

JUL 13 1978

The 1980-90 Shuttle Star Catalog for Onboard and Ground Programs

(NASA-TM-79514) THE 1980-90 SHUTTLE STAR
CATALOG FOR ONBOARD AND GROUND PROGRAMS
(NASA) 79 p HC A05/MF A01 CSCL 22A

N78-27166

Unclas
G3/16 25175

Mission Planning and Analysis Division
June 1978



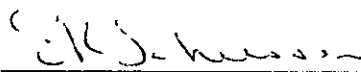
National Aeronautics and
Space Administration

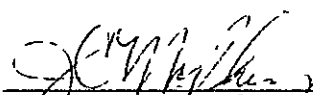
Lyndon B. Johnson Space Center
Houston Texas

SHUTTLE PROGRAM

THE 1980-90 SHUTTLE STAR CATALOG
FOR ONBOARD AND GROUND PROGRAMS

By Sandy Richardson, Mathematical Physics Branch and Rosemary Killen, McDonnell
Douglas Technical Services Co.

Approved: 
Emil R. Schiesser, Chief
Mathematical Physics Branch

Approved: 
Ronald L. Berry, Chief
Mission Planning and Analysis Division

Mission Planning and Analysis Division
National Aeronautics and Space Administration
Lyndon B. Johnson Space Center
Houston, Texas
June 1978

CONTENTS

Section		Page
1.0	<u>SUMMARY</u>	1
2.0	<u>INTRODUCTION</u>	1
3.0	<u>PREPARATION OF THE DATA</u>	1
4.0	<u>DATA FORMAT FOR THE SHUTTLE STAR CATALOG</u>	2
5.0	<u>CONCLUSION</u>	3
6.0	<u>REFERENCES</u>	3

TABLES

Table		Page
I	UNIVAC 1108 COMPUTER PROGRAM LISTING	4
II	THE 1950.0 STAR POSITIONS IN M1950.0 COORDINATES	7
III	THE SHUTTLE STAR CATALOG	10

THE 1980-90 SHUTTLE STAR CATALOG FOR ONBOARD AND GROUND PROGRAMS

By Sandy Richardson, Mathematical Physics Branch and Rosemary Killen,
McDonnell Douglas Technical Services Co.

1.0 SUMMARY

The 1980-90 Shuttle star catalog for onboard and ground programs is presented. The data used in this catalog are explained according to derivation, input, format for the catalog, and preparation. The tables include the computer program listing, input star position, and the computed star positions for the years 1980-90.

2.0 INTRODUCTION

During the first two Shuttle missions, the brightest 50 stars will be used to verify and compute onboard optical alinements. This star catalog contains the locations (unit vectors) of 149 bright stars, which are stored by the spacecraft onboard computer and the right ascension and declination for the Mission Control Center (MCC) ground computers.

3.0 PREPARATION OF THE DATA

The Shuttle missions require that stellar positions for 1980-90 be in 1950.0 coordinates because the coordinate system for Shuttle is based on the mean Equator and equinox at the beginning of the Besselian Year 1950. In order to compute these stellar positions in 1950.0 coordinates, corrections were applied for the proper motions of star positions in the Equator and equinox of 1950.0 from 1950 to 1980 and each subsequent year to 1990. The initial input data consisting of proper motions, right ascension, and declination for 1950 were obtained from reference 1. The star positions were punched on cards containing the following star data.

- a. Identification numbers
- b. Right ascension
- c. Proper motion in right ascension
- d. Declination
- e. Proper motion in declination
- f. S20 magnitude

ORIGINAL PAGE IS
OF POOR QUALITY

g. Common name

h. Star number (ref. 1)

The 1108 Univac computer program listed in table I generated the data presented in tables II and III. The stars in table III are ordered by decreasing magnitude. The program calculated new coordinates and unit vectors for the 149 stars.

4.0 DATA FORMAT FOR THE SHUTTLE STAR CATALOG

The data for the Shuttle star catalog (table II) are presented in the following format.

a. 1950.0 star positions in M1950.0 coordinates

- (1) Identification number
- (2) Right ascension - hours, minutes, and seconds
- (3) Proper motion in right ascension
- (4) Declination - degrees, minutes, and seconds
- (5) Proper motion in declination
- (6) Magnitude (S20)
- (7) Common name of selected stars

The data for the Shuttle star catalog (table III) are presented in the following format.

a. 1980-90 star positions in M1950.0 coordinates

- (1) Identification number
- (2) Right ascension - degrees
- (3) Declination - degrees
- (4) Common name of selected stars

b. Unit vectors in M1950.0 coordinates for the years 1980-90.

- (1) Identification number
- (2) Magnitude (S20)
- (3) Unit vector X in M1950.0 coordinates

- (4) Unit vector Y in M1950.0 coordinates
- (5) Unit vector Z in M1950.0 coordinates
- (6) Common name of selected stars

5.0 CONCLUSION

This internal note provides 149 bright stars, their positions, and unit vectors. Verification of star positions was done by comparison with the RTCC Star Catalogue for 1973 stellar positions (ref. 2). All but 16 of the 149 were available in the RTCC 1973 catalog. The input for these 16 stars was verified by three persons according to the right ascension and declination in the source star catalog. The stars are presented in Equator and equinox of 1950.0 and epoch of 1980-1990.0 and are ordered by S20 magnitude.

6.0 REFERENCES

1. Becvar, Antonin: Atlas of the Heavens II Catalogue - 1950, 1964.
2. Cockrell, B. F.: Skylab Program - The RTCC Star Catalogue for Skylab, MSC Internal Note No. 72-FM-116. May 4, 1972.

TABLE I.- UNIVAC 1108 COMPUTER PROGRAM LISTING

FOR,IS TPF\$,STAR,,STARR
FOR SDE3-06/13/78-21:25:42 (,0)

MAIN PROGRAM

STORAGE USED: CODE(1) 307405; DATA(0) 005411; BLANK COMMON(2) 000000

EXTERNAL REFERENCES (BLOCK, NAME)

```

0003 - NINTR$
0004 - NRDU$
0005 - NI02$
0006 - NWOU$
0007 - COS ---
0010 - SIN
0011 - NSTOP$

```

STORAGE ASSIGNMENT (BLOCK, TYPE, RELATIVE LOCATION, NAME)

0000	005235	10F	0001	007401	100PL	0000	005245	11F	0001	000015	1146	0001	007057	145G
0001	000124	176G --	0000	005324	20F	0001	000310	24Z G	0001	000363	2706	0001	005255	30F
0000	005273	35F	0000	005316	36F	0000	005272	4F	0000	000523	5F	0001	000101	55L
0000	005306	60F	0000	005337	61F	0000	005353	62F	0001	000177	70L	0001	000205	71L
0000	004766	ADEC	0000	005232	00	0000	005522	2 DEC D	0000	000363	QECDEG	0000	005231	DECS
0000	005221	DELTA	0000	002260	DPM	0000	005523	2 FLAG	0000	005215	I	0000	000000	ID
0000	001356	IDECD	0000	001604	IDECM	0000	002632	2 IDECS	0000	005210	IDELYR	0000	005216	IDUM
0000	000226	IRAH	0000	007454	IRAM	0000	005217	1 IYEAR	0000	002506	MAG	0000	005214	N
0000	002734	NAME	0000	005225	PMS	0000	005225	PMS	0000	003410	RADNW	0000	005223	RAH
0000	005224	RAM	0000	001130	PAPM	0000	000702	RAS	0000	005226	PAST	0000	005227	RASTNW
0000	004064	X	0000	004312	Y	0000	004547	Z						

```

J0101 1* DIMENSION ID(150),IRAH(150),IRAM(150),RAS(150),RAPM(150)
J0101 2* 1,IDECD(150),IDECM(150),IDEC(S(150),DPM(150),MAG(150),NAME(150,2)
J0101 3* 1,RADN(150),DECOEG(150),X(150),Y(150),Z(150),ADEC(150)
J0103 4* 5 FORMAT (I2)
J0104 5* 10 FORMAT (I3,I3,I3,F7.3,F10.7,3I3,I2,F8.5,F10.6,2A6)
J0105 11* 11 FORMAT (2X,I3,I3,I3,F7.3,F10.7,3I3,F8.5,F10.6,4X,2A6)
J0106 7* 30 FORMAT (2X,1D -RA(H,MIN,SEC) PMALPH DEC (D,M,S) PMDEC
J0106 8* 1 MAG NAME '/')
J0106 9* C COMMENT:READ INPUT
J0107 10* 4 FORMAT(I3)
J0110 11* READ(5,4)N
J0113 12* DO 40 I=1,N
J0116 13* 40 READ(5,10) ID(I),IRAH(I),IRAM(I),RAS(I),RAPM(I),
J0116 14* 1IDECD(I),IDECM(I),IDEC(S(I),IDUM,OPM(I),MAG(I),NAME(I,1)
J0116 15* 1,NAME(I,2)
J0116 16* C COMMENT:WRITE INPUT
J0136 17* IYEAR=50
J0137 18* WRITE(6,20)IYEAR
J0142 19* 1,1IJE(6,30)
J0144 20* DO 50 I=1,N
J0147 21* 50 WRITE(6,11) ID(I),IRAH(I),IRAM(I),RAS(I),RAPM(I),IDECD(I),
J0147 22* 1IDECM(I),IDEC(S(I),DPM(I),MAG(I),NAME(I,1),NAME(I,2)
J0147 23* C COMMENT:CALCULATE NEW COORDINATES

```

00U000
00G000
00O000
00G001
00O001
00G001
00U001
00C001
00G001
00J001
00O001
00G007
00O015
00O015
00O015
00O015
00O037
00O041
00O047
00O057
00O057
00O057
00O057

ORIGINAL PAGE IS
OF POOR QUALITY

TABLE I.- Continued

00166	24*	55	READ(5,5) IYEAR	000161
00171	25*		IF(IYEAR.EQ.0) GO TO 1000	000161
00173	26*		IDELYP=IYEAR-5	000163
00174	27*		DELTA=FLOAT(IDELYP)	000168
00175	28*		DO 100 I=1,N	000168
00200	29*		DECD=FLOAT(IDECD(I))	000168
00201	30*		RAH=FLOAT(IRAH(I))	000168
00202	31*		RAM=FLOAT(IRAM(I))	000168
00203	32*		PMS=RAM(I)*DELTA	000168
00204	33*		RAST=(RAH*3600.)+(RAM*60.)+RAS(I)	000168
00205	34*		RASTNW=PMS*RAST	000168
00206	35*		RADNW(I)=RASTNW/240.	000168
00207	36*		PMS=OPM(I)*DELTA	000168
00210	37*		DECS=(ABS(IDECD(I))*3600)+ABS(IDECM(I)*60)+IDECS(I)	000168
00211	38*		IF(IDECD.EQ.0) GO TO 70	000167
00213	39*		DECS=SIGN(DECS,DECD)	000171
00214	40*		GO TO 71	000175
00215	41*	70	DECS=SIGN(DECS,IDECM(I))	000177
00216	42*	71	CONTINUE	000205
00217	43*		DECS=DECS+PMS	000205
00220	44*		DECDEG(I)=DECS/3600.	000207
00221	45*		IF(DECDEG(I).GT.90.) DECDEG(I)=180.-DECDEG(I)	000211
00223	46*		IF(DECDEG(I).LT.-90.) DECDEG(I)=-180.-DECDEG(I)	000220
00225	47*		ADEC(I)=ABS(DECDEG(I))	000227
00225	48*	C	COMMENT:CALCULATE UNIT VECTORS	000227
00226	49*		DO 300 I=1,N	000231
00227	50*		X(I)=COS(DD*DECDEG(I))*COS(DD*RADNW(I))	000233
00230	51*		Y(I)=COS(DD*DECDEG(I))*SIN(DD*RADNW(I))	000251
00231	52*	100	Z(I)=SIN(DD*DECDEG(I))	000270
00231	53*	C	COMMENT:PRINT OUTPUT	000270
00233	54*		WRITE(6,2C) IYEAR	000300
00236	55*		WRITE(6,35)	000306
00240	56*	35	FORMAT(2X,'ID',10X,' RA(+DEG)',10X,' DEC(DEG) NAME'/)	000316
00241	57*		DO 200 I=1,N	000316
00244	58*		FLAG=1HS	000317
00245	59*		IF(IDECD(I).GE.0) FLAG=1HN	000324
00247	60*		IF(IDECM(I).LT.0) FLAG=1HS	000331
00251	61*	200	WRITE(6,36) ID(I),RADNW(I),ADEC(I),FLAG,NAME(I,1),NAME(I,2)	000345
00262	62*		WRITE(6,61) IYEAR	000353
00265	63*		WRITE(6,62)	000363
00267	64*		DO 300 I=1,N	000363
00272	65*	300	WRITE(6,60) ID(I),MAG(I),X(I),Y(I),Z(I),NAME(I,1),NAME(I,2)	000377
00304	66*		GO TO 55	000401
00305	67*	60	FORMAT(2X,I3,5X,F8.4,5X,F9.7,3X,F9.7,3X,F9.7,5X,2A6)	000401
00306	68*	36	FORMAT(2X,I3,3X,F20.4,F20.4,A1,4X,2A6)	000401
00307	69*	20	FORMAT(1H1,2X,'19',I2,' STAR POSITIONS IN M1950.0 COORDINATES'//)	000401
00310	70*	61	FORMAT(1H1,2X,' UNIT VECTORS IN M1950.0 COORDINATES FOR THE YEAR 19	000401
00310	71*	1	' I2'//)	000401
00311	72*	62	FORMAT(2X,'ID MAGNITUDE UNIT X UNIT Y UNIT Z	000401
00311	73*	1	NAME'/)	000401
00312	74*	1000	STOP	000401
00313	75*		END	000404

END OF COMPILATION:

NO DIAGNOSTICS.

3PREP

FURPUR 27R2 RL72-8 06/13/78 21:25:47

TABLE I.- Concluded

END PREP.

3XQT
 MAP28R2 RL71-3 06/13/78 21:26:12

ADDRESS LIMITS	001000 012446	4903 IBANK WORDS DECIMAL
STARTING ADDRESS	040000 051367	4856 DBANK WORDS DECIMAL
	012042	

SEGMENT %MAIN\$

- 001000 012446

040000 051367

NSWTC\$/FOR69	\$(1)	001000 001024			
NRBLK\$/FOR-E2	\$(1)	001025 001047			
NRWNDS\$/FOR-E3	\$(1)	001050 001133	\$(2)	040000 040011	
NWEF\$/FOR-E2	\$(1)	001134 001341	\$(2)	040012 040031	
NBDCV\$/FOR-E3	\$(1)	001342 001472	\$(2)	040032 040107	
NFTCH\$/FOR-E2	\$(1)	001473 001755	\$(2)	040110 040123	
NFTV\$/FOR-E2	\$(1)	001756 002000			
NCNVT\$/FOR68	\$(1)	002001 002222	\$(2)	040124 040220	
NCLOS\$/FOR-E3	\$(1)	002223 002460	\$(2)	040221 040246	
NMBLK\$/FOR68	\$(1)	002461 002572			
NBSBL\$/FOR-E3	\$(1)	002573 002627			
NUPDAS\$/FOR68	\$(1)	002630 002663			
NBFQDS			\$(2)	040247 042474	
NOTINS\$/FOR-E3	\$(1)	002664 003160	\$(2)	042475 042500	
NOHT\$/FOR-E3-UPD	\$(1)	003161 004674	\$(2)	042501 042542	
NIOERS\$/FOR-E3	\$(1)	004675 005114	\$(2)	042543 042712	
NININS\$/FOR-E3	\$(1)	005115 005352	\$(2)	042713 042714	
NINPT\$/FOR-E3-CORR	\$(1)	005353 006747	\$(2)	042715 042750	
NEMTS\$/FOR-E3	\$(1)	006750 007632	\$(2)	042751 043025	
NFCHK\$/FOR-E3	\$(1)	007633 010624	\$(2)	043026 043176	
	\$(3)	010625 010625	\$(4)	043177 043250	
VTAB\$/E3-JSC			\$(2)	043251 043310	
FORCOM\$/FOREIN			\$(2)	043311 043316	
NERR\$/FOR-E3	\$(1)	010626 011167	\$(2)	043317 043476	
ERUS\$/SYS72-B					
NERCOM\$/FOR-E3	\$(1)	011170 011247	\$(2)	043477 043512	
FORVCOM\$/FOR-E3			\$(2)	043513 043522	
NSTOP\$/FOR-E3-JSC	\$(1)	011250 011347	\$(2)	043523 043574	
SINCO\$/FOR-E3	\$(1)	011350 011504	\$(2)	043575 043617	
NOBUF\$/FOR68	\$(1)	011505 011545			
NTER\$/FOR-E3	\$(1)	011546 011724	\$(2)	043620 043737	
NIBUF\$/FOR-E2	\$(1)	011725 011754	\$(2)	043740 043740	
NINTR\$/FOR-E3-RLIB	\$(1)	011765 012041	\$(2)	043741 043756	
BLANK\$COMMON(COMMONBLOCK)					
STARR	\$(1)	012042 012446	\$(2)	043757 051367	
			\$(2)	BLANK\$COMMON	

SYS\$*RLIB\$. LEVEL 72-8

END MAP

ORIGINAL PAGE IS
 OF POOR QUALITY

TABLE II.- THE 1950.0 STAR POSITIONS IN M1950.0 COORDINATES

1950 STAR POSITIONS IN M1950.0 COORDINATES

ID	RA(H,MIN,SEC)	PMALPHA	DEC(D,M,S)	PMDEC	MAG	NAME
11	6 42 56.700	-0370000	-16 38 46	-1.21000	3.150000	SIPHIUS
12	5 22 50.500	-0020000	-52 40 4	-0.32000	1.500000	CANOPUS
13	5 12 8.000	0000000	-8 15 29	0.00000	.861000	RIGEL
14	19 35 14.700	0170000	38 44 9	.28000	.803000	VEGA
15	14 0 16.500	-0030000	-67 7 58	-0.03000	.745000	HADAR
16	1 35 51.200	0110000	-57 29 25	-0.03000	.691000	ACHERNAR
17	12 23 48.700	-0050000	-62 49 19	-0.02000	.667000	ACRU X
18	5 12 59.500	0080000	45 56 58	-0.43000	.514000	CAPELLA
19	13 22 33.300	-0030000	-10 54 4	-0.04000	.513000	SPICA
20	14 13 22.800	-0780000	19 26 31	-2.00000	.488000	ARCTURUS
21	7 36 41.100	-0470000	5 21 16	-1.03000	.477000	PPOCYON
22	19 48 20.600	0360000	8 44 5	.38000	.369000	ALTAIR
23	5 52 27.800	0020000	7 23 58	0.01000	.308000	BETELGEUSE
24	5 22 26.900	0000000	6 18 22	-0.31000	.274000	BELLATRIX
25	10 5 42.700	-0170000	12 12 44	-0.00000	.269000	REGULUS
26	22 54 53.500	0250000	-29 53 16	-0.16000	.267000	FOMALHAUT
27	23 39 43.500	0000000	45 6 3	0.00000	.254000	DENER
28	22 5 5.400	0120000	-47 12 15	-0.15000	.205000	ALNAIR
29	13 45 34.300	-0120000	49 33 44	-0.02000	.197000	ALKAID
30	16 26 20.200	-0010000	-26 19 22	-0.03000	.193000	ANTARES
31	7 31 24.700	-0130000	31 59 58	-0.11000	.191000	CASTOR
32	4 33 2.900	0050000	16 24 37	-0.19000	.191000	ALDEBARAN
33	20 21 42.200	0010000	-56 53 50	-0.09000	.188000	PEACOCK
34	9 12 39.700	-0290000	-69 30 40	-0.10000	.187000	MIAPLACIDUS
35	18 52 9.900	0010000	-26 21 39	-0.06000	.183000	NUNKI
36	18 20 51.200	-0030000	-34 24 37	-0.13000	.158000	KAUS AUSTRAL
37	0 5 47.800	0100000	28 48 52	-0.16000	.148000	ALPHERATZ
38	0 53 40.300	0040000	60 26 47	0.00000	.146000	NAVI
39	5 34 49.400	0030000	16 26 37	-0.05000	.137000	ALHANA
40	3 20 44.400	0030000	49 41 6	-0.02000	.116000	MIRFAK
41	11 46 30.600	-0340000	14 51 6	-0.12000	.112000	DENEbola
42	15 32 34.200	0090000	26 52 54	-0.10000	.110000	ALPHECCA
43	17 32 36.700	0080000	12 35 42	-0.23000	.109000	RASALHAGUE
44	10 58 50.300	0100000	56 39 3	0.03000	.096000	MERAK
45	1 48 48.500	0180000	89 1 44	0.00000	.095900	POLARIS
46	11 51 12.600	0110000	53 58 22	0.00000	.090200	ALCOP
47	12 13 13.900	-0110000	-17 15 52	-0.02000	.089300	GIENAH
48	15 14 18.700	-0070000	-9 11 59	-0.03000	.086900	ZUBENESCH
49	2 16 49.000	-0010000	-3 12 13	-0.23000	.082000	MIRA CETI
50	8 21 29.400	-0040000	-59 20 53	-0.01000	.076400	AVIOR
51	16 43 21.000	0040000	-68 56 20	-0.04000	.074000	ATRIA
52	2 4 20.900	0140000	23 13 37	-0.15000	.072000	HAMAL
53	14 3 43.900	-0040000	-36 7 30	-0.52000	.071400	MENKENT
54	0 41 4.800	0160000	-18 15 39	0.04000	.069800	DIPHDA
55	9 25 7.800	-0010000	-8 26 27	0.03000	.068200	ALPHARD
56	9 6 9.300	-0020000	-43 13 48	0.01000	.054000	AL SUHAIL
57	2 56 21.900	-0050000	-40 30 15	0.03000	.054000	ACAMAR
58	21 44 17.000	0180000	-16 21 19	-0.29000	.049500	DENE B ALGEID
59	23 1 20.800	0140000	27 48 40	.14000	.047300	SCHEAT
60	21 41 43.700	0020000	9 38 41	0.00000	.045800	ENIF
61	14 36 11.200	-0490000	-60 37 49	-0.70000	.0709000	RIGIL KENT
62	12 44 47.100	-0050000	-59 24 57	-0.03000	.391000	BE CRUX
63	5 56 39.600	0000000	-28 54 10	0.00000	.317000	ADHARA
64	8 7 59.500	-0010000	-47 11 18	0.00000	.270000	REGOR

TABLE II.- Continued

65	5	33	40.500	.00030000	-1	13	56	.000000	.256000	ANILAM
66	5	38	14.100	.00030000	-1	58	3	.000000	.252000	ALNITAK
67	5	23	7.800	.00230000	28	34	2	.180000	.218000	ELNATH
68	5	20	29.800	.00000000	-17	55	47	.000000	.203000	MUR7IM
69	3	1	49.600	.00330000	-39	51	41	.010000	.196000	NAOS
70	5	45	23.000	.00000000	-9	41	9	.000000	.177000	SAIPH
71	7	42	15.600	.04730000	28	8	55	.050000	.171000	POLLUX
72	5	29	27.000	.00000000	0	20	4	.000000	.168000	MINTAKA
73	12	51	50.100	.01400000	56	13	51	.010000	.164000	ALIO TH
74	15	57	22.300	.00100000	-22	28	52	.030000	.147000	DZUBA
75	8	43	19.400	.00200000	-54	31	29	.080000	.144000	
76	14	38	35.500	.00200000	-47	10	30	.030000	.144000	
77	13	36	42.300	.00330000	-53	12	47	.020000	.143000	
78	5	55	51.600	.00530000	44	56	41	.000000	.139000	MENKLINAN
79	14	32	19.300	.00300000	-41	56	22	.030000	.132000	
80	17	39	1.500	.00100000	-39	0	23	.030000	.130000	
81	3	4	54.400	.00000000	40	52	0	.000000	.129000	BATEN KAITCS
82	9	20	33.900	.00100000	-54	47	48	.000000	.124000	
83	13	21	55.000	.01400000	55	11	9	.030000	.123000	MIZAP
84	17	33	43.400	.00100000	-47	58	5	.000000	.122000	SARGAS
85	12	38	44.900	.02030000	-48	41	8	.020000	.117000	MUHLIFAIN
86	13	52	24.500	.00600000	-47	2	35	.050000	.112000	
87	12	5	45.400	.00430000	-50	26	39	.020000	.109000	
88	7	22	7.000	.00030000	-29	12	16	.000000	.109000	ALUDPA
89	12	28	22.700	.00330000	-56	50	1	.270000	.107000	GACRUX
90	15	2	31.500	.00130000	-19	40	13	.030000	.106000	ACRAE
91	7	6	21.500	.00030000	-26	18	45	.000000	.105000	ALWAZN
92	10	41	10.100	.00330000	-64	7	55	.010000	.102000	
93	14	55	14.800	.00430000	-42	56	2	.050000	.099000	
94	15	34	24.100	.00130000	-10	28	3	.020000	.096800	
95	12	34	10.600	.00630000	-68	51	37	.020000	.094000	
96	15	32	45.900	.00130000	-28	6	51	.030000	.092000	
97	0	10	39.400	.00000000	14	54	20	.010000	.090500	ALGENIB
98	11	0	39.500	.01730000	62	1	17	.070000	.090000	DUBHE
99	12	12	28.600	.00500000	-58	28	15	.020000	.089000	
100	15	31	48.000	.00130000	-41	0	1	.030000	.089000	
101	15	18	8.700	.00130000	-25	28	29	.030000	.088000	
102	9	15	45.100	.00200000	-59	3	54	.000000	.086000	SCUTULUM
103	23	2	16.100	.00400000	14	56	9	.040000	.085900	MARKAB
104	3	54	29.500	.00200000	39	52	2	.030000	.085100	
105	0	6	29.800	.06800000	58	52	27	.180000	.084300	GAPH
106	5	37	50.200	.00030000	-34	5	59	.030000	.084000	PHACT
107	17	7	30.500	.00200000	-15	39	53	.090000	.083100	SABIK
108	15	55	49.300	.00100000	-25	58	18	.030000	.083000	
109	5	56	18.700	.00430000	37	12	40	.080000	.080000	
110	17	27	58.300	.00300000	-49	50	20	.080000	.076300	
111	16	48	28.700	.00130000	-37	57	49	.030000	.076000	
112	21	17	23.200	.02100000	62	22	24	.050000	.075900	ALDERAMIN
113	18	59	25.900	.00200000	-29	57	13	.000000	.074000	ASCELLA
114	5	34	39.300	.00000000	21	6	50	.020000	.073600	
115	10	17	13.100	.07200000	20	5	43	.150000	.072700	ALGEIBA
116	20	20	25.900	.00000000	40	5	44	.000000	.071400	SADIP
117	11	11	27.100	.01000000	20	47	52	.140000	.071300	ZOZCA
118	6	18	23.600	.00000000	-30	2	24	.000000	.070000	
119	7	0	56.200	.00000000	-23	45	33	.000000	.070000	
120	13	46	35.700	.00200000	-42	13	32	.020000	.067000	
121	12	43	11.500	.00500000	-67	50	5	.030000	.067000	
122	7	24	26.400	.00300000	8	23	30	.040000	.066600	GOMEISA
123	5	30	31.400	.00000000	-17	51	24	.000000	.066600	APNEB

TABLE II.- Concluded

124	1	22	31.500	.0400000	59	58	34	-.05000	.066100	RUCHFACH
125	3	50	59.000	.0010000	31	44	12	-.01000	.065400	
126	1	51	52.300	.0070000	20	33	52	-.11000	.065300	SHERATAN
127	21	28	1.400	.0020000	70	20	28	.01000	.065300	ALPHIRK
128	1	6	55.500	.0140000	35	21	22	-.11000	.065100	MIPACH
129	14	55	53.900	-.0020000	-41	54	18	-.03000	.065000	
130	13	17	46.700	-.0280000	-36	26	57	-.09000	.064000	
131	12	53	41.500	-.0200000	38	35	17	.05000	.063800	COR CAROL I
132	14	50	49.700	-.0080000	74	21	35	.01000	.063400	KOCHAB
133	22	39	41.400	.0130000	-47	8	48	-.01000	.063000	
134	3	39	21.300	-.0030000	47	37	46	-.04000	.061900	
135	5	5	23.400	-.0060000	-5	8	58	-.08000	.061000	KURS A
136	19	43	24.600	.0040000	45	3	28	.04000	.060600	
137	2	0	49.200	.0040000	42	5	27	-.05000	.060000	ALMACH
138	14	48	6.500	-.0070000	-15	50	7	-.07000	.059600	ZUBENELGENUB
139	21	50	54.400	.0080000	-37	36	4	-.01000	.059000	
140	15	14	12.600	-.0110000	-68	29	49	-.03000	.058000	
141	3	37	39.300	.0060000	56	15	49	-.03000	.057700	SCHE DAR
142	12	27	16.400	-.0150000	-16	14	14	-.14000	.057500	ALGORAB
143	14	42	48.200	-.0040000	27	17	2	.01000	.055700	IZAR
144	17	55	26.600	-.0010000	51	29	38	-.02000	.055000	ELTAMIN
145	15	46	55.200	-.0490000	-34	12	16	-.26000	.054000	
146	12	39	7.500	-.0380000	-1	10	32	.00000	.054000	
147	19	3	6.700	-.0010000	13	47	15	-.10000	.053700	
148	13	52	18.200	-.0040000	18	38	51	-.36000	.052100	MUFRIID
149	11	33	27.900	-.0050000	-62	44	35	-.02000	.051000	
150	23	44	11.200	.0280000	33	46	55	.32000	.050800	
151	3	23	49.000	.0180000	-42	34	39	-.40000	.050700	ANKA A
152	1	57	11.700	.0370000	-61	48	45	.03000	.050000	
153	9	45	51.200	-.0020000	-64	50	22	.00000	.049000	
154	15	20	47.400	-.0040000	72	0	43	.02000	.048600	
155	8	5	24.800	-.0060000	-24	9	32	.05000	.047000	
156	2	6	33.600	.0120000	34	45	6	-.04000	.046400	
157	19	6	47.400	.0000000	-21	6	18	-.04000	.046000	
158	15	50	43.000	-.0280000	-63	15	43	-.40000	.046000	
159	16	39	24.000	-.0370000	31	41	32	.38000	.045900	

TABLE III.- THE SHUTTLE STAR CATALOG
1980 STAR POSITIONS IN M1950.0 COORDINATES

ID	RA(+DEG)	DEC(DEG)	NAME
11	100.7316	16.6562S	SIRIUS
12	95.7107	52.6676S	CANOPUS
13	78.0333	8.2581S	RIGEL
14	278.8134	38.7382N	VEGA
15	210.0684	60.1330S	HADAR
16	23.9647	57.4905S	ACHERNAR
17	185.9523	62.8221S	ACRUX
18	78.2489	45.9459N	CAPELLA
19	270.6384	10.9014S	SPICA
20	213.3353	19.4253N	ARCTURUS
21	114.1654	5.3459N	PROCYON
22	297.0903	8.7379N	ALTAIR
23	88.1161	7.3995N	BETELGEUSE
24	80.6121	6.3060N	BELLATRIX
25	151.4258	12.2122N	REGULUS
26	343.7260	29.8891S	FOMALHAUT
27	379.9313	45.1008N	DENEK
28	331.2740	47.2054S	AL NA IR
29	276.3914	49.5621N	ALKAID
30	246.5840	26.3230S	ANTARES
31	112.8513	31.9985N	CASTOR
32	68.2627	16.4087N	ALDEBARAN
33	305.4260	56.8980S	PEACOCK
34	138.1518	69.5103S	MIAPLACIDUS
35	283.0414	26.3613S	NUNKI
36	275.2130	34.4114S	KAUS AUSTRAL
37	1.4504	28.8131N	ALPHERATZ
38	13.4184	60.4464N	NAVI
39	98.7062	16.4432N	ALHENA
40	50.1854	49.6848N	MIRFAK
41	176.6233	14.8507N	DENEbola
42	233.1436	26.8808N	ALPHECCA
43	263.1539	12.5931N	RASALHAGUE
44	164.7108	56.6511N	MERAK
45	27.2247	89.0289N	POLARIS
46	177.8039	53.9728N	ALCOR
47	183.3065	17.2643S	GIENAH
48	228.5770	9.2000S	ZUBENESCH
49	34.2040	3.2055S	MIRA CETI
50	125.3720	59.3480S	AVIOR
51	250.8380	68.9392S	ATRIA
52	31.0888	23.2257N	HAMAL
53	210.9275	36.1293S	MENKENT
54	10.2720	18.2605S	DIPHDA
55	141.2824	8.4406S	ALPHARD
56	136.5385	43.2299S	AL SUHAIL
57	44.0906	40.5039S	ACAMAR
58	326.0731	16.3577S	DENEK ALGEID
59	345.3384	27.8123N	SCHEAT
60	325.4323	9.6447N	ENIF
61	218.9854	60.6244S	RIGIL KENT
62	191.1956	59.4161S	BECRUX
63	104.1650	28.9028S	ADHARA
64	121.9978	47.1883S	REGOR

ORIGINAL PAGE IS
OF POOR QUALITY

TABLE III.- Continued

65	83.4188	1.2322S	ANILAM
66	84.5588	1.9675S	ALNITAK
67	80.7927	28.5657N	EL NATH
68	95.1242	17.9297S	MURZIM
69	120.4563	39.6613S	NAOS
70	86.3458	9.6858S	SAIPH
71	115.5591	28.1482N	ROLLUX
72	82.3625	.3344S	MINTAKA
73	192.9605	56.2308N	ALIOTH
74	239.3428	22.4814S	DZUBA
75	130.8311	54.5254S	
76	219.6477	47.1753S	
77	204.1759	53.2132S	
78	88.9644	44.9447N	MENKLINAN
79	218.0800	41.9397S	
80	264.7561	39.0066S	
81	46.2267	40.7644N	BATEN KAITOS
82	140.1411	54.7967S	
83	200.4809	55.1856N	MIZAR
84	263.4310	42.9681S	SARGAS
85	189.6846	48.6857S	MUHLIFAIN
86	208.1013	47.0435S	
87	181.4387	50.4443S	
88	110.5292	29.2044S	ALUDPA
89	187.0942	56.8359S	GACRUX
90	240.6311	19.6705S	ACRAB
91	106.5896	26.3125S	AL WAZN
92	160.2917	64.1319S	
93	223.8112	42.9343S	
94	248.6005	10.4673S	
95	188.5443	68.8604S	
96	248.1911	28.1144S	
97	2.6642	14.9055N	ALGENIB
98	165.1625	62.0208N	DUBHE
99	183.1185	58.4710S	
100	232.9499	41.0005S	
101	244.5361	25.4750S	
102	138.9377	59.0650S	SCUTULUM
103	345.5576	14.9355N	MARKAB
104	58.6232	39.8670N	
105	1.6327	58.8727N	CAPH
106	84.4592	34.1000S	PHACT
107	256.8773	15.6640S	SABIK
108	238.9553	25.9719S	
109	89.0784	37.2104N	
110	261.9925	49.8396S	
111	252.1195	37.9639S	
112	319.3493	62.3737N	ALDERAMIN
113	284.6577	29.9536S	ASCELLA
114	83.6637	21.1137N	
115	154.3073	20.0940N	ALGEIBA
116	305.1079	40.0956N	SADIR
117	167.8642	20.7966N	ZOZCA
118	94.5983	30.0400S	
119	105.2342	23.7592S	
120	206.6485	42.2257S	
121	190.7973	67.8350S	
122	111.1096	8.3913N	GOMEISA
123	82.6308	17.8567S	ARNEB

TABLE III.- Continued

124	20.6362	59.9757N	RUCHBACH
125	57.7460	31.7366N	
126	27.9688	20.5635N	SHERATAN
127	322.0061	70.3412N	ALPHIRK
128	16.7330	35.3552N	MIRACH
129	223.9743	41.9052S	
130	199.4411	36.4499S	
131	193.4204	38.5885N	COR CAROLI
132	222.7061	74.3598N	KOCHAB
133	339.9241	47.1467S	
134	54.8391	47.6291N	
135	76.3468	5.1501S	KURSA
136	295.8530	45.0081N	
137	30.2055	42.0904N	ALMACH
138	222.0262	15.8359S	ZUBENELGENUB
139	327.7277	37.6012S	
140	228.5511	68.4972S	
141	9.4145	56.2634N	SCHE DAR
142	186.8165	16.2384S	ALGORAB
143	220.7003	27.2840N	IZAR
144	268.8507	51.4937N	ELTAMIN
145	251.7239	34.2066S	
146	189.7765	1.1756S	
147	285.7778	13.7867N	
148	208.0753	18.6445N	MUFRI D
149	173.3556	62.7432S	
150	311.0502	33.7846N	
151	5.9564	42.5808S	ANKAA
152	29.3034	61.8123S	
153	146.4631	64.8394S	
154	230.1970	72.0121N	
155	121.3526	24.1585S	
156	31.6415	34.7513N	
157	286.6975	21.1053S	
158	237.6757	63.2819S	
159	249.8454	31.6054N	

TABLE III.- Continued

UNIT VECTORS IN M1950.0 COORDINATES FOR THE YEAR 1980

ID	MAGNITUDE	UNIT X	UNIT Y	UNIT Z	NAME
11	3.1500	-.1783960	.9412859	-.2866281	SIRIUS
12	1.5000	-.0603436	.6034283	-.7951308	CANOPUS
13	.8610	.2051927	.9681249	-.1436318	RIGEL
14	.8030	.1195109	-.7708039	.6257624	VEGA
15	.7450	-.4309728	-.2495085	-.8671839	HADAR
16	.6910	.4911095	.2182937	-.8433026	ACHERNAR
17	.6670	-.4542921	-.0473656	-.8895927	ACRUX
18	.5140	.1416127	.6807646	.7186831	CAPELLA
19	.5130	-.9189358	-.3461078	-.1891202	SPICA
20	.4880	-.7879112	-.5182551	.3325772	ARCTURUS
21	.4770	-.4075911	.9083993	.0931676	PROCYON
22	.3690	.4501091	-.8799567	.1519145	ALTAIR
23	.3080	.0326009	.9911362	.1287874	BETELGEUSE
24	.2740	.1621309	.9806370	.1098389	BELLATRIX
25	.2690	-.8583254	.4674731	.2115333	PEGULUS
26	.2670	.8322535	-.2429575	-.4983230	FOomalhaut
27	.2540	.4530697	-.5412652	.7083501	DENEb
28	.2050	.5957603	-.3265208	-.7337941	ALNAIR
29	.1970	-.5810234	-.2883140	.7611089	ALKAID
30	.1930	-.3561961	-.8224919	-.4434315	ANTARES
31	.1910	-.3293369	.7815023	.5298975	CASTOR
32	.1910	.3552674	.8910590	-.2824870	ALDEBARAN
33	.1880	.3165653	-.4450237	-.8376994	PEACOCK
34	.1870	-.2607903	.2334866	-.9367350	MIAPLACIDUS
35	.1830	.2021890	-.8729012	-.4440306	NUNKI
36	.1580	.0749577	-.8215891	-.5651306	KAUS AUSTRAL
37	.1480	.8759157	.0221781	.4819542	ALPHERATZ
38	.1460	.4797730	.1144610	.8698946	NAVI
39	.1370	-.1451771	.9480496	.2830646	ALHENA
40	.1160	.4142725	.4969673	.7624971	MIRFAK
41	.1120	-.9649189	.0569338	.2563006	DENEbola
42	.1100	-.5350009	-.7136853	.4521364	ALPHECCA
43	.1090	-.1163350	-.9689846	.2180254	RASALHAGUE
44	.0960	-.5302795	.1449603	.8353383	MERAK
45	.0959	.0150707	.0077535	.9998564	POLARIS
46	.0902	-.5877376	.0225388	.8087376	ALCOR
47	.0893	-.9533563	-.0550794	-.2967796	GIENAH
48	.0869	-.6531016	-.7402002	-.1598807	ZUBENESCH
49	.0820	.8257469	.5612622	-.0559178	MIRACETI
50	.0764	-.2951276	.4157150	-.8602794	AVIOR
51	.0740	-.1179558	-.3394476	-.9331997	ATRIA
52	.0720	.7869665	.4745194	.3943541	HAMAL
53	.0714	-.6928494	-.4151143	-.5896099	MENKENT
54	.0698	.9344211	.1693414	-.3133378	DIPHDA
55	.0682	-.7717870	.6187079	-.1467837	ALPHARD
56	.0540	-.5288527	.5011875	-.6849276	ALSUHAIL
57	.0540	.5461222	.5290560	-.6495000	ACAMAR
58	.0495	.7961636	-.5355430	-.2816330	DENERALGEID
59	.0473	.8556802	-.2238705	.4665762	SCHEAT
60	.0458	.8118175	-.5593596	.1675383	ENIF
61	.7090	-.3812936	-.3086048	-.8714232	RIGIL KENT
62	.3910	-.4991173	-.0987883	-.8608849	BECRUX
63	.3170	-.2142337	.8488233	-.4833248	ADHARA
64	.2700	-.3601060	.5763395	-.7335915	REGOR

ORIGINAL PAGE IS
OF POOR QUALITY

TABLE III.- Continued

65	.2560	.1145856	.9931806	-.0215047	ANILAM
66	.2520	.0947691	.9949071	-.0343326	ALNITAK
67	.2180	.1406798	.8669291	-.4781665	EL NATH
68	.2030	.0849768	.9476324	-.3078502	MURZIM
69	.1960	.3890809	.6616820	-.6409314	NAOS
70	.1770	.0628255	.9837410	-.1682457	SAIPH
71	.1710	.3804157	.7954447	-.4717537	POLLUX
72	.1680	.1329029	.9911119	-.0058371	MINTAKA
73	.1640	.5416892	-.1246655	-.8312829	ALIOTH
74	.1470	.4711502	-.7948590	-.3823829	DZUBA
75	.1440	.3794458	.4391104	-.8143728	
76	.1440	.5234020	-.4337298	-.7334363	
77	.1430	.5463162	-.2452478	-.8008696	
78	.1390	.0127926	-.7076730	-.7064242	MENKLINAN
79	.1320	.5855204	-.4587774	-.6683480	
80	.1300	.0710207	-.7738208	-.6294104	
81	.1290	.5239750	.5469054	-.6529507	BATEN KAITOS
82	.1240	.4425206	.3694653	-.8171114	
83	.1230	.5348316	-.1997623	-.8210056	MIZAR
84	.1220	.0837107	-.7269298	-.6815905	SARGAS
85	.1170	.6507804	-.1110597	-.7510996	MUHLIFAIN
86	.1120	.6011119	-.3209819	-.7318709	
87	.1090	.6366269	-.0159887	-.7710062	
88	.1090	.3061066	.8174507	-.4879274	ALUDRA
89	.1070	.5428515	-.0675600	-.8371069	GACRUX
90	.1060	.4618107	-.8206241	-.3366109	ACRAB
91	.1050	.2559319	.8590771	-.4432668	AL WAZN
92	.1020	.4107437	.1471346	-.8998005	
93	.0990	.5283273	-.5068453	-.6811593	
94	.0960	.3587962	-.9155651	-.1816749	
95	.0940	.3566382	-.0535816	-.9327048	
96	.0920	.3276764	-.8188815	-.4712338	
97	.0905	.9653070	.0449177	.2572251	ALGENIB
98	.0900	.4535075	.1201398	.8831180	DUBHE
99	.0890	.5221557	-.0284484	-.8523756	
100	.0890	.4547191	-.6023354	-.6560660	
101	.0880	.3881401	-.8150747	-.4301168	
102	.0860	.3876729	.3376791	-.8577510	SCUTULUM
103	.0859	.9357250	-.2408178	.2577315	MAR KAB
104	.0851	.3996281	.6552915	.6410073	
105	.0843	.5167319	.0147285	.8560206	CAPH
106	.0840	.0799535	.8241916	-.5606386	PHACT
107	.0831	.2186050	-.9377177	-.2699950	SABIK
108	.0830	.4636249	-.7702394	-.4379306	
109	.0800	.0128096	.7963167	.6047443	
110	.0760	.2898401	-.6386421	-.7642414	
111	.0760	.2420648	-.7503183	-.6151643	
112	.0759	.3518084	-.3020768	.8859912	ALDERAMIN
113	.0740	.2221688	-.8374616	-.4992987	ASCELLA
114	.0736	.1029542	.9271687	.3602202	
115	.0727	.8462806	.4071540	.3435618	ALGEIBA
116	.0714	.4399490	-.6258004	.6440643	SADIR
117	.0713	.9139547	.1965329	.3550517	ZOZCA
118	.0700	.0694012	.8628897	-.5006045	
119	.0700	.2404945	.8830852	-.4028931	
120	.0670	.6618430	-.3321273	-.6720531	
121	.0670	.3705963	-.0706769	-.9261010	
122	.0666	.3562979	.9229059	.1459334	GOMEISA
123	.0666	.1220831	.9439648	-.3066368	ARNEB

TABLE III.- Continued

124	.0661	.4682621	.1763464	.8658132	RUC HBACH
125	.0654	.4538768	.7192387	.5260148	
126	.0653	.8269284	.4391080	.3512457	SHERATAN
127	.0653	.2651232	-.2070917	.9417127	ALPHIRK
128	.0651	.7810463	.2348155	.5786436	MIRACH
129	.0650	-.5356004	-.5167599	-.6679007	
130	.0640	-.7585144	-.2677265	-.5941199	
131	.0638	-.7603018	-.1814158	.6237223	COR CAROLI
132	.0634	-.1981102	-.1828498	.9629737	KOC HAB
133	.0630	.6387979	-.2334620	-.7330981	
134	.0619	.3880972	.5509612	-.7387979	
135	.0610	.2350924	.9678191	-.0897654	KURSA
136	.0606	.3082999	-.6362465	.7072069	
137	.0600	.6413321	.3733466	.6703025	ALMACH
138	.0596	-.7146460	-.6440623	-.2728824	ZUBENELGENUB
139	.0590	.6698857	-.4230317	-.6101617	
140	.0580	-.2426362	-.2747439	-.9303996	
141	.0577	.5478958	.0908460	.8315991	SCHEDAR
142	.0575	-.9533200	-.1139542	-.2796344	ALGORAB
143	.0557	-.6737851	-.5795534	.4584009	IZAR
144	.0550	-.0123792	-.6224773	.7825399	ELTAMIN
145	.0540	-.2593495	-.7852979	-.5621788	
146	.0540	-.9852702	-.1697696	-.0205159	
147	.0537	.2640735	-.9345987	.2383075	
148	.0521	-.8360253	-.4459335	.3196953	MUFRID
149	.0510	-.4549123	.0529118	-.8889630	
150	.0508	.5458218	-.6267871	.5560724	
151	.0507	.7323482	.0764097	-.6766297	ANKAA
152	.0500	.4119191	.2311901	-.8814045	
153	.0490	-.3543805	.2348879	-.9051200	
154	.0486	-.1976885	-.2372479	.9511218	
155	.0470	-.4747333	.7791874	-.4092618	
156	.0464	.6994955	.4310312	.5700159	
157	.0460	.2680453	-.8935835	-.3600836	
158	.0460	-.2404065	-.3799281	-.8932297	
159	.0459	-.2931657	-.7987524	.5254032	

ORIGINAL PAGE IS
OF POOR QUALITY

TABLE III.- Continued

1981 STAR POSITIONS IN M1950.0 COORDINATES

ID	RA (+DEG)	DEC (DEG)	NAME
11	100.7315	16.6565S	SIRIUS
12	95.7107	52.6676S	CANOPUS
13	78.0333	8.2581S	RIGEL
14	278.8134	38.7382N	VEGA
15	210.0684	60.1330S	HADAR
16	23.9648	57.4905S	ACHERNAR
17	185.9523	62.8221S	ACRUX
18	78.2489	45.9457N	CAPELLA
19	200.6384	10.9015S	SPICA
20	213.3349	19.4247N	ARCTURUS
21	114.1652	5.3456N	PROCYON
22	297.0905	8.7380N	ALTAIR
23	88.1161	7.3995N	BETELGEUSE
24	80.6121	6.3060N	BELLATRIX
25	151.4257	12.2122N	REGULUS
26	343.7261	29.8892S	FOMALHAUT
27	309.9313	45.1008N	DENER
28	331.2740	47.2055S	AL NAIR
29	206.3914	49.5621N	ALKAID
30	246.5840	26.3230S	ANTARES
31	112.8512	31.9985N	CASTOR
32	68.2627	16.4086N	ALDEBARAN
33	305.4260	56.8980S	PEACOCK
34	138.1617	69.5103S	MIAPLACIDUS
35	283.0414	26.3614S	NUNKI
36	275.2129	34.4114S	KAUS AUSTRAL
37	1.4505	28.8131N	ALPHERATZ
38	13.4184	60.4464N	NAVI
39	98.7062	16.4432N	ALHENA
40	50.1854	49.6848N	MIRFAK
41	176.6231	14.8506N	DENEbola
42	233.1437	26.8808N	ALPHECCA
43	263.1539	12.5930N	RASALHAGUE
44	164.7109	56.6511N	MERAK
45	27.2255	89.0289N	POLARIS
46	177.8039	53.9728N	ALCOR
47	183.3065	17.2643S	GIENAH
48	228.5770	9.2000S	ZUBENESCH
49	34.2040	3.2056S	MIRA CETI
50	125.3720	59.3480S	AVIOR
51	250.8380	68.9392S	ATRIA
52	31.0889	23.2257N	HAMAL
53	210.9274	36.1295S	MENKENT
54	16.2721	18.2605S	DIPHDA
55	141.2824	8.4406S	ALPHARD
56	136.5385	43.2299S	AL SUHAIL
57	44.0906	40.5039S	ACAMAR
58	326.0732	16.3578S	DENEb ALGEID
59	345.3385	27.8123N	SCHEAT
60	325.4323	9.6447N	ENIF
61	218.9834	60.6243S	RIGIL KENT
62	191.1956	59.4161S	BECRUX
63	104.1650	28.9028S	ADHARA
64	121.9978	47.1883S	REGOR

TABLE III.- Continued

65	83.4188	1.2322S	ANILAM
66	84.5588	1.9675S	ALNITAK
67	80.7828	28.5657N	EL NATH
68	95.1242	17.9297S	MURZIM
69	120.4563	39.8613S	NAOS
70	86.3458	9.6858S	SAIPH
71	115.5589	28.1482N	POLLUX
72	82.3625	.3344S	MINTAKA
73	192.9506	56.2307N	ALIO TH
74	239.3428	22.4814S	DZUBA
75	130.8311	54.5254S	
76	219.6477	47.1753S	
77	204.1759	53.2132S	
78	88.9544	44.9447N	MENKLINAN
79	218.4800	41.9397S	
80	264.7561	39.0066S	
81	46.2267	40.7644N	BATEN KAITOS
82	140.1411	54.7967S	
83	200.4810	55.1856N	MIZAR
84	263.4310	42.9681S	SARGAS
85	189.6845	48.6857S	MUHLIFAIN
86	208.1013	47.0435S	
87	181.4387	50.4443S	
88	110.5292	29.2044S	ALUDRA
89	187.0942	56.8359S	GACRUX
90	240.6311	19.6705S	ACRAB
91	106.5896	26.3125S	AL WAZN
92	160.2917	64.1319S	
93	223.8112	42.9343S	
94	248.6005	10.4673S	
95	188.5442	68.8604S	
96	248.1911	28.1144S	
97	2.6642	14.9055N	ALGENIB
98	165.1624	62.0208N	DUBHE
99	183.1185	58.4710S	
100	232.9499	41.0005S	
101	244.5361	25.4750S	
102	138.9377	59.0650S	SCUTULUM
103	345.5676	14.9355N	MARKAB
104	58.6232	39.8670N	
105	1.6329	58.8726N	CAPH
106	84.4592	34.1000S	PHACT
107	256.8773	15.6639S	SABIK
108	238.9553	25.9719S	
109	89.0784	37.2104N	
110	261.9925	49.8396S	
111	252.1195	37.9639S	
112	319.3494	62.3738N	ALDERAMIN
113	284.8577	29.9536S	ASCELLA
114	83.6637	21.1137N	
115	154.3074	20.0940N	ALGEIBA
116	305.1079	40.0956N	SADIP
117	167.8642	20.7966N	ZOZCA
118	94.5983	30.0400S	
119	105.2342	23.7592S	
120	206.6485	42.2257S	
121	190.7973	67.8350S	
122	111.1096	8.3913N	GOMEISA
123	82.6308	17.8567S	ARNEB

ORIGINAL PAGE IS
OF POOR QUALITY

TABLE III.- Continued.

124	20.6364	59.9757N	RUCHBACH
125	57.7460	31.7366N	
126	27.9588	20.5635N	SHERATAN
127	322.0061	70.3412N	ALPHIRK
128	16.7331	35.3552N	MIRACH
129	223.9743	41.9053S	
130	199.4410	36.4499S	
131	193.4203	38.5885N	COP CAROL I
132	222.7061	74.3598N	KOCHAB
133	339.9242	47.1468S	
134	54.8391	47.6291N	
135	76.3467	5.1501S	KURSA
136	295.8530	45.0081N	
137	30.2055	42.0904N	ALMACH
138	222.0262	15.8359S	ZUBENELGENUB
139	327.7277	37.6012S	
140	228.5511	68.4972S	
141	9.4145	56.2634N	SCHEDAR
142	186.8164	16.2384S	ALGORAB
143	220.7003	27.2840N	IZAR
144	268.6507	51.4937N	ELTAMIN
145	251.7237	34.2067S	
146	189.7763	1.1756S	
147	285.7778	13.7866N	
148	208.0753	18.6444N	MUFRI'D
149	173.3656	62.7432S	
150	311.0503	33.7847N	
151	5.9565	42.5809S	ANKA-A
152	29.3035	61.8122S	
153	146.4531	64.8394S	
154	230.1970	72.0121N	
155	121.3526	24.1585S	
156	31.6415	34.7513N	
157	286.6975	21.1053S	
158	237.6756	63.2821S	
159	249.8452	31.6955N	

TABLE III.- Continued

UNIT VECTORS IN M1950.J COORDINATES FOR THE YEAR 1981

ID	MAGNITUDE	UNIT X	UNIT Y	UNIT Z	NAME
11	3.1500	-.1783931	.9412848	-.2866337	SIRIUS
12	1.5000	-.0603437	.6034283	-.7951307	CANOPUS
13	.8610	.2051927	.9681249	-.1436318	PIGEL
14	.8030	.1195117	-.7708029	.6257634	VEGA
15	.7450	-.4309727	-.2495083	-.8671840	HADAR
16	.6910	.4911093	-.2182940	-.8433027	ACHERNAR
17	.6670	-.4542920	-.0473654	-.8895927	ACRUX
18	.5140	.1416126	.6807661	.7186816	CAPELLA
19	.5130	-.9189358	-.3461076	-.1891204	SPICA
20	.4880	-.7879168	-.5182524	.3325681	ARCTURUS
21	.4770	-.4075882	.9084011	.0931626	PROCYON
22	.3690	.4501113	-.8799552	.1519163	ALTAIR
23	.3080	.03226007	.9911362	.1287875	BETELGEUSE
24	.2740	.1621310	.9806370	.1092388	BELLATRIX
25	.2690	-.8583248	.4674752	.2115333	REGULUS
26	.2670	.8322536	-.2429548	-.4983236	FOMALHAUT
27	.2540	.4530697	-.5412652	.7083501	DENER
28	.2050	.5957602	-.3265201	-.7337946	ALNAIR
29	.1970	-.5810237	-.2883136	.7611089	ALKAID
30	.1930	-.3561961	-.8224918	-.4434316	ANTARES
31	.1910	-.3293362	.7815029	.5298970	CASTOR
32	.1910	.3552672	.8910594	.2824861	ALDEBARAN
33	.1880	.3165652	-.4450234	.8376996	PEACOCK
34	.1870	-.2607901	.2334874	-.9367348	MIAPLACIDUS
35	.1830	.2021890	-.8729010	-.4440309	NUNKI
36	.1580	.0749575	-.8215888	-.5651311	KAUS AUSTRAL
37	.1480	.9759160	.0221788	.4819535	ALPHERATZ
38	.1460	.4797730	.1144612	.8698946	NAVI
39	.1370	-.1451773	.9480496	.2830644	ALHENA
40	.1160	.4142724	.4969674	.7624970	MIRFAK
41	.1120	-.9649189	.0569363	.2563001	DENEbola
42	.1100	-.5350006	-.7136858	.4521359	ALPHECCA
43	.1090	-.1163345	-.9689849	.2180243	RASALHAGUE
44	.0960	-.5302795	.1449599	.8353384	MERAK
45	.0950	.0150706	.0077537	.9998564	POLARIS
46	.0902	-.5877376	.0225384	.8087376	ALCOR
47	.0893	-.9533563	-.0550786	-.2967795	GIENAH
48	.0869	-.6531020	-.7401999	-.1598809	ZUBENESCH
49	.0820	.8257469	.5612621	-.0559189	MIRA CETI
50	.0764	-.2951275	.4157151	-.8602794	AVICOR
51	.0740	-.1179556	-.3394474	-.9331998	ATRIA
52	.0720	.7869662	.4745203	.3943534	HAMAL
53	.0714	-.6928494	-.4151113	-.5896120	MENKENT
54	.0698	.9344210	.1693425	-.3133377	DIPHDA
55	.0682	-.7717869	.6187079	-.1467836	ALPHARD
56	.0540	-.5288527	.5011876	-.6849276	AL SUHAIL
57	.0540	.5461225	.5290559	-.6494999	ACAMAR
58	.0495	.7961640	-.5355417	-.2816344	DENER ALGEID
59	.0473	.8556802	-.2238695	.4665768	SCHEAT
60	.0458	.8118176	-.5593595	.1675383	ENIF
61	.0409	-.3813068	-.3085930	-.8714215	RIGIL KENT
62	.0391	-.4991172	-.0987881	-.8608850	BE CRUX
63	.0317	-.2142337	.8488233	-.4833248	ADHARA
64	.0270	-.3601059	.5763395	-.7335915	REGOR

TABLE III.- Continued

65	.2560	.1145856	.9931806	-.0215047	ANILAM
66	.2520	.0947691	.9949071	-.0343326	ALNITAK
67	.2180	.1406797	.8669295	-.4781657	EL NATH
68	.2030	-.0849768	.9476324	-.3078502	MURZIM
69	.1960	-.3890807	.6616821	-.6409313	NAOS
70	.1770	-.0628255	.9837410	-.1682457	SAIPH
71	.1710	-.3604131	.7954461	-.4717535	POLLUX
72	.1680	.1329029	.9911119	-.0058371	MINTAKA
73	.1640	-.5416892	-.1246660	.8312829	ALIOTH
74	.1470	-.4711502	-.7948589	-.3823830	DZUBA
75	.1440	-.3794456	.4391101	-.8143730	
76	.1440	-.5234020	-.4337296	-.7334364	
77	.1430	-.5463162	-.2452476	-.8008696	
78	.1390	.0127929	.7076730	.7064242	MENKLINAN
79	.1320	-.5855205	-.4587772	-.6683482	
80	.1300	-.0710208	-.7738207	-.6294105	
81	.1290	.5239750	.5469054	.6529507	BATEN KAITOS
82	.1240	-.4425205	.3694653	-.8171114	
83	.1230	-.5348315	-.1997629	-.8210055	MIZAR
84	.1220	-.0837107	-.7269298	-.6815905	SARGAS
85	.1170	-.6507804	-.1110587	-.7510997	MUHLIFAIN
86	.1120	-.6011119	-.3209915	-.7318711	
87	.1090	-.6366268	-.0159885	-.7710063	
88	.1090	-.3061066	.8174507	-.4879274	ALUDRA
89	.1070	-.5428504	-.0675597	-.8371076	GACPUX
90	.1060	-.4618108	-.8206240	-.3366111	ACPAB
91	.1050	-.2559319	.8590771	-.4432668	AL WAZN
92	.1020	-.4107437	.1471347	-.8998005	
93	.0990	-.5283273	-.5068451	-.6811595	
94	.0960	-.3587961	-.9155652	-.1816748	
95	.0940	-.3566382	-.0535814	-.9327048	
96	.0920	-.3276764	-.8188814	-.4712340	
97	.0905	.9653070	.0449177	.2572250	ALGENIB
98	.0900	-.4535076	.1201404	.8831178	DUBHE
99	.0890	-.5221556	-.0284482	-.8523756	
100	.0890	-.4547191	-.6023353	-.6560661	
101	.0880	-.3881402	-.8150746	-.4301169	
102	.0860	-.3876028	.3376791	-.8577510	SCUTULUM
103	.0859	.9357251	-.2408176	.2577313	MARKAB
104	.0851	.3996281	.6552917	.6410072	
105	.0843	.5167326	.0147310	.8560201	CAPH
106	.0840	.0799535	.8241915	-.5606387	PHACT
107	.0831	-.2186048	-.9377179	-.2699946	SABIK
108	.0830	-.4636250	-.7702393	-.4379307	
109	.0800	.0128094	.7963169	.6047440	
110	.0760	-.0898402	-.6386418	-.7642417	
111	.0760	-.2420649	-.7503181	-.6151644	
112	.0759	.3518087	-.3020762	.8859913	ALDERAMIN
113	.0740	.2221686	-.9374616	-.4992987	ASCELLA
114	.0736	.1029542	.9271687	.3602201	
115	.0727	-.8462815	.4071528	-.3435611	ALGEIBA
116	.0714	.4399490	-.6258004	.6440643	SADIR
117	.0713	-.9139550	.1965323	.3550510	ZOZCA
118	.0700	-.0694012	.8628897	-.5006045	
119	.0700	-.2404945	.8830852	-.4028931	
120	.0670	-.6618430	-.3321272	-.6720532	
121	.0670	-.3705962	-.0706767	-.9261011	
122	.0666	-.3562977	.9229060	.1459332	GOMEISA
123	.0666	.1220831	.9439648	-.3066368	ARNEB

ORIGINAL PAGE IS
OF POOR QUALITY

TABLE III.- Continued

124	.0661	.4682618	.1763478	.8658131	RUCHBACH
125	.0654	.4538767	.7192388	.5260147	
126	.0653	.8269283	.4391085	.3512452	SHERATAN
127	.0653	.2651232	-.2070916	.9417127	ALPHERK
128	.0651	.7810463	.2348164	.5786431	MIRACH
129	.0650	-.5356005	-.5167597	-.6679009	
130	.0640	-.7585147	-.2677249	-.5941202	
131	.0638	-.7603019	-.1814146	.6237225	COR CAROLI
132	.0634	-.1981103	-.1828497	.9629737	KCC HAB
133	.0630	.5387981	-.2334614	-.7330981	
134	.0619	.3880972	.5509614	.7387977	
135	.0617	.2350929	.9678189	-.7897658	KURSA
136	.0606	.3083000	-.6362463	.7072070	
137	.0600	.6413321	.3733469	.6703023	ALMACH
138	.0596	-.7146463	-.6440619	-.2728828	ZUSENELGENUE
139	.0590	.5698859	-.4230313	-.6101617	
140	.0580	-.2426363	-.2747436	-.9303997	
141	.0577	.5478959	.0908463	.8315991	SCHEDAR
142	.0575	-.9533199	-.1139532	-.2796351	ALGRAB
143	.0557	-.6737853	-.5795532	.4584010	IZAR
144	.0550	-.0123793	-.6224774	.7825399	FLTAMIN
145	.0540	-.2593521	-.7852963	-.5621798	
146	.0540	-.9852707	-.1697669	-.0205159	
147	.0537	.2640735	-.9345988	.2383070	
148	.0521	-.3360259	-.4459335	.3196937	MUFRIQ
149	.0510	-.4549122	.0529119	-.8889630	
150	.0508	.5458225	-.6267853	.5560737	
151	.0507	.7323468	.0764105	-.6766311	ANKAA
152	.0500	.4119106	.2311913	-.8814044	
153	.0490	-.3543835	.2348879	-.9051200	
154	.0486	-.1975885	-.2372478	.9511218	
155	.0470	-.4747330	.7791877	-.4092616	
156	.0464	.6994952	.4310319	.5700157	
157	.0460	.2680453	-.8935834	-.3600838	
158	.0460	-.2404063	-.3799261	-.8932306	
159	.0459	-.2931675	-.7987507	.5254047	

ORIGINAL PAGE IS
OF POOR QUALITY

TABLE III.- Continued

1982 STAR POSITIONS IN M1950.0 COORDINATES

ID	RA(+DEG)	DEC(DEG)	NAME
11	100.7313	16.6569S	SIRIUS
12	95.7107	52.6676S	CANOPUS
13	78.0333	8.2581S	RIGEL
14	278.8135	38.7383N	VEGA
15	210.0684	60.1330S	HADAR
16	23.9648	57.4905S	ACHERNAR
17	185.9523	62.8221S	ACRUX
18	78.2490	45.9456N	CAPELLA
19	200.6384	10.9015S	SPICA
20	213.3346	19.4242N	ARCTURUS
21	114.1650	5.3453N	PROCYON
22	297.0906	8.7381N	ALTAIR
23	88.1161	7.3995N	BETELGEUSE
24	80.6121	6.3060N	BELLATRIX
25	151.4256	12.2122N	REGULUS
26	343.7262	29.8892S	FOMALHAUT
27	309.9313	45.1008N	DENER
28	331.2741	47.2055S	AL NAIR
29	206.3913	49.5620N	ALKAID
30	246.5840	26.3230S	ANTARES
31	112.8512	31.9985N	CASTOR
32	68.2627	16.4086N	ALDEBARAN
33	305.4260	56.8960S	PEACOCK
34	138.1616	69.5102S	MIAPLACIDUS
35	283.0414	26.3614S	NUNKI
36	275.2129	34.4114S	KAUS AUSTRAL
37	1.4505	28.8130N	ALPHERATZ
38	13.4184	60.4464N	NAVI
39	98.7062	16.4432N	ALHENA
40	50.1854	49.6848N	MIRFAK
41	176.6230	14.8506N	DENEbola
42	233.1437	26.8808N	ALPHECCA
43	263.1540	12.5930N	RASALHAGUE
44	164.7109	56.6511N	MERAK
45	27.2262	89.0289N	POLARIS
46	177.8240	53.9728N	ALCOR
47	183.3065	17.2643S	GIENAH
48	228.5770	9.2000S	ZUBENESCH
49	34.2040	3.2057S	MIRA CETI
50	125.3720	59.3480S	AVIOR
51	250.8380	68.9392S	ATRIA
52	31.0890	23.2256N	HAMAL
53	210.9272	36.1296S	MENKENT
54	10.2721	18.2605S	DIPHDA
55	141.2824	8.4406S	ALPHARD
56	136.5385	43.2299S	AL SUHAIL
57	44.0906	40.5039S	ACAMAR
58	326.0732	16.3579S	DENEb ALGEID
59	345.3385	27.8124N	SCHEAT
60	325.4323	9.6447N	ENIF
61	218.9813	60.6241S	RIGIL KENT
62	191.1956	59.4161S	BECRUX
63	104.1650	28.9028S	ADHARA
64	121.9978	47.1883S	REGOR

TABLE III.- Continued

65	83.4188	1.2322S	ANILAM
66	84.5588	1.9675S	ALNITAK
67	85.7828	28.5656N	EL. NATH
68	95.1242	17.9297S	MURZIM
69	120.4563	39.8613S	NAOS
70	86.3458	9.6858S	SAIPH
71	115.5587	28.1482N	POLLUX
72	82.3625	.3344S	MINTAKA
73	192.9606	56.2307N	ALIOTH
74	239.3428	22.4814S	DZUBA
75	130.8311	54.5254S	
76	219.6477	47.1753S	
77	204.1759	53.2132S	
78	88.9643	44.9447N	MENKLINAN
79	218.2800	41.9397S	
80	264.7561	39.0067S	
81	46.2267	40.7644N	BATEN KAITOS
82	140.1411	54.7967S	
83	200.4810	55.1856N	MIZAR
84	263.4310	42.9681S	SARGAS
85	189.6844	48.6857S	MUHLIFAIN
86	208.1013	47.0435S	
87	181.4386	50.4443S	
88	110.5292	29.2044S	ALUDRA
89	187.0942	56.8360S	GACRUX
90	240.6311	19.6705S	ACRAE
91	106.5896	26.3125S	AL WAZN
92	160.2917	64.1319S	
93	223.8111	42.9343S	
94	248.6005	10.4673S	
95	188.5442	68.8605S	
96	248.1911	28.1144S	
97	2.6642	14.9055N	ALGENIB
98	165.1623	62.0208N	DUBHE
99	183.1185	58.4710S	
100	232.9499	41.0005S	
101	244.5361	25.4750S	
102	138.9376	59.0650S	SCUTULUM
103	345.5676	14.9355N	MARKAB
104	58.6232	39.8670N	
105	1.6332	58.8726N	CAPH
106	84.4592	34.1000S	PHACT
107	256.8773	15.6639S	SABIK
108	238.9553	25.9719S	
109	89.0785	37.2104N	
110	261.9925	49.8396S	
111	252.1195	37.2639S	
112	319.3495	62.3738N	ALDERAMIN
113	284.8577	29.9536S	ASCELLA
114	83.6637	21.1137N	
115	154.3075	20.0939N	ALGEIBA
116	305.1079	40.0956N	SADIR
117	167.8642	20.7965N	ZOZCA
118	94.5983	30.0400S	
119	105.2342	23.7592S	
120	206.6485	42.2257S	
121	190.7973	67.8350S	
122	111.1096	8.3913N	GOMEISA
123	82.6308	17.8567S	ARNEB

TABLE III.- Continued

124	20.6366	59.9757N	RUCHBACH
125	57.7460	31.7366N	
126	27.9689	20.5635N	SHERATAN
127	322.0061	70.3412N	ALPHIRK
128	16.7331	35.3551N	MIRACH
129	223.9743	41.9053S	
130	199.4408	36.4500S	
131	193.4203	38.5885N	COR CAROLI
132	222.7060	74.3598N	KOCHAB
133	339.9242	47.1468S	
134	54.8391	47.6291N	
135	76.3467	5.1502S	KURSA
136	295.8530	45.0081N	
137	30.2055	42.0904N	ALMACH
138	222.0262	15.8359S	ZUBENELGENUB
139	327.7277	37.6012S	
140	228.5510	68.4972S	
141	9.4145	56.2633N	SCHEDAR
142	186.6163	16.2385S	ALGORAB
143	220.7003	27.2840N	IZAR
144	268.6607	51.4937N	ELTAMIN
145	251.7235	34.2068S	
146	189.7762	1.1756S	
147	285.7778	13.7866N	
148	208.0753	18.6443N	MUFRID
149	173.3556	62.7432S	
150	311.0504	33.7848N	
151	5.9566	42.5811S	ANKAA
152	29.3337	61.8122S	
153	146.4631	64.8394S	
154	230.1970	72.0121N	
155	121.3525	24.1584S	
156	31.6416	34.7513N	
157	286.6975	21.1054S	
158	237.6754	63.2822S	
159	249.8451	31.6956N	

ORIGINAL PAGE IS
OF POOR QUALITY

TABLE III.- Continued

UNIT VECTORS IN M1950.0 COORDINATES FOR THE YEAR 1982

ID	MAGNITUDE	UNIT X	UNIT Y	UNIT Z	NAME
11	3.1500	-.1783903	.9412836	-.2866394	SIRIUS
12	1.5000	-.3603438	.6034284	-.7951307	CANOPUS
13	.8610	.2051927	.9681249	-.1436318	PIGEL
14	.8030	.1195125	-.7708019	.6257645	VEGA
15	.7450	-.4309727	-.2495081	-.8671841	HADAP
16	.6910	.4911090	.2182944	-.8433028	ACHERNAR
17	.6670	-.4542920	-.0473652	-.8895928	ACRUX
18	.5140	.1415125	.6807677	.7186802	CAPELLA
19	.5130	-.9189358	-.3461074	-.1891206	SPICA
20	.4880	-.7879225	-.5182497	.3325589	ARCTURUS
21	.4770	-.4075853	.9084029	.0931576	PROCYON
22	.3690	.4501134	-.8799538	.1519181	ALTAIR
23	.3080	.0326006	.9911362	.1287875	BETELGEUSE
24	.2740	.1621310	.9806370	.1098388	BELLATRIX
25	.2690	-.8583243	.4674753	.2115333	REGULUS
26	.2670	.8322536	-.2429542	-.4983243	FOomalhaut
27	.2540	.4530697	-.5412652	.7083501	DENEb
28	.2050	.5957600	-.3265193	-.7337951	ALNAIR
29	.1970	-.5810241	-.2883131	.7611088	ALKAID
30	.1930	-.3561962	-.8224917	-.4434317	ANTARES
31	.1910	-.3293356	.7815035	.5298966	CASTOR
32	.1910	.3552670	.8910597	-.2824853	ALDEBARAN
33	.1880	.3165650	-.4450231	-.8376999	PEACOCK
34	.1870	-.2607900	.2334883	-.9367346	MIAPLACIDUS
35	.1830	.2021891	-.8729009	-.4440311	NUNKI
36	.1580	.0749573	-.8215885	-.5651316	KAUS AUSTRAL
37	.1480	.8759164	.0221794	.4819528	ALPHERATZ
38	.1460	.4797729	.1144613	.8698946	NAVI
39	.1370	-.1451775	.9480497	.2830641	ALHENA
40	.1160	.4142724	.4969676	.7624970	MIRFAK
41	.1120	-.9649189	.0569386	.2562995	DENEbola
42	.1100	-.5350003	-.7136864	.4521355	ALPHECCA
43	.1090	-.1163339	-.9689852	.2180233	RASALHAGUE
44	.0960	-.5302795	.1449595	.8353385	MERAK
45	.0959	.0150705	.0077539	.9998564	POLARIS
46	.0902	-.5877376	.0225379	.8087376	ALCOR
47	.0893	-.9533564	-.0550779	-.2967794	GIENAH
48	.0869	-.6531024	-.7401995	-.1598810	ZUBENESCH
49	.0820	.9257469	.5612620	-.0559201	MIRACETI
50	.0764	-.2951274	.4157153	-.8602794	AVIOR
51	.0740	-.1179555	-.3394473	-.9331999	ATRIA
52	.0720	.7869660	.4745213	.3943527	HAMAL
53	.0714	-.6928494	-.4151084	-.5896140	MENKENT
54	.0698	.9344209	.1693436	-.3133375	DIPHDA
55	.0682	-.7717869	.6187080	-.1467834	ALPHARD
56	.0540	-.5288526	.5011878	-.6849276	ALSUHAIL
57	.0540	.5461227	.5290557	-.6494998	ACAMAR
58	.0495	.7961644	-.5355404	-.2816357	DENEb ALGEID
59	.0473	.8556801	-.2238686	.4665774	SCHEAT
60	.0458	.8118177	-.5593594	.1675383	ENIF
61	.7090	-.3813201	-.3085813	-.8714198	RIGIL KENT
62	.3910	-.4991172	-.0987879	-.8608850	BECRUX
63	.3170	-.2142337	.8488233	-.4833248	ADHARA
64	.2700	-.3601059	.5763395	-.7335915	REGOR

TABLE III.- Continued

65	.2560	.1145856	.9931806	-.0215047	ANILAM
66	.2520	.0947691	.9949071	-.0343326	ALNITAK
67	.2180	.1406796	.8669299	.4781650	ELNATH
68	.2030	-.0849768	.9476324	-.3078502	MURZIM
69	.1960	-.3890806	.6616822	-.6409313	NAOS
70	.1770	.0628255	.9837410	-.1682457	SAIPH
71	.1710	-.3804104	.7954475	.4717533	POLLUX
72	.1680	.1329029	.9911119	-.0058371	MINTAKA
73	.1640	-.5416891	-.1246666	.8312829	ALIOTH
74	.1470	-.4711502	-.7948588	-.3823831	DZUBA
75	.1440	-.3794455	.4391098	-.8143732	
76	.1440	-.5234020	-.4337295	-.7334365	
77	.1430	-.5463162	-.2452475	-.8008697	
78	.1390	.0127932	.7076730	.7064242	MENKLINAN
79	.1320	-.5855205	-.4587770	-.6683483	
80	.1300	-.0710208	-.7738206	-.6294107	
81	.1290	.5239750	.5469054	.6529507	BATEN KAITOS
82	.1240	-.4425205	.3694653	-.8171114	
83	.1230	-.5348314	-.1997635	.8210054	MIZAR
84	.1220	-.0837106	-.7269298	-.6815905	SARGAS
85	.1170	-.6507805	-.1110578	-.7510998	MUHLIFAIN
86	.1120	-.6011119	-.3209812	-.7318713	
87	.1090	-.6366267	-.0159883	-.7710063	
88	.1090	-.3061066	.8174507	-.4879274	ALUDRA
89	.1070	-.5428493	-.0675595	.8371083	GACRUX
90	.1060	-.4618108	-.8206239	.3366112	ACRAB
91	.1050	-.2559319	.8590771	-.4432668	ALWAZN
92	.1020	-.4107437	.1471348	-.8998005	
93	.0990	-.5283274	-.5068448	-.6811597	
94	.0960	-.3587960	-.9155652	-.1816747	
95	.0940	-.3566381	-.0535812	-.9327048	
96	.0920	-.3276765	-.8188813	.4712341	
97	.0905	.9653070	.0449177	.2572250	ALGENIB
98	.0900	-.4535077	.1201411	.8831177	DUBHE
99	.0890	-.5221555	-.0284480	-.8523757	
100	.0890	-.4547190	-.6023352	-.6560662	
101	.0880	-.3881402	-.8150745	-.4301170	
102	.0860	-.3876028	.3376792	-.8577510	SCUTULUM
103	.0859	.9357252	-.2408173	.2577311	MARKAB
104	.0851	.3996280	.6552918	.6410071	
105	.0843	.5167333	.0147336	.8560197	CAPH
106	.0840	.0799535	.8241914	-.5606388	PHACT
107	.0831	-.2186047	-.9377180	-.2699942	SABIK
108	.0830	-.4636250	-.7702392	-.4379308	
109	.0800	.0128091	.7963171	.6047437	
110	.0760	-.0898403	-.6386415	-.7642419	
111	.0760	-.2420649	-.7503180	-.6151645	
112	.0759	.3518090	-.3020755	.8859915	ALDERAMIN
113	.0740	.2221685	-.8374616	-.4992987	ASCELLA
114	.0736	.1029542	.9271688	.3602201	
115	.0727	-.8462824	.4071515	.3435604	ALGETBA
116	.0714	.4399490	-.6258004	.6440643	SADIR
117	.0713	-.9139554	.1965317	.3550504	ZOZCA
118	.0700	-.0694012	.8628897	-.5006045	
119	.0700	-.2404945	.8830852	-.4028931	
120	.0670	-.6618429	-.3321270	-.6720532	
121	.0670	-.3705961	-.0706766	-.9261011	
122	.0666	-.3562975	-.9229061	.1459330	GOMEISA
123	.0666	-.1220831	.9439648	-.3066368	ARNER

T

TABLE III.- Continued

124	.0661	.4682615	.1763492	.8658130	RUCHBACH
125	.0654	.4538767	.7192388	.5260147	
126	.0653	.8269283	.4391091	.3512447	SHERATAN
127	.0653	.2651232	-.2070915	.9417127	ALPHIRK
128	.0651	.7810464	.2348173	.5786427	MIRACH
129	.0650	-.5356005	-.5167596	-.6679010	
130	.0640	-.7585150	-.2677233	-.5941206	
131	.0638	-.7603020	-.1814135	.6237227	COR CAROLI
132	.0634	-.1981104	-.1828495	.9629737	KOCHAB
133	.0630	.6387982	-.2334608	-.7330981	
134	.0619	.3880972	.5509616	.7387976	
135	.0610	.2350932	.9678188	-.0897662	KURSA
136	.0606	.3083002	-.6362461	.7072071	
137	.0600	.6413322	.3733471	.6703021	ALMACH
138	.0596	-.7146465	-.6440615	-.2728831	ZUBENELGENUB
139	.0590	.6698862	-.4230309	-.6101617	
140	.0580	-.2426365	-.2747433	-.9303997	
141	.0577	.5478960	.0908465	.8315990	SCHEDAR
142	.0575	-.9533199	-.1139521	-.2796358	ALGORAB
143	.0557	-.6737854	-.5795530	.4584010	IZAR
144	.0550	-.0123794	-.6224774	.7825398	ELTAMIN
145	.0540	-.2593547	-.7852947	-.5621809	
146	.0540	-.9852711	-.1697641	-.0205159	
147	.0537	.2640734	-.9345990	.2383065	
148	.0521	-.8360265	-.4459335	.3196920	MUFRIID
149	.0510	-.4549121	.0529121	-.8889631	
150	.0508	.5458232	-.6267836	.5560750	
151	.0507	.7323453	.0764113	-.6766325	ANKAA
152	.0500	.4119180	.2311924	-.8814043	
153	.0490	-.3543804	.2348880	-.9051200	
154	.0486	-.1976885	-.2372476	.9511219	
155	.0470	-.4747328	.7791880	-.4092614	
156	.0464	.6994950	.4310326	.5700156	
157	.0460	.2680453	-.8935834	-.3600840	
158	.0460	-.2404062	-.3799242	-.8932315	
159	.0459	-.2931693	-.7987490	.5254063	

T

TABLE III.- Continued

1983 STAR POSITIONS IN M1950.0 COORDINATES

ID	RA(+DEG)	DEC(DEG)	NAME
11	100.7312	16.6572S	SIRIUS
12	95.7107	52.6676S	CANOPUS
13	78.0333	8.2581S	RIGEL
14	278.8136	38.7384N	VEGA
15	210.0683	60.1331S	HADAR
16	23.9648	57.4906S	ACHERNAR
17	185.9522	62.8221S	ACRUX
18	78.2490	45.9455N	CAPELLA
19	200.6383	10.9015S	SPICA
20	213.3343	19.4236N	ARCTURUS
21	114.1648	5.3450N	PROCYON
22	297.0908	8.7382N	ALTAIR
23	88.1161	7.3995N	BETELGEUSE
24	80.6121	6.3060N	BELLATRIX
25	151.4256	12.2122N	REGULUS
26	343.7264	29.8892S	FOMALHAUT
27	309.9313	45.1008N	DENEK
28	331.2741	47.2055S	AL NA'IR
29	206.3913	49.5620N	ALKAID
30	246.5840	26.3231S	ANTARES
31	112.8511	31.9984N	CASTOR
32	68.2628	16.4085N	ALDEBARAN
33	305.4260	56.8980S	PEACOCK
34	138.1614	69.5102S	MIAPLACIDUS
35	283.0414	26.3614S	NUNKI
36	275.2129	34.4115S	KAUS AUSTRAL
37	1.4505	28.8130N	ALPHERATZ
38	13.4185	60.4464N	NAVI
39	98.7062	16.4432N	ALHENA
40	50.1854	49.6848N	MIRFAK
41	176.6228	14.8506N	DENEKOLA
42	233.1437	26.8808N	ALPHECCA
43	263.1540	12.5929N	RASALHAGUE
44	164.7110	56.6511N	MERAK
45	27.2270	89.0289N	POLARIS
46	177.8040	53.9728N	ALCOR
47	183.3064	17.2643S	GIENAH
48	228.5770	9.2000S	ZUBENESCH
49	34.2040	3.2057S	MIRA CETI
50	125.3720	59.3480S	AVIOR
51	250.8381	68.9393S	ATRIA
52	31.0890	23.2256N	HAMAL
53	210.9270	36.1298S	MENKENT
54	10.2722	18.2605S	DIPHDA
55	141.2824	8.4406S	ALPHARD
56	136.5385	43.2299S	AL SUHAIL
57	44.0906	40.5039S	ACAMAR
58	326.0733	16.3579S	DENEK ALGEID
59	345.3386	27.8124N	SCHEAT
60	325.4324	9.6447N	FNIE
61	218.9793	60.6239S	RIGIL KENT
62	191.1956	59.4161S	BECRUX
63	104.1650	28.9028S	ADHARA
64	121.9978	47.1883S	REGOR

ORIGINAL PAGE IS
OF POOR QUALITY

T

TABLE III.- Continued

65	83.4188	1.2322S	ANILAM
66	84.5588	1.9675S	ALNITAK
67	80.7828	28.5656N	EL NATH
68	95.1242	17.9297S	MURZIM
69	120.4563	39.8613S	NAOS
70	86.3458	9.6858S	SAIPH
71	115.5585	28.1482N	POILLUX
72	82.3625	3.3344S	MINTAKA
73	192.9607	56.2307N	ALIOTH
74	239.3428	22.4814S	DZUBA
75	130.8311	54.5255S	
76	219.6476	47.1753S	
77	204.1758	53.2132S	
78	88.9643	44.9447N	MENKLINAN
79	218.0800	41.9397S	
80	264.7561	39.0067S	
81	46.2267	40.7644N	BATEN KAITOS
82	140.1411	54.7967S	
83	200.4811	55.1856N	MIZAR
84	263.4310	42.9681S	SARGAS
85	189.6843	48.6857S	MUHLIFAIN
86	208.1013	47.0435S	
87	181.4386	50.4443S	
88	110.5292	29.2044S	ALUDRA
89	187.0942	56.8361S	GACRUX
90	240.6311	19.6706S	ACRAB
91	106.5896	26.3125S	AL WAZN
92	160.2917	64.1319S	
93	223.8111	42.9343S	
94	248.6006	10.4673S	
95	188.5442	68.8605S	
96	248.1911	28.1144S	
97	2.6642	14.9055N	ALGENIB
98	165.1622	62.0207N	DUBHE
99	183.1185	58.4710S	
100	232.9499	41.0006S	
101	244.5361	25.4750S	
102	138.9376	59.0650S	SCUTULUM
103	345.5676	14.9355N	MARKAB
104	58.6232	39.8669N	
105	1.6335	58.8725N	CAPH
106	84.4592	34.1000S	PHACT
107	256.8774	15.6639S	SABIK
108	238.9553	25.9719S	
109	89.0785	37.2104N	
110	261.9925	49.8396S	
111	252.1194	37.9639S	
112	319.3495	62.3738N	ALDERAMIN
113	284.8576	29.9536S	ASCELLA
114	83.6637	21.1137N	
115	154.3076	20.0939N	ALGETHA
116	305.1079	40.0956N	SADIR
117	167.8643	20.7965N	ZOZCA
118	94.5983	30.0400S	
119	105.2342	23.7592S	
120	206.6485	42.2257S	
121	190.7972	67.8350S	
122	111.1096	8.3913N	GOMEISA
123	82.6308	17.8567S	ARNEB

I

TABLE III.- Continued

124	20.6367	59.9757N	RUCHBACH
125	57.7460	31.7366N	
126	27.9689	20.5634N	SHERATAN
127	322.0061	70.3412N	ALPHIRK
128	16.7332	35.3551N	MIRACH
129	223.9743	41.9053S	
130	199.4407	36.4500S	
131	193.4202	38.5885N	COR CAROLI
132	222.7060	74.3598N	KOCHAB
133	339.9243	47.1468S	
134	54.8392	47.6291N	
135	76.3467	5.1502S	KURSA
136	295.8531	45.0081N	
137	30.2055	42.0904N	ALMACH
138	222.0261	15.8359S	ZUBENELGENUB
139	327.7278	37.6012S	
140	228.5510	68.4972S	
141	9.4146	56.2633N	SCHEAR
142	186.8163	16.2385S	ALGORAB
143	220.7003	27.2840N	IZAR
144	268.8607	51.4937N	ELTAMIN
145	251.7233	34.2068S	
146	189.7760	1.1756S	
147	285.7778	13.7866N	
148	208.0753	18.6442N	MUFRIQ
149	173.3656	62.7432S	
150	311.0505	33.7849N	
151	5.9566	42.5812S	ANKAA
152	29.3038	61.8122S	
153	146.4631	64.8394S	
154	230.1970	72.0121N	
155	121.3525	24.1584S	
156	31.6417	34.7513N	
157	286.6975	21.1054S	
158	237.6753	63.2823S	
159	249.8449	31.6957N	

ORIGINAL PAGE IS
OF POOR QUALITY

TABLE III.- Continued

UNIT VECTORS IN J1950.0 COORDINATES FOR THE YEAR 1983

ID	MAGNITUDE	UNIT X	UNIT Y	UNIT Z	NAME
11	3.1500	-.1783874	.9412824	-.2866450	SIRIUS
12	1.5000	-.0603439	.6034285	-.7951306	CANOPUS
13	.8610	.2051927	.9681249	-.1436318	RIGEL
14	.8030	.1195134	-.7708009	.6257655	VEGA
15	.7450	-.4309726	-.2495080	-.8671842	HADAR
16	.6910	-.4911087	-.2182947	-.8433028	ACHERNAR
17	.6670	-.4542919	-.0473651	-.8895928	ACRUX
18	.5140	.1416124	.6807693	.7186787	CAPELLA
19	.5130	-.9189359	-.3461072	-.1891208	SPICA
20	.4880	-.7879281	-.5182470	.3325498	ARCTURUS
21	.4770	-.4075824	.9384047	.0931526	PROCYON
22	.3690	.4501157	-.8799524	.1519199	ALTAIR
23	.3080	.0326004	.9911362	.1287876	BETELGEUSE
24	.2740	.1621310	.9806370	.1098387	BELATRIX
25	.2690	-.8583237	.4674763	.2115333	REGULUS
26	.2670	.8322537	-.2429526	-.4983250	FOMALHAUT
27	.2540	.4530697	-.5412652	.7083501	DENEK
28	.2050	.5957598	-.3265185	-.7337956	AL NA'IR
29	.1970	-.5810244	-.2883126	.7611087	ALKAID
30	.1930	-.3561962	-.8224916	.4434318	ANTARES
31	.1910	-.3293350	.7815040	.5298961	CASTOR
32	.1910	.3552667	.8910601	.2824844	ALDEBARAN
33	.1880	.3165648	-.4450228	-.8377001	PEACOCK
34	.1870	-.2607898	.2334891	-.9367345	MIAPLACIDUS
35	.1830	.2021891	-.8729007	-.4440314	NUNKI
36	.1580	.0749571	-.8215881	-.5651322	KAUS AUSTRAL
37	.1480	.8759168	.0221801	.4819522	ALPHERATZ
38	.1460	.4797729	.1144614	.8698946	NAVI
39	.1370	-.1451777	.9480497	.2830639	ALHENA
40	.1160	.4142723	.4969677	.7624969	MIRFAK
41	.1120	-.9649189	.0569410	.2562989	DENEKOLA
42	.1100	-.5349999	-.7136869	.4521351	ALPHECCA
43	.1090	-.1163334	-.9689855	.2180222	RAS ALHAGUE
44	.0960	-.5302795	.1449591	.8353386	MERAK
45	.0959	.0150704	.0077541	.9998564	POLARIS
46	.0902	-.5877376	.0225374	.8087376	ALCOR
47	.0893	-.9533565	-.0550771	.2967793	GIENAH
48	.0869	-.6531027	-.7401992	-.1598811	ZURENESEK
49	.0820	.8257469	.5612619	-.0559212	MIRA CETI
50	.0764	-.2951273	.4157154	-.8602794	AVIOR
51	.0740	-.1179553	-.3394472	-.9332000	ATRIA
52	.0720	.7869658	.4745222	.3943521	HAMAL
53	.0714	-.6928495	-.4151055	.5896160	MENKENT
54	.0698	.9344207	.1693447	-.3133373	DIPHDA
55	.0682	-.7717869	.6187081	.1467833	ALPHARD
56	.0540	-.5288525	.5011878	-.6849275	AL SUHAIL
57	.0540	.5461230	.5290556	-.6494997	ACAMAR
58	.0495	.7961648	-.5355392	-.2816371	DENEK ALGEID
59	.0473	.8556800	-.2238676	.4665780	SHEAT
60	.0458	-.8118178	-.5593593	.1675383	ENIF
61	.07090	-.3813334	-.3085696	-.8714182	RIGIL KENT
62	.3910	-.4991171	-.0987877	.8608851	BECRUX
63	.3170	-.2142337	.8488233	.4833248	ADHARA
64	.2700	-.3601058	.5763396	.7335915	REGOR

T

TABLE III.- Continued

65	.2560	.1145856	.9931806	.0215047	ANILAM
66	.2520	.0947691	.9949071	.0343326	ALNITAK
67	.2180	.1406796	.8669304	.4781642	EL NATH
68	.2030	.0849768	.9476324	.3078502	MURZIM
69	.1960	.3890805	.6616823	.6409313	NAOS
70	.1770	.0628255	.9837410	.1682457	SAIPH
71	.1710	.3804077	.7954489	.4717531	POLLUX
72	.1680	.1329029	.9911119	.0058371	MINTAKA
73	.1640	.5416890	.1246672	.8312828	ALIOH
74	.1470	.4711503	.7948588	.3823833	DZUBA
75	.1440	.3794453	.4391095	.8143734	
76	.1440	.5234020	.4337293	.7334366	
77	.1430	.5463162	.2452473	.8008698	
78	.1390	.0127934	.7076730	.7064242	MENKLINAN
79	.1320	.5855205	.4587768	.6683484	
80	.1300	.0710209	.7738205	.6294108	
81	.1290	.5239750	.5469054	.6529507	BATEN KAITOS
82	.1240	.4425205	.3694654	.8171114	
83	.1230	.5348313	.1997641	.8210053	MIZAR
84	.1220	.0837106	.7269298	.6815905	SARGAS
85	.1170	.6507806	.1110568	.7510998	MUHLIFAIN
86	.1120	.6011119	.3209808	.7318714	
87	.1090	.6366267	.0159881	.7710064	
88	.1090	.3061066	.8174507	.4879274	ALUDRA
89	.1070	.5428483	.0675592	.8371090	GACRUX
90	.1060	.4618109	.8206239	.3366113	ACRAB
91	.1050	.2559319	.8590771	.4432668	AL WAZN
92	.1020	.4107438	.1471349	.8998005	
93	.0990	.5283274	.5068445	.6811599	
94	.0960	.3587960	.9155653	.1816746	
95	.0940	.3566380	.0535810	.9327049	
96	.0920	.3276765	.8188812	.4712342	
97	.0905	.9653071	.0449177	.2572249	ALGENIB
98	.0900	.4535079	.1201417	.8831175	DUBHE
99	.0890	.5221555	.0284478	.8523757	
100	.0890	.4547190	.6023351	.6560663	
101	.0880	.3881402	.8150745	.4301172	
102	.0860	.3876027	.3376793	.8577510	SCUTULUM
103	.0859	.9357253	.2408171	.2577309	MAR KAB
104	.0851	.3996280	.6552920	.6410070	
105	.0843	.5167339	.0147362	.8560192	CAPH
106	.0840	.0799535	.8241914	.5606389	PHACT
107	.0831	.2186046	.9377182	.2699938	SABIK
108	.0830	.4636250	.7702391	.4379309	
109	.0800	.0128089	.7963174	.6047434	
110	.0760	.0898404	.6386412	.7642422	
111	.0760	.2420649	.7503179	.6151647	
112	.0759	.3518093	.3020748	.8859916	ALDERAMIN
113	.0740	.2221684	.8374617	.4992987	ASCCELLA
114	.0736	.1029542	.9271688	.3602200	
115	.0727	.8462832	.4071503	.7435598	ALGIEIRA
116	.0714	.4399490	.6258004	.6440643	SADIR
117	.0713	.9139558	.1965311	.3550498	ZOZCA
118	.0700	.0694012	.8628897	.5006045	
119	.0700	.2404945	.8830852	.4028931	
120	.0670	.6618429	.3321269	.6720533	
121	.0670	.3705960	.0706764	.9261012	
122	.0666	.3562973	.9229062	.1459328	GOMEISA
123	.0666	.1220831	.9439648	.3066368	ARNER

ORIGINAL PAGE IS
OF POOR QUALITY

T

TABLE III.- Continued

124	.0661	.4682612	.1763507	.8658129	RUCHBACH
125	.0654	.4538767	.7192389	.5260147	
126	.0653	.8269282	.4391096	.3512442	SHERATAN
127	.0653	.2651232	-.2070915	.9417127	ALPHIRK
128	.0651	.7810464	-.2348182	.5786423	MIRACH
129	.0650	-.5356005	-.5167594	-.6679011	
130	.0640	-.7585153	-.2677217	-.5941209	
131	.0638	-.7603021	-.1814123	.6237229	COR CAROLI
132	.0634	-.1981104	-.1828494	.9629737	KOCHAB
133	.0630	.6387984	-.2334601	-.7330982	
134	.0619	.3880971	.5509618	.7387975	
135	.0610	.2350937	.9678186	-.0897666	KURSA
136	.0606	.3083003	-.6362459	.7072073	
137	.0600	.6413322	.3733474	.6703020	ALMACH
138	.0596	-.7146468	-.6440610	-.2728834	ZURENELGENUB
139	.0590	.6698864	-.4230305	-.6101618	
140	.0580	-.2426366	-.2747430	-.9303998	
141	.0577	.5478961	.0908468	.8315989	SCHEDAR
142	.0575	-.9533198	-.1139511	-.2796364	ALGORAB
143	.0557	-.6737856	-.5795528	.4584011	IZAR
144	.0553	-.0123794	-.6224775	.7825398	ELTAMIN
145	.0540	-.2593572	-.7852931	-.5621819	
146	.0540	-.9852716	-.1697614	-.0205159	
147	.0537	.2640734	-.9345991	.2383060	
148	.0521	-.8360271	-.4459335	.3196904	MUFRIID
149	.0510	-.4549120	.0529122	-.8889631	
150	.0508	.5458239	-.6267818	.5560763	
151	.0507	.7323439	.0764122	-.6766340	ANKAA
152	.0500	.4119175	.2311936	-.8814043	
153	.0490	-.3543804	.2348880	-.9051200	
154	.0486	-.1976886	-.2372475	.9511219	
155	.0470	-.4747325	.7791883	-.4092612	
156	.0464	.6994947	.4310332	.5700154	
157	.0460	.2680452	-.8935833	-.3600842	
158	.0460	-.2404060	-.3799222	-.8932324	
159	.0459	-.2931711	-.7987473	.5254079	

L

TABLE III.- Continued

1984 STAR POSITIONS IN M1950.0 COORDINATES

ID	RA(+DEG)	DEC(DEG)	NAME
11	100.7310	16.6575S	SIRIUS
12	95.7107	52.6676S	CANOPUS
13	78.0333	8.2581S	RIGEL
14	278.8137	38.7385N	VEGA
15	210.0683	60.1331S	HADAR
16	23.9549	57.4906S	ACHERNAR
17	185.9522	62.8221S	ACRUX
18	78.2491	45.9454N	CAPELLA
19	200.6383	10.9015S	SPICA
20	213.3340	19.4231N	ARCTURUS
21	114.1646	5.3447N	PROCYON
22	297.0909	8.7383N	ALTAIR
23	88.1161	7.3995N	BETELGEUSE
24	80.6121	6.3060N	BELLATRIX
25	151.4255	12.2122N	REGULUS
26	343.7265	29.8893S	FOMALHAUT
27	309.9313	45.1008N	DENEK
28	331.2742	47.2056S	AL NAIR
29	206.3912	49.5620N	AL KATO
30	246.5840	26.3231S	ANTARES
31	112.8511	31.9984N	CASTOR
32	68.2628	16.4085N	ALDERARAN
33	305.4260	56.8981S	PEACOCK
34	138.1613	69.5102S	MIAPLACIDUS
35	283.0414	26.3614S	NUNKI
36	275.2129	34.4115S	KAUS AUSTRAL
37	1.4506	28.8129N	ALPHERATZ
38	13.4185	60.4464N	NAVI
39	98.7063	16.4431N	ALHENA
40	50.1854	49.6848N	MIRFAK
41	176.6227	14.8505N	DENEbola
42	233.1438	26.8807N	ALPHECCA
43	263.1540	12.5928N	RASALHAGUE
44	164.7110	56.6511N	MERAK
45	27.2277	89.0289N	POLARIS
46	177.8041	53.9728N	ALCOR
47	183.3064	17.2643S	GIENAH
48	228.5769	9.2000S	ZURENESCH
49	34.2040	3.2058S	MIRA CETI
50	125.3719	59.3480S	AVIOR
51	250.8381	68.9393S	ATRIA
52	31.0891	23.2255N	HAMAL
53	210.9268	36.1299S	MENKENT
54	10.2723	18.2605S	DIPHDA
55	141.2824	8.4406S	ALPHARD
56	136.5385	43.2299S	AL SUHAII
57	44.0905	40.5039S	ACAMAR
58	326.0734	16.3580S	DENEK ALGEID
59	345.3386	27.8124N	SCHEAT
60	325.4324	9.6447N	ENIE
61	218.9773	60.6237S	RIGIL KENT
62	191.1955	59.4161S	BECRUX
63	104.1650	28.9028S	ADHARA
64	121.9978	47.1883S	REGOR

ORIGINAL PAGE IS
OF POOR QUALITY

T

TABLE III.- Continued

65	83.4188	1.2322S	ANILAM
66	84.5588	1.9675S	ALNITAK
67	80.7828	28.5655N	EL NATH
68	95.1242	17.9297S	MURZIM
69	120.4562	39.8613S	NAOS
70	86.3458	9.6858S	SAIPH
71	115.5583	28.1481N	POLLUX
72	82.3625	.3344S	MINTAKA
73	192.9607	56.2307N	ALIOTH
74	239.3428	22.4814S	DZUBA
75	130.8311	54.5255S	
76	219.6476	47.1753S	
77	204.1758	53.2132S	
78	88.9643	44.9447N	MENKLINAN
79	218.0800	41.9397S	
80	264.7561	39.0067S	
81	46.2267	40.7644N	BATEN KAITOS
82	140.1411	54.7967S	
83	200.4811	55.1856N	MIZAR
84	263.4310	42.9681S	SARGAS
85	189.6843	48.6857S	MUHLIFAIN
86	208.1012	47.0435S	
87	181.4386	50.4444S	
88	110.5292	29.2044S	ALUDRA
89	187.0942	56.8362S	GACRUX
90	240.6311	19.6706S	ACRAB
91	106.5896	26.3125S	AL WAZN
92	160.2917	64.1319S	
93	223.8111	42.9344S	
94	248.6006	10.4673S	
95	188.5442	68.8605S	
96	248.1911	28.1144S	
97	2.6642	14.9055N	ALGENIB
98	165.1622	62.0207N	DUBHE
99	183.1185	58.4710S	
100	232.9499	41.0006S	
101	244.5361	25.4750S	
102	138.9376	59.0650S	SCUTULUM
103	345.5676	14.9355N	MARKAB
104	58.6232	39.8669N	
105	1.6338	58.8725N	CAPH
106	84.4592	34.1000S	PHACT
107	256.8774	15.6639S	SABIK
108	238.9553	25.9720S	
109	89.0785	37.2104N	
110	261.9925	49.8396S	
111	252.1194	37.9639S	
112	319.3496	62.3738N	ALDERAMIN
113	284.8576	29.9536S	ASCELLA
114	83.6637	21.1137N	
115	154.3077	20.0939N	ALGETHA
116	305.1079	40.0956N	SADIR
117	167.8643	20.7965N	ZOZCA
118	94.5983	30.0400S	
119	105.2342	23.7592S	
120	206.6485	42.2257S	
121	190.7972	67.8350S	
122	111.1096	8.3913N	GOMEISA
123	82.6308	17.8567S	ARNEB

ORIGINAL PAGE IS
OF POOR QUALITY

T

TABLE III.- Continued

124	20.6369	59.9756N	RUCHBACH
125	57.7460	31.7366N	
126	27.9689	20.5634N	SHERATAN
127	322.0061	70.3412N	ALPHIRK
128	16.7332	35.3551N	MIRACH
129	223.9743	41.9053S	
130	199.4406	36.4500S	
131	193.4201	38.5885N	COR CAROLI
132	222.7059	74.3598N	KOCHAB
133	339.9243	47.1468S	
134	54.8392	47.6291N	
135	76.3467	5.1502S	KURSA
136	295.8531	45.0082N	
137	30.2056	42.0904N	ALMACH
138	222.0261	15.8359S	ZUBENELGENUB
139	327.7278	37.6012S	
140	228.5509	68.4972S	
141	9.4146	56.2633N	SCHEDAR
142	186.8162	16.2385S	ALGORAB
143	220.7003	27.2840N	IZAR
144	268.8607	51.4937N	ELTAMIN
145	251.7231	34.2069S	
146	189.7759	1.1756S	
147	285.7778	13.7866N	
148	208.0753	18.6441N	MUFRID
149	173.3655	62.7432S	
150	311.0506	33.7850N	
151	5.9567	42.5813S	ANKAA
152	29.3040	61.8122S	
153	146.4630	64.8394S	
154	230.1969	72.0121N	
155	121.3525	24.1584S	
156	31.6417	34.7513N	
157	286.6975	21.1054S	
158	237.6752	63.2824S	
159	249.8448	31.6958N	

1

TABLE III.- Continued

UNIT VECTORS IN M1950.0 COORDINATES FOR THE YEAR 1984					
ID	MAGNITUDE	UNIT X	UNIT Y	UNIT Z	NAME
11	3.1500	-.1783846	.9412812	-.2866506	SIRIUS
12	1.5000	-.0603440	.6034285	-.7951306	CANOPUS
13	.8610	.2051927	.9681249	-.1436318	RIGEL
14	.8030	.1195142	-.7707999	.6257666	VEGA
15	.7450	-.4309725	-.2495078	-.8671842	HADAR
16	.6910	.4911084	.2182951	-.8433029	ACHERNAR
17	.6670	-.4542918	-.0473649	-.8895929	ACRUX
18	.5140	.1416123	.6807708	.7186773	CAPELLA
19	.5130	-.9189359	-.3461070	-.1891210	SPICA
20	.4880	-.7879337	-.5182443	.3325407	ARCTURUS
21	.4770	-.4075795	.9084066	.0931477	PROCYON
22	.3690	.4501179	-.8799510	.1519217	ALTAIR
23	.3080	.0326003	.9911362	.1287876	BETELGEUSE
24	.2740	.1621310	.9806370	.1098387	BELLATRIX
25	.2690	-.8583231	.4674774	.2115333	REGULUS
26	.2670	.8322538	-.2429509	-.4983257	FOMALHAUT
27	.2540	.4530697	-.5412652	.7083501	DENEK
28	.2050	.5957596	-.3265177	-.7337961	AL NAIR
29	.1970	-.5810247	-.2883121	.7611087	ALKAID
30	.1930	-.3561962	-.8224915	-.4434320	ANTARES
31	.1910	-.3293343	.7815046	.5298957	CASTOR
32	.1910	.3552665	.8910605	.2824835	ALDEBARAN
33	.1880	.3165646	-.4450225	-.8377003	PEACOCK
34	.1870	-.2607897	.2334900	-.9367343	MIAPLACIDUS
35	.1830	.2021892	-.8729006	-.4440316	NUNKI
36	.1580	.0749570	-.8215878	-.5651327	KAUS AUSTRAL
37	.1480	.8759171	.0221807	.4819515	ALPHERATZ
38	.1460	.4797729	.1144616	.8698946	NAVI
39	.1370	-.1451780	.9480497	.2830637	ALHENA
40	.1160	.4142723	.4969679	.7624968	MIRFAK
41	.1120	-.9649190	.0569434	.2562984	DENEKOLA
42	.1100	-.5349996	-.7136874	.4521346	ALPHECCA
43	.1090	-.1163329	-.9689858	.2180211	RASALHAGUE
44	.0960	-.5302795	.1449587	.8353386	MERAK
45	.0959	.0150703	.0077543	.9998564	POLARIS
46	.0902	-.5877376	.0225370	.8087376	ALCOR
47	.0893	-.9533565	-.0550763	-.2967792	GIENAH
48	.0869	-.6531031	-.7401988	-.1598813	ZUBENESCH
49	.0820	.8257469	.5612618	-.0559223	MIRA CETI
50	.0764	-.2951272	.4157155	-.8602793	AVIOR
51	.0740	-.1179552	-.3394470	-.9332000	ATRIA
52	.0720	.7869655	.4745232	.3943514	HAMAL
53	.0714	-.6928495	-.4151025	-.5896181	MENKENT
54	.0698	.9344206	.1693458	-.3133371	DIPHDA
55	.0682	-.7717869	.6187081	-.1467831	ALPHARD
56	.0540	-.5288525	.5011879	-.6849275	AL SUHAIL
57	.0540	.5461233	.5290555	-.6494996	ACAMAR
58	.0495	.7961651	-.5355379	-.2816384	DENEK ALGEID
59	.0473	.8556799	-.2238666	.4665786	SCHEAT
60	.0458	.8118178	-.5593592	.1675383	FNIE
61	.7090	-.3813467	-.3085578	-.8714165	RIGIL KENT
62	.3910	-.4991170	-.0980874	-.8608852	BEKRUX
63	.3170	-.2142337	.8488233	-.4833248	ADHARA
64	.2700	-.3601058	.5763396	-.7335915	REGOR

ORIGINAL PAGE IS
OF POOR QUALITY

TABLE III.- Continued

65	.2560	.1145856	.9931806	.0215047	ANILAM
66	.2520	.0947691	.9949071	.0343326	ALNITAK
67	.2180	.1406795	.8669308	.4781634	EL NATH
68	.2030	-.0849768	.9476324	-.3078502	MURZIM
69	.1960	-.3890803	.6616824	-.6409312	NAOS
70	.1770	.0628255	.9837410	-.1682457	SAIPH
71	.1710	-.3804050	.7954503	.4717529	POLLUX
72	.1680	.1329029	.9911119	-.0058371	MINTAKA
73	.1640	-.5416889	-.1246677	.8312828	ALIOTH
74	.1470	-.4711503	-.7948587	-.3823834	DZUBA
75	.1440	-.3794452	.4391092	-.8143737	
76	.1440	-.5234020	-.4337292	-.7334367	
77	.1430	-.5463162	-.2452472	-.8008698	
78	.1390	.0127937	.7076730	.7064242	MENKLINAN
79	.1320	-.5855205	-.4587766	-.6683485	
80	.1300	-.0710209	-.7738204	-.6294109	
81	.1290	.5239750	.5469054	.6529507	BATEN KAITOS
82	.1240	-.4425204	.3694654	-.8171114	
83	.1230	-.5348312	-.1997646	.8210052	MTZAR
84	.1220	-.0837105	-.7269298	-.6815905	SARGAS
85	.1170	-.6507807	-.1110559	-.7510999	MUHLIFAIN
86	.1120	-.6011119	-.3209805	-.7318716	
87	.1090	-.6366266	-.0159880	-.7710065	
88	.1090	-.3061066	.8174507	-.4879274	ALUDRA
89	.1070	-.5428472	-.0675590	-.8371097	GACRUX
90	.1060	-.4618109	-.8206238	-.3366115	ACRAB
91	.1050	-.2559319	.8590771	-.4432668	AL WAZN
92	.1020	-.4107438	.1471350	-.8998004	
93	.0990	-.5283274	-.5068443	-.6811601	
94	.0960	-.3587959	-.9155653	-.1816745	
95	.0940	-.3566379	-.0535809	-.9327049	
96	.0920	-.3276765	-.8188811	-.4712343	
97	.0905	.9653071	.0449177	.2572249	ALGENIB
98	.0900	-.4535080	.1201423	.8831174	DUBHE
99	.0890	-.5221554	-.0284476	-.8523758	
100	.0890	-.4547190	-.6023350	-.6560664	
101	.0880	-.3881402	-.8150744	-.4301173	
102	.0860	-.3876027	.3376793	-.8577510	SCUTULUM
103	.0859	.9357255	-.2408168	.2577308	MAR KAB
104	.0851	.3996279	.6552921	.6410068	
105	.0843	.5167346	.0147388	.8560188	CAPH
106	.0840	.0799535	.8241913	.5606391	PHACT
107	.0831	-.2186045	-.9377183	-.2699934	SABIK
108	.0830	-.4636250	-.7702391	-.4379311	
109	.0800	.0128087	.7963176	.6047431	
110	.0760	-.0898405	-.6386409	-.7642424	
111	.0760	-.2420650	-.7503178	-.6151648	
112	.0759	.3518096	-.3020741	.8859917	ALDERAMIN
113	.0740	.2221683	-.8374617	.4992987	ASCILLA
114	.0736	.1029542	.9271688	.3602199	
115	.0727	-.8462841	.4371491	.3435591	ALGETBA
116	.0714	.4399490	-.6258004	.6440643	SADIR
117	.0713	-.9139562	.1965305	.3550491	ZOZCA
118	.0700	-.0694012	.8628897	-.5006045	
119	.0700	-.2404945	.8830852	-.4028931	
120	.0670	-.6618429	-.3321268	.6720534	
121	.0670	-.3705959	-.0706762	.9261013	
122	.0666	-.3562971	.9229063	.1459326	GOMEISA
123	.0666	.1220831	.9439648	-.3066368	ARNER

ORIGINAL PAGE IS
OF POOR QUALITY

I

TABLE III.- Continued

124	.0661	.4682609	.1763521	.8658127	RUGHBACH
125	.0654	.4538766	.7192389	.5260146	
126	.0653	.8269282	.4391101	.3512437	SHERATAN
127	.0653	.2651232	-.2070914	.9417127	ALPHIRK
128	.0651	.7810465	.2348191	.5786418	MIRACH
129	.0650	-.5356005	-.5167593	-.6679012	
130	.0640	-.7585156	-.2677200	-.5941213	
131	.0638	-.7603022	-.1814112	.6237231	COR CAROLI
132	.0634	-.1981105	-.1828492	.9629737	KOCHAB
133	.0630	.6387986	-.2334595	.7330982	
134	.0619	.3880971	.5509620	.7387973	
135	.0610	.2350941	.9678185	-.0897669	KURSA
136	.0606	.3083004	-.6362456	.7072074	
137	.0600	.6413322	.3733477	.6703018	ALMACH
138	.0596	-.7146470	-.6440606	-.2728837	ZUBENELGENUB
139	.0590	.5698866	-.4230301	.6101618	
140	.0580	-.2426367	-.2747428	.9303998	
141	.0577	.5478962	.0908471	.8315988	SCHEDAR
142	.0575	-.9533197	-.1139500	-.2796371	ALGORAB
143	.0557	-.6737857	-.5795526	.4584011	IZAR
144	.0550	-.0123794	-.6224776	.7825397	ELTAMIN
145	.0540	-.2593598	-.7852915	-.5621830	
146	.0540	-.9852721	-.1697587	-.0205159	
147	.0537	.2640733	-.9345992	.2383056	
148	.0521	-.8360278	-.4459335	.3196887	MUFRID
149	.0510	-.4549119	-.0529124	.8889631	
150	.0508	.5458246	-.6267800	.5560776	
151	.0507	.7323425	.0764130	-.6766354	ANKAA
152	.0500	.4119170	.2311948	-.8814042	
153	.0490	-.3543804	.2348881	-.9051200	
154	.0486	-.1976886	-.2372474	.9511219	
155	.0470	-.4747322	.7791886	-.4092609	
156	.0464	.6994944	.4310339	.5700152	
157	.0460	.2680452	-.8935832	-.3600844	
158	.0460	-.2404059	-.3799203	-.8932332	
159	.0459	-.2931729	-.7987456	.5254094	

ORIGINAL PAGE IS
OF POOR QUALITY

T

TABLE III.- Continued

1985 STAR POSITIONS IN M1950.0 COORDINATES

ID	RA(+DEG)	DEC(DEG)	NAME
11	100.7309	16.6579S	SIRIUS
12	95.7107	52.6676S	CANOPUS
13	78.0333	8.2581S	RIGEL
14	278.8137	38.7386N	VEGA
15	210.0683	60.1331S	HADAR
16	23.9649	57.4906S	ACHERNAR
17	185.9522	62.8221S	ACRUX
18	78.2491	45.9453N	CAPELLA
19	200.6383	10.9015S	SPICA
20	213.3336	19.4225N	ARCTURUS
21	114.1644	5.3444N	PROCYON
22	297.0911	8.7384N	ALTAIR
23	88.1161	7.3995N	BETELGEUSE
24	80.6121	6.3060N	BELLATRIX
25	151.4254	12.2122N	REGULUS
26	343.7266	29.8893S	FOMALHAUT
27	309.9313	45.1008N	DENEK
28	331.2743	47.2056S	AL NA'IR
29	206.3912	49.5620N	ALKAID
30	246.5840	26.3231S	ANTARES
31	112.8510	31.9984N	CASTOR
32	68.2628	16.4084N	ALDEBARAN
33	305.4260	56.8981S	PEACOCK
34	138.1612	69.5101S	MIAPLACIDUS
35	283.0414	26.3614S	NUNKI
36	275.2129	34.4115S	KAUS AUSTRAL
37	1.4506	28.8129N	ALPHERATZ
38	13.4185	60.4464N	NAVI
39	98.7063	16.4431N	ALHENA
40	50.1854	49.6848N	MIRFAK
41	176.6225	14.8505N	DENEbola
42	233.1438	26.8807N	ALPHECCA
43	263.1541	12.5928N	RASALHAGUE
44	164.7110	56.6511N	MERAK
45	27.2285	89.0289N	POLARIS
46	177.8041	53.9728N	ALCOR
47	183.3063	17.2643S	GIENAH
48	228.5769	9.2000S	ZUBENESCH
49	34.2040	3.2058S	MIRA CETI
50	125.3719	59.3480S	AVIOR
51	250.8381	68.9393S	ATRIA
52	31.0891	23.2255N	HAMAL
53	210.9266	36.1301S	MENKENT
54	10.2723	18.2604S	DIPHDA
55	141.2824	8.4405S	ALPHARD
56	136.5385	43.2299S	AL SUHAIL
57	44.0905	40.5039S	ACAMAR
58	326.0735	16.3581S	DENEK ALGEID
59	345.3387	27.8125N	SCHEAT
60	325.4324	9.6447N	ENIE
61	218.9752	60.6235S	RIGIL KENT
62	191.1955	59.4161S	BEGRUX
63	104.1650	28.9028S	ADHARA
64	121.9978	47.1883S	REGOR

ORIGINAL PAGE IS
OF POOR QUALITY

I

TABLE III.- Continued

65	83.4188	1.2322S	ANILAM
66	84.5588	1.9675S	ALNITAK
67	80.7828	28.5655N	EL NATH
68	95.1242	17.9297S	MURZIM
69	120.4562	39.8613S	NAOS
70	86.3458	9.6858S	SAIPH
71	115.5581	28.1481N	POLLUX
72	82.3625	56.3344S	MINTAKA
73	192.9608	56.2307N	ALIOTH
74	239.3428	22.4814S	DZUBA
75	130.8311	54.5255S	
76	219.6476	47.1753S	
77	204.1758	53.2133S	
78	88.9543	44.9447N	MENKLINAN
79	218.0800	41.9397S	
80	264.7561	39.0067S	
81	46.2267	40.7644N	BATEN KAITOS
82	140.1411	54.7967S	
83	200.4812	55.1855N	HIZAR
84	263.4310	42.9681S	SARGAS
85	189.6842	48.6858S	MUHLIFAIN
86	208.1012	47.0435S	
87	181.4386	50.4444S	
88	110.5292	29.2044S	ALUDRA
89	187.0941	56.8362S	GACRUX
90	240.6311	19.6706S	ACRAB
91	106.5896	26.3125S	AL WAZN
92	160.2916	64.1318S	
93	223.8111	42.9344S	
94	248.6006	10.4673S	
95	188.5441	68.8605S	
96	248.1911	28.1145S	
97	2.6642	14.9055N	ALGENIB
98	165.1621	62.0207N	DUBHE
99	183.1184	58.4710S	
100	232.9499	41.0006S	
101	244.5361	25.4750S	
102	138.9376	59.0650S	SCUTULUM
103	345.5677	14.9354N	MARKAB
104	58.6232	39.8669N	
105	1.6341	58.8724N	CAPH
106	84.4592	34.1000S	PHACT
107	256.8774	15.6638S	SABIK
108	238.9553	25.9720S	
109	89.0785	37.2103N	
110	261.9925	49.8397S	
111	252.1194	37.9639S	
112	319.3497	62.3738N	ALDERAMIN
113	284.8576	29.9536S	ASCELLA
114	83.6637	21.1137N	
115	154.3078	20.0938N	ALGETHA
116	305.1079	40.0956N	SADIR
117	167.8644	20.7964N	ZOZCA
118	94.5983	30.0400S	
119	105.2342	23.7592S	
120	206.6485	42.2257S	
121	190.7972	67.8350S	
122	111.1096	8.3913N	GOMEISA
123	82.6308	17.8567S	ARNEB

T

TABLE III.- Continued

124	20.6371	59.9756N	RUCHBACH
125	57.7460	31.7366N	
126	27.9589	20.5634N	SHERATAN
127	322.0061	70.3412N	ALPHIRK
128	16.7333	35.3550N	MIRACH
129	223.9743	41.9053S	
130	199.4405	36.4500S	
131	193.4200	38.5885N	COR CAROLI
132	222.7059	74.3598N	KOCHAB
133	339.9244	47.1468S	
134	54.8392	47.6291N	
135	76.3466	5.1502S	KURSA
136	295.8531	45.0082N	
137	30.2056	42.0903N	ALMACH
138	222.0261	15.8360S	ZUBENELGENUB
139	327.7278	37.6012S	
140	228.5509	68.4972S	
141	9.4146	56.2633N	SCHEDAR
142	186.8161	16.2386S	ALGORAB
143	220.7003	27.2840N	IZAR
144	268.8607	51.4937N	ELTAMIN
145	251.7229	34.2070S	
146	189.7757	1.1756S	
147	285.7778	13.7865N	
148	208.0753	18.6440N	MUFRIQ
149	173.3655	62.7433S	
150	311.0507	33.7851N	
151	5.9568	42.5814S	ANKAA
152	29.3041	61.8122S	
153	146.4630	64.8394S	
154	230.1969	72.0121N	
155	121.3525	24.1584S	
156	31.6418	34.7513N	
157	286.6975	21.1054S	
158	237.6751	63.2825S	
159	249.8446	31.6959N	

ORIGINAL PAGE IS
OF POOR QUALITY

T

TABLE III.- Continued

UNIT VECTORS IN M1950.0 COORDINATES FOR THE YEAR 1985

ID	MAGNITUDE	UNIT X	UNIT Y	UNIT Z	NAME
11	3.1500	-.1783817	.9412801	-.2866562	SIRIUS
12	1.5000	-.0603441	.6034286	-.7951305	CANOPUS
13	.8610	.2051927	.9681249	-.1436318	RIGEL
14	.8030	.1195150	-.7707989	.6257677	VEGA
15	.7450	-.4309725	-.2495077	-.8671843	HADAR
16	.6910	.4911081	-.2182954	-.8433030	ACHERNAR
17	.6670	-.4542918	-.0473647	-.8895929	ACRUX
18	.5140	.1416122	.6807724	.7186758	CAPELLA
19	.5130	-.9189360	-.3461068	-.1891211	SPICA
20	.4880	-.7879394	-.5182416	.3325315	ARCTURUS
21	.4770	.4075766	.9384084	.0931427	PROCYON
22	.3690	.4501200	-.8799495	.1519236	ALTAIR
23	.3080	.0326002	.9911362	.1287877	BETELGEUSE
24	.2740	.1621310	.9806371	.1098386	DELAIRIX
25	.2690	-.8583225	.4674784	.2115333	REGULUS
26	.2670	.8322538	-.2429494	-.4983263	FOMALHAUT
27	.2540	.4530697	-.5412652	.7083501	DENEK
28	.2050	.5957594	-.3265169	-.7337966	AL NA'IR
29	.1970	-.5810250	-.2883117	.7611086	ALKAID
30	.1930	.3561962	.8224915	-.4434321	ANTARES
31	.1910	.3293337	.7815052	.5298952	CASTOR
32	.1910	.3552663	.8910608	.2824826	ALDEBARAN
33	.1880	.3165644	-.4450221	-.8377006	PEACOCK
34	.1870	-.2607895	.2334908	-.9367341	MIAPLACIDUS
35	.1830	.2021892	-.8729004	-.4440319	NUNKI
36	.1680	.0749567	-.8215875	-.5651332	KAUS AUSTRAL
37	.1480	.8759175	.0221814	.4819508	ALPHERATZ
38	.1460	.4797728	.1144617	.8698946	NAV I
39	.1370	-.1451782	.9480498	.2830634	ALHENA
40	.1160	.4142722	.4969680	.7624868	MIRFAK
41	.1120	-.9649190	.0569458	.2562978	DENEbola
42	.1100	-.5349992	-.7136879	.4521342	ALPHECCA
43	.1090	-.1163323	-.9689861	.2180200	RASALHAGUE
44	.0960	-.5302795	.1449583	.8353387	MERAK
45	.0959	.0150702	.0077545	.9998564	POLARIS
46	.0902	-.5877376	.0225365	.8087376	ALCOR
47	.0893	-.9533566	-.0550756	.2967791	GIENAH
48	.0869	.6531034	-.7401985	-.1598814	ZURENFESCH
49	.0820	.8257469	.5612617	-.0559234	MIRA CETI
50	.0764	-.2951271	.4157156	-.8602793	AVIOR
51	.0740	-.1179550	-.3394469	-.9332001	ATRIA
52	.0720	.7869653	.4745241	.3943507	HAMAL
53	.0714	-.6928495	-.4150996	-.5896201	MENKENT
54	.0698	.9344205	.1693469	.3133369	DIPHDA
55	.0682	-.7717868	.6187082	-.1467830	ALPHARD
56	.0540	-.5288524	.5011880	-.5849275	AL SUHAIL
57	.0540	.5461235	.5290553	-.6494995	ACAMAR
58	.0495	.7961655	-.5355366	-.2816398	DENEB ALGEID
59	.0473	.8556798	-.2238657	.4665792	SCHEAT
60	.0458	.8118179	-.5593591	.1675383	ENTE
61	.7090	-.3813600	-.3085461	-.8714148	RIGIL KENT
62	.3910	-.4991169	-.0987872	-.8608853	BECRUX
63	.3170	-.2142337	.8488233	.4833248	ADHARA
64	.2700	-.3601058	.5763396	-.7335915	REGOR

T

TABLE III.- Continued

65	.2560	.1145856	.9931806	-.0215047	ANILAM
66	.2520	.0947691	.9949071	-.0343326	ALNITAK
67	.2180	.1406795	.8669312	-.4781627	EL NATH
68	.2030	-.0849768	.9476324	-.3078502	MURZIM
69	.1960	-.3890802	.6616825	-.6409312	NAOS
70	.1770	-.0628255	.9837410	-.1682457	SAIPH
71	.1710	-.3804024	.7954517	-.4717526	POLUX
72	.1680	.1329029	.9911119	-.0058371	MINTAKA
73	.1640	-.5416888	-.1246683	-.8312828	ALIOH
74	.1470	-.4711504	-.7948586	-.3823835	DZUBA
75	.1440	-.3794451	.4391089	-.8143739	
76	.1440	-.5234019	-.4337290	-.7334368	
77	.1430	-.5463161	-.2452470	-.8008699	
78	.1390	.0127939	.7076730	-.7064242	MENKLINAN
79	.1320	-.5855206	-.4587764	-.6683486	
80	.1300	-.0710210	-.7738203	-.6294110	
81	.1290	.5239750	.5469054	.6529507	BATEN KAITOS
82	.1240	-.4425204	.3694654	.8171114	
83	.1230	-.5348311	-.1997652	-.8210052	MIZAR
84	.1220	-.0837104	-.7269298	-.6815905	SARGAS
85	.1170	-.6507808	-.1110549	-.7511000	MUHLIFAIN
86	.1120	-.5011119	-.3209801	-.7318718	
87	.1090	-.6366265	-.0159878	-.7710065	
88	.1090	-.3061066	.8174507	-.4879274	AEDRA
89	.1070	-.5428461	-.0675587	-.8371104	GACRUX
90	.1060	-.4618110	.8206237	-.3366116	ACRAB
91	.1050	-.2559319	.8590771	-.4432668	ALWAZN
92	.1020	-.4107438	.1471352	-.8998004	
93	.0990	-.5283274	-.5068440	-.6811602	
94	.0960	-.3587959	-.9155653	-.1816744	
95	.0940	-.3566379	-.0535807	-.9327049	
96	.0920	-.3276765	-.8188810	-.4712345	
97	.0905	.9653071	.0449177	-.2572249	ALGENIB
98	.0900	-.4535082	.1201430	-.8831172	DUBHE
99	.0890	-.5221553	-.0284074	-.8523758	
100	.0890	-.4547190	-.6023349	-.6560665	
101	.0880	-.3881403	-.8150743	-.4301174	
102	.0860	-.3876026	.3376794	-.8577510	SCUTULUM
103	.0859	.9357256	-.2408166	.2577306	MARKAB
104	.0851	.3996279	.6552922	.6410067	
105	.0843	.5167353	.0147414	.8560183	CAPH
106	.0840	.0799535	.8241912	-.5606392	PHACT
107	.0831	-.2186043	-.9377185	-.2699929	SABIK
108	.0830	-.4636251	-.7702389	-.4379312	
109	.0800	.0128085	.7963179	-.6047428	
110	.0760	-.3898406	-.6386406	-.7642427	
111	.0760	-.2420650	-.7503177	-.6151649	
112	.0759	.3518099	-.3020735	.8859918	ALDERAMIN
113	.0740	.2221682	-.8374617	-.4992987	ASCELLA
114	.0736	.1029542	.9271689	.3602198	
115	.0727	-.8462850	.4071478	.3435584	ALGETRA
116	.0714	.4399490	-.6258004	.6440643	SADIR
117	.0713	-.9139566	.1965298	.3550485	ZOZCA
118	.0700	-.0694012	.8628897	-.5006045	
119	.0700	-.2404945	.8830852	-.4028931	
120	.0670	-.6618429	-.3321266	-.6720534	
121	.0670	-.3705958	-.0706761	-.9261013	
122	.0666	-.3562969	.9229064	-.1459324	GOMEISA
123	.0666	.1220831	.9439648	-.3066368	ARNER

ORIGINAL PAGE IS
OF POOR QUALITY

T

TABLE III.- Continued

124	.0661	.4682606	.1763535	.8658126	RUCHBACH
125	.0654	.4538766	.7192390	.5260146	
126	.0653	.8269281	.4391106	.3512432	SHEPATAN
127	.0653	.2651232	-.2070913	.9417127	ALPHIRK
128	.0651	.7810466	.2348200	.5786414	MIRACH
129	.0650	-.5356005	-.5167591	-.6679013	
130	.0640	-.7585159	-.2677184	-.5941216	
131	.0638	-.7603023	-.1814100	.6237233	COR CAROLI
132	.0634	-.1981106	-.1828491	.9629737	KOCHAB
133	.0630	.6387988	-.2334589	-.7330982	
134	.0619	.3880970	.5509622	.7387972	
135	.0610	.2350945	.9678184	-.0897673	KURSA
136	.0606	.3083005	-.6362454	.7072076	
137	.0600	.6413323	.3733479	.6703016	ALMACH
138	.0596	-.7146473	-.6440602	-.2728841	ZUBENELGENUB
139	.0590	.5698868	-.4230297	-.6101619	
140	.0580	-.2426369	-.2747424	-.9303999	
141	.0577	.5478962	.0908473	.8315987	SCHEDAR
142	.0575	-.9533197	-.1139489	-.2796377	ALGORAB
143	.0557	-.6737859	-.5795524	.4584012	IZAR
144	.0550	-.0123795	-.6224777	.7825396	ELTAMIN
145	.0540	-.2593624	-.7852899	-.5621840	
146	.0540	-.9852726	-.1697560	-.0205159	
147	.0537	.2640733	-.9345993	.2383051	
148	.0521	-.8360284	-.4459336	.3196870	MUFRIQ
149	.0510	-.4549118	.0529125	.8889632	
150	.0508	.5458253	-.6267783	.5560788	
151	.0507	.7323411	.0764138	-.6766368	ANKAA
152	.0500	.4119165	.2311960	-.8814041	
153	.0490	-.3543803	.2348881	-.9051200	
154	.0486	-.1976886	-.2372472	.9511220	
155	.0470	-.4747319	.7791889	-.4092607	
156	.0464	.6994941	.4310346	.5700151	
157	.0460	.2680452	-.8935832	-.3600846	
158	.0460	-.2404057	-.3799183	.8932341	
159	.0459	-.2931747	-.7987439	.5254110	

T

TABLE III.- Continued

1986 STAR POSITIONS IN M1950.0 COORDINATES

ID	RA(+DEG)	DEC(DEG)	NAME
11	100.7307	16.6582S	SIRIUS
12	95.7107	52.6676S	CANOPUS
13	78.0333	8.2581S	RIGEL
14	278.8138	38.7386N	VEGA
15	210.0683	60.1331S	HADAR
16	23.9650	57.4906S	ACHERNAR
17	185.9522	62.8221S	ACRUX
18	78.2491	45.9451N	CAPELLA
19	200.6383	10.9015S	SPICA
20	213.3333	19.4219N	ARCTURUS
21	114.1642	5.3441N	PROCYON
22	297.0912	8.7385N	ALTAIR
23	88.1161	7.3995N	BETELGEUSE
24	80.6121	6.3060N	BELLATRIX
25	151.4254	12.2122N	REGULUS
26	343.7267	29.8894S	FOMALHAUT
27	309.9313	45.1008N	DENEK
28	331.2743	47.2057S	AL NA'IR
29	206.3911	49.5620N	ALKAID
30	246.5840	26.3231S	ANTARES
31	112.8510	31.9983N	CASTOR
32	68.2628	16.4084N	ALDEBARAN
33	305.4260	56.8981S	PEACOCK
34	138.1611	69.5101S	MIAPLACIDUS
35	283.0414	26.3614S	NUNKI
36	275.2129	34.4116S	KAUS AUSTRAL
37	1.4507	28.8128N	ALPHERATZ
38	13.4185	60.4464N	NAVI
39	98.7063	16.4431N	ALHENA
40	50.1854	49.6848N	MIRFAK
41	176.6224	14.8505N	DENEKOLA
42	233.1438	26.8807N	ALPHECCA
43	263.1541	12.5927N	RASALHAGUE
44	164.7111	56.6511N	MERAK
45	27.2292	89.0289N	POLARIS
46	177.8041	53.9728N	ALCOR
47	183.3063	17.2642S	GIENAH
48	228.5769	9.2000S	ZUBENESCH
49	34.2040	3.2059S	MIRA CETI
50	125.3719	59.3480S	AVIOR
51	250.8381	68.9393S	ATRIA
52	31.0892	23.2254N	HAMAL
53	210.9265	36.1302S	MENKENT
54	10.2724	18.2604S	DIPHDA
55	141.2824	8.4405S	ALPHARD
56	136.5385	43.2299S	AL SUHAIL
57	44.0905	40.5039S	ACAMAR
58	326.0735	16.3582S	DENEK ALGEID
59	345.3388	27.8125N	SCHEAT
60	325.4324	9.6447N	ENIE
61	218.9732	60.6233S	RIGIL KENT
62	191.1955	59.4161S	BEGRUX
63	104.1650	28.9028S	ADHARA
64	121.9978	47.1883S	REGOR

ORIGINAL PAGE IS
OF POOR QUALITY

T

TABLE III.- Continued

65	83.4188	1.2322S	ANILAM
66	84.5588	1.9675S	ALNITAK
67	80.7828	28.5654N	EL NATH
68	95.1242	17.9297S	MURZIM
69	120.4562	39.8613S	NAOS
70	86.3458	9.6858S	SAIPH
71	115.5580	28.1481N	POLLUX
72	82.3625	33.44S	MINTAKA
73	192.9608	56.2307N	ALIOTH
74	239.3428	22.4814S	DZUBA
75	130.8311	54.5255S	
76	219.6476	47.1753S	
77	204.1758	53.2133S	
78	88.9643	44.9447N	MENKLINAN
79	218.0800	41.9397S	
80	264.7561	39.0067S	
81	46.2267	40.7644N	BATEN KAITOS
82	140.1411	54.7967S	
83	200.4813	55.1855N	MI-ZAR
84	263.4310	42.9681S	SARGAS
85	189.6841	48.6858S	MUHLIFAIN
86	208.1012	47.0436S	
87	181.4386	50.4444S	
88	110.5292	29.2044S	ALUDRA
89	187.0941	56.8363S	GACRUX
90	240.6311	19.6706S	ACRAB
91	106.5896	26.3125S	AL WAZN
92	160.2916	64.1318S	
93	223.8111	42.9344S	
94	248.6006	10.4673S	
95	188.5441	68.8605S	
96	248.1911	28.1145S	
97	2.6642	14.9055N	AL GENIB
98	165.1620	62.0207N	DUBHE
99	183.1184	58.4710S	
100	232.9499	41.0006S	
101	244.5361	25.4750S	
102	138.9376	59.0650S	SCUTULUM
103	345.5677	14.9354N	MARKAB
104	58.6232	39.8669N	
105	1.6344	58.8724N	CAPH
106	84.4592	34.1000S	PHACT
107	256.8774	15.6638S	SABIK
108	238.9553	25.9720S	
109	89.0785	37.2103N	
110	261.9925	49.8397S	
111	252.1194	37.9639S	
112	319.3498	62.3738N	ALDERAMIN
113	284.8576	29.9536S	ASCELLA
114	83.6637	21.1137N	
115	154.3079	20.0938N	ALGETHA
116	305.1079	40.0956N	SADIR
117	167.8644	20.7964N	ZOZCA
118	94.5983	30.0400S	
119	105.2342	23.7592S	
120	206.6485	42.2258S	
121	190.7972	67.8350S	
122	111.1096	8.3913N	GOMEISA
123	82.6308	17.8567S	ARNEB

T

TABLE III.- Continued

124	20.6372	59.9756N	RUCHBACH
125	57.7460	31.7366N	
126	27.9590	20.5633N	SHERATAN
127	322.0061	70.3412N	ALPHIRK
128	16.7334	35.3550N	MIRACH
129	223.9743	41.9053S	
130	199.4404	36.4501S	
131	193.4199	38.5886N	COR CAROLI
132	222.7059	74.3598N	KOCHAB
133	339.9244	47.1468S	
134	54.8392	47.6290N	
135	76.3466	5.1502S	KURSA
136	295.8531	45.0082N	
137	30.2056	42.0903N	ALMACH
138	222.0260	15.8360S	ZUBENELGENUB
139	327.7279	37.6012S	
140	228.5508	68.4972S	
141	9.4146	56.2633N	SCHEGAR
142	186.8161	16.2386S	ALGORAB
143	220.7002	27.2840N	IZAR
144	268.8607	51.4937N	ELTAMIN
145	251.7227	34.2070S	
146	189.7756	1.1756S	
147	285.7778	13.7865N	
148	208.0752	18.6439N	MUFRID
149	173.3655	62.7433S	
150	311.0509	33.7851N	
151	5.9569	42.5815S	ANKAA
152	29.3043	61.8122S	
153	146.4630	64.8394S	
154	230.1969	72.0121N	
155	121.3524	24.1584S	
156	31.6418	34.7513N	
157	286.6975	21.1054S	
158	237.6750	63.2826S	
159	249.8445	31.6960N	

ORIGINAL PAGE IS
OF POOR QUALITY

T

TABLE III.- Continued

UNIT VECTORS IN M1950.0 COORDINATES FOR THE YEAR 1986

ID	MAGNITUDE	UNIT X	UNIT Y	UNIT Z	NAME
11	3.1500	-.1783789	.9412789	-.2866618	SIRIUS
12	1.5000	-.0603442	.6034287	-.7951304	CANOPUS
13	.8610	.2051927	.9681249	-.1436318	RIGEL
14	.8030	.1195158	-.7707979	.6257687	VEGA
15	.7450	-.4309724	-.2495075	-.8671844	HADAR
16	.6910	-.4911078	.2182958	-.8433031	ACHERNAR
17	.6670	-.4542917	-.0473645	-.8895930	ACRUX
18	.5140	.1416122	.6807739	.7186744	CAPELLA
19	.5130	-.9189360	-.3461065	-.1891213	SPICA
20	.4880	-.7879450	-.5182389	.3325224	ARCTURUS
21	.4770	-.4075737	.9384102	.0931377	PROCYON
22	.3690	.4501222	-.8799481	.1519254	ALTAIR
23	.3080	.0326000	.9911362	.1287877	BETELGEUSE
24	.2740	.1621310	.9806371	.1098386	BELLATRIX
25	.2690	-.8583220	.4674795	.2115333	REGULUS
26	.2670	.8322539	-.2429478	-.4983270	FOMALHAUT
27	.2540	.4530697	-.5412652	.7083501	DENEK
28	.2050	.5957592	-.3265162	-.7337971	ALNAIR
29	.1970	-.5810253	-.2883112	.7611085	ALKAID
30	.1930	-.3561963	-.8224914	-.4434322	ANTARES
31	.1910	-.3293331	.7815058	.5298948	CASTOR
32	.1910	.3552661	.8910612	.2824817	ALDEBARAN
33	.1880	.3165643	-.4450218	-.8377008	PEACOCK
34	.1870	-.2607894	.2334917	-.9367340	MIAPLACIDUS
35	.1830	.2021892	-.8729003	-.4440322	NUNKI
36	.1580	.0749565	-.8215871	-.5651337	KAUS AUSTRAL
37	.1480	.8759178	.0221820	.4819501	ALPHERATZ
38	.1460	.4797728	.1144619	.8698946	NAVI
39	.1370	-.1451784	.9480498	.2830632	ALHENA
40	.1160	.4142721	.4969682	.7624967	MIRFAK
41	.1120	-.9649190	.0569482	.2562972	DENEbola
42	.1100	-.5349989	-.7136885	.4521338	ALPHECCA
43	.1090	-.1163319	-.9689864	.2180189	RASALHAGUE
44	.0960	-.5302795	.1449578	.8353388	MERAK
45	.0959	.0150701	.0077547	.9998564	POLARIS
46	.0902	-.5877377	.0225360	.8087376	ALCOR
47	.0893	-.9533567	-.0550748	.2967790	GIENAH
48	.0869	-.6531038	-.7401981	.1598816	ZUBENESCH
49	.0820	.8257468	.5612616	-.0559245	MIRA CETI
50	.0764	-.2951270	.4157157	-.8602793	AVIOR
51	.0740	-.1179549	-.3394467	-.9332002	ATRIA
52	.0720	.7869651	.4745251	.3943500	HAMAL
53	.0714	-.6928495	-.4150967	-.5896221	MENKENT
54	.0698	.9344203	.1693480	-.3133367	DIPHDA
55	.0682	-.7717868	.6187083	-.1467828	ALPHARD
56	.0540	-.5288524	.5111882	-.6849274	AL SUHAIL
57	.0540	.5461238	.5290552	-.6494994	ACAMAR
58	.0495	.7961659	-.5355354	-.2816411	DENEB ALGEID
59	.0473	.8556798	-.2238647	.4665798	SCHEAT
60	.0458	.8118180	-.5593590	.1675383	ENIF
61	.7090	-.3813733	-.3085344	-.8714132	RIGIL KENT
62	.3910	-.4991168	-.0987870	-.8608853	BECRUX
63	.3170	-.2142337	.8488233	-.4833248	ADHARA
64	.2700	-.3601057	.5763396	-.7335915	REGOR

1

TABLE III.- Continued

65	.2560	.1145856	.9931806	-.0215047	ANILAM
66	.2520	.0947691	.9949071	-.0343326	ALNITAK
67	.2180	.1406794	.8669316	-.4781619	EL NATH
68	.2030	-.0849768	.9476324	-.3078502	MURZIM
69	.1960	-.3890801	.6616827	-.6409312	NAOS
70	.1770	.0628255	.9837410	-.1682457	SAIPH
71	.1710	-.3803997	.7954531	-.4717524	POLLUX
72	.1680	.1329029	.9911119	-.0058371	MINTAKA
73	.1640	-.5416887	-.1246689	.8312827	ALIOTH
74	.1470	-.4711504	-.7948585	-.3823837	DZUBA
75	.1440	-.3794449	.4391086	-.8143741	
76	.1440	-.5234019	-.4337289	-.7334369	
77	.1430	-.5463161	-.2452469	-.8008699	
78	.1390	.0127942	.7076730	.7064242	MENKLINAN
79	.1320	-.5855206	-.4587763	-.6683487	
80	.1300	-.0710210	-.7738202	-.6294111	
81	.1290	.5239750	.5469054	.6529507	BATEN KAITOS
82	.1240	-.4425204	.3694655	.8171114	
83	.1230	-.5348311	-.1997658	.8210051	MIZAR
84	.1220	-.0837104	-.7269298	-.6815905	SARGAS
85	.1170	-.6507809	-.1110540	-.7511000	MUHLIFAIN
86	.1120	-.6011118	-.3209798	-.7318719	
87	.1090	-.6366264	-.0159876	-.7710066	
88	.1090	-.3061066	.8174507	.4879274	ALUDRA
89	.1070	-.5428451	-.0675585	.8371112	GACRUX
90	.1060	-.4618110	-.8206236	.3366117	ACRAB
91	.1050	-.2559319	.8590771	.4432668	ALWAZN
92	.1020	-.4107438	.1471353	-.8998004	
93	.0990	-.5283275	-.5068437	-.6811604	
94	.0968	-.3587958	-.9155654	-.1816743	
95	.0940	-.3566378	-.0535805	-.9327050	
96	.0920	-.3276766	-.8188810	.4712346	
97	.0905	.9653071	.0449177	.2572248	ALGENIB
98	.0900	-.4535083	.1201436	.8831170	DUBHE
99	.0890	-.5221552	-.0284472	-.8523759	
100	.0890	-.4547190	-.6023348	-.6560666	
101	.0880	-.3881403	-.8150742	-.4301176	
102	.0860	-.3875026	.3376794	-.8577510	SCUTULUM
103	.0859	.9357257	-.2408163	.2577304	MARKAB
104	.0851	.3996278	.6552924	.6410066	
105	.0843	.5167359	.0147439	.8560179	CAPH
106	.0840	.0799535	.8241911	.5606393	PHACT
107	.0831	-.2186042	-.9377186	.2699925	SABIK
108	.0830	-.4636251	-.7702389	-.4379313	
109	.0800	.0128082	.7963181	.6047424	
110	.0760	-.0898407	-.6386402	-.7642429	
111	.0760	-.2420650	-.7503176	-.6151650	
112	.0759	.3518102	-.3020728	.8859919	ALDERAMIN
113	.0740	.2221681	-.8374618	.4992987	ASCELLA
114	.0736	.1029542	.9271689	.3602197	
115	.0727	-.8462859	.4371466	.3435577	ALGETHA
116	.0714	.4399490	-.6258004	.6440643	SADIR
117	.0713	-.9139569	.1965292	.3550479	ZOZCA
118	.0700	-.0694012	.8628897	-.5006045	
119	.0700	-.2404945	.8830852	-.4028931	
120	.0670	-.6618429	-.3321265	.6720535	
121	.0670	-.3705957	-.0706759	.9261014	
122	.0666	-.3562967	.9229065	.1459322	GOMEISA
123	.0666	.1220831	.9439648	-.3066368	ARNER

ORIGINAL PAGE IS
OF POOR QUALITY

1

TABLE III.- Continued

124	.0661	.4682602	.1763550	.8658125	RUCHBACH
125	.0654	.4538766	.7192390	.5260145	
126	.0653	.8269280	.4391111	.3512427	SHERATAN
127	.0653	.2651232	-.2070913	.9417128	ALPHIRK
128	.0651	.7810466	.2348208	.5786409	MIRACH
129	.0650	-.5356005	-.5167590	-.6679014	
130	.0640	-.7585162	-.2677168	-.5941220	
131	.0638	-.7603025	-.1814089	.6237235	COR CAROLI
132	.0634	-.1981107	-.1828489	.9629738	KOCHAB
133	.0630	.6387990	-.2334583	-.7330983	
134	.0619	.3880970	.5509624	.7387971	
135	.0610	.2350949	.9678182	-.0897677	KURSA
136	.0606	.3083006	-.6362452	.7072077	
137	.0600	.6413323	.3733482	.6703014	ALMACH
138	.0596	-.7145476	-.6440597	-.2728844	ZUBENELGENUB
139	.0590	.6698871	-.4230293	-.6101619	
140	.0580	-.2426370	-.2747422	-.9303999	
141	.0577	.5478963	.0908476	.8315987	SCHEDAR
142	.0575	-.9533196	-.1139479	-.2796384	ALGORAB
143	.0557	-.6737860	-.5795522	.4584012	IZAR
144	.0550	-.0123795	-.6224777	.7825396	ELTAMIN
145	.0540	-.2593649	-.7852883	-.5621851	
146	.0540	-.9852730	-.1697533	-.0205159	
147	.0537	.2640732	-.9345995	.2383046	
148	.0521	-.8360290	-.4459336	.3196854	MUFRIQ
149	.0510	-.4549117	.0529127	-.8889632	
150	.0508	.5458261	-.6267765	.5560801	
151	.0507	.7323397	.0764146	-.6766382	ANKAA
152	.0500	.4119160	.2311971	-.8814041	
153	.0490	-.3543803	.2348882	-.9051200	
154	.0486	-.1976886	-.2372471	.9511220	
155	.0470	-.4747316	.7791891	-.4092605	
156	.0464	.6994938	.4310352	.5700149	
157	.0460	.2680452	-.8935831	-.3600847	
158	.0460	-.2404056	-.3799164	-.8932350	
159	.0459	-.2931766	-.7987422	.5254126	

T

TABLE III.- Continued

1987 STAR POSITIONS IN M1950.0 COORDINATES

ID	RA(+DEG)	DEC(DEG)	NAME
11	100.7305	16.6585S	SIRIUS
12	95.7107	52.6676S	CANOPUS
13	78.0333	8.2581S	RIGEL
14	278.8139	38.7387N	VEGA
15	210.0583	60.1331S	HADAR
16	23.9650	57.4906S	ACHERNAR
17	185.9521	62.8221S	ACRUX
18	78.2492	45.9450N	CAPELLA
19	200.6383	10.9015S	SPICA
20	213.3330	19.4214N	ARCTURUS
21	114.1640	5.3439N	PROCYON
22	297.0914	8.7386N	ALTAIR
23	88.1161	7.3995N	BETELGEUSE
24	80.6121	6.3060N	BELLATRIX
25	151.4253	12.2122N	REGULUS
26	343.7268	29.8894S	FOMALHAUT
27	309.9313	45.1008N	DENEK
28	331.2743	47.2057S	AL NAIR
29	206.3911	49.5620N	ALKAID
30	246.5840	26.3231S	ANTARES
31	112.8509	31.9983N	CASTOR
32	68.2629	16.4083N	ALDEBARAN
33	305.4260	56.8981S	PEACOCK
34	138.1609	69.5101S	MIAPLACIDUS
35	283.0414	26.3615S	NUNKI
36	275.2129	34.4116S	KAUS AUSTRAL
37	1.4507	28.8128N	ALPHERATZ
38	13.4185	60.4464N	NAVI
39	98.7063	16.4431N	ALHENA
40	50.1855	49.6848N	MIRAK
41	176.6223	14.8504N	DENEKOLA
42	233.1439	26.8806N	ALPHECCA
43	263.1541	12.5926N	RASALHAGUE
44	164.7111	56.6511N	MERAK
45	27.2300	89.0289N	POLARIS
46	177.8042	53.9728N	ALCOR
47	183.3062	17.2642S	GIENAH
48	228.5768	9.2000S	ZUBENESCH
49	34.2040	3.2060S	MIRA CETI
50	125.3719	59.3480S	AVIOR
51	250.8381	68.9393S	ATRIA
52	31.0892	23.2254N	HAMAL
53	210.9263	36.1303S	MENKENT
54	10.2725	18.2604S	DIPHDA
55	141.2823	8.4405S	ALPHARD
56	136.5384	43.2299S	AL SUHAIL
57	44.0905	40.5039S	ACAMAR
58	326.0736	16.3583S	DENEK ALGEID
59	345.3388	27.8126N	SCHEAT
60	325.4324	9.6447N	FNIE
61	218.9711	60.6231S	RIGIL KENT
62	191.1955	59.4161S	BECRUX
63	104.1650	28.9028S	ADHARA
64	121.9978	47.1883S	REGOR

ORIGINAL PAGE IS
OF POOR QUALITY

T

TABLE III.- Continued

65	83.4188	1.2322S	ANILAM
66	84.5588	1.9675S	ALNITAK
67	80.7828	28.5654N	EL NATH
68	95.1242	17.9297S	MURZIM
69	120.4562	39.8613S	NAOS
70	86.3458	9.6858S	SAIPH
71	115.5578	28.1481N	POLLUX
72	82.3625	.3344S	MINTAKA
73	192.9609	56.2307N	ALIOTH
74	239.3428	22.4814S	DZUBA
75	130.8311	54.5255S	
76	219.6476	47.1753S	
77	204.1758	53.2133S	
78	88.9642	44.9447N	MENKLINAN
79	218.6800	41.9398S	
80	264.7561	39.0067S	
81	46.2267	40.7644N	BATEN KAITOS
82	140.1411	54.7967S	
83	200.4813	55.1855N	MIZAR
84	263.4310	42.9681S	SARGAS
85	189.6840	48.6858S	MUHLIFAIN
86	208.1012	47.0436S	
87	181.4386	50.4444S	
88	110.5292	29.2044S	ALUDRA
89	187.0941	56.8364S	GACRUX
90	240.6311	19.6706S	ACRAB
91	106.5896	26.3125S	AL WAZN
92	160.2916	64.1318S	
93	223.8111	42.9344S	
94	248.6006	10.4673S	
95	188.5441	68.8605S	
96	248.1911	28.1145S	
97	2.6642	14.9055N	ALGENIB
98	165.1620	62.0207N	DUBHE
99	183.1184	58.4710S	
100	232.9498	41.0006S	
101	244.5361	25.4750S	
102	138.9376	59.0650S	SCUTULUM
103	345.5677	14.9354N	MARKAB
104	58.6232	39.8669N	
105	1.6347	58.8723N	CAPH
106	84.4592	34.1000S	PHACT
107	256.8774	15.6638S	SABIK
108	238.9553	25.9720S	
109	89.0785	37.2103N	
110	261.9925	49.8397S	
111	252.1194	37.9639S	
112	319.3499	62.3738N	ALDERAMIN
113	284.8576	29.9536S	ASCELLA
114	83.6637	21.1137N	
115	154.3080	20.0937N	ALGETBA
116	305.1079	40.0956N	SADIR
117	167.8645	20.7963N	ZOZCA
118	94.5983	30.0400S	
119	105.2342	23.7592S	
120	206.6484	42.2258S	
121	190.7971	67.8350S	
122	111.1095	8.3913N	GOMEISA
123	82.6308	17.8567S	ARNEB

L

TABLE III.- Continued

124	20.6374	59.9756N	RUCHBACH
125	57.7460	31.7366N	
126	27.9690	20.5633N	SHERATAN
127	322.0061	70.3412N	ALPHIRK
128	16.7334	35.3550N	MIRACH
129	223.9743	41.9053S	
130	199.4403	36.4501S	
131	193.4198	38.5886N	COR CAROLI
132	222.7059	74.3598N	KOCHAB
133	339.9245	47.1468S	
134	54.8392	47.6290N	
135	76.3466	5.1503S	KURSA
136	295.8531	45.0082N	
137	30.2056	42.0903N	ALMACH
138	222.0260	15.8360S	ZUBENELGENUB
139	327.7279	37.6012S	
140	228.5508	68.4973S	
141	9.4147	56.2633N	SCHEDAR
142	186.8160	16.2387S	ALGORAB
143	220.7002	27.2840N	IZAR
144	268.8607	51.4937N	ELTAMIN
145	251.7224	34.2071S	
146	189.7754	1.1756S	
147	285.7778	13.7865N	
148	208.0752	18.6438N	MUFRID
149	173.3655	62.7433S	
150	311.0510	33.7852N	
151	5.9569	42.5816S	ANKAA
152	29.3045	61.8122S	
153	146.4630	64.8394S	
154	230.1969	72.0121N	
155	121.3524	24.1584S	
156	31.6418	34.7513N	
157	286.6975	21.1054S	
158	237.6749	63.2827S	
159	249.8443	31.6961N	

ORIGINAL PAGE IS
ON POOR QUALITY

TABLE III.- Continued

UNIT VECTORS IN M1950.0 COORDINATES FOR THE YEAR 1987

ID	MAGNITUDE	UNIT X	UNIT Y	UNIT Z	NAME
11	3.1500	-.1783761	.9412777	-.2866675	SIRIUS
12	1.5000	-.0603443	.6034287	-.7951304	CANOPUS
13	.8610	.2051927	.9681249	-.1436318	RIGEL
14	.8030	.1195167	-.7707969	.6257698	VEGA
15	.7450	-.4309724	-.2495073	-.8671845	HADAR
16	.6910	.4911075	.2182961	-.8433031	ACHERNAR
17	.6670	-.4542916	-.0473644	-.8895930	ACRUX
18	.5140	.1416120	.6807754	.7186730	CAPELLA
19	.5130	-.9189360	-.3461063	-.1891215	SPICA
20	.4880	-.7879506	-.5182362	.3325132	ARCTURUS
21	.4770	-.4075707	.9084120	.0931328	PROCYON
22	.3690	.4501243	-.8799467	.1519272	ALTAIR
23	.3080	.0325999	.9911362	.1287878	BETELGEUSE
24	.2740	.1621310	.9806371	.1098385	BELLATRIX
25	.2690	-.8583214	.4674806	.2115333	REGULUS
26	.2670	.8322540	-.2429461	-.4983277	FOMALHAUT
27	.2540	.4530697	-.5412652	.7083501	DENEK
28	.2050	.5957590	-.3265154	-.7337976	ALNAIR
29	.1970	-.5810257	-.2883107	.7611085	ALKAID
30	.1930	-.3561963	-.8224913	-.4434324	ANTARES
31	.1910	-.3293325	.7815063	.5298943	CASTOR
32	.1910	.3552658	.8910616	.2824808	ALDEBARAN
33	.1880	.3165641	-.4450215	-.8377011	PEACOCK
34	.1870	-.2607892	.2334925	-.9367338	MIAPLACIDUS
35	.1830	.2021893	-.8729002	-.4440324	NUNKI
36	.1580	.0749563	-.8215868	-.5651342	KAUS AUSTRAL
37	.1480	.8759182	.0221827	.4819494	ALPHERATZ
38	.1460	.4797728	.1144620	.8698946	NAVI
39	.1370	-.1451786	.9480499	.2830630	ALHENA
40	.1160	.4142721	.4969683	.7624967	MIRFAK
41	.1120	-.9649190	.0569506	.2562967	DENEbola
42	.1100	-.5349986	-.7136890	.4521333	ALPHECCA
43	.1090	-.1163313	-.9689867	.2180178	RASALHAGUE
44	.0960	-.5302794	.1449574	.8353389	MERAK
45	.0959	.0150700	.0077549	.9998564	POLARIS
46	.0902	-.5877377	.0225355	.8087376	ALCOR
47	.0893	-.9533568	-.0550741	-.2967789	GIENAH
48	.0869	-.6531042	-.7401978	-.1598817	ZUBENESCH
49	.0820	.8257468	.5612615	-.0559256	MIRACETI
50	.0764	-.2951269	.4157159	-.8602793	AVIOR
51	.0740	-.1179547	-.3394466	-.9332002	ATRIA
52	.0720	.7869648	.4745260	.3943494	HAMAL
53	.0714	-.6928496	-.4150937	-.5896242	MENKENT
54	.0698	.9344202	.1693491	-.3133366	DIPHDA
55	.0682	-.7717868	.6187083	-.1467827	ALPHARD
56	.0540	-.5288524	.5111882	-.6849274	ALSUHAIL
57	.0540	.5461240	.5290551	-.6494993	ACAMAR
58	.0495	.7961662	-.5355342	-.2816425	DENEK ALGEID
59	.0473	.8556797	-.2238638	.4665804	SHEAT
60	.0458	.8118181	-.5593588	.1675383	ENIF
61	.7090	-.3813866	-.3085227	-.8714115	RIGIL KENT
62	.3910	-.4991167	-.0987868	-.8608854	BECRUX
63	.3170	-.2142337	.8488233	-.4833248	ADHARA
64	.2700	-.3601057	.5763397	-.7335915	REGOR

TABLE III.- Continued

65	.2560	.1145856	.9931806	-.0215047	ANILAM
66	.2520	.0947691	.9949071	-.0343326	ALNITAK
67	.2180	.1406793	.8669321	-.4781611	EL NATH
68	.2030	-.0849768	.9476324	-.3078502	MURZIM
69	.1960	-.3890800	.6616828	-.6409311	NAOS
70	.1770	.0628255	.9837410	-.1682457	SAIPH
71	.1710	-.3803971	.7954545	-.4717522	POLLUX
72	.1680	.1329029	.9911119	-.0058371	MINTAKA
73	.1640	-.5416886	-.1246694	-.8312827	ALIOTH
74	.1470	-.4711504	-.7948584	-.3823838	DZUBA
75	.1440	-.3794448	.4391083	-.8143743	
76	.1440	-.5234019	-.4337288	-.7334370	
77	.1430	-.5463161	-.2452467	-.8008700	
78	.1390	.0127944	.7076730	-.7064242	MENKLINAN
79	.1320	-.5855206	-.4587761	-.6683488	
80	.1300	-.0710211	-.7738201	-.6294112	
81	.1290	.5239750	.5469054	.6529507	BATEN KAITOS
82	.1240	-.4425204	.3694655	-.8171114	
83	.1230	-.5348310	-.1997664	-.8210050	MIZAR
84	.1220	-.0837104	-.7269298	-.6815905	SARGAS
85	.1170	-.6507810	-.1110530	-.7511001	MUHLIFAIN
86	.1120	-.6011118	-.3209794	-.7318721	
87	.1090	-.6366264	-.0159874	-.7710067	
88	.1090	-.3061066	.8174507	-.4879274	ALUDRA
89	.1070	-.5428440	-.0675582	-.8371119	GACRUX
90	.1060	-.4618110	-.8206236	-.3366119	ACRAB
91	.1050	-.2559319	.8590771	-.4432668	AL WAZN
92	.1020	-.4107438	.1471354	-.8998004	
93	.0990	-.5283275	-.5068435	-.6811606	
94	.0968	-.3587958	-.9155654	-.1816742	
95	.0940	-.3566378	-.0535804	-.9327050	
96	.0920	-.3276766	-.8188809	-.4712347	
97	.0905	.9653071	.0449177	.2572248	ALGENIB
98	.0900	-.4535084	.1201443	-.8831169	DOUBHE
99	.0890	-.5221552	-.0284470	-.8523759	
100	.0890	-.4547190	-.6023347	-.6560667	
101	.0880	-.3881403	-.8150741	-.4301177	
102	.0860	-.3876025	.3376795	-.8577510	SCUTULUM
103	.0859	.9357258	-.2408160	.2577302	MARKAB
104	.0851	.3996278	.6552925	.6410065	
105	.0843	.5167366	.0147465	.8560174	GAPH
106	.0840	-.0799535	.8241910	-.5606394	PHACT
107	.0831	-.2186042	-.9377188	-.2699921	SABIK
108	.0830	-.4636251	-.7702388	-.4379315	
109	.0800	.0128080	.7963183	.6047421	
110	.0760	-.0898408	-.6386399	-.7642432	
111	.0760	-.2420651	-.7503175	-.6151651	
112	.0759	.3518105	-.3020721	.8859920	ALDERAMIN
113	.0740	.2221680	-.8374618	-.4992987	ASCELLA
114	.0736	.1029542	.9271690	.3602196	
115	.0727	-.8462868	.4071453	.3435570	ALGIBA
116	.0714	.4399490	-.6258004	.6440643	SADIR
117	.0713	-.9139573	.1965286	.3550472	ZOZCA
118	.0700	-.0694012	.8628897	-.5006045	
119	.0700	-.2404945	.8830852	-.4028931	
120	.0670	-.5618429	-.3321264	-.6720536	
121	.0670	-.3705956	-.0706758	.9261014	
122	.0666	-.3562965	.9229066	.1459320	GOMEISA
123	.0666	.1220831	.9439648	-.3066368	ARNEB

ORIGINAL PAGE IS
OF POOR QUALITY

1

TABLE III.- Continued

124	.0661	.4682599	.1763564	.8658124	RUCHBACH
125	.0654	.4538765	.7192391	.5260145	
126	.0653	.8269280	.4391116	.3512422	SHERATAN
127	.0657	.2651231	-.2070912	.9417128	ALPHIRK
128	.0651	.7810467	.2348217	.5786405	MIRACH
129	.0650	-.5356005	-.5167588	-.6679015	
130	.0640	-.7585165	-.2677151	-.5941223	
131	.0638	-.7603026	-.1814078	.6237237	COR CAROLI
132	.0634	-.1981107	-.1828488	.9629738	KOCHAB
133	.0630	.6387992	-.2334577	.7330983	
134	.0619	.3880970	.5509626	.7387969	
135	.0610	.2350953	.9678181	-.0897681	KURSA
136	.0606	.3083008	-.6362450	.7072078	
137	.0600	.6413323	.3733485	.6703012	ALMACH
138	.0596	-.7146478	-.6440593	-.2728847	ZUBENELGENUB
139	.0590	.6698873	-.4230289	-.6101619	
140	.0580	-.2426371	-.2747419	-.9304000	
141	.0577	.5478964	.0908478	.8315986	SCHEDAR
142	.0575	-.9533195	-.1139468	-.2796390	ALGORAB
143	.0557	-.6737862	-.5795519	.4584013	IZAR
144	.0550	-.0123796	-.6224778	.7825395	ELTAMIN
145	.0540	-.2593676	-.7852867	-.5621861	
146	.0540	-.9852735	-.1697505	-.0205159	
147	.0537	.2640732	-.9345996	.2383042	
148	.0521	-.8360296	-.4459336	.3196837	MUFRIID
149	.0510	-.4549116	.0529128	-.8889633	
150	.0508	.5458267	-.6267748	.5560814	
151	.0507	.7323383	.0764155	-.6766397	ANKAA
152	.0500	.4119155	.2311983	-.8814040	
153	.0490	-.3543803	.2348882	-.9051200	
154	.0486	-.1976886	-.2372470	.9511220	
155	.0470	-.4747313	.7791895	-.4092603	
156	.0464	.6994935	.4310359	.5700148	
157	.0460	.2680452	-.8935830	.3600849	
158	.0460	-.2404054	-.3799144	-.8932358	
159	.0459	-.2931784	-.7987405	.5254141	

TABLE III.- Continued

1988 STAR POSITIONS IN M1950.0 COORDINATES

ID	RA(+DEG)	DEC(DEG)	NAME
11	100.7304	16.6589S	SIRIUS
12	95.7107	52.6676S	CANOPUS
13	78.0333	8.2581S	RIGEL
14	278.8139	38.7388N	VEGA
15	210.0683	60.1331S	HADAR
16	23.9651	57.4906S	ACHERNAR
17	185.9521	62.8222S	ACRUX
18	78.2492	45.9449N	CAPELLA
19	200.6383	10.9015S	SPICA
20	213.3327	19.4208N	ARCTURUS
21	114.1638	5.3436N	PROCYON
22	297.0915	8.7387N	ALTAIR
23	88.1161	7.3996N	BETELGEUSE
24	80.6121	6.3060N	BELLATRIX
25	151.4252	12.2122N	REGULUS
26	343.7269	29.8895S	FOMALHAUT
27	309.9313	45.1008N	DENEK
28	331.2744	47.2057S	AL NAIR
29	206.3910	49.5620N	ALKAID
30	246.5840	26.3231S	ANTARES
31	112.8509	31.9983N	CASTOR
32	68.2629	16.4083N	ALDEBARAN
33	305.4260	56.8982S	PEACOCK
34	138.1608	69.5101S	MIAPLACIDUS
35	283.0414	26.3615S	NUNKI
36	275.2129	34.4117S	KAUS AUSTRAL
37	1.4507	28.8128N	ALPHERATZ
38	13.4185	60.4464N	NAVI
39	98.7063	16.4431N	ALHENA
40	50.1855	49.6848N	MIRFAK
41	176.6221	14.8504N	DENEKOLA
42	233.1439	26.8806N	ALPHECCA
43	263.1542	12.5926N	RASALHAGUE
44	164.7112	56.6512N	MERAK
45	27.2307	89.0289N	POLARIS
46	177.8042	53.9728N	ALCOR
47	183.3062	17.2642S	GIENAH
48	228.5768	9.2000S	ZUBENESCH
49	34.2040	3.2060S	MIRA CETI
50	125.3719	59.3480S	AVIOR
51	250.8381	68.9393S	ATRIA
52	31.0893	23.2254N	HAMAL
53	210.9261	36.1305S	MENKENT
54	10.2725	18.2604S	DIPHDA
55	141.2823	8.4405S	ALPHARD
56	136.5384	43.2299S	AL SUHAIL
57	44.0905	40.5039S	ACAMAR
58	326.0737	16.3583S	DENEK ALGEID
59	345.3389	27.8126N	SCHEAT
60	325.4324	9.6447N	ENIE
61	218.9691	60.6229S	RIGIL KENT
62	191.1955	59.4162S	BECRUX
63	104.1650	28.9028S	ADHARA
64	121.9978	47.1883S	REGOR

16

TABLE III.- Continued

65	83.4188	1.2322S	ANILAM
66	84.5588	1.9675S	ALNITAK
67	80.7828	28.5653N	EL NATH
68	95.1242	17.9297S	MURZIM
69	120.4562	39.8613S	NAOS
70	86.3458	9.6858S	SAIPH
71	115.5576	28.1481N	POLLUX
72	82.3625	.3344S	MINTAKA
73	192.9610	56.2307N	ALIO TH
74	239.3428	22.4814S	DZUBA
75	130.8312	54.5256S	
76	219.6476	47.1753S	
77	204.1758	53.2133S	
78	88.9542	44.9447N	MENKLINAN
79	218.0799	41.9398S	
80	264.7561	39.0067S	
81	46.2267	40.7644N	BATEN KAITOS
82	140.1411	54.7967S	
83	200.4814	55.1855N	MIZAR
84	263.4310	42.9681S	SARGAS
85	189.6839	48.6858S	MUHLIFAIN
86	208.1011	47.0436S	
87	181.4385	50.4444S	
88	110.5292	29.2044S	ALUDRA
89	187.0941	56.8365S	GACRUX
90	240.6311	19.6706S	ACRAB
91	106.5896	26.3125S	AL WAZN
92	160.2916	64.1318S	
93	223.8110	42.9344S	
94	248.6906	10.4673S	
95	188.5441	68.8605S	
96	248.1911	28.1145S	
97	2.6642	14.9055N	ALGENIB
98	165.1619	62.0207N	DUBHE
99	183.1184	58.4710S	
100	232.9498	41.0006S	
101	244.5361	25.4750S	
102	138.9376	59.0650S	SCUTULUM
103	345.5677	14.9354N	MARKAB
104	58.6232	39.8669N	
105	1.6349	58.8723N	CAPH
106	84.4592	34.1000S	PHACT
107	256.8774	15.6638S	SABIK
108	238.9553	25.9720S	
109	89.0785	37.2103N	
110	261.9924	49.8397S	
111	252.1194	37.9639S	
112	319.3500	62.3739N	ALDERAMIN
113	284.8576	29.9536S	ASCELLA
114	83.6637	21.1137N	
115	154.3081	20.0937N	ALGETHA
116	305.1079	40.0956N	SADIR
117	167.8645	20.7963N	ZOZCA
118	94.5983	30.0400S	
119	105.2342	23.7592S	
120	206.6484	42.2258S	
121	190.7971	67.8350S	
122	111.1095	8.3912N	GOMEISA
123	82.6308	17.8567S	ARNEB

T

TABLE III.- Continued

124	20.6376	59.9756N	RUCHBACH
125	17.7460	31.7366N	
126	27.9590	20.5633N	SHERATAN
127	322.0061	70.3412N	ALPHIRK
128	16.7335	35.3550N	MIRACH
129	223.9743	41.9053S	
130	199.4401	36.4501S	
131	193.4198	38.5886N	COR CAROLI
132	222.7058	74.3598N	KOCHAB
133	339.9246	47.1468S	
134	54.8392	47.6290N	
135	76.3466	5.1503S	KURSA
136	295.8531	45.0082N	
137	30.2056	42.0903N	ALMACH
138	222.0260	15.8360S	ZUBENELGENUB
139	327.7279	37.6012S	
140	228.5508	68.4973S	
141	9.4147	56.2633N	SCHEDAR
142	186.8160	16.2387S	ALGORAB
143	220.7002	27.2840N	IZAR
144	268.8607	51.4937N	ELTAMIN
145	251.7222	34.2072S	
146	189.7752	1.1756S	
147	285.7778	13.7864N	
148	208.0752	18.6437N	MUFRID
149	173.3655	62.7433S	
150	311.0511	33.7853N	
151	5.9570	42.5817S	ANKAA
152	29.3046	61.8122S	
153	146.4630	64.8394S	
154	230.1969	72.0122N	
155	121.3524	24.1584S	
156	31.6419	34.7512N	
157	286.6975	21.1054S	
158	237.6747	63.2828S	
159	249.8441	31.6962N	

TABLE III.- Continued

UNIT VECTORS IN M1950.0 COORDINATES FOR THE YEAR 1988

ID	MAGNITUDE	UNIT X	UNIT Y	UNIT Z	NAME
11	3.1500	-.1783732	.9412765	-.2866731	SIRIUS
12	1.5000	-.0603444	.6034288	-.7951303	CANOPUS
13	.8610	.2051927	.9681249	-.1436318	RIGEL
14	.8030	.1195175	-.7707960	.6257709	VEGA
15	.7450	-.4309723	-.2495072	-.8671845	HADAR
16	.6910	.4911073	-.2182964	-.8433032	ACHERNAR
17	.6670	-.4542916	-.0473642	-.8895931	ACRUX
18	.5140	.1416120	.6807770	.7186715	CAPELLA
19	.5130	-.9189361	-.3461061	-.1891217	SPICA
20	.4880	-.7879563	-.5182335	.3325041	ARCTURUS
21	.4770	-.4075678	.9084138	.0931278	PROCYON
22	.3690	.4501265	-.8799453	.1519290	ALTAIR
23	.3080	.0325997	.9911362	.1287878	BETELGEUSE
24	.2740	.1621310	.9806371	.1098385	BELLATRIX
25	.2690	-.8583208	.4674816	.2115333	REGULUS
26	.2670	.8322540	-.2429446	-.4983284	FOomalhaut
27	.2540	.4530697	-.5412652	.7083501	DENEb
28	.2050	.5957589	-.3265147	-.7337980	ALNAIR
29	.1970	-.5810260	-.2883102	.7611084	ALKAID
30	.1930	-.3561963	-.8224912	-.4434325	ANTARES
31	.1910	-.3293318	.7815069	.5298939	CASTOR
32	.1910	.3552656	.8910620	.2824800	ALDEBARAN
33	.1880	.3165639	-.4450212	-.8377013	PEACOCK
34	.1870	-.2607891	.2334934	-.9367336	MIAPLACIDUS
35	.1830	.2021893	-.8729000	-.4440327	NUNKI
36	.1580	.0749561	-.8215864	-.5651348	KAUSAUSTRAL
37	.1480	.8759185	.0221833	.4819488	ALPHERATZ
38	.1460	.4797727	.1144621	.8698946	NAVI
39	.1370	-.1451788	.9480499	.2830627	ALHENA
40	.1160	.4142720	.4969685	.7624966	MIRFAK
41	.1120	-.9649190	.0569530	.2562961	DENEbola
42	.1100	-.5349982	-.7136895	.4521329	ALPHECCA
43	.1090	-.1163308	-.9689870	.2180167	RASALHAGUE
44	.0960	-.5302794	.1449570	.8353390	MERAK
45	.0959	.0150699	.0077551	.9998564	POLARIS
46	.0902	-.5877377	.0225351	.8087376	ALCOR
47	.0893	-.9533568	-.0550733	-.2967788	GIENAH
48	.0869	-.6531045	-.7401975	-.1598819	ZUBENESCH
49	.0820	.8257468	.5612614	-.0559267	MIRACETI
50	.0764	-.2951269	.4157160	-.8602792	AVIOR
51	.0740	-.1179545	-.3394465	-.9332003	ATRIA
52	.0720	.7869646	.4745270	.3943487	HAMAL
53	.0714	-.6928496	-.4150908	-.5896262	MENKENT
54	.0698	.9344200	.1693502	-.3133364	DIPHOA
55	.0682	-.7717867	.6187084	-.1467826	ALPHARD
56	.0540	-.5288523	.5011883	-.6849274	ALSUHAIL
57	.0540	.5461243	.5290549	-.6494991	ACAMAR
58	.0495	.7961667	-.5355328	-.2816438	DENEb ALGEID
59	.0473	.8556796	-.2238629	.4665810	SCHEAT
60	.0458	.8118182	-.5593587	.1675383	FNIE
61	.07090	-.3813999	-.3085109	-.8714098	RIGIL KENT
62	.3910	-.4991166	-.0987866	-.8608855	BECRUX
63	.3170	-.2142337	.8488233	-.4833248	ADHARA
64	.2700	-.3601057	.5763397	-.7335915	REGOR

T

TABLE III.- Continued

65	.2560	.1145856	.9931806	-.0215047	ANILAM
66	.2520	.0947691	.9949071	-.0343326	ALNITAK
67	.2180	.1406793	.8669325	-.4781604	EL NATH
68	.2030	-.0849768	.9476324	-.3078502	MURZIM
69	.1960	-.3890798	.6616829	-.6409311	NAOS
70	.1770	.0628255	.9837410	-.1682457	SAIPH
71	.1710	-.3803944	.7954559	-.4717520	POL LUX
72	.1680	.1329029	.9911119	-.0058371	MINTAKA
73	.1640	-.5416885	-.1246700	-.8312827	ALIOH
74	.1470	-.4711504	-.7948584	-.3823839	DZUBA
75	.1440	.3794446	.4391080	-.8143746	
76	.1440	-.5234019	-.4337286	-.7334371	
77	.1430	-.5463161	-.2452466	-.8008700	
78	.1390	.0127947	.7076730	-.7064242	MENKLINAN
79	.1320	-.5855206	-.4587759	-.6683489	
80	.1300	-.0710211	-.7738200	-.6294113	
81	.1290	.5239750	.5469054	.6529507	BATEN KAITOS
82	.1240	-.4425203	.3694655	-.8171114	
83	.1230	-.5348309	-.1997670	-.8210049	MIZAR
84	.1220	-.0837103	-.7269298	-.6815905	SARGAS
85	.1170	-.6507811	-.1110520	-.7511001	MUHLIFAIN
86	.1120	-.6011118	-.3209791	-.7318723	
87	.1090	-.6366263	-.0159872	-.7710067	
88	.1090	-.3061066	.8174507	-.4879274	AEDRA
89	.1070	-.5428429	-.0675579	-.8371126	GACRUX
90	.1060	-.4618111	-.8206235	-.3366120	ACRAB
91	.1050	-.2559319	.8590771	-.4432668	AL WAZN
92	.1020	-.4107438	.1471354	-.8998004	
93	.0990	-.5283275	-.5068432	-.6811608	
94	.0968	-.3587957	-.9155655	-.1816741	
95	.0940	-.3566377	-.0535802	-.9327051	
96	.0920	-.3276767	.8188808	-.4712348	
97	.0905	.9653071	.0449177	.2572247	ALGENIB
98	.0900	-.4535086	.1201449	-.8831167	DUBHE
99	.0890	-.5221551	-.0284468	-.8523760	
100	.0890	-.4547190	-.6023346	-.6560668	
101	.0880	-.3881404	-.8150740	-.4301178	
102	.0860	-.3876025	.3376795	-.8577510	SCUTULUM
103	.0859	.9357259	-.2408158	-.2577300	MAR KAB
104	.0851	.3996277	.6552927	.6410064	
105	.0843	.5167373	.0147491	.8560170	CAPH
106	.0840	.0799535	.8241910	-.5606395	PHACT
107	.0831	-.2186040	-.9377189	-.2699917	SABIK
108	.0830	-.4636251	-.7702387	-.4379316	
109	.0800	.0128078	.7963186	.6047418	
110	.0760	-.0898409	-.6386396	-.7642435	
111	.0760	-.2420651	-.7503174	-.6151652	
112	.0759	.3518108	-.3020714	.8859921	ALDERAMIN
113	.0740	.2221679	-.8374618	-.4992987	ASCELLA
114	.0736	.1029542	.9271690	.3602195	
115	.0727	-.8462876	.4071440	-.3435563	ALGETRA
116	.0714	.4399490	-.6258004	.6440643	SADIR
117	.0713	-.9139577	.1965280	.3550466	ZOZCA
118	.0700	-.0694012	.8628897	-.5006045	
119	.0700	-.2404945	.8830852	-.4028931	
120	.0670	-.6618429	-.3321263	-.6720537	
121	.0670	-.3705955	-.0706756	-.9261015	
122	.0666	-.3562963	.9229067	-.1459319	GOMEISA
123	.0666	.1220831	.9439648	-.3066368	ARNER

ORIGINAL PAGE IS
OF POOR QUALITY

T

TABLE III.- Continued

124	.0661	.4682596	.1763579	.8658122	RUCHBACH
125	.0654	.4538765	.7192391	.5260144	
126	.0653	.8269279	.4391121	.3512417	SHERATAN
127	.0653	.2651231	-.2070911	.9417128	ALPHIRK
128	.0651	.7810467	.2348226	.5786401	MIRACH
129	.0650	-.5356005	-.5167587	-.6679016	
130	.0640	-.7585168	-.2677135	-.5941227	
131	.0638	-.7603027	-.1814066	.6237238	COR CAROLI
132	.0634	-.1981108	-.1828486	.9629738	KOCHAB
133	.0630	.6387993	-.2334571	-.7330983	
134	.0619	.3880969	.5509628	.7387968	
135	.0610	.2350957	.9678180	-.0897685	KURSA
136	.0606	.3083009	-.6362448	.7072080	
137	.0600	.6413324	.3733488	.6703011	ALMACH
138	.0596	-.7146481	-.6440589	-.2728850	ZUBENELGENUB
139	.0590	.6698875	-.4230285	-.6101620	
140	.0580	-.2426373	-.2747416	-.9304000	
141	.0577	.5478965	.0908481	.8315985	SCHEDAR
142	.0575	-.9533195	-.1139458	-.2796397	ALGORAB
143	.0557	-.6737863	-.5795517	.4584013	IZAR
144	.0550	-.0123796	-.6224779	.7825395	ELTAMIN
145	.0540	-.2593701	-.7852851	-.5621871	
146	.0540	-.9852740	-.1697478	-.0205159	
147	.0537	.2640732	-.9345997	.2383037	
148	.0521	-.8360302	-.4459336	.3196821	MUFRID
149	.0510	-.4549114	.0529130	-.8889633	
150	.0508	.5458274	-.6267730	.5560827	
151	.0507	.7323369	.0764163	-.6766411	ANKAA
152	.0500	.4119150	.2311995	-.8814039	
153	.0490	-.3543802	.2348883	-.9051200	
154	.0486	-.1976886	-.2372468	.9511221	
155	.0470	-.4747310	.7791897	-.4092601	
156	.0464	.6994933	.4310366	.5700146	
157	.0460	.2680451	-.8935830	-.3600851	
158	.0460	-.2404053	-.3799124	-.8932367	
159	.0459	-.2931802	-.7987388	.5254157	

TABLE III.- Continued

1989 STAR POSITIONS IN M1950.0 COORDINATES

ID	RA(+DEG)	DEC(DEG)	NAME
11	100.7302	16.6592S	SIRIUS
12	95.7107	52.6676S	CANOPUS
13	78.0333	8.2581S	RIGEL
14	278.8140	38.7389N	VEGA
15	210.0683	60.1331S	HADAR
16	23.9551	57.4906S	ACHERNAR
17	185.9521	62.8222S	ACRUX
18	78.2492	45.9448N	CAPELLA
19	200.6383	10.9015S	SPICA
20	213.3323	19.4203N	ARCTURUS
21	114.1636	5.3433N	PROCYON
22	297.0917	8.7388N	ALTAIR
23	88.1162	7.3996N	BETELGEUSE
24	80.6121	6.3060N	BELLATRIX
25	151.4252	12.2122N	REGULUS
26	343.7270	29.8895S	FOMALHAUT
27	309.9313	45.1008V	DENEK
28	331.2744	47.2058S	AL NAIR
29	206.3910	49.5620N	ALKAID
30	246.5840	26.3231S	ANTARES
31	112.8508	31.9983N	CASTOR
32	68.2629	16.4082N	ALDEBARAN
33	305.4260	56.8982S	PEACOCK
34	138.1607	69.5100S	MIAPLACIDUS
35	283.0414	26.3615S	NUNKI
36	275.2128	34.4117S	KAUS AUSTRAL
37	1.4508	28.8127N	ALPHERATZ
38	13.4186	60.4464N	NAVI
39	98.7063	16.4431N	ALHENA
40	50.1855	49.6848N	MIRFAK
41	176.6220	14.8504N	DENEbola
42	233.1440	26.8806N	ALPHECCA
43	263.1542	12.5925N	RASALHAGUE
44	164.7112	56.6512N	MERAK
45	27.2315	89.0289N	POLARIS
46	177.8043	53.9728N	ALCOR
47	183.3061	17.2642S	GIENAH
48	228.5768	9.2000S	ZUBENESCH
49	34.2040	3.2061S	MIRA CETI
50	125.3719	59.3479S	AVIOR
51	250.8382	68.9393S	ATRIA
52	31.0894	23.2253N	HAMAL
53	210.9259	36.1306S	MENKENT
54	10.2726	18.2604S	DIPHDA
55	141.2823	8.4405S	ALPHARD
56	136.5384	43.2299S	AL SUHAIE
57	44.0904	40.5038S	ACAMAR
58	326.0738	16.3584S	DENEK ALGEID
59	345.3389	27.8126N	SCHEAT
60	325.4324	9.6447N	ENIE
61	218.9670	60.6227S	RIGIL KENT
62	191.1954	59.4162S	BECRUX
63	104.1650	28.9028S	ADHARA
64	121.9978	47.1883S	REGOR

1

TABLE III.- Continued

65	83.4188	1.2322S	ANILAM
66	84.5588	1.9675S	ALNITAK
67	80.7828	28.5653N	EL NATH
68	95.1242	17.9297S	MURZIM
69	120.4562	39.8613S	NAOS
70	86.3458	9.6858S	SAIPH
71	115.5574	28.1481N	POLLUX
72	82.3625	.3344S	MINTAKA
73	192.9610	56.2307N	ALIO TH
74	239.3428	22.4814S	DZUBA
75	130.8312	54.5256S	
76	219.6476	47.1753S	
77	204.1758	53.2133S	
78	88.9642	44.9447N	MENKLINAN
79	218.0799	41.9398S	
80	264.7561	39.0067S	
81	46.2267	40.7644N	BATEN KAITOS
82	140.1411	54.7967S	
83	200.4814	55.1855N	MITAR
84	263.4310	42.9681S	SARGAS
85	189.6838	48.6858S	MUHLIFAIN
86	208.1011	47.0436S	
87	181.4385	50.4444S	
88	110.5292	29.2044S	ALUDRA
89	187.0941	56.8365S	GACRUX
90	240.6311	19.6706S	ACRAB
91	106.5896	26.3125S	AL WAZN
92	160.2916	64.1318S	
93	223.8110	42.9344S	
94	248.6006	10.4673S	
95	188.5440	68.8605S	
96	248.1911	28.1145S	
97	2.6542	14.9054N	ALGENIB
98	165.1618	62.0206N	DUBHE
99	183.1184	58.4711S	
100	232.9498	41.0006S	
101	244.5361	25.4750S	
102	138.9376	59.0650S	SCUTULUM
103	345.5577	14.9354N	MARKAB
104	58.6232	39.8669N	
105	1.6352	58.8722N	CAPH
106	84.4592	34.1000S	PHACT
107	256.8774	15.6637S	SABIK
108	238.9553	25.9720S	
109	89.0786	37.2102N	
110	261.9924	49.8398S	
111	252.1194	37.9639S	
112	319.3501	62.3739N	ALDERAMIN
113	284.8576	29.9536S	ASCELLA
114	83.6637	21.1137N	
115	154.3082	20.0937N	ALGEIBA
116	305.1079	40.0956N	SADIR
117	167.8645	20.7963N	ZOZCA
118	94.5983	30.0400S	
119	105.2342	23.7592S	
120	206.6484	42.2258S	
121	190.7971	67.8350S	
122	111.1095	8.3912N	GOMEISA
123	82.6308	17.8567S	ARNEB

TABLE III.- Continued

124	20.6378	59.9756N	RUCHBACH
125	57.7460	31.7366N	
126	27.9691	20.5633N	SHERATAN
127	322.0062	70.3412N	ALPHIRK
128	16.7335	35.3549N	MIRACH
129	223.9743	41.9053S	
130	199.4400	36.4501S	
131	193.4197	38.5886N	COR CAROLI
132	222.7058	74.3598N	KOCHAB
133	339.9246	47.1468S	
134	54.8392	47.6290N	
135	76.3465	5.1503S	KURSA
136	295.8531	45.0082N	
137	30.2056	42.0903N	ALMACH
138	222.0259	15.8360S	ZUBENELGENUB
139	327.7280	37.6012S	
140	228.5507	68.4973S	
141	9.4147	56.2633N	SCHEGAR
142	186.8159	16.2387S	ALGORAB
143	220.7002	27.2840N	IZAR
144	268.8607	51.4937N	ELTAMIN
145	251.7220	34.2073S	
146	189.7751	1.1756S	
147	285.7778	13.7864N	
148	208.0752	18.6436N	MUFRIID
149	173.3654	62.7433S	
150	311.0512	33.7854N	
151	5.9571	42.5818S	ANKAA
152	29.3048	61.8122S	
153	146.4530	64.8394S	
154	230.1969	72.0122N	
155	121.3524	24.1583S	
156	31.6419	34.7512N	
157	286.6975	21.1054S	
158	237.6746	63.2829S	
159	249.8440	31.6963N	

ORIGINAL PAGE IS
OF POOR QUALITY

TABLE III.- Continued

UNIT VECTORS IN M1950.0 COORDINATES FOR THE YEAR 1989

ID	MAGNITUDE	UNIT X	UNIT Y	UNIT Z	NAME
11	3.1500	-.1783703	.9412754	-.2866787	SIRIUS
12	1.5000	-.0603445	.6034289	-.7951303	CANOPUS
13	.8610	.2051927	.9681249	-.1436318	RIGEL
14	.8030	.1195183	-.7707950	.6257719	VEGA
15	.7450	-.4309723	-.2495070	-.8671846	HADAR
16	.6910	-.4911070	.2182968	-.8433033	ACHERNAR
17	.6670	-.4542915	-.0473640	-.8895931	ACRUX
18	.5140	.1416119	.6807786	.7186700	CAPELLA
19	.5130	-.9189361	-.3461059	-.1891219	SPICA
20	.4880	-.7879619	-.5182308	.3324949	ARCTURUS
21	.4770	-.4075649	.9084156	.0931228	PROCYON
22	.3690	.4501287	-.8799438	.1519308	ALTAIR
23	.3080	.0325996	.9911362	.1287879	BETELGEUSE
24	.2740	.1621310	.9806371	.1098384	BELLATRIX
25	.2690	-.8583202	.4674827	.2115333	REGULUS
26	.2670	.8322541	-.2429429	-.4983290	FOMALHAUT
27	.2540	.4530697	-.5412652	.7083501	DENEK
28	.2050	.5957587	-.3265138	-.7337985	ALNAIR
29	.1970	-.5810263	-.2883098	.7611084	ALKAID
30	.1930	-.3561964	-.8224911	-.4434326	ANTARES
31	.1910	-.3293312	.7815075	.5298934	CASTOR
32	.1910	.3552654	.8910623	.2824791	ALDEBARAN
33	.1880	.3165637	-.4450208	-.8377015	PEACOCK
34	.1870	-.2607889	.2334943	-.9367335	MIAPLACIDUS
35	.1830	.2021893	-.8728999	-.4440329	NUNKI
36	.1580	.0749559	-.8215861	-.5651353	KAUS AUSTRAL
37	.1480	.8759189	.0221840	.4819481	ALPHERATZ
38	.1460	.4797727	.1144623	.8698946	NAVI
39	.1370	-.1451790	.9480499	.2830625	ALHENA
40	.1160	.4142720	.4969686	.7624965	MIRFAK
41	.1120	-.9649190	.0569554	.2562956	DENEbola
42	.1100	-.5349979	-.7136900	.4521325	ALPHECCA
43	.1090	-.1163303	-.9689873	.2180156	RASALHAGUE
44	.0960	-.5302794	.1449566	.8353390	MERAK
45	.0959	.00150698	.0077553	.9998564	POLARIS
46	.0902	-.5877377	.0225346	.8087376	ALCOR
47	.0893	-.9533569	-.0550725	-.2967787	GIENAH
48	.0869	-.6531049	-.7401971	-.1598820	ZUBENESCH
49	.0820	.8257468	.5612613	-.0559279	MIRACETI
50	.0764	-.2951268	.4157161	-.8602792	AVIOR
51	.0740	-.1179544	-.3394463	-.9332004	ATRIA
52	.0720	.7869643	.4745279	.3943480	HAMAL
53	.0714	-.6928496	-.4150879	-.5896283	MENKENT
54	.0698	.9344199	.1693513	-.3133362	DIPHDA
55	.0682	-.7717867	.6187085	-.1467824	ALPHARD
56	.0540	-.5288523	.5011884	-.6849273	ALSUHAIL
57	.0540	.5461246	.5290548	-.6494990	ACAMAR
58	.0495	.7961670	-.5355316	-.2816452	DENEK ALGEID
59	.0473	.8556795	-.2238619	.4665816	SCHEAT
60	.0458	.8118182	-.5593586	.1675383	ENIE
61	.7090	-.3814132	-.3084992	-.8714082	RIGIL KENT
62	.3910	-.4991165	-.0987864	-.8608855	BECRUX
63	.3170	-.2142337	.8488233	-.4833248	ADHARA
64	.2700	-.3601056	.5763397	-.7335915	REGOR

TABLE III.- Continued

65	.2560	.1145856	.9931806	-.0215047	ANILAM
66	.2520	.0947691	.9949071	-.0343326	ALNITAK
67	.2180	.1406792	.8669330	-.4781596	EL NATH
68	.2030	-.0849768	.9476324	-.3078502	MURZIM
69	.1960	-.3890797	.6616830	-.6409310	NAOS
70	.1770	.0628255	.9837410	-.1682457	SAIPH
71	.1710	-.3803917	.7954573	-.4717518	POLLUX
72	.1680	.1329029	.9911119	-.0058371	MINTAKA
73	.1640	-.5416885	-.1246705	.8312827	ALIOTH
74	.1470	-.4711505	-.7948583	-.3823841	DZUBA
75	.1440	-.3794445	.4391077	-.8143748	
76	.1440	-.5234019	-.4337285	-.7334372	
77	.1430	-.5463161	-.2452464	-.8008701	
78	.1390	.0127950	.7076730	.7064242	MENKLINAN
79	.1320	-.5855206	-.4587757	-.6683490	
80	.1300	-.3710212	-.7738199	-.6294114	
81	.1290	.5239750	.5469054	.6529507	BATEN KAITOS
82	.1240	-.4425203	.3694655	-.8171114	
83	.1230	-.5348308	-.1997676	.8210048	MIZAR
84	.1220	-.0837102	-.7269298	-.6815905	SARGAS
85	.1170	-.6507812	-.1110511	-.7511002	MUHLIFAIN
86	.1120	-.6011118	-.3209787	-.7318724	
87	.1090	-.6366262	-.0159870	-.7710068	
88	.1090	-.3061066	.8174507	-.4879274	ALUDRA
89	.1070	-.5428418	-.0675577	-.8371133	GACRUX
90	.1060	-.4618111	-.8206234	-.3366122	ACRAB
91	.1050	-.2559319	.8590771	-.4432668	AL WAZN
92	.1020	-.4107438	.1471356	-.8998003	
93	.0990	-.5283276	-.5068429	-.6811609	
94	.0968	-.3587956	-.9155655	-.1816740	
95	.0940	-.3566376	-.0535800	-.9327051	
96	.0920	-.3276767	-.8188807	-.4712350	
97	.0905	.9653071	.0449177	.2572247	ALGENIB
98	.0900	-.4535087	.1201455	.8831166	DUBHE
99	.0890	-.5221550	-.0284466	-.8523760	
100	.0890	-.4547189	-.6023345	-.6560670	
101	.0880	-.3881404	-.8150740	-.4301180	
102	.0860	-.3876024	.3376796	-.8577510	SCUTULUM
103	.0859	.9357260	-.2408155	.2577298	MARKAB
104	.0851	.3996277	.6552928	.6410063	
105	.0843	.5167380	.0147517	.8560165	CAPH
106	.0840	.0799534	.8241909	-.5606397	PHACT
107	.0831	-.2186039	-.9377191	-.2699913	SABIK
108	.0830	-.4636251	-.7702386	-.4379317	
109	.0800	.0128076	.7963188	.6047415	
110	.0760	-.0898410	-.6386393	-.7642437	
111	.0760	-.2420651	-.7503173	-.6151653	
112	.0759	.3518111	-.3020707	.8859922	ALDERAMIN
113	.0740	.2221677	-.8374619	-.4992987	ASCELLA
114	.0736	.1029542	.9271690	.3602194	
115	.0727	-.8462885	.4071428	.3435557	ALGIBA
116	.0714	.4399490	-.6258004	.6440643	SADIR
117	.0713	-.9139581	.1965274	.3550460	ZOCA
118	.0700	-.0694012	.8628897	-.5006045	
119	.0700	-.2404945	.8830852	-.4028931	
120	.0670	-.6618429	-.3321261	-.6720537	
121	.0670	-.3705954	-.0706754	-.9261015	
122	.0666	-.3562961	.9229068	.1459317	GOMEISA
123	.0666	-.1220831	.9439648	-.3066368	ARNER

ORIGINAL PAGE IS
OF POOR QUALITY

1

TABLE III.- Continued

124	.0661	.4682593	.1763593	.8658121	RUCHBACH
125	.0654	.4538764	.7192392	.5260144	
126	.0653	.8269279	.4391126	.3512412	SHERATAN
127	.0653	.2651231	-.2070911	.9417128	ALPHIRK
128	.0651	.7810468	-.2348235	.5786396	MIRACH
129	.0650	-.5356005	-.5167585	-.6679017	
130	.0640	-.7585171	-.2677119	-.5941230	
131	.0638	-.7603028	-.1814055	.6237240	COR CAROLI
132	.0634	-.1981109	-.1828485	.9629738	KOCHAB
133	.0630	.6387996	-.2334564	-.7330984	
134	.0619	.3880969	.5509631	.7387967	
135	.0610	.2350961	.9678178	-.0897689	KURSA
136	.0606	.3083010	-.6362446	.7072081	
137	.0600	.6413324	.3733490	.6703009	ALMACH
138	.0596	-.7146483	-.6440585	-.2728854	ZUBENELGENUB
139	.0590	.6698877	-.4230281	-.6101620	
140	.0580	-.2426374	-.2747413	.9304001	
141	.0577	.5478966	.0908484	.8315984	SCHEDAR
142	.0575	-.9533194	-.1139447	-.2796403	ALGORAB
143	.0557	-.6737865	-.5795515	.4584013	IZAR
144	.0550	-.0123797	-.6224780	.7825394	ELTAMIN
145	.0540	-.2593727	-.7852835	-.5621882	
146	.0540	-.9852744	-.1697450	-.0205159	
147	.0537	.2640732	-.9345999	.2383032	
148	.0521	-.8360309	-.4459336	.3196804	MUFRIID
149	.0510	-.4549114	-.0529132	-.8889634	
150	.0508	.5458281	-.6267712	.5560840	
151	.0507	.7323355	.0764171	-.6766425	ANKAA
152	.0500	.4119145	.2312006	-.8814038	
153	.0490	-.3543802	.2348883	-.9051200	
154	.0486	-.1976886	-.2372467	.9511221	
155	.0470	-.4747308	.7791900	.4092598	
156	.0464	.6994930	.4310372	.5700144	
157	.0460	.2680451	-.8935829	-.3600853	
158	.0460	-.2404051	-.3799105	-.8932376	
159	.0459	-.2931820	-.7987371	.5254173	

T

TABLE III.- Continued

1990 STAR POSITIONS IN M1950.0 COORDINATES

ID	RA(+DEG)	DEC(DEG)	NAME
11	100.7301	16.6596S	SIRIUS
12	95.7107	52.6676S	CANOPUS
13	78.0333	8.2581S	RIGEL
14	278.8141	38.7389N	VEGA
15	210.0683	60.1331S	HADAR
16	23.9652	57.4906S	ACHERNAR
17	185.9521	62.8222S	ACRUX
18	78.2492	45.9447N	CAPELLA
19	200.6383	10.9016S	SPICA
20	213.3320	19.4197N	ARCTURUS
21	114.1634	5.3430N	PROCYON
22	297.0918	8.7389N	ALTAIR
23	88.1162	7.3996N	BETELGEUSE
24	80.6121	6.3060N	BELLATRIX
25	151.4251	12.2122N	REGULUS
26	343.7271	29.8896S	FOMALHAUT
27	309.9313	45.1008N	DENERB
28	331.2745	47.2058S	AL NA'IR
29	206.3909	49.5620N	ALKAID
30	246.5840	26.3231S	ANTARES
31	112.8508	31.9982N	CASTOR
32	68.2529	16.4082N	ALDEBARAN
33	305.4260	56.8982S	PEACOCK
34	138.1606	69.5100S	MIAPLACIDUS
35	283.0414	26.3615S	NUNKI
36	275.2128	34.4117S	KAUS AUSTRAL
37	1.4508	28.8127N	ALPHERATZ
38	13.4186	60.4464N	NAVI
39	98.7063	16.4431N	ALHENA
40	50.1855	49.6848N	MIRFAK
41	176.6218	14.8503N	DENEbola
42	233.1440	26.8806N	ALPHECCA
43	263.1542	12.5924N	RASALHAGUE
44	164.7113	56.6512N	MERAK
45	27.2323	89.0289N	POLARIS
46	177.8043	53.9728N	ALCOR
47	183.3061	17.2642S	GIENAH
48	228.5768	9.2001S	ZUBENESCH
49	34.2040	3.2062S	MIRA CETI
50	125.3718	59.3479S	AVIOR
51	250.8382	68.9393S	ATRIA
52	31.0894	23.2253N	HAMAL
53	210.9258	36.1308S	MENKENT
54	10.2727	18.2604S	DIPHDA
55	141.2823	8.4405S	ALPHARD
56	136.5384	43.2299S	AL SUHAIL
57	44.0904	40.5038S	ACAMAR
58	326.0738	16.3585S	DENEb ALGEID
59	345.3390	27.8127N	SCHEAT
60	325.4324	9.6447N	ENIE
61	218.9650	60.6225S	RIGIL KENT
62	191.1954	59.4162S	BECRUX
63	104.1650	28.9028S	ADHARA
64	121.9978	47.1883S	REGOR

T

TABLE III.- Continued

65	83.4188	1.2322S	ANILAM
66	84.5588	1.9675S	ALNITAK
67	80.7928	28.5652N	EL NATH
68	95.1242	17.9297S	MURZIM
69	120.4562	39.8613S	NAOS
70	86.3458	9.6858S	SAIPH
71	115.5572	28.1481N	POLLUX
72	82.3625	.3344S	MINTAKA
73	192.9611	56.2307N	ALIOTH
74	239.3428	22.4814S	DZUBA
75	130.8312	54.5256S	
76	219.6476	47.1753S	
77	204.1758	53.2133S	
78	88.9542	44.9447N	MENKLINAN
79	218.0799	41.9398S	
80	264.7561	39.0067S	
81	46.2267	40.7644N	BATEN KAITOS
82	140.1411	54.7967S	
83	200.4815	55.1855N	MIZAR
84	263.4310	42.9681S	SARGAS
85	189.6838	48.6858S	MUHLIFAIN
86	208.1011	47.0436S	
87	181.4385	50.4444S	
88	110.5292	29.2044S	ALUDRA
89	187.0941	56.8366S	GACRUX
90	240.6311	19.6706S	ACRAB
91	106.5896	26.3125S	AL WAZN
92	160.2916	64.1318S	
93	223.8110	42.9344S	
94	248.6006	10.4673S	
95	188.5440	68.8605S	
96	248.1911	28.1145S	
97	2.6642	14.9054N	ALGENIB
98	165.1618	62.0206N	DUBHE
99	183.1183	58.4711S	
100	232.9498	41.0006S	
101	244.5361	25.4751S	
102	138.9376	59.0650S	SCUTULUM
103	345.5677	14.9354N	MARKAB
104	58.6233	39.8669N	
105	1.6355	58.8722N	CAPH
106	84.4592	34.1001S	PHACT
107	256.8774	15.6637S	SABIK
108	238.9553	25.9720S	
109	89.0786	37.2102N	
110	261.9924	49.8398S	
111	252.1194	37.9639S	
112	319.3502	62.3739N	ALDERAMIN
113	284.8576	29.9536S	ASCELLA
114	83.6637	21.1137N	
115	154.3082	20.0936N	ALGETBA
116	305.1079	40.0956N	SADIR
117	167.8646	20.7962N	ZOZCA
118	94.5983	30.0400S	
119	105.2342	23.7592S	
120	206.6484	42.2258S	
121	190.7971	67.8351S	
122	111.1095	8.3912N	GOMEISA
123	82.6308	17.8567S	ARNER

TABLE III.- Continued

124	20.6379	59.9756N	RUCHBACH
125	57.7460	31.7366N	
126	27.9691	20.5632N	SHERATAN
127	322.0062	70.3412N	ALPHIRK
128	16.7336	35.3549N	MIRACH
129	223.9743	41.9053S	
130	199.4399	36.4502S	
131	193.4196	38.5886N	COR CAROLI
132	222.7058	74.3598N	KOCHAB
133	339.9247	47.1468S	
134	54.8393	47.6290N	
135	76.3465	5.1503S	KURSA
136	295.8532	45.0082N	
137	30.2057	42.0903N	ALMACH
138	222.0259	15.8361S	ZUBENELGENUB
139	327.7280	37.6012S	
140	228.5507	68.4973S	
141	9.4147	56.2633N	SCHEGAR
142	186.8158	16.2388S	ALGORAB
143	220.7002	27.2840N	IZAR
144	268.8607	51.4937N	ELTAMIN
145	251.7218	34.2073S	
146	189.7749	1.1756S	
147	285.7778	13.7864N	
148	208.0752	18.6435N	MUFRID
149	173.3654	62.7433S	
150	311.0513	33.7855N	
151	5.9572	42.5819S	ANKAA
152	29.3049	61.8122S	
153	146.4630	64.8394S	
154	230.1968	72.0122N	
155	121.3523	24.1583S	
156	31.6420	34.7512N	
157	286.6975	21.1054S	
158	237.6745	63.2831S	
159	249.8438	31.6964N	

TABLE III.- Continued

UNIT VECTORS IN M1950.0 COORDINATES FOR THE YEAR 1990

ID	MAGNITUDE	UNIT X	UNIT Y	UNIT Z	NAME
11	3.1500	-.1783675	.9412742	-.2866843	SIRIUS
12	1.5000	-.0603445	-.6034289	-.7951302	CANOPUS
13	.8610	.2051927	.9681249	-.1436318	RIGEL
14	.8030	.1195191	-.7707940	.6257730	VEGA
15	.7450	-.4309722	-.2495069	-.8671847	HADAP
16	.6910	-.4911067	-.2182974	-.8433034	ACHERNAR
17	.6670	-.4542914	-.0473638	-.8895931	ACRUX
18	.5140	.1416118	.6807801	.7186686	CAPELLA
19	.5130	-.9189362	-.3461057	-.1891221	SPICA
20	.4880	-.7879675	-.5182281	.3324858	ARCTURUS
21	.4770	-.4075620	.9384175	.0931178	PROCYON
22	.3690	.4501309	-.7799424	.1519327	ALTAIR
23	.3080	.0325995	.9911362	.1287879	BETELGEUSE
24	.2740	.1621310	.9806371	.1098384	BELLATRIX
25	.2690	-.8583196	.4674838	.2115333	REGULUS
26	.2670	.8322542	-.2429413	-.4983297	FOMALHAUT
27	.2540	.4530697	-.5412652	.7083501	DENEK
28	.2050	.5957585	-.3265130	-.7337990	ALNAIR
29	.1970	-.5810266	-.2883093	.7611083	ALKAID
30	.1930	-.3561964	-.8224910	.4434328	ANTARES
31	.1910	-.3293306	.7815080	.5298930	CASTOR
32	.1910	.3552652	.8910627	.2824782	ALDEBARAN
33	.1880	.3165635	-.4450205	-.8377018	PEACOCK
34	.1870	-.2607887	.2334951	-.9367333	MIAPLACIDUS
35	.1830	.2021894	-.8728998	-.4440332	NUNKI
36	.1580	.0749556	-.8215858	-.5651358	KAUS AUSTRAL
37	.1480	.8759193	.0221846	.4819474	ALPHERATZ
38	.1460	.4797727	.1144624	.8698946	NAVI
39	.1370	-.1451793	.9480500	.2830623	ALHENA
40	.1160	.4142719	.4969688	.7624965	MIREK
41	.1120	-.9649190	.0569578	.2562950	DENEKOLA
42	.1100	-.5349976	-.7136906	.4521320	ALPHECCA
43	.1090	-.1163297	-.9689876	.2180145	RASALHAGUE
44	.0960	-.5302794	.1449561	.8353391	MERAK
45	.0959	.0150697	.0077555	.9998564	POLARIS
46	.0902	-.5877377	.0225341	.8087376	ALCOR
47	.0893	-.9533570	-.0550717	-.2967786	GIENAH
48	.0869	-.6531052	-.7401967	-.1598821	ZUBENESCH
49	.0820	.8257468	.5612612	-.0559290	MIRA CETI
50	.0764	-.2951267	.4157162	-.8602792	AVIOR
51	.0740	-.1179542	-.3394462	-.9332004	ATRIA
52	.0720	.7869641	.4745289	.3943474	HAMAL
53	.0714	-.6928496	-.4150850	-.5896303	MENKENT
54	.0698	.9344198	.1693524	-.3133360	DIPHDA
55	.0682	-.7717867	.6187085	-.1467823	ALPHARD
56	.0540	-.5288522	.5011885	-.6849273	AL SUHAIL
57	.0540	.5461248	.5290547	-.6494989	ACAMAR
58	.0495	.7961674	-.5355303	-.2816465	DENEK ALGEID
59	.0473	.8556795	-.2238610	.4665822	SCHEAT
60	.0458	.8118183	-.5593585	.1675383	ENIE
61	.7090	-.3814265	-.3084875	-.8714065	RIGIL KENT
62	.3910	-.4991165	-.0987862	-.8608856	BEKRUX
63	.3170	-.2142337	.8488233	-.4833248	ADHARA
64	.2700	-.3601056	.5763397	-.7335915	REGOR

TABLE III.- Continued

65	.2560	.1145856	.9931806	-.0215047	ANTI LAM
66	.2520	.0947691	.9949071	-.0343326	ALNITAK
67	.2180	.1406792	.8669334	-.4781589	EL NATH
68	.2030	-.0849768	.9476324	-.3078502	MUR ZIM
69	.1960	-.3890796	.6616831	-.6409310	NAO S
70	.1770	.0628255	.9837410	-.1682457	SAIPH
71	.1710	-.3803890	.7954588	-.4717516	POLLUX
72	.1680	-.1329029	.9911119	-.0058371	MINTAKA
73	.1640	-.5416884	-.1246711	.8312826	ALIO TH
74	.1470	-.4711505	-.7948582	-.3823842	DZUBA
75	.1440	-.3794443	.4391074	-.8143750	
76	.1440	-.5234018	-.4337283	-.7334373	
77	.1430	-.5463160	-.2452463	-.8008702	
78	.1390	.0127952	.7076730	.7064242	MENKLINAN
79	.1320	-.5855207	-.4587755	-.6683491	
80	.1300	-.0710212	-.7738198	-.6294116	
81	.1290	.5239750	.5469054	.6529507	BATEN KAITOS
82	.1240	-.4425203	.3694656	-.8171114	
83	.1230	-.5348307	-.1997682	.8210047	MIZAR
84	.1220	-.0837102	-.7269299	-.6815905	SARGAS
85	.1170	-.6507813	-.1110501	-.7511003	MUHLIFAIN
86	.1120	-.6011118	-.3209784	-.7318726	
87	.1090	-.6366262	-.0159868	-.7710068	
88	.1090	-.3061066	.8174507	-.4879274	ALUDRA
89	.1070	-.5428408	-.0675575	-.8371140	GACRUX
90	.1060	-.4618111	-.8206233	-.3366123	ACRAB
91	.1050	-.2559319	.8590771	-.4432668	AL WAZN
92	.1020	-.4107438	.1471357	-.8998003	
93	.0990	-.5283276	-.5068427	-.6811611	
94	.0968	-.3587956	-.9155656	-.1816739	
95	.0940	-.3566376	-.0535799	-.9327051	
96	.0920	-.3276767	-.8188806	-.4712351	
97	.0905	.9653071	.0449177	.2572246	ALGENIB
98	.0900	-.4535089	.1201462	.8831164	DUBHE
99	.0890	-.5221550	-.0284465	-.8523761	
100	.0890	-.4547189	-.6023344	-.6560671	
101	.0880	-.3881404	-.8150739	-.4301181	
102	.0860	-.3876024	.3376796	-.8577510	SCUTULUM
103	.0859	.9357262	-.2408153	.2577296	MAR KAB
104	.0851	.3996276	.6552929	.6410062	
105	.0843	.5167386	.0147542	.8560161	CAPH
106	.0840	.0799534	.8241908	.5606398	PHACT
107	.0831	-.2186038	-.9377192	-.2699908	SABIK
108	.0830	-.4636252	-.7702385	-.4379319	
109	.0800	.0128073	.7963191	.6047412	
110	.0760	-.0898411	-.6386390	-.7642440	
111	.0760	-.2420651	-.7503172	-.6151655	
112	.0759	.3518114	-.3020701	.8859923	ALDERAMIN
113	.0740	.2221676	-.8374619	.4992987	ASCELLA
114	.0736	.1029542	.9271691	.3602193	
115	.0727	-.8462894	.4071416	.3435560	ALGETRA
116	.0714	.4399490	-.6258004	.6440643	SADIR
117	.0713	-.9139584	.1965268	.3550453	ZOZCA
118	.0700	-.0694012	.8628897	-.5006045	
119	.0700	-.2404945	.8830852	-.4028931	
120	.0670	-.6618429	-.3321260	.6720538	
121	.0670	-.3705953	-.0706753	.9261016	
122	.0666	-.3562960	.9229069	.1459315	GOMEISA
123	.0666	.1220831	.9439648	-.3066368	ARNEB

ORIGINAL PAGE IS
OF POOR QUALITY

TABLE III.- Concluded

124	.0661	.4682590	.1763607	.8658120	RUCHBACH
125	.0654	.4538764	.7192392	.5260144	
126	.0653	.8269278	.4391131	.3512407	SHERATAN
127	.0653	.2651231	.2070910	.9417128	ALPHIRK
128	.0651	.7810468	.2348244	.5786392	MIRACH
129	.0650	.5355005	.5167584	.6679018	
130	.0640	.7585174	.2677103	.5941234	
131	.0638	.7603029	.1814043	.6237242	COR CAROLI
132	.0634	.1981109	.1828483	.9629738	KOCHAB
133	.0630	.6387997	.2334558	.7330984	
134	.0619	.3880969	.5509633	.7387965	
135	.0610	.2350966	.9678177	.2897693	KURSA
136	.0606	.3083011	.6362444	.7072082	
137	.0600	.5413324	.3733493	.6703007	ALMACH
138	.0596	.7146486	.6440580	.2728857	ZUBENELGENUB
139	.0590	.5698879	.4230277	.6101621	
140	.0580	.2426375	.2747410	.9304001	
141	.0577	.5478966	.0908486	.8315983	SCHEDAR
142	.0575	.9533193	.1139437	.2796410	ALGORAB
143	.0557	.6737866	.5795513	.4584014	IZAR
144	.0550	.7123797	.6224781	.7825393	ELTAMIN
145	.0540	.2593753	.7852819	.5621892	
146	.0540	.9852749	.1697424	.0205159	
147	.0537	.2640731	.9346000	.2383028	
148	.0521	.8360315	.4459337	.3196788	MUFRIID
149	.0510	.4549112	.0529133	.8889634	
150	.0508	.5458289	.6267695	.5560853	
151	.0507	.7323341	.0764179	.6766440	ANKAA
152	.0500	.4119140	.2312018	.8814038	
153	.0490	.3543802	.2348884	.9051200	
154	.0486	.1976886	.2372466	.9511221	
155	.0470	.4747304	.7791903	.4092596	
156	.0464	.6994927	.4310379	.5700143	
157	.0460	.2680451	.8935828	.3600855	
158	.0460	.2404049	.3799086	.8932385	
159	.0459	.2931838	.7987354	.5254188	

3FIN

DISTRIBUTION FOR JSC IN 78-FM-38

JM6/Technical Library (2)
JM61/Center Data Management (3)
CF6/G. Doerre
 C. Alford
 R. Fitts
CG5/R. Nute
 C. Stough
EG5/C. Manry
 A. Turley
FM/J. McPherson
FM/Branch Chiefs (5)
FM2/R. Duncan
FM8/J. Blucker (5)
 S. Richardson
 H. deVezin
 R. Savely
FM14/Report Control Files (25)
 P. Marsden
 A. Martinec
FM17/H. Conway
FS5/T. Price
CSDL-Cambridge/M. Landey
IBM-Hou/K. Koerber (2)
MDTSCO-Hou/D. Lukaszewski (2)
 W. Wedlake (3)
 P. Dugge
 B. Abramson
LEC B14/W. T. Miller
ZC08/B. Hodges