word	Star A	Star B
HD Number	1	6	921
SKYMAP Number	2	2390144	130148
SAO Number	3	75499	109075
DM Number	4	12500432	10500018
HR Number	5	0	0
ADS Number	6	2010	0
VSC Number	7	0	0
Star Name	8-10	blank	blank
Variable Name	11-12	blank	blank
Position Error	15	0.32	0.22
R.A., 1950	21	39.11003	2.77598
Dec., 1950	22	25.65713	6.30240
R.A., 1900	23	0.0	0.0
Dec., 1900	24	0.0	0.0
μ_{RA}	25	3.76×10^{-7}	6.21×10^{-6}
μ_{DEC}	26	3.61×10^{-6}	-4.72×10^{-6}
Photovisual Mag.	36	8.7	8.5
Photographic Mag.	37	8.7	-9.999
ptv-ptg flag	38	1	4
Observed V	39	8.69	8.66
Observed B-V	40	-9.999	-9.999
Ovserved U-B	41	-9.999	-9.999
HD Spectral Type	46	3000*	3200*
Observed Spectral Type	47	0	0
Observed Luminosity	48	0	0

Table 1. Descriptive Data for Two Missing Stars (2 of 2)

Date	MC Word	Star A	Star B
Observed Peculiarity	49	0	0
Parallax	51	-999.999	-999.999
Parallax Error	52	-999.999	-999.999
Absolute Visual Mag.	56	-999.999	-999.999
Variability Code	70	0	0
Questionability	71	0	0
Variable Difference	72	-999.999	-999.999
Type Variability	73	0	0
Variation Epoch	74	0.0	0.0
Variation Period	75	0.0	0.0
Multiple Separation	76	0.8	0.0
Magnitude Separation	77	0.0	-9.999
Year Observed	78	1942	1000
Position Source	90	1	1
Multiple Star Flag	92	1	0
Deleted Duplicate Entries	95	0	0

*Master Catalog Version 3.1 Style Spectral Type

Table 2 - Improved V Magnitude Data

SAO	SKYMAP	V
26295	7210155	9.630
26300	7220007	8.300
26303	7220037	8.840
26307	7220118	9.140
26317	7230070	7.870
26654	8040166	7.810
26657	8040180	8.680
41727	7220222	8.340
41757	7250172	8.010
41758	7250182	6.750
41760	7250190	8.310
41932	7410031	8 340
41938	7410139	8.000
41948	7420183	7.930
41976	7450025	8.890
41985	7450189	8.630
42007	7480082	7.660
42139	8030045	8.360
53738	130113	8.000
53746	140064	9.570
53762	150126	8.740
53784	170065	8.640
53810	190101	9.450
53989	330110	8 740
53993	340031	7.820
56082	3000066	8 360
56137	3040107	8 330
56146	3050085	8 470
56148	3050089	8.440
61552	9320093	10.030
61624	9400123	7.970
61649	9420150	6.770
73791	110005	8.560
73797	110053	9.270
73805	120021	9.560
73810	120050	9.010
73812	120057	8.400
73889	190056	7 440
73904	200103	7 380
73910	210025	9 170
73921	210076	8.070
73938	220106	7.000
73950	230101	8 900
73986	260076	9.620
74057	310052	9.530
74066	310146	9.360
74073	320037	9.890
74074	320038	9.240
74101	330117	8 360
74115	340111	8 810
74138	360064	9.010
74147	360155	9.040
74168	380156	6.910
74181	390121	8.670
74189	400088	9.010
74191	400099	9.180
74192	400102	8.650
74217	420124	7.410
75472	2370041	9 320
75512	2400139	9 170
75514	2410024	9.330
75516	2410026	9.150
75522	2410111	8 250
75525	2420020	9.340
75528	2420066	8.[illegible]0
75530	2430010	8.080
75533	2430067	8 880
75535	2430086	7.530
75536	2430094	9 160
75541	2440011	8 730
75552	2450073	9.510
75553	2450082	8.900
75556	2450116	8.660
75560	2460049	8 840
75563	2460079	8.850
75564	2460099	8 750
75566	2460121	8 980
75567	2470005	8.970
75569	2470026	8 540
75570	2470040	7 900
75571	2470043	7.180
75575	2470078	7.480
75576	2470101	7 130
75577	2470116	8.900
75599	2500050	8 480
75602	2500115	7 740
75636	2550036	8.090
75647	2550122	9 520
75722	3050054	9.090
75729	3050092	7.640
75734	3060038	8 570
75744	3070108	8.010
80858	9290191	9.660
80859	9300011	8.170
80865	9300097	9.520
80872	9310029	9 570
80951	9380194	9 010
80961	9400058	7.950
90370	22160015	9 010
90371	22160021	8 370
90372	22160035	9 730
90376	22160076	9.030
90498	22250107	8 450
90509	22260108	8.840
109074	130094	9 800
109081	140019	9.210
109091	150096	6.960
109110	230137	7 880
109119	250134	8 650
109202	260008	9.060
109206	260057	6.910
109236	300009	9.930
110675	2400080	7.640
110700	2420155	8.180
110769	2480146	8.540
110786	2510031	8.700
110801	2520028	8.060
110811	2530009	9.140
110814	2530041	8.920
110822	2540026	7.630
110831	2540112	7.800
110841	2550063	8.440
110878	2560075	7.520
110919	3020034	9.050
110982	3070017	8 350
111066	3140038	9.020
112761	5260078	7.670
112785	5270057	8 660
112810	5280149	9.240
112851	5300159	8.820
112874	5310144	6.640
112910	5340130	7.740
112915	5340156	9 320
112924	5350032	8.320
112970	5370138	7.680
112978	5370189	7.780
113054	5420051	8 360
113062	5420177	8.630
113182	5490207	7 900
113331	5590131	9.060
113332	5590143	9 310
113334	5590162	8 500
113362	6000201	6.970
113377	6010112	7 190
118495	10470082	7.530
118501	10480021	9 100
118503	10480026	8 630
118506	10480049	8.980
118508	10480077	9.000
126822	21280173	9.750
126830	21290064	8 510
130102	2460041	9 980
130103	2460070	9 670
130104	2460072	8 100
130125	2480130	8 170
130147	2510055	8 390
130148	2510057	7.480
130151	2510072	9.390
130225	2590083	8 790
13023	2590114	8.010
13023[illegible]	3000013	7 840
130281	3060034	10.000
132544	5480027	8 120
132548	5480052	9.380
132550	5480079	7 350
132560	5480188	8.590
132574	5490159	7 170
132605	5530083	8 840
132641	5550076	7.620

3. Miscellaneous Errors

In Reference 1, Table A-1 shows 20 stars that have V magnitudes brighter than $5^m.0$, and whose magnitude source is listed as the SAO Catalog. The SKYMAP number and SKYMAP V magnitude for these stars are shown in Table 3. Because it is very unusual for stars that bright not to have photoelectric magnitudes, an investigation of magnitude data was conducted for those 20 stars.

The result of the investigation was that several errors were found, but the majority of the stars in Table 3 were the rare few that appear to have been passed over by photometrists. No better data is known to be available for these stars. Those stars which require comments are described below.

- 23010163 — This is a very close binary system, whose data have been merged into a single SKYMAP entry. SKYMAP retains the wrong HD number, causing additional errors.
- 15590080 — This is the recurrent nova T CrB. Its last flare-up was in 1946, and preceeded the time when photoelectric data was easily available. It has been quiescent at about $10^m.0$ for 35 years; however, since SKYMAP retains the brightest possible magnitude a variable can attain, it appears as a magnitude 2.0 star. No better data is available. SKYMAP does not show the variable type.
- 18540173 — Photometric data is available in Nicolet. No explanation can be offered as to why this data is not already in SKYMAP.
- 9470084 — No better data is available, probably because this is a large-magnitude, semi-regular variable. SKYMAP does not show the variable type.
- 3180046 — This is a very peculiar case. It may be a duplicate to SKYMAP 3180045, or a close secondary companion to that star. SKYMAP 3180046 has a DM number out of bounds, and has the wrong SAO number attached. SKYMAP 3180045 is consistent in all respects, except that it lacks available binary star data.

- 18060160 — The DM number is incorrect in SKYMAP. This has caused a duplicate entry under SKYMAP number 18170212. The second entry has the correct HD number, star name, and photoelectric magnitudes. At one time, the duplicate star also had incorrect coordinates. These two stars can be merged using utility COMBINER if the spurious DM number is corrected.
- 12260079
- 14400004

  A curious aspect of photoelectric photometry is that it is at least as difficult to make accurate measurents for exceptionally bright stars as it is to measure exceptionally faint ones. These are two of the brightest stars in the far southern skies. There is no better data available.

The required Master Catalog data changes for the above stars are shown in Table 4. These changes should be included in SKYMAP when the next Master Catalog is created.

Table 3. SKYMAP Number and V Magnitude for Twenty Stars with Magnitude Brighter than 5.0

	SKYMAP Number	SKYMAP V	Discussed in Text
1	23010163	3.56	Yes
2	15590080	2.0	Yes
3	18540173	4.52	Yes
4	9470084	4.85	Yes
5	7330181	4.91	No
6	18540164	4.96	No
7	19170148	4.93	No
8	19460087	4.95	No
9	3180046	4.96	Yes
10	16030055	4.99	No
11	18580178	4.84	No
12	7000257	4.87	No
13	18060160	3.79	Yes
14	18580107	4.96	No
15	5330123	3.76	No
16	9320044	3.82	No
17	9450045	4.14	No
18	12260079	1.40	Yes
19	14400004	0.15	Yes
20	18560208	4.15	No

Table 4. Proposed Changes in SKYMAP Master Catalog

SKYMAP Number	MC Word	Value
23010163	1	217675
	95	217676
	39	3.62
	40	-.09
	41	-.53
	42	1600
	43	0
	44	240001
	45	7
15590080	70	263
18540173	39	4.59
	40	.78
	41	.49
9470084	70	180
3180046	Delete Star	
3180045	78	1959
	77	1.5
	76	0.2
18060160	4	4911720
	Merge with SKYMAP 18170212	

REFERENCES

1. Computer Sciences Corporation, CSC/TM-81/6110, Investigation of Smithsonian Astrophysical Observatory (SAO) Magnitudes in SKYMAP, S. McLaughlin, to be published

COMPUTER SCIENCES CORPORATION
SYSTEM SCIENCES DIVISION (301) 589-1545
8728 COLESVILLE ROAD • SILVER SPRING, MARYLAND 20910

May 27, 1981

National Aeronautics and Space Administration
Goddard Space Flight Center
Greenbelt, Maryland 20771

1 JUN 1981
Code

Attention: Mr. T. Stengle
Code 581.2
Bldg. 23, Room S-411

Subject: Contract NAS 5-24300
Task Assignment 41503
Information: SKYMAP Error Report Number 19
Delivery: B61-I-41503-32

Dear Mr. Stengle:

Please find enclosed SKYMAP Error Report Number 19. The data in this report was generated during the process of hand-referencing stars in the Jaschek Spectral Catalog. Though compiled some weeks ago, this information was not reported until now so that task personnel could bring analysis of the Jaschek Catalog to a close. Until completion of the analysis, it was possible that some information in this Error Report might change.

Yours truly,

Steven F. McLaughlin

Steven F. McLaughlin
Attitude Analysis Department

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copies:

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R. Werking	D. Sood
G. Repass	W. Myers
W. Warren	C. Sturch

SKYMAP ERROR REPORT 19

The information contained in this report was generated during the recent analysis of the Jaschek Spectral Types Catalog. As part of that analysis, computer techniques were used to automatically attach a SKYMAP number to Jaschek entries for eventual merging of the spectral data with the SKYMAP Master Catalog.

Of about 30,000 Jaschek catalog entries, about 10,000 entries could not be cross-referenced automatically by the computer. It was felt that a significant number of these 10,000 entries might be in SKYMAP, but they could not be cross-referenced by normal, automatic means. Thus, a computer program was run which listed the SKYMAP stars with unreferenced Jaschek entries that might be the same star based upon positional and magnitude (when available) data only. A check of this listing was made by hand to locate additional Jaschek entries which could be cross-referenced to SKYMAP.

The hand check process located over 600 Jaschek entries that could be added to the file of cross-referenced stars. About 4,000 stars were checked during this process. During the hand check process, a significant amount of new and corrected information was compiled for SKYMAP. Not surprisingly, it was often found that the reason certain stars could not be cross-referenced by normal means was because of insufficient or erroneous data in SKYMAP. Because of the quantity of the automatic and hand check analyses, it is not possible to give a description of the logical process followed in compiling the corrected data for each SKYMAP star. However, the accumulated data is presented in Table 1, and it is recommended that this data be merged with SKYMAP when the next Master Catalog is compiled.

The format for the data in Table 1 is one that has been used successfully in the past. Three numbers are presented for each piece of new data. These are SKYMAP number, processing code, and information in either integer, real, or exponential format. A total of 1,654 data entries are in the table. The processing code consists of the integer 888, 999, or the Master Catalog data word which is to be filled by the given information. If the code is 888, it implies that the SKYMAP number belongs to a star which has been determined to be totally spurious and which should be deleted. There are three such entries in the table. If the code is 999, it implies that the given information is a SKYMAP number. These two associated SKYMAP stars have been determined to be duplicate entries and should be merged. There are 96 such entries in the table.

Table 1 - Corrected Data for Various SKYMAP Stars (1 of 26)

SKYMAP NUMBER	PROCESSING CODE[1]	CONTENTS	SEQUENCE NUMBER
90140	4	16002668	00000010
	39	8.95	00000020
	40	.46	00000030
	41	-.48	00000040
130091	999	130082	00000050
130141	1	236346	00000060
	39	8.86	00000070
	40	.69	00000080
	41	.68	00000090
260119	1	1939	00000100
300010	1	236433	00000110
310089	1	2885	00000120
	76	27.8	00000130
	77	.17	00000140
	92	2884	00000150
310151	77	0.37	00000160
	92	2839	00000170
350049	999	350027	00000180
350019	1	3514	00000190
350117	4	1120111	00000200
1000011	1	5789	00000210
	92	5788	00000220
	999	1000004	00000230
1020134	1	236605	00000240
1020058	39	8.37	00000250
	40	.07	00000260
	41	.08	00000270
1040096	1	236612	00000280
	999	1040055	00000290
1060042	4	16300137	00000300
	39	8.98	00000310
	40	1.30	00000320
	41	1.21	00000330
1060131	1	236625	00000340
1070058	1	236630	00000350
1080220	1	236632	00000360
1090021	1	236633	00000370
	3	11597	00000380
	4	15900191	00000390
	21	16.51754	00000400
	22	60.36183	00000410
	25	-2.88E-06	00000420
	26	3.33E-06	00000430
	15	0.14	00000440
	36	9.0	00000450
	37	9.5	00000460
	38	1	00000470
	90	1	00000480
1100119	1	236639	00000490
1120002	4	16000179	00000500
	39	8.90	00000510
	40	.42	00000520
	77	1.00	00000530
	76	3.3	00000540
	92	1	00000550
1130133	1	236667	00000560
1150074	3	22132	00000570
	90	1	00000580
	1	7432	00000590
	21	18.13075	00000600
	22	59.02831	00000610
	25	-6.43E-07	00000620
	26	2.50E-06	00000630
	15	0.14	00000640
	36	8.3	00000650

[1] AN ENTRY OF 888 INDICATES THAT THE SKYMAP NUMBER BELONGS TO A STAR WHICH HAS BEEN DETERMINED TO BE SPURIOUS AND WHICH SHOULD BE DELETED. AN ENTRY OF 999 MEANS THE ENTRY IS A SKYMAP NUMBER, AND THE TWO ASSOCIATED SKYMAP STARS HAVE BEEN DETERMINED TO BE DUPLICATE ENTRIES. THESE ENTRIES SHOULD BE MERGED.

Table 1 - Corrected Data for Various SKYMAP Stars (2 of 26)

SKYMAP NUMBER	PROCESSING CODE	CONTENTS	SEQUENCE NUMBER
	37	8.5	00000660
	38	1	00000670
1160057	1	236678	00000680
1280123	1	236750	00000690
1290058	1	236784	00000700
1310084	1	236767	00000710
1340130	1	236791	00000720
	39	8.81	00000730
	40	1.80	00000740
1340131	1	236789	00000750
1360137	1	236800	00000760
	39	8.56	00000770
	40	.30	00000780
	41	-.55	00000790
1380062	1	236811	00000800
1380082	1	236812	00000810
1390118	1	10360	00000820
	77	.000001	00000830
	92	10361	00000840
1390129	1	236817	00000850
	39	8.71	00000860
	40	.63	00000870
	999	1390144	00000880
1410114	1	236826	00000890
1430070	1	236840	00000900
1440002	1	236843	00000910
	39	9.07	00000920
	40	.94	00000930
	999	1440013	00000940
1450005	1	236855	00000950
	999	1450014	00000960
1450047	1	236859	00000970
	999	1450046	00000980
1460038	1	232522	00000990
	39	8.67	00001000
	40	-.01	00001010
	41	-.84	00001020
	999	1460017	00001030
1460043	1	236867	00001040
	999	1460061	00001050
1460110	1	236869	00001060
	39	8.82	00001070
	40	.72	00001080
	999	1460121	00001090
1470014	1	236871	00001100
	3	11978	00001110
	90	1	00001120
	4	15900319	00001130
	21	25.89343	00001140
	22	60.12294	00001150
	25	-4.15E-07	00001160
	26	1.11E-06	00001170
	15	0.47	00001180
	36	9.6	00001190
	38	4	00001200
	39	8.84	00001210
	40	2.25	00001220
1480021	1	236877	00001230
	999	1480039	00001240
1480079	1	236879	00001250
	999	1480102	00001260
1480116	1	236882	00001270
	999	1480128	00001280
1500029	1	11154	00001290
	76	2.7	00001300
	78	1959	00001310

Table 1 - Corrected Data for Various SKYMAP Stars (3 of 26)

SKYMAP NUMBER	PROCESSING CODE	CONTENTS	SEQUENCE NUMBER
	92	11155	00001320
1830079	1	11503	00001330
	92	11502	00001340
1830131	1	236901	00001350
1840026	1	236903	00001360
1840092	1	236908	00001370
	39	8.84	00001380
	40	1.19	00001390
	999	1840086	00001400
1840089	1	236906	00001410
1880060	999	1880070	00001420
2020014	92	12446	00001430
2030134	92	12534	00001440
	77	2.74	00001450
2040066	1	236937	00001460
	999	2040065	00001470
2100130	1	13295	00001480
	92	13294	00001490
2130068	3	12176	00001500
	90	1	00001510
	4	16100391	00001520
	21	32.48782	00001530
	22	62.16959	00001540
	25	-1.17E-06	00001550
	26	1.67E-06	00001560
	15	0.38	00001570
	36	9.3	00001580
	37	10.8	00001590
	38	1	00001600
2130068	1	236954	00001610
	39	9.40	00001620
	40	.65	00001630
	41	-.23	00001640
2160122	4	16600512	00001650
2220130	1	14520	00001660
	3	23258	00001670
	90	1	00001680
	21	34.78376	00001690
	22	66.85940	00001700
	25	2.51E-06	00001710
	26	2.90E-06	00001720
	36	9.1	00001730
	37	9.2	00001740
	38	1	00001750
	15	0.14	00001760
2240048	1	236960	00001770
	39	9.76	00001780
	40	.45	00001790
	41	-.51	00001800
	999	2240068	00001810
2240087	999	2240089	00001820
2240100	999	2240107	00001830
2240121	1	236961	00001840
	999	2240114	00001850
2260055	4	15900485	00001860
2280157	999	2280138	00001870
2310102	999	2310088	00001880
2320010	1	14548	00001890
	3	23406	00001900
	90	1	00001910
	21	37.12330	00001920
	22	56.44566	00001930
	25	-1.38E-06	00001940
	26	1.94E-06	00001950
	15	0.14	00001960
	36	9.0	00001970

Table 1 - Corrected Data for Various SKYMAP Stars (4 of 26)

SKYMAP NUMBER	PROCESSING CODE	CONTENTS	SEQUENCE NUMBER
	37	0.0	00001980
	38	1	00001990
	39	0.27	00002000
	40	.28	00002010
	41	-.68	00002020
2320068	1	236968	00002030
	999	2320064	00002040
2360060	1	236971	00002050
	39	0.55	00002060
	40	.50	00002070
	41	-.40	00002080
2360063	999	2360039	00002090
2370064	999	2370093	00002100
2370117	1	236976	00002110
2410002	4	16800284	00002120
	3	12384	00002130
	90	1	00002140
	21	39.22460	00002150
	22	65.43082	00002160
	25	2.36E-05	00002170
	26	-1.58E-05	00002180
	19	0.52	00002190
	36	0.9	00002200
	38	4	00002210
2430087	1	236989	00002220
2450016	1	236995	00002230
	39	0.63	00002240
	40	.52	00002250
2470091	1	237000	00002260
2500075	1	237007	00002270
2520101	1	237015	00002280
	39	0.44	00002290
	40	.24	00002300
	41	-.43	00002310
2530007	1	237016	00002320
2530029	1	237018	00002330
2540104	1	237023	00002340
2570049	1	237034	00002350
2570086	1	237036	00002360
2580038	1	18623	00002370
	76	0.2	00002380
	77	1.20	00002390
	92	18622	00002400
2580053	1	237040	00002410
	39	0.32	00002420
	40	.30	00002430
	41	-.13	00002440
	999	2580048	00002450
2580026	1	18520	00002460
	92	18519	00002470
3000117	77	1.46	00002480
	92	18538	00002490
3020041	1	237054	00002500
3090051	4	15800597	00002510
	39	0.37	00002520
	40	.21	00002530
	41	-.23	00002540
3140060	1	237088	00002550
3160079	1	237102	00002560
3170084	1	237108	00002570
3220051	1	237126	00002580
3220074	1	20714	00002590
	3	23987	00002600
	90	1	00002610
	21	49.69914	00002620
	22	51.48292	00002630

Table 1 - Corrected Data for Various SKYMAP Stars (5 of 26)

SKYMAP NUMBER	PROCESSING CODE	CONTENTS	SEQUENCE NUMBER
	25	8.04E-06	00002640
	26	-4.72E-06	00002650
	15	0.14	00002660
	36	8.8	00002670
	37	9.3	00002680
	38	1	0000269C
3230008	1	237128	00002700
3390081	1	237162	00002710
	999	3390041	00002720
3410045	1	232820	00002730
3480127	1	237170	00002740
	3	24192	00002750
	90	1	00002760
	92	237169	00002770
	21	55.45908	00002780
	22	58.16050	00002790
	25	8.79E-07	00002800
	26	2.80E-06	00002810
	15	0.14	00002820
	36	9.0	00002830
	37	10.1	00002840
	38	1	00002850
	76	76.36	00002860
	77	0.3	00002870
	78	1950	00002880
3480136	1	232830	00002890
	39	9.29	00002900
	40	.52	00002910
3480089	1	237178	00002920
3480092	1	237176	00002930
	39	8.36	00002940
	40	1.95	00002950
3470117	1	232835	00002960
	999	3470087	00002970
3470143	1	237180	00002980
3480096	1	24072	00002990
	92	24071	00003000
3490106	1	275877	00003010
	39	9.36	00003020
	40	.52	00003030
	41	.52	00003040
3500052	4	15100786	00003050
	39	9.60	00003060
	40	.50	00003070
3510046	1	237185	00003080
	999	3510023	00003090
3520059	1	237188	00003100
	999	3520041	00003110
3540034	77	1.35	00003120
	92	24554	00003130
3540038	1	232854	00003140
	999	3540008	00003150
3540042	999	3540041	00003160
3550011	1	237193	00003170
3550035	1	237194	00003180
3560124	1	237198	00003190
3570040	1	232862	00003200
	4	15000864	00003210
	3	24317	00003220
	90	1	00003230
	21	58.39949	00003240
	22	50.71224	00003250
	25	1.50E-05	00003260
	26	-1.94E-05	00003270
	36	8.8	00003280
	37	10.5	00003290

Table 1 - Corrected Data for Various SKYMAP Stars (6 of 26)

SKYMAP NUMBER	PROCESSING CODE	CONTENTS	SEQUENCE NUMBER
	38	1	00003300
	39	9.46	00003310
	40	.87	00003320
3870060	1	232861	00003330
	39	9.72	00003340
	40	.28	00003350
3880024	4	15500837	00003360
	39	9.58	00003370
	40	.70	00003380
	41	-.27	00003390
3880057	1	237201	00003400
3890074	1	232864	00003410
	39	9.45	00003420
	40	.17	00003430
4020073	4	15200744	00003440
	39	9.21	00003450
	40	.86	00003460
4080028	1	283384	00003470
4120007	1	283509	00003480
4120091	1	283486	00003490
4120148	1	281812	00003500
4130098	1	283504	00003510
4160141	1	283543	00003520
4200031	1	283561	00003530
4200040	1	276247	0000354C
	39	9.90	00003550
4200104	1	284316	00003560
4210159	1	283572	00003570
4210160	1	284382	00003580
4220040	1	282041	00003590
4220061	1	284366	00003600
4230023	1	283563	00003610
4230021	1	283578	00003620
4230016	1	283604	00003630
4240095	1	282032	00003640
4240123	1	283661	00003650
4250100	1	282168	00003660
4260090	1	282155	00003670
4270118	1	282164	00003680
4280092	1	282132	00003690
4280133	1	284490	00003700
4290089	1	283697	00003710
4300028	1	282259	00003720
4300130	1	282244	00003730
4310027	1	282274	00003740
4310063	1	282230	00003750
	999	4310061	00003760
4310083	1	284405	00003770
4320036	1	282226	00003780
	999	4320014	00003790
4330102	1	282256	00003800
4330087	1	284483	00003810
4340099	1	283691	00003820
4350005	1	282331	00003830
4350021	1	282339	00003840
4380072	1	29666	00003850
	39	9.23	00003860
	40	.66	00003870
	41	.09	00003880
4380132	1	283758	00003890
4380143	4	14400996	00003900
	3	39657	00003910
	90	1	00003920
	36	8.7	00003930
	37	9.2	00003940
	38	1	00003950

Table 1 - Corrected Data for Various SKYMAP Stars (7 of 26)

SKYMAP NUMBER	PROCESSING CODE	CONTENTS	SEQUENCE NUMBER
	15	0.43	00003960
	21	68.60882	00003970
	22	44.38787	00003980
	25	8.64E-06	00003990
	26	-2.36E-05	00004000
4380002	1	284882	00004010
4400063	1	283775	00004020
4440036	1	284645	00004030
4440063	1	283812	00004040
4470041	1	284652	00004050
4490032	1	283882	00004060
4500119	1	284757	00004070
4510002	1	283886	00004080
4510111	1	283929	00004090
4510142	1	283922	00004100
4520016	1	283920	00004110
4520147	1	283916	00004120
4540061	1	283939	00004130
4540079	1	283924	00004140
4560044	1	283938	00004150
4560053	1	283958	00004160
4580029	4	14801187	00004170
5010147	1	269006	00004180
	39	9.90	00004190
	40	.10	00004200
	41	-.73	00004210
5020076	3	3998[illegible]	00004220
	4	144010[illegible]0	00004230
	39	9.12	00004240
	40	.85	00004250
	21	74.68840	00004260
	22	44.19843	00004270
	25	1.43E-05	00004280
	26	-6.67E-06	00004290
	15	0.56	00004300
	36	9.0	00004310
	37	10.0	00004320
	38	1	00004330
	90	1	00004340
5030014	4	14401083	00004350
	39	9.93	00004360
	40	.13	00004370
5050077	1	240579	00004380
5050109	1	293772	00004390
5050110	1	287493	00004400
5060166	1	289963	00004410
5070054	1	287509	00004420
5070135	1	287517	00004430
5070166	1	293810	00004440
5070175	1	287544	00004450
5080037	1	287545	00004460
5080093	1	287514	00004470
5080142	1	289961	00004480
5090102	1	293852	00004490
5100083	1	287595	00004500
5110112	1	290038	00004510
5120062	1	287574	00004520
5120140	1	287611	00004530
5120152	1	287609	00004540
5130053	1	293884	00004550
5180045	1	269321	00004560
	39	10.81	00004570
	40	.09	00004580
	41	-.65	00004590
5190057	1	287736	00004600
5230012	1	290322	00004610

Table 1 - Corrected Data for Various SKYMAP Stars (8 of 26)

SKYMAP NUMBER	PROCESSING CODE	CONTENTS	SEQUENCE NUMBER
5330084	1	280608	00004620
5340120	1	36884	00004630
5340126	1	244894	00004640
	39	9.86	00004650
	40	.45	00004660
	41	-.61	00004670
5350029	92	36862	00004680
5350058	1	36880	00004690
5550060	1	280856	00004700
5560184	1	288350	00004710
5580184	1	41004	00004720
6010042	1	281026	00004730
6010088	1	288372	00004740
6010089	1	280371	00004750
6020054	1	288408	00004760
6040233	1	251117	00004770
	39	9.11	00004780
	40	.17	00004790
	41	-.75	00004800
6110161	3	40925	00004810
	92	42126	00004820
	21	91.84488	00004830
	22	48.72357	00004840
	25	5.50E-06	00004850
	26	-1.39E-05	00004860
6120204	1	253393	00004870
6140019	999	6140017	00004880
6160001	1	43206	00004890
	3	78155	00004900
	15	0.23	00004910
	36	9.0	00004920
	37	9.1	00004930
	38	1	00004940
	21	93.23748	00004950
	22	23.80088	00004960
	25	7.62E-07	00004970
	26	6.33E-07	00004980
	90	1	00004990
6160172	3	95482	00005000
	4	11201088	00005010
	21	93.49850	00005020
	22	12.08444	00005030
	25	-1.63E-06	00005040
	26	-8.33E-06	00005050
	15	0.20	00005060
	90	1	00005070
	36	8.7	00005080
	38	4	00005090
6220145	999	6210056	00005100
6230173	1	256276	00005110
	39	9.25	00005120
	40	.16	00005130
	41	-.70	00005140
6240009	999	6240003	00005150
6280158	999	6280154	00005160
6290161	4	16100887	00005170
6340068	4	11601194	00005180
6380028	1	261092	00005190
6400039	999	6400057	00005200
6400178	1	261783	00005210
6400227	999	6400219	00005220
6450051	3	114359	00005230
	1	48752	00005240
	4	10901374	00005250
	36	8.5	00005260
	38	4	00005270

Table 1 - Corrected Data for Various SKYMAP Stars (9 of 26)

SKYMAP NUMBER	PROCESSING CODE	CONTENTS	SEQUENCE NUMBER
	80	1	00005280
	21	100.62051	00005290
	22	9.74077	00005300
	25	8.21E-07	00005310
	26	-2.90E-06	00005320
	15	0.80	00005330
6520091	3	25998	00005340
	1	239289	00005350
	4	15001389	00005360
	39	10.04	00005370
	40	.20	00005380
	41	.12	00005390
	15	0.14	00005400
	21	101.92267	00005410
	22	50.72562	00005420
	25	2.37E-06	00005430
	26	1.67E-06	00005440
	36	8.9	00005450
	37	9.9	00005460
	38	1	00005470
	80	1	00005480
6590136	1	267341	00005490
7050138	4	2700378	00005500
7060238	4	9201742	00005510
	39	7.91	00005520
	40	4.03	00005530
7130207	70	1	00005540
	11	80 C	00005550
	12	MA	00005560
7140121	4	8201866	00005570
7220235	92	57102	00005580
7280220	92	59500	00005590
	3	198038	00005600
	78	1950	00005610
	76	8.9	00005620
	77	0.7	00005630
	15	0.25	00005640
	21	111.73295	00005650
	22	-31.74434	00005660
	25	7.09E-06	00005670
	26	2.78E-07	00005680
7340159	92	60179	00005690
7490031	4	6905135	00005700
7570198	4	3900969	00005710
7580036	4	3900981	00005720
7580071	4	3900945	00005730
8090172	1	68325	00005740
8120042	6	6650	00005750
	39	6.20	00005760
	40	-9.999	00005770
	41	-9.999	00005780
	76	0.0	00005790
	77	-9.999	00005800
	92	0	00005810
	36	6.0	00005820
	38	4	00005830
8120049	3	97645	00005840
	4	11801867	00005850
	21	122.33647	00005860
	22	17.79998	00005870
	25	1.86E-05	00005880
	26	-3.86E-05	00005890
	15	0.11	00005900
	76	1.0	00005910
	77	0.4	00005920
	92	68256	00005930

Table 1 - Corrected Data for Various SKYMAP Stars (10 of 26)

SKYMAP NUMBER	PROCESSING CODE	CONTENTS	SEQUENCE NUMBER
	90	1	00005940
	36	5.1	00005950
	38	4	00005960
	6	6650	00005970
8220166	4	13301686	00005980
8220108	1	71128	00005990
	92	71130	00006000
8220185	4	8402405	00006010
8260173	92	71150	00006020
8320008	4	11802050	00006030
8360186	999	8360197	00006040
8370010	888	0	00006050
8440097	1	74348	00006060
	39	8.60	00006070
	40	.56	00006080
	76	23.4	00006090
	77	1.20	00006100
	92	1	00006110
8470048	1	75239	00006120
8480020	1	75386	00006130
8480081	1	75465	00006140
	39	9.04	00006150
	40	.19	00006160
	40	.19	00006170
	41	-.51	00006180
8480152	1	75477	00006190
8530062	999	8530054	00006200
8530047	888	0	00006210
8550093	92	76370	00006220
8560188	999	8560192	00006230
9080095	999	9080108	00006240
9180068	4	15201378	00006250
9360123	1	237822	00006260
	6	7447	00006270
	39	9.96	00006280
	40	.63	00006290
	41	.03	00006300
	999	9360121	00006310
	92	1	00006320
	77	0.07	00006330
	78	1919	00006340
9520022	4	12701818	00006350
	3	81057	00006360
	21	147.31817	00006370
	22	27.14156	00006380
	25	7.04E-06	00006390
	26	-1.39E-06	00006400
	15	0.32	00006410
10040033	1	87467	00006420
10090082	1	88799	00006430
	3	256688	00006440
	39	9.27	00006450
	40	.03	00006460
	41	-.43	00006470
	36	8.7	00006480
	38	4	00006490
	15	1.41	00006500
	90	1	00006510
	21	152.37688	00006520
	22	-78.52972	00006530
	25	5.55E-06	00006540
	26	7.50E-06	00006550
10120089	1	88703	00006560
	39	9.11	00006570
	40	.05	00006580
	41	.03	00006590

Table 1 - Corrected Data for Various SKYMAP Stars (11 of 26)

SKYMAP NUMBER	PROCESSING CODE	CONTENTS	SEQUENCE NUMBER
10200135	999	10200148	00006600
10290091	4	13002022	00006610
	39	8.78	00006620
	40	1.11	00006630
	41	.93	00006640
10310072	4	14601635	00006650
10350084	4	4203339	00006660
10350106	4	4203346	00006670
10380004	1	300933	00006680
10460102	1	237929	00006690
11040107	1	96214	00006700
11140102	1	306168	00006710
	39	9.81	00006720
	40	.17	00006730
	41	-.73	00006740
11320028	3	179968	00006750
	92	100286	00006760
	15	0.28	00006770
	21	172.44749	00006780
	22	-28.98686	00006790
	25	-8.38E-07	00006800
	26	3.92E-05	00006810
11370028	4	14801958	00006820
	39	10.41	00006830
	40	.89	00006840
11370090	1	101084	00006850
	3	251495	00006860
	4	3702151	00006870
	15	0.14	00006880
	21	173.79968	00006890
	22	-63.07063	00006900
	25	1.51E-06	00006910
	26	4.17E-06	00006920
11420021	4	13802270	00006930
11450081	4	17300533	00006940
11460036	4	13302152	00006950
	39	9.80	00006960
	40	.75	00006970
11460117	4	14002465	00006980
	39	9.98	00006990
	40	.75	00007000
11460124	4	13702213	00007010
	39	9.75	00007020
	40	1.05	00007030
11490108	3	62719	00007040
	4	13802283	00007050
	21	176.81690	00007060
	22	38.18402	00007070
	25	-1.54E-05	00007080
	26	-1.58E-05	00007090
	15	0.31	00007100
	36	9.3	00007110
	37	10.8	00007120
	38	1	00007130
	90	1	00007140
11490125	4	14002470	00007150
11530019	4	12702065	00007160
	39	9.83	00007170
	40	1.50	00007180
	41	1.88	00007190
11580136	4	12902241	00007200
11590091	4	12802066	00007210
	39	10.03	00007220
	40	1.02	00007230
	41	.82	00007240
12010033	4	12902246	00007250

Table 1 - Corrected Data for Various SKYMAP Stars (12 of 26)

SKYMAP NUMBER	PROCESSING CODE	CONTENTS	SEQUENCE NUMBER
	39	10.07	00007260
	40	1.04	00007270
	41	.89	00007280
12020036	4	14002493	00007290
12030030	1	233895	00007300
12030034	4	13002214	00007310
	39	10.14	00007320
	40	.80	00007330
12030122	4	12802073	00007340
12040026	4	13802298	00007350
	39	10.06	00007360
	40	1.44	00007370
	41	1.62	00007380
12050044	4	14002496	00007390
	39	9.69	00007400
	40	.98	00007410
	41	.75	00007420
12050076	4	13302191	00007430
12060082	4	12502459	00007440
12160035	4	12702109	00007450
12160097	4	13002251	00007460
	39	9.48	00007470
	40	.88	00007480
	76	2.6	00007490
	77	0.20	00007500
	92	1	00007510
12180080	1	107054	00007520
	92	107055	00007530
12200108	4	13502332	00007540
	40	1.09	00007550
12220093	4	13302228	00007560
	39	9.64	00007570
	40	1.33	00007580
12220137	1	233930	00007590
	999	12220119	00007600
12250009	4	13502336	00007610
12250058	4	12902287	00007620
12260079	92	108249	00007630
12280067	4	13702281	00007640
	39	10.22	00007650
	40	.88	00007660
12280069	4	13002277	00007670
	39	10.07	00007680
	40	.71	00007690
12290060	4	13102370	00007700
	39	9.76	00007710
	40	1.52	00007720
	41	1.90	00007730
12290099	4	12802122	00007740
	39	9.66	00007750
	40	1.43	00007760
	41	1.84	00007770
12320022	4	13002288	00007780
	39	10.03	00007790
	40	1.28	00007800
	41	1.43	00007810
12330035	4	13402329	00007820
	40	1.41	00007830
12330109	4	13902535	00007840
	3	63069	00007850
	21	187.79145	00007860
	22	38.89624	00007870
	25	1.04E-05	00007880
	26	8.33E-07	00007890
	15	0.37	00007900
	36	9.4	00007910

Table 1 - Corrected Data for Various SKYMAP Stars (13 of 26)

SKYMAP NUMBER	PROCESSING CODE	CONTENTS	SEQUENCE NUMBER
	38	4	00007920
	9C	1	00007930
12330117	4	13702292	00007940
	39	10.26	00007950
	40	.96	00007960
	41	.66	00007970
12360006	4	12602368	00007980
	39	10.07	00007990
	40	1.05	00008000
12380025	1	110027	00008010
	92	110026	00008020
12410111	4	13902545	00008030
12420059	3	82445	00008040
	4	12802143	00008050
	39	9.99	00008060
	40	.78	00008070
	41	.33	00008080
	15	0.32	00008090
	25	1.05E-05	00008100
	26	-1.58E-05	00008110
	21	189.98130	00008120
	22	28.21970	00008130
	9C	1	00008140
12440077	3	83172	00008150
	4	13702317	00008160
	21	190.52863	00008170
	22	36.55253	00008180
	25	3.01E-06	00008190
	26	-0.01E-06	00008200
	15	0.42	00008210
	39	10.13	00008220
	40	.76	00008230
	76	4.2	00008240
	77	0.70	00008250
	92	1	00008260
	36	10.0	00008270
	38	4	00008280
12450106	4	13202273	00008290
	39	9.94	00008300
	40	1.24	00008310
	41	1.34	00008320
12460072	4	13102404	00008330
	39	10.25	00008340
	40	1.15	00008350
	41	1.15	00008360
12460106	4	13302268	00008370
	39	9.64	00008380
	40	1.06	00008390
12500095	4	13602312	00008400
	39	10.47	00008410
	40	.86	00008420
	41	.41	00008430
12510079	1	111782	00008440
	39	9.30	00008450
	40	.41	00008460
	41	-.01	00008470
12520071	4	13002337	00008480
	39	10.51	00008490
	40	.76	00008500
	41	.37	00008510
12540026	4	13602316	00008520
	39	10.08	00008530
	40	1.19	00008540
	41	1.39	00008550
12540054	4	12902337	00008560
	39	10.40	00008570

Table 1 - Corrected Data for Various SKYMAP Stars (14 of 26)

SKYMAP NUMBER	PROCESSING CODE	CONTENTS	SEQUENCE NUMBER
	40	.96	00008580
	41	.65	00008590
12540130	4	13102423	00008600
	39	10.39	00008610
	40	1.14	00008620
	41	.88	00008630
12550016	4	14002592	00008640
12550104	4	13202295	00008650
	39	9.44	00008660
	40	1.15	00008670
12560087	1	112319	00008680
12560096	4	13702337	00008690
12560100	4	12902344	00008700
	39	9.86	00008710
	40	1.02	00008720
	41	.84	00008730
12580108	4	13802587	00008740
12580073	1	112873	00008750
	3	63281	00008760
	39	9.23	00008770
	40	.83	00008780
	41	.44	00008790
	21	194.26739	00008800
	22	30.32921	00008810
	25	4.32E-06	00008820
	26	-1.89E-05	00008830
	15	0.25	00008840
	36	8.4	00008850
	37	9.8	00008860
	38	1	00008870
	90	1	00008880
12590104	1	238179	00008890
13010073	4	13002353	00008900
	39	10.04	00008910
	40	1.01	00008920
	41	.75	00008930
13010136	1	113034	00008940
	39	9.29	00008950
	40	1.07	00008960
	41	-.03	00008970
13030046	4	12902359	00008980
	39	10.32	00008990
	40	.69	00009000
	41	.09	00009010
13100037	4	13102460	00009020
	39	9.94	00009030
	40	.70	00009040
	41	.19	00009050
13130088	4	12902383	00009060
	39	9.61	00009070
	40	1.24	00009080
	41	1.41	00009090
13140096	1	238208	00009100
13160084	1	115236	00009110
	3	224021	00009120
	4	5508539	00009130
	21	198.40428	00009140
	22	-44.44063	00009150
	25	-1.19E-06	00009160
	26	2.22E-06	00009170
	15	0.69	00009180
	36	7.1	00009190
	38	4	00009200
	90	1	00009210
13210032	1	115673	00009220
13230050	1	238224	00009230

Table 1 - Corrected Data for Various SKYMAP Stars (15 of 26)

SKYMAP NUMBER	PROCESSING CODE	CONTENTS	SEQUENCE NUMBER
13230118	76	18.5	00009240
	92	116657	00009250
13280107	4	11102576	00009260
	39	9.04	00009270
	40	1.50	00009280
	41	1.26	00009290
13370034	1	118576	00009300
	3	63646	00009310
	39	9.32	00009320
	40	.64	00009330
	41	.11	00009340
	77	1.20	00009350
	36	8.7	00009360
	38	4	00009370
	15	0.38	00009380
	21	203.72975	00009390
	22	30.33864	00009400
	25	-3.88E-05	00009410
	26	7.22E-06	00009420
	90	1	00009430
14050135	92	123102	00009440
14130055	92	124674	00009450
14230045	92	126125	00009460
14240023	92	126270	00009470
15050018	92	133243	00009480
15140004	1	134929	00009490
15140001	76	0.0	00009500
	77	-9.999	00009510
	92	0	00009520
	39	8.66	00009530
	40	.81	00009540
	41	.49	00009550
	76	0.0	00009560
	77	-9.999	00009570
	92	0	00009580
15230032	92	137108	00009590
15280156	4	13102738	00009600
15390051	92	139891	00009610
15560147	92	142630	00009620
15580071	1	151055	00009630
16040068	92	144070	00009640
16240111	92	147723	00009650
16250111	92	147933	00009660
	1	147934	00009670
16280068	92	148479	00009680
16340077	4	3705377	00009690
16340131	999	16340142	00009700
16360165	1	149426	00009710
	39	9.51	00009720
	40	.62	00009730
	41	-.38	00009740
16380018	1	149589	00009750
	39	9.39	00009760
	40	.26	00009770
	41	-.55	00009780
16390091	1	149834	00009790
	39	9.13	00009800
	40	.21	00009810
	41	-.56	00009820
16410055	92	150135	00009830
16410071	999	16410077	00009840
16410119	1	150197	00009850
	39	9.51	00009860
	40	.40	00009870
	41	-.57	00009880
16440143	1	150772	00009890

Table 1 - Corrected Data for Various SKYMAP Stars (16 of 26)

SKYMAP NUMBER	PROCESSING CODE	CONTENTS	SEQUENCE NUMBER
	39	9.33	00009900
	40	.12	00009910
	41	-.31	00009920
16470135	1	151212	00009930
	39	9.25	00009940
	40	.10	00009950
	41	-.77	00009960
17140049	1	155615	00009970
	3	208567	00009980
	39	9.13	00009990
	40	.05	00010000
	41	-.38	00010010
	21	257.72916	00010020
	22	-33.20843	00010030
	25	3.49E-07	00010040
	26	9.17E-06	00010050
	15	0.44	00010060
	38	9.2	00010070
	37	9.1	00010080
	38	1	00010090
	90	1	00010100
17150073	92	155885	00010110
17220063	1	156817	00010120
17240004	4	7013477	00010130
17230117	92	157779	00010140
17350040	4	11803630	00010150
	3	103956	00010160
	21	278.28229	00010170
	22	15.61269	00010180
	25	7.50E-06	00010190
	26	2.22E-06	00010200
	15	0.19	00010210
	90	1	00010220
	36	9.1	00010230
	38	4	00010240
17460062	1	161387	00010250
	3	185724	00010260
	4	7312327	00010270
	21	258.83215	00010280
	22	-26.18196	00010290
	25	1.50E-06	00010300
	26	-4.72E-06	00010310
	36	8.3	00010320
	38	4	00010330
	90	1	00010340
17560097	4	15800772	00010350
17590030	4	12004010	00010360
18000002	1	164002	00010370
	39	7.42	00010380
	40	01	00010390
	41	-.79	00010400
18030085	1	164927	00010410
	3	123066	00010420
	92	1	00010430
	76	1.0	00010440
	77	1.2	00010450
	78	1943	00010460
	15	0.22	00010470
	21	270.22993	00010480
	22	4.77626	00010490
	25	6.64E-06	00010500
	26	-5.56E-07	00010510
	90	1	00010520
18040057	4	7704543	00010530
18060204	92	165190	00010540
18250119	1	169515	00010550

Table 1 - Corrected Data for Various SKYMAP Stars (17 of 26)

SKYMAP NUMBER	PROCESSING CODE	CONTENTS	SEQUENCE NUMBER
	3	161488	00010560
	4	8705045	00010570
	39	9.23	00010580
	40	1.10	00010590
	41	-.06	00010600
	36	8.8	00010610
	38	4	00010620
	15	0.31	00010630
	21	275.67784	00010640
	22	-12.71923	00010650
	25	-4.47E-06	00010660
	26	1.38E-06	00010670
	90	1	00010680
18270048	1	169985	00010690
	92	169986	00010700
	39	9.20	00010710
	40	.49	00010720
18430179	1	172582	00010730
18440069	92	173583	00010740
18440080	92	173608	00010750
18540021	4	13603311	00010760
18590093	3	86669	00010770
	4	12803429	00010780
	36	8.2	00010790
	38	4	00010800
	21	284.35390	00010810
	22	29.53274	00010820
	25	5.44E-06	00010830
	26	5.56E-07	00010840
	15	0.37	00010850
	90	1	00010860
19010177	4	12903447	00010870
19120022	1	179957	00010880
	3	48193	00010890
	92	179958	00010900
	15	0.22	00010910
	21	287.69824	00010920
	22	49.76195	00010930
	25	-5.84E-05	00010940
	26	1.77E-04	00010950
	90	1	00010960
19130008	1	230891	00010970
19220207	1	231267	00010980
	39	9.84	00010990
	40	.44	00011000
19230065	4	12002054	00011010
19240070	1	338266	00011020
19240160	4	12203685	00011030
19260193	4	11904023	00011040
	39	9.35	00011050
	40	.73	00011060
	41	.27	00011070
19280106	1	231517	00011080
19280210	4	14502906	00011090
19330158	4	9903775	00011100
19340252	4	12903652	00011110
19550062	4	13104073	00011120
19570118	3	97980	00011130
	4	12603741	00011140
	70	1	00011150
	71	1	00011160
	15	0.31	00011170
	21	298.84952	00011180
	22	26.42120	00011190
	25	2.99E-06	00011200
	26	8.33E-07	00011210

Table 1 - Corrected Data for Various SKYMAP Stars (18 of 26)

SKYMAP NUMBER	PROCESSING CODE	CONTENTS	SEQUENCE NUMBER
	90	1	00011220
19870132	4	13003829	00011230
19880085	1	226851	00011240
	39	9.12	00011250
	40	.16	00011260
	41	-.74	00011270
19880188	4	12903836	00011280
20020071	1	227247	00011290
	3	69289	00011300
	4	13403880	00011310
	39	9.22	00011320
	40	.35	00011330
	41	-.58	00011340
	36	9.0	00011350
	37	9.1	00011360
	38	1	00011370
	21	300.12579	00011380
	22	35.17077	00011390
	25	-7.83E-06	00011400
	26	-4.44E-06	00011410
	90	1	00011420
20030040	1	227349	00011430
20030047	1	331777	00011440
	39	8.16	00011450
	40	1.94	00011460
	41	1.34	00011470
20030140	1	227382	00011480
20040019	1	227457	00011490
20040069	999	20040049	00011500
20050126	4	15702134	00011510
20060146	1	227695	00011520
20060184	1	227719	00011530
	39	9.67	00011540
	40	.21	00011550
	41	.12	00011560
20070041	1	227758	00011570
	3	69444	00011580
	39	9.18	00011590
	40	.11	00011600
	41	.01	00011610
	36	9.1	00011620
	37	9.2	00011630
	38	1	00011640
	90	1	00011650
	21	301.34620	00011660
	22	35.42868	00011670
	25	5.77E-06	00011680
	26	1.11E-05	00011690
	15	0.31	00011700
20070134	1	227785	00011710
20080030	1	354994	00011720
20080218	4	11504061	00011730
20090217	1	228052	00011740
20110008	1	228147	00011750
20110036	1	228171	00011760
20110120	1	228205	00011770
20120040	1	228264	00011780
20120058	4	13203739	00011790
20120162	1	228312	00011800
20120244	1	355163	00011810
20120247	1	228339	00011820
20130006	1	228346	00011830
	39	9.98	00011840
	40	.70	00011850
	41	.54	00011860
20140009	1	228450	00011870

Table 1 - Corrected Data for Various SKYMAP Stars (19 of 26)

SKYMAP NUMBER	PROCESSING CODE	CONTENTS	SEQUENCE NUMBER
20140050	1	228475	00011880
20150081	1	228592	00011890
20180184	1	193427	00011900
	3	69813	00011910
	36	8.9	00011920
	37	9.5	00011930
	38	1	00011940
	90	1	00011950
	39	9.22	00011960
	40	.44	00011970
	41	-.45	00011980
	21	304.23560	00011990
	22	39.24867	00012000
	25	1.61E-06	00012010
	26	-6.39E-06	00012020
	15	0.31	00012030
20360099	1	340667	00012040
20410009	92	197178	00012050
20410068	999	20410070	00012060
20410139	92	196068	00012070
20430106	1	347287	00012080
20430118	4	13104201	00012090
20450038	1	235350	00012100
	39	9.27	00012110
	40	.29	00012120
	41	-.61	00012130
20460201	4	14303714	00012140
20480024	4	14403588	00012150
	39	9.57	00012160
	40	.08	00012170
	41	.01	00012180
20490070	4	13203954	00012190
	39	9.61	00012200
	40	4.14	00012210
	92	1	00012220
	76	9.8	00012230
	77	1.11	00012240
	78	1892	00012250
20510004	4	14503303	00012260
	39	9.22	00012270
	40	.10	00012280
	41	-.03	00012290
20510130	92	198161	00012300
20510177	4	14703204	00012310
	3	50151	00012320
	39	9.24	00012330
	40	.14	00012340
	15	0.41	00012350
	21	312.57956	00012360
	22	47.40597	00012370
	25	1.69E-06	00012380
	26	-5.56E-06	00012390
	90	1	00012400
	36	8.9	00012410
	37	9.2	00012420
	38	1	00012430
20540038	4	14703217	00012440
20540059	999	20540058	00012450
20550101	3	50237	00012460
	4	14703222	00012470
	39	9.17	00012480
	40	.29	00012490
	21	313.42000	00012500
	22	47.48799	00012510
	25	1.07E-05	00012520
	26	2.50E-06	00012530

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Table 1 - Corrected Data for Various SKYMAP Stars (20 of 26)

SKYMAP NUMBER	PROCESSING CODE	CONTENTS	SEQUENCE NUMBER
	15	0.53	00012540
	36	8.9	00012550
	37	9.1	00012560
	38	1	00012570
	90	1	00012580
20860042	4	14403637	00012590
20870163	4	14403645	00012600
21000107	4	14703249	00012610
21020160	3	50389	00012620
	4	14803375	00012630
	39	9.13	00012640
	40	.14	00012650
	15	0.38	00012660
	36	8.8	00012670
	37	8.9	00012680
	38	1	00012690
	90	1	00012700
	21	315.28362	00012710
	22	46.12342	00012720
	25	8.09E-06	00012730
	26	4.17E-06	00012740
21030109	4	14803156	00012750
21040020	1	200496	00012760
	92	200497	00012770
	39	8.54	00012780
	40	.68	00012790
	41	.41	00012800
21050084	4	14803397	00012810
21070011	4	14803414	00012820
	39	9.49	00012830
	40	.04	00012840
21140144	1	239618	00012850
	39	8.45	00012860
	40	.50	00012870
	41	-.42	00012880
21170106	1	239626	00012890
	39	9.29	00012900
	40	.35	00012910
	41	-.57	00012920
21180117	999	21180077	00012930
21230085	1	203664	00012940
	39	8.59	00012950
	40	-.18	00012960
	41	-.99	00012970
21270047	1	239671	00012980
21320044	999	21320045	00012990
21330025	1	51010	00013000
	4	14703462	00013010
	21	322 72817	00013020
	22	48.26136	00013030
	25	1.11E-06	00013040
	26	-2.78E-06	00013050
	15	0.45	00013060
	36	8.8	00013070
	37	9.1	00013080
	38	1	00013090
	90	1	00013100
21360033	4	14803436	00013110
21360136	1	239710	00013120
	39	9.50	00013130
	40	.36	00013140
	41	-.43	00013150
21360180	1	239712	00013160
	39	8.65	00013170
	40	.41	00013180
	41	-.27	00013190

Table 1 - Corrected Data for Various SKYMAP Stars (21 of 26)

SKYMAP NUMBER	PROCESSING CODE	CONTENTS	SEQUENCE NUMBER
21380121	1	239724	00013200
	39	9.14	00013210
	40	.37	00013220
	41	-.49	00013230
21380015	1	239725	00013240
	39	9.15	00013250
	40	.26	00013260
	41	-.46	00013270
21380083	1	239732	00013280
21380084	1	239729	00013290
	39	8.35	00013300
	40	.36	00013310
	41	-.54	00013320
21420168	1	239743	00013330
	39	9.01	00013340
	40	.59	00013350
	41	-.15	00013360
21440030	92	206827	00013370
	40	.68	00013380
	41	-.31	00013390
21440114	1	239758	00013400
	39	9.51	00013410
	40	.26	00013420
	41	-.54	00013430
21460156	1	235618	00013440
	39	9.66	00013450
21510096	92	208132	00013460
21570132	1	235673	00013470
	3	33909	00013480
	4	15203071	00013490
	39	9.14	00013500
	40	.21	00013510
	41	-.77	00013520
	21	328.95399	00013530
	22	52.5813[illegible]	00013540
	25	-1.52E-06	00013550
	26	2.50E-06	00013560
	15	0.14	00013570
	36	9.0	00013580
	37	9.2	00013590
	38	1	00013600
	90	1	00013610
21580004	1	208718	00013620
	3	127196	00013630
	76	10.7	00013640
	77	0.3	00013650
	21	328.87969	00013660
	22	5.70150	00013670
	25	4.98E-06	00013680
	26	-8.33E-07	00013690
	15	0.35	00013700
	36	7.3	00013710
	38	4	00013720
	90	1	00013730
	92	1	00013740
22030117	92	209790	00013750
22090060	1	234740	00013760
	39	9.04	00013770
	40	.64	00013780
	41	.16	00013790
22100151	1	235745	00013800
22120047	1	235750	00013810
22120053	1	235751	00013820
22130005	1	235756	00013830
	999	22120177	00013840
22130018	1	235757	00013850

Table 1 - Corrected Data for Various SKYMAP Stars (22 of 26)

SKYMAP NUMBER	PROCESSING CODE	CONTENTS	SEQUENCE NUMBER
	999	2212 0176	00013860
22130040	1	235759	00013870
	999	22130039	00013880
	39	8.67	00013890
	40	2.17	00013900
	41	1.88	00013910
22130070	1	235760	00013920
	999	22130073	00013930
	39	8.98	00013940
	40	1.79	00013950
	41	1.65	00013960
22130090	4	16901231	00013970
22140181	1	235767	00013980
	999	22140169	00013990
	39	9.30	00014000
	40	1.16	00014010
	41	.97	00014020
22150105	1	235771	00014030
	999	22150090	00014040
	39	8.83	00014050
	40	.50	00014060
	41	-.04	00014070
22150133	1	235773	00014080
22150144	1	235772	00014090
22160027	1	235774	00014100
	999	22160023	00014110
22160039	1	235777	00014120
	999	22160032	00014130
22160051	1	235778	00014140
	999	22160055	00014150
	39	9.16	00014160
	40	2.10	00014170
22170099	1	235786	00014180
	999	22170095	00014190
22180082	3	34287	00014200
	4	15103321	00014210
	21	334.05338	00014220
	22	52.28349	00014230
	25	2.29E-06	00014240
	26	-5.56E-07	00014250
	15	0.14	00014260
	36	9.4	00014270
	37	11.4	00014280
	38	1	00014290
	90	1	00014300
22180091	1	239919	00014310
22180176	1	235794	00014320
	39	9.04	00014330
	40	1.06	00014340
	41	.77	00014350
22180029	1	235796	00014360
	999	22190031	00014370
	39	8.48	00014380
	40	1.62	00014390
	41	1.96	00014400
22190035	1	235797	00014410
	39	8.67	00014420
	40	1.81	00014430
	41	2.18	00014440
22200050	1	235802	00014450
	999	22200051	00014460
22200165	1	239929	00014470
	999	22200175	00014480
22200181	1	235805	00014490
	39	8.41	00014500
	40	1.40	00014510

Table 1 - Corrected Data for Various SKYMAP Stars (23 of 26)

SKYMAP NUMBER	PROCESSING CODE	CONTENTS	SEQUENCE NUMBER
	41	1.33	00014820
22210037	1	2358\	00014830
	39	9.96	00014840
	40	.21	00014850
	41	-.67	00014860
22210067	1	235809	00014870
	999	22210070	00014880
22210136	1	235811	00014890
22220095	1	235812	00014900
	999	22220093	00014910
22220128	1	235818	00014920
	999	22220137	00014930
22220124	1	235817	00014940
	999	22220136	00014950
22230032	1	235823	00014960
	999	22230038	00014970
22230115	1	235827	00014980
	39	9.02	00014990
	40	.55	00015000
	41	.04	00015010
22250084	1	235835	00015020
	999	22250085	00015030
22250123	1	235837	00015040
22260058	1	235844	00015050
	999	22260053	00015060
22260093	1	235845	00015070
	999	22260096	00015080
22280123	76	3.9	00015090
	92	213052	00015100
22290004	1	235857	00015110
	999	22290013	00015120
22290030	1	235858	00015130
22300051	1	213470	00015140
	92	213471	00015150
	39	6.65	00015160
	40	56	00015170
	41	.24	00015180
	77	1.8	00015190
22300120	1	235865	00015200
	999	22300125	00015210
22310093	1	235870	00015220
22320007	1	235872	00015230
	999	22320001	00015240
22330105	1	239994	00015250
	999	22330093	00015260
22340097	1	235883	00015270
22350046	1	235886	00015280
	999	22350051	00015290
22350052	1	235887	00015300
22350096	1	235888	00015310
	999	22350093	00015320
22360009	1	235890	00015330
22370058	1	235899	00015340
22380076	1	235909	00015350
	999	22380091	00015360
22380086	1	235910	00015370
	999	22380095	00015380
22450060	1	240047	00015390
	39	9.83	00015400
	40	.35	00015410
	41	-.43	00015420
22460095	1	215544	00015430
	39	9.22	00015440
	40	1.01	00015450
22470044	1	240068	00015460
	39	9.65	00015470

Table 1 - Corrected Data for Various SKYMAP Stars (24 of 26)

SKYMAP NUMBER	PROCESSING CODE	CONTENTS	SEQUENCE NUMBER
	40	.48	00015180
	41	-.51	00015190
22810062	4	11704819	00015200
22860085	999	22860085	00015210
22880009	999	22880017	00015220
22880129	999	22880109	00015230
	39	9.78	00015240
	40	.78	00015250
	41	.41	00015260
23010163	39	9.62	00015270
	40	-.08	00015280
	41	-.83	00015290
23030141	1	236031	00015300
	39	9.00	00015310
	40	.26	00015320
	41	-.14	00015330
23100082	1	218693	00015340
23140078	1	240233	00015350
	39	9.42	00015360
	40	.15	00015370
	999	23140068	00015380
23160027	3	20829	00015390
	4	16002811	00015400
	39	9.29	00015410
	40	17	00015420
	36	9.2	00015430
	37	9.3	00015440
	38	1	00015450
	90	1	00015460
	15	0.30	00015470
	21	348.88569	00015480
	22	61.25875	00015490
	25	1.20E-06	00015500
	26	2.78E-06	00015510
23160135	1	240244	00015520
	999	23160199	00015530
	39	9.51	00015540
	40	.43	00015550
23160153	1	240245	00015560
	39	9.24	00015570
	40	.09	00015580
	41	-.02	00015590
	999	23160147	00015600
23180034	1	240253	00015610
	39	9.40	00015620
	40	.24	00015630
	41	.14	00015640
	999	23180011	00015650
23180089	999	23180099	00015660
23180135	999	23180111	00015670
	1	240255	00015680
	39	9.64	00015690
	40	.21	00015700
23210044	3	35350	00015710
	4	15702728	00015720
	39	9.48	00015730
	40	50	00015740
	41	-.06	00015750
	15	0.14	00015760
	36	9.0	00015770
	37	10.0	00015780
	38	1	00015790
	90	1	00015800
	21	349.81137	00015810
	22	58.09450	00015820
	25	8.81E-07	00015830

Table 1 - Corrected Data for Various SKYMAP Stars (25 of 26)

SKYMAP NUMBER	PROCESSING CODE	CONTENTS	SEQUENCE NUMBER
	26	2.22E-06	00015840
23230023	1	220326	00015850
	39	9.38	00015860
	40	.26	00015870
	41	.08	00015880
23230036	1	220364	00015890
	3	165665	00015900
	39	9.24	00015910
	40	.21	00015920
	41	.11	00015930
	90	1	00015940
	36	9.2	00015950
	38	4	00015960
	21	350.15107	00015970
	22	-16.81118	00015980
	25	1.60E-06	00015990
	26	-9.00E-06	00016000
	15	0.34	00016010
23250052	1	220609	00016020
	39	10.15	00016030
	40	.16	00016040
	41	.15	00016050
23270128	1	220817	00016060
	39	9.28	00016070
	40	.20	00016080
	41	.18	00016090
23350050	1	221793	00016100
	39	10.22	00016110
	40	.07	00016120
	41	.08	00016130
23350066	1	221805	00016140
	39	9.69	00016150
	40	.06	00016160
	41	.08	00016170
23360023	1	240338	00016180
	39	9.41	00016190
	40	.40	00016200
	41	.02	00016210
23360068	4	16002590	00016220
	39	9.74	00016230
	40	.18	00016240
	41	.01	00016250
23430155	1	222802	00016260
	39	9.43	00016270
	40	.13	00016280
	41	.13	00016290
23470044	999	23470033	00016300
23490139	4	16601646	00016310
23510143	999	23510118	00016320
23570073	888	0	00016330
23570089	1	240455	00016340
	39	9.10	00016350
	40	.92	00016360
	41	.73	00016370
23570101	999	23570090	00016380
23590078	3	20976	00016390
	4	16302084	00016400
	39	9.16	00016410
	40	.31	00016420
	15	0.36	00016430
	76	8.3	00016440
	37	8.9	00016450
	38	1	00016460
	21	359.17231	00016470
	22	63.54125	00016480
	25	-5.57E-07	00016490

Table 1 - Corrected Data for Various SKYMAP Stars (26 of 26)

SKYMAP NUMBER	PROCESSING CODE	CONTENTS	SEQUENCE NUMBER
	26	1.67E-06	00016500
23580153	1	236265	00016510
	38	10.22	00016520
	40	.13	00016530
	41	.09	00016540

COMPUTER SCIENCES CORPORATION
SYSTEM SCIENCES DIVISION (301) 589 1545
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June 1, 1981

National Aeronautics and Space Administration
Goddard Space Flight Center
Greenbelt, Maryland 20771

Attention: Mr. T. Stengle
Code 581.2
Bldg. 23, Room S-411

Subject: Contract NAS 5-24300
Task Assignment 41503
Information: SKYMAP Error Report Number 20
Delivery: B61-I-41503-33

Dear Mr. Stengle:

Please find enclosed SKYMAP Error Report Number 20. This report reviews several errors reported to us by Dr. Wayne Warren of the NSSDC in a letter dated January 24, 1981. This is the last of the Error Reports which is intended to be included in the upcoming revision of the SKYMAP Master Catalog.

Yours truly,

Steven F. McLaughlin

Steven F. McLaughlin
Attitude Analysis Department

SFM/lf
Enclosure
copies:

GSFC	CSC
R. Werking	D. Sood
G. Repass	W. Myers
W. Warren	C. Sturch

8 JUN 1981
WWW

SKYMAP ERROR REPORT NUMBER 20

A number of errors in the SKYMAP Master Catalog have recently been reported by Dr. Wayne H. Warren, Jr. of the National Space Science Data Center (NSSDC). These reported errors were reviewed by task personnel, and were found to be genuine errors.

1. For SKYMAP star 10490067, the 1900 right ascension (Master Catalog word 23) is in error. It should be replaced by the value 160.775 during the next Master Catalog update. Because the 1950 coordinates are correct, and because these are preferred over the 1900 coordinates, this error is of relatively minor consequence to the current catalog.

2. Fifteen stars have been identified which have an extra absolute value of 100 kilometers/second in their radial velocity (Master Catalog word 59). These SKYMAP stars and the correct radial velocity are presented in Table 1. The HD numbers used to identify these stars are also listed.

3. SKYMAP star 23010026 was identified by Dr. Warren as having an incorrect standard epoch position. This star's true position is very close to the South Celestial Pole, but in SKYMAP its declination has been converted to a positive value. Because the only coordinates available for 23010026 are epoch 1900 coordinates, these must be precessed to achieve the standard epoch 2000 coordinates. Dr. Warren has suggested that the source of the problem lies in the inability of the software to correctly precess far southern stars.

In order to more completely define the problem, a run of utility MCDUMP was executed which listed all stars with epoch 1900 declinations south of -88.0 degrees or north of +88.0 degrees. Approximately 70 stars were output for manual examination. For these stars, a check of the coordinates showed that only SKYMAP star 23010026 has a coordinate error apparently caused by precession-related software. A check of all of the

Table 1 - Stars with Radial Velocity Errors

	SKYMAP	RV	HD
1	13400038	-18.0	119035
2	13400059	- 0.2	119213
3	13400065	-10.0	119124
4	13400073	-10.0	118957
5	13400079	0.2	119054
6	13400089	4.2	118942
7	13400107	-62.8	119081
8	13400111	-25.0	119055
9	13400123	-17.1	119228
10	13410009	4.5	119126
11	13410076	-36.6	119149
12	13410109	2.0	118991
13	13410111	27.6	119090
14	13410136	49.0	119217
15	13420005	-30.0	118978
16	13420144	-48.0	119159

observational data for star 23010026 showed that none of the data were erroneous.

The above findings indicate that there is a possible shortcoming in SKYMAP software, but further checks will be required to confirm this conclusion. The precession is carried out by subroutine PRECES in program UPDATE. The problem probably occurs because of the trigonometric functions which are used, and in spite of the fact that all calculations are double precision.

Rough bounds can be placed upon the problem by identifying a declination of -89.750 degrees as being incorrectly precessed, and a declination of -89.517 degrees as having no apparent problems. A northern declination of 89.748 degrees is handled correctly, implying that the problem exists for extreme southern stars only.

A thorough check should be conducted of PRECES to determine if the problem can be corrected. Because of the complexity of the analysis required, it will not be possible to resolve this problem prior to the upcoming revision of the Master Catalog. Since only one $9^{m}.4$ star is known to be affected it is not judged that this omission is serious.