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VIEWS FROM THE SPACECRAFT DURING APOLLO 10 (MISSION F) MAY 18, 1969 LAUNCH DATE

Flight Analysis Branch

MISSION PLANNING AND ANALYSIS DIVISION

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

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PROJECT APOLLO

VIEWS FROM THE SPACECRAFT DURING APOLLO 10 (MISSION F) MAY 18, 1969 LAUNCH DATE

By Alfred N. Lunde
Flight Analysis Branch

April 22, 1969

MISSION PLANNING AND ANALYSIS DIVISION
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

Approved: Charlie C. Allen
Charlie C. Allen, Chief
Flight Analysis Branch

Approved: D. H. Owen
for John P. Mayer, Chief
Mission Planning and Analysis Division

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VIEWS FROM THE SPACECRAFT DURING APOLLO 10 (MISSION F)

MAY 18, 1969 LAUNCH DATE

By Alfred N. Lunde

SUMMARY

The purpose of this document is to visually depict various aspects of the Apollo 10 (Mission F) lunar flight. Views of the earth and the moon as seen from the spacecraft are shown during the translunar and transearth coast phases as well as the view from the spacecraft during critical maneuvers. The data should prove invaluable in assuring the crew that maneuver attitudes are correct. All data presented in this report are for the first opportunity, 72° launch azimuth, May 18, 1969 launch date.

INTRODUCTION

The geometry of a lunar mission can be very difficult to visualize. The primary objective of this report is to provide views from the spacecraft during Apollo 10 (Mission F) because a knowledge of how the spacecraft should be oriented with respect to familiar objects visible from the spacecraft window would be invaluable for performance of the various maneuvers.

A detailed visual representation of Apollo 10 (Mission F) for the May 17, 1969 launch date is presented in reference 1. Because of the 1-day slip in the launch date, most of the data in reference 1 are no longer applicable to the Apollo 10 flight. A discussion of the trajectory geometry and the general information are presented in reference 1.

In the figures for the lunar orbit phase section, the location of the planets Venus, Mars, Jupiter, and Saturn has been shown.

SYMBOLS

c.g.	center of gravity
CDH	constant delta height
CM	command module
CSI	concentric sequencing initiation
CSM	command and service modules
DOI	descent orbit insertion
EI	entry interface
g.e.t.	ground elapsed time
h_E	altitude above earth's surface
h_M	altitude above moon's surface
LOI	lunar orbit insertion
LM	lunar module
PTC	passive thermal control
R_E	radius from center of earth
R_M	radius from center of moon
SEQ	star identification number
SM	service module
TEC	transearth coast
TEI	transearth injection
TLC	translunar coast
TLI	translunar injection
TPI	terminal phase initiation
V_i	inertial velocity

DISCUSSION OF THE DATA

The geometry associated with the Apollo 10 lunar mission is presented in figures 1 through 5. A detailed description of figures 1 through 4 can be found in reference 1. The nominal F mission rendezvous is presented in figure 5.

Translunar Injection Burn

The beginning, middle, and end of the TLI burn are shown in figure 6. The maneuver is executed in a heads down position. The horizon is in darkness until toward the end of the burn. The TLI burn places the spacecraft on its lunar trajectory so that at the end of the burn the velocity is 35 591 fps.

Earth and Moon Views During TLC

The earth is shown in figure 7 with a constant field of view. Because the earth gets quite small as the spacecraft progresses on its lunar trajectory, the earth with a variable field of view is presented in figure 8. The purpose of the enlarged views of the earth is to show details such as continents and terminator. Because these views are almost identical to the views shown on pages 60 through 77 in reference 1, only a few TLC variable field views are shown in this report. The reader who desires to find out what portion of the earth is visible to the crew every hour during TLC should consult the above mentioned pages in reference 1.

Views of the moon are presented in figures 9 and 10. Because of the earth-moon-sun geometry at this particular time, the moon will be almost totally dark as viewed from the spacecraft on the approach trajectory.

Lunar Orbit Insertion Maneuver

The beginning, middle, and end of the LOI burn are depicted in figure 11. There is a rather large yaw attitude component during this burn designed to place the spacecraft in an orbit similar to that of the lunar landing mission. The crew are in a heads down position during this burn, and the burn is performed in a retrograde attitude to brake the trajectory speed so that a lunar orbit may be achieved.

Lunar Orbit Phase

Various LM events after separation from the CSM and prior to docking again with the CSM are shown in figure 12. The view from the commander's front LM window and from the docking window are shown with the correct burn attitude for DOI burn, phasing burn, LM descent stage jettison burn, insertion burn, CSI burn, CDH burn, and the TPI burn. The reader should consult figure 5 for a better understanding of those views.

Transearth Injection Maneuver

As with TLI and LOI, the beginning, middle, and end of the TEI burn are shown in the correct burn attitude. This maneuver is a posigrade burn designed to free the spacecraft from the lunar gravitational attraction. The spacecraft attains a velocity of 8958 fps at the end of the burn to return the spacecraft to earth in approximately 54.5 hours.

Post-TEI Views

The four post-TEI views depict the view from the spacecraft as the earth comes into view over the lunar horizon. The Southeast Asia portion of the earth is visible at this time.

Transearth Coast

As with the translunar coast, the views of the earth and the moon are shown at various times during the coast period (figs. 15, 16, 17, and 18). During this coast period, approximately half of the earth and moon are in sunlight as seen from the spacecraft. The spacecraft leaves the lunar gravitational sphere of influence at approximately 148 hours g.e.t., at which time the velocity will gradually increase until it reaches 36 309 fps at entry.

Entry

The entry phase is shown in figure 19. The SM is jettisoned approximately 15 minutes prior to entry interface, and the CM is in a heatshield forward attitude. The angle between the spacecraft X-axis and the earth horizon is held at +31.7°, which can be monitored on the 31.7° scribe on the window. The moon is visible during part of the entry phase. The entry REFSMMAT's were obtained from reference 2.

(Most of the vectors needed to generate the data shown in this report were obtained from reference 3.)

CONCLUSIONS

An understanding of spacecraft attitudes with respect to the sun, earth, moon, and stars is particularly useful to verify maneuver attitudes normally described by IMU gimbal angles. This information is especially useful for Apollo 10 (Mission F) because IMU gimbal angles are referenced to several specific inertial orientations (REFSMMAT) instead of to preferred platform alinements.

This report has presented numerous figures which depict the view from the Apollo 10 (Mission F) windows: star field, earth and moon terminators, and horizon orientations are included. This information should prove invaluable in assuring the crew that maneuver attitudes are correct.

TABLE I. - STAR INDENTIFICATION CATALOGUE

SEQ NO.	IDENTIFICATION		RIGHT ASCENSION DECIMAL	HRS	MIN	SEC	DECLINATION DEGREES	DEG	MIN	SEC	MAG	IDENTIFICATION		
1	33330		.00275000	.0	.0	9.9	-6.20861110	-6.0	12.0	31.0	4.66	30		PSC
2	23		.03244444	.0	1.0	56.8	-17.53083300	-17.0	31.0	51.0	4.62	2		CET
3	59		.05905555	.0	3.0	32.6	-5.90333330	-5.0	54.0	12.0	4.68	33		PSC
4	127	ALPHERATZ SIRRAH	.10955555	.0	6.0	34.4	28.89722100	28.0	53.0	50.0	2.15	21	A	AND
5	147	CAPH	.12163889	.0	7.0	17.9	58.95666400	58.0	57.0	24.0	2.42	11	B	CAS
6	158		.12733333	.0	7.0	38.4	-45.94055500	-45.0	56.0	24.0	3.94	0	E	PHE
7	238	ALGENIB	.19049999	.0	11.0	25.8	14.98916660	14.0	59.0	21.0	2.87	88	G	PEG
8	272		.21438888	.0	12.0	51.8	-19.12666600	-19.0	7.0	36.0	4.68	7		CET
9	334		.25427777	.0	15.0	15.4	38.48749900	38.0	29.0	15.0	4.44	29	J	AND
10	362		.27486110	.0	16.0	29.5	36.59138800	36.0	35.0	29.0	4.51	25	S	AND
11	388		.29405555	.0	17.0	38.6	-9.01777770	-9.0	1.0	4.0	3.75	8	I	CET
12	401		.30430555	.0	18.0	15.5	-65.08055500	-65.0	4.0	50.0	4.34	0	Z	TUC
13	503	ALGENIB	.39897221	.0	23.0	56.3	-77.45138800	-77.0	27.0	5.0	2.90	0	B	HYI
14	516		.40808333	.0	24.0	29.1	-43.87388800	-43.0	52.0	26.0	3.90	0	K	PHE
15	519	ANKAA	.40927777	.0	24.0	33.4	-42.49611000	-42.0	29.0	46.0	2.44	0	A	PHE
16	625		.49936111	.0	29.0	57.7	-63.15833300	-63.0	9.0	30.0	4.52	0	B	TUC
17	645		.51655555	.0	30.0	59.6	62.73888900	62.0	44.0	20.0	4.24	15	K	CAS
18	729		.58341666	.0	35.0	.3	33.52694400	33.0	31.0	37.0	4.44	29	P	AND
19	727		.58349999	.0	35.0	.6	53.70444400	53.0	42.0	16.0	3.72	17	Z	CAS
20	759		.61166666	.0	36.0	42.0	29.12194400	29.0	7.0	19.0	4.52	30	E	AND
21	774		.62416665	.0	37.0	27.0	30.66972200	30.0	40.0	11.0	3.49	31	D	AND
22	792	SCHEDIR SCHEDAR	.64180554	.0	38.0	30.5	56.34583300	56.0	20.0	45.0	2.47	18	A	CAS
23	823		.66124999	.0	39.0	40.5	-46.27694400	-46.0	16.0	37.0	4.65	0	M	PHE
24	866		.69694444	.0	41.0	47.2	-57.65499900	-57.0	39.0	18.0	4.53	0	M	PHE
25	865	DIPHDA DENEB	.69722222	.0	41.0	50.0	-18.17833300	-18.0	10.0	42.0	2.24	16	B	CET KAITOS
26	882		.71275000	.0	42.0	45.9	48.09305500	48.0	5.0	35.0	4.70	22	Q	CAS
27	940		.75797221	.0	45.0	28.7	24.07694400	24.0	4.0	37.0	4.30	34	Z	AND
28	963		.78105554	.0	46.0	51.8	7.39500000	7.0	23.0	42.0	4.55	63	D	PSC
29	962	ACHIRD	.78277776	.0	46.0	58.0	57.63055500	57.0	37.0	50.0	3.64	24	H	CAS
30	989		.79791665	.0	47.0	52.5	40.88861000	40.0	53.0	19.0	4.42	35	N	AND
31	1117		.90966666	.0	54.0	34.8	60.52777800	60.0	31.0	40.0	2.30	27	G	CAS
32	1122		.91338888	.0	54.0	48.2	38.31000000	38.0	18.0	36.0	3.94	37	M	AND
33	1136		.92222221	.0	55.0	20.0	23.22916600	23.0	13.0	45.0	4.62	38	M	AND
34	1172		.94866666	.0	56.0	55.2	-29.54638800	-29.0	32.0	47.0	4.39	0	A	SCL
35	1258		1.01872221	1.0	1.0	7.4	7.70222220	7.0	42.0	8.0	4.45	71	E	PSC
36	1288		1.05997221	1.0	3.0	35.9	86.07055500	86.0	4.0	14.0	4.50	43		CEP
37	1335		1.07541665	1.0	4.0	31.5	-46.90583300	-46.0	54.0	21.0	3.35	0	B	PHE
38	1384		1.11380555	1.0	6.0	49.7	-10.36722210	-10.0	22.0	2.0	3.60	31	M	CET
39	1387		1.11527777	1.0	6.0	55.0	-55.43249900	-55.0	25.0	57.0	4.13	0	Z	PHE
40	1394		1.12433332	1.0	7.0	27.6	47.05555500	47.0	3.0	20.0	4.28	42	V	AND
41	1400	MIRACH	1.12941666	1.0	7.0	45.9	35.43555500	35.0	26.0	8.0	2.37	43	B	AND
42	1424		1.14930554	1.0	8.0	57.5	54.96416600	54.0	57.0	51.0	4.52	33	J	CAS
43	1441		1.16211109	1.0	9.0	43.6	29.90416600	29.0	54.0	15.0	4.70	83	Y	PSC
44	1474		1.19736110	1.0	11.0	50.5	24.39861100	24.0	23.0	55.0	4.64	85	V	PSC
45	1591		1.29227777	1.0	17.0	32.2	27.08055500	27.0	4.0	50.0	4.67	90	U	PSC
46	1695		1.37119444	1.0	22.0	16.3	-8.36361110	-8.0	21.0	49.0	3.83	45	J	CET
47	1715	KSORA RUCHA	1.39180554	1.0	23.0	30.5	60.05916600	60.0	3.0	15.0	2.80	37	D	CAS
48	1787		1.44744442	1.0	26.0	50.8	-43.49722200	-43.0	29.0	50.0	3.40	0	G	PHE
49	1839		1.49344443	1.0	29.0	36.4	15.16583320	15.0	9.0	57.0	3.72	99	M	PSC
50	1847		1.49658331	1.0	29.0	47.7	-49.25916600	-49.0	15.0	15.0	3.96	0	D	PHE
51	1948		1.57888888	1.0	34.0	44.0	41.23111100	41.0	13.0	52.0	4.18	50	U	AND
52	1966		1.59719443	1.0	35.0	49.9	48.45166600	48.0	27.0	6.0	3.77	51		AND
53	1979	ACHERNAR	1.60686110	1.0	36.0	24.7	-57.41416600	-57.0	24.0	51.0	.60	0	A	ERI
54	2055		1.66011110	1.0	39.0	36.4	5.31111110	5.0	18.0	40.0	4.68	106	N	PSC
55	2102		1.69091664	1.0	41.0	27.3	50.51305500	50.0	30.0	47.0	4.20V	0	V	PER

TABLE I. - STAR IDENTIFICATION CATALOGUE - Continued

56	2123			1.70736109	1.0	42.0	26.5	-16.12111000	-16.0	7.0	16.0	3.65	52	T	CET	
57	2139			1.72569442	1.0	43.0	32.5	8.98222220	8.0	58.0	56.0	4.50	110	O	PSC	
58	2249	BATEN KAITOS		1.82886110	1.0	49.0	43.9	-10.50722210	-10.0	30.0	26.0	3.92	55	Z	CET	
59	2272	METALLAH MOTHALLAH		1.85133332	1.0	51.0	4.8	29.74249900	29.0	44.0	33.0	3.58	2	A	TRI	
60	2291			1.86008333	1.0	51.0	36.3	19.12277700	19.0	7.0	22.0	4.75	5	G	ARI	
61	2289	SEGIN		1.86424999	1.0	51.0	51.3	63.49861100	63.0	29.0	55.0	3.44	45	E	CAS	
62	2303			1.87072220	1.0	52.0	14.6	-46.47361000	-46.0	28.0	25.0	4.41	0	Y	PHE	
63	2309	SHERATAN		1.87836109	1.0	52.0	42.1	20.63777700	20.0	38.0	16.0	2.72	6	B	ARI	
64	2331			1.90074998	1.0	54.0	2.7	-67.81916600	-67.0	49.0	9.0	4.72	0	H	HYI	
65	2339			1.90994443	1.0	54.0	35.8	-51.78277700	-51.0	46.0	58.0	3.73	0	X	ERI	
66	2369			1.92966665	1.0	55.0	46.8	-47.55555500	-47.0	33.0	20.0	4.74	0		PHE	
67	2405			1.96111110	1.0	57.0	40.0	-61.73972100	-61.0	44.0	23.0	3.02	0	A	HYI	
68	2419			1.97258331	1.0	58.0	21.3	-21.24666600	-21.0	14.0	48.0	4.18	59	U	CET	
69	2424			1.98408331	1.0	59.0	2.7	70.73861000	70.0	44.0	19.0	4.61	48		CAS	
70	2243	POLARIS	ALRUCCABA	1.99008331	1.0	59.0	24.3	89.10222100	89.0	6.0	8.0	2.12	0	A	UMI	CYNSR
71	2452	ALRISHA	KAITAIN	2.00388890	2.0	.0	14.0	2.59555550	2.0	35.0	44.0	4.33	113	A	PSC	OKDA
72	2445			2.00675000	2.0	.0	24.3	72.25333300	72.0	15.0	12.0	4.06	50		CAS	
73	2477	ALMACH	ALAMAK	2.02902770	2.0	1.0	44.5	42.16277700	42.0	9.0	46.0	2.28	0	G	AND	
74	2506			2.04869440	2.0	2.0	55.3	-29.46416700	-29.0	27.0	51.0	4.74	0	N	FOR	
75	2538	HAMAL		2.08658320	2.0	5.0	11.7	23.29777700	23.0	17.0	52.0	2.23	13	A	ARI	
76	2572			2.12422210	2.0	7.0	27.2	34.82250000	34.0	49.0	21.0	3.08	4	B	TRI	
77	2656			2.19902770	2.0	11.8	8.5	8.68333330	8.0	41.0	.0	4.54	65	C	CET	
78	2742			2.25377770	2.0	15.0	13.6	33.68638800	33.0	41.0	11.0	4.07	9	G	TRI	
79	2756			2.25430550	2.0	15.0	15.5	-51.67361100	-51.0	40.0	25.0	3.78	0	V	ERI	
80	2796	MIRA		2.29291660	2.0	17.0	34.5	-3.13555550	-3.0	8.0	8.0	2.00V	68	O	CET	
81	2872			2.35200000	2.0	21.0	7.2	-68.81833200	-68.0	49.0	6.0	4.26	0	B	HYI	
82	2954			2.42836100	2.0	25.0	42.1	-47.86027700	-47.0	51.0	37.0	4.44	0	K	ERI	
83	2952			2.43588880	2.0	26.0	9.2	67.24666600	67.0	14.0	48.0	4.59	0	I	CAS	
84	2960			2.43824990	2.0	26.0	17.7	8.30416660	8.0	18.0	15.0	4.34	73	C	CET	
85	3192			2.62808320	2.0	37.0	41.1	.17861111	.0	10.0	43.0	4.04	82	D	CET	
86	3217			2.64108330	2.0	38.0	27.9	-43.04111100	-43.0	2.0	28.0	4.53	0		ERI	
87	3240			2.65074990	2.0	39.0	2.7	-68.41638800	-68.0	24.0	59.0	4.26	0	E	HYI	
88	3237			2.65474990	2.0	39.0	17.1	-40.00444400	-40.0	.0	16.0	4.06	0	I	ERI	
89	3273			2.68986110	2.0	41.0	23.5	27.55944400	27.0	33.0	34.0	4.58	35		ARI	
90	3276	KAFFALJIDHMA		2.69141660	2.0	41.0	29.1	3.08916670	3.0	5.0	21.0	3.58	86	G	CET	
91	3277			2.69661110	2.0	41.0	47.8	49.08166600	49.0	4.0	54.0	4.22	13	J	PER	
92	3300			2.70758330	2.0	42.0	27.3	-14.00611100	-14.0	.0	22.0	4.39	89	P	CET	
93	3309			2.71744440	2.0	43.0	2.8	9.96750000	9.0	58.0	3.0	4.36	87	H	CET	
94	3318			2.72447210	2.0	43.0	28.1	-18.71972200	-18.0	43.0	11.0	4.61	1	Y	ERI	
95	3356			2.76363890	2.0	45.0	49.1	29.10277800	29.0	6.0	10.0	4.62	39		ARI	
96	3387			2.79374990	2.0	47.0	37.5	-32.55222100	-32.0	33.0	8.0	4.50	0	B	FOR	
97	3391			2.79863890	2.0	47.0	55.1	27.11760000	27.0	7.0	3.0	3.68	41		ARI	
98	3390	MIRAM		2.80213890	2.0	48.0	7.7	55.75166600	55.0	45.0	6.0	3.93	15	H	PER	
99	3401			2.80611110	2.0	48.0	22.0	38.17583300	38.0	10.0	33.0	4.27	16		PER	
100	3419			2.82252770	2.0	49.0	21.1	34.91694400	34.0	55.0	1.0	4.67	17		PER	
101	3463			2.84461100	2.0	50.0	40.6	-75.20999900	-75.0	12.0	36.0	4.70	0	N	HYI	
102	3462			2.86272220	2.0	51.0	45.8	52.62055500	52.0	37.0	14.0	4.06	18	Y	PER	
103	3539	AZHA		2.91191660	2.0	54.0	42.9	-9.03638890	-9.0	2.0	11.0	4.05	3	H	ERI	
104	3567			2.94191660	2.0	56.0	30.9	39.52388800	39.0	31.0	26.0	4.62	22	P	PER	
105	3584	ACAMAR		2.94888880	2.0	56.0	56.0	-40.44416600	-40.0	26.0	39.0	3.42	0	J	ERI	
106	3582			2.95341660	2.0	57.0	12.3	21.20138900	21.0	12.0	5.0	4.64	48	E	ARI	
107	3595			2.96391660	2.0	57.0	50.1	8.76888890	8.0	46.0	8.0	4.69	91	L	CET	
108	3643	MENKAR	MEKAB	3.00744440	3.0	.0	26.8	3.95361110	3.0	57.0	13.0	2.82	92	A	CET	
109	3649			3.01413890	3.0	.0	50.9	-23.76055500	-23.0	45.0	38.0	4.16	11	Y	ERI	
110	3664			3.03747220	3.0	2.0	14.9	53.37083300	53.0	22.0	15.0	3.08	23	G	PER	
111	3682			3.04877770	3.0	2.0	55.6	38.70583300	38.0	42.0	21.0	3.00V	25		PER	
112	3733	ALGOL	GORGONA	3.09805550	3.0	5.0	53.0	40.82222100	40.0	49.0	20.0	2.30	26	B	PER	
113	3740			3.10883330	3.0	6.0	31.8	49.48111100	49.0	28.0	52.0	4.17	0	I	PER	

TABLE I. - STAR IDENTIFICATION CATALOGUE - Continued

114	3755	MISAM		3.11874990	3.0	7.0	7.5	44.72611000	44.0	43.0	34.0	4.00	27	K	PER
115	3805	BOTEIN		3.16038880	3.0	9.0	37.4	19.59555500	19.0	35.0	44.0	4.53	57	D	ARI
116	3831			3.17638880	3.0	10.0	35.0	-29.12416600	-29.0	7.0	27.0	3.95	0	A	FOR
117	3979			3.29930550	3.0	17.0	57.5	-21.88416600	-21.0	53.0	3.0	3.95	16	T	ERI
118	3981			3.30361110	3.0	18.0	13.0	28.92277800	28.0	55.0	22.0	4.72	0		ARI
119	4000			3.30886100	3.0	18.0	31.9	-43.20277700	-43.0	12.0	10.0	4.30	82		ERI
120	4041	MIRFAK	MARFAK	3.36355550	3.0	21.0	48.8	49.73833300	49.0	44.0	18.0	1.90	33	A	PER
121	4070			3.38211100	3.0	22.0	55.6	8.90694440	8.0	54.0	25.0	3.80	1	O	TAU
122	4107			3.42113880	3.0	25.0	16.1	9.61194450	9.0	36.0	43.0	3.75	2	C	TAU
123	4113			3.43697210	3.0	26.0	13.1	59.82027700	59.0	49.0	13.0	4.42	2		CAM
124	4133			3.44758320	3.0	26.0	51.3	49.38916600	49.0	23.0	21.0	4.67	34		PER
125	4158			3.46827770	3.0	28.0	5.8	47.87611100	47.0	52.0	34.0	4.55	35	S	PER
126	4184			3.48227770	3.0	28.0	56.2	12.81805550	12.0	49.0	5.0	4.28	5		TAU
127	4244			3.52133330	3.0	31.0	16.8	-9.57555550	-9.0	34.0	32.0	3.81	18	E	ERI
128	4258			3.53733330	3.0	32.0	14.4	-21.74916600	-21.0	44.0	57.0	4.32	19	T	ERI
129	4287			3.56655550	3.0	33.0	59.6	48.07777700	48.0	4.0	40.0	4.26	37	Y	PER
130	4313			3.58474990	3.0	35.0	5.1	.29166666	.0	17.0	30.0	4.40	10		TAU
131	4329			3.59727770	3.0	35.0	50.2	-40.38861000	-40.0	23.0	19.0	4.58	0		ERI
132	4427			3.67372220	3.0	40.0	25.4	47.67722100	47.0	40.0	38.0	3.10	39	D	PER
133	4455			3.69225000	3.0	41.0	32.1	-37.42305500	-37.0	25.0	23.0	4.64	0		ERI
134	4450	RANA		3.69283330	3.0	41.0	34.2	-9.88083330	-9.0	52.0	51.0	3.72	23	D	ERI
135	4461	ATIKS		3.70197210	3.0	42.0	7.1	32.17888800	32.0	10.0	44.0	3.94	38	O	PER
136	4477	ELECTRA		3.71322220	3.0	42.0	47.6	24.00472200	24.0	.0	17.0	3.81	17		TAU
137	4474			3.71347220	3.0	42.0	48.5	42.46972100	42.0	28.0	11.0	3.93	41	N	PER
138	4486	TAYGETA		3.71866660	3.0	43.0	7.2	24.35888900	24.0	21.0	32.0	4.37	19		TAU
139	4500	MAIA		3.72899990	3.0	43.0	44.4	24.25972100	24.0	15.0	35.0	4.02	20		TAU
140	4517			3.72922220	3.0	43.0	45.2	-64.91694300	-64.0	55.0	1.0	3.80	0	B	RET
141	4512	MEROPE		3.73741660	3.0	44.0	14.7	23.84083300	23.0	50.0	27.0	4.25	23		TAU
142	4525			3.74141660	3.0	44.0	29.1	-12.21027760	-12.0	12.0	37.0	4.64	26	P	ERI
143	4547			3.75569440	3.0	45.0	20.5	-23.35194300	-23.0	21.0	7.0	4.33	27	Y	ERI
144	4541	ALCYONE		3.75666660	3.0	45.0	24.0	23.99833300	23.0	59.0	54.0	2.96	25	H	TAU
145	4553			3.77158330	3.0	46.0	17.7	65.41999900	65.0	25.0	12.0	4.71	0		CAM
146	4557			3.77719440	3.0	46.0	37.9	71.22694400	71.0	13.0	37.0	4.67	0	G	CAM
147	4586	ATLAS		3.78461110	3.0	47.0	4.6	23.94777800	23.0	56.0	52.0	3.80	27		TAU
148	4633			3.79602770	3.0	47.0	45.7	-74.34666600	-74.0	20.0	48.0	3.17	0	G	HYI
149	4624			3.80238880	3.0	48.0	8.6	-36.30527700	-36.0	18.0	19.0	4.24	0		ERI
150	4688	MENKHIB		3.86544440	3.0	51.0	55.6	31.78111100	31.0	46.0	52.0	2.91	44	Z	PER
151	4759			3.92497220	3.0	55.0	29.9	39.91055500	39.0	54.0	38.0	2.96	45	E	PER
152	4778	ZAURAK		3.93991660	3.0	56.0	23.7	-13.60694440	-13.0	36.0	25.0	3.19	34	G	ERI
153	4779			3.94480550	3.0	56.0	41.3	35.69194400	35.0	41.0	31.0	4.05	46	C	PER
154	4808			3.96977770	3.0	58.0	11.2	-61.49861100	-61.0	29.0	55.0	4.41	0	Q	RET
155	4801			3.97386100	3.0	58.0	25.9	-24.11444400	-24.0	6.0	52.0	4.69	36	Y	ERI
156	4805			3.97897210	3.0	58.0	44.3	12.39277770	12.0	23.0	34.0	3.90	35	L	TAU
157	4855			4.00641660	4.0	.0	23.1	-62.25666600	-62.0	15.0	24.0	4.46	0	G	RET
158	4862			4.02152770	4.0	1.0	17.5	5.89361110	5.0	53.0	37.0	3.94	38	N	TAU
159	4897			4.04369440	4.0	2.0	37.3	21.98777700	21.0	59.0	16.0	4.50	37		TAU
160	4924			4.06613880	4.0	3.0	58.1	50.25805500	50.0	15.0	29.0	4.33	47	L	PER
161	4967			4.10186100	4.0	6.0	6.7	47.62083300	47.0	37.0	15.0	4.03	48	U	PER
162	5056	BEID		4.16924990	4.0	10.0	9.3	-6.92749990	-6.0	55.0	39.0	4.14	38	O	ERI
163	5099			4.20533330	4.0	12.0	19.2	48.32222200	48.0	19.0	20.0	4.26	51	M	PER
164	5121			4.21400000	4.0	12.0	50.4	-42.37999900	-42.0	22.0	48.0	3.83	0	A	HOR
165	5134			4.22719430	4.0	13.0	37.9	8.80611110	8.0	48.0	22.0	4.32	49	M	TAU
166	5138			4.22766660	4.0	13.0	39.6	-7.70611110	-7.0	42.0	22.0	4.48	40	O	ERI
167	5164			4.23283320	4.0	13.0	58.2	-62.56111000	-62.0	33.0	40.0	3.36	0	A	RET
168	5179			4.25177770	4.0	15.0	6.4	-51.57416600	-51.0	34.0	27.0	4.36	0	G	DOR
169	5174			4.26005550	4.0	15.0	36.2	50.21138900	50.0	12.0	41.0	4.60	0		PER
170	5194			4.26458320	4.0	15.0	52.5	-59.38583300	-59.0	23.0	9.0	4.42	0	E	RET
171	5201			4.27613880	4.0	16.0	34.1	-33.88277700	-33.0	52.0	58.0	3.59	41	U	ERI

TABLE I. - STAR IDENTIFICATION CATALOGUE - Continued

172	5226			4.29663880	4.0	17.0	47.9	15.54444450	15.0	32.0	40.0	3.86	54	G	TAU	
173	5304			4.34855550	4.0	20.0	54.8	17.46194400	17.0	27.0	43.0	3.93	61	O	TAU	
174	5349			4.37866660	4.0	22.0	43.2	-34.09722100	-34.0	5.0	50.0	4.06	43	U	ERI	
175	5350			4.38799990	4.0	23.0	16.8	22.21527700	22.0	12.0	55.0	4.36	65	K	TAU	
176	5354			4.39102780	4.0	23.0	27.7	17.84944400	17.0	50.0	58.0	4.24	68		TAU	
177	5370			4.40350000	4.0	24.0	12.6	22.73583300	22.0	44.0	9.0	4.40	69	U	TAU	
178	5375			4.40580550	4.0	24.0	20.9	15.54027770	15.0	32.0	25.0	4.60	71		TAU	
179	5430	AIN		4.44283320	4.0	26.0	34.2	19.10416600	19.0	6.0	15.0	3.63	74	E	TAU	
180	5433			4.44286100	4.0	26.0	34.3	15.88583320	15.0	53.0	9.0	4.04	77	J	TAU	
181	5436			4.44433320	4.0	26.0	39.6	15.79472210	15.0	47.0	41.0	3.62	78	J	TAU	
182	5558			4.53100000	4.0	31.0	51.6	14.77222220	14.0	46.0	20.0	4.75	86	R	TAU	
183	5572			4.53561100	4.0	32.0	8.2	-29.83638900	-29.0	50.0	11.0	4.59	50	U	ERI	
184	5600			4.55397210	4.0	33.0	14.3	-55.11694400	-55.0	7.0	1.0	3.47	0	A	DOR	
185	5599			4.56213880	4.0	33.0	43.7	10.09055550	10.0	5.0	26.0	4.38	88		TAU	
186	5605	ALDEBARAN	PALILIC	4.56516660	4.0	33.0	54.6	16.44027800	16.0	26.0	25.0	1.06	87	A	TAU	IUM
187	5614	THEEMIN		4.56980550	4.0	34.0	11.3	-30.63305500	-30.0	37.0	59.0	3.88	52	U	ERI	
188	5609			4.57097220	4.0	34.0	15.5	41.19472200	41.0	11.0	41.0	4.46	58		PER	
189	5617			4.57613890	4.0	34.0	34.1	-3.42277770	-3.0	25.0	22.0	4.12	48	N	ERI	
190	5645			4.60330550	4.0	36.0	11.9	12.44222210	12.0	26.0	32.0	4.30	90		TAU	
191	5657	SCEPTRUM		4.60961100	4.0	36.0	34.6	-14.37111110	-14.0	22.0	16.0	3.98	53		ERI	
192	5695			4.64849990	4.0	38.0	54.6	-19.73750000	-19.0	44.0	15.0	4.54	54		ERI	
193	5708			4.65719440	4.0	39.0	25.9	-41.92972200	-41.0	55.0	47.0	4.52	0	A	CAE	
194	5716			4.66902770	4.0	40.0	8.5	22.89138800	22.0	53.0	29.0	4.33	94	T	TAU	
195	5796			4.72916660	4.0	43.0	45.0	-3.31750000	-3.0	19.0	3.0	4.18	57	M	ERI	
196	5875	TABIT		4.77897220	4.0	47.0	56.3	6.90166670	6.0	54.0	6.0	3.31	1	P	ORI	
197	5892			4.81169440	4.0	48.0	42.1	8.84166660	8.0	50.0	30.0	4.35	2	P	ORI	
198	5911			4.82233320	4.0	49.0	20.4	5.54666660	5.0	32.0	48.0	3.78	3	P	ORI	
199	5924			4.84261100	4.0	50.0	33.4	66.28583200	66.0	17.0	9.0	4.38	9	A	CAM	
200	5954			4.85288880	4.0	51.0	10.4	-5.51000000	-5.0	30.0	36.0	4.45	61	B	ERI	
201	5978			4.87377770	4.0	52.0	25.6	2.38472220	2.0	23.0	5.0	3.90	8	P	ORI	
202	5987			4.88277770	4.0	52.0	58.0	10.09666650	10.0	5.0	48.0	4.74	7	P	ORI	
203	6025			4.90669440	4.0	54.0	24.1	13.46055540	13.0	27.0	38.0	4.28	9	O	ORI	
204	6017			4.90788880	4.0	54.0	28.4	53.69833300	53.0	41.0	54.0	4.44	7		CAM	
205	6029	HASSALEH		4.91186100	4.0	54.0	42.7	33.11249900	33.0	6.0	45.0	2.90	3	I	AUR	
206	6068			4.94552770	4.0	56.0	43.9	1.66166665	1.0	39.0	42.0	4.73	10	P	ORI	
207	6123			4.99088880	4.0	59.0	27.2	43.77333300	43.0	46.0	24.0	3.00V	7	E	AUR	
208	6137	HOEDUS I		5.00047210	5.0	.0	1.7	41.02666600	41.0	1.0	36.0	3.90	8	Z	AUR	
209	6136			5.00494440	5.0	.0	17.8	60.39361100	60.0	23.0	37.0	4.22	10	B	CAM	
210	6158			5.01669440	5.0	1.0	.1	21.54166600	21.0	32.0	30.0	4.70	102	I	TAU	
211	6191			5.04277770	5.0	2.0	34.0	15.35694450	15.0	21.0	25.0	4.65	11		ORI	
212	6212			5.05244430	5.0	3.0	8.8	-35.52999900	-35.0	31.0	48.0	4.62	0	G	CAE	
213	6231			5.06630550	5.0	3.0	58.7	-22.41694400	-22.0	25.0	1.0	3.29	2	E	LEP	
214	6226	HOEDUS II		5.06761110	5.0	4.0	3.4	41.18888800	41.0	11.0	20.0	3.28	10	H	AUR	
215	6274	CURSA		5.10213880	5.0	6.0	7.7	-5.13027770	-5.0	7.0	49.0	2.92	67	B	ERI	
216	6304			5.12449990	5.0	7.0	28.2	-8.79749990	-8.0	47.0	51.0	4.34	69	L	ERI	
217	6374			5.17772210	5.0	10.0	39.8	-11.90972220	-11.0	54.0	35.0	4.54	3	I	LEP	
218	6382			5.18930550	5.0	11.0	21.5	-16.24583300	-16.0	14.0	45.0	3.30	5	M	LEP	
219	6381			5.19099990	5.0	11.0	27.6	2.82083330	2.0	49.0	15.0	4.64	17	B	ORI	
220	6387			5.19355540	5.0	11.0	36.8	-12.98166660	-12.0	58.0	54.0	4.46	4	K	LEP	
221	6410	RIGEL		5.21424990	5.0	12.0	51.3	-8.24083330	-8.0	14.0	27.0	.34	19	B	ORI	
222	6427	CAPELLA	ALMAJOTH	5.23500000	5.0	14.0	6.0	45.96444400	45.0	57.0	52.0	.21	13	A	AUR	
223	6480			5.26508320	5.0	15.0	54.3	-6.88083330	-6.0	52.0	51.0	3.68	20	T	ORI	
224	6531			5.29936110	5.0	17.0	57.7	-13.21166660	-13.0	12.0	42.0	4.29	6	L	LEP	
225	6559			5.31588880	5.0	18.0	57.2	-21.27361100	-21.0	14.0	25.0	4.73	0		LEP	
226	6579			5.33291660	5.0	19.0	58.5	-.41555555	.0	24.0	56.0	4.65	22	O	ORI	
227	6646			5.37099990	5.0	22.0	15.6	-7.83888890	-7.0	50.0	20.0	4.21	29		ORI	
228	6655			5.37861100	5.0	22.0	43.0	-2.42777770	-2.0	25.0	40.0	3.44	28	M	ORI	
229	6660			5.38213880	5.0	22.0	55.7	1.81583333	1.0	48.0	37.0	4.73	25		ORI	

TABLE I. - STAR IDENTIFICATION CATALOGUE - Continued

230	6668	BELLATRIX		5.38752780	5.0	23.0	15.1	6.31944440	6.0	19.0	10.0	1.70	24	G	ORI
231	6681	ELNATH	NATH	5.40130550	5.0	24.0	4.7	28.57972200	28.0	34.0	47.0	1.78	112	B	TAU
232	6713			5.41669440	5.0	25.0	.1	3.06666660	3.0	4.0	.0	4.66	30	Y	ORI
233	6762	NIHAL		5.44574990	5.0	26.0	44.7	-20.78611000	-20.0	47.0	10.0	2.96	9	B	LEP
234	6813			5.48183330	5.0	28.0	54.6	5.92277770	5.0	55.0	22.0	4.32	32		ORI
235	6846			5.49947220	5.0	29.0	58.1	-35.49527700	-35.0	29.0	43.0	3.92	0	E	COL
236	6841			5.50266660	5.0	30.0	9.6	18.56972200	18.0	34.0	11.0	4.70	119		TAU
237	6847	MINTAKA		5.50361100	5.0	30.0	13.0	-.32361110	.0	19.0	25.0	2.48	34	D	ORI
238	6850			5.50399430	5.0	30.0	14.2	-7.32583330	-7.0	19.0	33.0	4.64	36	U	ORI
239	6875	ARNEB		5.51975000	5.0	31.0	11.1	-17.84611000	-17.0	50.0	46.0	2.69	11	A	LEP
240	6907			5.54830550	5.0	32.0	53.9	9.46750000	9.0	28.0	3.0	4.53	37	V	ORI
241	6915	HEKA		5.55347220	5.0	33.0	12.5	9.91222220	9.0	54.0	44.0	3.66	39	L	ORI
242	6944			5.55530550	5.0	33.0	19.1	-62.51250000	-62.0	30.0	45.0	4.00V	0	B	DOR
243	6926			5.55555540	5.0	33.0	20.0	-6.02388890	-6.0	1.0	26.0	4.67	0		ORI
244	6934			5.56097220	5.0	33.0	39.5	-4.85999990	-4.0	51.0	36.0	4.65	42		ORI
245	6937	HATYSA		5.56199990	5.0	33.0	43.2	-5.93138890	-5.0	55.0	53.0	2.87	44	I	ORI
246	6960	ALNILAM		5.57394440	5.0	34.0	26.2	-1.22277777	-1.0	13.0	22.0	1.75	46	E	ORI
247	6972			5.58302780	5.0	34.0	58.9	9.27305560	9.0	16.0	23.0	4.39	40	V	ORI
248	6985			5.59252780	5.0	35.0	33.1	21.12277700	21.0	7.0	22.0	3.00	123	Z	TAU
249	7031			5.61647220	5.0	36.0	59.3	-2.61888880	-2.0	37.0	8.0	3.78	48	S	ORI
250	7042			5.62227770	5.0	37.0	20.2	4.10305550	4.0	6.0	11.0	4.54	47	H	ORI
251	7078	PHAKT		5.63966660	5.0	38.0	22.8	-34.09166600	-34.0	5.0	30.0	2.75	0	A	COL
252	7089	ALNITAK		5.64986110	5.0	38.0	59.5	-1.95972221	-1.0	57.0	35.0	2.05	50	Z	ORI
253	7197			5.71672220	5.0	43.0	.2	-22.45861100	-22.0	27.0	31.0	3.80	13	G	LEP
254	7246			5.74516660	5.0	44.0	42.6	-65.74861000	-66.0	44.0	55.0	4.52	0	D	DOR
255	7247			5.75613880	5.0	45.0	22.1	-14.83388870	-14.0	50.0	2.0	3.67	14	Z	LEP
256	7264	SAIPH		5.76824990	5.0	46.0	5.7	-9.68083320	-9.0	40.0	51.0	2.20	53	K	ORI
257	7287			5.77425000	5.0	46.0	27.3	-51.07861100	-51.0	4.0	43.0	3.94	0	B	PIC
258	7277			5.77913890	5.0	46.0	44.9	39.17111100	39.0	10.0	16.0	4.64	29	T	AUR
259	7334			5.81772220	5.0	49.0	3.8	39.14027700	39.0	8.0	25.0	4.18	32	N	AUR
260	7353			5.81983330	5.0	49.0	11.4	-56.17472200	-56.0	10.0	29.0	4.38	0	G	PIC
261	7364			5.82875000	5.0	49.0	43.5	-35.78055500	-36.0	46.0	50.0	3.22	0	B	COL
262	7362			5.83024990	5.0	49.0	48.9	-20.88083300	-20.0	52.0	51.0	3.90	15	D	LEP
263	7389			5.85211110	5.0	51.0	7.6	27.60555500	27.0	36.0	20.0	4.54	136		TAU
264	7419			5.87180550	5.0	52.0	18.5	20.27138800	20.0	16.0	17.0	4.62	54	X	ORI
265	7451	BETELGEUSE		5.88794440	5.0	53.0	16.6	7.40194440	7.0	24.0	7.0	.00V	58	A	ORI
266	7477			5.89719440	5.0	53.0	49.9	-63.10027700	-63.0	6.0	1.0	4.53	0		PIC
267	7492			5.91350000	5.0	54.0	48.6	-14.17277780	-14.0	10.0	22.0	3.77	16	H	LEP
268	7536			5.93824990	5.0	56.0	17.7	-35.28611100	-35.0	17.0	10.0	4.36	0	G	COL
269	7521			5.94408330	5.0	56.0	38.7	54.28416600	54.0	17.0	3.0	3.88	33	D	AUR
270	7543	MENKALINAN		5.94933320	5.0	56.0	57.6	44.94583300	44.0	56.0	45.0	2.07	34	B	AUR
271	7557			5.95555550	5.0	57.0	20.0	37.21194300	37.0	12.0	43.0	2.71	37	J	AUR
272	7554			5.95561100	5.0	57.0	20.2	45.93555500	45.0	56.0	8.0	4.59	35	P	AUR
273	7591			5.96788880	5.0	58.0	4.4	-42.81638900	-42.0	48.0	59.0	4.03	0	H	COL
274	7587			5.97172220	5.0	58.0	18.2	-3.07416660	-3.0	4.0	27.0	4.68	0		ORI
275	7635			6.00761110	6.0	.0	27.4	9.64888890	9.0	38.0	56.0	4.19	61	M	ORI
276	7675			6.03066670	6.0	1.0	50.4	20.14083300	20.0	8.0	27.0	4.71	62	X	ORI
277	7676			6.03319440	6.0	1.0	59.5	23.26694400	23.0	16.0	1.0	4.30	1		GEM
278	7742			6.07616660	6.0	4.0	34.2	-14.93083330	-14.0	55.0	51.0	4.67	18	J	LEP
279	7772			6.09288890	6.0	5.0	34.4	14.77416660	14.0	46.0	27.0	4.40	67	N	ORI
280	7889			6.16583330	6.0	9.0	57.0	14.21833320	14.0	13.0	6.0	4.35	70	C	ORI
281	7969	TEJAT PRIOR		6.21274990	6.0	12.0	45.9	22.51861100	22.0	31.0	7.0	3.00V	7	H	GEM
282	7981			6.21913890	6.0	13.0	8.9	29.51277700	29.0	30.0	46.0	4.45	44	K	AUR
283	7986			6.21913890	6.0	13.0	8.9	-6.26277770	-6.0	15.0	46.0	4.09	5	G	MON
284	8020			6.24988880	6.0	14.0	59.6	69.33527700	69.0	20.0	7.0	4.73	22		CAM
285	8062			6.25508320	6.0	15.0	18.3	-35.12805500	-36.0	7.0	41.0	4.51	0	K	COL
286	8068			6.27561110	6.0	16.0	32.2	59.02611000	59.0	1.0	34.0	4.42	2		LYN
287	8170	FURUD		6.31613880	6.0	18.0	58.1	-30.04666600	-30.0	2.0	48.0	3.10	1	Z	CMA

TABLE I. - STAR IDENTIFICATION CATALOGUE - Continued

288	8214			6.34722220	6.0	20.0	50.0	-33.41777700	-33.0	25.0	4.0	3.98	3	D	COL
289	8208	TEJAT POSTERIOR		6.34738880	6.0	20.0	50.6	22.53333300	22.0	32.0	.0	3.19	13	M	GEM
290	8223	MIRZAM		6.35263880	6.0	21.0	9.5	-17.93722100	-17.0	56.0	14.0	1.99	2	B	CMA
291	8240			6.36522220	6.0	21.0	54.8	4.61194440	4.0	36.0	43.0	4.48	8	E	MON
292	8302	CANOPUS	SUHEL	6.38625000	6.0	23.0	10.5	-52.67611100	-52.0	40.0	34.0	-.86	0	A	CAR
293	8410			6.44783330	6.0	26.0	52.2	-32.55694400	-32.0	33.0	25.0	4.40	0	L	CMA
294	8394			6.44808320	6.0	26.0	53.1	20.23583300	20.0	14.0	9.0	4.06	18	N	GEM
295	8413			6.45197220	6.0	27.0	7.1	-7.00916660	-7.0	.0	33.0	4.64	11	B	MON
296	8496			6.50661100	6.0	30.0	23.8	-23.39194400	-23.0	23.0	31.0	4.35	4	C	CMA
297	8506			6.51686110	6.0	31.0	.7	7.35999990	7.0	21.0	36.0	4.50	13		MON
298	8577			6.55980540	6.0	33.0	35.3	-22.93583300	-22.0	56.0	9.0	4.54	5	C	CMA
299	8604			6.57005560	6.0	34.0	12.2	-52.94638900	-52.0	56.0	47.0	4.44	0		CAR
300	8624			6.58594440	6.0	35.0	9.4	-19.22500000	-19.0	13.0	30.0	4.14	7	N	CMA
301	8633	ALHENA		6.59483330	6.0	35.0	41.4	16.43055500	16.0	25.0	50.0	1.93	24	G	GEM
302	8660			6.60583330	6.0	36.0	21.0	-18.20583300	-18.0	12.0	21.0	4.65	8	N	CMA
303	8675			6.61194990	6.0	36.0	41.4	-43.16444400	-43.0	9.0	52.0	3.18	0	N	PUP
304	8720			6.65083330	6.0	39.0	3.0	9.92972220	9.0	55.0	47.0	4.60	15		MON
305	8786	MEBSUTA		6.69633320	6.0	41.0	46.8	25.16749900	26.0	10.0	3.0	3.18	27	E	GEM
306	8793			6.70025000	6.0	42.0	.9	13.26472210	13.0	15.0	53.0	4.65	30		GEM
307	8823			6.72208320	6.0	43.0	19.5	12.93472220	12.0	56.0	5.0	3.40	31	C	GEM
308	8833	SIRIUS	CANICULA	6.72677770	6.0	43.0	36.4	-16.66666600	-16.0	40.0	.0	-1.37	9	A	CMA
309	8892			6.76724990	6.0	46.0	2.1	2.45194440	2.0	27.0	7.0	4.70	18		MON
310	8941			6.79722210	6.0	47.0	50.0	-61.90361000	-61.0	54.0	13.0	3.30	0	A	PIC
311	8946			6.80888880	6.0	48.0	32.0	-32.46694400	-32.0	28.0	1.0	3.78	13	K	CMA
312	8969			6.81777780	6.0	49.0	4.0	-50.57222200	-50.0	34.0	20.0	2.83	0	T	PUP
313	8972			6.81825000	6.0	49.0	5.7	-53.58083200	-53.0	34.0	51.0	4.38	0		CAR
314	8989			6.84138880	6.0	50.0	29.0	34.00527800	34.0	.0	19.0	3.64	34	J	GEM
315	9034			6.86724990	6.0	52.0	2.1	-20.17972200	-20.0	10.0	47.0	4.66	15		CMA
316	9051			6.87605540	6.0	52.0	33.8	-11.99361120	-11.0	59.0	37.0	4.25	14	J	CMA
317	9049			6.87783320	6.0	52.0	40.2	13.22361100	13.0	13.0	25.0	4.70	38		GEM
318	9059			6.87797210	6.0	52.0	40.7	-24.13916600	-24.0	8.0	21.0	4.12	14	O	CMA
319	9096			6.90175000	6.0	54.0	6.3	-20.09055500	-20.0	5.0	26.0	4.62	18	P	CMA
320	9082			6.90419440	6.0	54.0	15.1	58.47083300	58.0	28.0	15.0	4.54	18		LYN
321	9107			6.90958330	6.0	54.0	34.5	-17.00750000	-17.0	.0	27.0	4.39	20	I	CMA
322	9073			6.91652770	6.0	54.0	59.5	77.02583300	77.0	1.0	33.0	4.75	24		CAM
323	9188	ADHARA	ADARA	6.95416670	6.0	57.0	15.0	-28.92333300	-28.0	55.0	24.0	1.63	21	E	CMA
324	9276			7.00541660	7.0	.0	19.5	-27.88361100	-27.0	53.0	1.0	3.68	22	S	CMA
325	9307			7.02605550	7.0	1.0	33.8	-23.78111000	-23.0	46.0	52.0	3.12	24	O	CMA
326	9313	MEKBUDA		7.03388880	7.0	2.0	2.0	20.62333300	20.0	37.0	24.0	3.90	43	Z	GEM
327	9320	MULIPHEIN		7.03624990	7.0	2.0	10.5	-15.58027770	-15.0	34.0	49.0	4.07	23	G	CMA
328	9443	WEZEN		7.11613880	7.0	6.0	58.1	-26.33666600	-26.0	20.0	12.0	1.98	25	D	CMA
329	9484			7.14855550	7.0	8.0	54.8	30.30416600	30.0	18.0	15.0	4.48	46	Y	GEM
330	9514			7.15086110	7.0	9.0	3.1	-70.44222100	-70.0	26.0	32.0	3.87	0	G	VOL
331	9518			7.16794440	7.0	10.0	4.6	-.43333333	.0	26.0	.0	4.09	22	D	MON
332	9569			7.19269440	7.0	11.0	33.7	-46.69999900	-46.0	42.0	.0	4.47	0		PUP
333	9604			7.20783330	7.0	12.0	28.2	-44.58194400	-44.0	34.0	55.0	4.50	0		PUP
334	9608			7.21375000	7.0	12.0	49.5	-26.29111000	-26.0	17.0	28.0	4.66	27		CMA
335	9625			7.22316660	7.0	13.0	23.4	-26.71083300	-26.0	42.0	39.0	3.83	28	B	CMA
336	9706			7.26511110	7.0	15.0	54.4	-37.03361100	-37.0	2.0	1.0	2.74	0	P	PUP
337	9701			7.26805550	7.0	16.0	5.0	16.60499900	16.0	36.0	18.0	3.65	54	L	GEM
338	9747			7.28088890	7.0	16.0	51.2	-67.89333200	-67.0	53.0	36.0	4.02	0	B	VOL
339	9733			7.28436100	7.0	17.0	3.7	-36.66916600	-36.0	40.0	9.0	4.68	0	U	PUP
340	9736			7.28761110	7.0	17.0	15.4	-24.88944400	-24.0	53.0	22.0	4.40	30	T	CMA
341	9755	WASAT		7.30058330	7.0	18.0	2.1	22.04833300	22.0	2.0	54.0	3.51	55	D	GEM
342	9886	ALUDRA		7.37850000	7.0	22.0	42.6	-29.23388900	-29.0	14.0	2.0	2.43	31	M	CMA
343	9897			7.39258330	7.0	23.0	33.3	27.86916600	27.0	52.0	9.0	3.89	60	I	GEM
344	9909			7.40130550	7.0	24.0	4.7	49.28305500	49.0	16.0	59.0	4.45	21		LYN
345	9947	GOMEISA		7.42088880	7.0	25.0	15.2	8.36111110	8.0	21.0	40.0	3.09	3	B	CMI

TABLE I. - STAR IDENTIFICATION CATALOGUE - Continued

346	9974		7.43763880	7.0	26.0	15.5	8.99777770	8.0	59.0	52.0	4.60	4	G	CMI
347	9987		7.44772210	7.0	26.0	51.8	31.85555500	31.0	51.0	20.0	4.18	62	R	GEM
348	10040		7.46866660	7.0	28.0	7.2	-43.22972100	-43.0	13.0	47.0	3.27	0	S	PUP
349	10120	CASTOR	7.53947210	7.0	32.0	22.1	31.96638800	31.0	57.0	59.0	1.58	66	A	GEM
350	10134		7.54255550	7.0	32.0	33.2	-22.21944400	-22.0	13.0	10.0	4.52	10B		PUP
351	10167		7.56280550	7.0	33.0	46.1	26.97500000	26.0	58.0	30.0	4.22	69	U	GEM
352	10178		7.56624990	7.0	33.0	58.5	-28.29111100	-28.0	17.0	28.0	4.55	0		PUP
353	10246		7.60119440	7.0	36.0	4.3	-34.88888800	-34.0	53.0	20.0	4.62	0		PUP
354	10266		7.61405550	7.0	36.0	50.6	-25.28444400	-25.0	17.0	4.0	4.64	0		PUP
355	10281	MARKEB	7.62311100	7.0	37.0	23.2	-26.72111100	-26.0	43.0	16.0	4.50	0	K	PUP
356	10277	PROCYON ELGOMAISA	7.62449990	7.0	37.0	28.2	5.31583330	5.0	18.0	57.0	.48	10	A	CMI
357	10345		7.65958320	7.0	39.0	34.5	-9.46833330	-9.0	28.0	6.0	4.07	26	A	MON
358	10373		7.68544440	7.0	41.0	7.6	28.96972100	28.0	58.0	11.0	4.26	75	S	GEM
359	10444		7.70438890	7.0	42.0	15.8	-72.52249900	-72.0	31.0	21.0	3.89	0	I	VOL
360	10403		7.70561110	7.0	42.0	20.2	24.48333300	24.0	29.0	.0	3.68	77	K	GEM
361	10417		7.70669450	7.0	42.0	24.1	-28.87027700	-28.0	52.0	13.0	4.10	3		PUP
362	10438	POLLUX	7.71961110	7.0	43.0	10.6	28.11222200	28.0	6.0	44.0	1.21	78	B	GEM
363	10462		7.73344440	7.0	44.0	.4	-37.88277700	-37.0	52.0	58.0	3.72	0		PUP
364	10532		7.77716660	7.0	46.0	37.8	-25.84916700	-25.0	50.0	57.0	4.59	0	O	PUP
365	10553		7.78824990	7.0	47.0	17.7	-46.98861000	-46.0	59.0	19.0	4.64	0		PUP
366	10562	AZMIDISKE	7.79702770	7.0	47.0	49.3	-24.77083300	-24.0	46.0	15.0	3.47	7	C	PUP
367	10576		7.80286100	7.0	48.0	10.3	-46.28444400	-46.0	17.0	4.0	4.25	0		PUP
368	10655		7.85022210	7.0	51.0	.8	-40.48472200	-40.0	29.0	5.0	3.76	0	A	PUP
369	10661		7.85675000	7.0	51.0	24.3	-38.77138800	-38.0	46.0	17.0	4.53	0		PUP
370	10689		7.87122210	7.0	52.0	16.4	-48.01111100	-48.0	.0	40.0	4.32	0		PUP
371	10756		7.92255550	7.0	55.0	21.2	-22.78555500	-22.0	47.0	8.0	4.35	11		PUP
372	10770		7.93147220	7.0	55.0	53.3	-52.88777700	-52.0	53.0	16.0	3.60	0	I	CAR
373	10802		7.95388880	7.0	57.0	14.0	-49.14916600	-49.0	8.0	57.0	4.00V	0		PUP
374	10825		7.97163890	7.0	58.0	17.9	-18.30222200	-18.0	18.0	8.0	4.64	232		PUP
375	10891		8.00741670	8.0	.0	26.7	2.43194440	2.0	25.0	55.0	4.52	0		CMI
376	10947	NAOS	8.03922210	8.0	2.0	21.2	-39.90361000	-39.0	54.0	13.0	2.27	0	I	PUP
377	11034		8.10088870	8.0	6.0	3.2	-24.20250000	-24.0	12.0	9.0	2.88	15	R	PUP
378	11051		8.11391650	8.0	6.0	50.1	-2.88055550	-2.0	52.0	50.0	4.41	29	I	MON
379	11071		8.12438870	8.0	7.0	27.8	-19.14138800	-19.0	8.0	29.0	4.34	16		PUP
380	11098		8.13041650	8.0	7.0	49.5	-68.51416500	-68.0	30.0	51.0	4.46	0	E	VOL
381	11105		8.14088880	8.0	8.0	27.2	-47.23277800	-47.0	13.0	58.0	1.90	0	G	VEL
382	11134		8.16049990	8.0	9.0	37.8	-12.82194440	-12.0	49.0	19.0	4.68	19		PUP
383	11149		8.16844440	8.0	10.0	6.4	-39.51333300	-39.0	30.0	48.0	4.43	0		PUP
384	11215		8.21341660	8.0	12.0	48.3	-40.24027700	-40.0	14.0	25.0	4.43	0		PUP
385	11254		8.24363880	8.0	14.0	37.1	9.29472220	9.0	17.0	41.0	3.76	17	B	CNC
386	11343		8.28741660	8.0	17.0	14.7	-36.55000000	-36.0	33.0	.0	4.43	0		PUP
387	11419		8.32433320	8.0	19.0	27.6	-76.80972100	-76.0	48.0	35.0	4.08	0	A	CMA
388	11401		8.34077770	8.0	20.0	26.8	43.30194400	43.0	18.0	7.0	4.43	31		LYN
389	11481		8.36211100	8.0	21.0	43.6	-77.37222200	-77.0	22.0	20.0	4.26	0	J	CMA
390	11463	AVIOR	8.36327770	8.0	21.0	47.8	-59.39638800	-59.0	23.0	47.0	1.74	0	E	CAR
391	11499		8.39852770	8.0	23.0	54.7	-3.79111100	-3.0	47.0	28.0	3.95	30		MON
392	11567		8.42272210	8.0	25.0	21.8	-66.01972100	-66.0	1.0	11.0	3.65	0	B	VOL
393	11593		8.45619430	8.0	27.0	22.3	60.83694400	60.0	50.0	13.0	3.47	1	O	UMA
394	11823		8.59674990	8.0	35.0	48.3	5.82694440	5.0	49.0	37.0	4.18	4	D	HYA
395	11852		8.60686100	8.0	36.0	24.7	-42.86611100	-42.0	51.0	58.0	4.13	0		VEL
396	11856		8.61547210	8.0	36.0	55.7	3.46527780	3.0	27.0	55.0	4.54	5	S	HYA
397	11923		8.64552770	8.0	38.0	43.9	-35.18305500	-35.0	10.0	59.0	4.04	0	B	PYX
398	11943		8.65483320	8.0	39.0	17.4	-52.79722200	-52.0	47.0	50.0	3.68	0	O	VEL
399	11951		8.65772210	8.0	39.0	27.8	-46.52361100	-46.0	31.0	25.0	4.06	53		VEL
400	11964		8.66408330	8.0	39.0	50.7	-59.63583300	-59.0	38.0	9.0	4.42	0		CAR
401	11982	ASELLUS-BOR.	8.68772210	8.0	41.0	15.8	21.59555600	21.0	35.0	44.0	4.73	43	G	CNC
402	11987		8.68994440	8.0	41.0	23.8	3.52527770	3.0	31.0	31.0	4.32	7	M	HYA
403	12006		8.69924980	8.0	41.0	57.3	-7.10666660	-7.0	6.0	24.0	4.70	31		MON

TABLE I. - STAR IDENTIFICATION CATALOGUE - Continued

404	12018		8.70308320	8.0	42.0	11.1	-33.05944400	-33.0	3.0	34.0	3.70	0	A	PYX		
405	12022	ASELLUS-AUSTR.	8.71163880	8.0	42.0	41.9	18.28416600	18.0	17.0	3.0	4.17	47	D	CNC		
406	12050		8.71913870	8.0	43.0	8.9	-42.52166600	-42.0	31.0	18.0	4.12	0		VEL		
407	12069		8.72894430	8.0	43.0	44.2	-54.57972100	-54.0	34.0	47.0	2.01	0	D	VEL		
408	12083		8.74305540	8.0	44.0	35.0	28.88916700	28.0	53.0	21.0	4.20	48	I	CNC		
409	12097		8.74536100	8.0	44.0	43.3	-13.41888870	-13.0	25.0	8.0	4.44	12		HYA		
410	12109		8.74733320	8.0	44.0	50.4	-45.91277700	-45.0	54.0	46.0	4.09	0		VEL		
411	12102		8.74872210	8.0	44.0	55.4	6.54833330	6.0	32.0	54.0	3.48	11	E	HYA		
412	12138		8.76341660	8.0	45.0	48.3	-56.64055500	-56.0	38.0	26.0	4.63	0		CAR		
413	12148		8.77633330	8.0	46.0	34.8	5.98472220	5.0	58.0	65.0	4.42	13	R	HYA		
414	12216		8.81744440	8.0	49.0	2.8	-27.57916600	-27.0	34.0	45.0	4.19	0	G	PYX		
415	12327		8.89241660	8.0	53.0	32.7	6.07972220	6.0	4.0	47.0	3.30	16	Z	HYA		
416	12359		8.90427770	8.0	54.0	15.4	-60.51027800	-60.0	30.0	37.0	3.98	0		CAR		
417	12406	ACUBENS SERTAN	8.94291650	8.0	56.0	34.5	11.99416670	11.0	59.0	39.0	4.27	65	A	CNC		
418	12407	TALITHA	8.94699990	8.0	56.0	49.2	48.18027700	48.0	10.0	49.0	3.12	9	I	UMA		
419	12434		8.97291650	8.0	58.0	22.5	41.92249900	41.0	55.0	21.0	4.09	10		UMA		
420	12451		8.97969420	8.0	58.0	46.9	-41.11666600	-41.0	7.0	.0	4.42	91		VEL		
421	12503		9.02074990	9.0	1.0	14.7	47.29611100	47.0	17.0	46.0	3.68	12	K	UMA		
422	12532		9.03163890	9.0	1.0	53.9	-66.25611000	-66.0	15.0	22.0	4.18	0	A	VOL		
423	12545		9.04908320	9.0	2.0	56.7	-46.95777700	-46.0	57.0	28.0	3.69	0		VEL		
424	12565		9.07180550	9.0	4.0	18.5	38.59333300	38.0	35.0	36.0	4.71	0		LYN		
425	12595		9.08452740	9.0	5.0	4.3	-72.46194300	-72.0	27.0	43.0	4.50	0		CAR		
426	12604		9.10688880	9.0	6.0	24.8	51.74722100	51.0	44.0	50.0	4.54	15		UMA		
427	12623	SUHAIL ALSUHAIL	9.11177770	9.0	6.0	42.4	-43.29055500	-43.0	17.0	26.0	2.22	0	L	VEL		
428	12646		9.13422220	9.0	8.0	3.2	63.65749900	63.0	39.0	27.0	4.74	14	T	UMA		
429	12696		9.16741660	9.0	10.0	2.7	-58.82305500	-58.0	49.0	23.0	3.56	0		CAR		
430	12707		9.17474990	9.0	10.0	29.1	-62.17305500	-62.0	10.0	23.0	4.18	0		CAR		
431	12743		9.20908320	9.0	12.0	32.7	2.44277770	2.0	27.0	46.0	3.84	22	J	HYA		
432	12744	MIAPLACIDUS	9.21374990	9.0	12.0	49.5	-69.57305500	-69.0	34.0	23.0	1.80	0	B	CAR		
433	12787		9.23916650	9.0	14.0	21.0	-37.26666600	-37.0	16.0	.0	4.70	0		VEL		
434	12813		9.25358320	9.0	15.0	12.9	-57.39444300	-57.0	23.0	40.0	4.18	0		CAR		
435	12831	TUREIS	9.26922220	9.0	16.0	9.2	-59.12805500	-59.0	7.0	41.0	2.25	0	I	CAR		
436	12830		9.27786100	9.0	16.0	40.3	36.95194400	36.0	57.0	7.0	3.82	38		LYN		
437	12880		9.31547220	9.0	18.0	55.7	34.54166700	34.0	32.0	30.0	3.30	40	A	LYN		
438	12938		9.35047210	9.0	21.0	1.7	-54.84083300	-54.0	51.0	39.0	2.63	0	K	VEL		
439	12972		9.37699990	9.0	22.0	37.2	26.33388900	26.0	20.0	2.0	4.61	1	K	LEO		
440	13044	ALPHARD COR-HYDRAE	9.43111100	9.0	25.0	52.0	-8.50611110	-8.0	30.0	22.0	2.16	30	A	HYA	ALFARD	
441	13091		9.46330550	9.0	27.0	47.9	-35.79777700	-36.0	47.0	52.0	4.64	0	E	ANT		
442	13109		9.47983320	9.0	28.0	47.4	63.21611000	63.0	12.0	58.0	3.75	23		UMA		
443	13140		9.48866660	9.0	29.0	19.2	-40.31277700	-40.0	18.0	46.0	3.64	0	Y	VEL		
444	13143		9.49544430	9.0	29.0	43.6	23.12333300	23.0	7.0	24.0	4.48	4	L	LEO		
445	13160		9.50261090	9.0	30.0	9.4	-56.87944400	-56.0	52.0	46.0	3.00	0		VEL		
446	13153		9.50330550	9.0	30.0	11.9	-1.02972221	-1.0	1.0	47.0	4.50	32	T	HYA		
447	13157		9.50877760	9.0	30.0	31.6	51.83777700	51.0	50.0	16.0	3.26	25	J	UMA		
448	13192		9.52274990	9.0	31.0	21.9	-62.63361100	-62.0	38.0	1.0	4.00V	0		CAR		
449	13171		9.52366670	9.0	31.0	25.2	69.98555400	69.0	59.0	8.0	4.57	24		UMA		
450	13203		9.53474990	9.0	32.0	5.1	36.55388900	36.0	33.0	14.0	4.62	10		LMI		
451	13174		9.53741660	9.0	32.0	14.7	81.48333200	81.0	29.0	.0	4.58	1		DRA		
452	13212		9.54061110	9.0	32.0	26.2	52.20805500	52.0	12.0	29.0	4.65	26		UMA		
453	13246		9.55713880	9.0	33.0	25.7	-59.07305500	-59.0	4.0	23.0	4.20	0		CAR		
454	13293		9.59288870	9.0	35.0	34.4	-49.19777700	-49.0	11.0	52.0	4.49	0		VEL		
455	13341		9.63447210	9.0	38.0	4.1	-.98305555	.0	58.0	59.0	4.10	35	I	HYA		
456	13355		9.63966660	9.0	38.0	22.8	-61.16916600	-61.0	10.0	9.0	4.67	0		CAR		
457	13366	SUBRA	9.65472210	9.0	39.0	17.0	10.05222220	10.0	3.0	8.0	3.76	14	O	LEO		
458	13373		9.66141660	9.0	39.0	41.1	-23.43166600	-23.0	25.0	54.0	4.74	0		HYA		
459	13443	RAS-ELASED AUSTR.	9.73113870	9.0	43.0	52.1	23.93611100	23.0	56.0	10.0	3.12	17	E	LEO		
460	13462		9.73808310	9.0	44.0	17.1	-62.34583300	-62.0	20.0	45.0	4.00	0		CAR		
461	13506		9.77047220	9.0	46.0	13.7	-64.90916600	-64.0	54.0	33.0	3.08	0	U	CAR		

TABLE I. - STAR IDENTIFICATION CATALOGUE - Continued

462	13540		9.80861110	9.0	48.0	31.0	59.20444400	59.0	12.0	16.0	3.89	29	U	UMA
463	13559		9.82894440	9.0	49.0	44.2	54.22888800	54.0	13.0	44.0	4.54	30	V	UMA
464	13570		9.82988890	9.0	49.0	47.6	-14.68166660	-14.0	40.0	54.0	4.29	39	U	HYA
465	13587		9.83872210	9.0	50.0	19.4	-46.38305500	-46.0	22.0	59.0	4.56	0		VEL
466	13590	RAS-ELASED BOR.	9.84627760	9.0	50.0	46.6	26.17249900	26.0	10.0	21.0	4.10	24	N	LEO
467	13711		9.92719430	9.0	55.0	37.9	-54.40055500	-54.0	24.0	2.0	3.70	0	V	VEL
468	13861		10.05697210	10.0	3.0	25.1	-12.89444430	-12.0	53.0	40.0	4.72	40	U	HYA
469	13896		10.08949980	10.0	5.0	22.2	35.41611100	35.0	24.0	58.0	4.47	21		LMI
470	13899		10.09044420	10.0	5.0	25.6	16.93388800	16.0	56.0	2.0	3.58	30	M	LEO
471	13911		10.10080530	10.0	6.0	2.9	10.16972210	10.0	10.0	11.0	4.58	31		LEO
472	13916		10.10244430	10.0	6.0	8.8	-.20000000	.0	12.0	.0	4.50	15	A	SEX
473	13926	REGULUS KALB	10.10849980	10.0	6.0	30.6	12.13888880	12.0	8.0	20.0	1.34	32	A	LEO
474	13982		10.14799980	10.0	8.0	52.8	-12.18055550	-12.0	10.0	50.0	3.83	41	L	HYA
475	14074		10.21516650	10.0	12.0	54.6	-69.86388900	-69.0	51.0	50.0	3.56	0	W	CAR
476	14076		10.22105530	10.0	13.0	15.8	-41.94833300	-41.0	56.0	54.0	4.09	0		VEL
477	14107	ADHAFERA	10.24577750	10.0	14.0	44.8	23.59222200	23.0	35.0	32.0	3.65	36	Z	LEO
478	14113	TANIA BOR.	10.24988870	10.0	14.0	59.6	43.08972200	43.0	5.0	23.0	3.52	33	L	UMA
479	14133		10.26519430	10.0	15.0	54.7	-61.15694400	-61.0	9.0	25.0	3.44	187		CAR
480	14177	ALGIEBA	10.30074980	10.0	18.0	2.7	20.01916600	20.0	1.0	9.0	2.61	41	G	LEO
481	14185		10.30491650	10.0	18.0	17.7	-54.85333300	-54.0	51.0	12.0	4.58	0		VEL
482	14220		10.32677770	10.0	19.0	36.4	-55.86638800	-55.0	51.0	59.0	4.65	0		VEL
483	14232	TANIA AUSTR.	10.33749980	10.0	20.0	15.0	41.67611100	41.0	40.0	34.0	3.21	34	M	UMA
484	14323		10.39511100	10.0	23.0	42.4	-73.85333300	-73.0	51.0	12.0	4.08	0		CAR
485	14326		10.40661110	10.0	24.0	23.8	-16.65694400	-16.0	39.0	25.0	4.06	42	M	HYA
486	14352		10.42580540	10.0	25.0	32.9	-30.88916600	-30.0	53.0	21.0	4.42	0	A	ANT
487	14358		10.43108310	10.0	25.0	51.9	36.88722200	36.0	53.0	14.0	4.41	31	B	LMI
488	14388		10.44316650	10.0	26.0	35.4	-58.56027700	-58.0	33.0	37.0	4.08	0		CAR
489	14489		10.51291640	10.0	30.0	46.5	-61.50500000	-61.0	30.0	18.0	3.58	0		CAR
490	14487		10.51616640	10.0	30.0	58.2	9.48722220	9.0	29.0	14.0	3.85	47	R	LEO
491	14570		10.57063880	10.0	34.0	14.3	-57.37611100	-57.0	22.0	34.0	4.54	0		CAR
492	14604		10.58452760	10.0	35.0	4.3	-78.42611000	-78.0	25.0	34.0	4.10	0	G	CHA
493	14614		10.59711100	10.0	35.0	49.6	-48.04361100	-48.0	2.0	37.0	4.06	0		VEL
494	14647		10.62358320	10.0	37.0	24.9	-59.00055500	-59.0	.0	2.0	4.73	0		CAR
495	14662		10.63183320	10.0	37.0	54.6	-55.42083300	-55.0	25.0	15.0	4.25	0		VEL
496	14755		10.69505540	10.0	41.0	42.2	-64.21083200	-64.0	12.0	39.0	3.03	0	J	CAR
497	14762		10.70333330	10.0	42.0	12.0	-60.38277700	-60.0	22.0	58.0	4.49	0		CAR
498	14842		10.75430540	10.0	45.0	15.5	-49.23472200	-49.0	14.0	5.0	2.84	0	M	VEL
499	14863		10.75799970	10.0	45.0	28.8	-80.35555600	-80.0	21.0	20.0	4.62	0	D	CHA
500	14898		10.79827770	10.0	47.0	53.8	-16.01000000	-16.0	.0	36.0	3.32	0	N	HYA
501	14961		10.85599990	10.0	51.0	21.6	34.40388800	34.0	24.0	14.0	3.92	46	O	LMI
502	14980		10.86774980	10.0	52.0	3.9	-58.66722200	-58.0	40.0	2.0	3.88	0		CAR
503	15016		10.89536100	10.0	53.0	43.3	24.93666600	24.0	56.0	12.0	4.51	54		LEO
504	15047		10.91819940	10.0	55.0	5.5	-36.94944400	-36.0	56.0	58.0	4.70	0	I	ANT
505	15106	ALKES	10.96788870	10.0	58.0	4.4	-18.11194400	-18.0	6.0	43.0	4.20	7	A	CRT
506	15118		10.97572210	10.0	58.0	32.6	-42.03777700	-42.0	2.0	16.0	4.56	239		VEL
507	15145	MERAK	10.99569420	10.0	59.0	44.5	56.57027700	56.0	34.0	13.0	2.44	48	B	UMA
508	15162		11.00772220	11.0	.0	27.8	20.36777700	20.0	22.0	4.0	4.42	60		LEO
509	15185	DUBHE	11.02638870	11.0	1.0	35.0	61.94027700	61.0	56.0	25.0	1.95	50	A	UMA
510	15235		11.05352770	11.0	3.0	12.7	7.52555550	7.0	31.0	32.0	4.66	63	X	LEO
511	15329		11.11813870	11.0	7.0	5.3	-58.78527700	-58.0	47.0	7.0	4.02	260		CAR
512	15340		11.12838880	11.0	7.0	42.2	44.68861100	44.0	41.0	19.0	3.15	0	Y	UMA
513	15385		11.16555540	11.0	9.0	56.0	-22.63444400	-22.0	38.0	4.0	4.52	11	B	CRT
514	15415		11.18486090	11.0	11.0	5.5	-60.12694400	-60.0	7.0	37.0	4.73	0		CAR
515	15438	ZOSMA	11.20416660	11.0	12.0	15.0	20.71555500	20.0	42.0	56.0	2.58	68	D	LEO
516	15441	COXA	11.20675000	11.0	12.0	24.3	15.62111110	15.0	37.0	16.0	3.41	70	J	LEO
517	15511		11.24802750	11.0	14.0	52.9	-3.45999990	-3.0	27.0	36.0	4.58	74	V	LEO
518	15537	ALULA-AUSTR.	11.27199990	11.0	16.0	19.2	31.72638900	31.0	43.0	35.0	3.88	53	C	UMA
519	15547	ALULA-BOR.	11.27652760	11.0	16.0	35.5	33.28555500	33.0	17.0	8.0	3.71	54	N	UMA

TABLE I. - STAR IDENTIFICATION CATALOGUE - Continued

520	15567			11.29313870	11.0	17.0	35.3	-14.58888890	-14.0	35.0	20.0	3.82	12	D	CRT
521	15600			11.32219430	11.0	19.0	19.9	6.22138890	6.0	13.0	17.0	4.13	77	S	LEO
522	15601			11.32338880	11.0	19.0	24.2	-54.29916600	-54.0	17.0	57.0	4.26	0	P	CEN
523	15652			11.36836100	11.0	22.0	6.1	10.72222220	10.0	43.0	20.0	4.03	78	I	LEO
524	15669			11.38550000	11.0	23.0	7.8	-17.49166600	-17.0	29.0	30.0	4.14	15	G	CRT
525	15799	GIANFAR		11.48911090	11.0	29.0	20.8	69.52444300	69.0	31.0	28.0	4.06	1	L	DRA
526	15845			11.52127770	11.0	31.0	16.6	-31.66388900	-31.0	39.0	50.0	3.72	0	C	HYA
527	15899			11.56930540	11.0	34.0	9.5	-62.82611000	-62.0	49.0	34.0	3.34	0	L	CEN
528	15927			11.58594430	11.0	35.0	9.4	-.63055555	.0	37.0	50.0	4.47	92	U	LEO
529	16131			11.73238870	11.0	43.0	56.6	-66.53472100	-66.0	32.0	5.0	3.80	0	L	MUS
530	16135			11.73433320	11.0	44.0	3.6	6.72555550	6.0	43.0	32.0	4.20	3	N	VIR
531	16137			11.73680540	11.0	44.0	12.5	47.97333300	47.0	58.0	24.0	3.85	63	I	UMA
532	16147			11.74683320	11.0	44.0	48.6	-60.98388800	-60.0	59.0	2.0	4.22	65		CEN
533	16173			11.76969440	11.0	46.0	10.9	20.41333300	20.0	24.0	48.0	4.54	93		LEO
534	16176			11.77574990	11.0	46.0	32.7	-66.62027700	-66.0	37.0	13.0	4.71	0	H	MUS
535	16189	DENEBOLA		11.78791660	11.0	47.0	16.5	14.76777760	14.0	46.0	4.0	2.23	94	B	LEO
536	16201			11.79949980	11.0	47.0	58.2	-63.59388800	-63.0	35.0	38.0	4.52	0		CEN
537	16215	ALARAPH	ZAVIJAH	11.81452770	11.0	48.0	52.3	1.96194443	1.0	57.0	43.0	3.80	5	B	VIR
538	16226			11.82311090	11.0	49.0	23.2	-44.97861000	-44.0	58.0	43.0	4.71	0		CEN
539	16258			11.85224980	11.0	51.0	8.1	-33.71333300	-33.0	42.0	48.0	4.40	0	B	HYA
540	16268	PHECDA	PHEKDA	11.86661090	11.0	51.0	59.8	53.88916600	53.0	53.0	21.0	2.54	64	G	UMA
541	16425			11.98463870	11.0	59.0	4.7	6.80944440	6.0	48.0	34.0	4.57	8	P	VIR
542	16463			12.02052770	12.0	1.0	13.9	-63.11805500	-63.0	7.0	5.0	4.48	0	J	CRU
543	16512			12.05711100	12.0	3.0	25.6	8.92722210	8.0	55.0	38.0	4.24	9	O	VIR
544	16551			12.08402770	12.0	5.0	2.5	-64.41861000	-64.0	25.0	7.0	4.30	0	H	CRU
545	16584			12.10891650	12.0	6.0	32.1	-50.52777800	-50.0	31.0	40.0	2.88	0	D	CEN
546	16586	ALCHITA		12.11005540	12.0	6.0	36.2	-24.53388900	-24.0	32.0	2.0	4.18	1	A	CRV
547	16618	MINKAR		12.13869440	12.0	8.0	19.3	-22.42527800	-22.0	25.0	31.0	3.21	2	E	CRV
548	16651			12.16355550	12.0	9.0	48.8	-52.17388900	-52.0	10.0	26.0	4.20	0	R	CEN
549	16724			12.22124980	12.0	13.0	16.5	-58.55444400	-58.0	33.0	16.0	3.08	0	D	CRU
550	16736	MEGREZ	KAFFA	12.22836110	12.0	13.0	42.1	57.22694400	57.0	13.0	37.0	3.44	69	D	UMA
551	16740	GIENAH		12.23338870	12.0	14.0	.2	-17.34777700	-17.0	20.0	52.0	2.78	4	G	CRV
552	16764			12.26105540	12.0	15.0	39.8	-67.76611000	-67.0	45.0	58.0	4.16	0	E	MUS
553	16775			12.27094440	12.0	16.0	15.4	-79.11805500	-79.0	7.0	5.0	4.38	0	B	CHA
554	16785			12.27541660	12.0	16.0	31.5	-63.80888800	-63.0	48.0	32.0	4.26	0	Z	CRU
555	16813			12.30188880	12.0	18.0	6.8	-.47250000	.0	28.0	21.0	4.00	15	H	VIR
556	16849			12.32430550	12.0	19.0	27.5	-60.20805500	-60.0	12.0	29.0	3.57	0	E	CRU
557	16953	ACRUX		12.41061110	12.0	24.0	38.2	-62.90527700	-62.0	54.0	19.0	1.00	0	A	CRU
558	16964			12.41991650	12.0	25.0	11.7	28.46277700	28.0	27.0	46.0	4.56	15	G	COM
559	16990			12.43563880	12.0	26.0	8.3	-50.03722200	-50.0	2.0	14.0	4.16	0	S	CEN
560	17029	ALGORAB		12.46749980	12.0	28.0	3.0	-16.32083300	-16.0	19.0	15.0	3.11	7	D	CRV
561	17052	GACRUX		12.48686110	12.0	29.0	12.7	-56.91749900	-56.0	55.0	3.0	1.61	0	G	CRU
562	17087			12.50438870	12.0	30.0	15.8	-16.00249900	-16.0	.0	9.0	4.42	8	H	CRV
563	17086			12.50588860	12.0	30.0	21.2	-71.94000000	-71.0	56.0	24.0	4.04	0	G	MUS
564	17126			12.53330560	12.0	31.0	59.9	69.98083300	69.0	58.0	51.0	3.88	5	K	DRA
565	17127	ASTERION		12.53472210	12.0	32.0	5.0	41.54722200	41.0	32.0	50.0	4.32	8	B	CVN
566	17133	KRAZ		12.54241660	12.0	32.0	32.7	-23.20333300	-23.0	12.0	12.0	2.84	9	B	CRV
567	17179			12.58461090	12.0	35.0	4.6	-68.94305500	-68.0	56.0	35.0	2.94	0	A	MUS
568	17194			12.59630530	12.0	35.0	46.7	-48.34888900	-48.0	20.0	56.0	4.02	0	T	CEN
569	17262			12.65961100	12.0	39.0	34.6	-48.76777700	-48.0	46.0	4.0	2.38	0	G	CEN
570	17270	ARICH	PORRIMA	12.66474990	12.0	39.0	53.1	-1.25777777	-1.0	15.0	28.0	2.91	29	B	VIR
571	17282			12.67738880	12.0	40.0	38.6	-48.62111100	-48.0	37.0	16.0	4.65	0		CEN
572	17339			12.72597210	12.0	43.0	33.5	-60.78944400	-60.0	47.0	22.0	4.68	0	I	CRU
573	17348			12.73524980	12.0	44.0	6.9	-67.91694300	-67.0	55.0	1.0	3.26	0	B	MUS
574	17374	BETA CRUCIS		12.76102750	12.0	45.0	39.7	-59.49777700	-59.0	29.0	52.0	1.50	0	B	CRU
575	17473			12.85205540	12.0	51.0	7.4	-48.75305400	-48.0	45.0	11.0	4.35	0		CEN
576	17489			12.85816440	12.0	51.0	29.4	-39.98888800	-39.0	59.0	20.0	4.34	0		CEN
577	17518	ALIOTH		12.87491650	12.0	52.0	29.7	56.14944400	56.0	8.0	58.0	1.68	77	E	UMA

TABLE I. - STAR IDENTIFICATION CATALOGUE - Continued

578	17512			12.87538870	12.0	52.0	31.4	-56.98833300	-56.0	59.0	18.0	4.26	0	M	CRU
579	17543	AUVA	MINELAUVA	12.89730550	12.0	53.0	50.3	3.58722220	3.0	35.0	14.0	3.66	43	D	VIR
580	17557	CHARA	COR CAROLI	12.90655540	12.0	54.0	23.6	38.50694400	38.0	30.0	25.0	2.90	12	A	CVN
581	17672			12.99724980	12.0	59.0	50.1	-71.34083300	-71.0	21.0	39.0	3.63	0	D	MUS
582	17687	VINDEMIATRIX		13.00722210	13.0	.0	26.0	11.14694450	11.0	8.0	49.0	2.95	47	E	VIR
583	17773			13.08094430	13.0	4.0	51.4	-49.71916600	-49.0	43.0	9.0	4.40	0	C	CEN
584	17828			13.13558330	13.0	8.0	8.1	-5.35249990	-6.0	21.0	9.0	4.44	51	J	VIR
585	17833	DIADEM		13.13808320	13.0	8.0	17.1	17.71388900	17.0	42.0	50.0	4.50	42	A	COM
586	17874			13.17066650	13.0	10.0	14.4	28.05500000	28.0	3.0	18.0	4.32	43	B	COM
587	18000			13.26624970	13.0	15.0	58.5	40.75638800	40.0	45.0	23.0	4.66	20		CVN
588	18012			13.28355550	13.0	17.0	.8	-22.98750000	-22.0	59.0	15.0	3.33	46	G	HYA
589	18039			13.31038880	13.0	18.0	37.4	-36.52833300	-36.0	31.0	42.0	2.91	0	I	CEN
590	18087			13.33922210	13.0	20.0	21.2	-60.80555500	-60.0	48.0	20.0	4.62	0		CEN
591	18107			13.36061090	13.0	21.0	38.2	-64.35333200	-64.0	21.0	12.0	4.50	0		CEN
592	18133	MIZAR		13.37533320	13.0	22.0	31.2	55.10749900	55.0	6.0	27.0	2.40	79	Z	UMA
593	18144	SPICA	AZIMECH	13.38908330	13.0	23.0	20.7	-10.97916660	-10.0	58.0	45.0	1.21	67	A	VIR
594	18155	ALCOR		13.39711100	13.0	23.0	49.6	55.17000000	55.0	10.0	12.0	4.02	80		UMA
595	18239			13.46325000	13.0	27.0	47.7	-23.10111100	-23.0	6.0	4.0	3.00V	0		HYA
596	18254			13.48344430	13.0	29.0	.4	-39.22722200	-39.0	13.0	38.0	3.96	0		CEN
597	18351	HEZE		13.54844440	13.0	32.0	54.4	-.41777777	.0	25.0	4.0	3.44	79	Z	VIR
598	18356			13.55044440	13.0	33.0	1.6	49.19916600	49.0	11.0	39.0	4.63	24		CVN
599	18458			13.62761100	13.0	37.0	39.4	-53.28916600	-53.0	17.0	21.0	2.56	0	E	CEN
600	18504			13.65686100	13.0	39.0	24.7	54.85833300	54.0	51.0	30.0	4.75	83		UMA
601	18593			13.72819440	13.0	43.0	41.5	-32.86749900	-32.0	52.0	3.0	4.36	1		CEN
602	18607			13.74047200	13.0	44.0	25.7	-51.25805500	-51.0	15.0	29.0	4.68	0		CEN
603	18637			13.75997220	13.0	45.0	35.9	17.63027800	17.0	37.0	49.0	4.51	4	T	BOO
604	18643	ALKAID	BENETNASH	13.76938880	13.0	46.0	9.8	49.48749900	49.0	29.0	15.0	1.91	85	M	UMA
605	18665			13.78994440	13.0	47.0	23.8	-41.51916600	-41.0	30.0	51.0	3.53	0	N	CEN
606	18666			13.79016670	13.0	47.0	24.6	-34.27666600	-34.0	16.0	36.0	4.40	2		CEN
607	18667			13.79163890	13.0	47.0	29.9	-42.29999900	-42.0	18.0	.0	3.32	0	M	CEN
608	18674			13.79647210	13.0	47.0	47.3	15.97083330	15.0	58.0	15.0	4.28	5	U	BOO
609	18724			13.82997210	13.0	49.0	47.9	-32.82138900	-32.0	49.0	17.0	4.72	3		CEN
610	18805	MUFRID		13.88361110	13.0	53.0	1.0	18.57250000	18.0	34.0	21.0	2.80	8	M	BOO
611	18809			13.88908330	13.0	53.0	20.7	-47.11694400	-47.0	7.0	1.0	3.06	0	Z	CEN
612	18845			13.91824990	13.0	55.0	5.7	-63.51611100	-63.0	30.0	58.0	4.68	294		CEN
613	18874			13.93555550	13.0	56.0	8.0	-41.93055500	-41.0	55.0	50.0	4.05	0	V	CEN
614	18883			13.94177760	13.0	56.0	30.4	-44.63361100	-44.0	38.0	1.0	4.17	0	U	CEN
615	18939			13.99216650	13.0	59.0	31.8	-45.43472200	-45.0	26.0	5.0	4.39	0	U	CEN
616	18945			13.99772200	13.0	59.0	51.8	1.71305555	1.0	42.0	47.0	4.34	93	Y	VIR
617	18971			14.02227770	14.0	1.0	20.2	-60.20527700	-60.0	12.0	19.0	.86	0	B	CEN
618	19019	THUBAN		14.05733320	14.0	3.0	26.4	64.54249900	64.0	32.0	33.0	3.64	11	A	DRA
619	19017			14.06500000	14.0	3.0	54.0	-41.01277700	-41.0	.0	46.0	4.54	0	X	CEN
620	19029			14.07286090	14.0	4.0	22.3	-26.51472200	-26.0	30.0	53.0	3.48	49	P	HYA
621	19033	MENKENT		14.07691660	14.0	4.0	36.9	-36.19861100	-36.0	11.0	55.0	2.26	5	J	CEN
622	19168			14.18374990	14.0	11.0	1.5	-10.11166650	-10.0	6.0	42.0	4.31	98	K	VIR
623	19207			14.20383320	14.0	12.0	13.8	51.95305500	51.0	57.0	11.0	4.60	17	K	BOO
624	19242	ARCTURUS		14.23438880	14.0	14.0	3.8	19.36388800	19.0	21.0	50.0	.24	16	A	BOO
625	19244			14.23627760	14.0	14.0	10.6	-5.83416660	-5.0	50.0	3.0	4.16	99	I	VIR
626	19273			14.25088870	14.0	15.0	3.2	46.24833200	46.0	14.0	54.0	4.26	19	L	BOO
627	19304			14.28586100	14.0	17.0	9.1	-45.89749900	-45.0	53.0	51.0	4.10	0	I	LUP
628	19311			14.28686110	14.0	17.0	12.7	-13.21083340	-13.0	12.0	39.0	4.60	100	L	VIR
629	19318			14.29774980	14.0	17.0	51.9	-56.22638800	-56.0	13.0	35.0	4.41	0	U	CEN
630	19337			14.30699990	14.0	18.0	25.2	-37.72527700	-37.0	43.0	31.0	4.17	0	Y	CEN
631	19377			14.34786100	14.0	20.0	52.3	-39.35305600	-39.0	21.0	11.0	4.55	0		CEN
632	19349			14.35141650	14.0	21.0	5.1	-83.50999900	-83.0	30.0	36.0	4.14	0	D	OCT
633	19453			14.39799990	14.0	23.0	52.8	-45.06416600	-45.0	3.0	51.0	4.65	0	T	LUP
634	19454			14.39863890	14.0	23.0	55.1	-45.22222100	-45.0	13.0	20.0	4.49	0	T	LUP
635	19467			14.40008330	14.0	24.0	.3	52.01194400	52.0	.0	43.0	4.06	23	J	BOO

TABLE I. - STAR IDENTIFICATION CATALOGUE - Continued

636	19548			14.45961090	14.0	27.0	34.6	75.85138800	75.0	51.0	5.0	4.37	5		UMI	
637	19590			14.50408310	14.0	30.0	14.7	-50.30305500	-50.0	18.0	11.0	4.60	0	S	LUP	
638	19597			14.50536100	14.0	30.0	19.3	30.52416600	30.0	31.0	27.0	3.78	25	R	BOO	
639	19607	HARIS		14.51113860	14.0	30.0	40.1	38.46055500	38.0	27.0	38.0	3.00	27	G	BOO	
640	19659			14.55258320	14.0	33.0	9.3	29.89638800	29.0	53.0	47.0	4.48	28	S	BOO	
641	19656			14.55458310	14.0	33.0	16.5	-42.00500000	-42.0	.0	18.0	2.65	0	H	CEN	
642	19698			14.59199990	14.0	35.0	31.2	-49.27444400	-49.0	16.0	28.0	4.14	0	R	LUP	
643	19728	RIGIL KENTAURUS		14.62013870	14.0	37.0	12.5	-60.69222200	-60.0	41.0	32.0	.06	0	A	CEN	TOLIMN
644	19777			14.65791660	14.0	39.0	28.5	13.87750000	13.0	52.0	39.0	3.86	30	Z	BOO	
645	19774			14.65986100	14.0	39.0	35.5	-47.23916600	-47.0	14.0	21.0	2.89	0	A	LUP	
646	19772			14.66091660	14.0	39.0	39.3	-64.82416600	-64.0	49.0	27.0	3.41	0	A	CIR	
647	19779			14.66297210	14.0	39.0	46.7	-37.64444400	-37.0	38.0	40.0	4.09	0		CEN	
648	19816			14.68686100	14.0	41.0	12.7	-5.50722220	-5.0	30.0	26.0	3.95	107	H	VIR	
649	19820			14.69180550	14.0	41.0	30.5	-35.02416600	-35.0	1.0	27.0	4.13	371		CEN	
650	19834			14.72374990	14.0	43.0	25.5	-78.89833200	-78.0	53.0	54.0	3.81	0	A	APS	
651	19856	IZAR	PULCHERRIMA	14.72430540	14.0	43.0	27.5	27.22083300	27.0	13.0	15.0	2.70	36	E	BOO	MIRAK
652	19858			14.72677770	14.0	43.0	36.4	17.11138900	17.0	6.0	41.0	4.69	35	O	BOO	
653	19884			14.74127750	14.0	44.0	28.6	2.03916660	2.0	2.0	21.0	3.76	109		VIR	
654	19954			14.80377760	14.0	48.0	13.6	-27.81583300	-27.0	48.0	57.0	4.63	58		HYA	
655	19975	ZUBEN ELGENUBI		14.81563880	14.0	48.0	56.3	-15.89744990	-15.0	53.0	51.0	2.90	9	A	LIB	KIFFAA
656	19977			14.82241660	14.0	49.0	20.7	-43.43166600	-43.0	25.0	54.0	4.49	0	O	LUP	
657	19991			14.82952760	14.0	49.0	46.3	19.24527700	19.0	14.0	43.0	4.64	37	C	BOO	
658	20029	KOCHAB		14.84444430	14.0	50.0	47.2	74.29861100	74.0	17.0	55.0	2.24	7	B	UMI	
659	20115			14.92252770	14.0	55.0	21.1	-4.20500000	-4.0	12.0	18.0	4.59	16		LIB	
660	20128			14.93716660	14.0	56.0	13.8	-42.99444400	-42.0	59.0	40.0	2.81	0	B	LUP	
661	20146			14.94791660	14.0	56.0	52.5	-41.96500000	-41.0	57.0	54.0	3.35	0	K	CEN	
662	20226	MEREZ	NEKKAR	15.01044440	15.0	.0	37.6	40.52749900	40.0	31.0	39.0	3.43	42	B	BOO	
663	20237			15.01883330	15.0	1.0	7.8	2.22749990	2.0	13.0	39.0	4.62	110		VIR	
664	20253			15.03361110	15.0	2.0	1.0	-25.14583300	-25.0	8.0	45.0	3.41	20	S	LIB	
665	20271			15.04541670	15.0	2.0	43.5	-46.91555500	-46.0	54.0	56.0	4.02	0	P	LUP	
666	20285			15.04908320	15.0	2.0	56.7	27.08305500	27.0	4.0	59.0	4.67	43	Y	BOO	
667	20356			15.10791640	15.0	6.0	28.5	-45.14666400	-45.0	8.0	48.0	4.39	0	L	LUP	
668	20409			15.15816660	15.0	9.0	29.4	-48.60638800	-48.0	36.0	23.0	4.14	0	K	LUP	
669	20418			15.16263870	15.0	9.0	45.5	-51.96744900	-51.0	58.0	3.0	3.50	0	Z	LUP	
670	20433			15.17036110	15.0	10.0	13.3	-19.66055500	-19.0	39.0	38.0	4.66	24	I	LIB	
671	20523			15.23483310	15.0	14.0	5.4	33.44444400	33.0	26.0	40.0	3.54	49	D	BOO	
672	20507			15.24594430	15.0	14.0	45.4	-58.67222200	-58.0	40.0	20.0	4.16	0	B	CIR	
673	20539	ZUBEN ELSCHEMALI		15.25199980	15.0	15.0	7.2	-9.25500000	-9.0	15.0	18.0	2.74	27	B	LIB	KIFFAB
674	20538			15.26024980	15.0	15.0	36.9	-68.55222100	-68.0	33.0	8.0	3.06	0	G	TRA	
675	20550			15.26158320	15.0	15.0	41.7	-30.02138800	-30.0	1.0	17.0	4.43	2		LUP	
676	20556			15.26811090	15.0	16.0	5.2	-47.74777700	-47.0	44.0	52.0	4.36	0	H	LUP	
677	20620			15.31788870	15.0	19.0	4.4	-40.52222100	-40.0	31.0	20.0	3.43	0	D	LUP	
678	20643			15.32630530	15.0	19.0	34.7	-36.13583300	-36.0	8.0	9.0	3.59	0	V	LUP	
679	20659			15.33824980	15.0	20.0	17.7	-44.56499900	-44.0	33.0	54.0	3.74	0	E	LUP	
680	20663			15.34288870	15.0	20.0	34.4	-59.19638900	-59.0	11.0	47.0	4.54	0	B	CIR	
681	20692	PHERKAD		15.34613880	15.0	20.0	46.1	71.95861000	71.0	57.0	31.0	3.14	13	G	UMI	
682	20676			15.34852770	15.0	20.0	54.7	-36.73444400	-36.0	44.0	4.0	4.69	0	V	LUP	
683	20714			15.38430540	15.0	23.0	3.5	-38.61111000	-38.0	36.0	40.0	4.68	0	K	LUP	
684	20724	ALKALUROPS		15.38611100	15.0	23.0	10.0	37.49888800	37.0	29.0	56.0	4.47	51	M	BOO	
685	20747			15.40222210	15.0	24.0	8.0	59.08805500	59.0	5.0	17.0	3.47	12	I	DRA	
686	20795	NUSAKAN		15.43974980	15.0	26.0	23.1	29.22527700	29.0	13.0	31.0	3.72	3	B	CRB	
687	20908			15.52527770	15.0	31.0	31.0	31.47611000	31.0	28.0	34.0	4.17	4	J	CRB	
688	20926			15.54466670	15.0	32.0	48.0	-41.05055500	-41.0	3.0	2.0	2.95	0	G	LUP	
689	20942			15.55213880	15.0	33.0	7.7	10.65472200	10.0	39.0	17.0	4.24	13	D	SER	
690	20947	ALPHECCA	GNOSIA	15.55341660	15.0	33.0	12.3	26.83138800	26.0	49.0	53.0	2.31	5	A	CRB	GEMMA
691	20932			15.55822210	15.0	33.0	29.6	-66.20166500	-66.0	12.0	6.0	4.11	0	E	TRA	
692	20949	ZUBEN ELAKRAB		15.55941660	15.0	33.0	33.9	-14.67416660	-14.0	40.0	27.0	4.02	38	G	LIB	
693	20979			15.58155550	15.0	34.0	53.6	-28.02055500	-28.0	1.0	14.0	3.78	39	U	LIB	

TABLE I. - STAR IDENTIFICATION CATALOGUE - Continued

694	21001			15.59480530	15.0	35.0	41.3	-42.45388800	-42.0	27.0	14.0	4.27	0	W	LUP
695	21019			15.60833320	15.0	36.0	30.0	-29.66416600	-29.0	39.0	51.0	3.80	40	T	LIB
696	21042			15.62561090	15.0	37.0	32.2	-34.29888900	-34.0	17.0	56.0	4.63	3	Y	LUP
697	21070			15.64622210	15.0	38.0	46.4	-44.54694400	-44.0	32.0	49.0	4.69	0		LUP
698	21102			15.66647220	15.0	39.0	59.3	19.78194400	19.0	46.0	55.0	4.49	21	I	SER
699	21130			15.68786100	15.0	41.0	16.3	26.40527700	26.0	24.0	19.0	3.93	8	G	CRB
700	21158	COR SERPENTIS	UNUK	15.70002760	15.0	42.0	32.6	6.53444440	6.0	32.0	4.0	2.75	24	A	SER ELHAIA
701	21194			15.74283320	15.0	44.0	34.2	15.53000000	16.0	31.0	48.0	3.74	28	B	SER
702	21201			15.74569430	15.0	44.0	44.5	7.46166660	7.0	27.0	42.0	4.42	27	L	SER
703	21243			15.75447200	15.0	45.0	16.1	77.90305500	77.0	54.0	11.0	4.34	16	Z	UMI
704	21255			15.78605550	15.0	47.0	9.8	18.24833300	18.0	14.0	54.0	4.28	35	K	SER
705	21269			15.79650000	15.0	47.0	47.4	-3.32444440	-3.0	19.0	28.0	3.63	32	N	SER
706	21276			15.80208330	15.0	48.0	7.5	26.17416600	26.0	10.0	27.0	4.73	10	D	CRB
707	21281			15.81213880	15.0	48.0	43.7	-33.52222100	-33.0	31.0	20.0	4.11	5	X	LUP
708	21288			15.81780540	15.0	49.0	4.1	4.58166670	4.0	34.0	54.0	3.75	37	E	SER
709	21340			15.85772200	15.0	51.0	27.8	42.54861000	42.0	32.0	55.0	4.61	1	X	HER
710	21329			15.85841660	15.0	51.0	30.3	-25.22416600	-25.0	13.0	27.0	4.66	2		SCO
711	21342			15.86380540	15.0	51.0	49.7	-16.62805500	-16.0	37.0	41.0	4.34	46	J	LIB
712	21332			15.86733310	15.0	52.0	2.4	-63.32472100	-63.0	19.0	29.0	3.04	0	B	TRA
713	21398			15.91197220	15.0	54.0	43.1	-29.11333300	-29.0	6.0	48.0	4.02	5	R	SCO
714	21408			15.91391650	15.0	54.0	50.1	15.77444430	15.0	46.0	28.0	3.86	41	G	SER
715	21440			15.93561100	15.0	56.0	8.2	26.97805500	26.0	58.0	41.0	4.22	13	E	CRB
716	21439			15.93708320	15.0	56.0	13.5	-14.18000000	-14.0	10.0	48.0	4.68	48		LIB
717	21447			15.94549980	15.0	56.0	43.8	-26.01472100	-26.0	.0	53.0	3.00	6	P	SCO
718	21478			15.96325000	15.0	57.0	47.7	-38.29833300	-38.0	17.0	54.0	3.64	0	H	LUP
719	21489	DSCHUBBA		15.97099990	15.0	58.0	15.6	-22.52361100	-22.0	31.0	25.0	2.54	7	D	SCO
720	21539			16.01052700	16.0	.0	37.9	-49.13388900	-49.0	8.0	2.0	4.74	0	H	NOR
721	21572			16.02050000	16.0	1.0	13.8	58.65805500	58.0	39.0	29.0	4.11	13	J	DRA
722	21580			16.02844400	16.0	1.0	42.4	46.13305500	46.0	7.0	59.0	4.64	6	U	HER
723	21593			16.04066600	16.0	2.0	26.4	-11.27805560	-11.0	16.0	41.0	4.16	0	C	SCO
724	21609	ACRAB	ELACRAB	16.05663800	16.0	3.0	23.9	-19.71111100	-19.0	42.0	40.0	2.90	8	B	SCO
725	21625			16.07147200	16.0	4.0	17.3	-36.70861100	-36.0	42.0	31.0	4.33	0	J	LUP
726	21639			16.07924900	16.0	4.0	45.3	-20.57583300	-20.0	34.0	33.0	4.13	9	W	SCO
727	21659			16.08913800	16.0	5.0	20.9	-20.77555500	-20.0	46.0	32.0	4.58	10	W	SCO
728	21736			16.12775000	16.0	7.0	39.9	45.02555500	45.0	1.0	32.0	4.26	11	V	HER
729	21773	LESATH		16.14594300	16.0	9.0	57.4	-19.37111000	-19.0	22.0	16.0	4.29	14	N	SCO
730	21778			16.14902700	16.0	10.0	8.5	-27.83722200	-27.0	50.0	14.0	4.70	13		SCO
731	21819			16.20391600	16.0	12.0	14.1	-63.59861000	-63.0	35.0	55.0	4.03	0	D	TRA
732	21838	YED PRIOR		16.20847100	16.0	12.0	30.5	-3.60555550	-3.0	36.0	20.0	3.03	1	D	OPH
733	21920	YED POSTERIOR		16.27444400	16.0	16.0	28.0	-4.60861100	-4.0	36.0	31.0	3.34	2	E	OPH
734	21933			16.28686000	16.0	17.0	12.7	-50.07166600	-50.0	4.0	18.0	4.14	0	G	NOR
735	21987			16.31144400	16.0	18.0	41.2	46.39583300	46.0	23.0	45.0	3.91	22	T	HER
736	21982			16.31761000	16.0	19.0	3.4	-25.51055400	-25.0	30.0	38.0	2.87	20	S	SCO
737	22012			16.33958300	16.0	20.0	22.5	19.23416600	19.0	14.0	3.0	3.79	20	G	HER
738	22020			16.34552700	16.0	20.0	43.9	30.97222100	30.0	58.0	20.0	4.72	19	C	CRB
739	22042			16.36752700	16.0	22.0	3.1	-19.95694400	-19.0	57.0	25.0	4.59	4	Y	OPH
740	22101			16.39186100	16.0	23.0	30.7	61.59305500	61.0	35.0	35.0	2.89	14	H	DRA
741	22090	KAJAM		16.39663800	16.0	23.0	47.9	14.11250000	14.0	6.0	45.0	4.53	24	W	HER
742	22134			16.43177700	16.0	25.0	54.4	-8.29500000	-8.0	17.0	42.0	4.68	3	U	OPH
743	22157	ANTARES	VESPERTIL	16.45427700	16.0	27.0	15.4	-26.35611100	-26.0	21.0	22.0	1.22	21	A	SCO IO
744	22142			16.46702700	16.0	28.0	1.3	-78.82222200	-78.0	49.0	20.0	3.90	0	G	APS
745	22193	KORNEPHOROS	RUTIL	16.47855500	16.0	28.0	42.8	21.56472200	21.0	33.0	53.0	2.81	27	B	HER ICUS
746	22195			16.48483300	16.0	29.0	5.4	-34.62972200	-34.0	37.0	47.0	4.33	8		SCO
747	22200			16.48552700	16.0	29.0	7.9	-16.53805500	-16.0	32.0	17.0	4.40	0	V	OPH
748	22203			16.48577700	16.0	29.0	8.8	2.05916660	2.0	3.0	33.0	3.85	10	L	OPH
749	22221			16.50094400	16.0	30.0	3.4	-21.39305500	-21.0	23.0	35.0	4.57	9	W	OPH
750	22296			16.54955500	16.0	32.0	58.4	42.50833300	42.0	30.0	30.0	4.25	35	S	HER
751	22303			16.56166600	16.0	33.0	42.0	-28.14500000	-28.0	8.0	42.0	2.91	23	T	SCO

TABLE I. - STAR IDENTIFICATION CATALOGUE - Continued

752	22311			16.56777700	16.0	34.0	4.0	-35.18527700	-35.0	11.0	7.0	4.30	0		SCO
753	22332			16.58713800	16.0	35.0	13.7	-10.49777760	-10.0	29.0	52.0	2.70	13	Z	OPH
754	22370			16.63386100	16.0	38.0	1.9	-77.44777700	-77.0	26.0	52.0	4.16	0	B	APS
755	22464			16.66608300	16.0	39.0	57.9	31.66500000	31.0	39.0	54.0	3.00	40	Z	HER
756	22502			16.69491600	16.0	41.0	41.7	38.98777700	38.0	59.0	16.0	3.61	44	M	HER
757	22558	ATRIA		16.74902700	16.0	44.0	56.5	-68.96611000	-68.0	57.0	58.0	1.88	0	A	TRA
758	22606			16.77922200	16.0	46.0	45.2	-58.98138800	-58.0	58.0	53.0	3.60	0	M	ARA
759	22640			16.79819400	16.0	47.0	53.5	-34.23138900	-34.0	13.0	53.0	2.36	26	E	SCO
760	22643			16.79825000	16.0	47.0	53.7	-10.72277770	-10.0	43.0	22.0	4.73	20		OPH
761	22749			16.82477700	16.0	49.0	29.2	82.09750000	82.0	5.0	51.0	4.40	22	E	UMI
762	22677			16.82491600	16.0	49.0	29.7	-37.98916600	-37.0	59.0	21.0	3.09	0	M	SCO
763	22691			16.83266600	16.0	49.0	57.6	-37.95972200	-37.0	57.0	35.0	3.64	0	M	SCO
764	22751	GRAFIAS		16.86858300	16.0	52.0	6.9	-42.30333300	-42.0	18.0	12.0	3.75	0	Z	SCO
765	22775			16.87249900	16.0	52.0	21.0	10.22166650	10.0	13.0	18.0	4.29	25	I	OPH
766	22845			16.92858300	16.0	55.0	42.9	-55.93694400	-56.0	56.0	13.0	3.06	0	Z	ARA
767	22862			16.93349900	16.0	56.0	.6	9.42805550	9.0	25.0	41.0	3.42	27	K	OPH
768	22869			16.94444400	16.0	56.0	47.2	-53.10888800	-53.0	6.0	32.0	4.15	0	E	ARA
769	22935			16.98247200	16.0	58.0	56.9	30.97666600	30.0	58.0	36.0	3.92	58	E	HER
770	23158	SABIK		17.13947100	17.0	8.0	22.1	-15.68333330	-16.0	41.0	.0	2.63	35	M	OPH
771	23182	NODUS I		17.14469300	17.0	8.0	40.9	65.75750000	65.0	45.0	27.0	3.22	22	Z	DRA
772	23180			17.16069400	17.0	9.0	38.5	-43.19500000	-43.0	11.0	42.0	3.44	0	M	SCO
773	23277	RAS-ALGETHI		17.21749900	17.0	13.0	3.0	14.42888890	14.0	25.0	44.0	3.50	64	A	HER
774	23294	SARIN		17.22652700	17.0	13.0	35.5	24.87916600	24.0	52.0	45.0	3.16	65	D	HER
775	23302			17.23044400	17.0	13.0	49.6	36.84750000	36.0	50.0	51.0	3.36	67	P	HER
776	23359			17.26719400	17.0	16.0	1.9	33.13666600	33.0	8.0	12.0	4.00V	68		HER
777	23392			17.30538800	17.0	18.0	19.4	-67.73666500	-67.0	44.0	12.0	4.74	0	Z	APS
778	23424			17.31427800	17.0	18.0	51.4	-12.81305550	-12.0	48.0	47.0	4.35	53	N	SER
779	23423			17.31505500	17.0	18.0	54.2	-21.07694400	-21.0	4.0	37.0	4.46	40	C	OPH
780	23451			17.33094400	17.0	19.0	51.4	-24.96638800	-24.0	57.0	59.0	3.37	42	J	OPH
781	23515			17.37308300	17.0	22.0	23.1	-55.49916600	-56.0	29.0	57.0	2.80	0	B	ARA
782	23517			17.37402700	17.0	22.0	26.5	-56.34694400	-56.0	20.0	49.0	3.51	0	G	ARA
783	23544			17.37455500	17.0	22.0	28.4	37.17694400	37.0	10.0	37.0	4.52	0	R	HER
784	23597			17.40383300	17.0	24.0	13.8	-24.14500000	-24.0	8.0	42.0	4.28	44		OPH
785	23617			17.41286100	17.0	24.0	46.3	-5.05722220	-5.0	3.0	26.0	4.61	27		OPH
786	23621			17.41294300	17.0	24.0	46.6	4.16916660	4.0	10.0	9.0	4.44	49	B	OPH
787	23627			17.41861000	17.0	25.0	7.0	-29.83722200	-29.0	50.0	14.0	4.37	45		OPH
788	23681			17.46555500	17.0	27.0	56.0	-60.65694400	-60.0	39.0	25.0	3.79	0	D	ARA
789	23693			17.47302700	17.0	28.0	22.9	-37.27000000	-37.0	16.0	12.0	2.80	34	U	SCO
790	23708			17.48552700	17.0	29.0	7.9	-49.85055500	-49.0	51.0	2.0	2.97	0	A	ARA
791	23726	MAASYM		17.48869400	17.0	29.0	19.3	26.13583300	26.0	8.0	9.0	4.48	76	L	HER
792	23741	ALWAID		17.49399900	17.0	29.0	38.4	52.32638900	52.0	19.0	35.0	2.99	23	B	DRA
793	23769	SHAULA		17.52049900	17.0	31.0	13.8	-37.08027700	-37.0	4.0	49.0	1.71	35	L	SCO
794	23815			17.55083300	17.0	33.0	3.0	-46.48361100	-46.0	29.0	1.0	4.63	0	S	ARA
795	23837	RAS-ALHAGUE		17.55513800	17.0	33.0	18.5	12.58416670	12.0	35.0	3.0	2.14	55	A	OPH
796	23846			17.56888900	17.0	34.0	8.0	-38.61249900	-38.0	36.0	45.0	4.34	0		SCO
797	23857			17.58000000	17.0	34.0	48.0	-42.97750000	-42.0	58.0	39.0	2.04	0	J	SCO
798	23881			17.59299900	17.0	35.0	34.8	-15.37833320	-16.0	22.0	42.0	3.64	55	C	SER
799	23889			17.59899900	17.0	35.0	56.4	-8.09916670	-8.0	5.0	57.0	4.65	57	M	OPH
800	23965			17.64124900	17.0	38.0	28.5	46.02416600	46.0	1.0	27.0	3.79	85	I	HER
801	23978			17.65741600	17.0	39.0	26.7	-12.85833330	-12.0	51.0	30.0	4.39	56	O	SER
802	23988			17.66772200	17.0	40.0	3.8	-39.01388900	-39.0	.0	50.0	2.51	0	K	SCO
803	24048	KELB-ALRAI		17.69569400	17.0	41.0	44.5	4.58027770	4.0	34.0	49.0	2.94	60	B	OPH
804	24044			17.70488800	17.0	42.0	17.6	-64.70972200	-64.0	42.0	35.0	3.58	0	H	PAV
805	24236	PHERKARD	YILDUN	17.72425000	17.0	43.0	27.3	86.60472200	86.0	36.0	17.0	4.44	23	D	UMI
806	24138			17.75144300	17.0	45.0	5.2	27.73999900	27.0	44.0	24.0	3.48	86	M	HER
807	24125			17.75225000	17.0	45.0	8.1	-40.11527700	-40.0	6.0	55.0	3.14	0	I	SCO
808	24135			17.75591600	17.0	45.0	21.3	-27.81916600	-27.0	49.0	9.0	4.00V	3		SGR
809	24162			17.76894400	17.0	46.0	8.2	2.71888890	2.0	43.0	8.0	3.74	62	G	OPH

TABLE I. - STAR IDENTIFICATION CATALOGUE - Continued

810	24188			17.79125000	17.0	47.0	28.5	-37.03416600	-37.0	2.0	3.0	3.55	0		SCO
811	24364	GRUMIUM		17.88202700	17.0	52.0	55.3	56.87749900	56.0	52.0	39.0	3.90	32	C	DRA
812	24415			17.91752700	17.0	55.0	3.1	37.25416700	37.0	15.0	15.0	3.99	91	J	HER
813	24432	ELTANIN	RASTABAN	17.92986000	17.0	55.0	47.5	51.49222200	51.0	29.0	32.0	2.42	33	G	DRA ETAMIN
814	24448			17.94005500	17.0	56.0	24.2	29.25055500	29.0	15.0	2.0	3.82	92	C	HER
815	24468			17.95163800	17.0	57.0	5.9	-9.77083330	-9.0	46.0	15.0	3.50	69	N	OPH
816	24478			17.95269400	17.0	57.0	9.7	30.19111100	30.0	11.0	28.0	4.48	94	N	HER
817	24502			17.97494400	17.0	58.0	29.8	16.75166600	16.0	45.0	6.0	4.71	93		HER
818	24503			17.97719400	17.0	58.0	37.9	-3.68944440	-3.0	41.0	22.0	4.60	57	Z	SER
819	24509			17.98149900	17.0	58.0	53.4	2.93166660	2.0	55.0	54.0	3.92	67		OPH
820	24534			17.99961000	17.0	59.0	58.6	1.30444443	1.0	18.0	16.0	4.44	68		OPH
821	24605			18.04638800	18.0	2.0	47.0	-29.58333300	-29.0	35.0	.0	4.00V	0		SGR
822	24632	NASH	NUSHABA	18.05930500	18.0	3.0	33.5	-30.42638800	-30.0	25.0	35.0	3.07	10	B	SGR
823	24641			18.06141600	18.0	3.0	41.1	2.50611100	2.0	30.0	22.0	4.07	70		OPH
824	24635			18.06508300	18.0	3.0	54.3	-50.09611000	-50.0	5.0	46.0	3.90	0	J	ARA
825	24665			18.08680500	18.0	5.0	12.5	-63.67249900	-63.0	40.0	21.0	4.44	0	P	PAV
826	24693			18.09383300	18.0	5.0	37.8	8.72805550	8.0	43.0	41.0	4.73	71		OPH
827	24695			18.09480500	18.0	5.0	41.3	9.55749990	9.0	33.0	27.0	3.73	72		OPH
828	24694			18.09774900	18.0	5.0	51.9	-28.46277700	-28.0	27.0	46.0	4.66	0		SGR
829	24711			18.10291600	18.0	6.0	10.5	28.75638800	28.0	45.0	23.0	3.83	103	B	HER
830	24740			18.12100000	18.0	7.0	15.6	20.80777700	20.0	48.0	28.0	4.32	102		HER
831	24767			18.14383300	18.0	8.0	37.8	-45.96249900	-45.0	57.0	45.0	4.60	0	E	TEL
832	24856			18.19447100	18.0	11.0	40.1	-21.04972200	-21.0	4.0	11.0	4.00V	13	H	SGR
833	24944			18.25427700	18.0	15.0	15.4	-36.77416600	-36.0	46.0	27.0	3.16	0	H	SGR
834	24961			18.26436000	18.0	15.0	51.7	-27.05694400	-27.0	3.0	25.0	4.69	0		SGR
835	25032			18.31055500	18.0	18.0	38.0	36.04777800	36.0	2.0	52.0	4.34	1	K	LYR
836	25024	KAUS-MEDIUS		18.31255500	18.0	18.0	45.2	-29.84499900	-29.0	50.0	42.0	2.84	0	D	SGR
837	25096			18.32494400	18.0	19.0	29.8	-2.90944440	-2.0	54.0	34.0	3.42	58	H	SER
838	25095			18.33336100	18.0	20.0	.1	-61.51222100	-61.0	30.0	44.0	4.25	0	C	PAV
839	25114			18.35433200	18.0	21.0	15.6	71.31944400	71.0	19.0	10.0	4.24	43	V	DRA
840	25122			18.36147200	18.0	21.0	41.3	72.71805500	72.0	43.0	5.0	3.69	44	X	DRA
841	25100	KAUS AUSTR.		18.36413800	18.0	21.0	50.9	-34.40305500	-34.0	24.0	11.0	1.95	20	E	SGR
842	25116			18.37008300	18.0	22.0	12.3	21.75250000	21.0	45.0	9.0	3.92	109		HER
843	25154			18.40630500	18.0	24.0	22.7	-45.98972100	-45.0	59.0	23.0	3.76	0	A	TEL
844	25180	KAUS-BOR.		18.43016600	18.0	25.0	48.6	-25.44277800	-25.0	26.0	34.0	2.94	22	L	SGR
845	25183			18.43558300	18.0	26.0	8.1	-49.09194400	-49.0	5.0	31.0	4.14	0	Z	TEL
846	25220			18.45336000	18.0	27.0	12.1	-14.58972220	-14.0	35.0	23.0	4.73	0	G	SCT
847	25313			18.51672200	18.0	31.0	.2	-42.33972200	-42.0	20.0	23.0	4.69	0	J	CRA
848	25385			18.55502700	18.0	33.0	18.1	-8.27000000	-8.0	16.0	12.0	4.06	0	A	SCT
849	25446	VEGA		18.59586100	18.0	35.0	45.1	38.75000000	38.0	45.0	.0	.14	3	A	LYR
850	25522			18.64925000	18.0	38.0	57.3	-71.46138800	-71.0	27.0	41.0	4.10	0	Z	PAV
851	25580			18.67261000	18.0	40.0	21.4	-9.08750000	-9.0	5.0	15.0	4.70V	0	D	SCT
852	25668			18.72033300	18.0	43.0	13.2	39.57527700	39.0	34.0	31.0	4.50	5	E	LYR
853	25661			18.72450000	18.0	43.0	28.2	-27.02861100	-27.0	1.0	43.0	3.30	27	V	SAG
854	25676			18.72608300	18.0	43.0	33.9	37.56749900	37.0	34.0	3.0	4.29	6	Z	LYR
855	25698			18.73588800	18.0	44.0	9.2	20.51166600	20.0	30.0	42.0	4.26	110		HER
856	25730			18.75527700	18.0	45.0	19.0	-4.78694440	-4.0	47.0	13.0	4.47	0	B	SCT
857	25734			18.75788800	18.0	45.0	28.4	18.14111000	18.0	8.0	28.0	4.37	111		HER
858	25735			18.76022100	18.0	45.0	36.8	-5.74416660	-5.0	44.0	39.0	4.00V	0		SCT
859	25847	SHELIAK		18.81311000	18.0	48.0	47.2	33.32083300	33.0	19.0	15.0	3.38	10	B	LYR
860	25823			18.81630500	18.0	48.0	58.7	-62.23027700	-62.0	13.0	49.0	4.42	0	L	PAV
861	25941	NUNKI		18.88491600	18.0	53.0	5.7	-26.34194400	-26.0	20.0	31.0	2.14	34	S	SGR
862	25954			18.88780500	18.0	53.0	16.1	22.59944400	22.0	35.0	58.0	4.56	113		HER
863	25959			18.88797100	18.0	53.0	16.7	36.85333300	36.0	51.0	12.0	4.50V	12	D	LYR
864	25930			18.88916600	18.0	53.0	21.0	-67.28027700	-67.0	16.0	49.0	4.00V	0	K	PAV
865	25996			18.90447100	18.0	54.0	16.1	43.89888800	43.0	53.0	56.0	4.00V	13		LYR
866	25991	ALYA		18.90797200	18.0	54.0	28.7	4.15666660	4.0	9.0	24.0	4.50	63	J	SER
867	26019			18.92736000	18.0	55.0	38.5	-21.15444400	-21.0	9.0	16.0	3.61	37	C	SGR

TABLE I. - STAR IDENTIFICATION CATALOGUE - Continued

868	26086	SULAPHAT		18.96055500	18.0	57.0	38.0	32.64027700	32.0	38.0	25.0	3.30	14	G	LYR
869	26091			18.96722200	18.0	58.0	2.0	15.01944440	15.0	1.0	10.0	4.21	13	E	AQL
870	26141			18.99683300	18.0	59.0	48.6	-5.78972220	-5.0	47.0	23.0	4.15	12		AQL
871	26161	ASCELLA		19.00641600	19.0	.0	23.1	-29.93194400	-29.0	55.0	55.0	2.71	38	Z	SGR
872	26224			19.04308300	19.0	2.0	35.1	-21.79444400	-21.0	47.0	40.0	3.90	39	O	SGR
873	26270			19.06333300	19.0	3.0	48.0	13.81000000	13.0	48.0	36.0	3.02	17	Z	AQL
874	26263			19.06755500	19.0	4.0	3.2	-37.11527700	-37.0	6.0	55.0	4.26	0	G	CRA
875	26285			19.07316600	19.0	4.0	23.4	-4.93638880	-4.0	56.0	11.0	3.55	16	L	AQL
876	26291			19.07924900	19.0	4.0	45.3	-27.72333200	-27.0	43.0	24.0	3.42	40	Y	SGR
877	26322			19.09855500	19.0	5.0	54.8	-40.55277800	-40.0	33.0	10.0	4.66	0	D	CRA
878	26360			19.11822200	19.0	7.0	5.6	-37.96083300	-37.0	57.0	39.0	4.12	0	A	CRA
879	26380			19.12702700	19.0	7.0	37.3	-39.39833300	-39.0	23.0	54.0	4.16	0	B	CRA
880	26386			19.12802700	19.0	7.0	40.9	-21.08083300	-21.0	4.0	51.0	3.02	41	P	SGR
881	26520	NODUS II	ALDIB	19.20916600	19.0	12.0	33.0	67.59999900	67.0	36.0	.0	3.24	57	D	DRA
882	26507			19.20941600	19.0	12.0	33.9	39.08472100	39.0	5.0	5.0	4.46	20	H	LYR
883	26569			19.24516600	19.0	14.0	42.6	21.32749900	21.0	19.0	39.0	4.60	1		VUL
884	26585			19.25252700	19.0	15.0	9.1	38.07027700	38.0	4.0	13.0	4.46	21	J	LYR
885	26638			19.27058200	19.0	16.0	14.1	73.29111100	73.0	17.0	28.0	4.63	60	Y	DRA
886	26621			19.27155500	19.0	16.0	17.6	53.30333300	53.0	18.0	12.0	3.98	1	K	CYG
887	26694			19.32738900	19.0	19.0	38.6	-17.91472200	-17.0	54.0	53.0	3.95	44	R	SGR
888	26697			19.32869400	19.0	19.0	43.3	-16.02222200	-16.0	1.0	20.0	4.58	46	U	SGR
889	26703	ARKAB-PRIOR		19.33538800	19.0	20.0	7.4	-44.52666600	-44.0	31.0	36.0	4.24	0	B	SGR
890	26735			19.34152700	19.0	20.0	29.5	65.64694300	65.0	38.0	49.0	4.63	58	P	DRA
891	26718	ARKAB-POSTERIOR		19.34488900	19.0	20.0	41.6	-44.86749900	-44.0	52.0	3.0	4.51	0	B	SGR
892	26737	ALRAMI	RUKBAT	19.35772200	19.0	21.0	27.8	-40.68361100	-40.0	41.0	1.0	4.11	0	A	SGR
893	26816	DENEB OKAB		19.39555500	19.0	23.0	44.0	3.04361100	3.0	2.0	37.0	3.44	30	D	AQL
894	26904			19.45413800	19.0	27.0	14.9	24.59277700	24.0	35.0	34.0	4.63	6	A	VUL
895	26947			19.48038900	19.0	28.0	49.4	51.65444400	51.0	39.0	16.0	3.94	10	I	CYG
896	26953	ALBIREO		19.48847200	19.0	29.0	18.5	27.88500000	27.0	53.0	6.0	3.24	6	B	CYG
897	27030			19.53963900	19.0	32.0	22.7	7.30333330	7.0	18.0	12.0	4.65	38	M	AQL
898	27089			19.57630500	19.0	34.0	34.7	-24.96250000	-24.0	57.0	45.0	4.66	52		SGR
899	27103			19.58183300	19.0	34.0	54.6	-1.36555554	-1.0	21.0	56.0	4.28	41	I	AQL
900	27141			19.59169400	19.0	35.0	30.1	50.13916400	50.0	8.0	21.0	4.64	13	J	CYG
901	27215	SHAM		19.64216600	19.0	38.0	31.8	17.93194400	17.0	55.0	55.0	4.37	5	A	SGE
902	27236			19.65791600	19.0	39.0	28.5	17.39361100	17.0	23.0	37.0	4.45	6	B	SGE
903	27347			19.73130500	19.0	43.0	52.7	45.04444400	45.0	2.0	40.0	2.97	18	D	CYG
904	27354	REDA	TARAZED	19.74325000	19.0	44.0	35.7	10.52666660	10.0	31.0	36.0	2.80	50	G	AQL
905	27391			19.76377700	19.0	45.0	49.6	18.44466600	18.0	26.0	48.0	3.78	7	D	SGE
906	27471	TYL		19.80499900	19.0	48.0	18.0	70.17888800	70.0	10.0	44.0	3.99	63	E	DRA
907	27470	ALTAIR		19.81791600	19.0	49.0	4.5	8.77444440	8.0	46.0	28.0	.89	53	A	AQL
908	27481			19.82030500	19.0	49.0	13.1	32.82444400	32.0	49.0	28.0	4.00V	0	X	CYG
909	27517			19.84483300	19.0	50.0	41.4	.91444443	.0	54.0	52.0	3.00V	55	M	AQL
910	27544			19.86619400	19.0	51.0	58.3	23.98722200	23.0	59.0	14.0	4.50	13		VUL
911	27557			19.88083300	19.0	52.0	51.0	-41.94194400	-41.0	57.0	43.0	4.21	0	I	SGR
912	27587	ALSHAIN		19.89322200	19.0	53.0	35.6	6.31805550	6.0	19.0	5.0	3.90	60	B	AQL
913	27605			19.91336000	19.0	54.0	48.1	-27.26416600	-27.0	15.0	51.0	4.62	59		SGR
914	27622			19.91652700	19.0	54.0	59.5	34.98944400	34.0	59.0	22.0	4.03	21	H	CYG
915	27631			19.94291600	19.0	56.0	34.5	-73.00583300	-73.0	.0	21.0	4.10	0	E	PAV
916	27672			19.95330500	19.0	57.0	11.9	19.39583300	19.0	23.0	45.0	3.71	12	G	SGE
917	27670			19.95749400	19.0	57.0	27.7	-35.37277700	-35.0	22.0	22.0	4.39	0	J	SGR
918	27753			19.99430500	19.0	59.0	39.5	27.65583300	27.0	39.0	21.0	4.74	15		VUL
919	27763			20.00847200	20.0	.0	30.5	-27.80861000	-27.0	48.0	31.0	4.60	62		SGR
920	27856			20.04441600	20.0	2.0	39.9	67.77361100	67.0	46.0	25.0	4.66	67	R	DRA
921	27886			20.08847100	20.0	5.0	18.5	-66.27361100	-66.0	16.0	25.0	3.64	0	D	PAV
922	28010			20.15830500	20.0	9.0	29.9	-.92666665	.0	55.0	36.0	3.37	65	J	AQL
923	28066			20.16836000	20.0	10.0	6.1	77.60694400	77.0	36.0	25.0	4.40	1	K	CEP
924	28099			20.20880500	20.0	12.0	31.7	46.63444400	46.0	38.0	4.0	3.95	31	O	CYG
925	28108			20.20974900	20.0	12.0	35.1	56.45999900	56.0	27.0	36.0	4.32	33		CYG

TABLE I. - STAR IDENTIFICATION CATALOGUE - Continued

926	28152		20.23861000	20.0	14.0	19.0	27.70583300	27.0	42.0	21.0	4.73	23		VUL	
927	28160		20.23980500	20.0	14.0	23.3	47.60611100	47.0	36.0	22.0	4.16	32	O	CYG	
928	28189		20.26180500	20.0	15.0	42.5	-12.61777770	-12.0	37.0	4.0	4.55	5	A	CAP	
929	28200	GREDI	20.26855500	20.0	16.0	6.8	-12.65472200	-12.0	39.0	17.0	3.77	6	A	CAP	
930	28295	DABIH	20.31741600	20.0	19.0	2.7	-14.89333330	-14.0	53.0	36.0	3.25	9	B	CAP	
931	28338	SADOR	20.34950000	20.0	20.0	58.2	40.14388800	40.0	8.0	38.0	2.32	37	G	CYG	
932	28378		20.37433300	20.0	22.0	27.6	32.07611100	32.0	4.0	34.0	4.60	39		CYG	
933	28374	PEACOCK	20.38147200	20.0	22.0	53.3	-56.84916600	-56.0	50.0	57.0	2.12	0	A	PAV	
934	28513		20.46605500	20.0	27.0	57.8	30.25083300	30.0	15.0	3.0	4.09	41		CYG	
935	28541		20.48327700	20.0	28.0	59.8	62.87611100	62.0	52.0	34.0	4.28	2	J	CEP	
936	28593		20.52566600	20.0	31.0	32.4	11.18305550	11.0	10.0	59.0	3.98	2	E	DEL	
937	28659		20.56119400	20.0	33.0	40.3	14.55249990	14.0	33.0	9.0	4.69	4	Z	DEL	
938	28682		20.58519400	20.0	35.0	6.7	-47.41499900	-47.0	24.0	54.0	3.21	0	A	IND	
939	28709	ROTANEV	20.59844400	20.0	35.0	54.4	14.47222220	14.0	28.0	20.0	3.72	6	B	DEL	
940	28725		20.60883300	20.0	36.0	31.8	-1.22861110	-1.0	13.0	43.0	4.51	71		AQL	
941	28780	SVALOCIN	20.63352700	20.0	38.0	.7	15.78749980	15.0	47.0	15.0	3.86	9	A	DEL	
942	28846	DENEB CYGNI	20.67061100	20.0	40.0	14.2	45.15444400	45.0	9.0	16.0	1.33	50	A	CYG	ARIDED
943	28860		20.69127700	20.0	41.0	28.6	-52.04749900	-52.0	2.0	51.0	4.70	0	H	IND	
944	28873		20.69705500	20.0	41.0	49.4	14.94777770	14.0	56.0	52.0	4.53	11	O	DEL	
945	28862		20.69708300	20.0	41.0	49.5	-66.33083200	-66.0	19.0	51.0	3.60	0	B	PAV	
946	28929		20.73374900	20.0	44.0	1.5	-25.39805500	-25.0	23.0	53.0	4.26	16	Y	CAP	
947	28942		20.73491600	20.0	44.0	12.9	30.59111100	30.0	35.0	28.0	4.34	52		CYG	
948	28956		20.74138800	20.0	44.0	29.0	57.45361100	57.0	27.0	13.0	4.63	6		CEP	
949	28962		20.74299900	20.0	44.0	34.8	61.70250000	61.0	42.0	9.0	3.58	3	H	CEP	
950	28959	GIENAH	20.74455500	20.0	44.0	47.6	33.83805500	33.0	50.0	17.0	2.64	53	E	CYG	
951	28966		20.75055500	20.0	45.0	2.0	15.99722220	15.0	59.0	50.0	4.49	12	B	DEL	
952	28978	ALBALI	20.76302700	20.0	45.0	46.9	-9.62499990	-9.0	37.0	30.0	3.83	2	E	AQR	
953	28979		20.76483300	20.0	45.0	53.4	-5.15694440	-5.0	9.0	25.0	4.60	3		AQR	
954	28994		20.76738800	20.0	46.0	2.6	36.36111000	36.0	21.0	40.0	4.47	54	L	CYG	
955	29079		20.82891600	20.0	49.0	44.1	-27.05138800	-27.0	3.0	5.0	4.24	18	H	CAP	
956	29150		20.86677700	20.0	52.0	.4	44.25388800	44.0	15.0	14.0	4.68	57		CYG	
957	29133		20.86813800	20.0	52.0	5.3	-58.58777800	-58.0	35.0	16.0	3.72	0	B	IND	
958	29251		20.93111100	20.0	55.0	52.0	41.03166600	41.0	1.0	54.0	4.04	58	N	CYG	
959	29331		20.98580500	20.0	59.0	8.9	-32.39583300	-32.0	23.0	45.0	4.71	0	G	MIC	
960	29459		21.06091600	21.0	3.0	39.3	43.78750000	43.0	47.0	15.0	3.92	62	C	CYG	
961	29460		21.06636100	21.0	3.0	58.9	-17.37305500	-17.0	22.0	23.0	4.19	23	J	CAP	
962	29490		21.08472100	21.0	5.0	5.0	-25.14494400	-25.0	8.0	49.0	4.60	24		CAP	
963	29571		21.12813800	21.0	7.0	41.3	-11.51444440	-11.0	30.0	52.0	4.52	13	N	AQR	
964	29661		21.19074900	21.0	11.0	24.7	30.08250000	30.0	4.0	57.0	3.40	64	Z	CYG	
965	29591		21.21291600	21.0	12.0	46.5	9.86416660	9.0	51.0	51.0	4.76	5	D	EQU	
966	29723		21.22319300	21.0	13.0	23.5	37.89527700	37.0	53.0	43.0	3.82	65	Y	CYG	
967	29735		21.23455500	21.0	14.0	4.4	5.10222220	5.0	6.0	8.0	4.14	8	A	EQU	
968	29786		21.26730500	21.0	16.0	2.3	39.24722100	39.0	14.0	50.0	4.28	67	B	CYG	
969	29802		21.27461100	21.0	16.0	28.6	34.74916600	34.0	44.0	57.0	4.42	66	U	CYG	
970	29819		21.28969400	21.0	17.0	22.9	-53.59749900	-53.0	35.0	51.0	4.60	0	J	IND	
971	29848	ALDERAMIN	21.29572200	21.0	17.0	44.6	62.43694400	62.0	26.0	13.0	2.60	5	A	CEP	
972	29903		21.33833200	21.0	20.0	18.0	-16.98472200	-16.0	59.0	5.0	4.30	32	I	CAP	
973	29914		21.34111100	21.0	20.0	28.0	19.65388800	19.0	39.0	14.0	4.24	1		PEG	
974	29979		21.39288800	21.0	23.0	34.4	-65.52611100	-65.0	31.0	34.0	4.30	0	G	PAV	
975	30020		21.41119400	21.0	24.0	40.3	-22.56388800	-22.0	33.0	50.0	3.86	34	Z	CAP	
976	30059		21.44549900	21.0	26.0	43.8	-21.96055500	-21.0	57.0	38.0	4.59	36		CAP	
977	30118	ALPHIRK	21.47024900	21.0	28.0	12.9	70.40694400	70.0	24.0	25.0	3.32	8	B	CEP	
978	30137	SADALSUD	21.49527700	21.0	29.0	43.0	-5.72611110	-5.0	43.0	34.0	3.07	22	B	AQR	
979	30207		21.54436000	21.0	32.0	39.7	45.43638800	45.0	26.0	11.0	4.22	73	R	CYG	
980	30252		21.58536100	21.0	35.0	7.3	-19.62388800	-19.0	37.0	26.0	4.72	39	E	CAP	
981	30289		21.62761100	21.0	37.0	39.4	-77.54722200	-77.0	32.0	50.0	3.74	0	N	OCT	
982	30320	NASHIRA	21.63588900	21.0	38.0	9.2	-16.82138800	-16.0	49.0	17.0	3.80	40	G	CAP	
983	30440	ERAKIS	21.70724900	21.0	42.0	26.1	58.61888800	58.0	37.0	8.0	4.00V	0	M	CEP	

TABLE I. - STAR IDENTIFICATION CATALOGUE - Continued

984	30431	ENIF		21.70774900	21.0	42.0	27.9	9.71361100	9.0	42.0	49.0	2.54	8	E	PEG
985	30438			21.70958300	21.0	42.0	34.5	28.58388900	28.0	35.0	2.0	4.73	78	H	CYG
986	30444			21.71419300	21.0	42.0	51.1	17.18861100	17.0	11.0	19.0	4.52	9		PEG
987	30439			21.71444400	21.0	42.0	52.0	-33.18638800	-33.0	11.0	11.0	4.35	9	I	PSA
988	30450			21.71763800	21.0	43.0	3.5	25.48333300	25.0	29.0	.0	4.27	10	K	PEG
989	30483			21.74063800	21.0	44.0	26.3	60.95888800	60.0	57.0	32.0	4.46	10	N	CEP
990	30491	DENEB ALGIEDI		21.75183300	21.0	45.0	6.6	-16.28694400	-16.0	17.0	13.0	2.98	49	D	CAP SCHEDI
991	30512			21.75827700	21.0	45.0	29.8	49.14694400	49.0	8.0	49.0	4.26	81	P	CYG
992	30640			21.86358300	21.0	51.0	48.9	-37.53027800	-37.0	31.0	49.0	3.16	0	G	GRU
993	30720			21.92580500	21.0	55.0	32.9	-55.15999900	-55.0	9.0	36.0	4.56	0	D	IND
994	30817			22.01158300	22.0	.0	41.7	-56.93111000	-56.0	55.0	52.0	4.74	0	E	IND
995	30844			22.02505500	22.0	1.0	30.2	-2.32499990	-2.0	19.0	30.0	4.66	31	O	AQR
996	30877			22.04624900	22.0	2.0	46.5	64.45694300	64.0	27.0	25.0	4.57	17	C	CEP
997	30896	SADALMELEK		22.06641600	22.0	3.0	59.1	-.49055555	.0	29.0	26.0	3.19	34	A	AQR
998	30892			22.06683300	22.0	4.0	.6	-39.71305500	-39.0	42.0	47.0	4.60	0	L	GRU
999	30914			22.07580500	22.0	4.0	32.9	-14.04027770	-14.0	2.0	25.0	4.35	33	I	AQR
1000	30932			22.08963900	22.0	5.0	22.7	25.17333300	25.0	10.0	24.0	3.96	24	I	PEG
1001	30942	NAQIR	ALNAIR	22.10058300	22.0	6.0	2.1	-47.13138900	-47.0	7.0	53.0	2.16	0	A	GRU
1002	30954			22.10575000	22.0	6.0	20.7	-33.16027700	-33.0	9.0	37.0	4.62	14	N	PSA
1003	31016			22.14049900	22.0	8.0	25.8	33.00583300	33.0	.0	21.0	4.38	29	P	PEG
1004	31013			22.14055500	22.0	8.0	26.0	6.02500000	6.0	1.0	30.0	3.70	26	J	PEG
1005	31044			22.16061100	22.0	9.0	38.2	58.02833300	58.0	1.0	42.0	3.62	21	Z	CEP
1006	31104			22.20622200	22.0	12.0	22.4	39.54055500	39.0	32.0	24.0	4.64	1		LAC
1007	31135			22.22905500	22.0	13.0	44.6	56.86861100	56.0	52.0	7.0	4.23	23	E	CEP
1008	31143			22.24066600	22.0	14.0	26.4	37.57388800	37.0	34.0	26.0	4.22	1		LAC
1009	31152	ANCHA		22.24977700	22.0	14.0	59.2	-7.95833330	-7.0	57.0	30.0	4.32	43	J	AQR
1010	31183			22.26863900	22.0	16.0	7.1	-60.43499900	-60.0	26.0	6.0	2.91	0	A	TUC
1011	31252			22.32625000	22.0	19.0	34.5	46.35972200	46.0	21.0	35.0	4.66	2		LAC
1012	31257	SADALACHBIA		22.33080500	22.0	19.0	50.9	-1.56444444	-1.0	33.0	52.0	3.97	48	G	AQR
1013	31310			22.36963800	22.0	22.0	10.7	52.05305500	52.0	3.0	11.0	4.58	3	B	LAC
1014	31326			22.38486000	22.0	23.0	5.5	49.29833300	49.0	17.0	54.0	4.64	4		LAC
1015	31328			22.39147100	22.0	23.0	29.3	1.19916666	1.0	11.0	57.0	4.64	52	P	AQR
1016	31399			22.45049900	22.0	27.0	1.8	-.20000000	.0	12.0	.0	4.42	55	Z	AQR
1017	31400			22.45305500	22.0	27.0	11.0	-43.67499900	-43.0	40.0	30.0	4.02	0	D	GRU
1018	31412			22.46122100	22.0	27.0	40.4	-43.92916600	-43.0	55.0	45.0	4.31	0	D	GRU
1019	31421			22.46444400	22.0	27.0	52.0	58.23555500	58.0	14.0	8.0	3.96	27	D	CEP
1020	31426			22.46780500	22.0	28.0	4.1	47.52722200	47.0	31.0	38.0	4.61	5		CAC
1021	31449			22.48286000	22.0	28.0	58.3	42.94361000	42.0	56.0	37.0	4.54	6		LAC
1022	31459			22.49199900	22.0	29.0	31.2	-32.52611000	-32.0	31.0	34.0	4.36	17	B	PSA
1023	31471			22.49741600	22.0	29.0	50.7	50.10194300	50.0	6.0	7.0	3.85	7	A	LAC
1024	31534			22.55927700	22.0	33.0	33.4	-.29833332	.0	17.0	54.0	4.13	62	H	AQR
1025	31646			22.64538900	22.0	38.0	43.4	-27.22666600	-27.0	13.0	36.0	4.22	18	E	PSA
1026	31652			22.64958200	22.0	38.0	58.5	44.09305500	44.0	5.0	35.0	4.64	11		LAC
1027	31664	HOMAM		22.66191600	22.0	39.0	42.9	10.64805540	10.0	38.0	53.0	3.61	42	Z	PEG
1028	31685			22.67641600	22.0	40.0	35.1	-47.06833300	-47.0	4.0	6.0	2.24	0	B	GRU
1029	31706	MATAR		22.68930500	22.0	41.0	21.5	30.03777700	30.0	2.0	16.0	3.10	44	H	PEG
1030	31712			22.70994400	22.0	42.0	35.8	-81.56611000	-81.0	33.0	58.0	4.34	0	B	OCT
1031	31776			22.74736000	22.0	44.0	50.5	23.38083300	23.0	22.0	51.0	4.14	47	L	PEG
1032	31778			22.74902700	22.0	44.0	56.5	11.99277770	11.0	59.0	34.0	4.31	46	C	PEG
1033	31813			22.77413800	22.0	46.0	26.9	-51.50138800	-51.0	30.0	5.0	3.69	0	E	GRU
1034	31836			22.79566600	22.0	47.0	44.4	-13.77777770	-13.0	46.0	40.0	4.21	71	T	AQR
1035	31851			22.80516600	22.0	48.0	18.6	24.41638900	24.0	24.0	59.0	3.67	48	H	PEG
1036	31857			22.80713800	22.0	48.0	25.7	66.01611000	66.0	.0	58.0	3.68	32	I	CEP
1037	31895			22.84305500	22.0	50.0	35.0	-33.06166600	-33.0	3.0	42.0	4.52	22	G	PSA
1038	31903			22.84647200	22.0	50.0	47.3	-7.76638880	-7.0	45.0	59.0	3.84	73	L	AQR
1039	31943	SKAT		22.87988800	22.0	52.0	47.6	-16.00749900	-16.0	.0	27.0	3.51	76	D	AQR
1040	31974			22.90022100	22.0	54.0	.8	-32.72722100	-32.0	43.0	38.0	4.33	23	D	PSA
1041	32000	FOMALHAUT		22.92866600	22.0	55.0	43.2	-29.80833300	-29.0	48.0	30.0	1.29	24	A	PSA

TABLE I. - STAR IDENTIFICATION CATALOGUE - Concluded

1042	32061		22.98036100	22.0	58.0	49.3	-52.94222200	-52.0	56.0	32.0	4.18	0	Z	GRU
1043	32095		23.00508300	23.0	.0	18.3	42.13749900	42.0	8.0	15.0	3.40V	1	O	AND
1044	32135	SCHEAT	23.03455500	23.0	2.0	4.4	27.89249900	27.0	53.0	33.0	2.61	53	B	PEG
1045	32134		23.03488900	23.0	2.0	5.6	3.63138880	3.0	37.0	53.0	4.58	4	B	PSC
1046	32149	MARKAB	23.05024900	23.0	3.0	.9	15.01666670	15.0	1.0	.0	2.57	54	A	PEG
1047	32184		23.08188800	23.0	4.0	54.8	-43.70999900	-43.0	42.0	36.0	4.35	0	J	GRU
1048	32196		23.08733300	23.0	5.0	14.4	9.21999990	9.0	13.0	12.0	4.69	55		PEG
1049	32237		23.11297100	23.0	6.0	46.7	75.19833200	75.0	11.0	54.0	4.56	33	P	CEP
1050	32246		23.12636100	23.0	7.0	34.9	-21.36277700	-21.0	21.0	46.0	3.80	88		ABR
1051	32270		23.13972100	23.0	8.0	23.0	-45.43666600	-45.0	26.0	12.0	4.10	0	I	GRU
1052	32316		23.18233300	23.0	10.0	56.4	49.21472100	49.0	12.0	53.0	4.62	7		AND
1053	32346		23.20847100	23.0	12.0	30.5	-6.23805550	-6.0	14.0	17.0	4.40	90	V	AQR
1054	32374		23.23430500	23.0	14.0	3.5	-9.27861110	-9.0	16.0	43.0	4.46	91	Y	AQR
1055	32415		23.25583200	23.0	15.0	21.0	3.09083330	3.0	5.0	27.0	3.85	6	G	PSC
1056	32413		23.25661000	23.0	15.0	23.8	-58.42805500	-58.0	25.0	41.0	4.10	0	G	TUC
1057	32429		23.26808300	23.0	16.0	5.1	-9.37388890	-9.0	22.0	26.0	4.56	93	Y	AQR
1058	32450		23.28227800	23.0	16.0	56.2	-32.72305500	-32.0	43.0	23.0	4.51	0	G	SCL
1059	32503	KERB	23.31502700	23.0	18.0	54.1	23.54861100	23.0	32.0	55.0	4.65	62	T	PEG
1060	32540		23.35222100	23.0	21.0	8.0	-20.29194400	-20.0	17.0	31.0	4.20	98		AQR
1061	32585		23.39380500	23.0	23.0	37.7	23.21111000	23.0	12.0	40.0	4.57	68	U	PEG
1062	32594		23.40347200	23.0	24.0	12.5	-20.83416600	-20.0	50.0	3.0	4.52	99		AQR
1063	32647		23.43649900	23.0	26.0	11.4	6.18638890	6.0	11.0	11.0	4.45	10	J	PSC
1064	32667		23.45636000	23.0	27.0	22.9	12.56722210	12.0	34.0	2.0	4.67	70		PEG
1065	32744		23.51830500	23.0	31.0	5.9	-38.01222100	-38.0	.0	44.0	4.46	0	B	SCL
1066	32832		23.59738900	23.0	35.0	50.6	46.26833300	46.0	16.0	6.0	4.00	16	L	AND
1067	32850		23.60688800	23.0	36.0	24.8	43.07416600	43.0	4.0	27.0	4.28	17	I	AND
1068	32875	ALRAI	23.63155500	23.0	37.0	53.6	77.43694300	77.0	26.0	13.0	3.42	35	B	CEP
1069	32879		23.63580500	23.0	38.0	8.9	5.43638890	5.0	26.0	11.0	4.28	17	I	PSC
1070	32886		23.64461000	23.0	38.0	40.6	44.14000000	44.0	8.0	24.0	4.33	19	K	AND
1071	32917		23.67097100	23.0	40.0	15.5	1.58749999	1.0	35.0	15.0	4.61	18	L	PSC
1072	32931		23.68177700	23.0	40.0	54.4	-14.73861110	-14.0	44.0	19.0	4.62	105	B	AQR
1073	33050		23.78508300	23.0	47.0	6.3	-28.32388900	-28.0	19.0	26.0	4.64	0	D	SCL
1074	33160		23.87708300	23.0	52.0	37.5	57.30472100	57.0	18.0	17.0	4.00V	7	R	CAS
1075	33230		23.93283200	23.0	55.0	58.2	24.94694400	24.0	56.0	49.0	4.75	89	Y	PEG
1076	33262		23.95852700	23.0	57.0	30.7	6.66944440	6.0	40.0	10.0	4.03	28	B	PSC
1077	33280		23.96849900	23.0	58.0	6.6	-65.77194400	-65.0	46.0	19.0	4.71	0	E	TUC
1078	33321		23.99702700	23.0	59.0	49.3	-77.25888800	-77.0	15.0	32.0	4.73	0	J	OCT

TRANSLUNAR INJECTION BURN

TRANSLUNAR COAST

EARTH VIEWS

MOON VIEWS

LUNAR ORBIT INSERTION BURN

LUNAR ORBIT PHASE

TRANSEARTH INJECTION BURN

TRANSEARTH COAST

POST TEI

MOON VIEWS

EARTH VIEWS

ENTRY PHASE

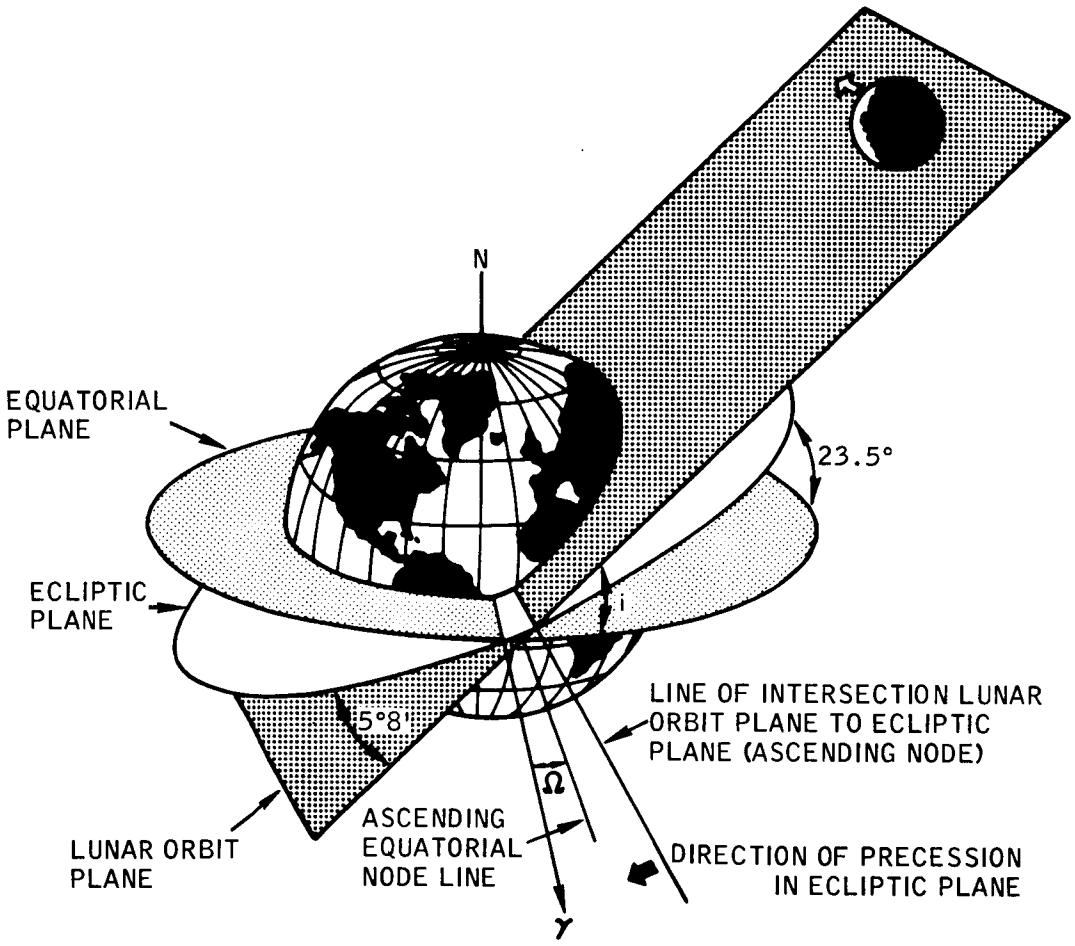


Figure 1.- Illustration of lunar orbit plane in year 1969 - inclination angle (i) ≈ 28°, right ascension of ascending equatorial node (Ω) = 5°.

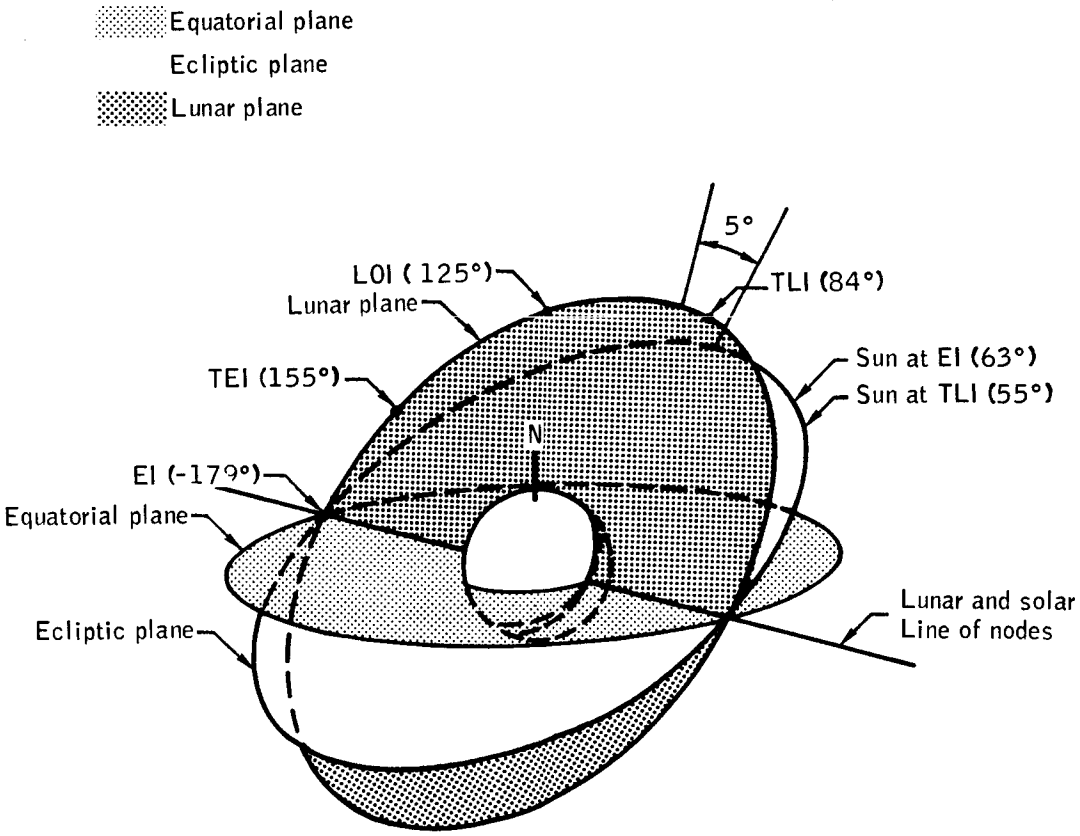


Figure 2.- Sun and moon location at major phases during Apollo 10 (Mission F).

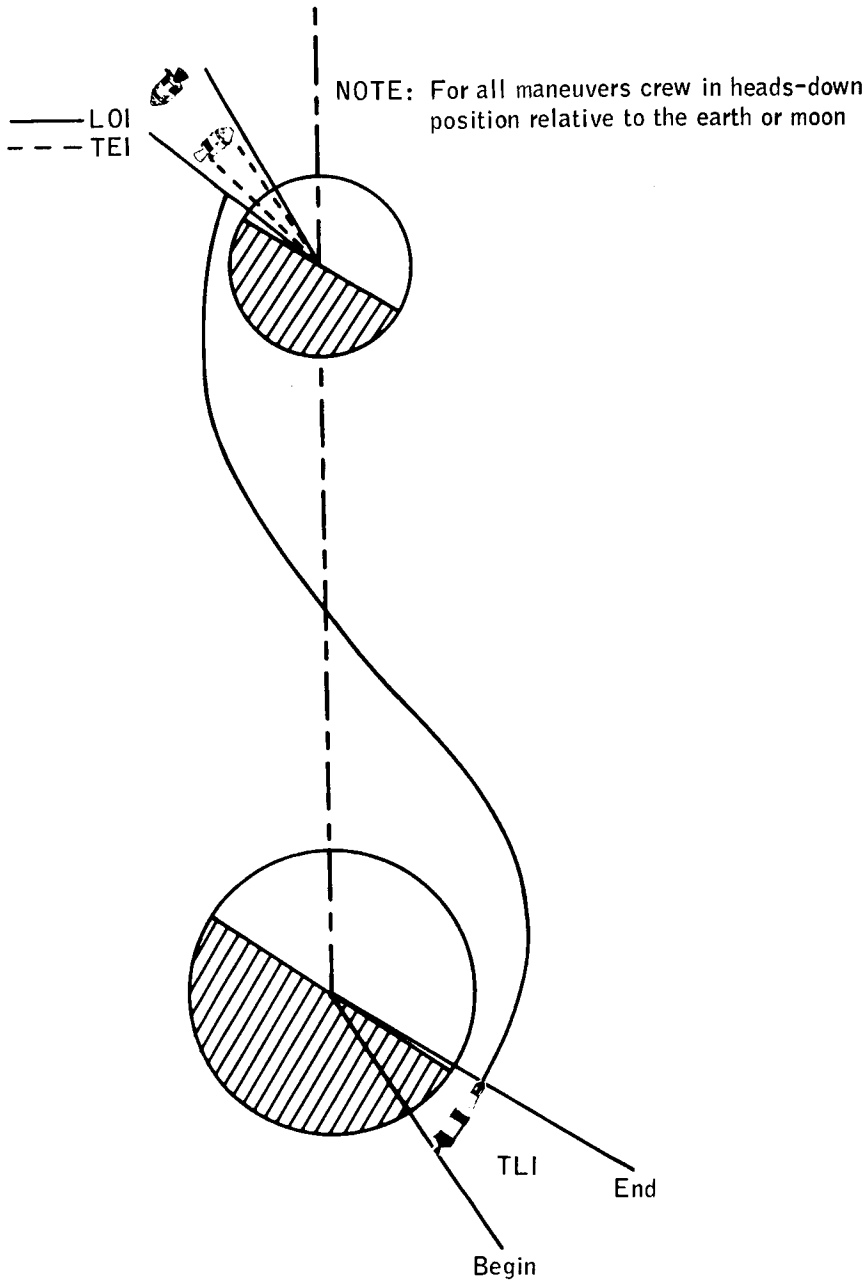


Figure 3.- A schematic of the maneuver attitudes and lighting conditions for the nominal Apollo 10 (Mission F).

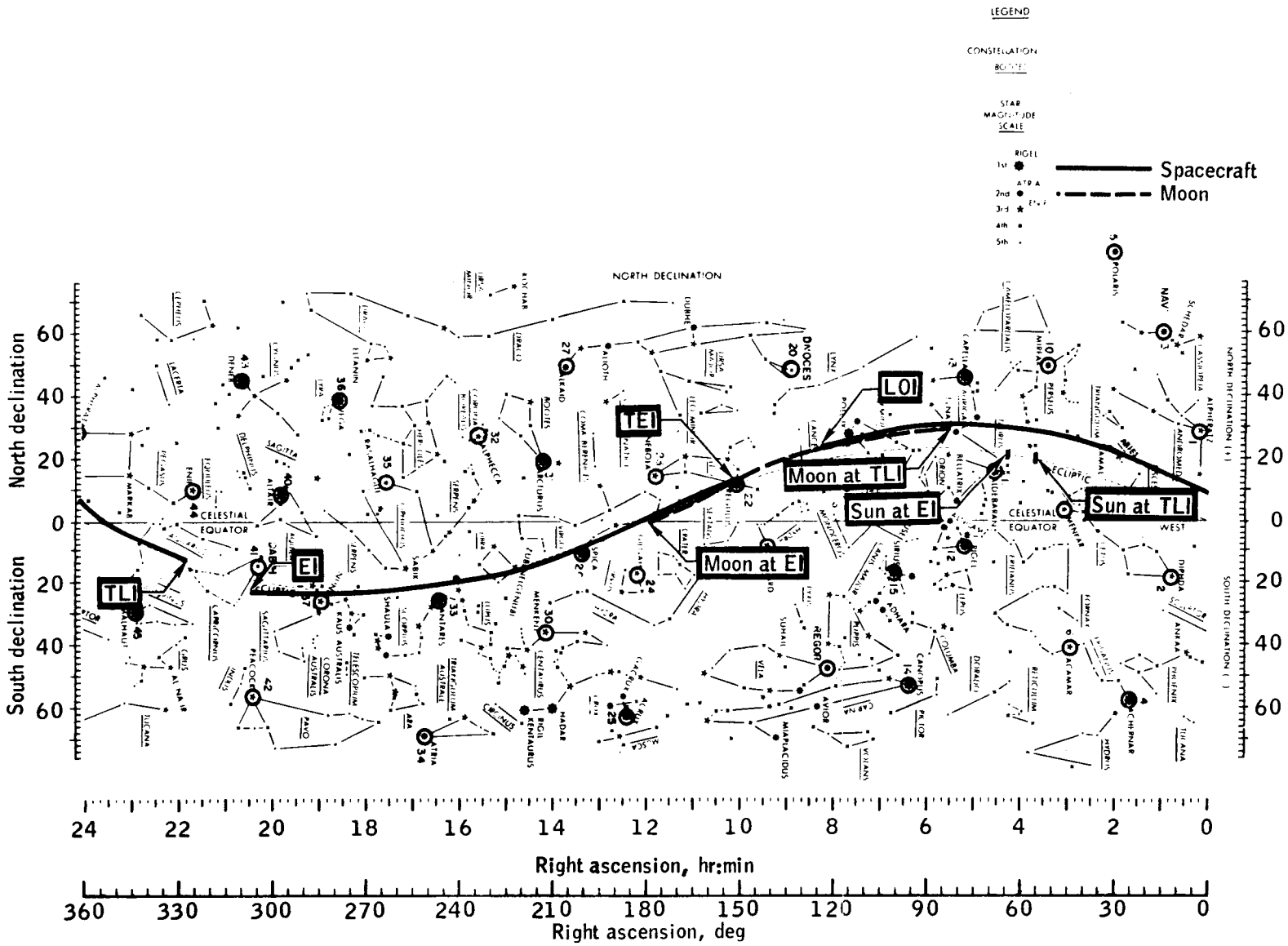


Figure 4.- Nominal Apollo 10 (Mission F) projected on a map of the celestial sphere.

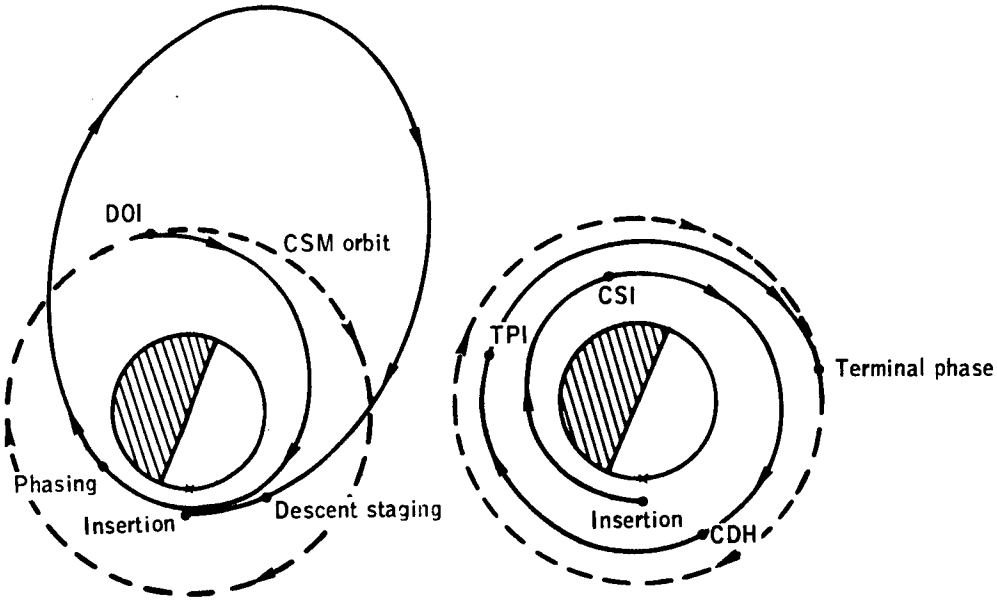
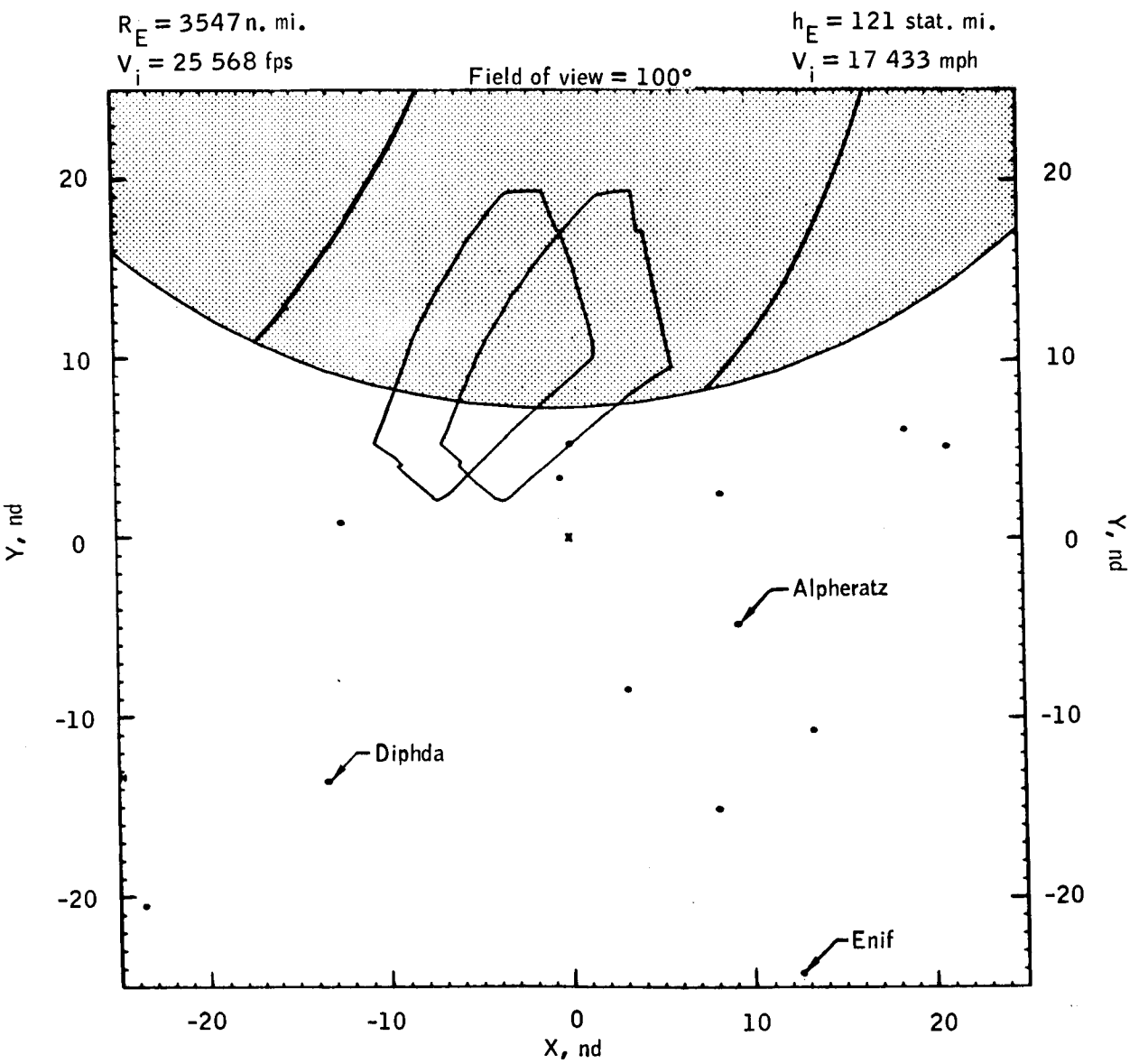


Figure 5.- F mission nominal rendezvous.

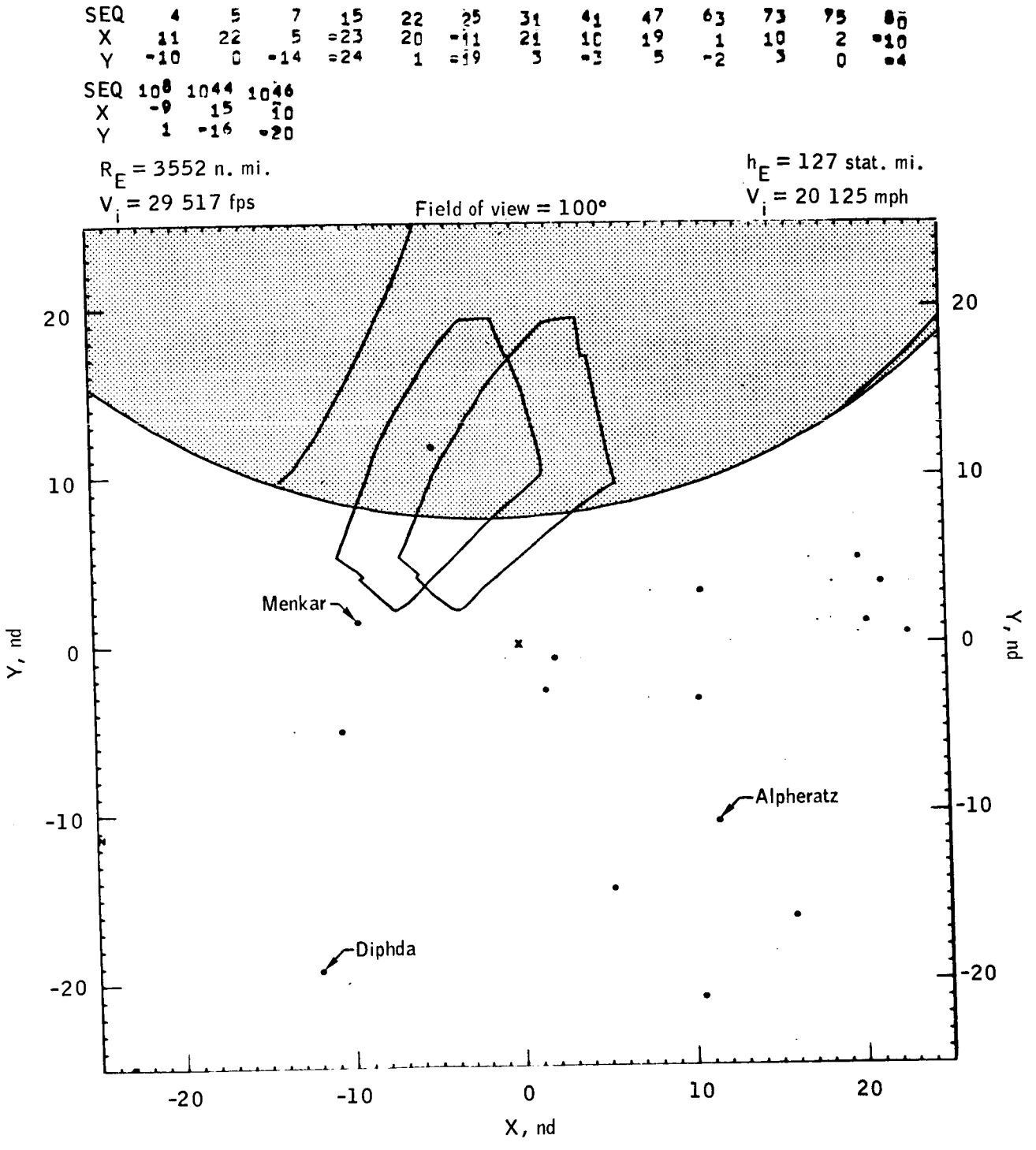
TRANSLUNAR INJECTION BURN

SEG	4	5	7	15	22	25	41	63	75	80	984	1044	1046
X	9	20	3	-23	18	-13	8	0	0	-12	12	13	8
Y	-4	5	-8	-20	6	-13	2	3	5	0	-24	-10	-14



(a) Begin TLI (g.e.t. = 2:33:17.7).

Figure 6.- Translunar injection burn.



(b) Middle of TLI (g.e.t. = 2:36:08.0).

Figure 6.- Continued.

SEQ	4	5	7	22	25	31	41	47	63	73	75	80	108
X	13	24	6	22	-11	22	12	21	3	12	3	-8	-9
Y	-14	-2	-18	-2	-22	0	-7	1	-6	-1	-5	-8	-2

SEQ	111	112	120	144	150	151	186	215	1044
X	8	9	13	0	3	7	-4	-16	17
Y	3	4	7	5	7	8	10	11	-30

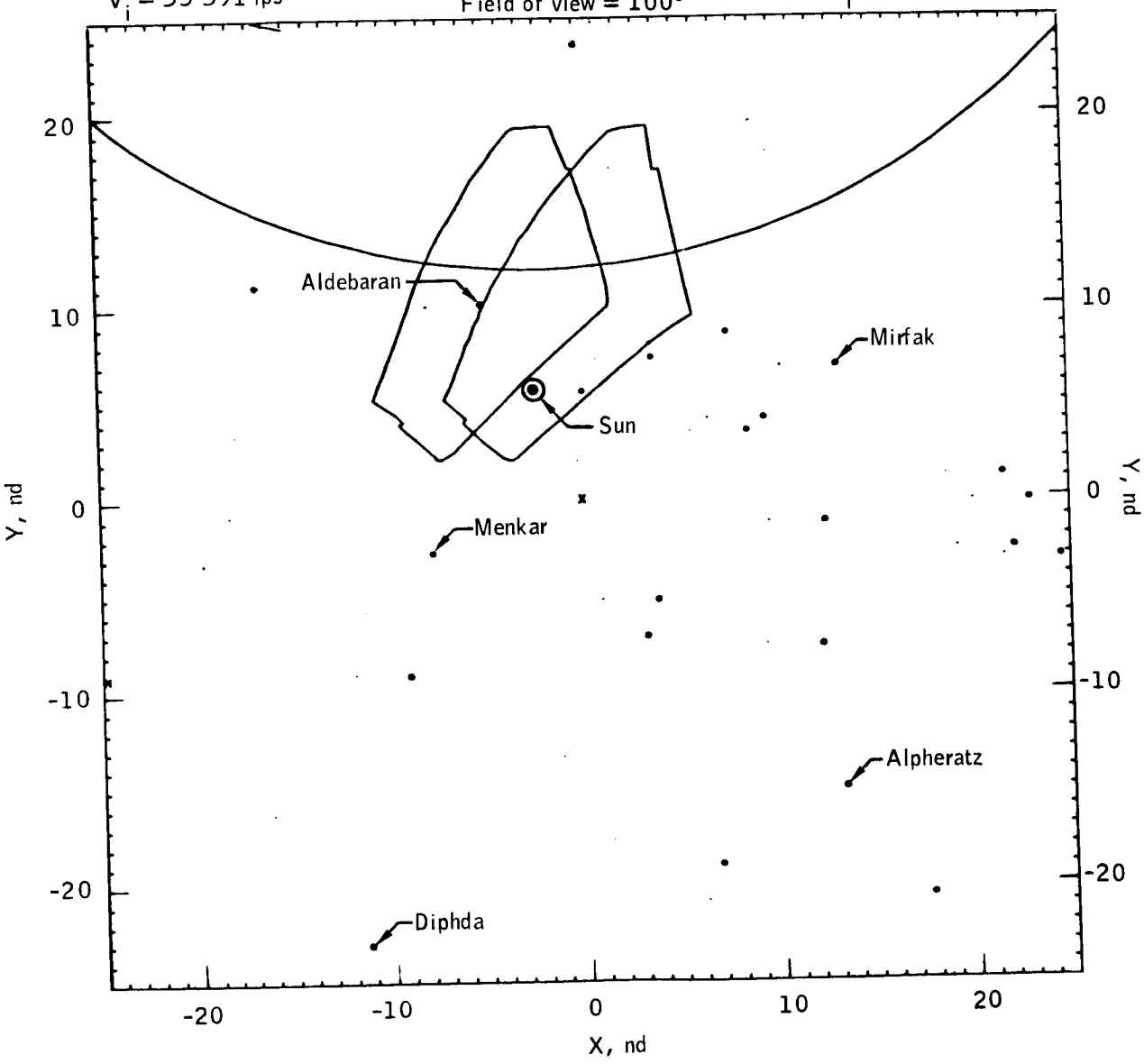
R_E = 3613 n. mi.

V_i = 35 591 fps

Field of view = 100°

h_E = 196 stat. mi.

V_i = 24 267 mph

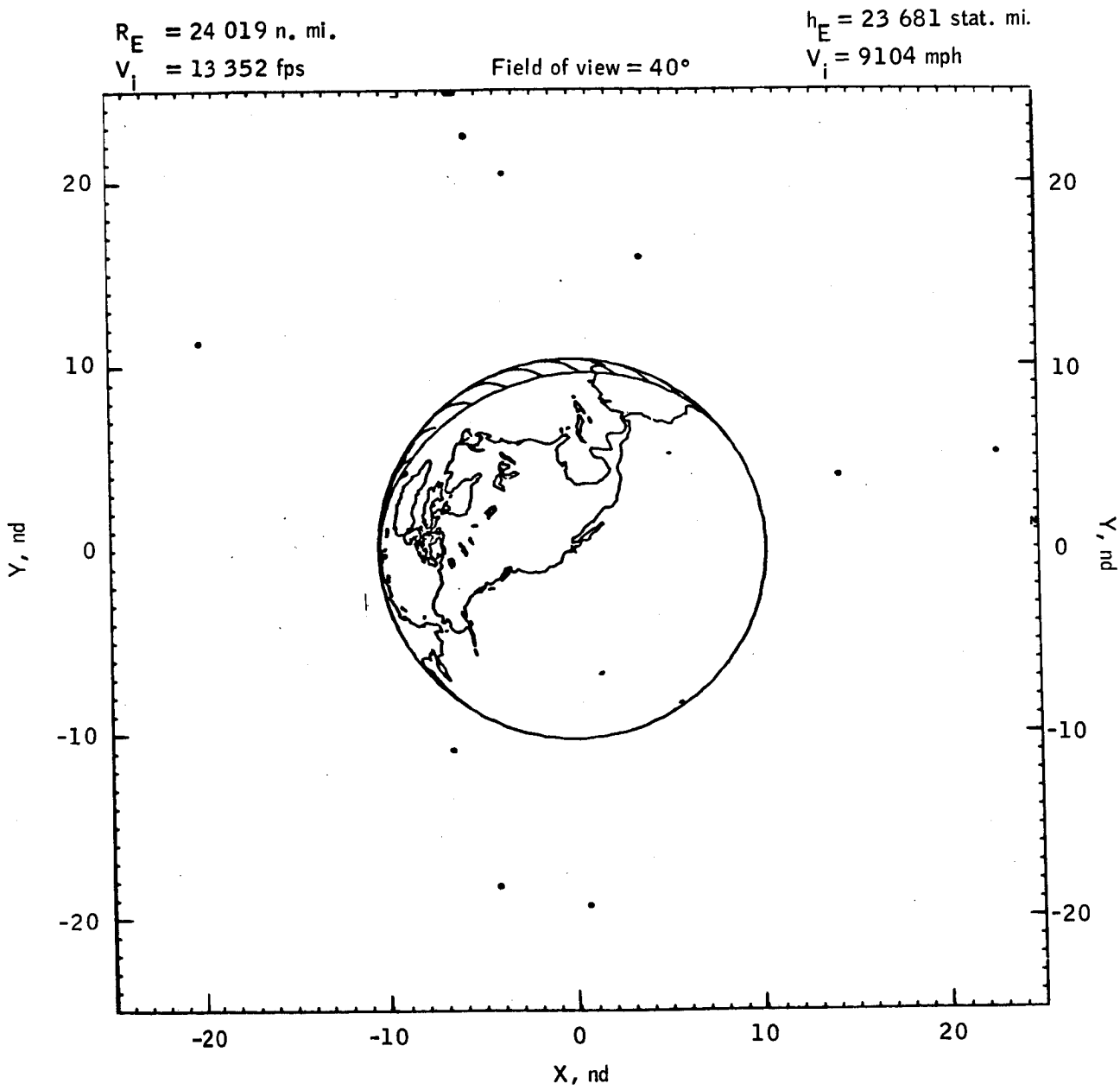


(c) End of TLI (g.e.t. = 2:38:59.5).

Figure 6. - Concluded.

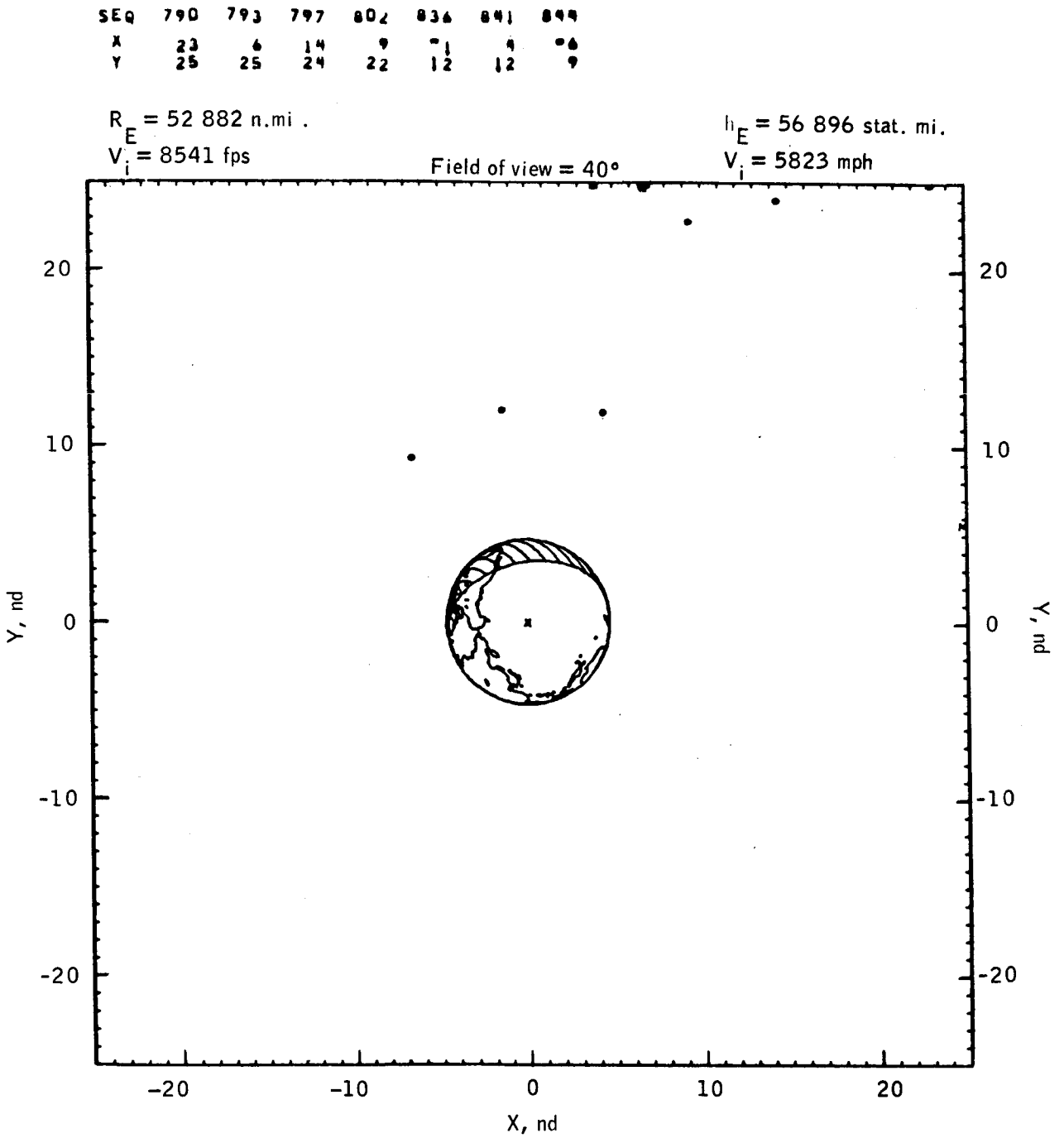
TRANSLUNAR COAST

EARTH VIEWS



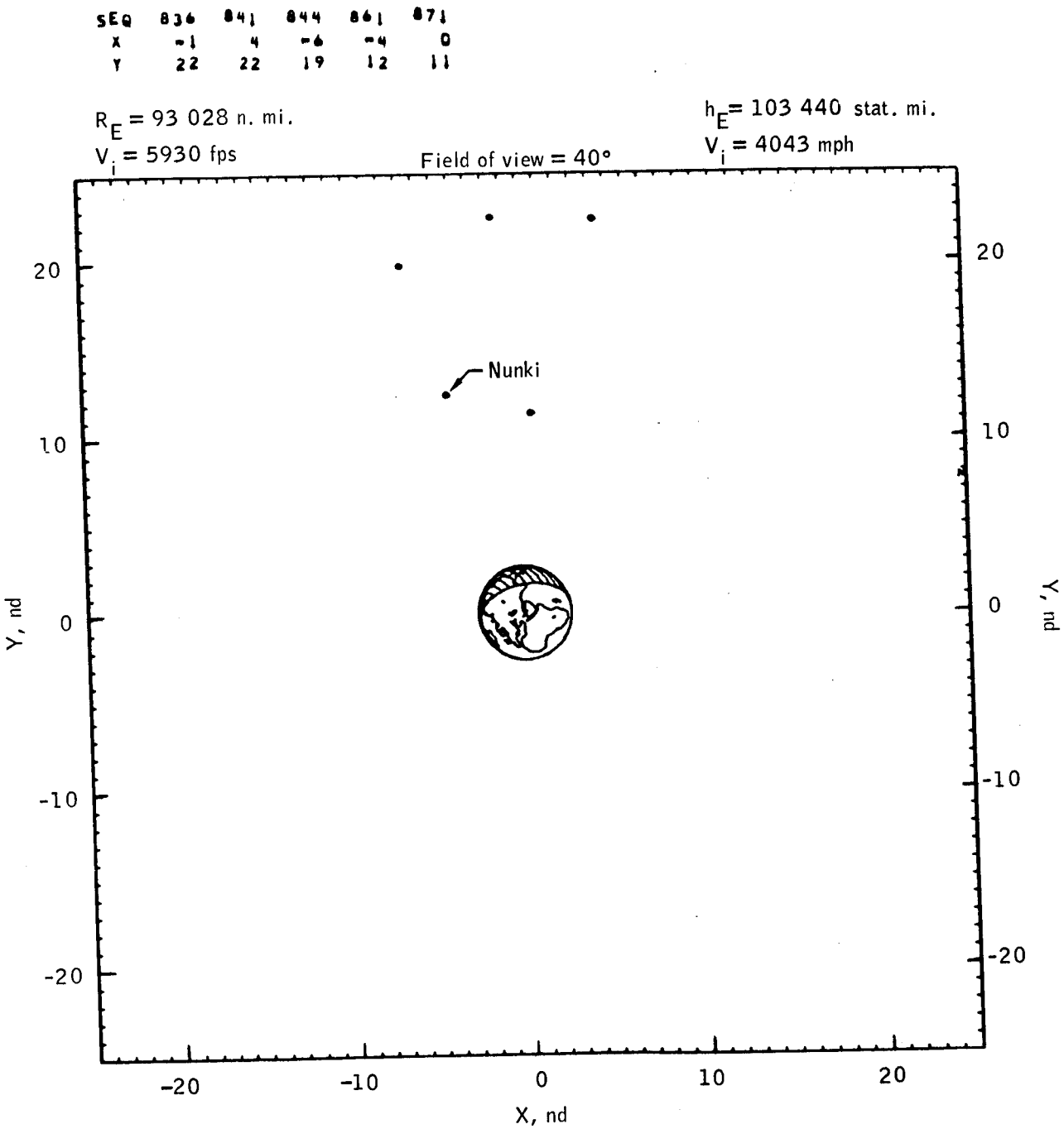
(a) G.e.t. = 5 hours.

Figure 7.- Translunar coast - constant field of view (earth).



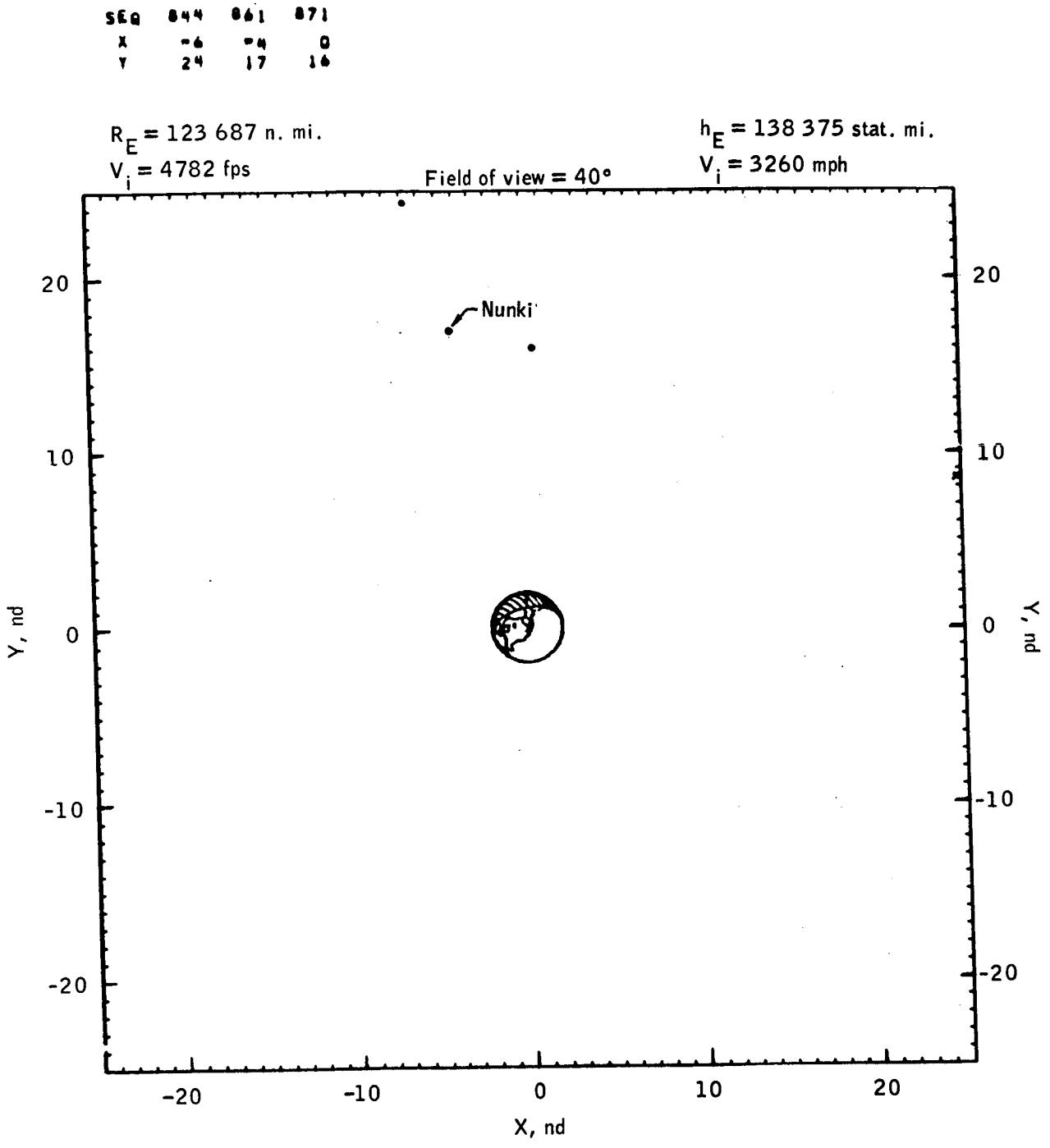
(b) G.e.t. = 10 hours.

Figure 7.- Continued.



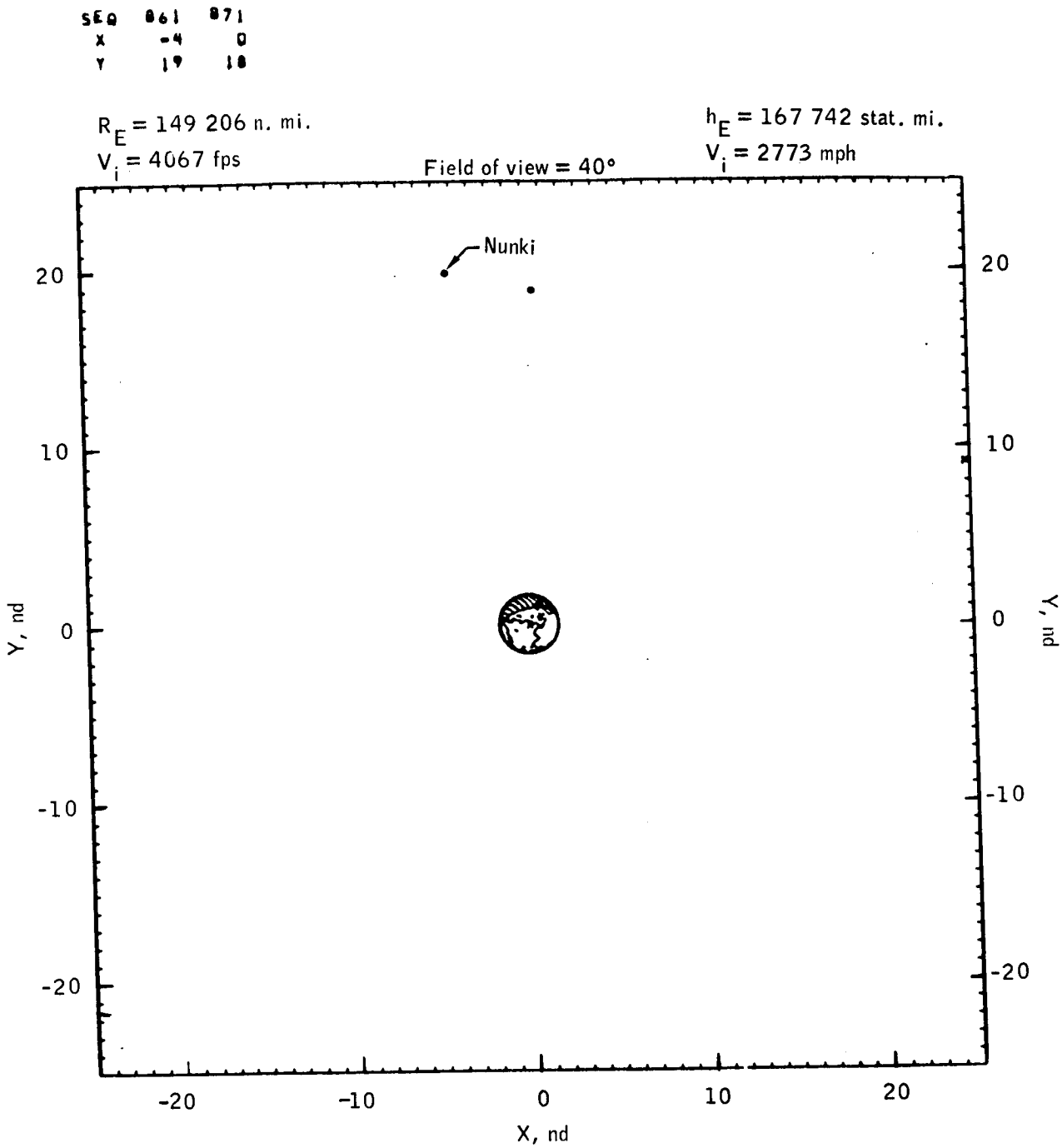
(c) G.e.t. = 20 hours.

Figure 7.- Continued.



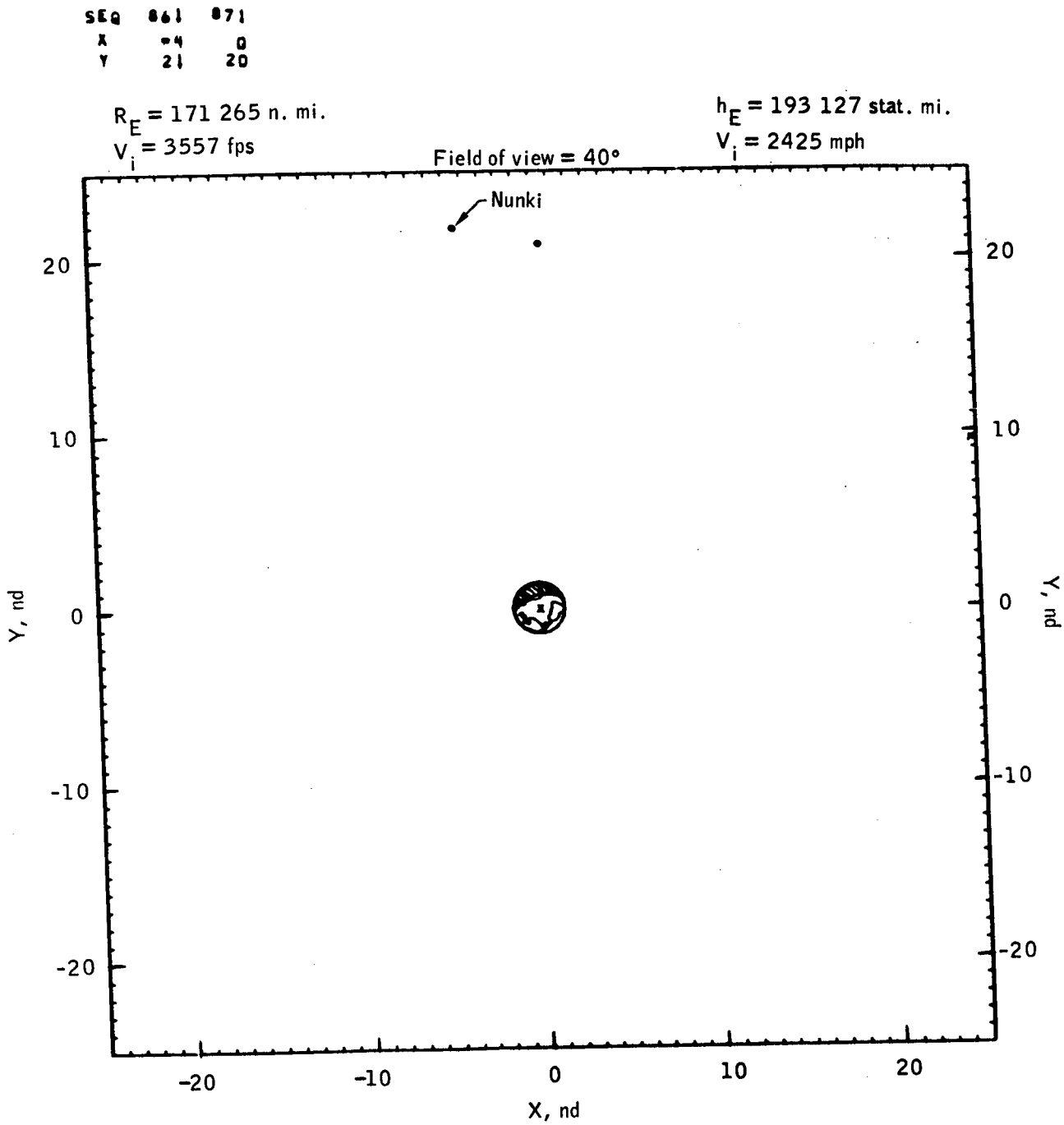
(d) G.e.t. = 30 hours.

Figure 7.- Continued.



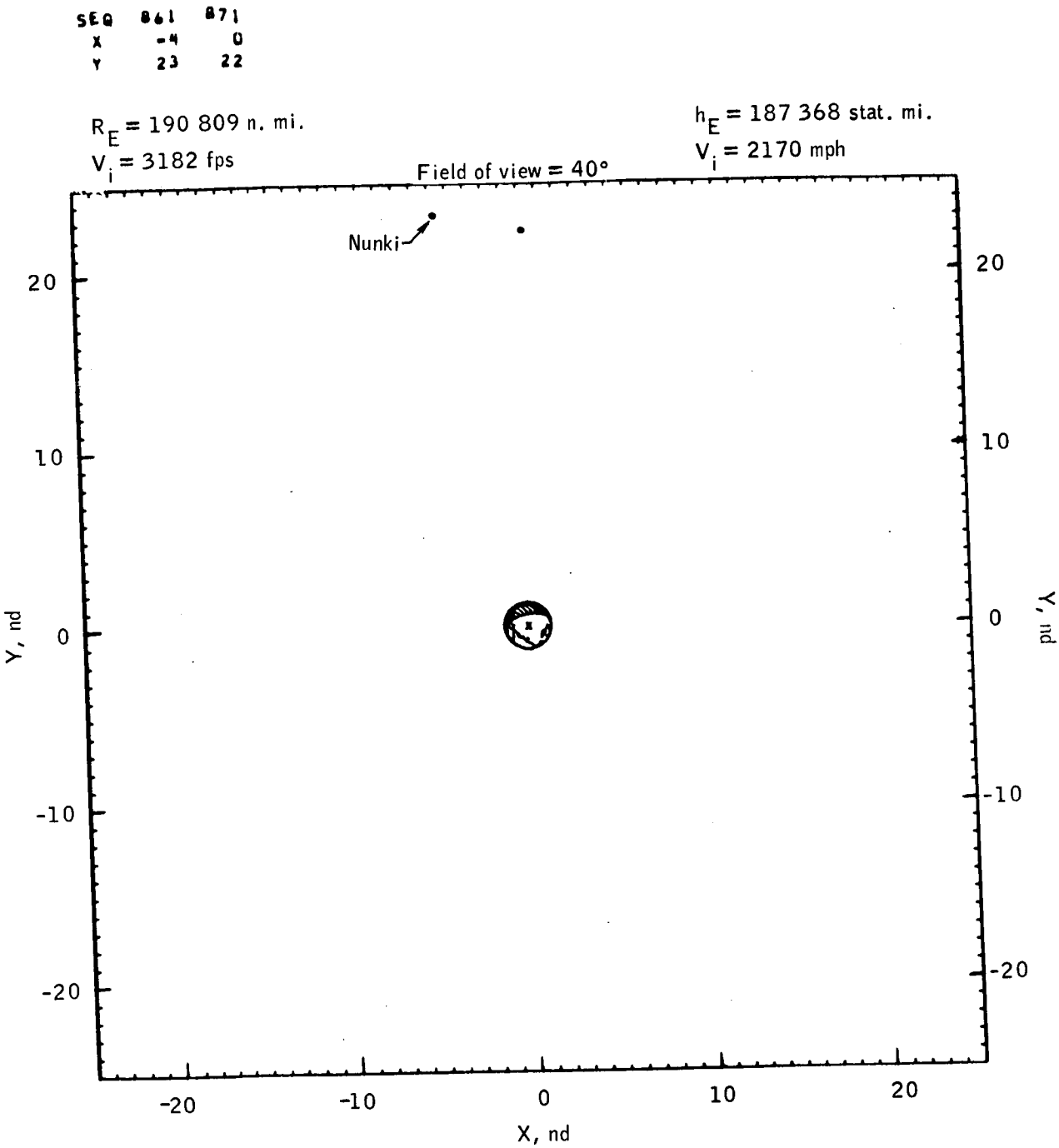
(e) G.e.t. = 40 hours.

Figure 7.- Continued.



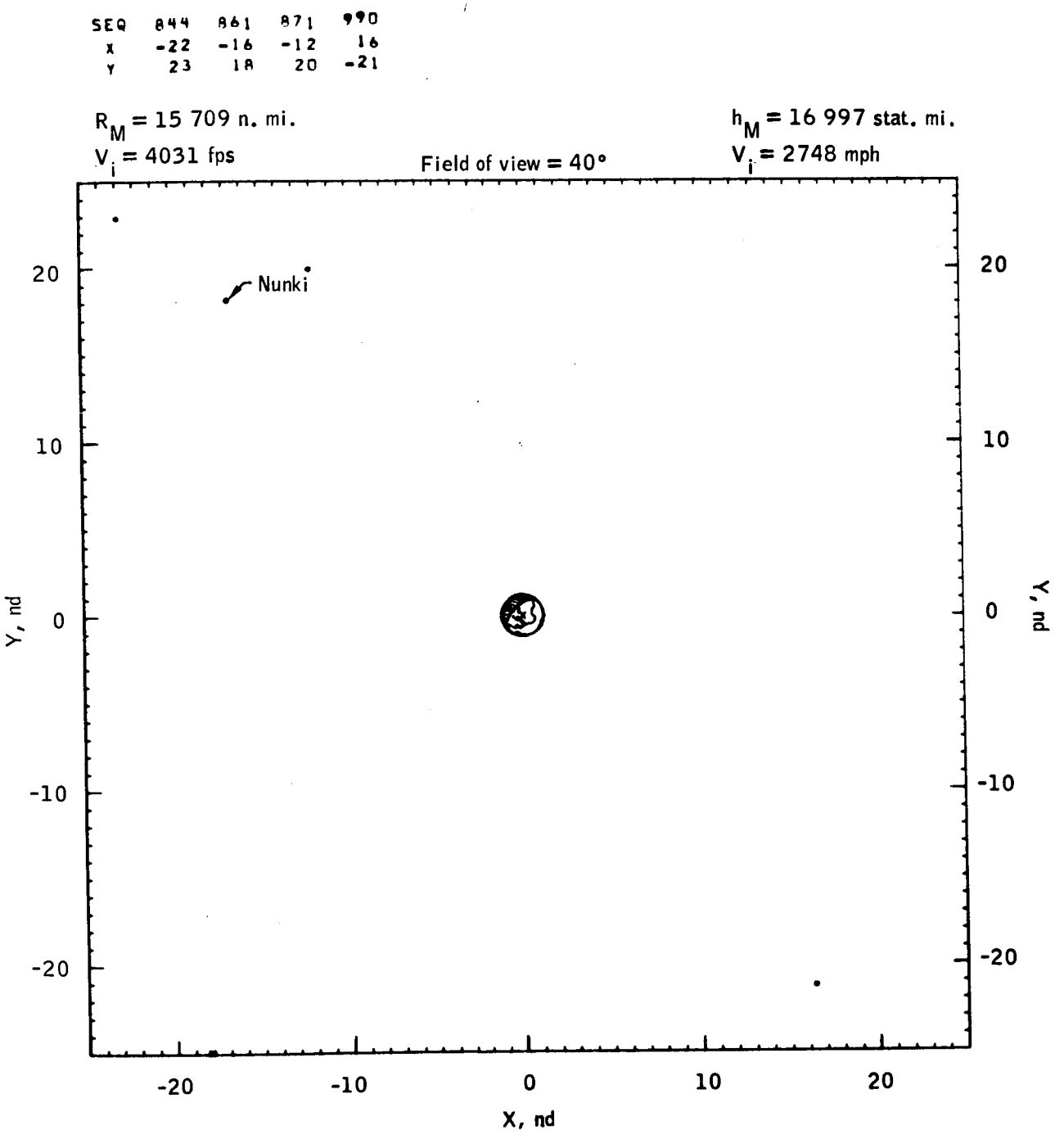
(f) G.e.t. = 50 hours.

Figure 7.- Continued.



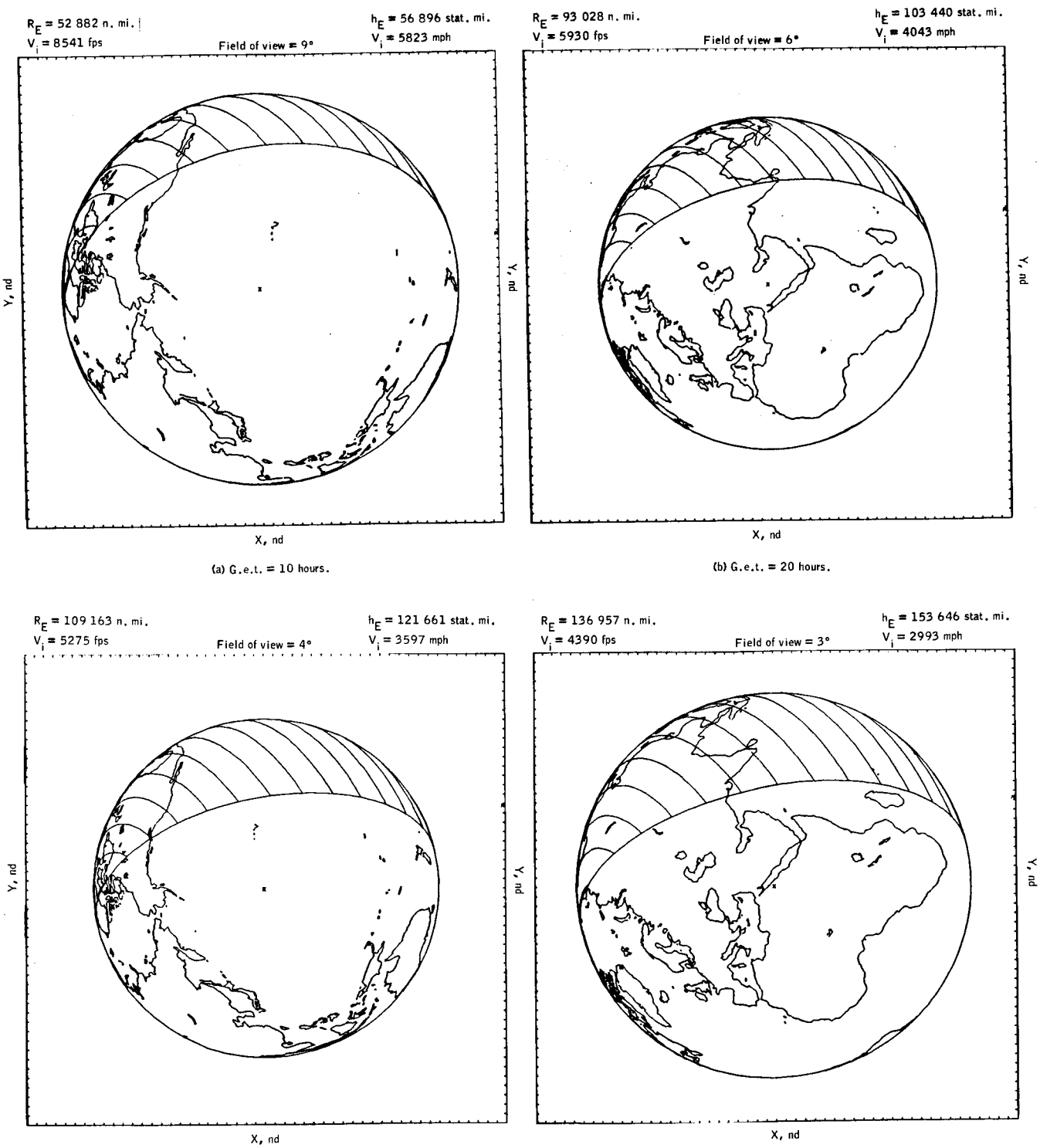
(g) G.e.t. = 60 hours.

Figure 7.- Continued.



(h) G.e.t. = 70 hours.

Figure 7.- Concluded.



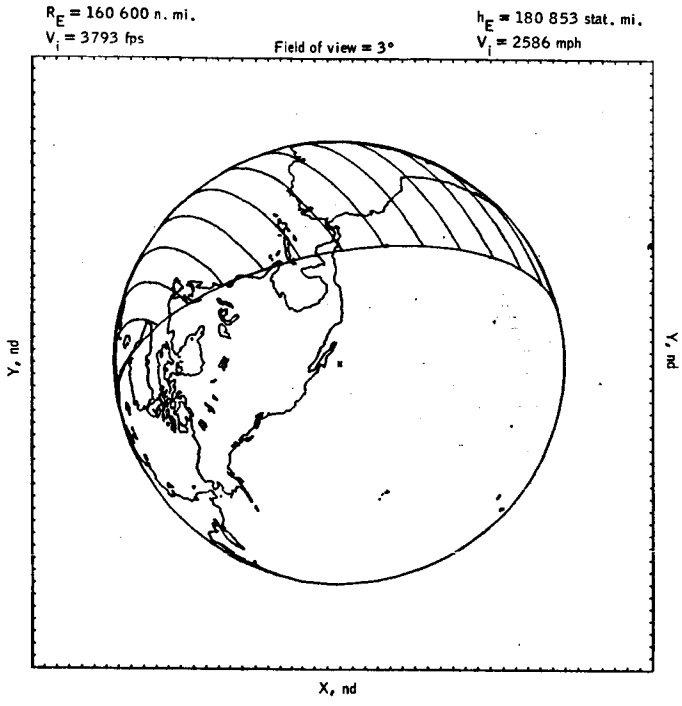
(a) G.e.t. = 10 hours.

(b) G.e.t. = 20 hours.

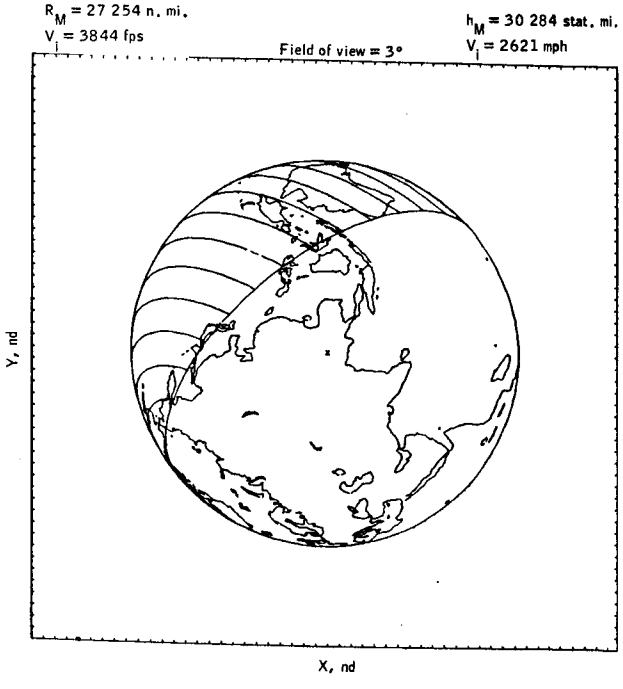
(c) G.e.t. = 25 hours.

(d) G.e.t. = 35 hours.

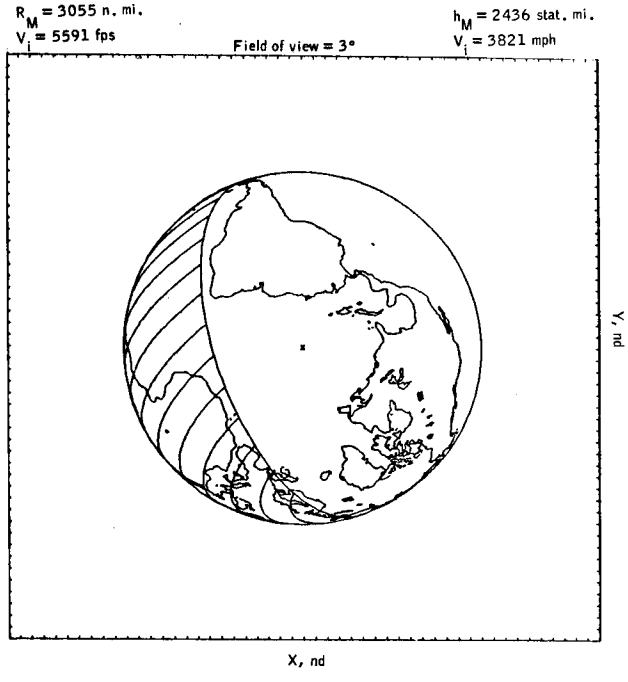
Figure 8.- Translunar coast - variable field of view (earth).



(e) G.e.t. = 45 hours.



(f) G.e.t. = 65 hours.

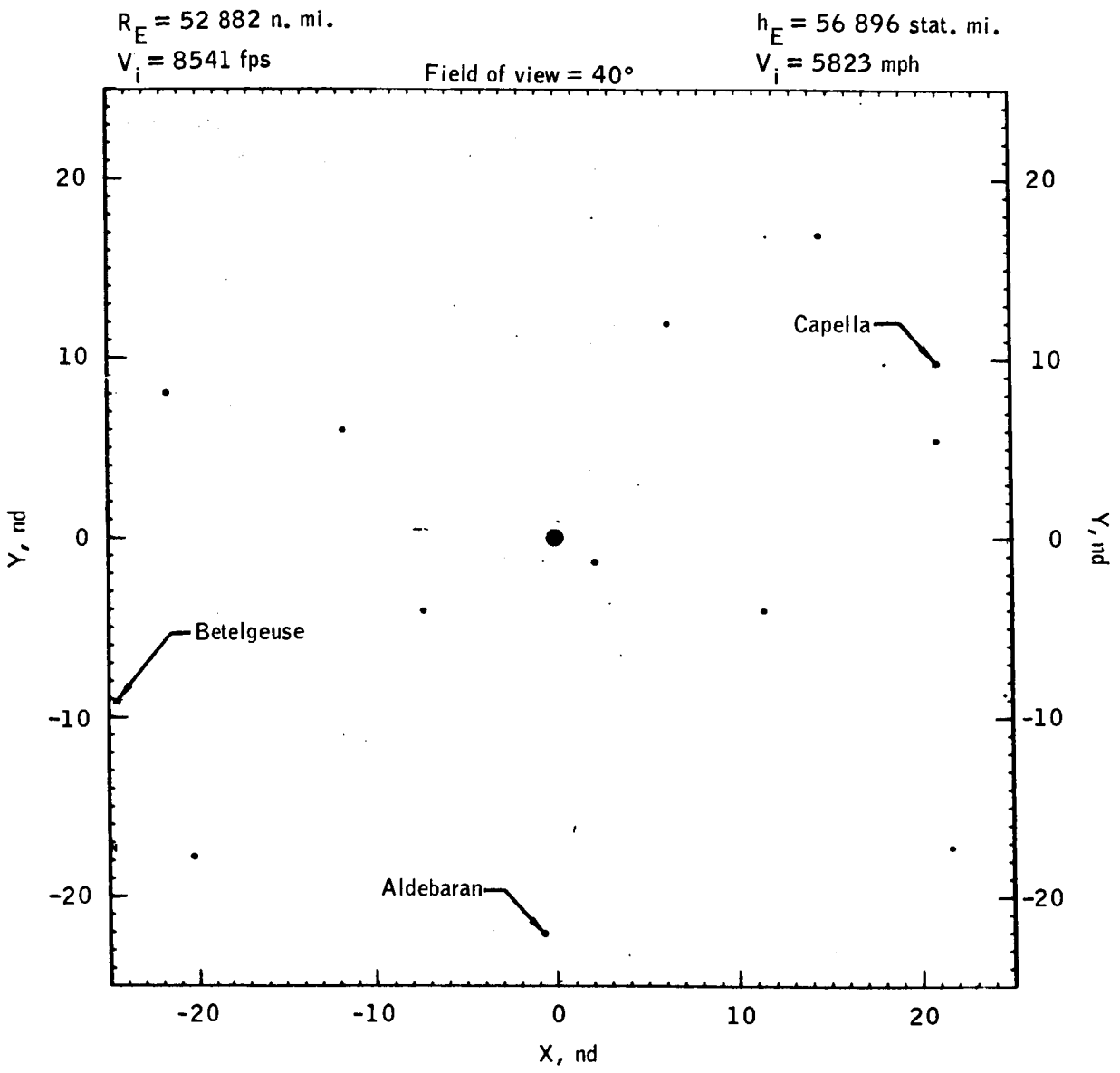


(g) G.e.t. = 75 hours.

Figure 8.- Concluded.

MOON VIEWS

SEQ	150	186	205	207	222	230	231	248	265	270	271	281	301
X	21	0	11	20	21	-20	2	-7	-24	14	6	-11	-21
Y	-17	-21	-3	5	9	-17	-1	-3	-9	17	12	6	8



(a) G.e.t. = 10 hours.

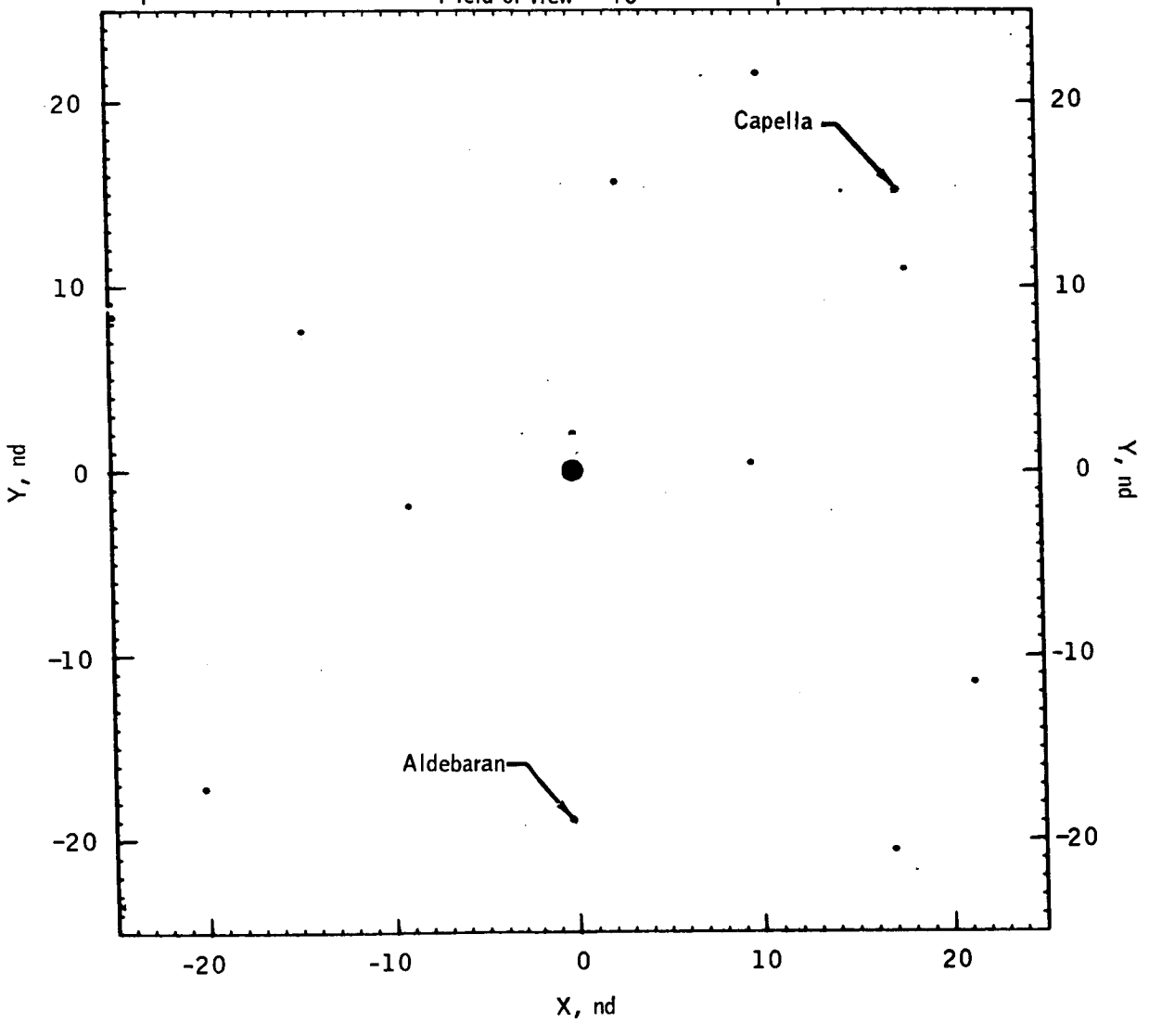
Figure 9.- Translunar coast-constant field of view (moon).

SEQ	144	150	186	205	207	222	230	231	248	270	271	281	301
X	16	21	0	9	17	17	-20	0	-9	10	2	-14	-24
Y	-20	-11	-18	0	11	15	-17	2	-1	21	15	7	6

R_E = 93 028 n. mi.
V_i = 5930 fps

Field of view = 40°

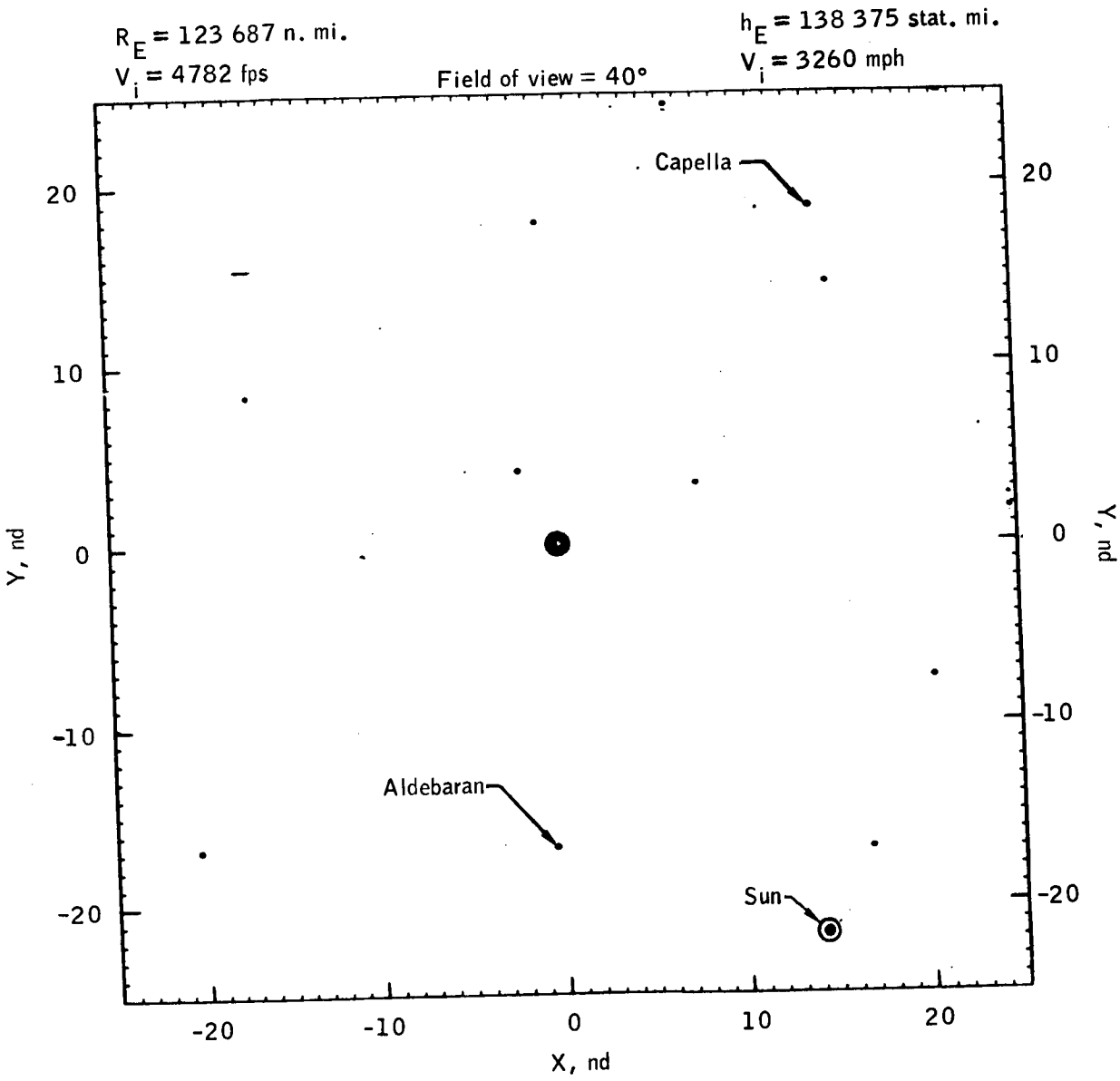
h_E = 103 440 stat. mi.
V_i = 4043 mph



(b) G.e.t. = 20 hours.

Figure 9.- Continued.

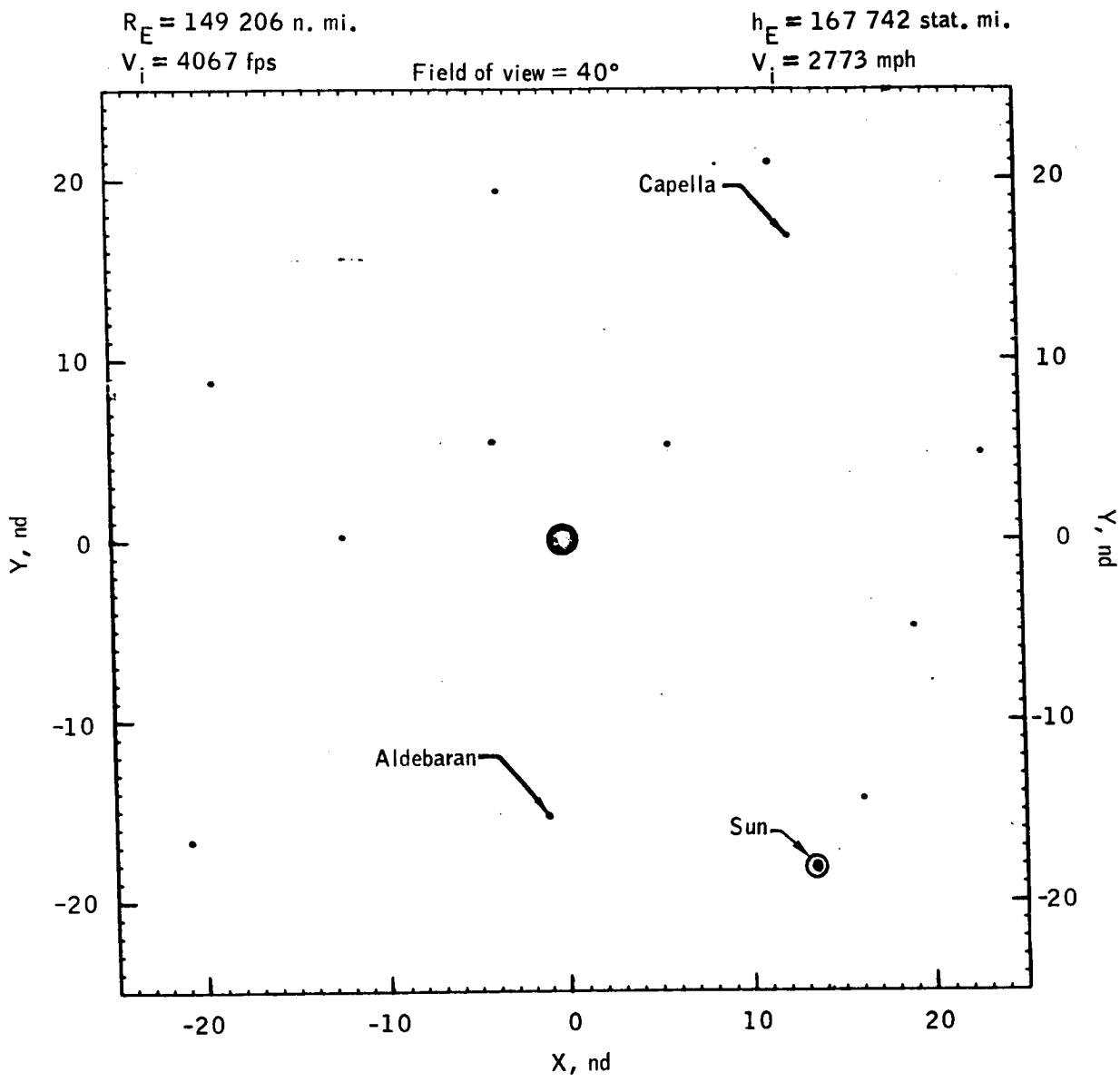
SEQ	144	150	151	186	205	207	222	230	231	248	270	271	281
X	16	20	24	0	7	15	14	-20	-2	-10	6	0	-17
Y	-16	-7	1	-16	3	14	18	-16	4	0	24	18	8



(c) G.e.t. = 30 hours.

Figure 9.- Continued.

SEQ	144	150	151	186	205	207	222	230	231	248	270	271	281
X	16	20	24	0	7	15	14	-20	-2	-10	6	0	-17
Y	-16	-7	1	-16	3	14	18	-16	4	0	24	18	8



(d) G.e.t. = 40 hours.

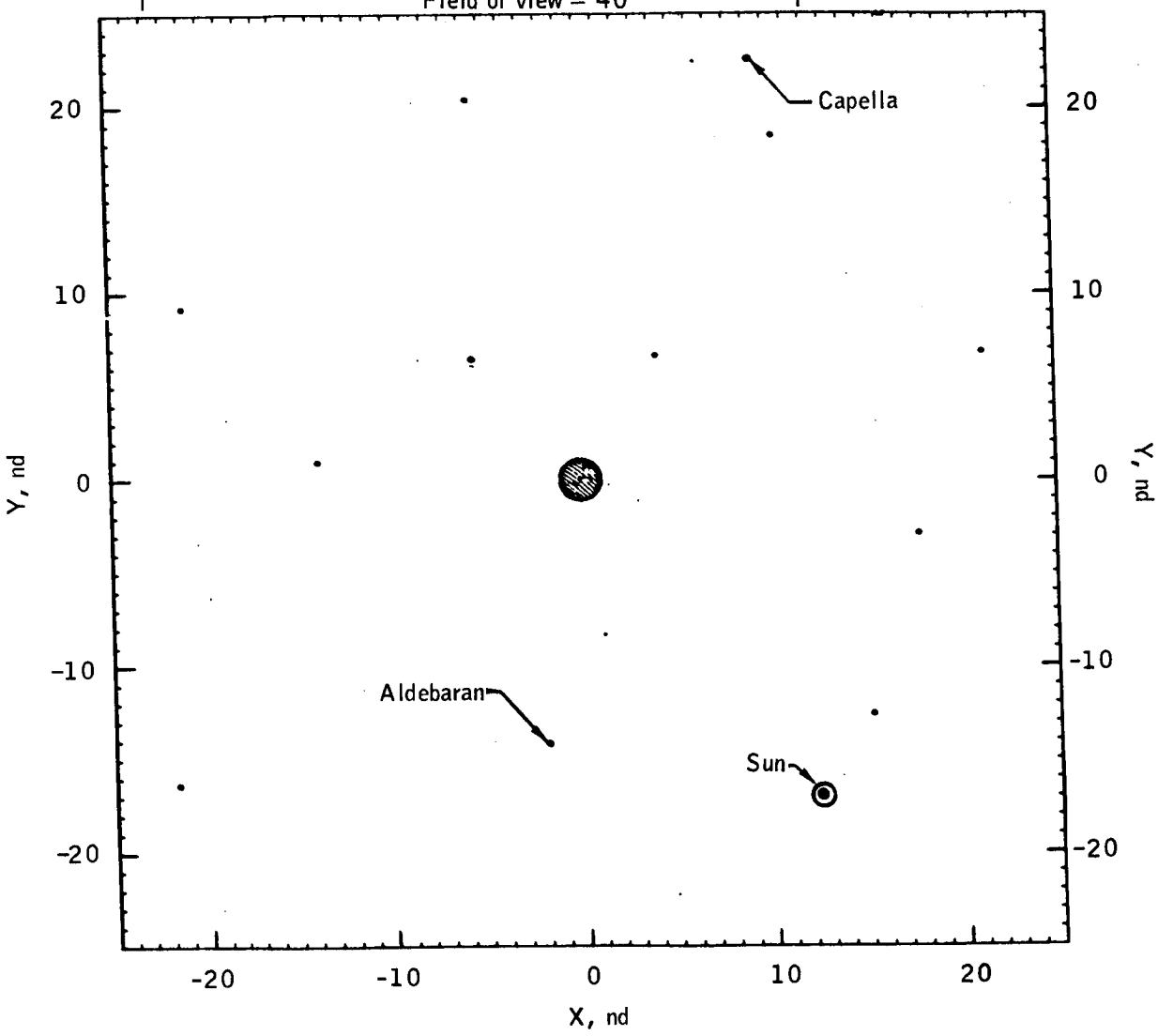
Figure 9 .- Continued.

SEQ	144	150	151	186	205	207	222	230	231	248	271	281
X	15	17	21	-1	4	10	9	-21	-5	-13	-5	-21
Y	-12	-2	6	-13	6	18	22	-16	6	1	20	9

R_E = 171 265 n. mi.
V_i = 3557 fps

h_E = 193 127 stat. mi.
V_i = 2425 mph

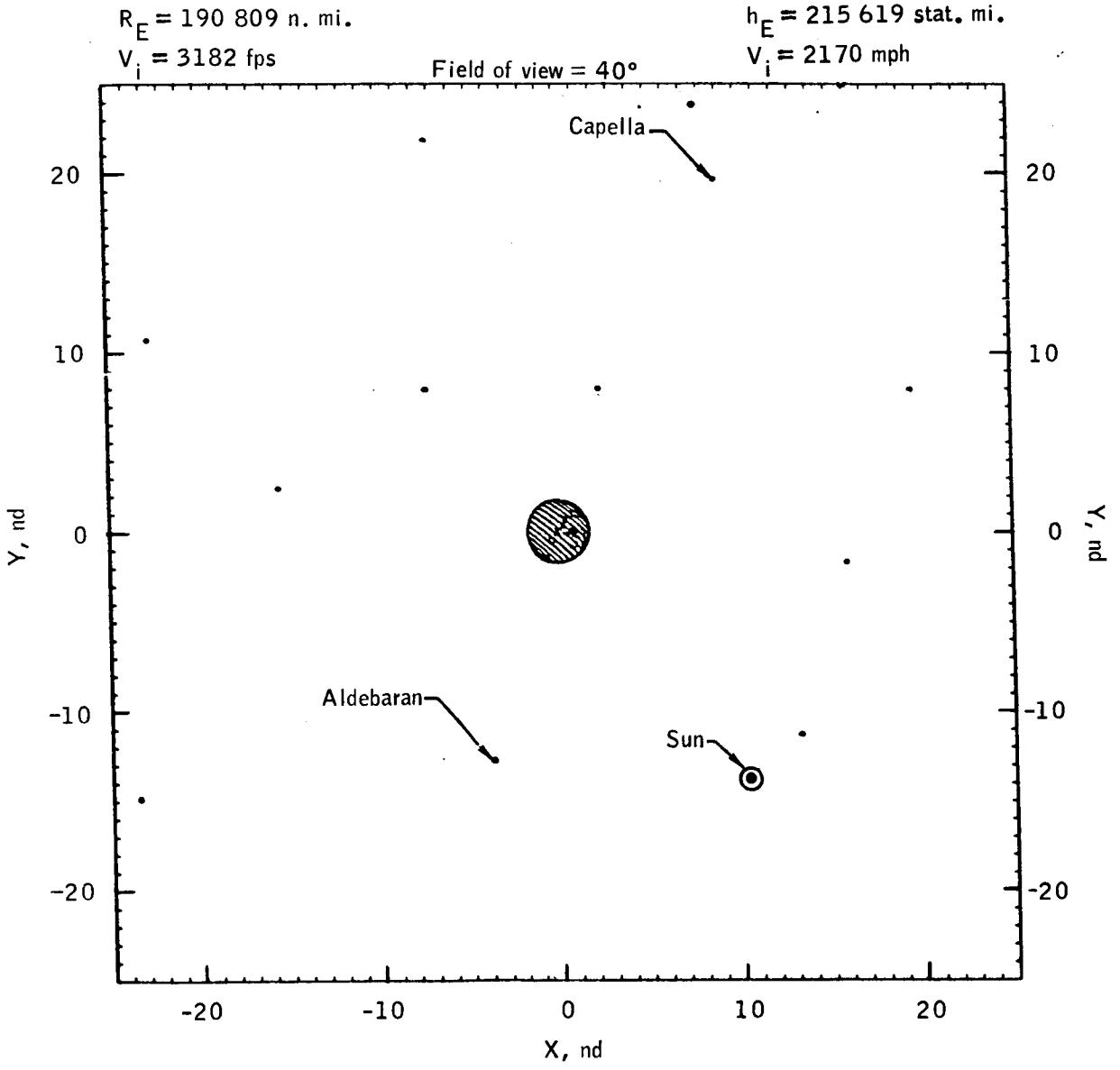
Field of view = 40°



(e) G.e.t. = 50 hours.

Figure 9.- Continued.

STW	144	150	151	186	205	207	222	230	231	248	271	281
X	15	17	21	-1	4	10	9	-21	-5	-13	-5	-21
Y	-12	-2	6	-13	6	18	22	-16	6	1	20	9



(f) G.e.t. = 60 hours.

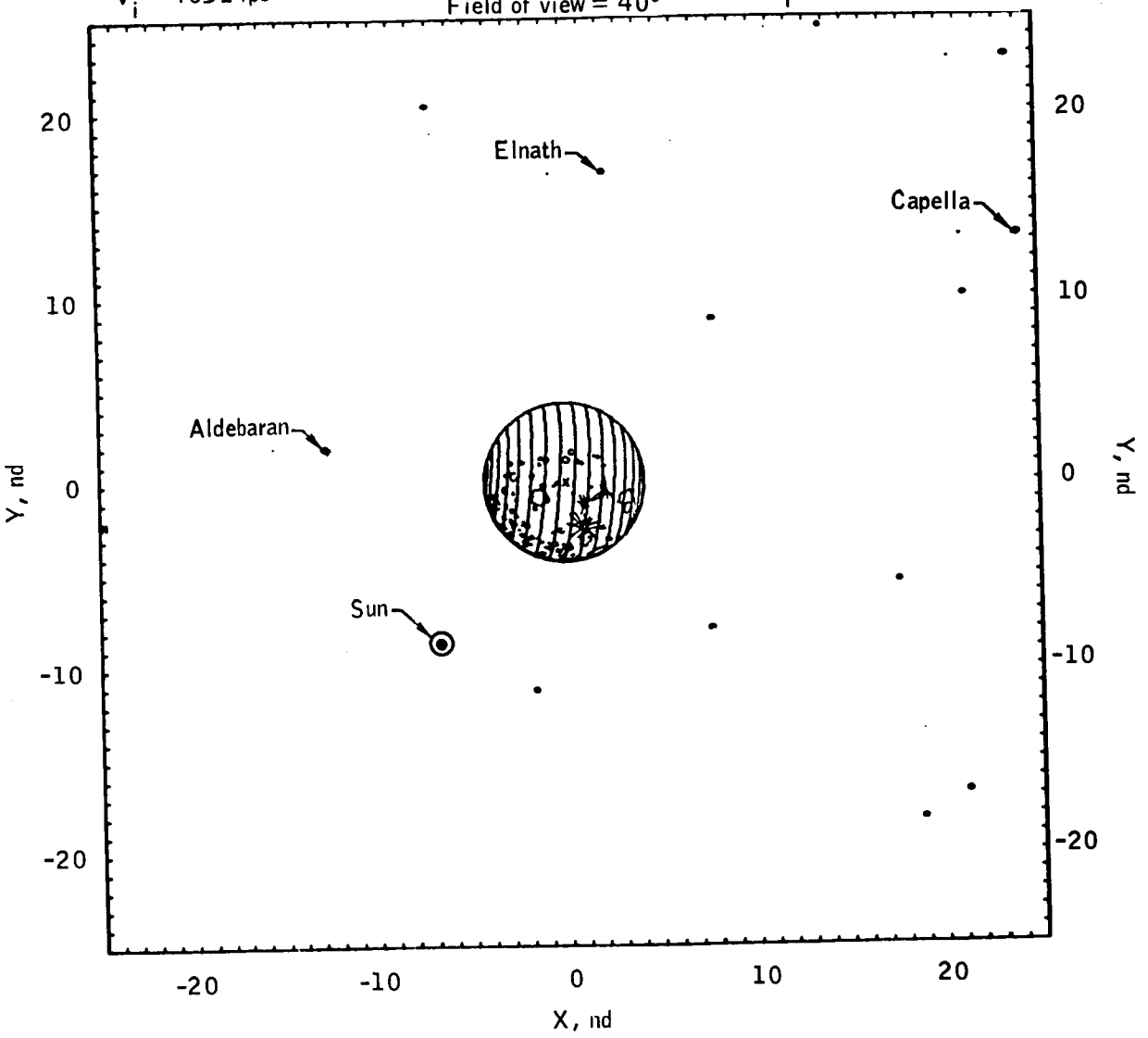
Figure 9.- Continued.

SEC	111	112	144	150	151	186	205	207	222	231	248	270	271
X	18	21	-1	7	17	-12	7	21	24	2	-7	23	13
Y	-18	-16	-11	-7	-5	2	8	10	13	16	20	22	24

R_M = 15 709 n. mi.
V_i = 4031 fps

h_M = 16 997 stat. mi.
V_i = 2748 mph

Field of view = 40°



(g) G.e.t. = 70 hours.

Figure 9.- Concluded.

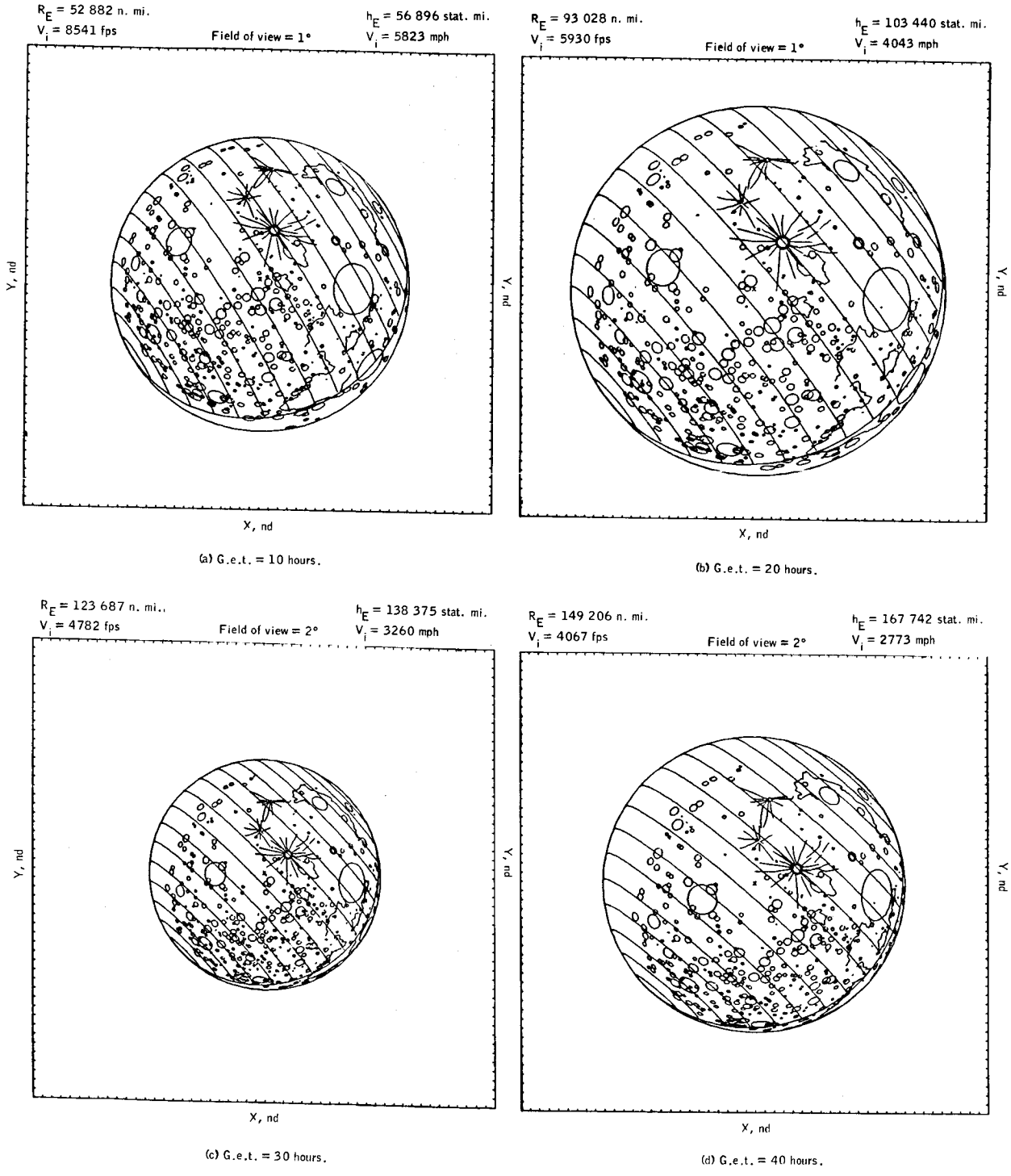
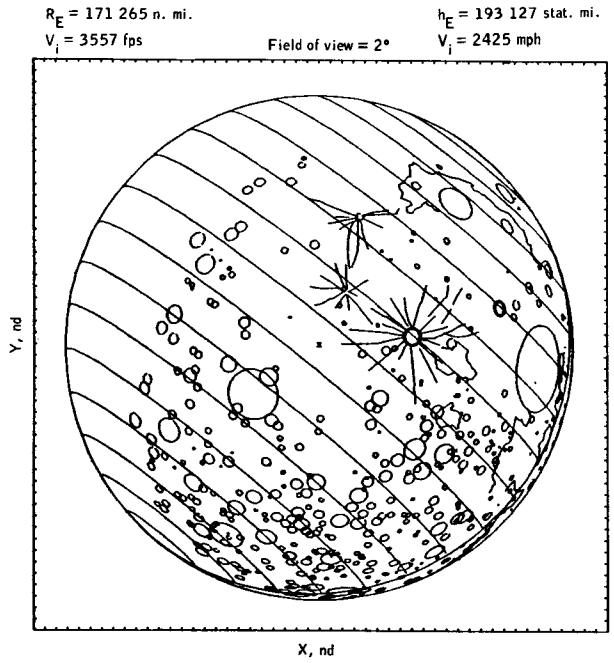
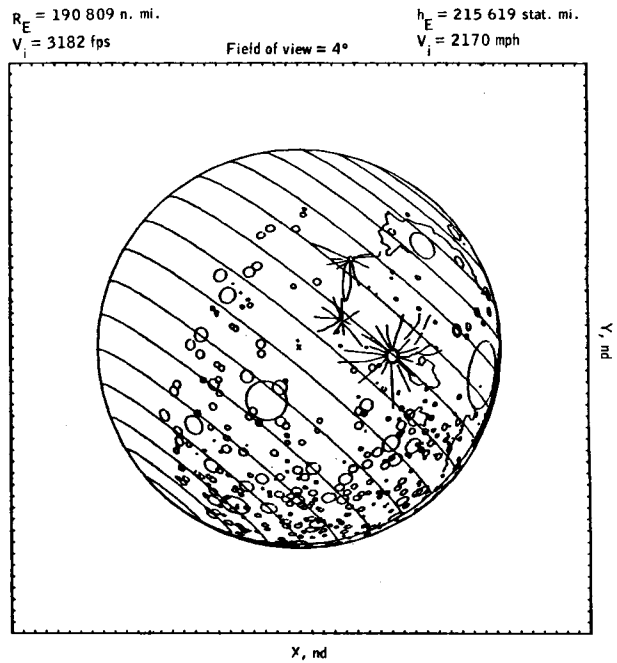


Figure 10.- Translunar coast - variable field of view (moon).



(e) G.e.t. = 50 hours.



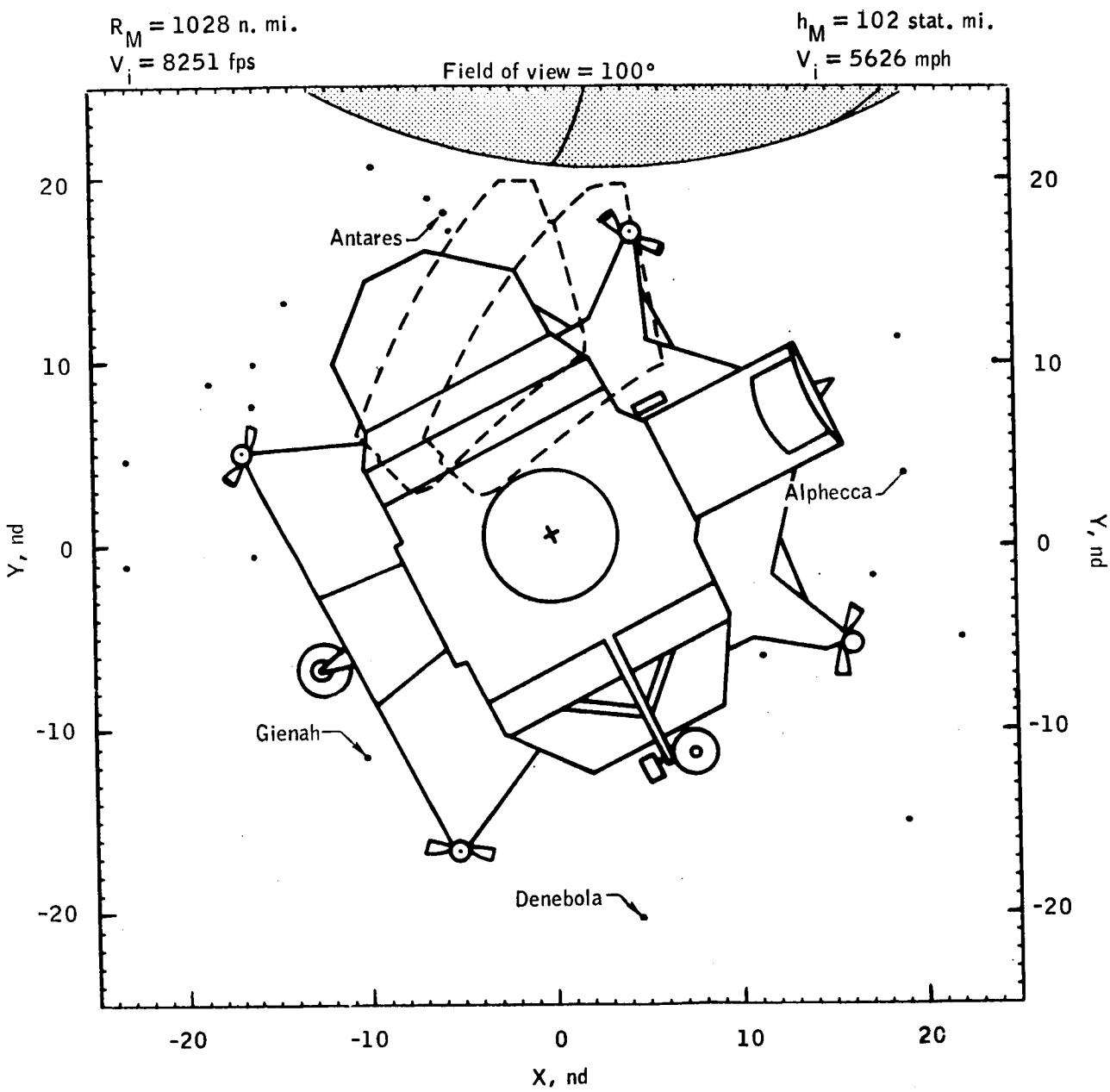
(f) G.e.t. = 60 hours.

Figure 10.- Concluded.

LUNAR ORBIT
INSERTION BURN

SEQ	535	551	569	580	589	599	610	639	641	645	651
X	4	-10	-23	19	-16	-23	11	22	-16	-18	17
Y	-20	-11	0	-19	0	4	-5	-4	7	8	-1

SEQ	660	688	690	736	743	745	751	755	759
X	-16	-14	19	-5	-5	18	-6	24	-9
Y	10	13	4	17	18	11	19	10	20

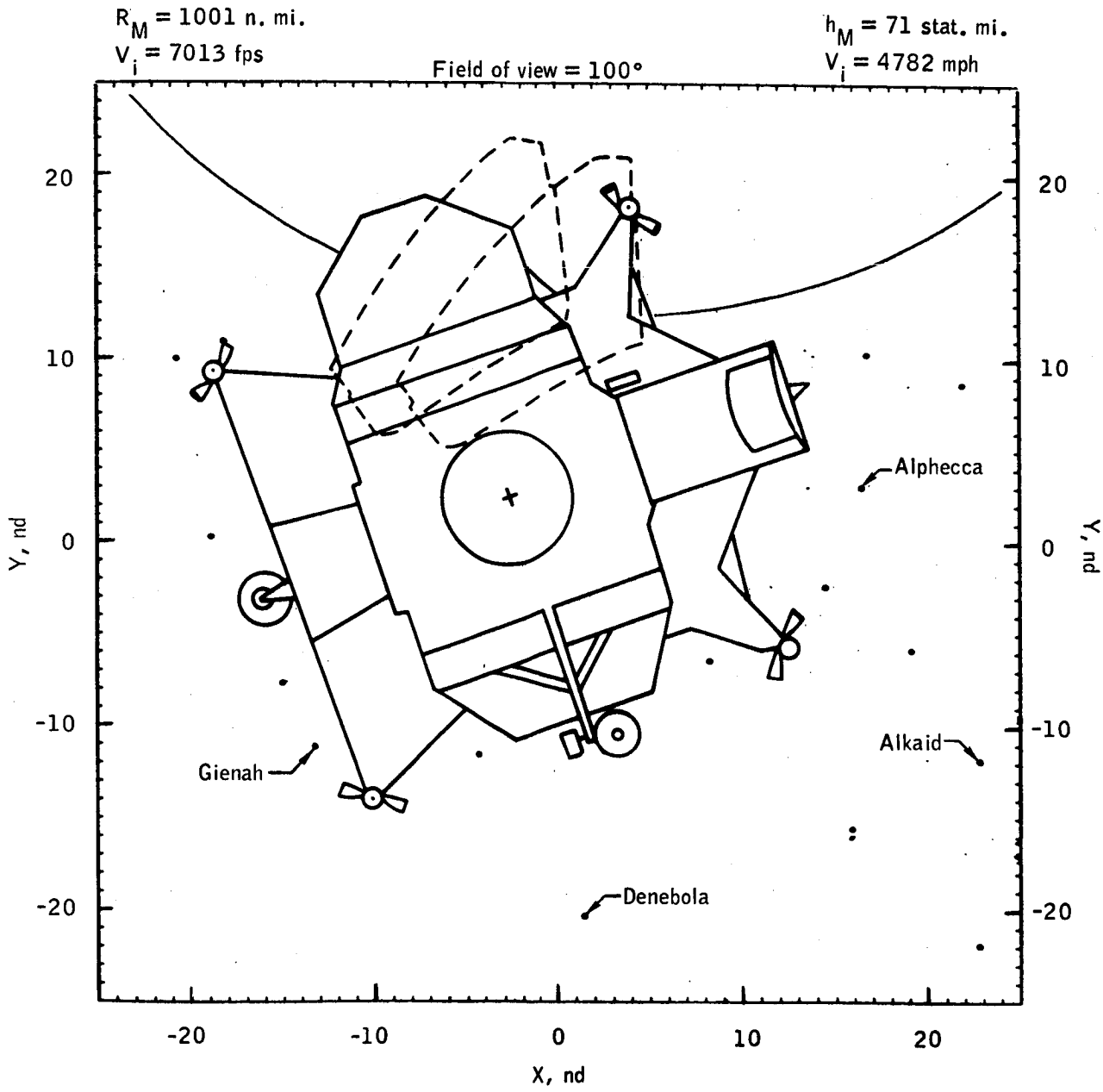


(a) Begin LOI (g.e.t. = 75:45:43.2).

Figure 11.- Lunar orbit insertion burn.

SEQ	535	540	551	566	570	577	580	589	604
X	1	22	-13	-14	-4	24	15	-18	-82
Y	-20	-21	-10	-7	-11	-16	-15	0	-11

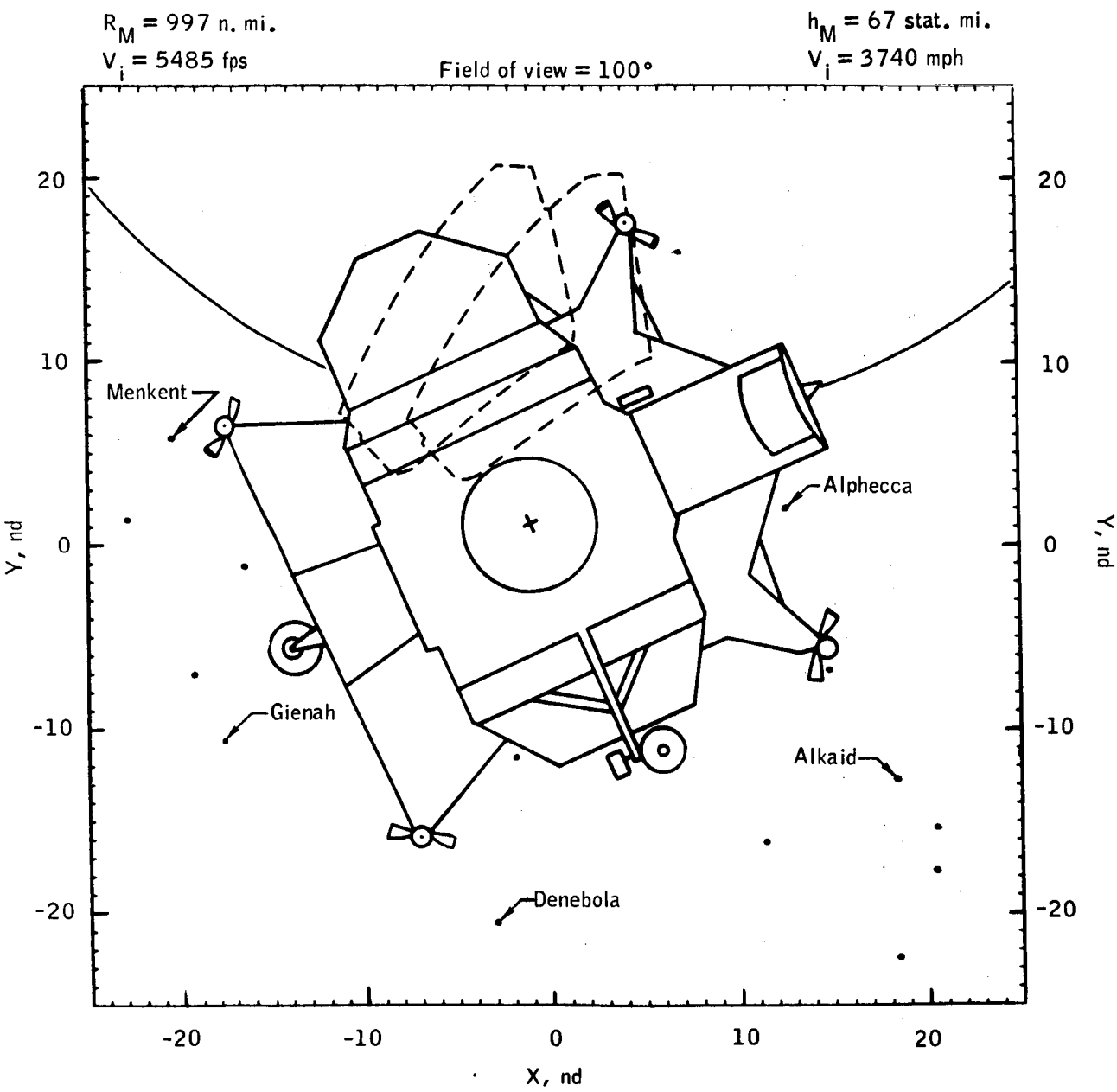
SEQ	610	639	645	651	660	690	741	799
X	8	19	-20	14	-18	16	18	21
Y	-6	-5	10	-2	11	3	10	8



(b) Middle of LOI (g.e.t. = 75:48:43.2).

Figure 11.- Continued.

SEQ	535	540	551	566	577	580	582	589	592	595	604	621	639	690
X	-2	18	-17	-19	20	11	-1	-22	20	-16	18	-20	14	12
Y	-20	-22	-10	-6	-17	-15	-11	1	-15	0	-12	5	-6	2



(c) End of LOI (g.e.t. = 75:51:44.7).

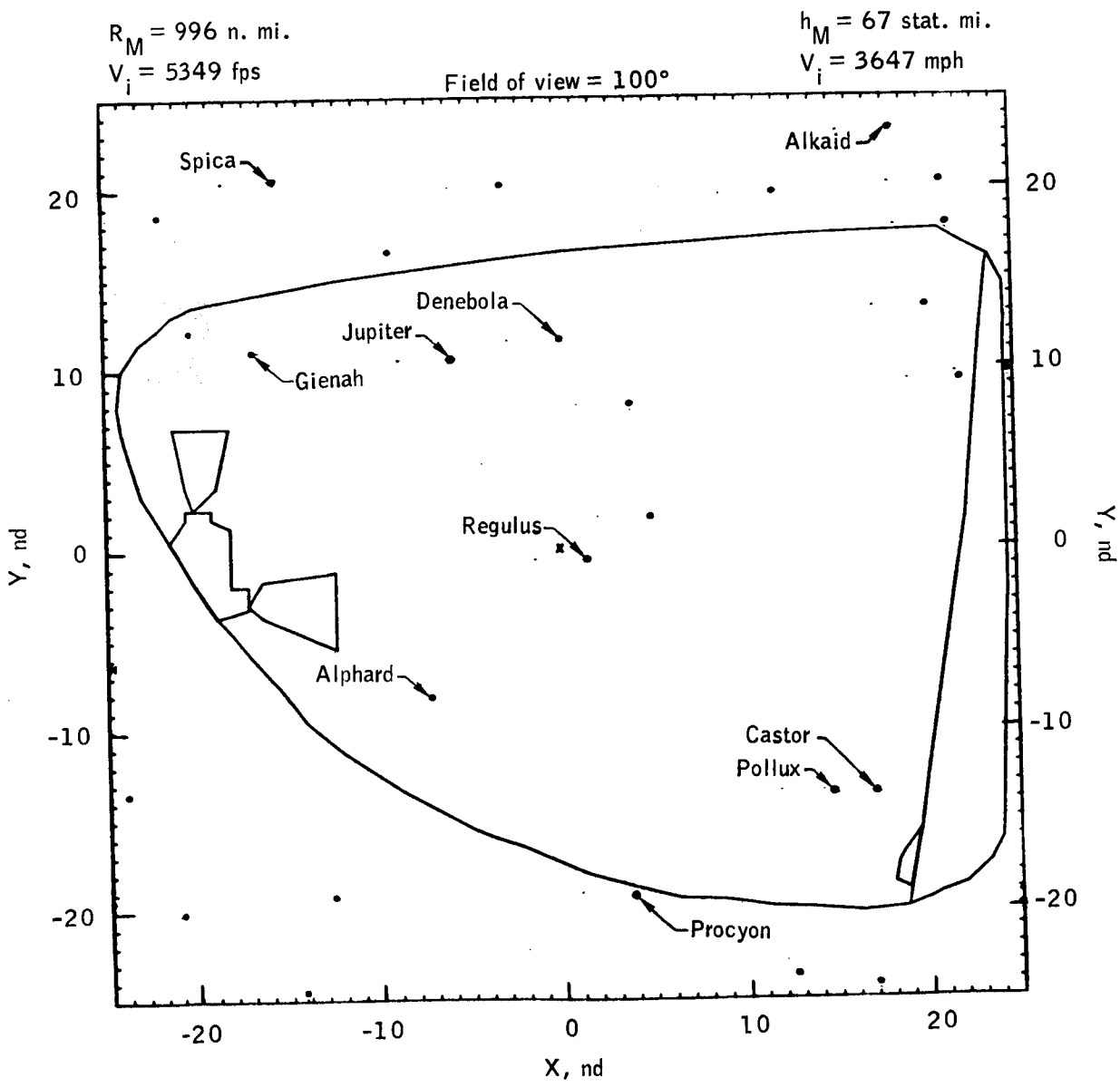
Figure 11.- Concluded.

LUNAR ORBIT PHASE

SEQ	271	281	301	342	349	356	362	376	377	381	427	440	473	480
X	24	17	12	-14	17	3	14	-20	-12	-24	-23	-7	1	5
Y	-19	-24	-23	-24	-13	-19	-13	-19	-19	-19	-13	08	0	1

SEQ	507	509	515	535	540	551	566	570	577	580	582	592	593	595
X	22	24	3	0	20	-16	-20	-9	21	11	-2	21	-15	-21
Y	9	9	8	11	13	11	12	16	18	19	20	20	20	18

SEQ	604	1081
X	18	-5
Y	23	10



(a) Begin DOI burn - front window (g.e.t. = 99:33:51).

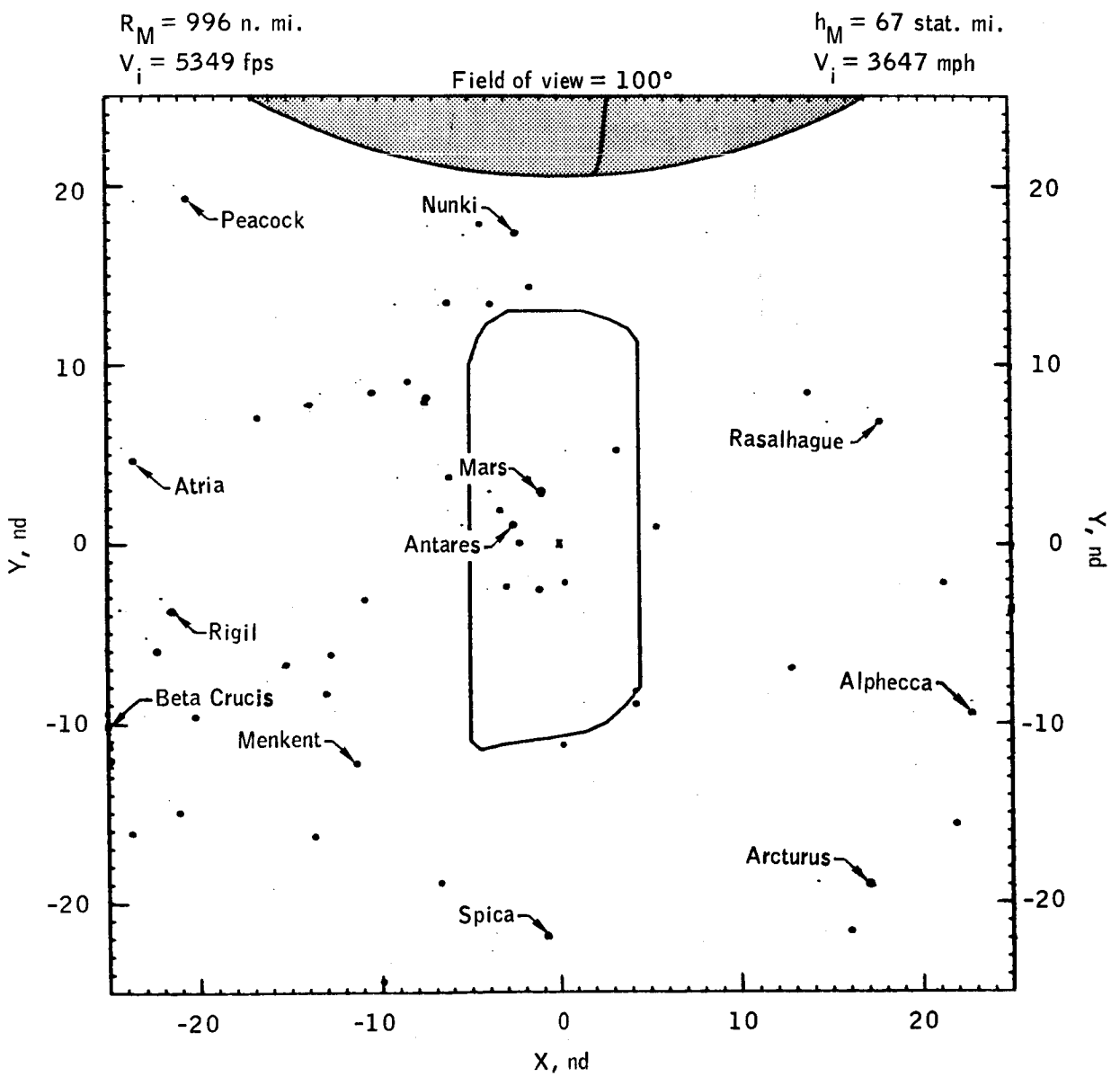
Figure 12.- Lunar orbit phase.

SEQ	545	561	566	569	574	589	593	595	599	610	617	621	624	641
X	-23	-24	-9	-21	-24	-13	0	-6	-20	16	-22	-11	17	-12
Y	-15	-11	-24	-14	-10	-16	-21	-18	-9	-21	-5	-12	-18	-8

SEQ	643	645	651	655	660	673	688	690	700	717	719	724	736	743
X	-21	-15	21	0	-12	4	-10	22	12	-2	-1	0	-2	-2
Y	-3	-6	-15	-11	-6	-8	-2	-9	-6	-2	-2	-2	0	1

SEQ	745	751	753	757	759	770	781	789	790	793	795	797	802	803
X	21	-3	5	-23	-6	3	-16	-7	-13	-7	17	-10	-8	13
Y	-2	2	1	4	3	5	7	8	7	8	6	8	9	8

SEQ	836	841	844	861	871	933	1080
X	-3	-6	-1	-2	-4	-20	-1
Y	13	13	14	17	17	19	3

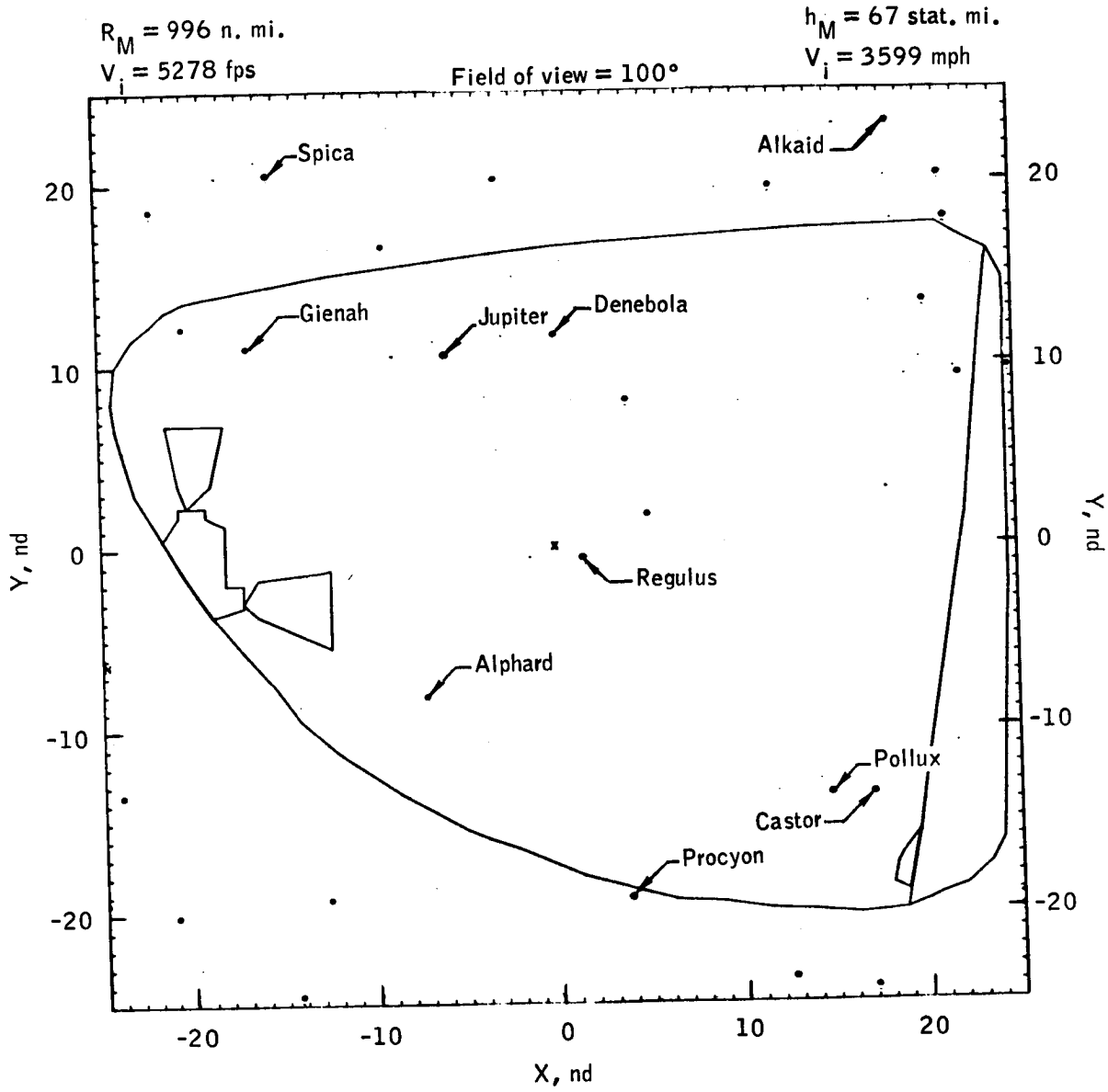


(b) Begin DOI burn - docking window (g.e.t. = 99:33:51).

Figure 12.- Continued.

SEQ	271	281	301	342	349	356	362	376	377	381	427	440	473	480	507
X	24	17	12	-14	17	3	14	-20	-12	-24	-23	-7	1	5	22
Y	-18	-24	-23	-24	-13	-19	-13	-19	-19	-19	-13	-8	0	1	9

SEQ	509	515	535	540	551	566	570	577	580	582	592	593	595	604	1081
X	24	3	0	20	-16	-20	-9	21	11	-2	21	-15	-21	18	-5
Y	9	8	11	13	11	12	16	18	19	20	20	20	18	23	10



(c) End DOI burn - Front window (g.e.t. = 99:34:26).

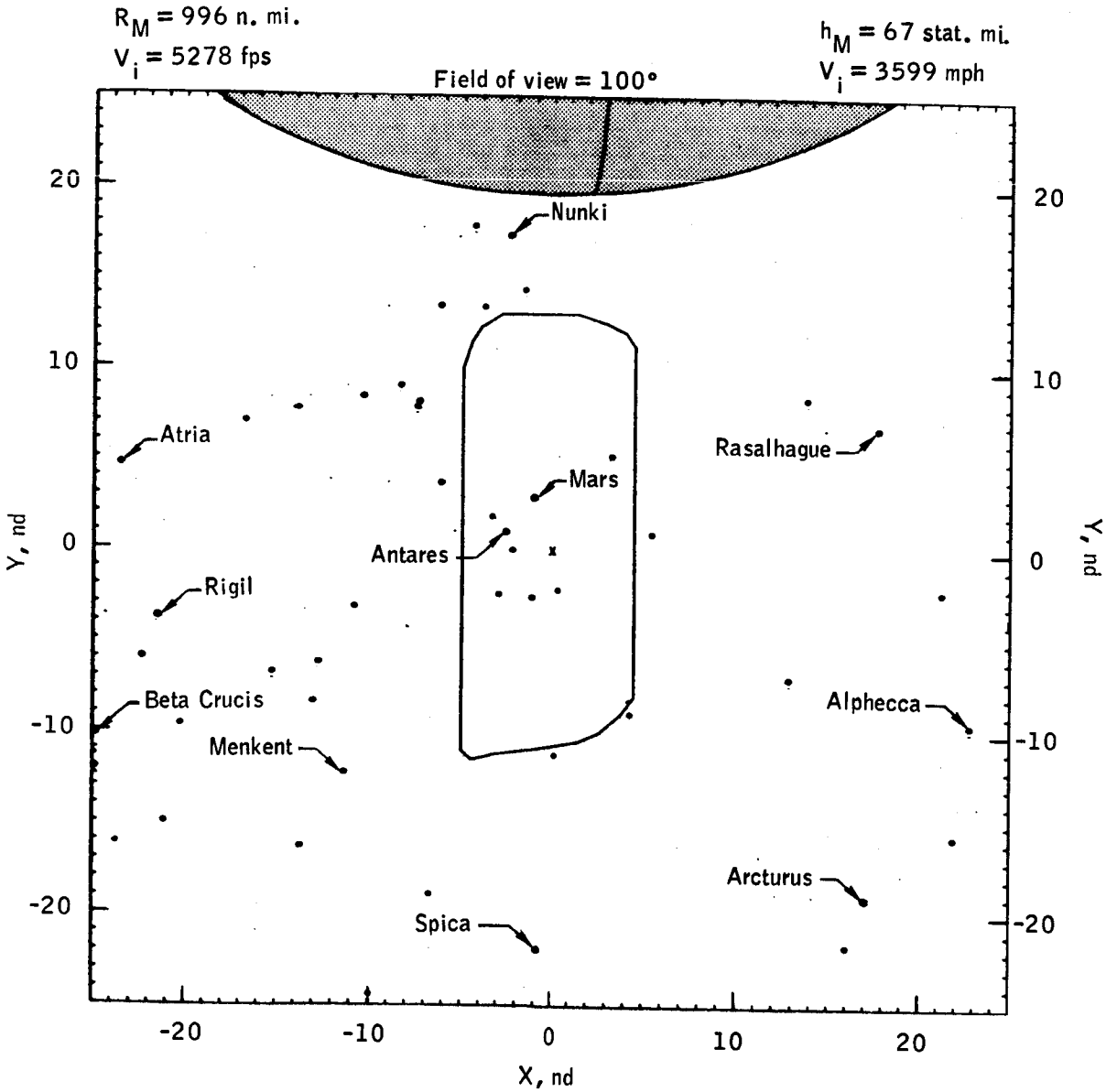
Figure 12.- Continued.

SEQ	545	561	566	569	574	589	593	595	599	610	617	621	624	641	643
X	-23	-24	-9	-21	-24	-13	0	-6	-20	16	-22	-11	17	-12	-21
Y	-15	-11	-24	-14	-10	-16	-21	-18	-9	-21	-5	-12	-19	-8	-3

SEQ	645	651	655	660	673	688	690	700	717	719	724	736	743	745	751
X	-15	21	0	-12	4	-10	22	12	-2	-1	0	-2	-2	21	-3
Y	-6	-15	-11	-6	-8	-2	-9	-6	-2	-2	-2	0	1	-2	2

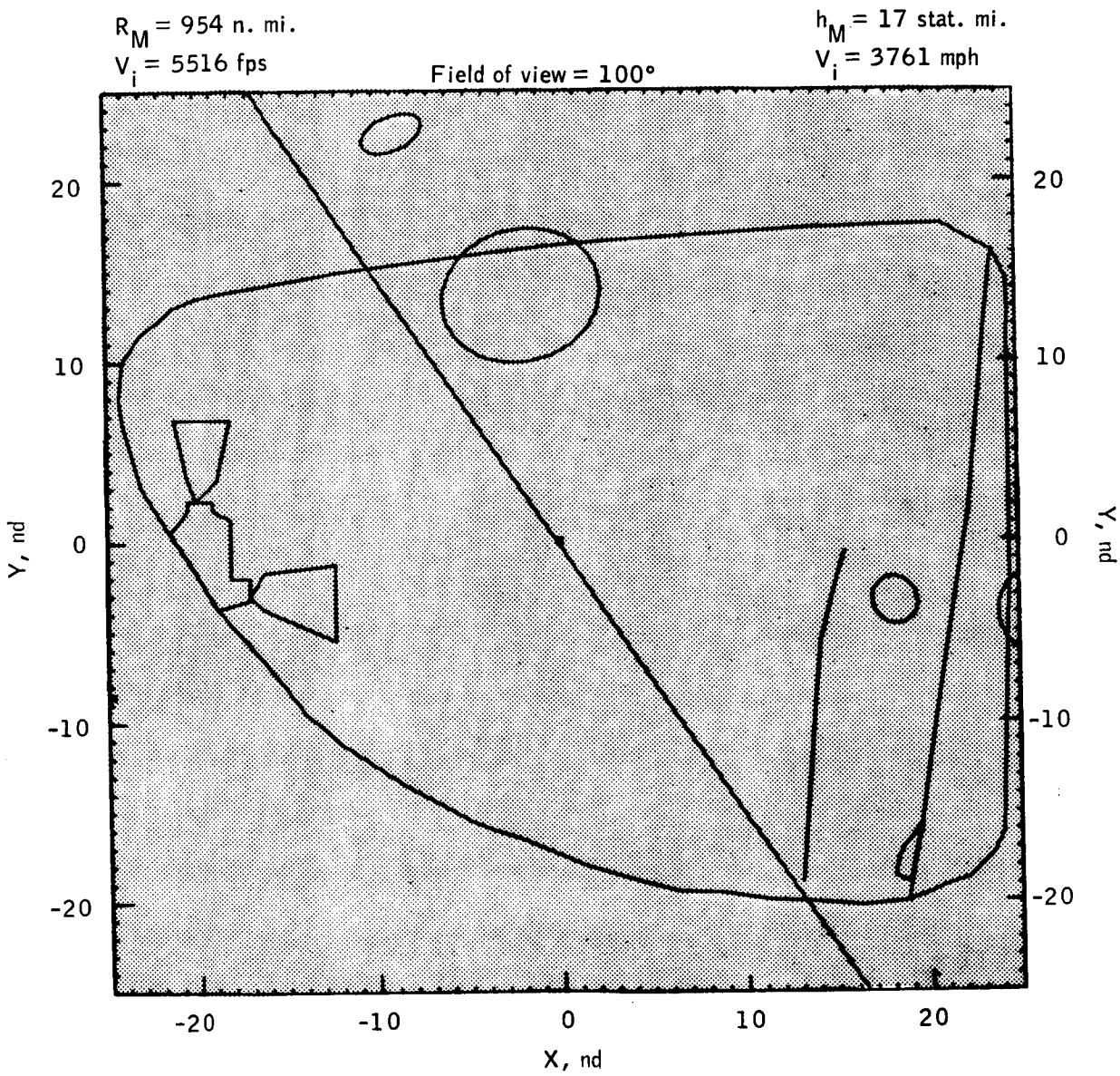
SEQ	753	757	759	770	781	789	790	793	795	797	802	803	836	841	844
X	5	-23	-6	3	-16	-7	-13	-7	17	-10	-8	13	-3	-6	-1
Y	1	4	3	5	7	8	7	9	6	8	9	8	13	13	14

SEQ	861	871	1080
X	-2	-4	-1
Y	17	17	3



(d) End DOI burn - docking window (g.e.t. = 99:34:26).

Figure 12.- Continued.



(e) Begin phasing burn - front window (g.e.t. = 100:64:21).

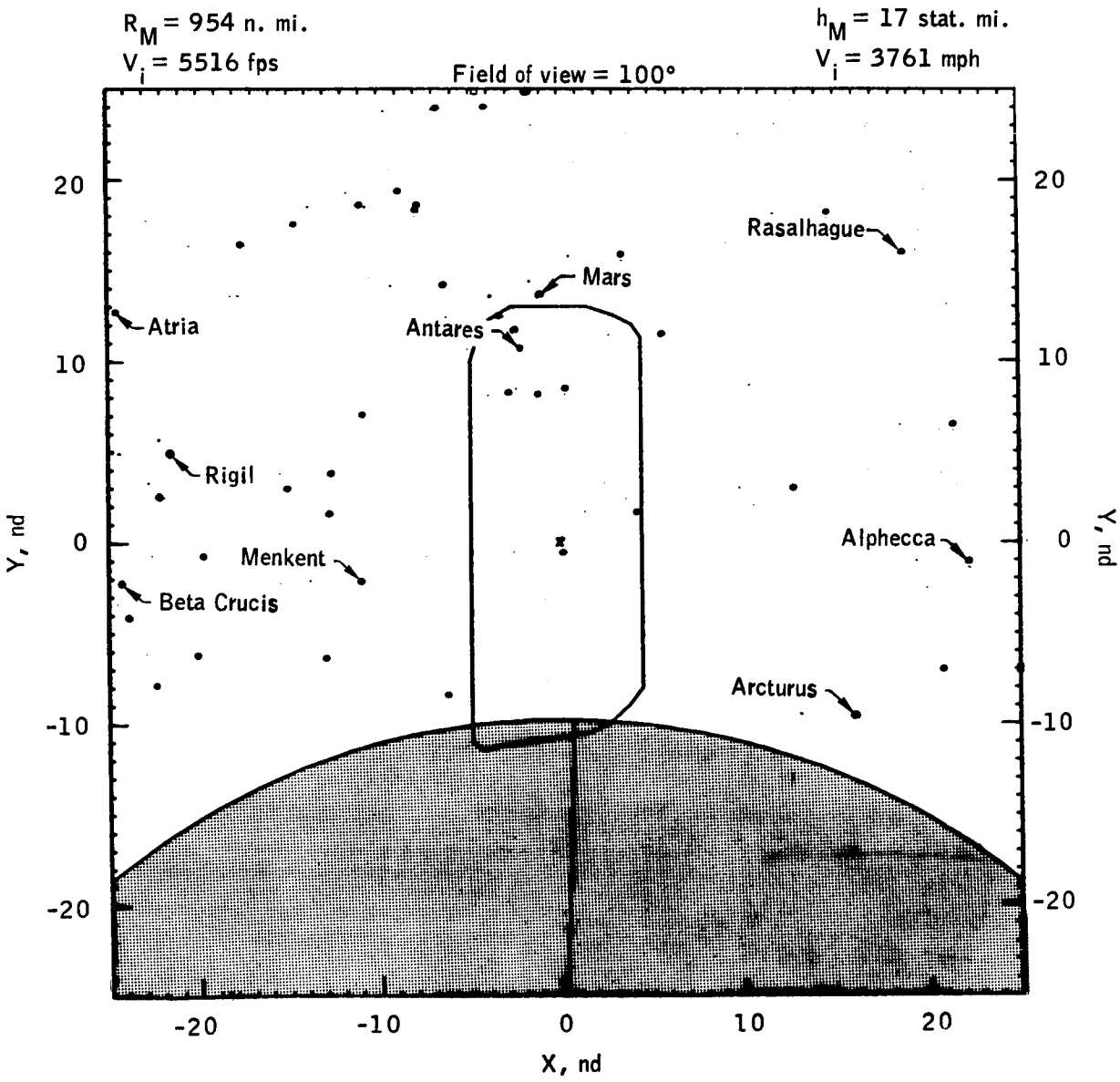
Figure 12.- Continued.

SEQ	545	561	569	574	589	595	599	617	621	624	641	643	645	651
X	-22	-23	-20	-24	-12	-6	-19	-22	-10	15	-12	-21	-15	20
Y	-7	-3	-6	-2	-6	-8	0	2	-1	-9	1	5	3	-6

SEQ	655	660	673	688	690	700	717	719	724	736	793	745	751	753
X	0	-12	4	-10	22	12	-2	-1	0	-2	-2	21	-3	5
Y	0	3	1	7	0	3	8	8	8	10	11	6	12	11

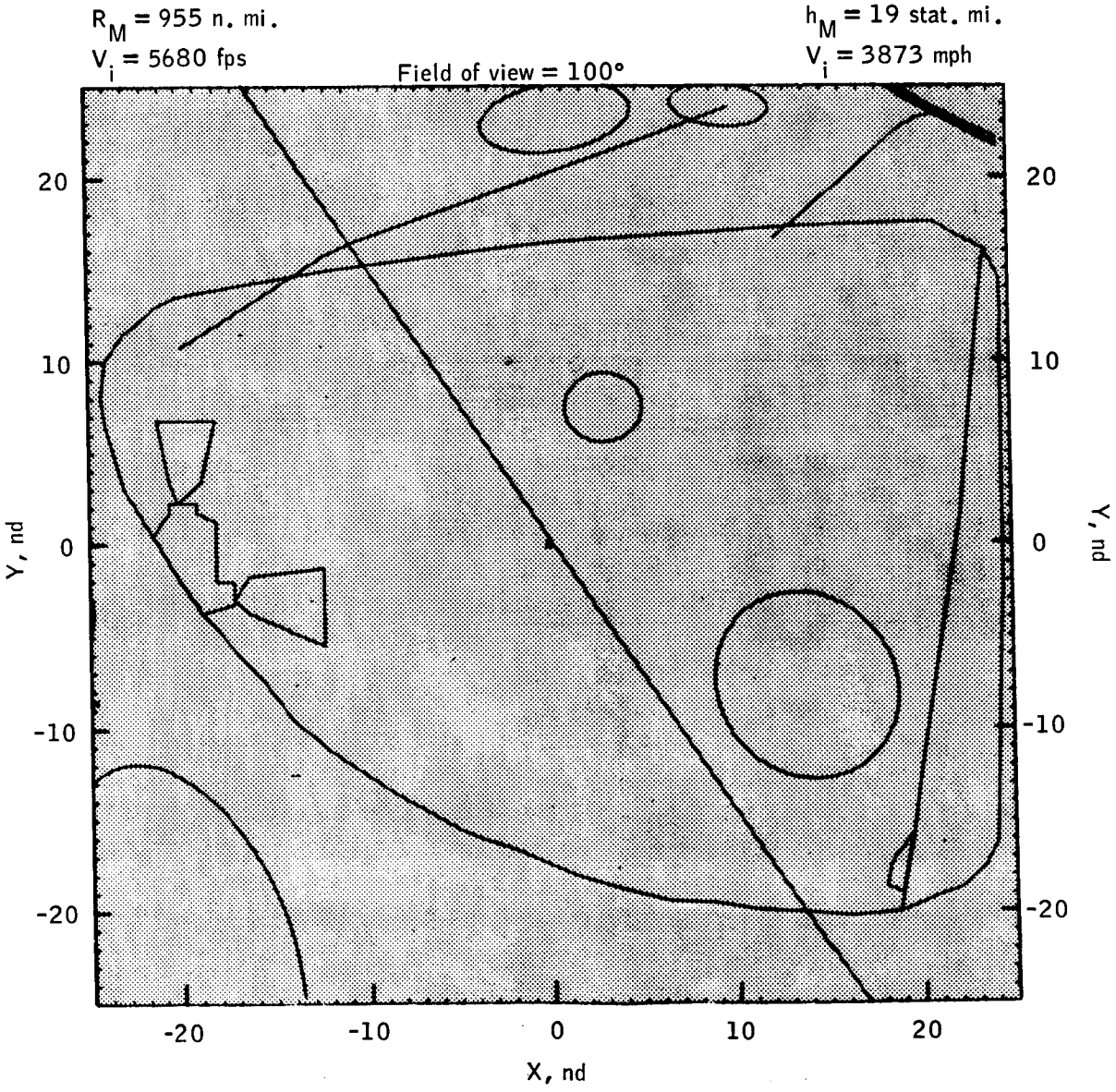
SEQ	757	759	770	781	789	790	793	795	797	802	803	836	841	844
X	-24	-6	3	-17	-7	-14	-7	18	-10	-8	14	-4	-6	-1
Y	12	14	16	16	18	17	18	16	18	19	18	24	24	25

SEQ	1080
X	-1
Y	13



(f) Begin phasing burn - docking window (g.e.t. = 100:46:21).

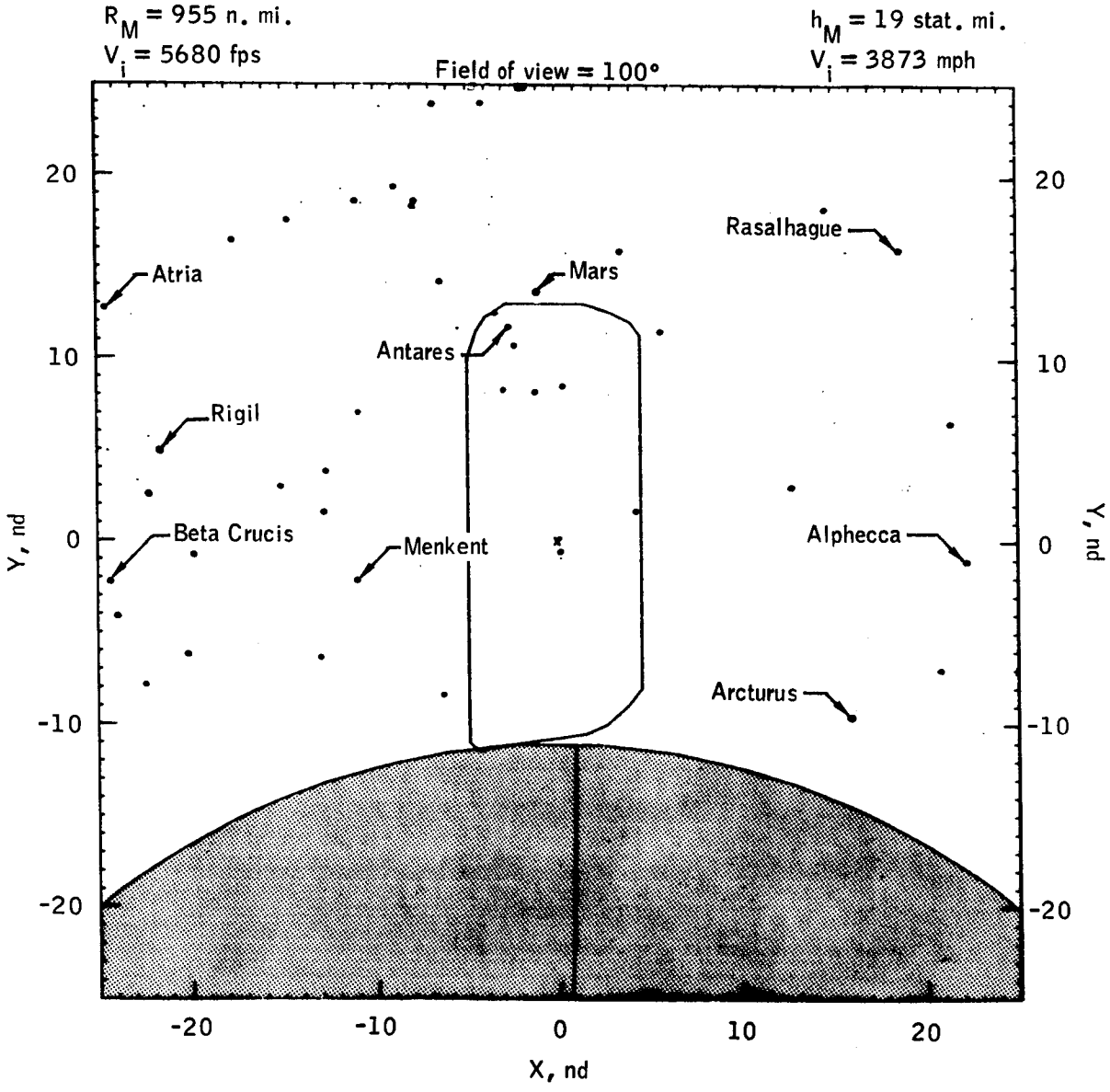
Figure 12.- Continued.



(g) End phasing burn - front window (g.e.t. = 100:47:03).

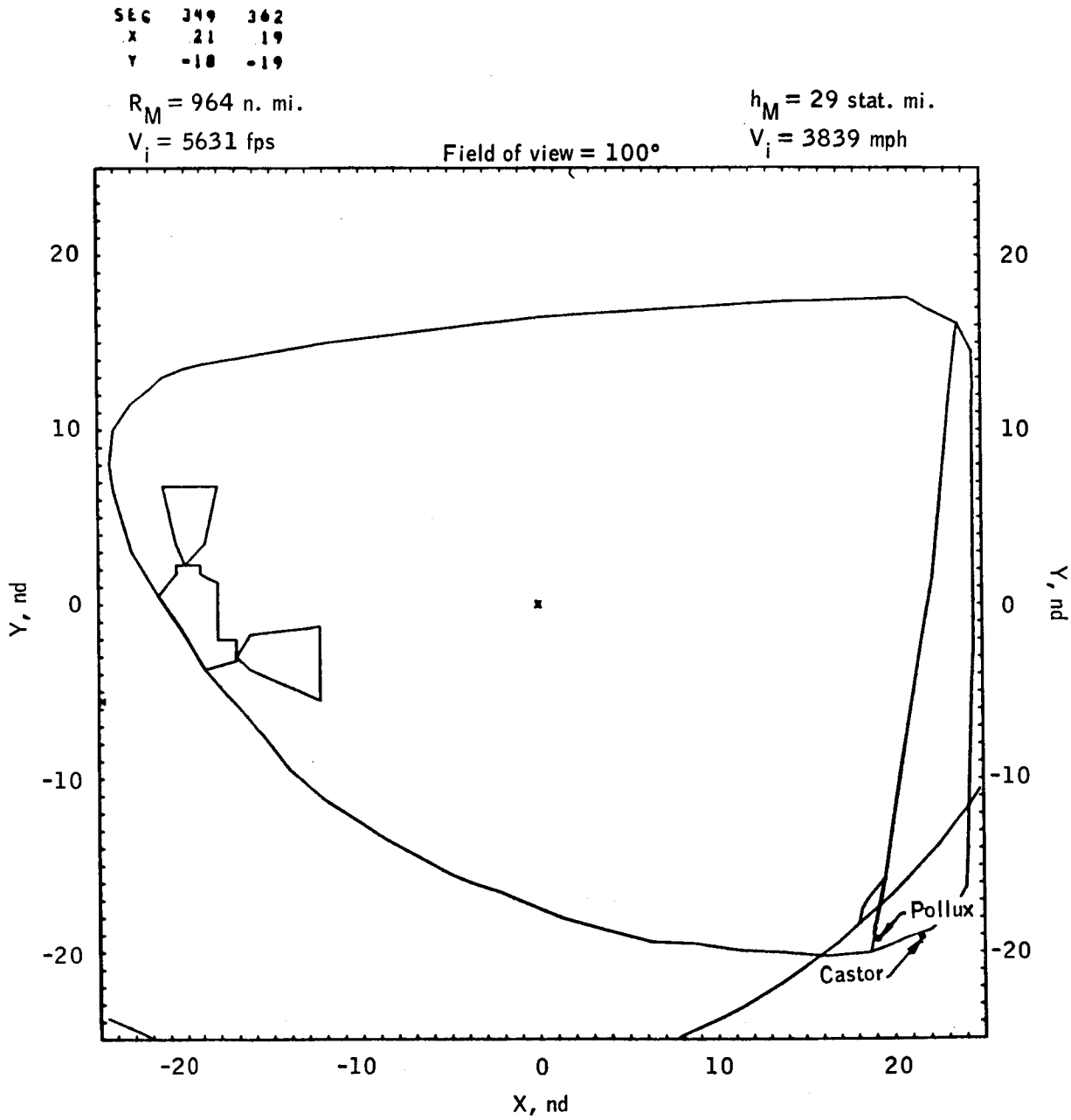
Figure 12.- Continued.

SEQ	545	561	569	574	589	595	599	617	621	624	641	643	645
X	-22	-23	-20	-24	-12	-6	-19	-22	-10	15	-12	-21	-15
Y	7	-3	-6	-2	-6	-8	0	2	-1	-9	1	5	3
SEQ	651	655	660	673	688	690	700	717	719	724	736	743	745
X	20	0	-12	4	-10	22	12	-2	-1	0	-2	-9	21
Y	-6	0	3	1	7	0	3	8	8	8	10	11	6
SEQ	751	753	757	759	770	781	789	790	793	795	797	802	803
X	-3	5	-24	-6	3	-17	-7	-14	-7	18	-10	-8	14
Y	12	11	12	14	16	16	18	17	18	16	18	19	18
SEQ	836	841	844	1080									
X	-4	-6	-1	-1									
Y	24	24	25	13									



(h) End phasing burn - docking window (g.e.t. = 100:47:03).

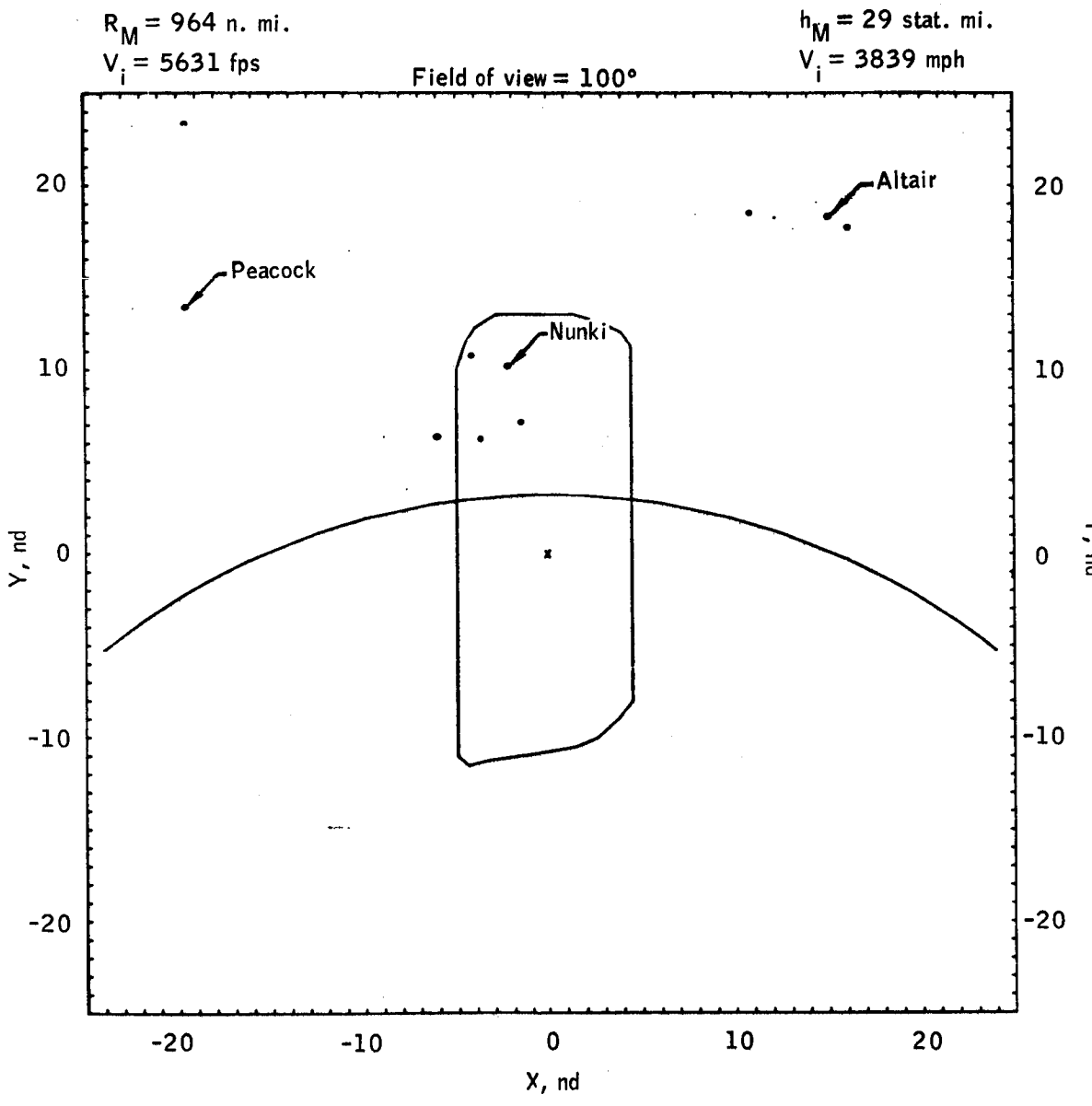
Figure 12.- Continued.



(i) Descent stage jettison (end burn)- front window (g.e.t.= 102:33:28).

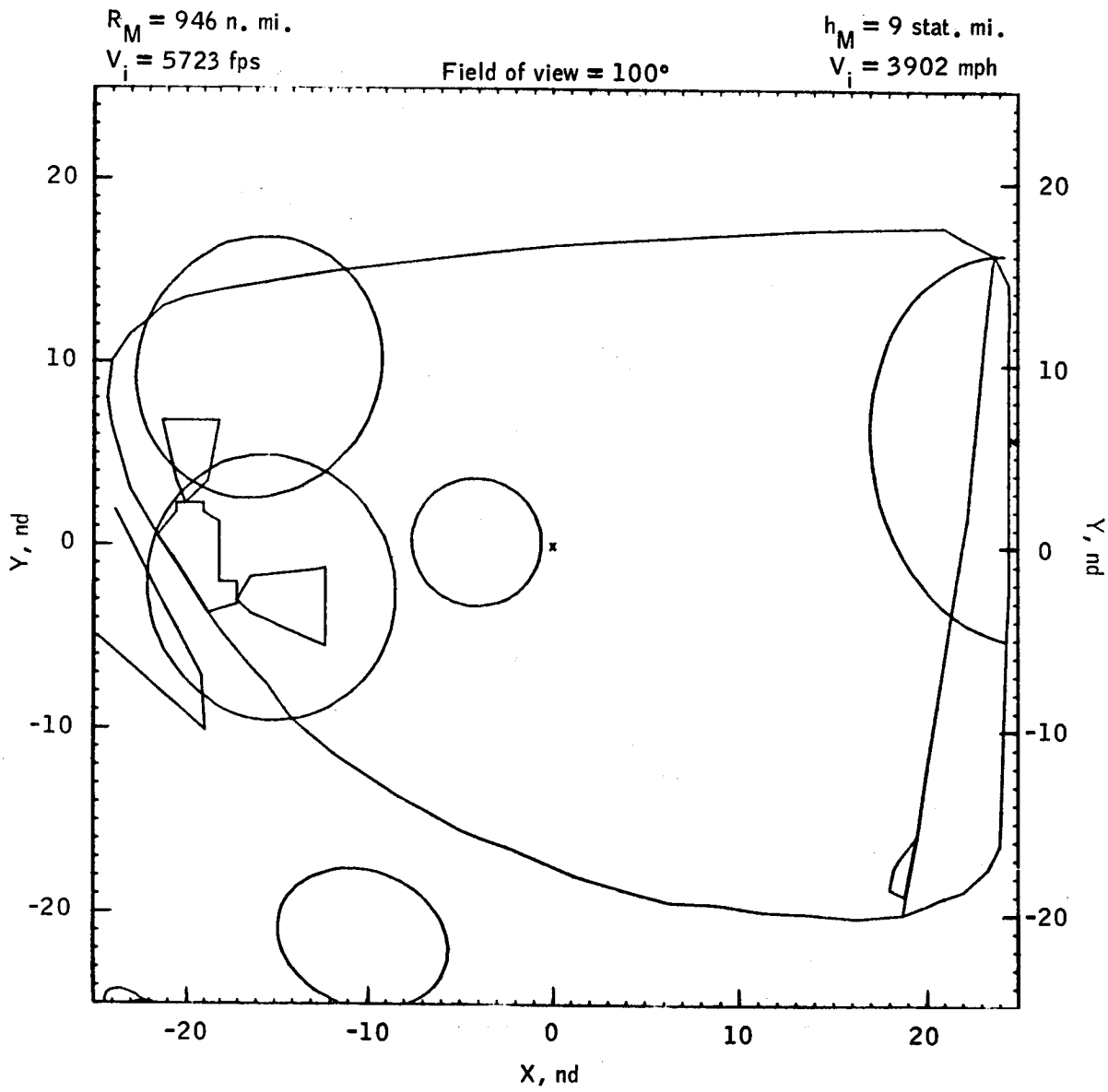
Figure 12.- Continued.

SEG	836	841	844	861	871	904	907	909	933	1001
X	-3	-6	-1	-2	-4	16	15	10	-19	-19
Y	6	6	7	10	10	17	18	18	13	23



(j) Descent stage jettison (end burn)- docking window (g.e.t. =102:33:28).

Figure 12.- Continued.

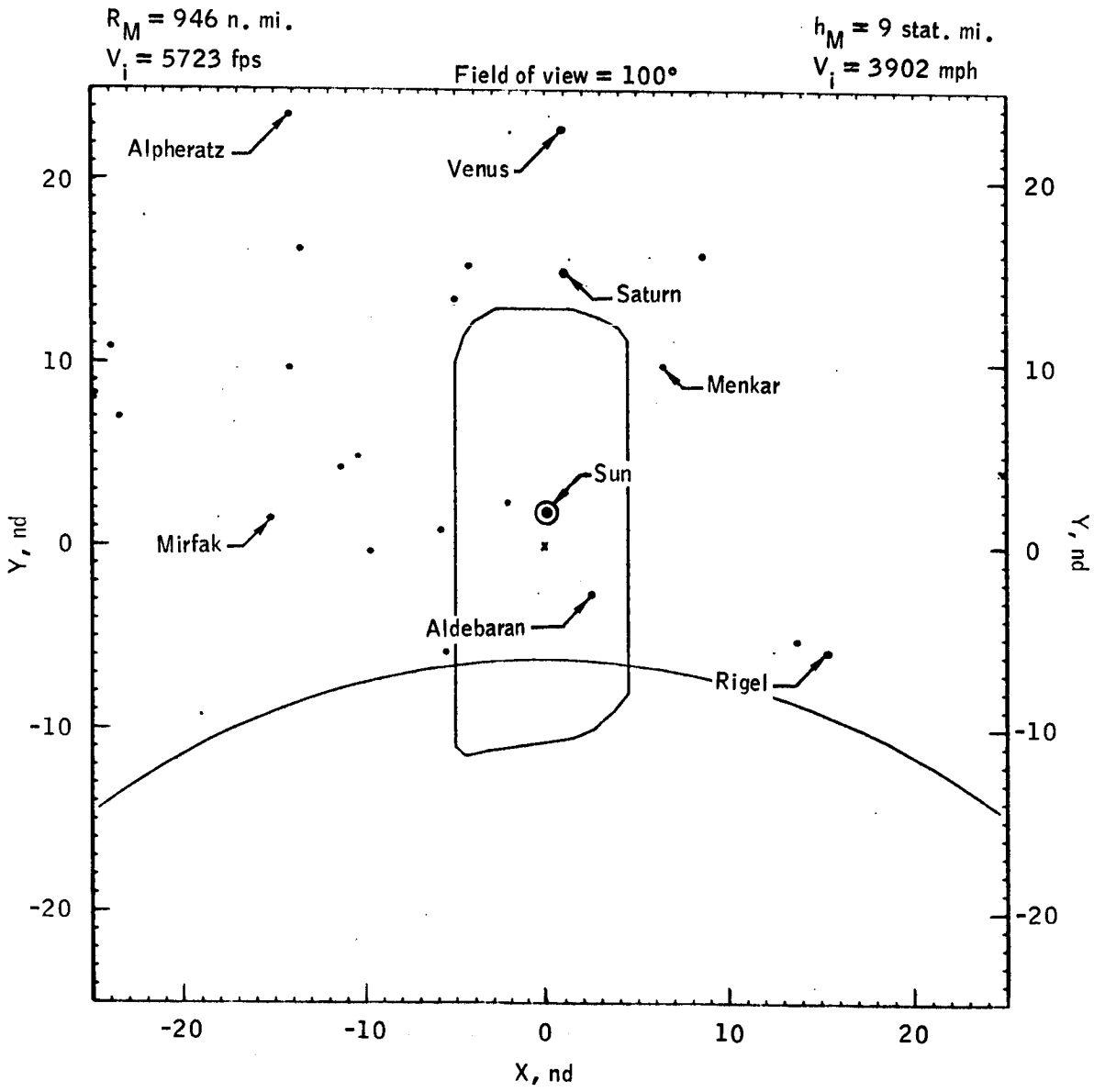


(k) Begin insertion burn - front window (g.e.t. = 102:43:18).

Figure 12.- Continued.

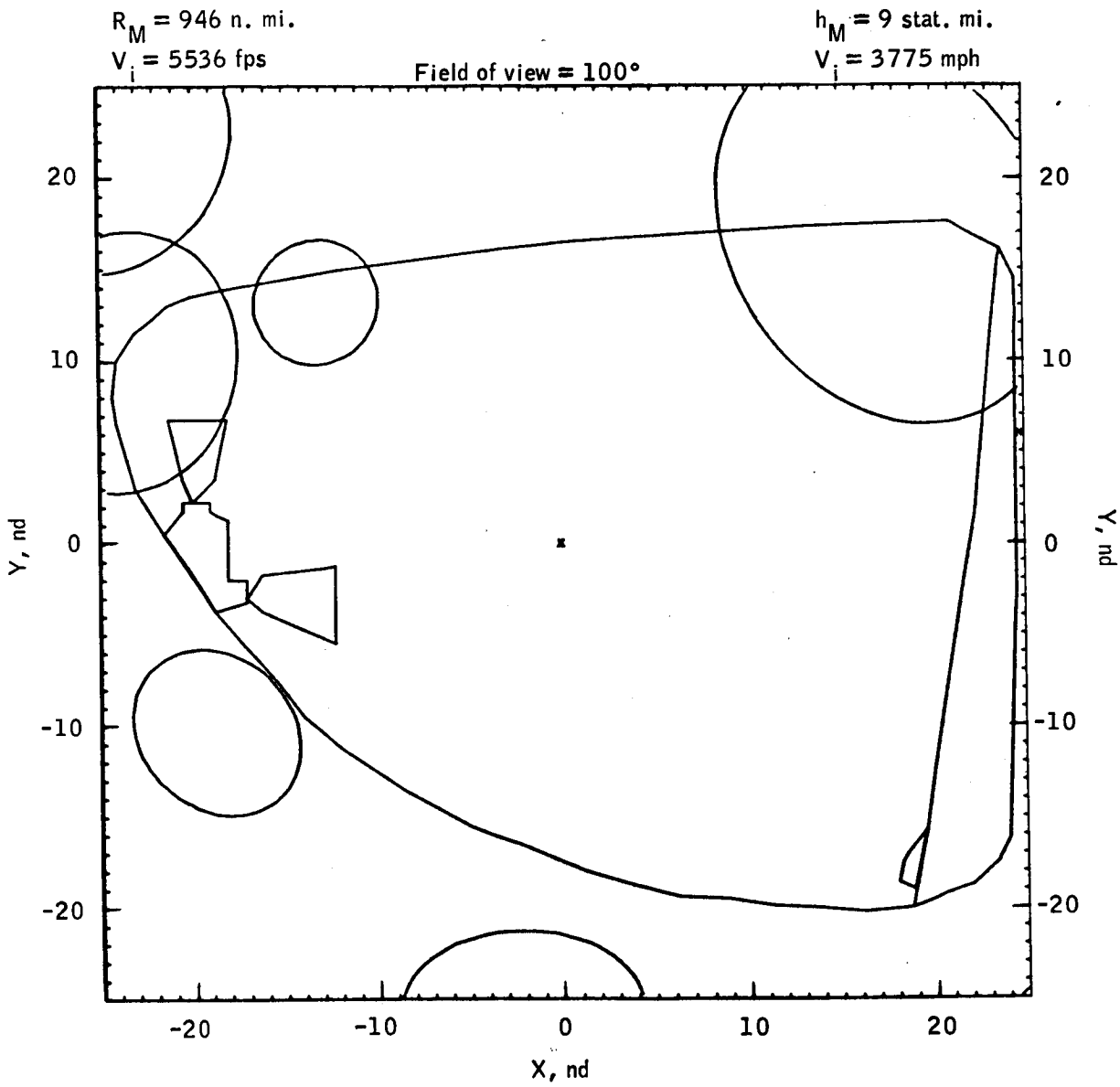
SEQ	4	22	31	41	47	63	73	75	80	108	111	112
X	-14	-23	-24	-13	-23	-4	-14	-5	8	6	-10	-11
Y	23	10	8	16	7	15	9	13	16	10	5	4

SEQ	120	144	150	151	186	205	215	221	1079	1082
X	-15	-2	-5	-9	2	-5	13	15	0	1
Y	1	2	1	0	-2	-5	-5	-5	22	15



(l) Begin insertion burn - docking window (g.e.t. = 102:43:18).

Figure 12.- Continued.

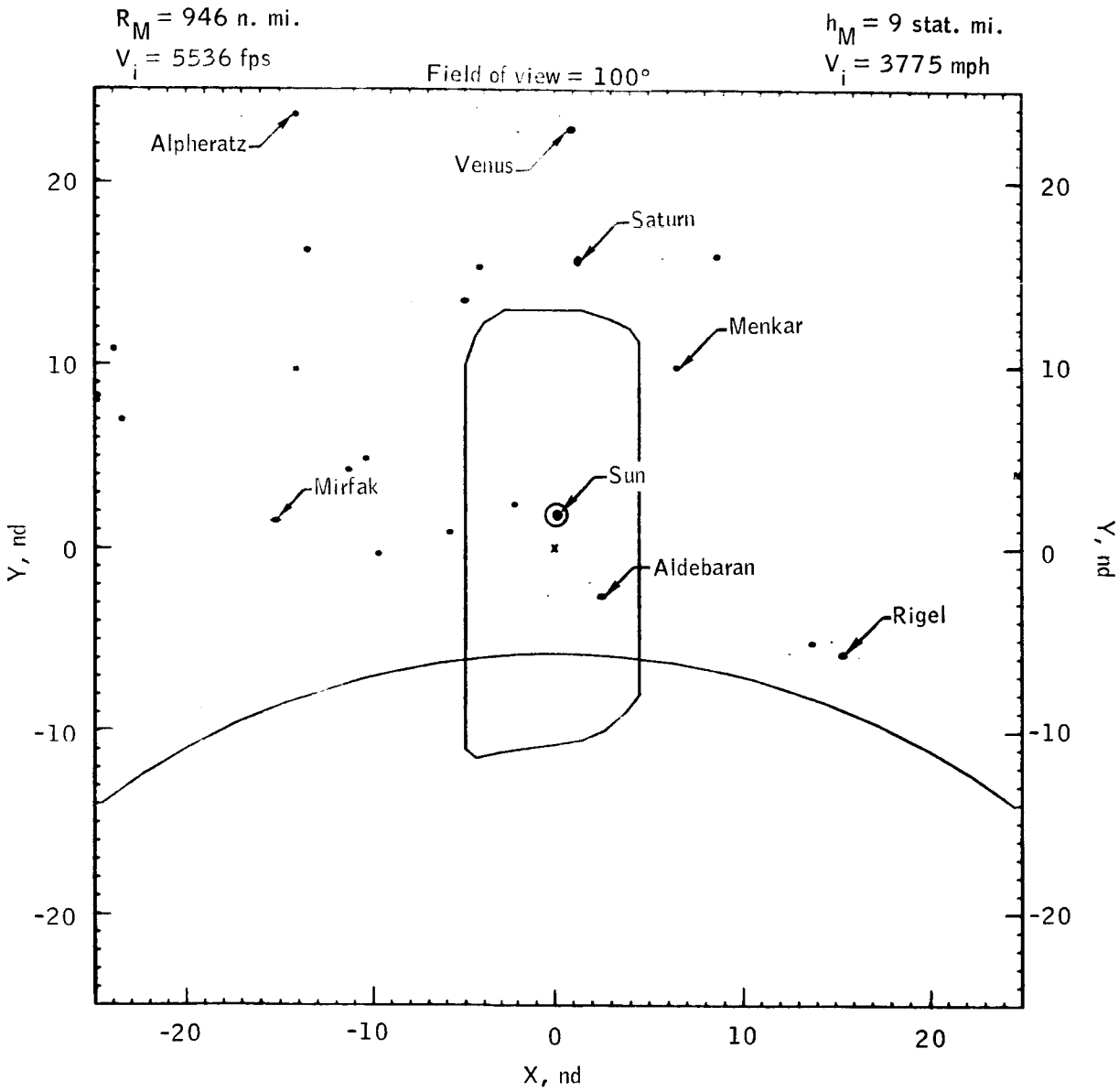


(m) End insertion burn - front window (g.e.t. = 102:43:33).

Figure 12.- Continued.

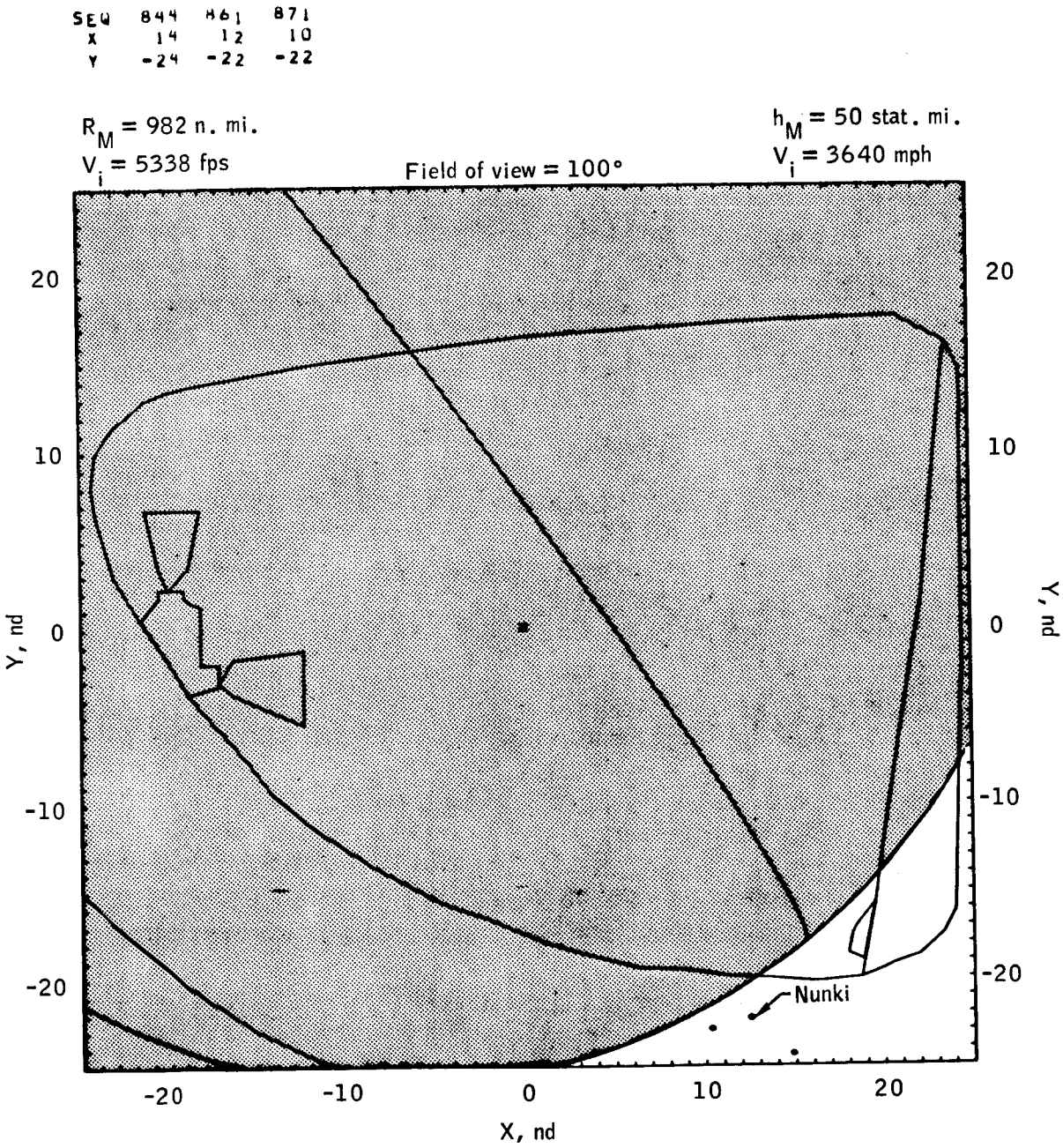
SEQ	4	22	31	41	47	63	73	75	80	108	111	112
X	-14	-23	-24	-13	-23	-4	-14	-5	8	6	-10	-11
Y	23	10	8	16	7	15	9	13	16	10	5	4

SEQ	120	144	150	151	186	215	221	1079	1082
X	-15	-2	-5	-9	2	13	15	0	1
Y	1	2	1	0	-2	-5	-5	22	15



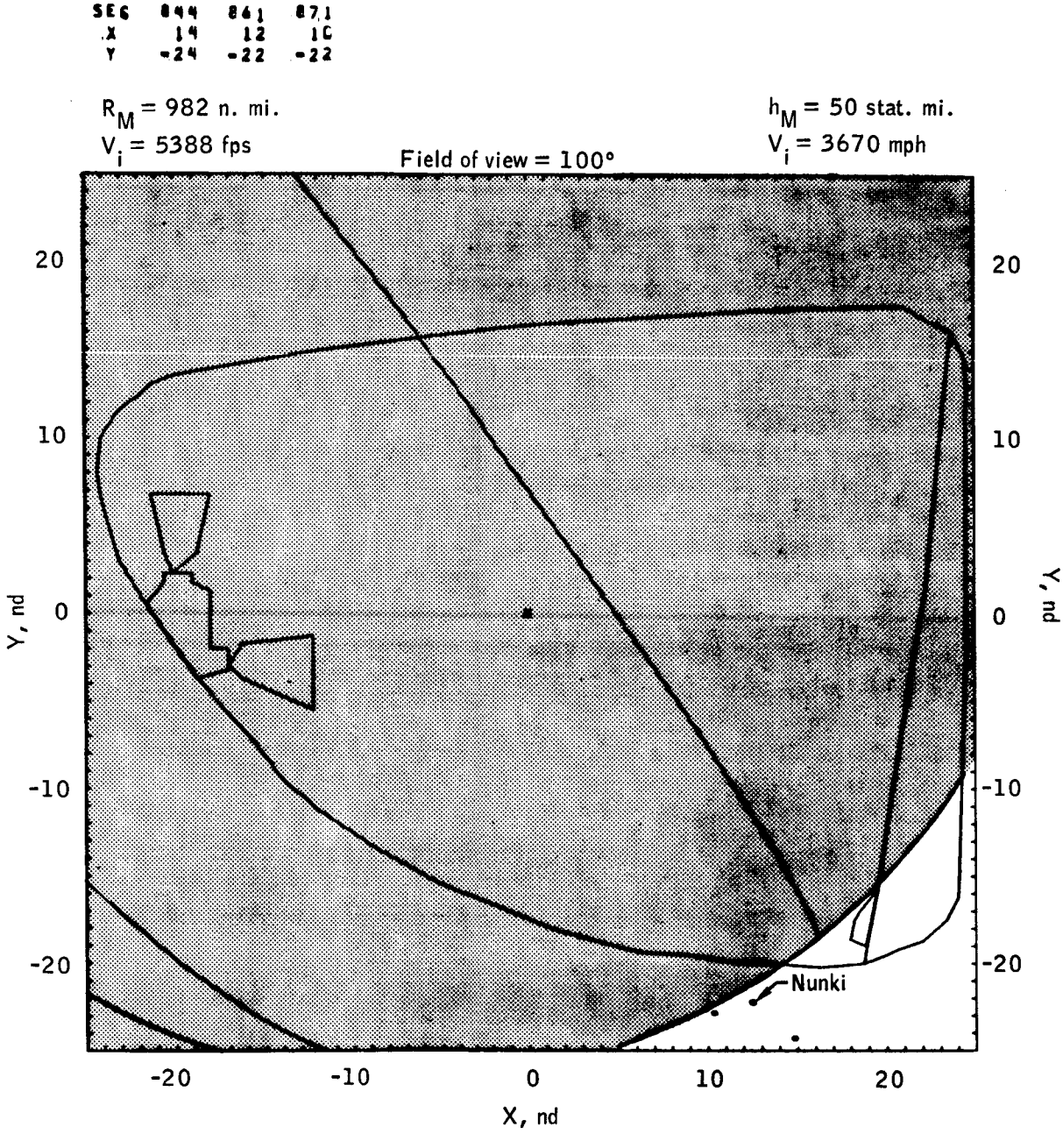
(n) End insertion burn - docking window (g.e.t. = 102:43:33).

Figure 12. - Continued.



(o) Begin CSI burn - front window (g.e.t. = 103:33:46).

Figure 12.- Continued.



(p) End CSI burn - front window (g.e.t. = 103:34:18).

Figure 12.- Continued.

SEQ	186	205	207	215	221	222	230	231	233	237	239	245	246
X	-2	5	10	-13	-15	11	-8	3	-21	-11	-20	-14	-12
Y	1	4	5	3	4	6	6	7	5	7	5	7	7

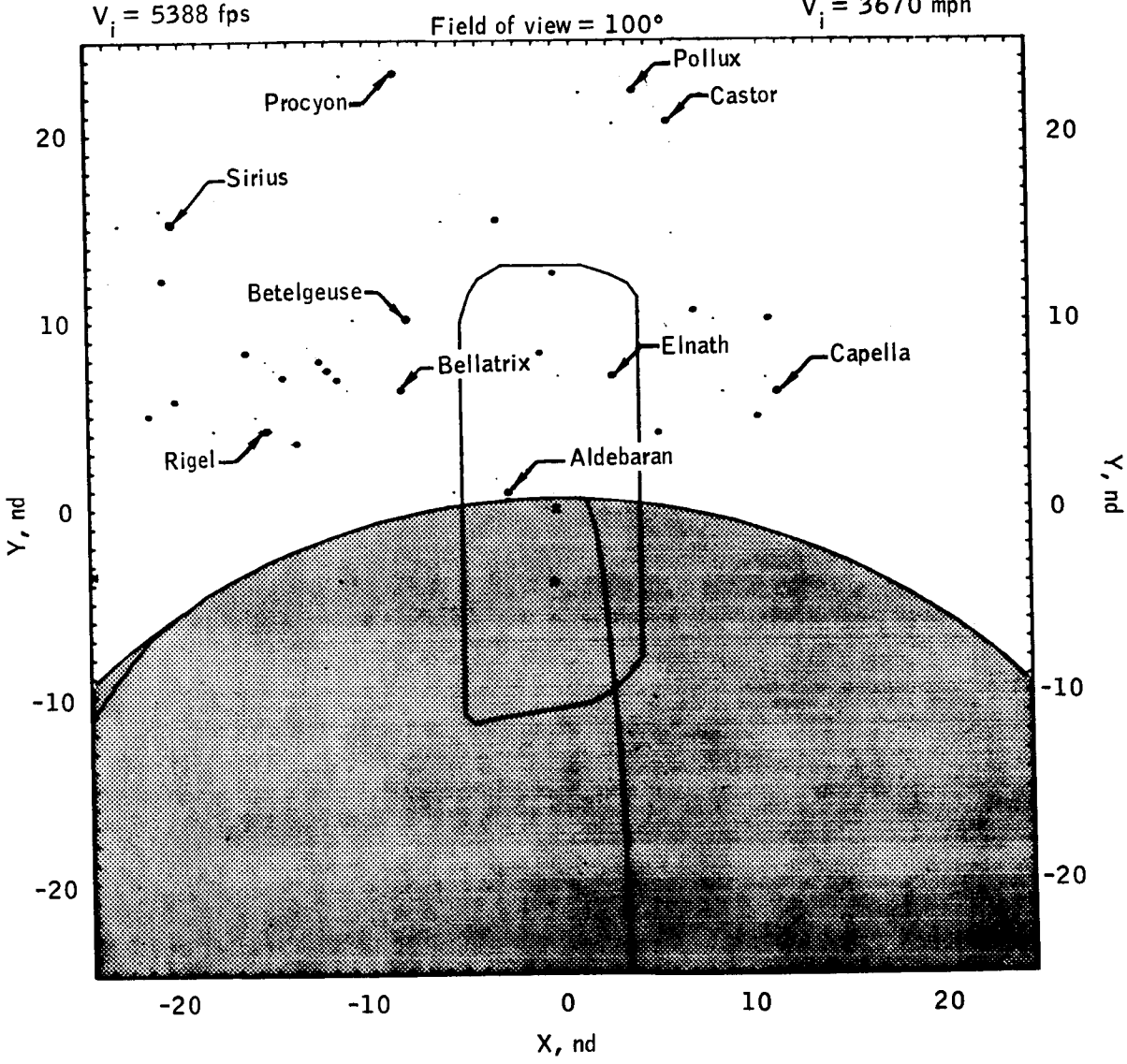
SEQ	248	252	256	265	270	271	281	290	301	308	349	356	362
X	0	-12	-16	-7	11	7	0	-20	-3	-20	6	-8	4
Y	8	8	8	10	10	10	12	12	15	15	20	23	22

R_M = 982 n. mi.

V_i = 5388 fps

h_M = 50 stat. mi.

V_i = 3670 mph



(q) End CSI burn - docking window (g.e.t. = 103:34:18).

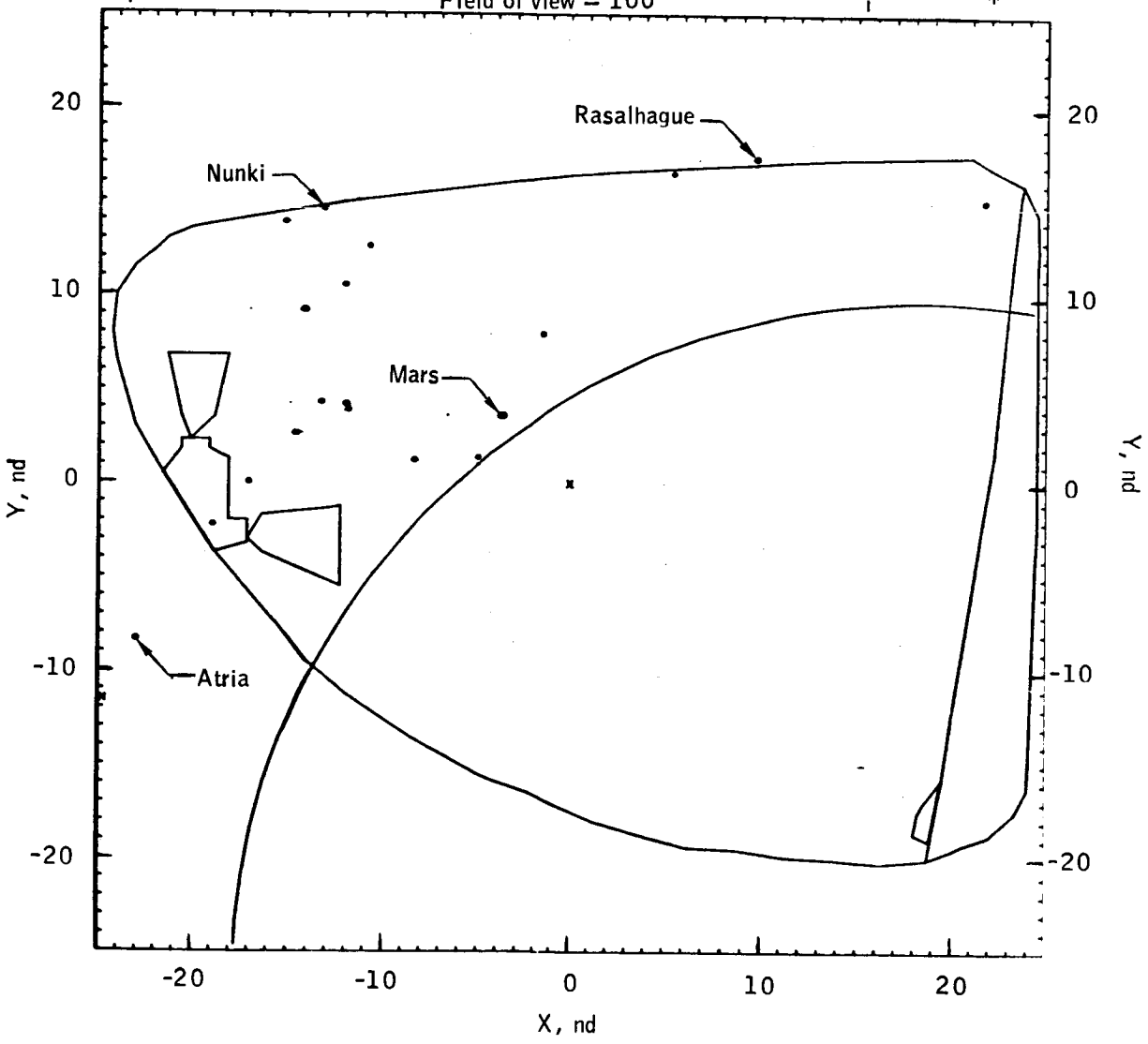
Figure 12.- Continued.

SEQ	751	755	757	759	770	781	789	790	793	795
X	-4	21	-22	-8	-1	-18	-11	-16	-11	9
Y	1	15	-8	1	8	-2	4	0	4	17

SEQ	797	802	803	836	841	844	861	871	1080
X	-14	-13	5	-12	-14	-10	-13	-15	-3
Y	2	4	16	10	9	12	14	14	3

R_M = 981 n. mi.
V_i = 5391 fps

h_M = 49 stat. mi.
V_i = 3676 mph



(r) Begin CDH burn - front window (g.e.t. = 104:31:42).

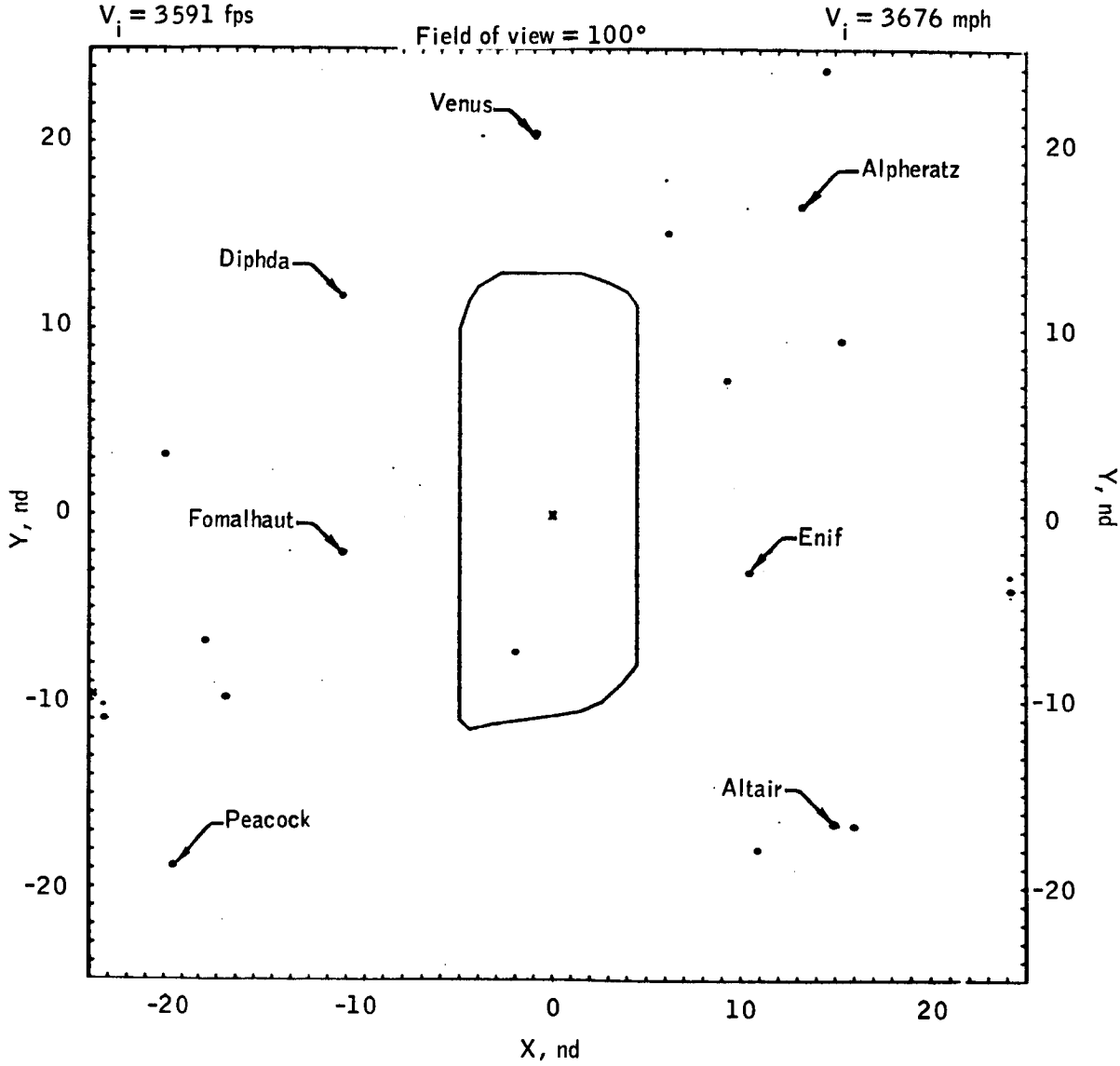
Figure 12.- Continued.

SEQ	4	7	15	25	41	904	907	909	933	950
X	13	6	-20	-11	14	16	14	10	-20	24
Y	16	15	3	11	24	-16	-16	-17	-18	-3

SEQ	984	990	1001	1010	1028	1041	1044	1046	1079
X	10	-1	-17	-24	-18	-11	15	9	0
Y	-2	-7	-9	-10	-6	-1	9	7	20

R_M = 981 n. mi.
V_i = 3591 fps

h_M = 49 stat. mi.
V_i = 3676 mph

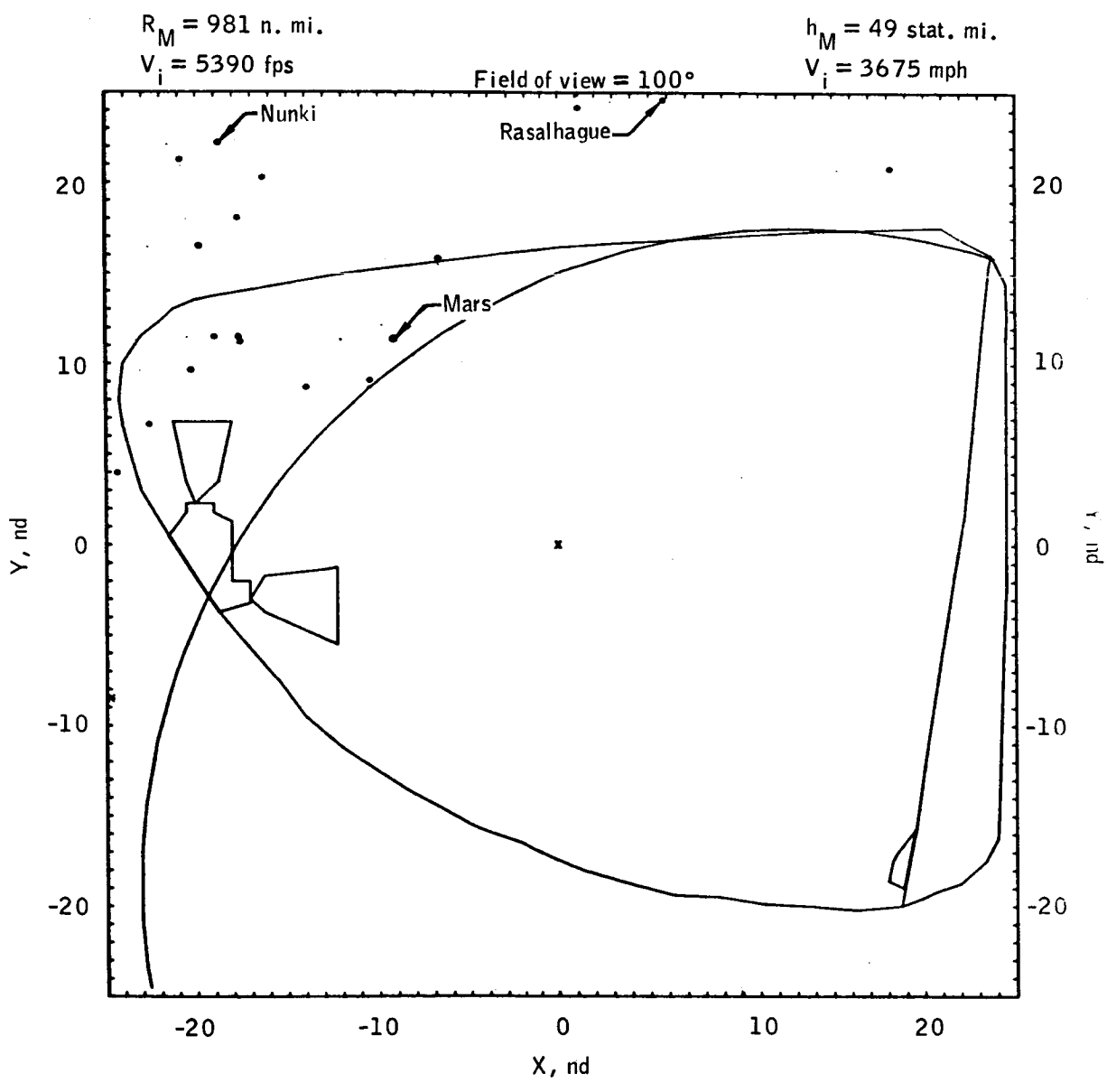


(s) Begin CDH burn - docking window (g.e.t. = 104:31:42).

Figure 12.- Continued.

SEQ	751	755	759	770	781	789	790	793	795
X	-10	18	-13	-6	-24	-17	-22	-17	5
Y	9	20	8	15	4	11	6	11	24

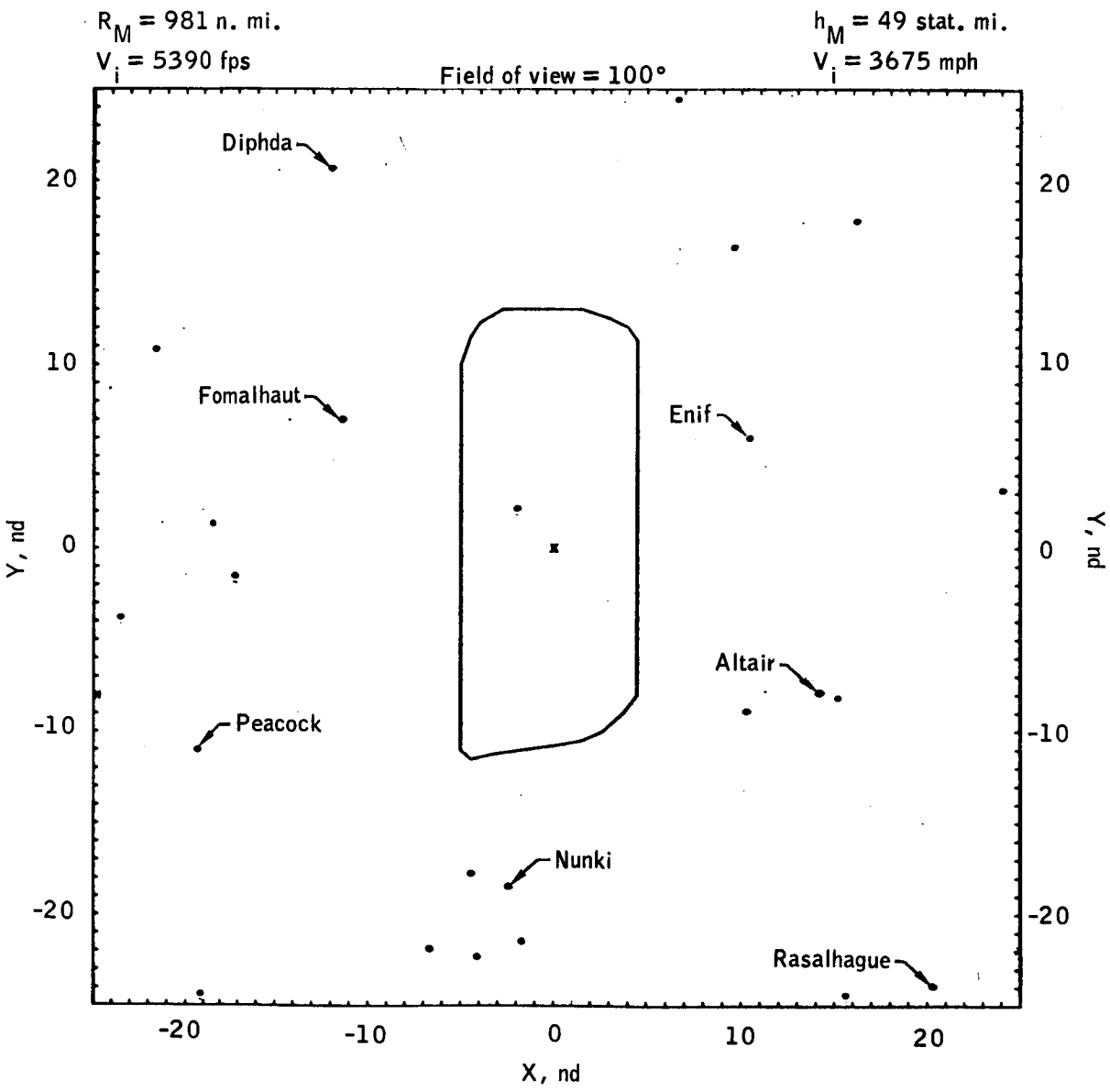
SEQ	797	802	803	836	841	844	861	871	1080
X	-20	-18	1	-17	-19	-16	-18	-20	-9
Y	9	11	24	18	16	20	22	21	11



(t) End of CDH burn - front window (g.e.t. = 104:31:45).

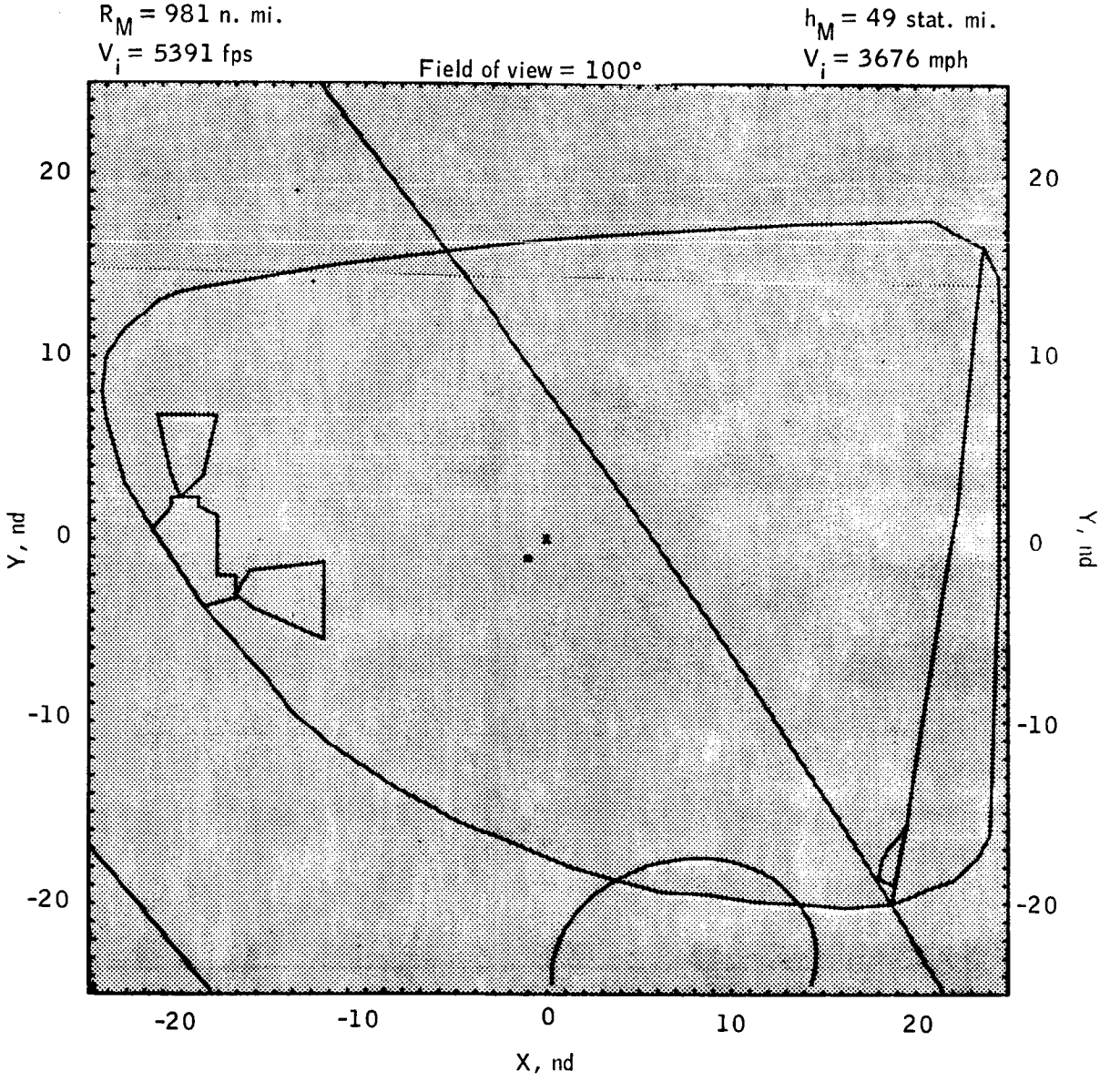
Figure 12.- Continued.

SEQ	7	15	25	781	795	803	836	841	844	861	871	904
X	6	-21	-11	-19	20	15	-4	-6	-1	-2	-4	15
Y	24	10	20	-24	-23	-24	-22	-21	-21	-18	-17	-8
SEQ	907	909	933	950	984	990	1001	1010	1028	1041	1044	1046
X	14	10	-19	24	10	-1	-17	-23	-18	-11	16	9
Y	-7	-8	-10	3	6	2	-1	-3	1	7	17	16



(u) End of CDH burn - docking window (g.e.t. = 104:31:45).

Figure 12.- Continued.



(v) Begin TPI burn - front window (g.e.t. = 105:08:57).

Figure 12.- Continued.

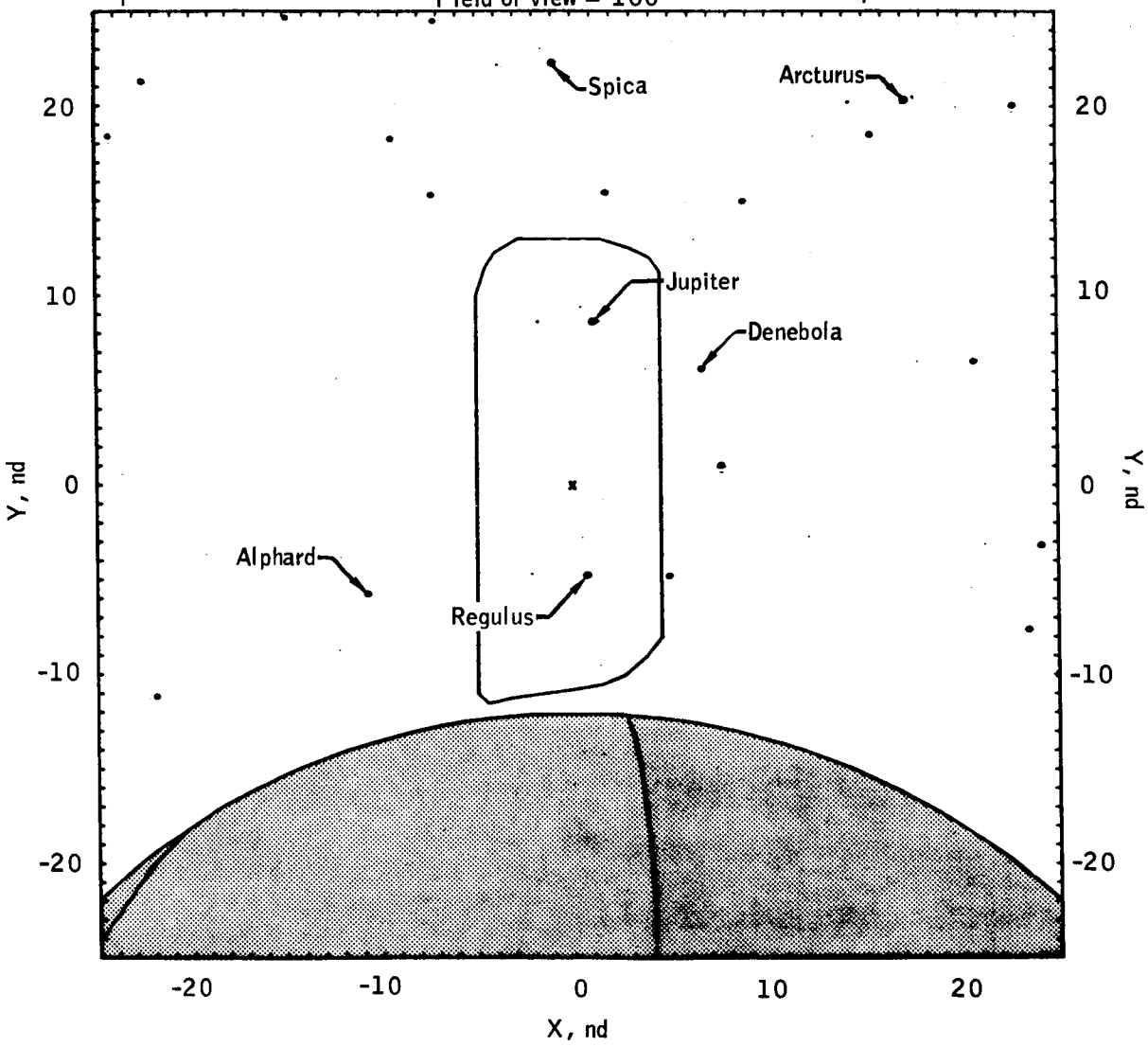
SEQ	377	440	473	480	507	515	535	540	545	551	566	569
X	-21	-10	0	4	23	7	6	24	-24	-7	-9	-22
Y	-11	-5	-4	-4	-7	1	6	-3	18	15	18	21

SEQ	570	580	582	589	593	595	610	624	651	1081
X	1	20	8	-14	0	-7	15	17	22	1
Y	15	6	15	24	22	24	18	20	20	8

R_M = 981 n. mi.
V_i = 5391 fps

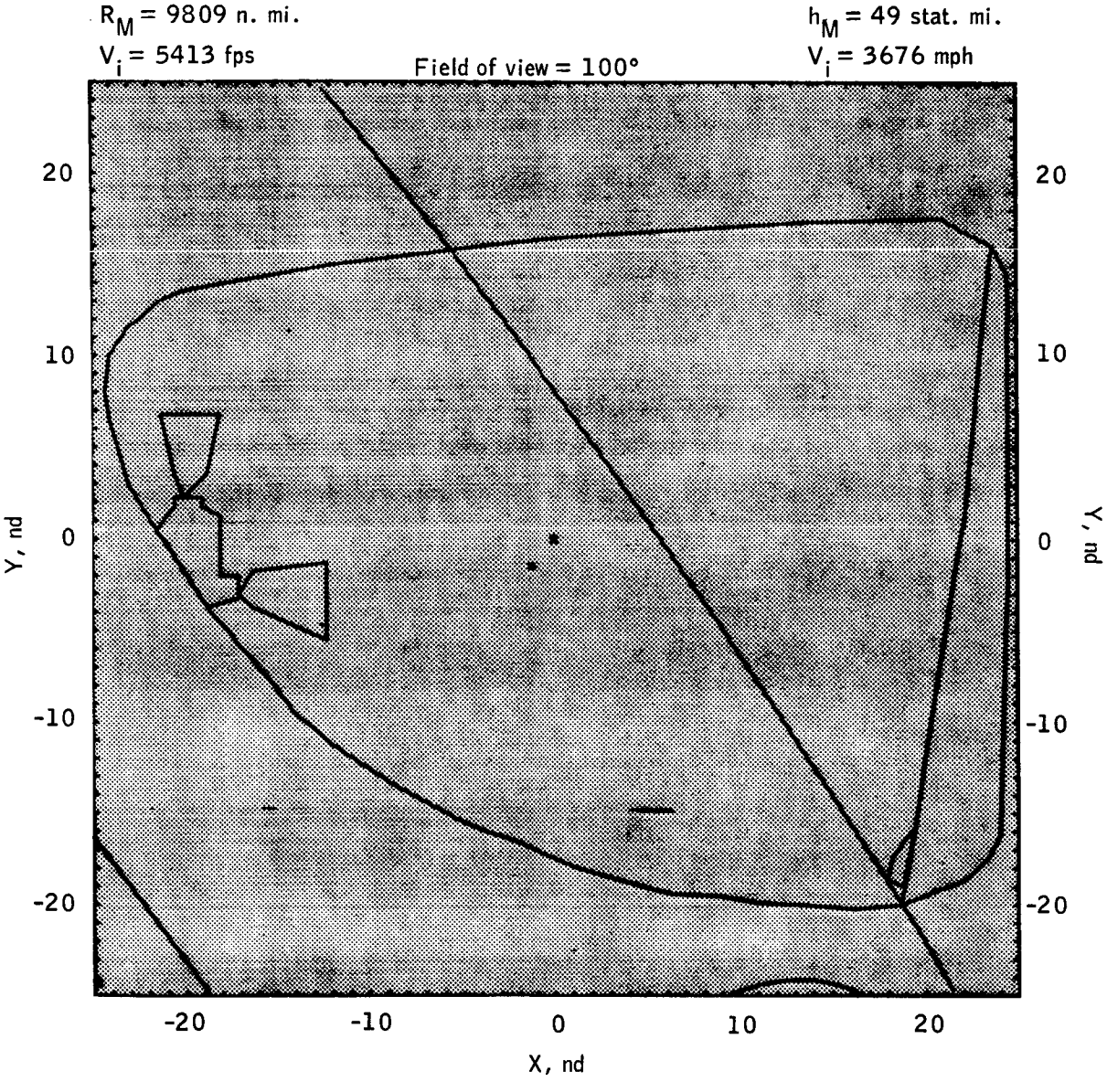
h_M = 49 stat. mi.
V_i = 3676 mph

Field of view = 100°



(w) Begin TPI burn - docking window (g.e.t. = 105:08:57).

Figure 12.- Continued.



(x) End TPI burn - front window (g.e.t. = 105:09:13).

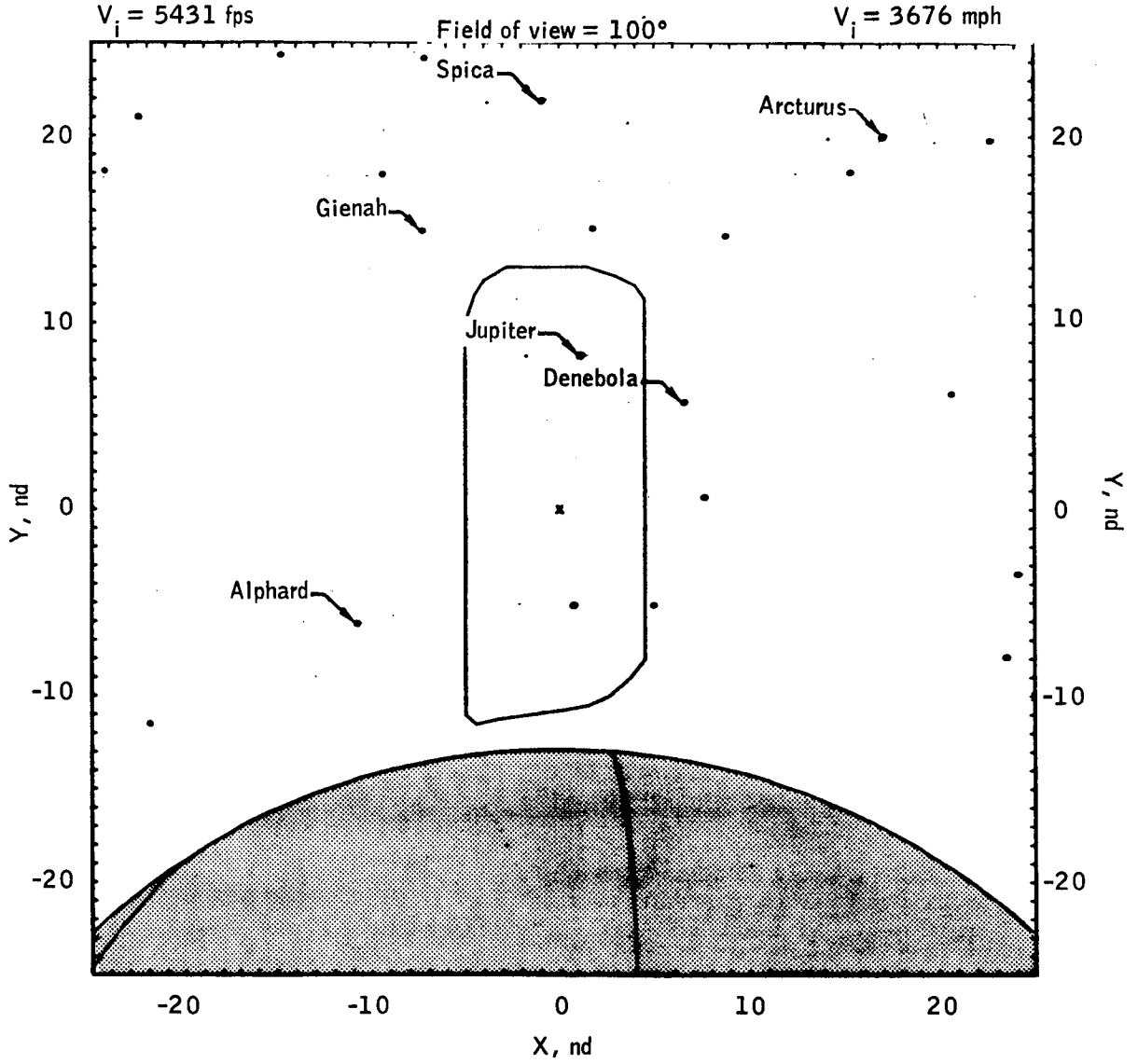
Figure 12.- Continued.

SEQ	377	440	473	480	507	515	535	540	545	551	566	569
X	-21	-10	0	4	23	7	6	24	-24	-7	-9	-22
Y	-11	-5	-4	-4	-7	0	5	-3	18	15	18	21

SEQ	570	580	582	589	593	595	610	624	651	1081
X	1	20	8	-14	0	-7	15	17	22	1
Y	15	6	14	24	22	24	18	20	19	8

R_M = 9809 n. mi.
V_i = 5431 fps

h_M = 49 stat. mi.
V_i = 3676 mph



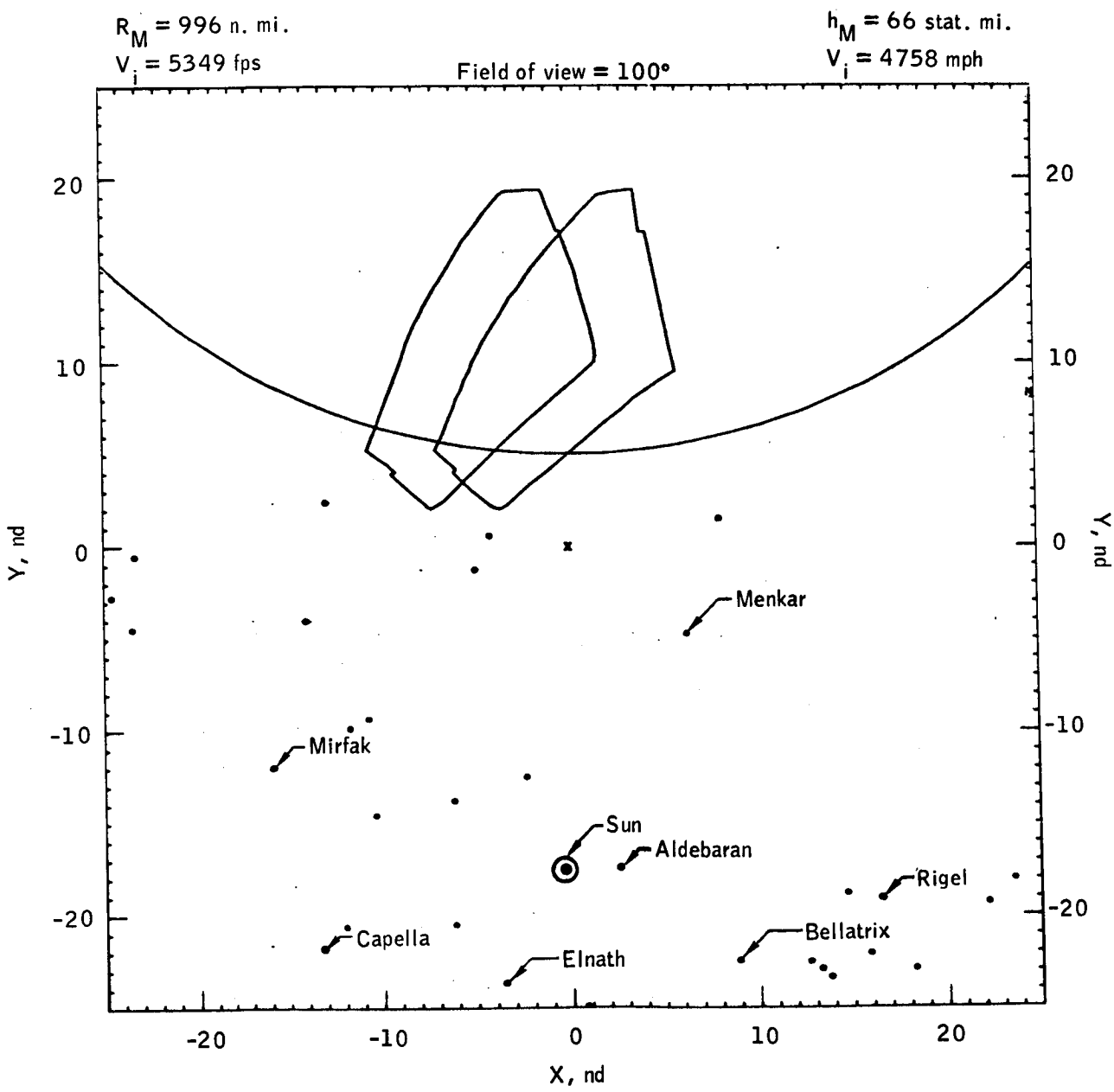
(y) End of TPI burn - docking window (g.e.t. = 105:09:13).

Figure 12.- Concluded.

TRANSEARTH INJECTION BURN

SEQ	22	31	41	47	63	73	75	80	108	111	112	120	144	150	151	186
X	-23	-24	-12	-23	-4	-13	-4	8	6	-10	-11	-15	-2	-6	-10	2
Y	0	-2	2	-4	0	-3	-1	1	-4	-9	-9	-11	-12	-13	-14	-17

SEQ	205	207	215	221	222	230	231	233	237	239	245	246	248	252	256
X	-6	-11	14	16	-13	8	-3	23	12	22	15	13	0	13	18
Y	-20	-20	-18	-18	-21	-22	-23	-17	-22	-19	-21	-22	-24	-23	-22

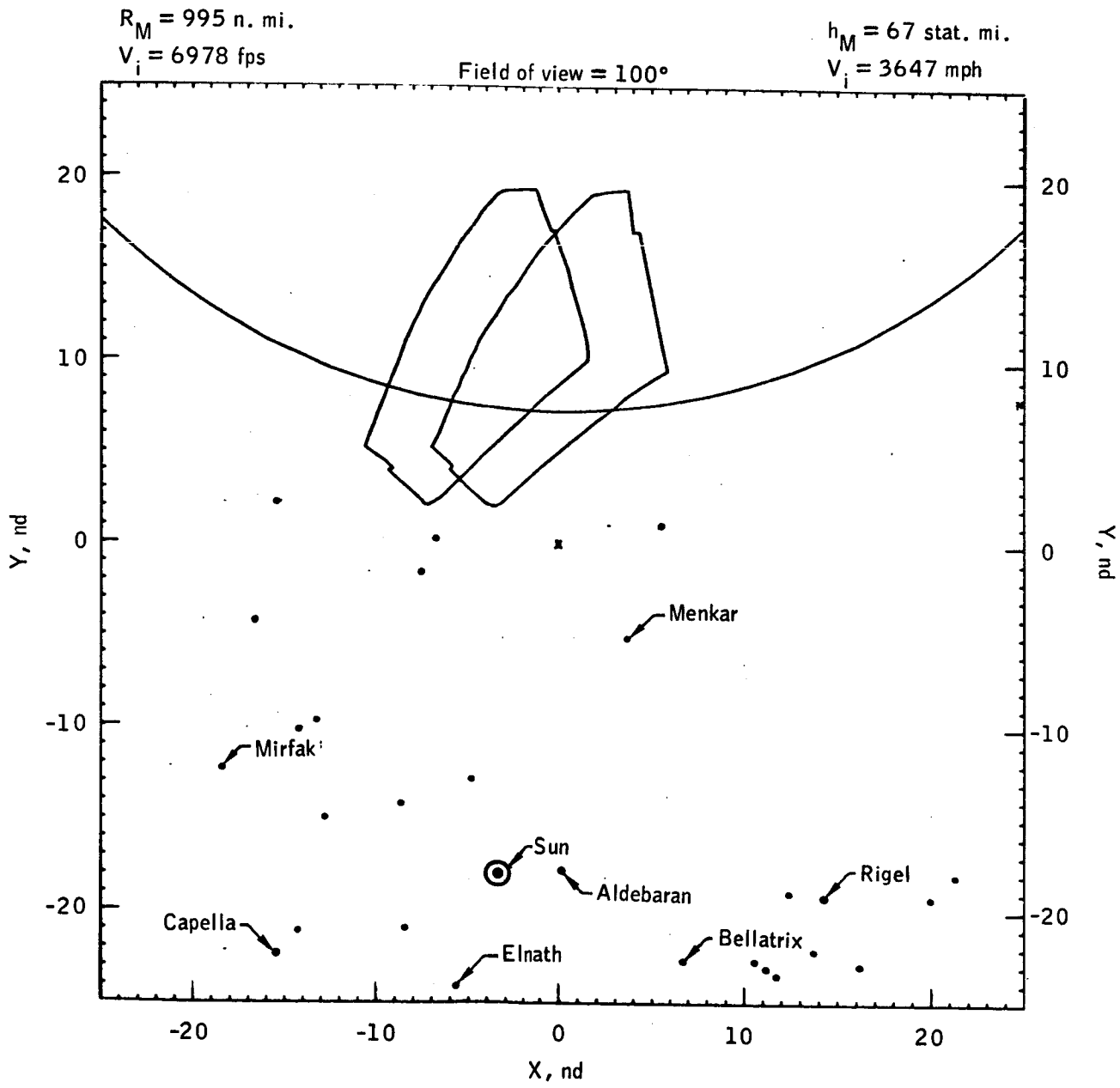


(a) Begin TEI burn (g.e.t. = 137:20:22.4).

Figure 13.- Transearth injection burn.

SEQ	41	63	73	75	80	108	111	112	120	144	150	151	186	205
X	-15	-6	-16	-7	5	3	-13	-14	-18	-4	-8	-12	0	-8
Y	2	0	-4	-1	1	-4	-9	-10	-12	-12	-14	-14	-17	-20

SEQ	207	215	221	222	230	231	233	237	239	245	246	252	256
X	-14	12	14	-15	6	-5	21	10	19	13	11	11	16
Y	-20	-18	-19	-22	-22	-23	-17	-22	-19	-21	-22	-23	-22

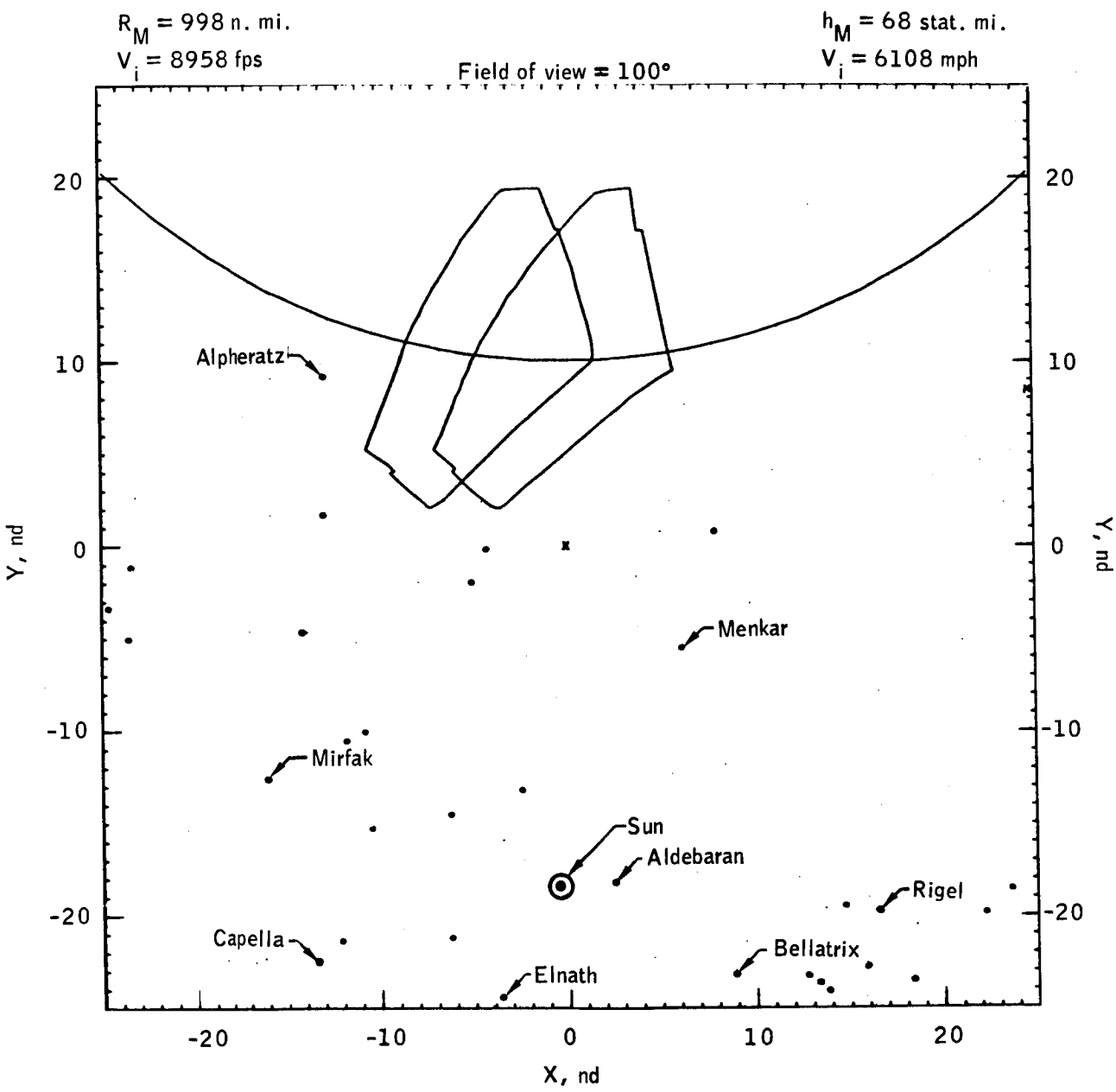


(b) Middle of TEI burn (g.e.t. = 137:21:52.4).

Figure 13.- Continued.

SEQ	4	22	31	41	47	63	73	75	80	108	111	112	120	144	150	151
X	-12	-23	-24	-12	-23	-4	-14	-5	7	6	-10	-11	-15	-2	-6	-10
Y	9	0	-3	1	-4	0	-4	-1	0	-5	-9	-10	-12	-13	-14	-15

SEQ	186	205	207	215	221	222	230	231	233	237	239	245	246	252	256
X	2	-6	-12	14	16	-13	8	-3	23	12	22	15	13	13	18
Y	-18	-21	-21	-19	-19	-22	-23	-24	-18	-23	-19	-22	-23	-23	-23

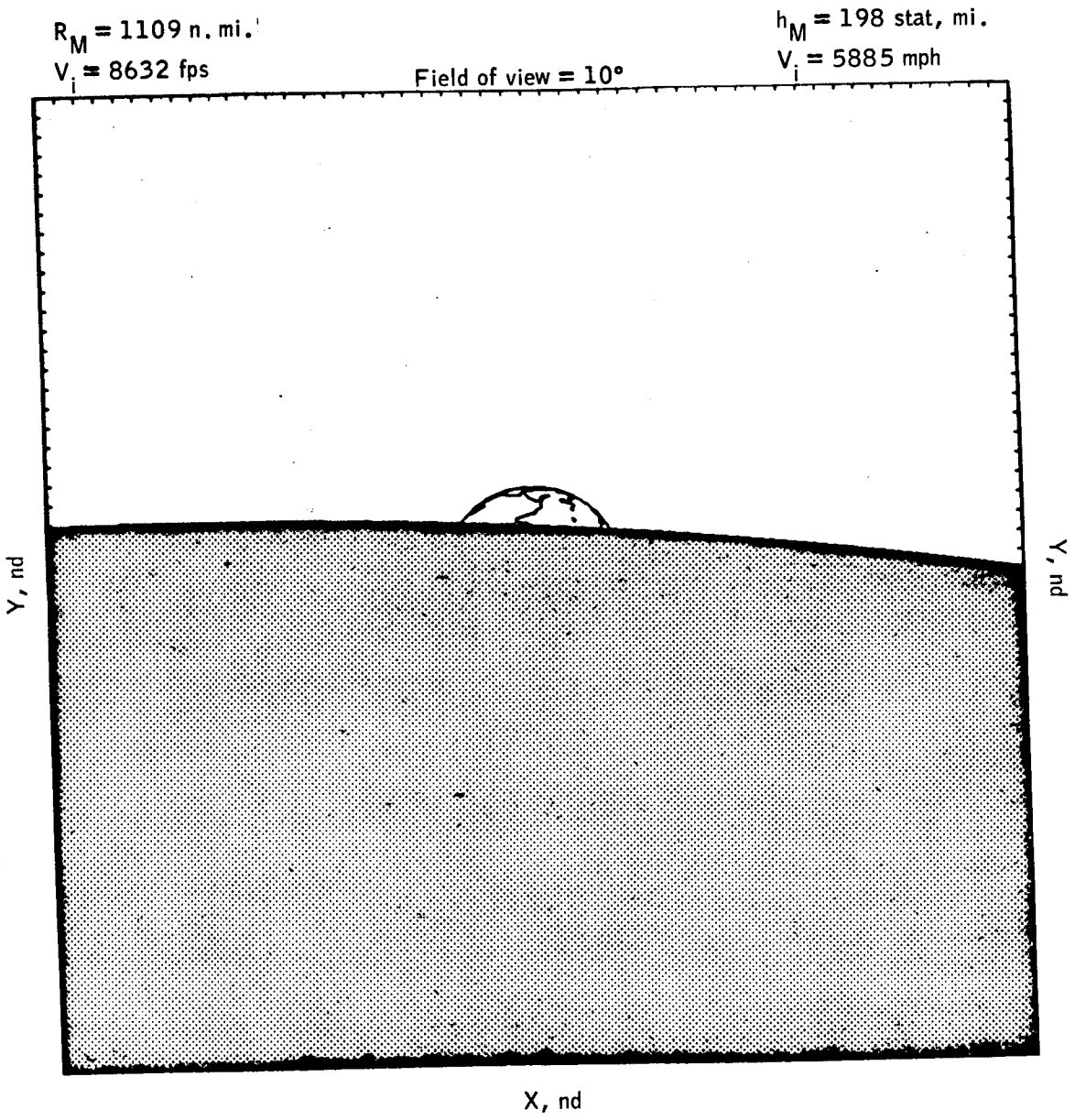


(c) End of TEI burn (g.e.t. = 137:23:11.3).

Figure 13.- Concluded.

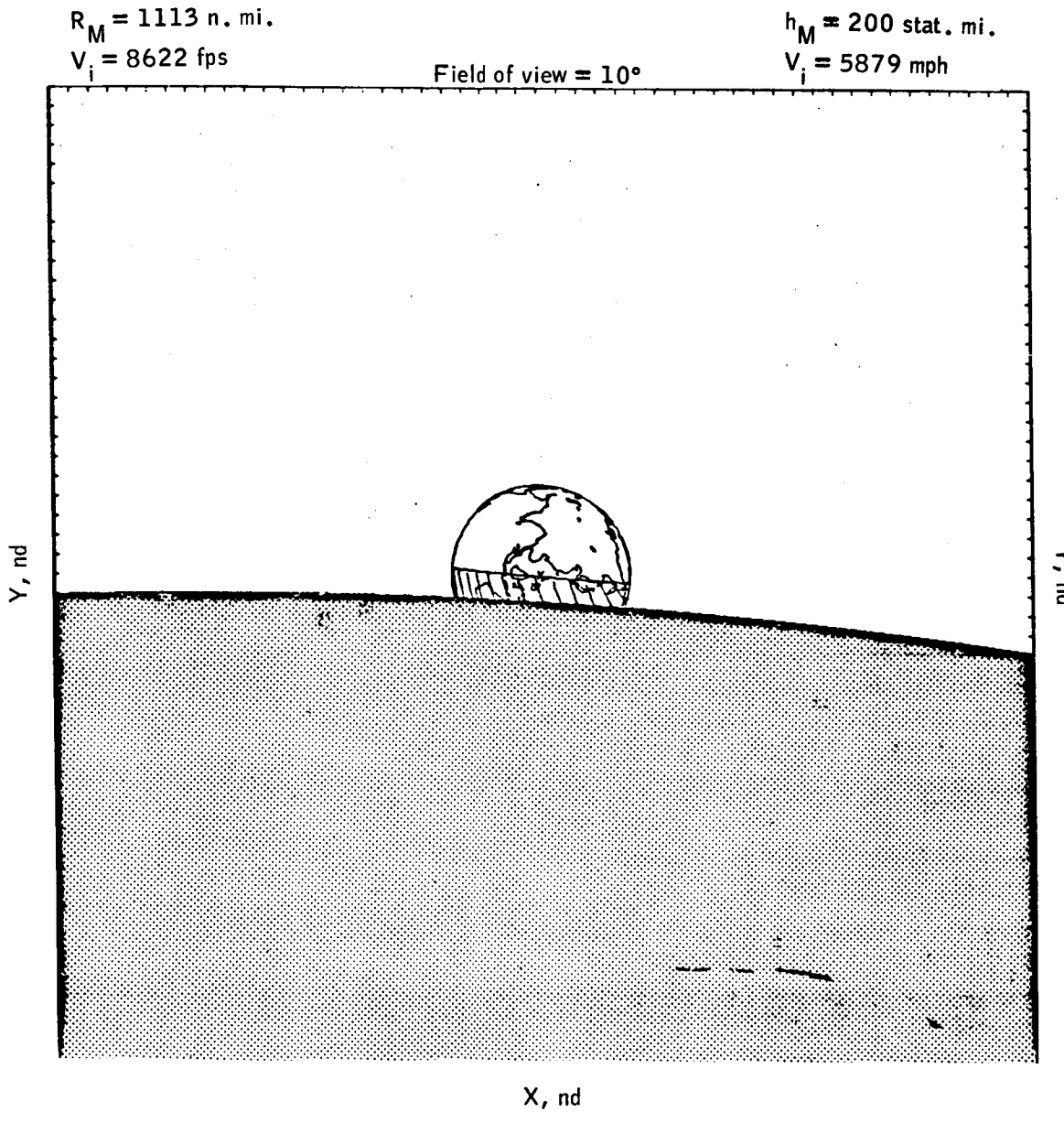
TRANSEARTH COAST

POST TEI



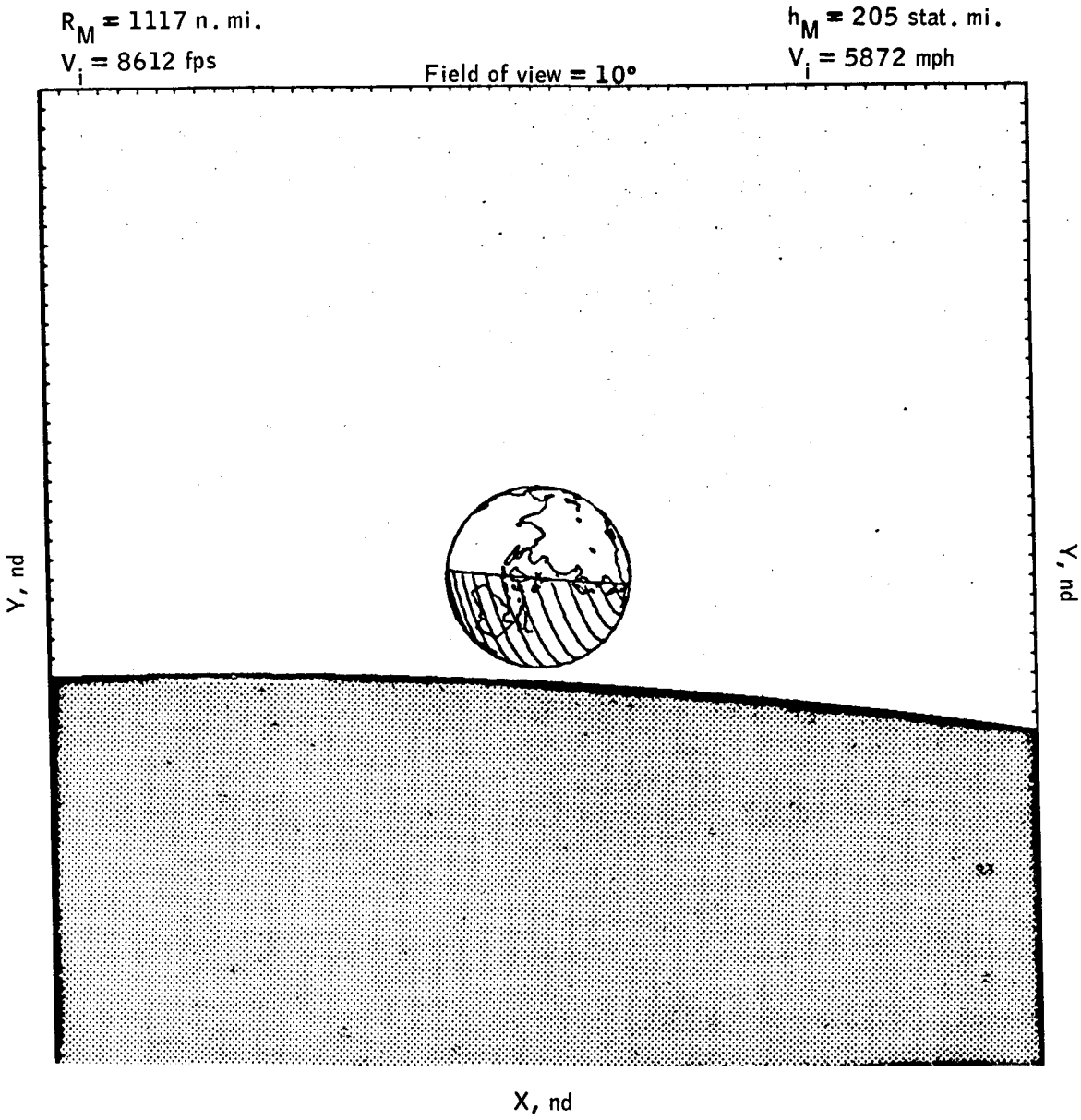
(a) G.e.t. = 137:29:11.3.

Figure 14.- Post TEI.



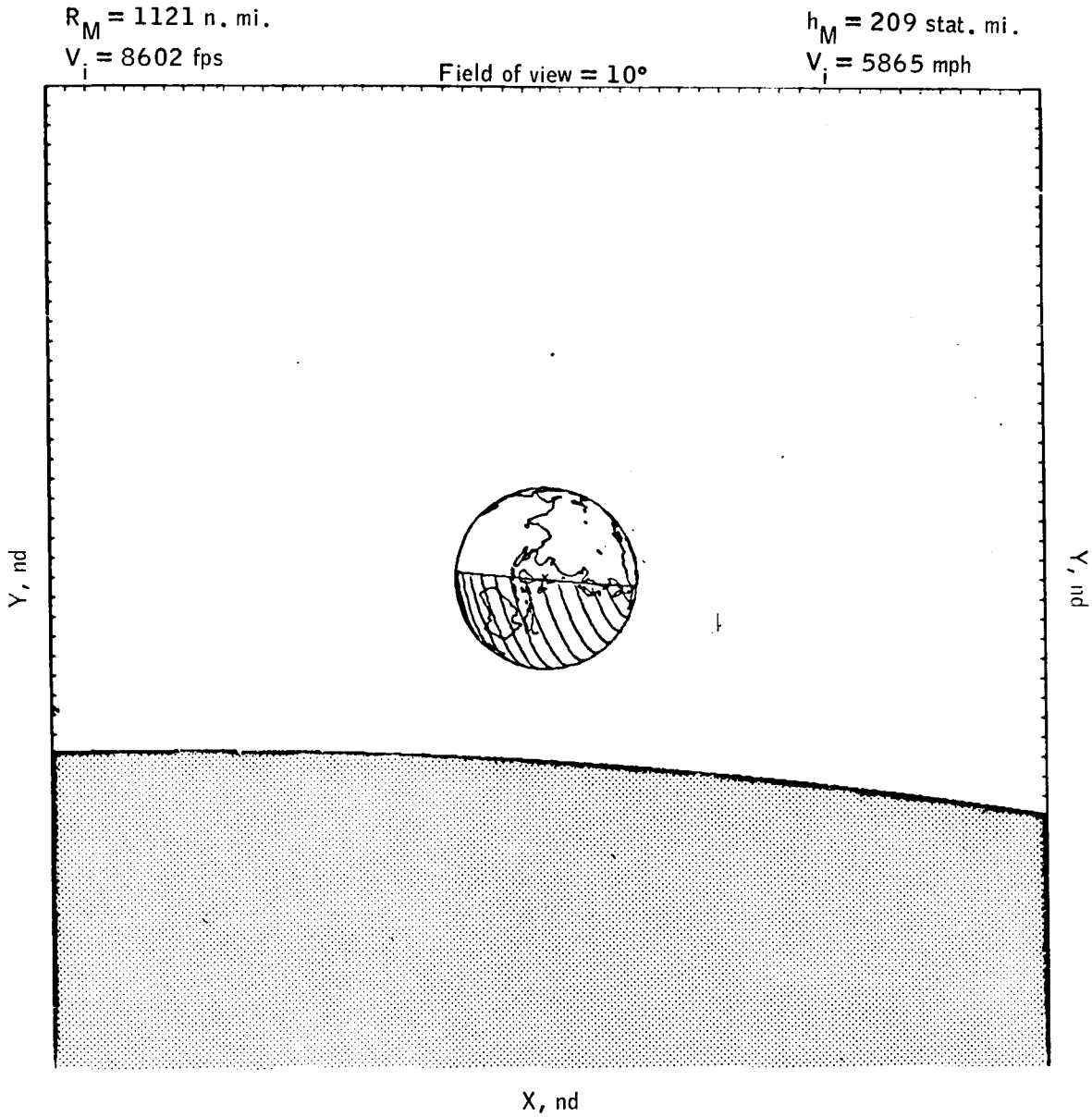
(b) G.e.t. = 137:29:18.5.

Figure 14.- Continued.



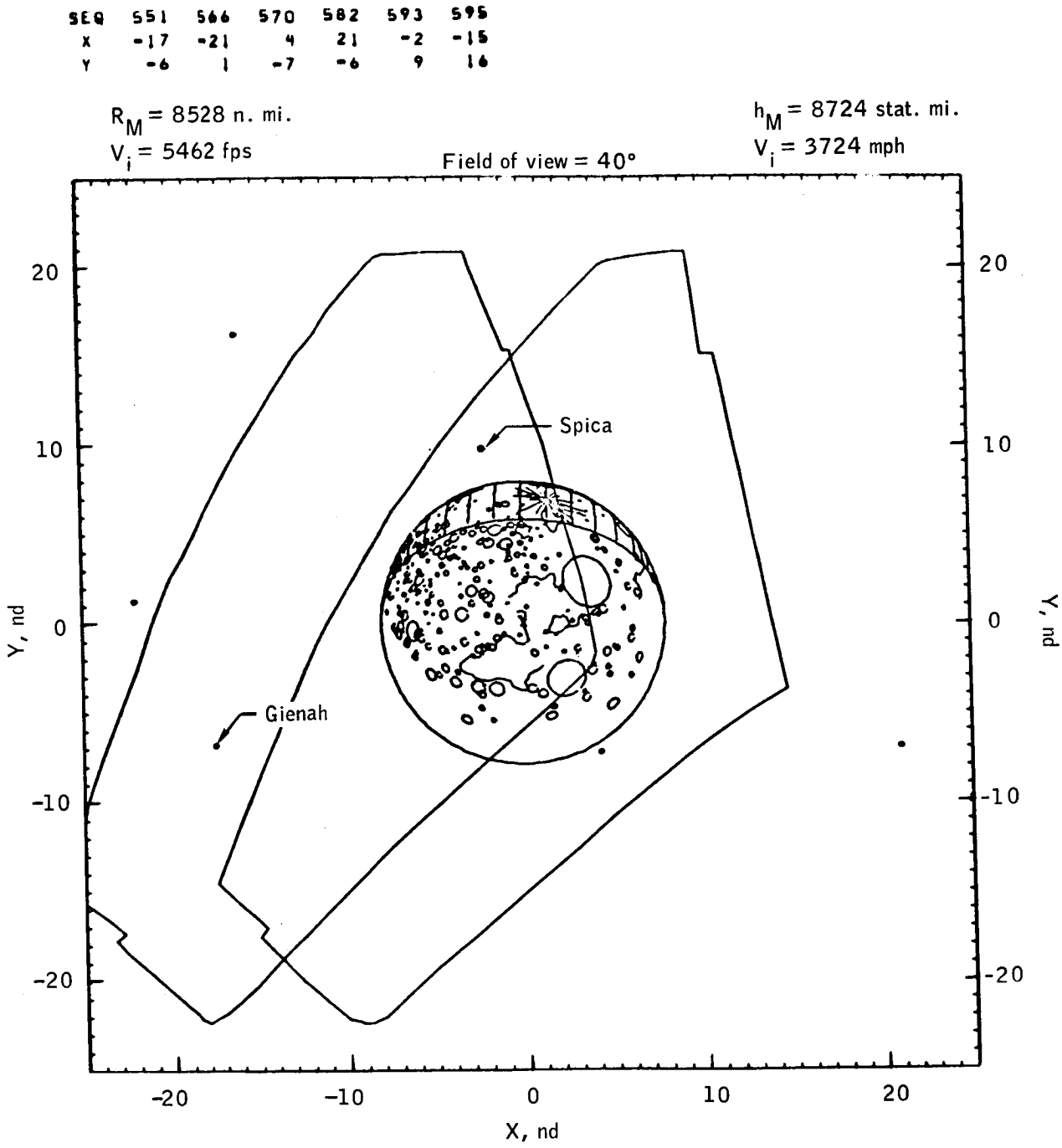
(c) G.e.t. = 137:29:25.7.

Figure 14.- Continued.



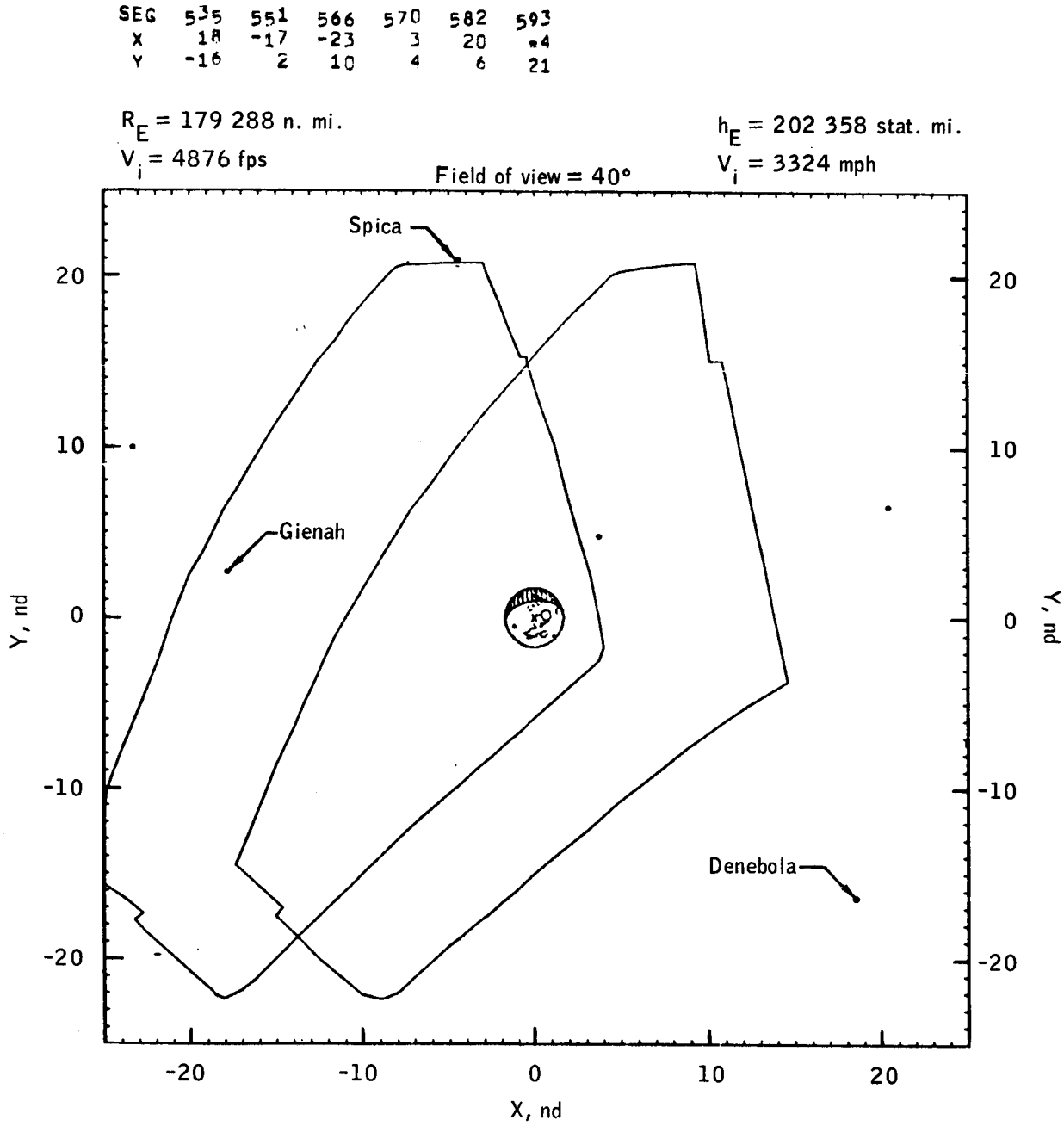
(d) G.e.t. = 137:29:32.9.

Figure 14.- Concluded.



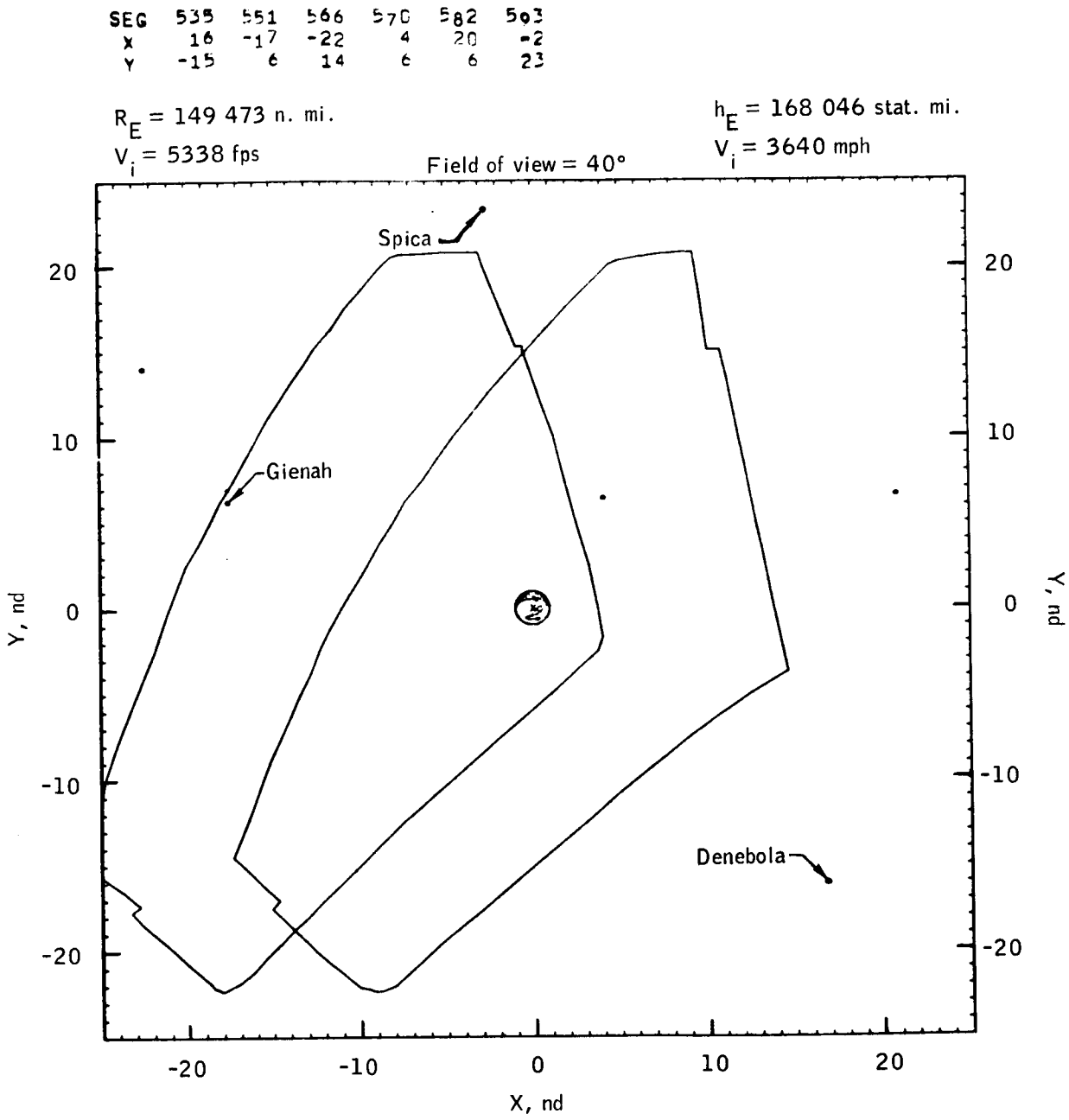
(a) G.e.t. = 140 hours.

Figure 15.- Transearth coast-constant field of view (moon).



(b) G.e.t. = 150 hours.

Figure 15.- Continued.



(c) G.e.t. = 160 hours.

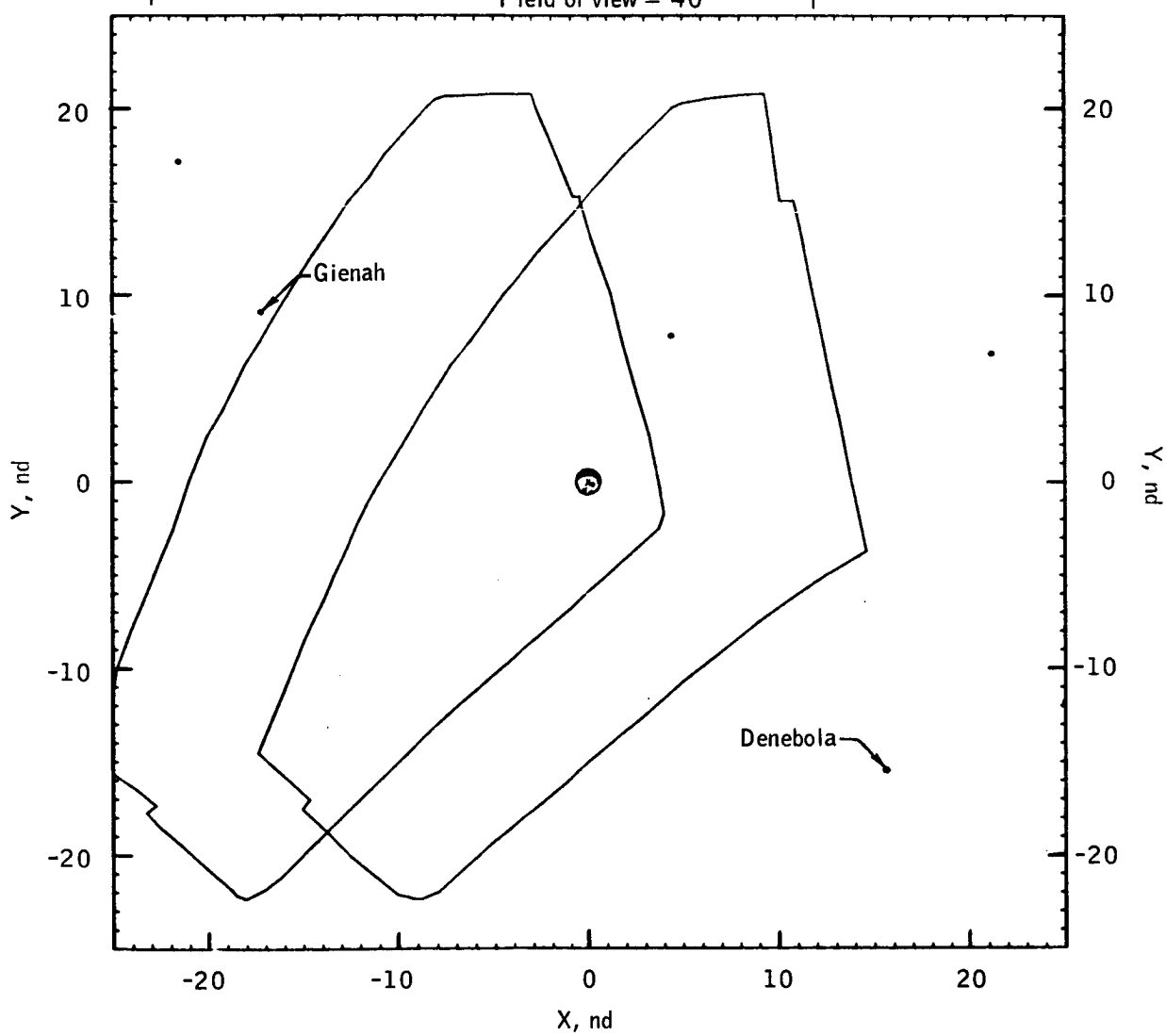
Figure 15.- Continued.

SEQ	535	551	566	570	582
X	15	-17	-21	4	21
Y	-15	9	17	7	7

R_E = 116 265 n. mi.
V_i = 6097 fps

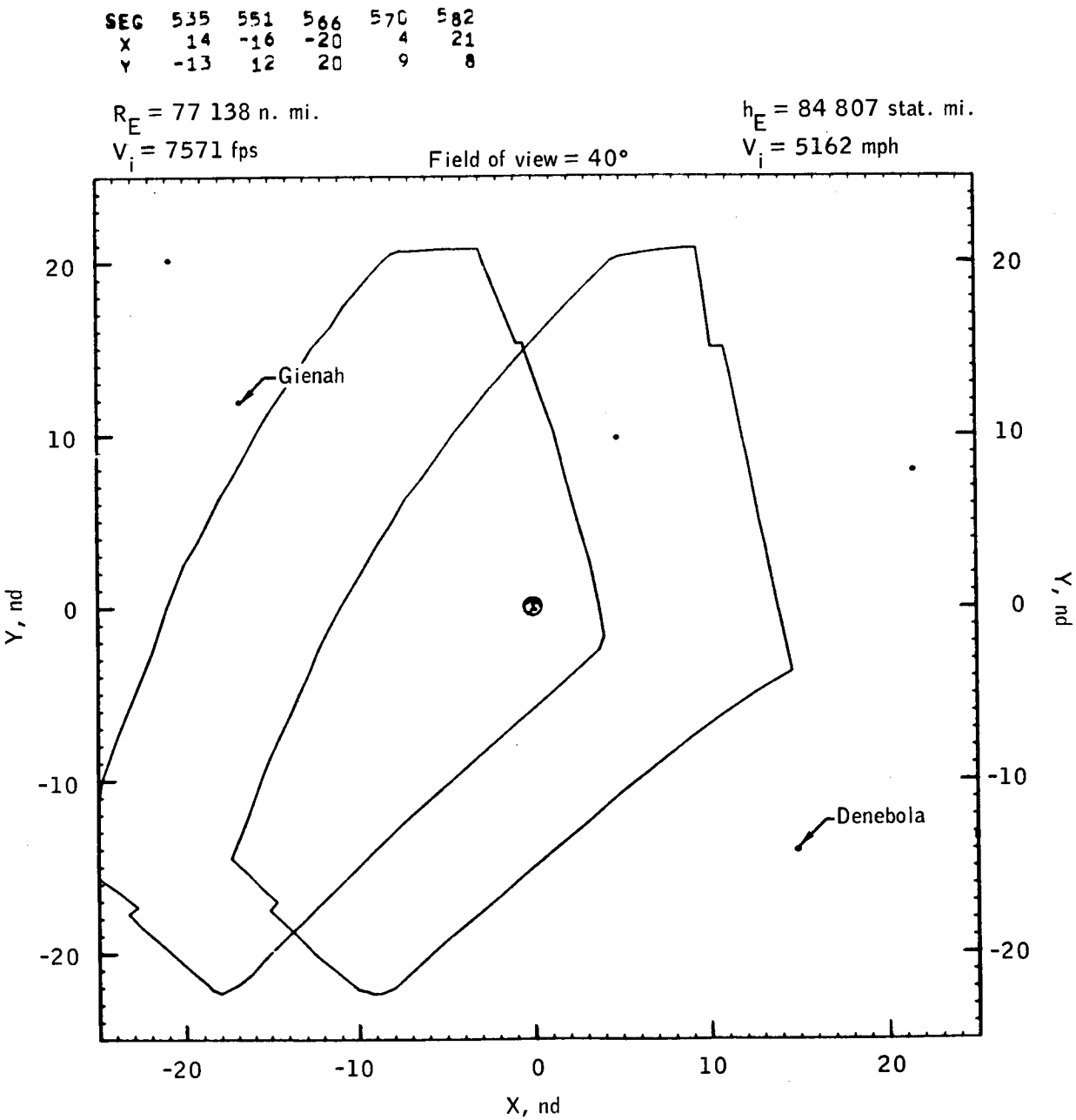
Field of view = 40°

h_E = 129 832 stat. mi.
V_i = 4157 mph



(d) G.e.t. = 170 hours.

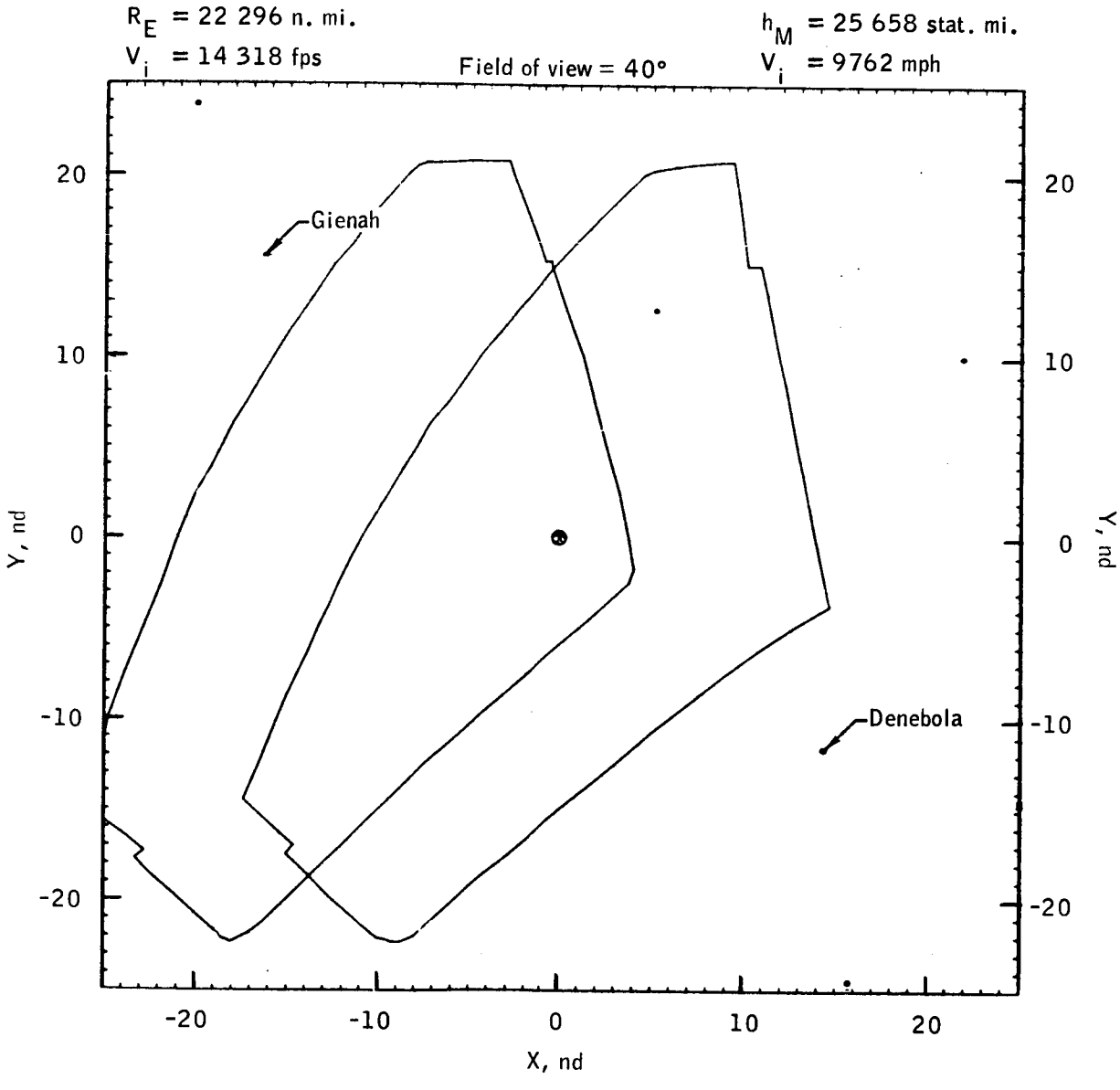
Figure 15.- Continued.



(e) G.e.t. = 180 hours.

Figure 15.- Continued.

SEG	515	535	551	566	570	582
X	15	14	-16	-20	5	21
Y	-24	-11	15	23	12	10



(f) G.e.t. = 190 hours.

Figure 15.- Concluded.

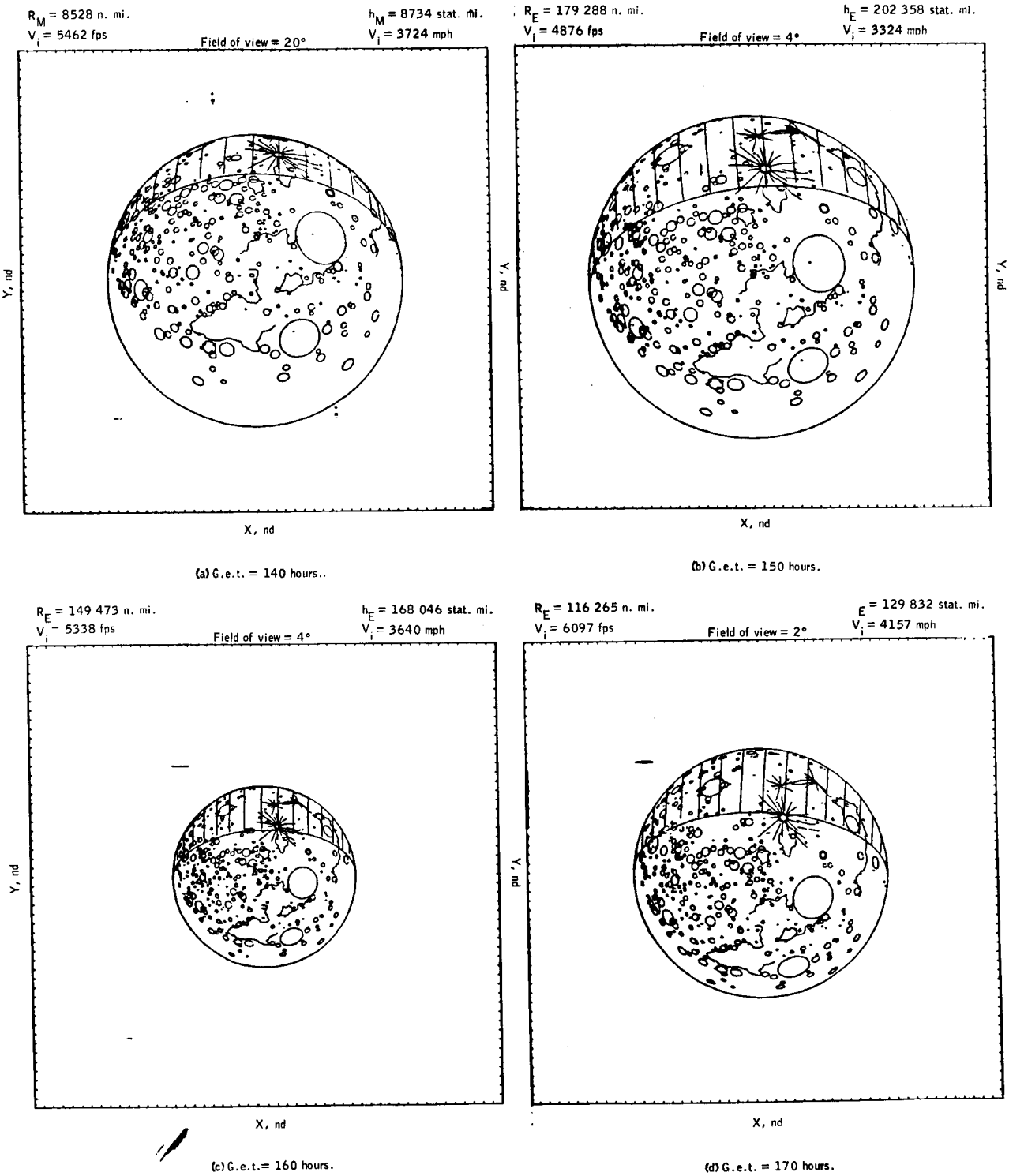
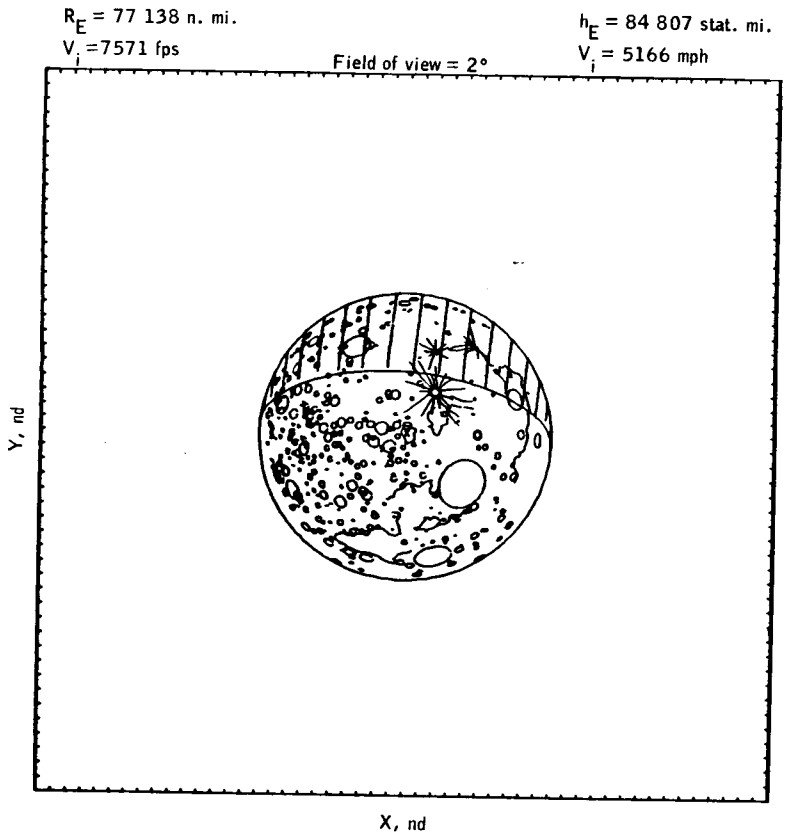
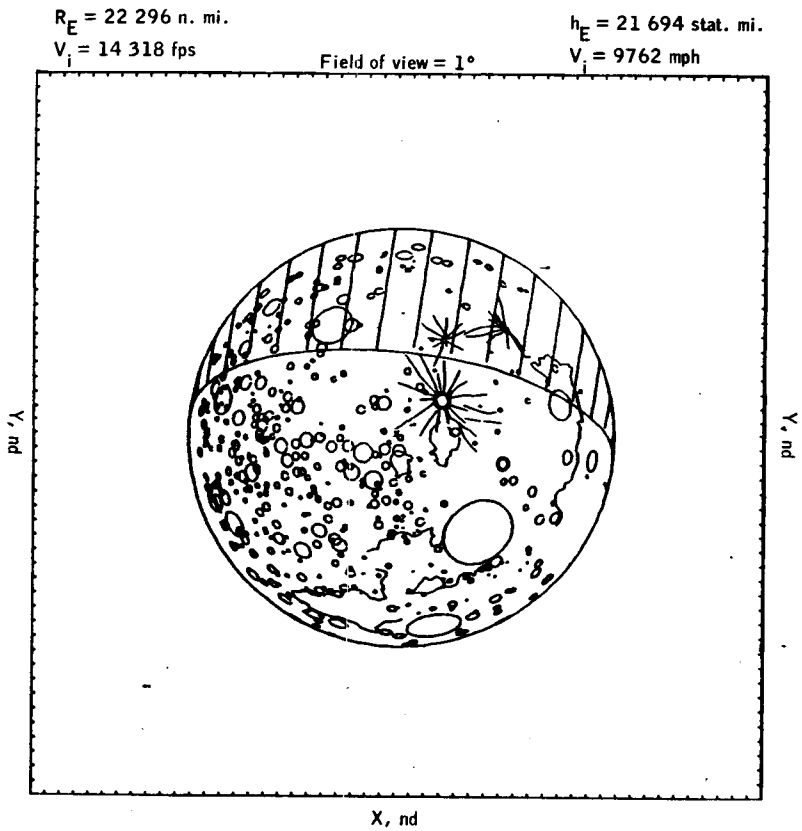


Figure 16.- Transearth coast variable field of view (moon).

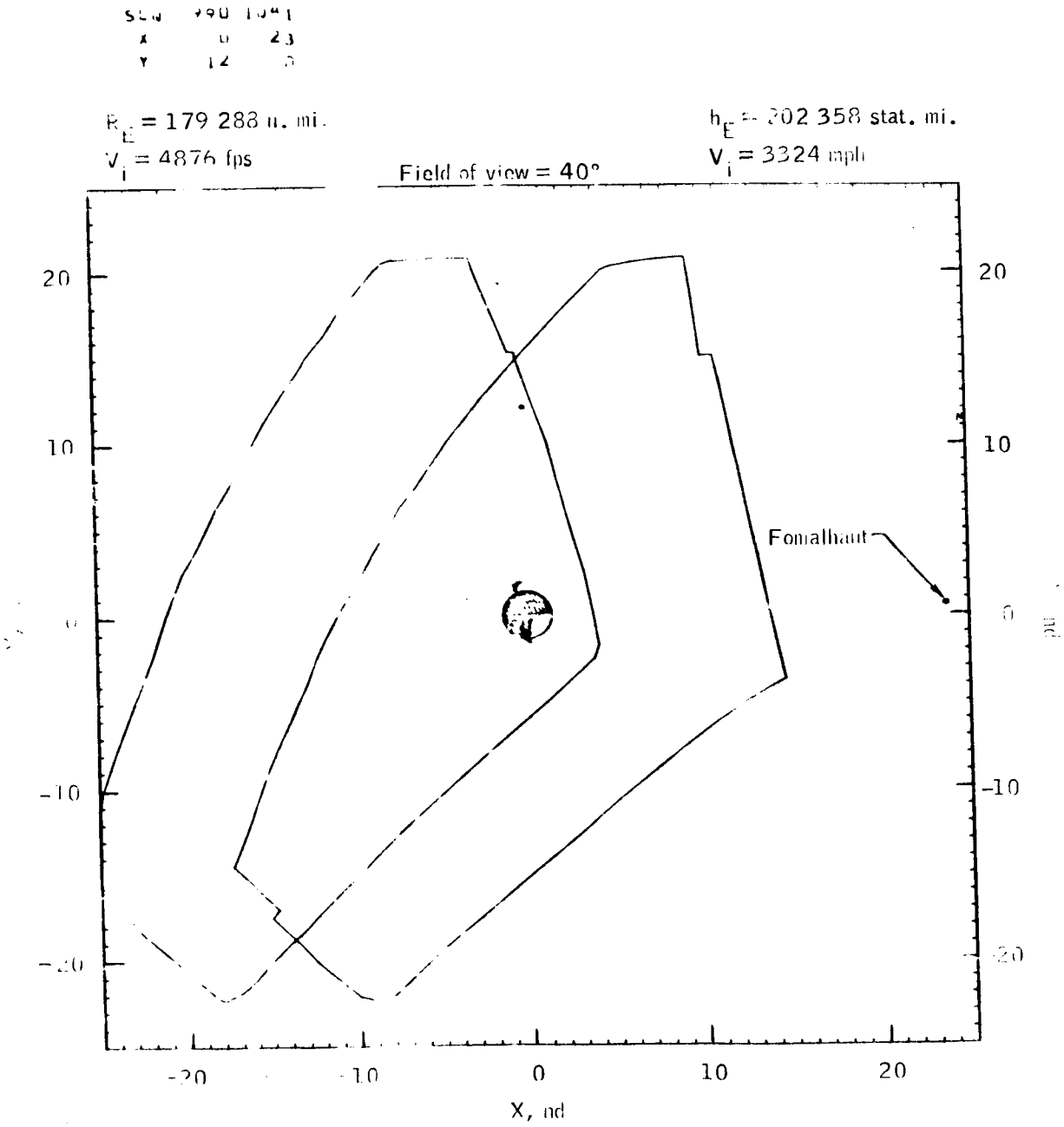


(e) G.e.t.= 180 hours.



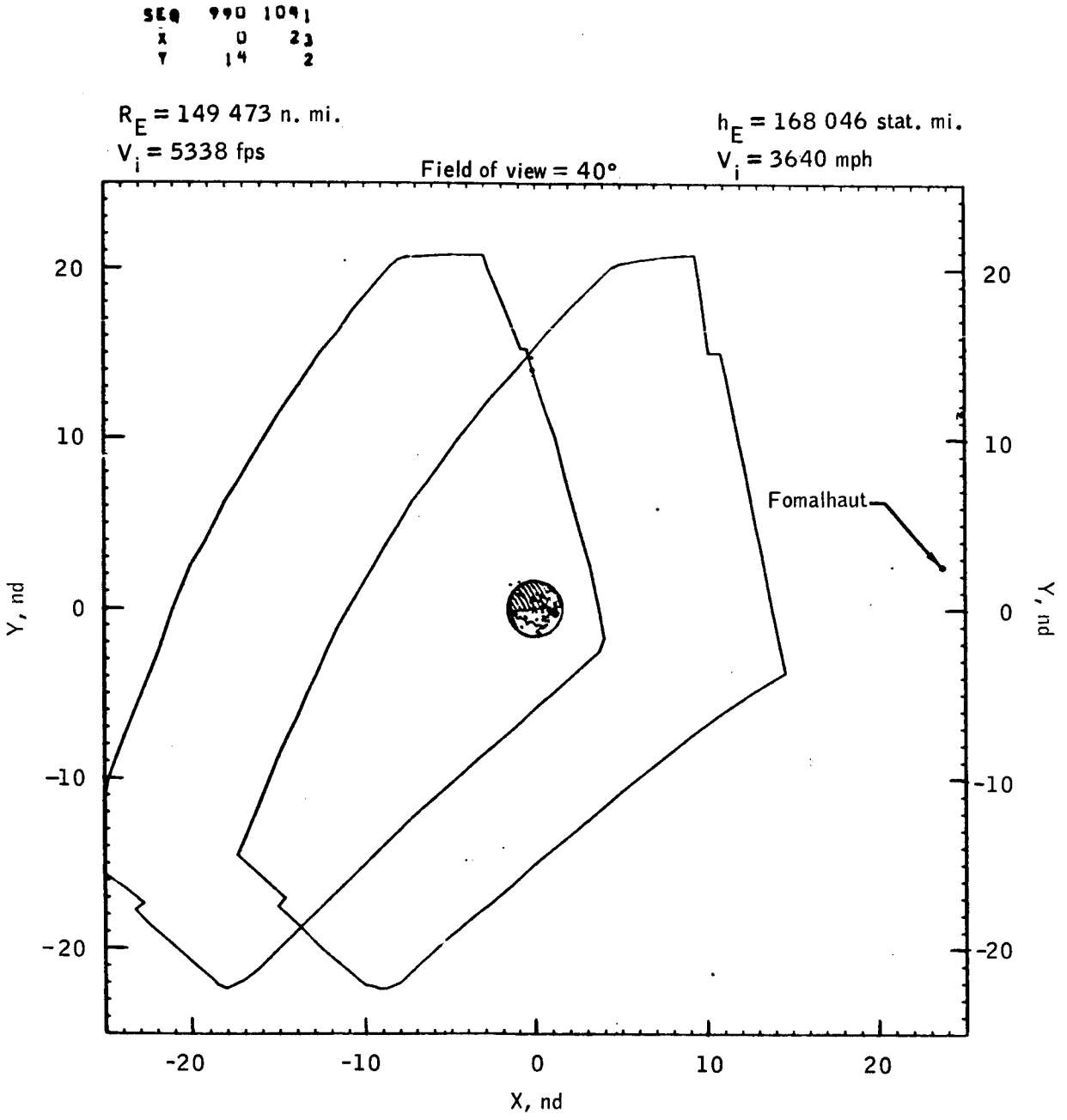
(f) G.e.t. = 190 hours.

Figure 16.- Concluded.



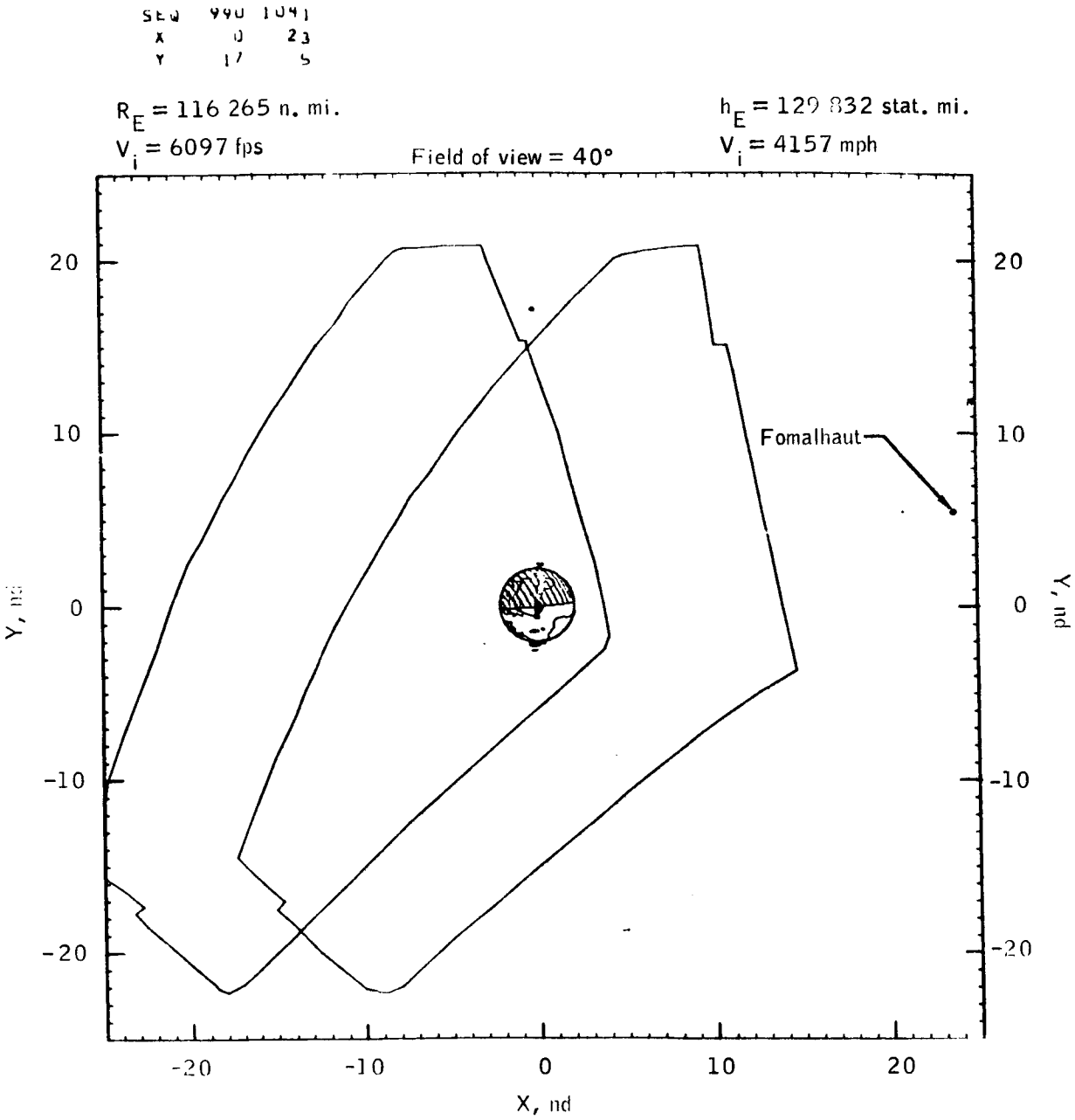
) G.e.t. = 150 hours.

Figure 17. Transearth coast-constant field of view (earth).



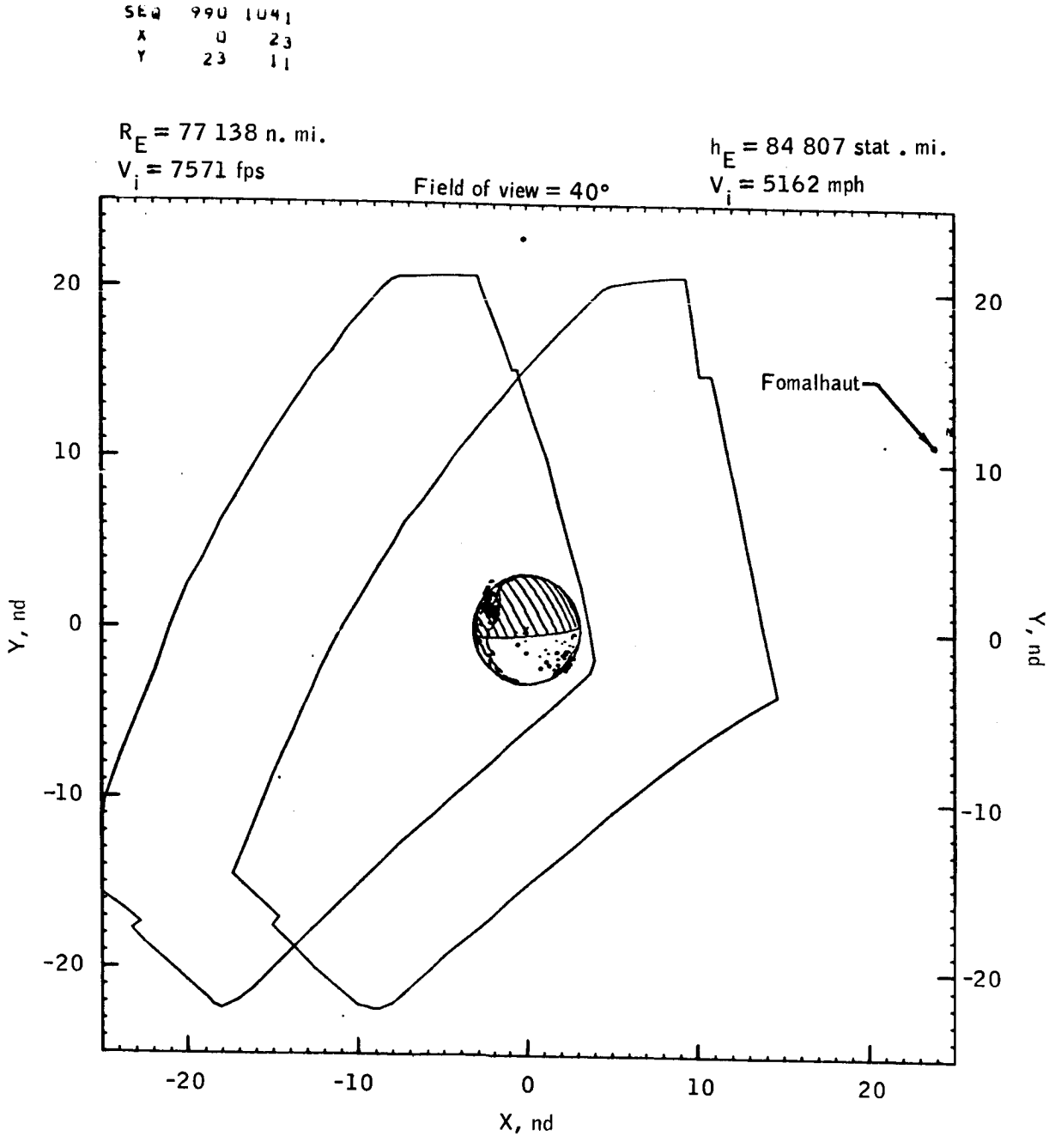
(b) G.e.t. = 160 hours.

Figure 17.- Continued.



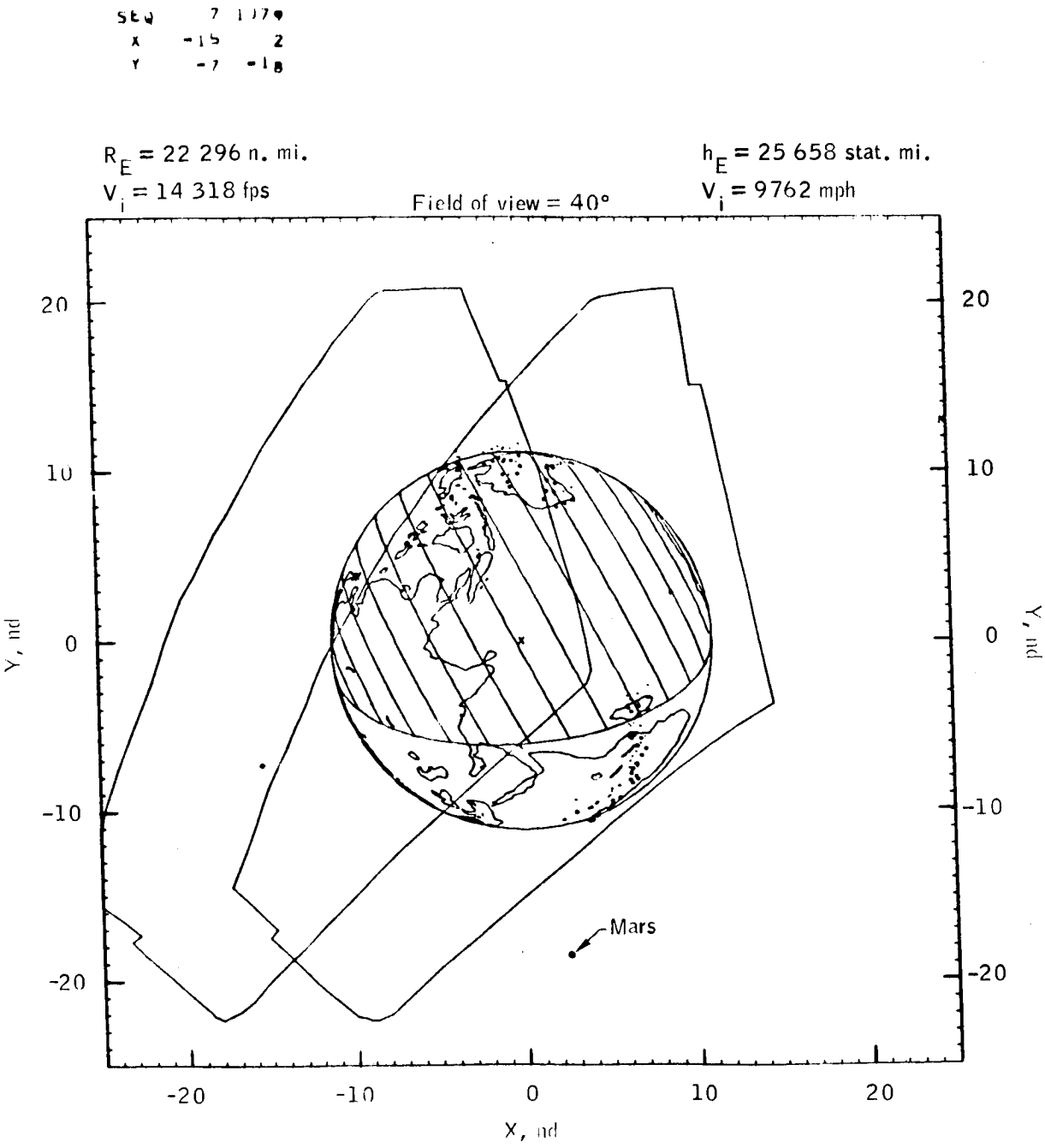
(c) G.c.t. = 170 hours.

Figure 17.- Continued.



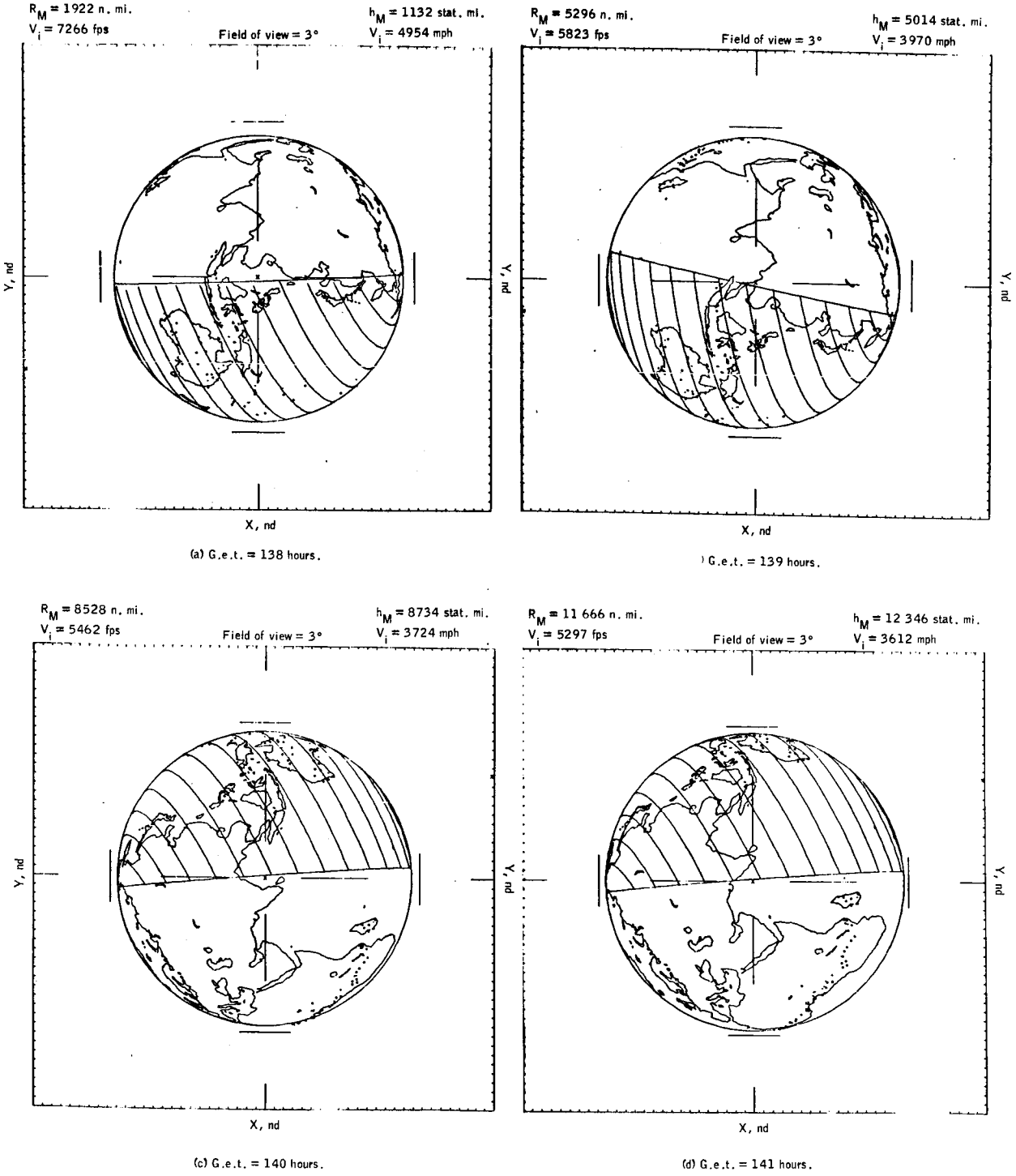
(d) G.e.t. = 180 hours.

Figure 17.- Continued.



(c) G.e.t. = 190 hours.

Figure 17.- Concluded.



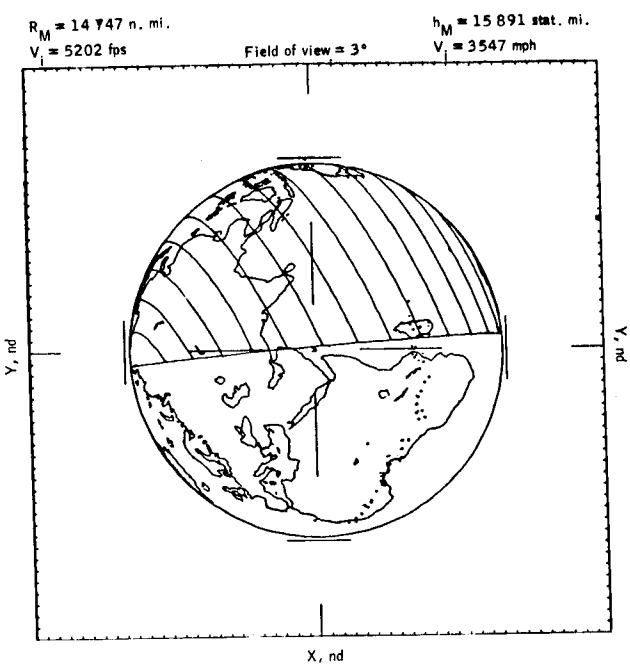
(a) G.e.t. = 138 hours.

) G.e.t. = 139 hours.

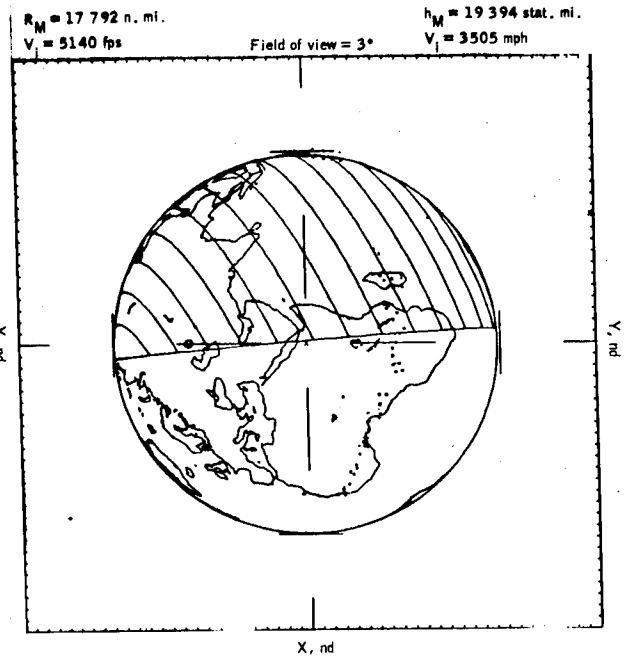
(c) G.e.t. = 140 hours.

(d) G.e.t. = 141 hours.

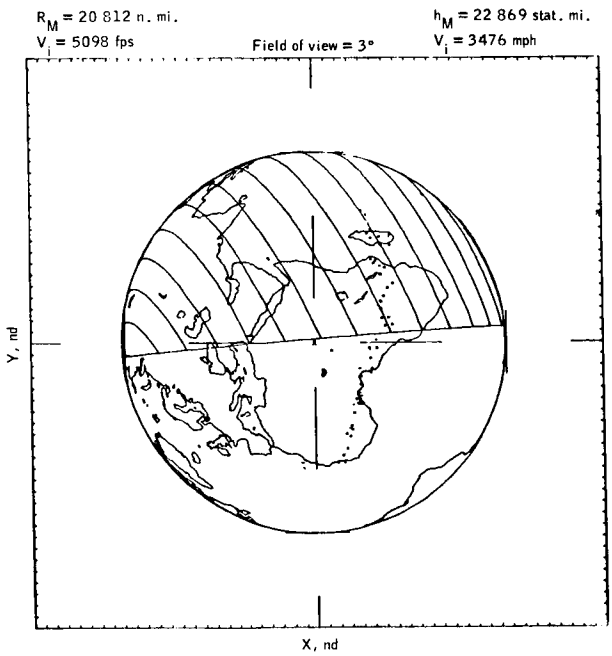
Figure 18.- Transearth coast - variable field of view (earth).



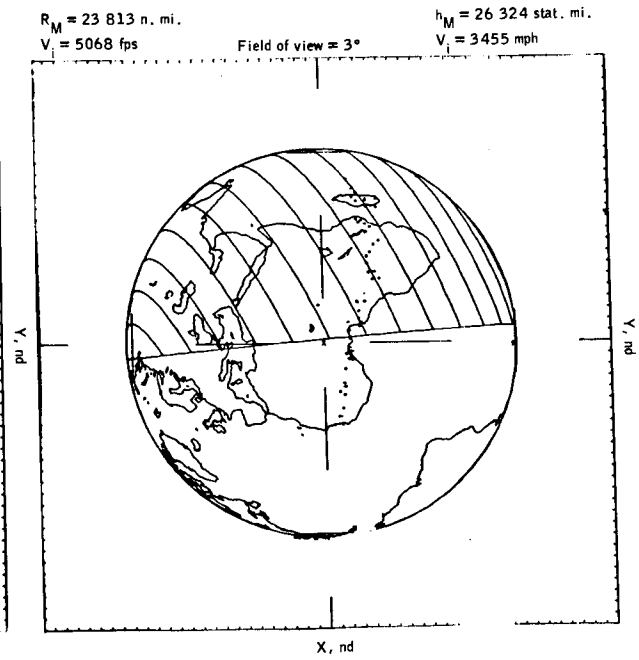
(e) G.e.t. = 142 hours.



(f) G.e.t. = 143 hours.

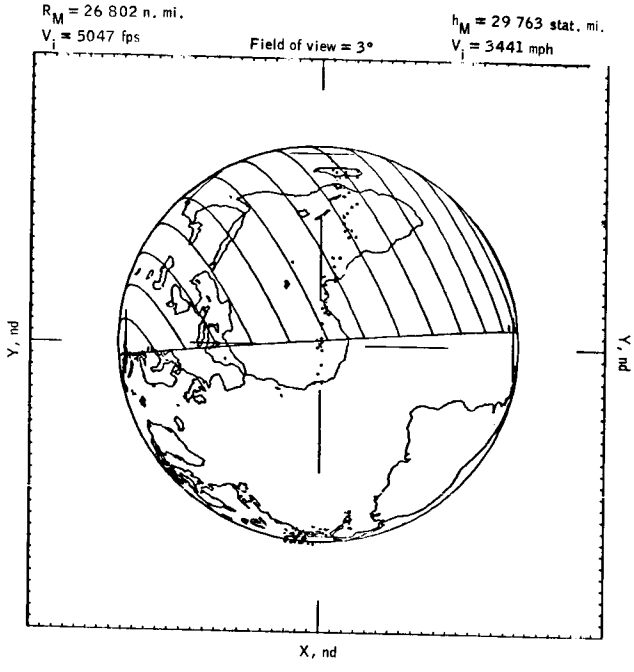


(g) G.e.t. = 144 hours.

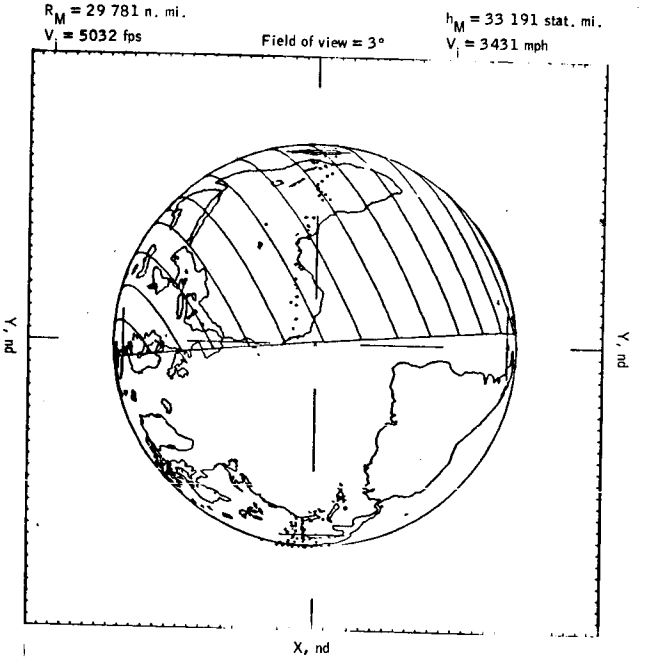


(h) G.e.t. = 145 hours.

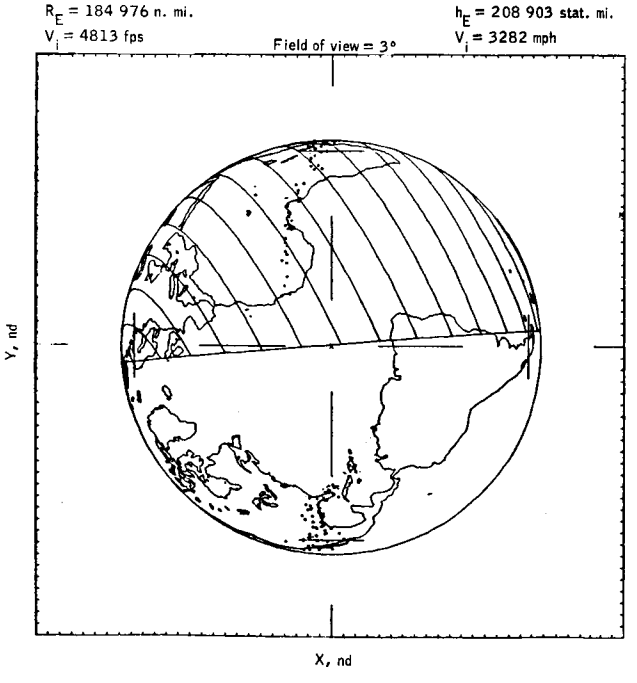
Figure 18.- Continued.



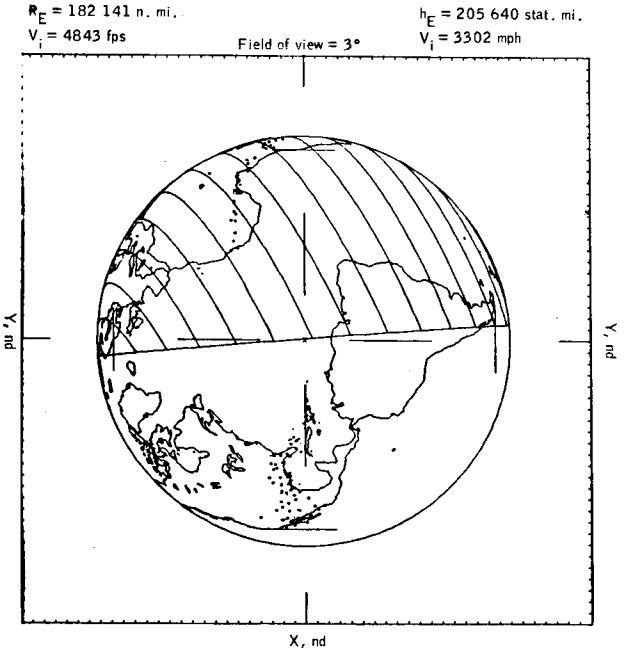
(i) G.e.t. = 146 hours.



(j) G.e.t. = 147 hours.

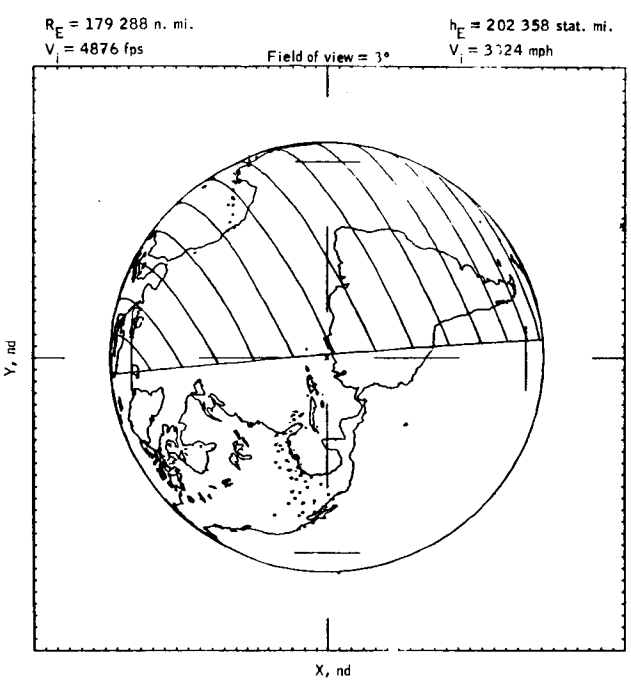


(k) G.e.t. = 148 hours.

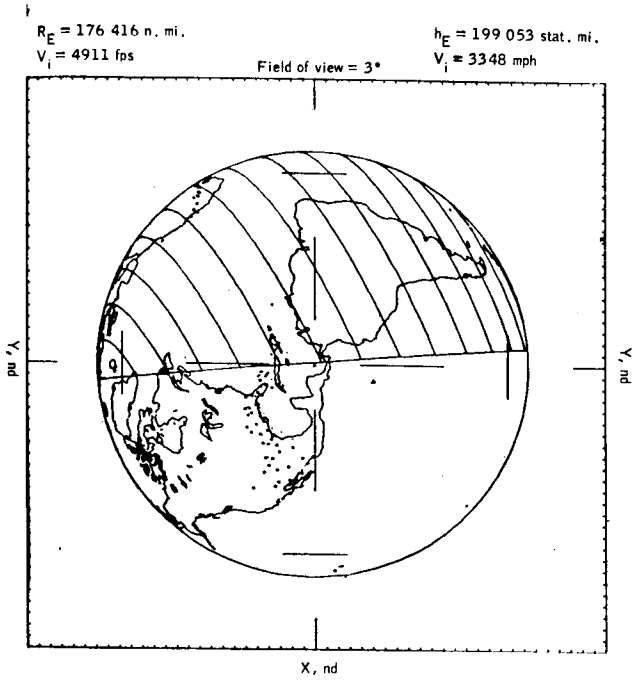


(l) G.e.t. = 149 hours.

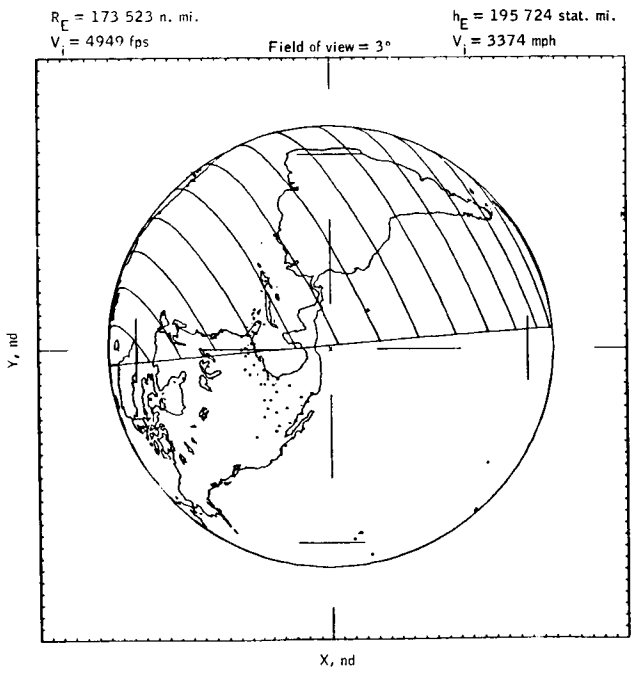
Figure 18.- Continued.



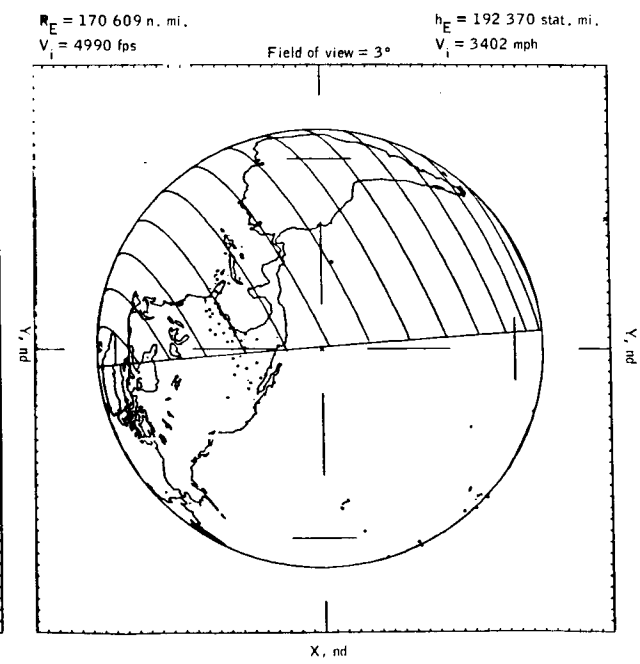
(m) G.e.t. = 150 hours.



(n) G.e.t. = 151 hours.

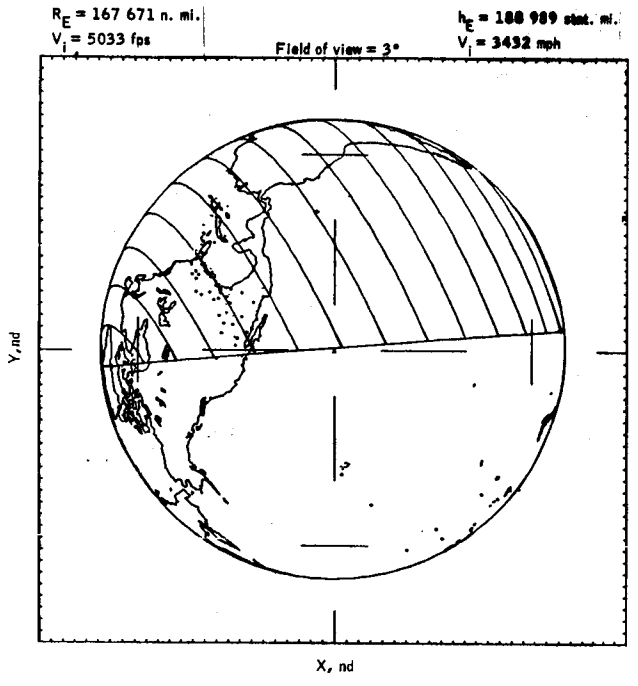


(o) G.e.t. = 152 hours.

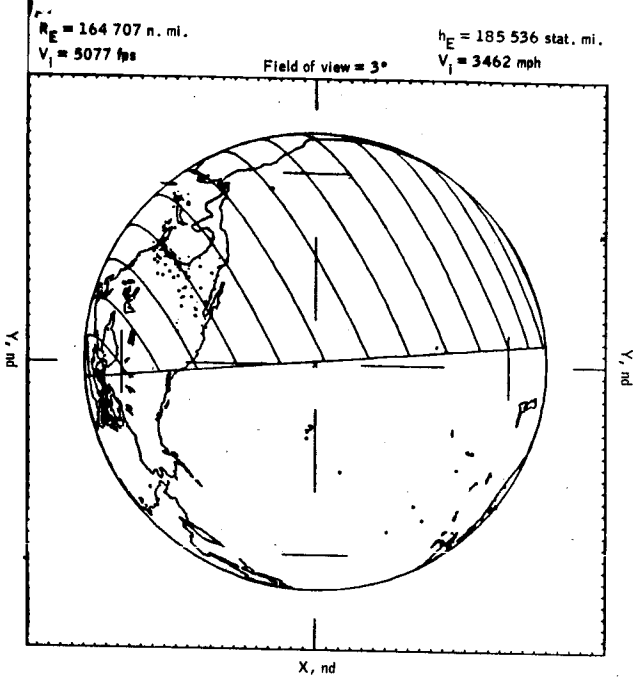


(p) G.e.t. = 153 hours.

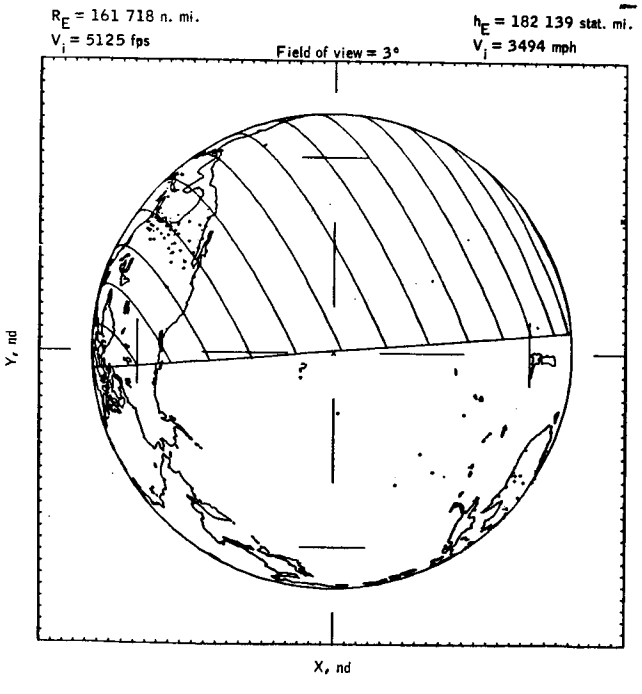
Figure 18.- Continued.



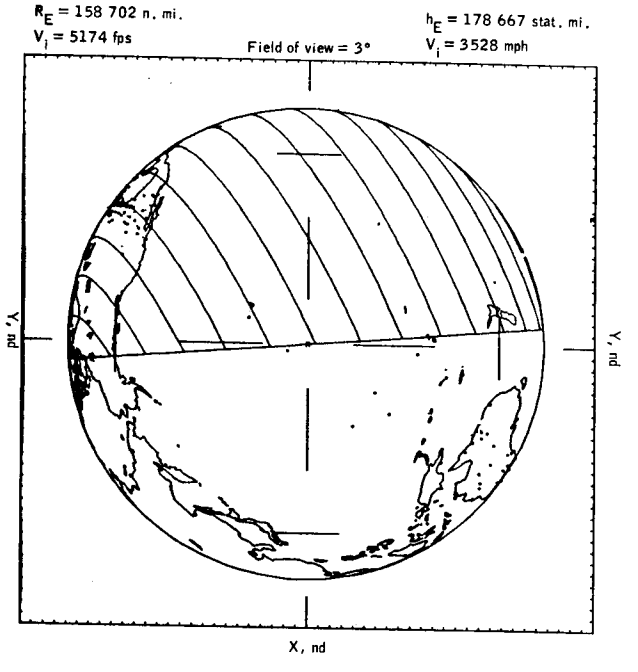
(q) G.e.t. = 154 hours.



(r) G.e.t. = 155 hours.

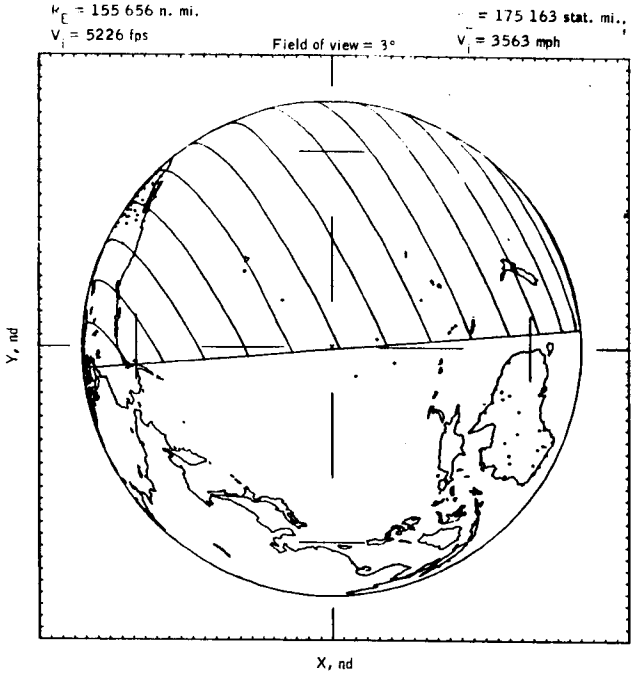


(s) G.e.t. = 156 hours.

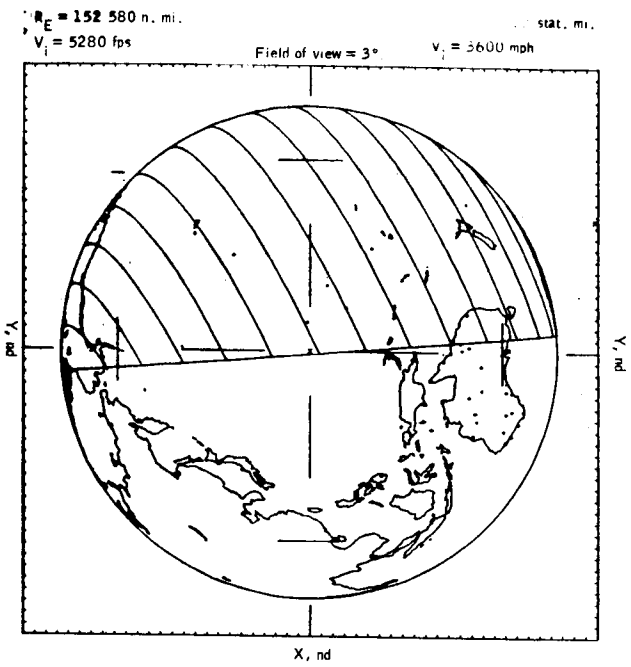


(t) G.e.t. = 157 hours.

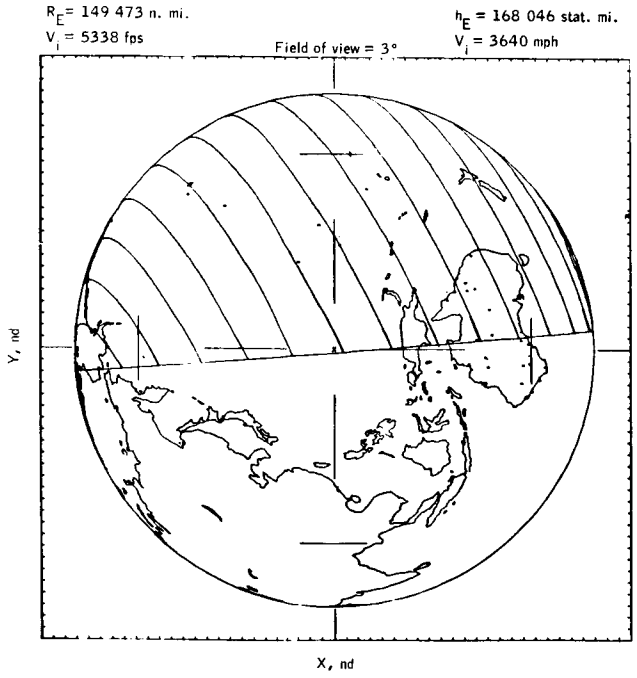
Figure 18.- Continued.



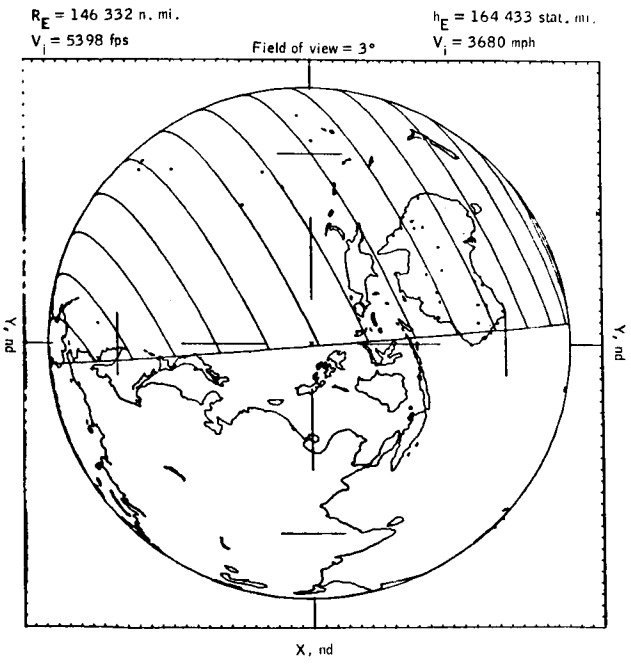
(u) G.e.t. = 158 hours.



(v) G.e.t. = 159 hours.

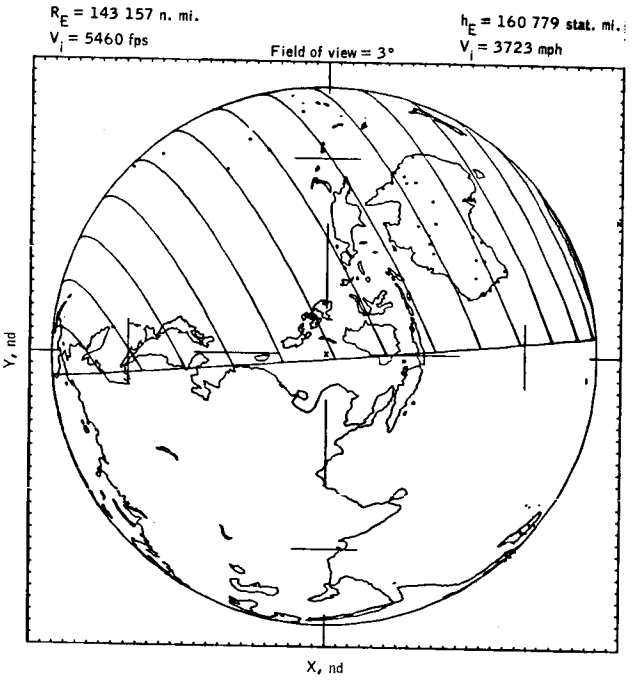


(w) G.e.t. = 160 hours.

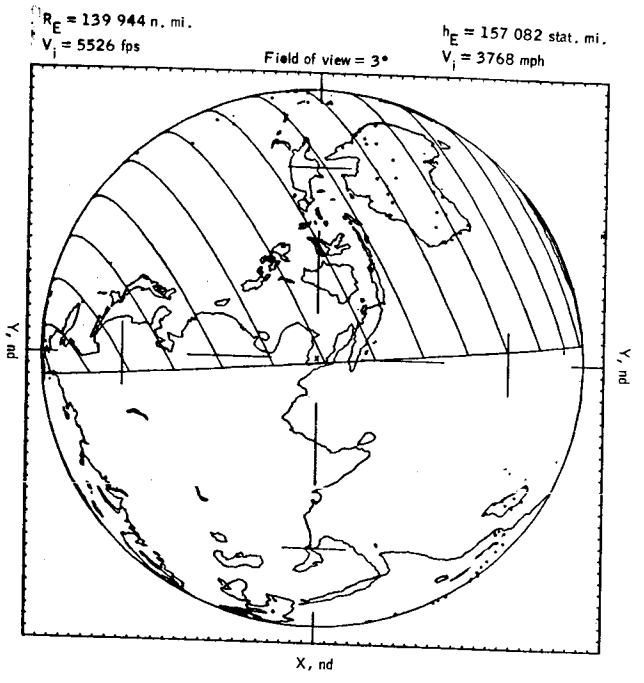


(x) G.e.t. = 161 hours.

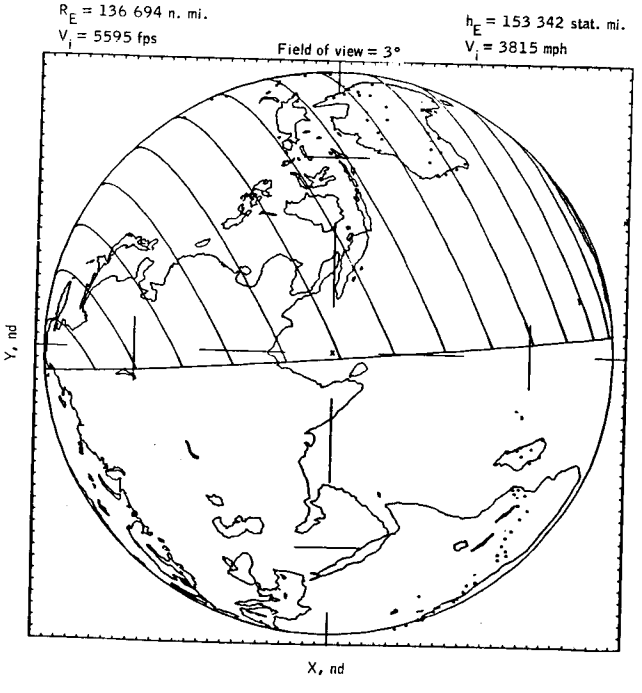
Figure 18.- Continued.



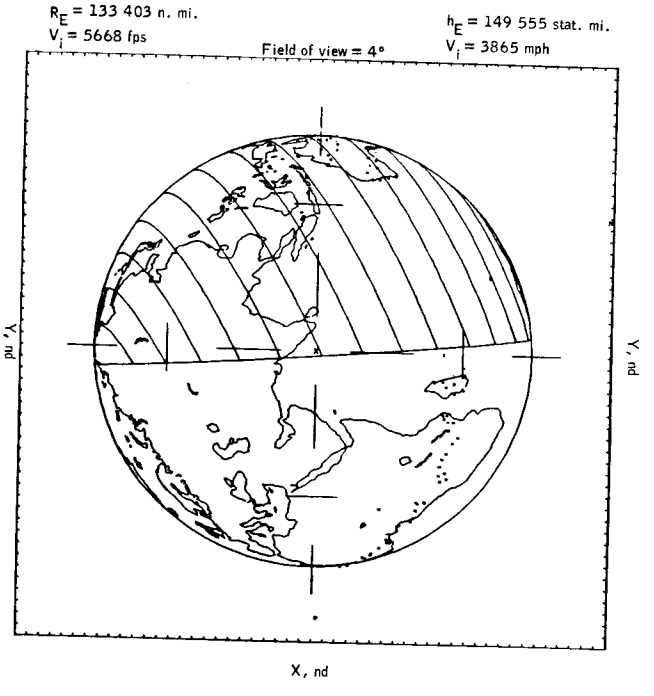
(y) G.e.t. = 162 hours.



(z) G.e.t. = 163 hours.

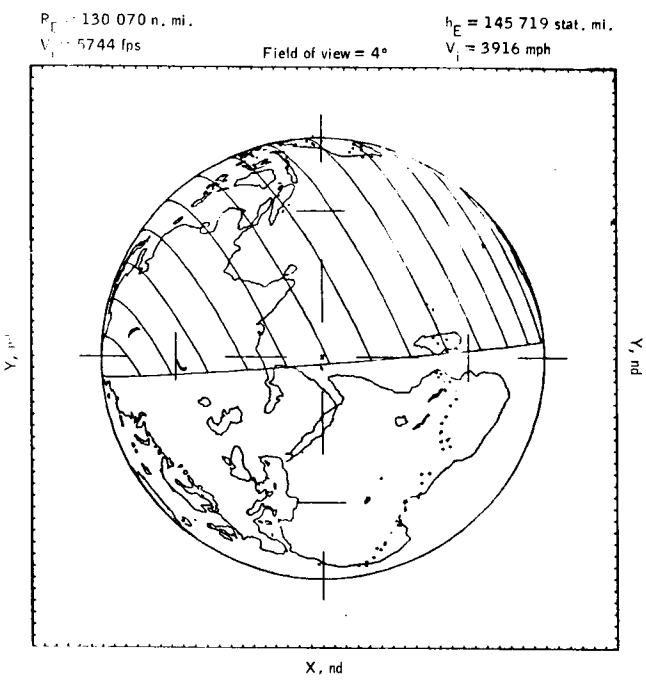


(aa) G.e.t. = 164 hours.

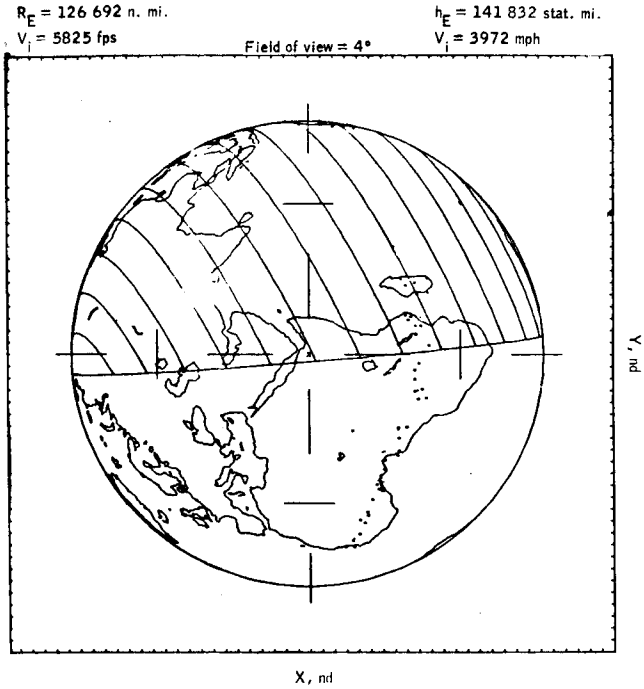


(bb) G.e.t. = 165 hours.

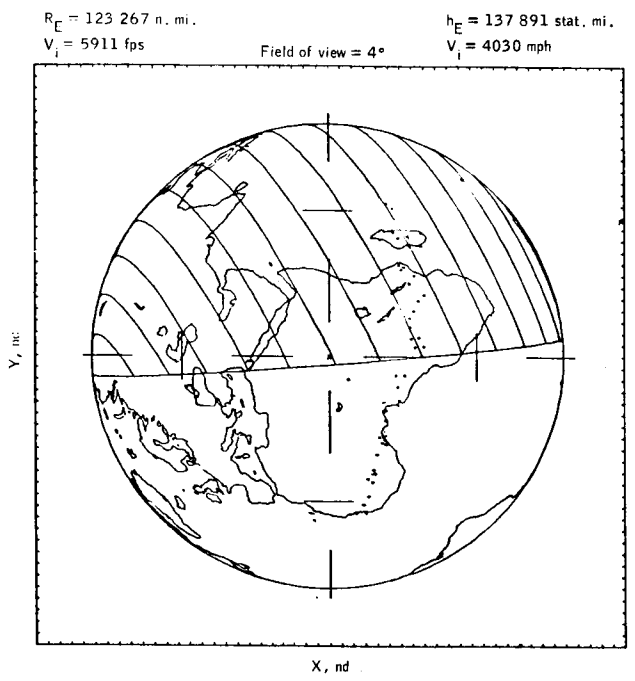
Figure 18.- Continued.



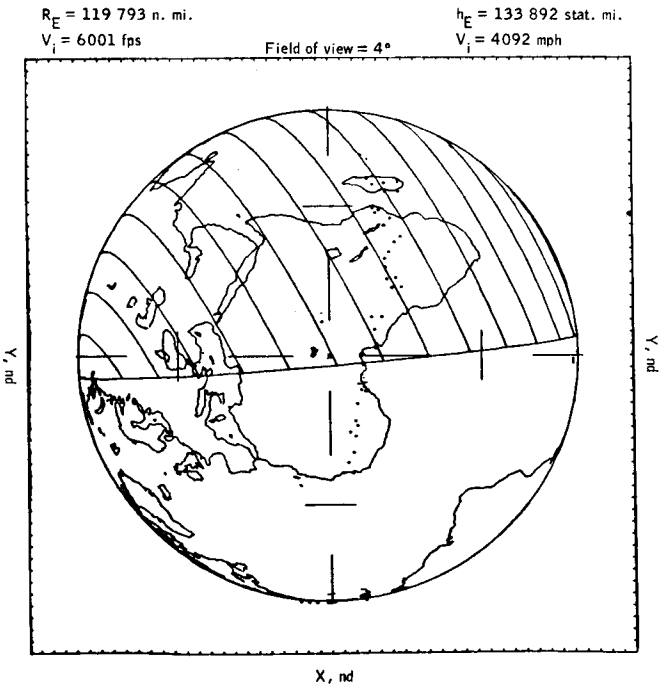
(cc) G.e.t. = 166 hours.



(dd) G.e.t. = 167 hours.

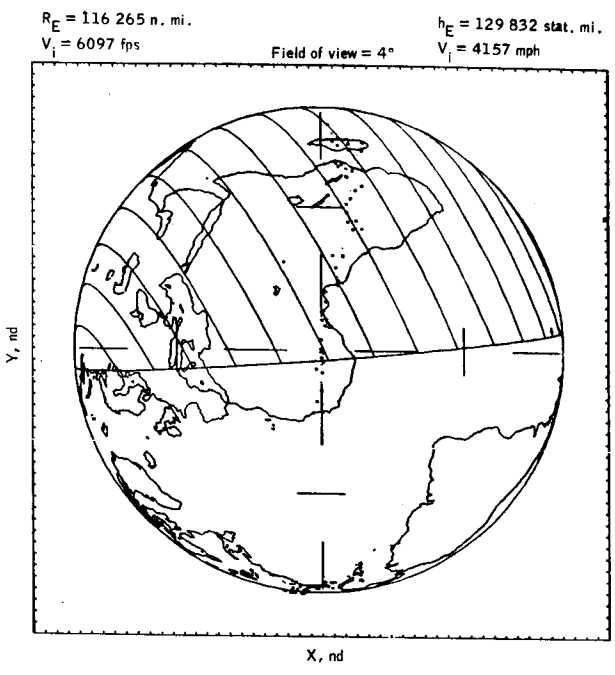


(ee) G.e.t. = 168 hours.

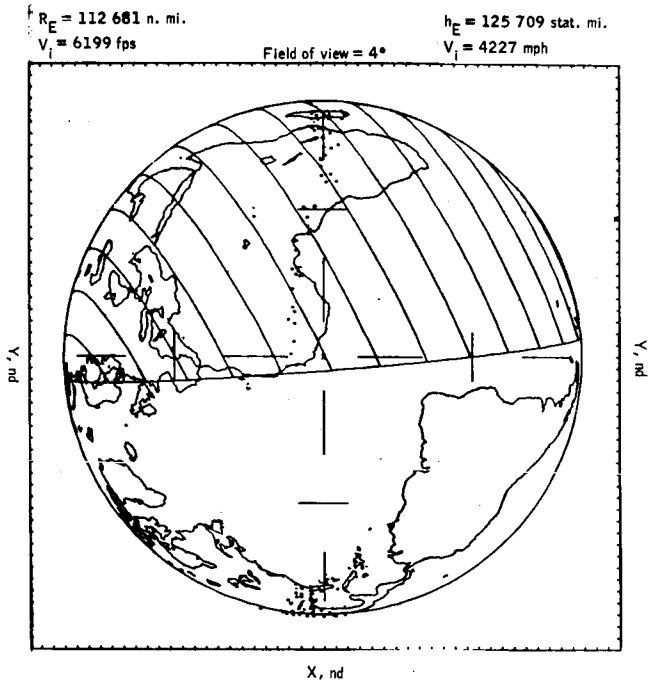


(ff) G.e.t. = 169 hours.

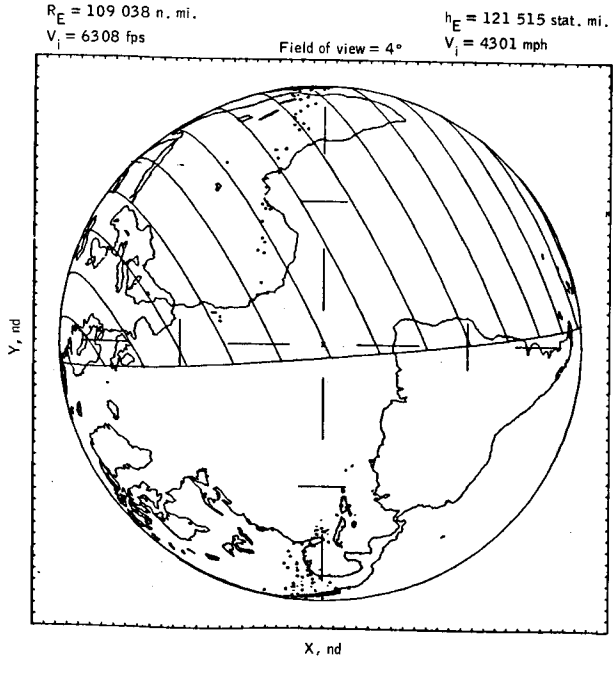
Figure 18.- Continued.



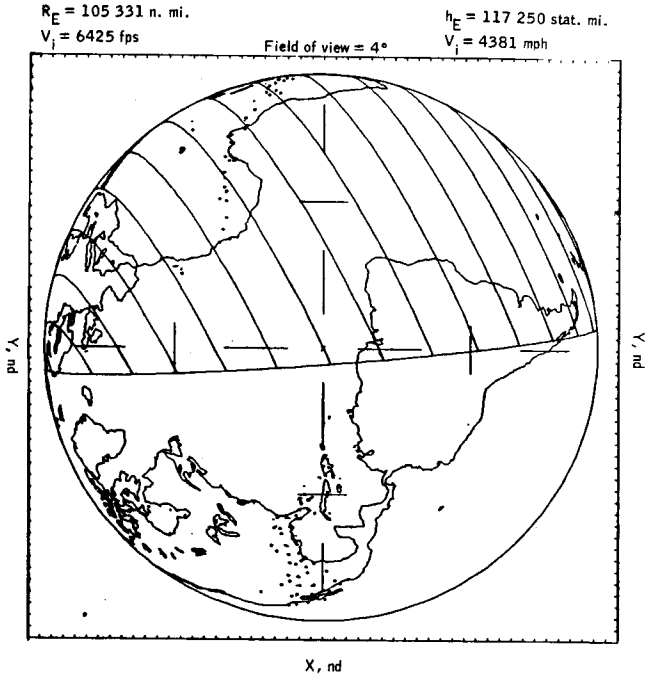
(gg) G.e.t. = 170 hours.



(hh) G.e.t. = 171 hours.

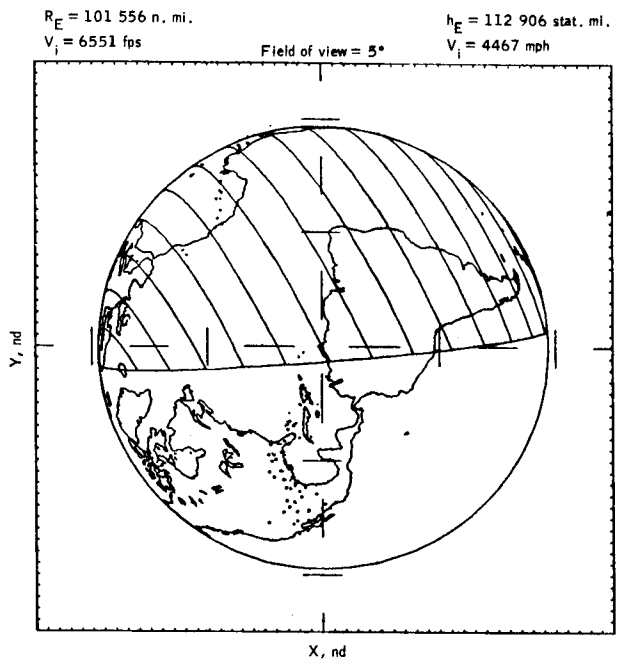


(ii) G.e.t. = 172 hours.

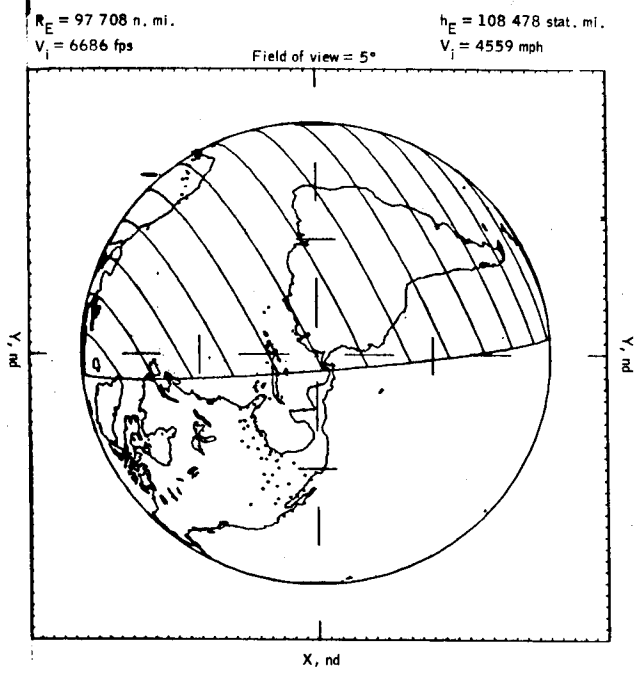


(jj) G.e.t. = 173 hours.

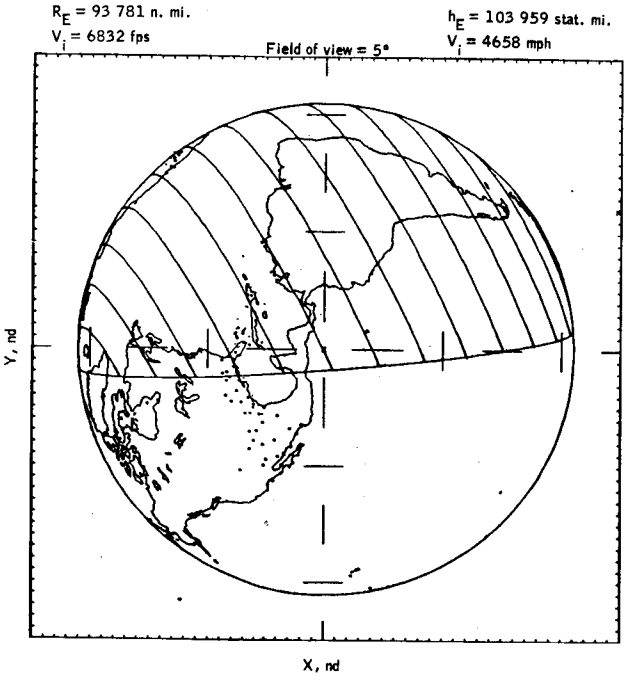
Figure 18.- Continued.



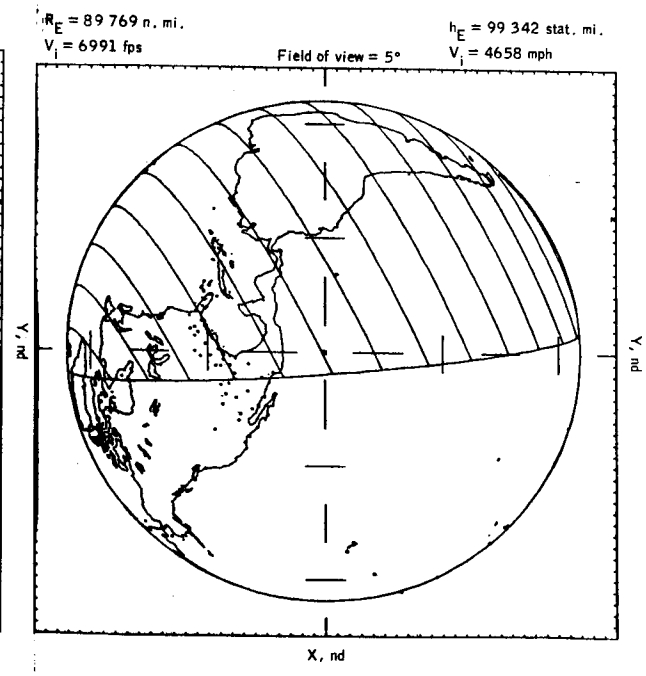
(kk) G.e.t. = 174 hours.



(ll) G.e.t. = 175 hours.

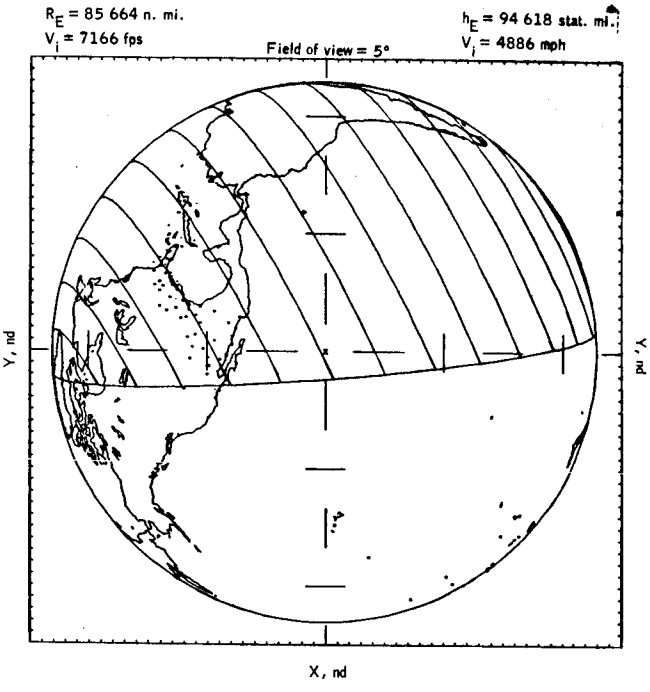


(mm) G.e.t. = 176 hours.

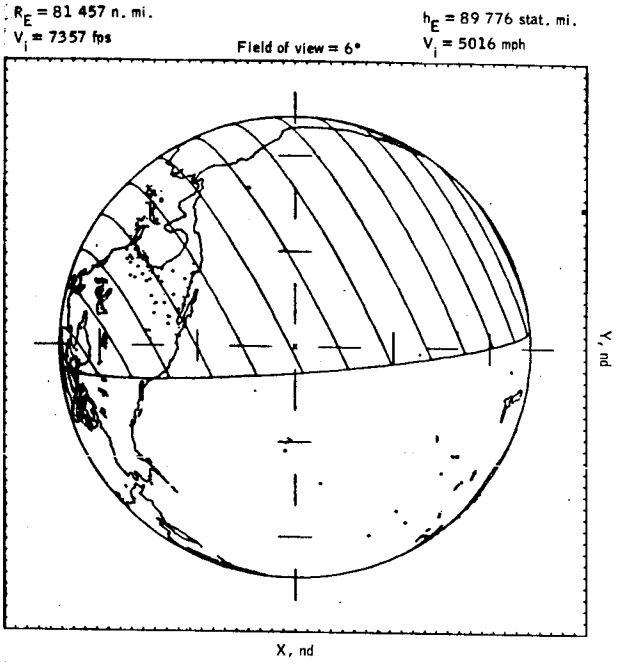


(nn) G.e.t. = 177 hours.

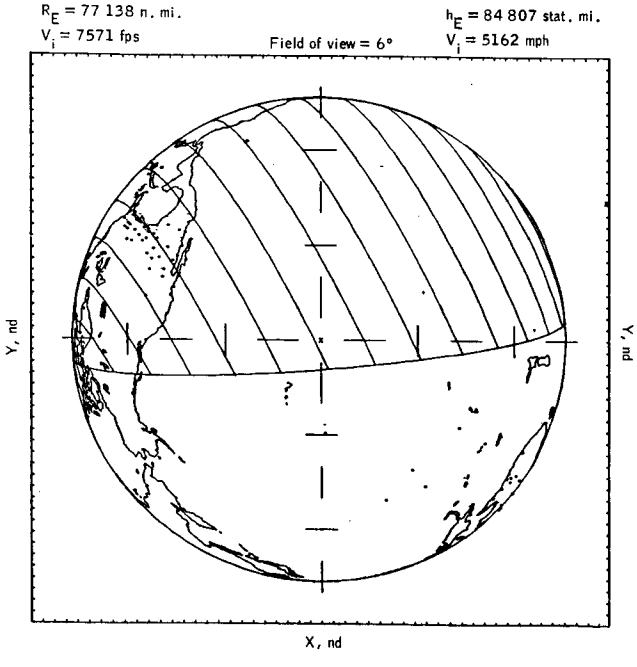
re 18.- Continued.



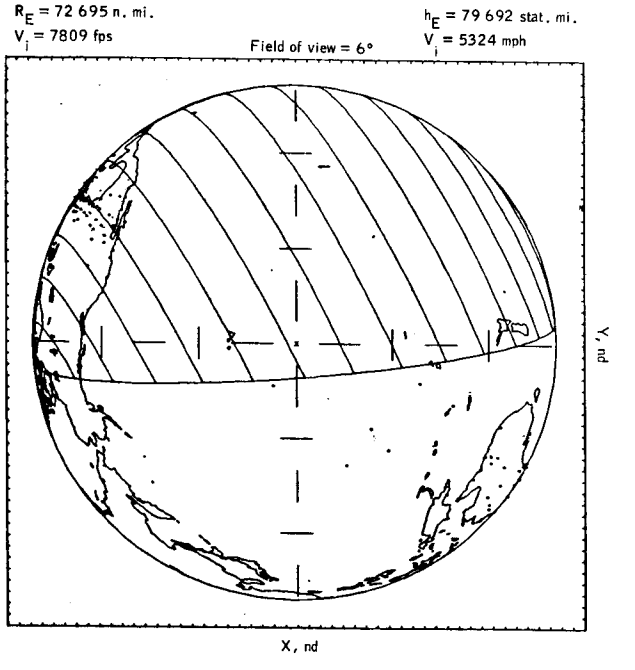
(oo) G.e.t. = 178 hours.



(pp) G.e.t. = 179 hours.

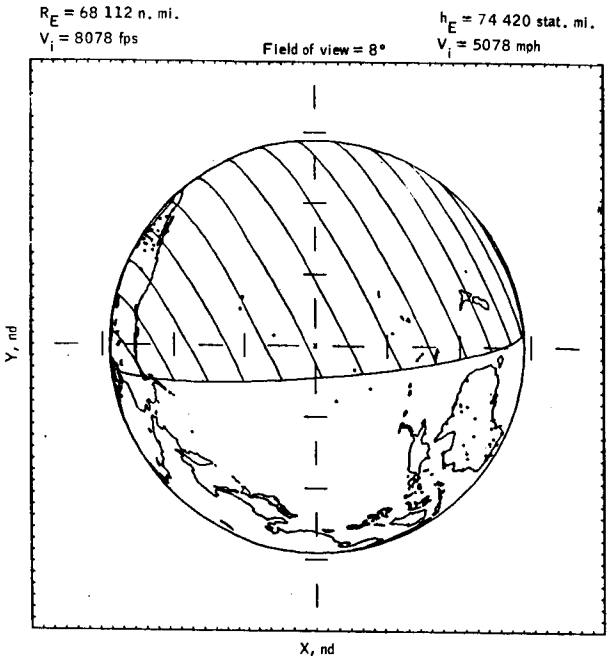


(qq) G.e.t. = 180 hours.

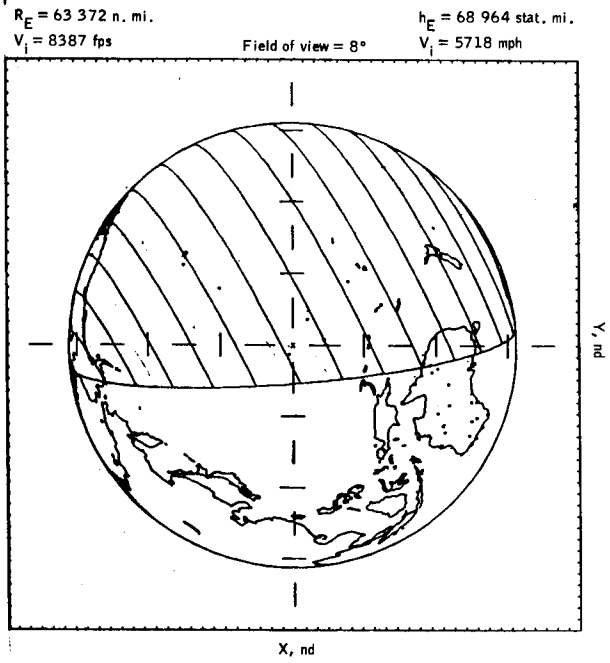


(rr) G.e.t. = 181 hours.

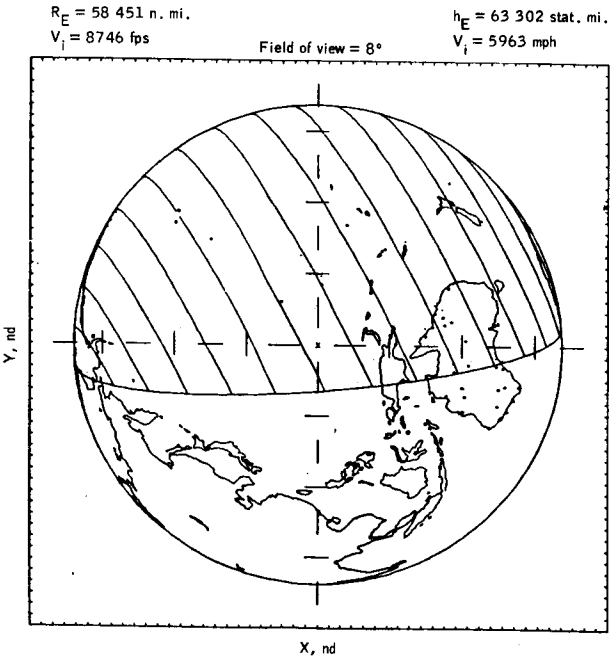
Figure 18.- Continued.



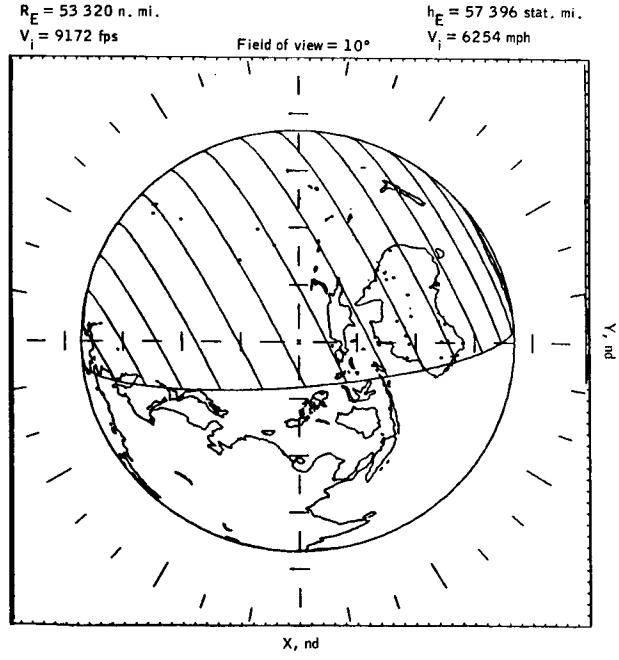
(ss) G.e.t. = 182 hours.



(tt) G.e.t. = 183 hours.

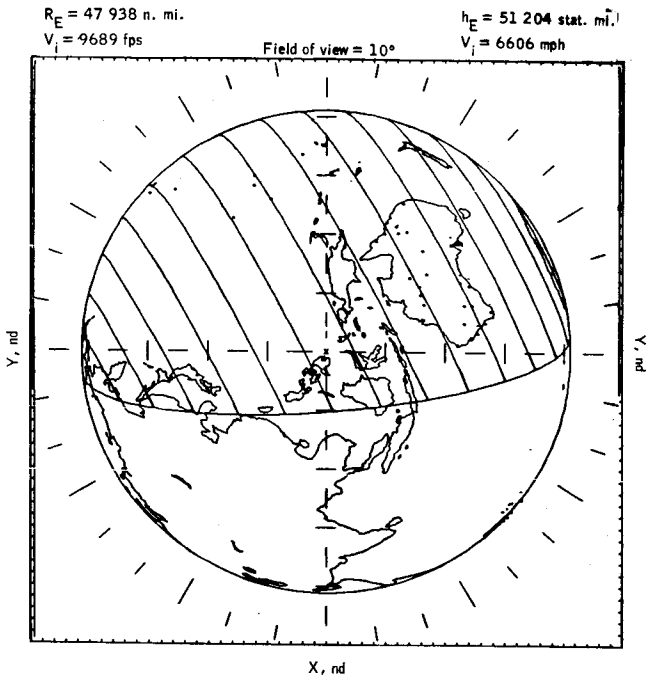


(uu) G.e.t. = 184 hours.

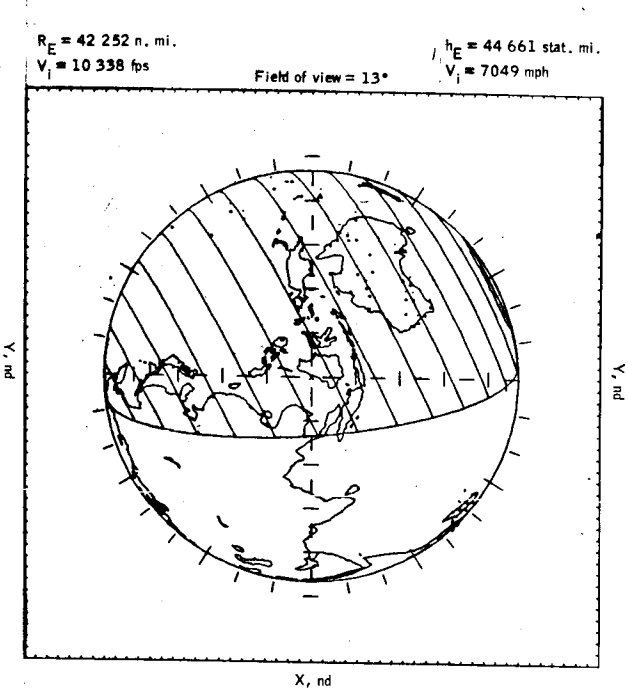


(vv) G.e.t. = 185 hours.

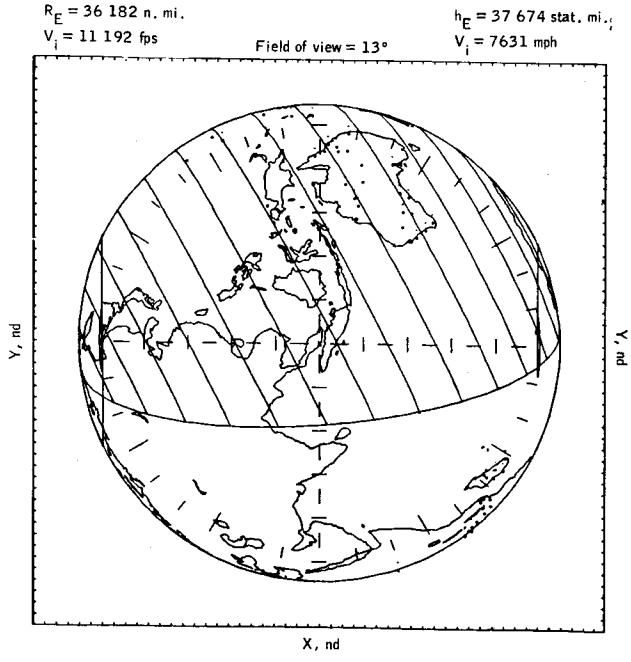
Figure 18.- Continued.



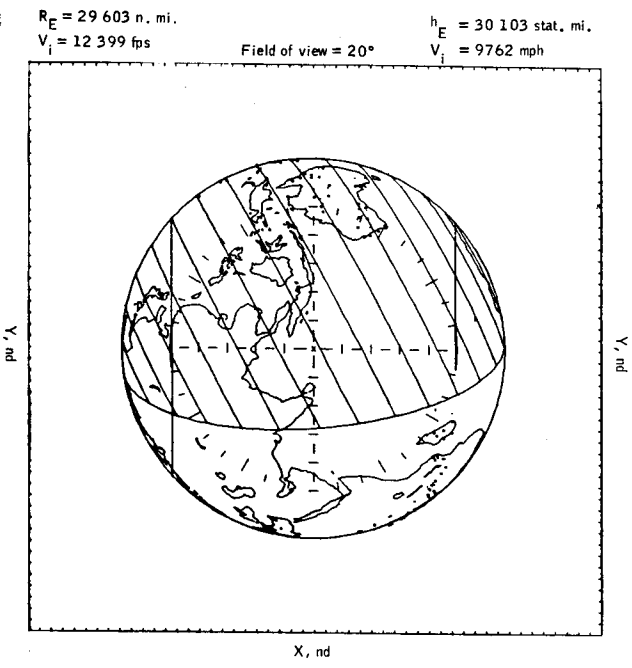
(ww) G.e.t. = 186 hours.



(xx) G.e.t. = 187 hours.

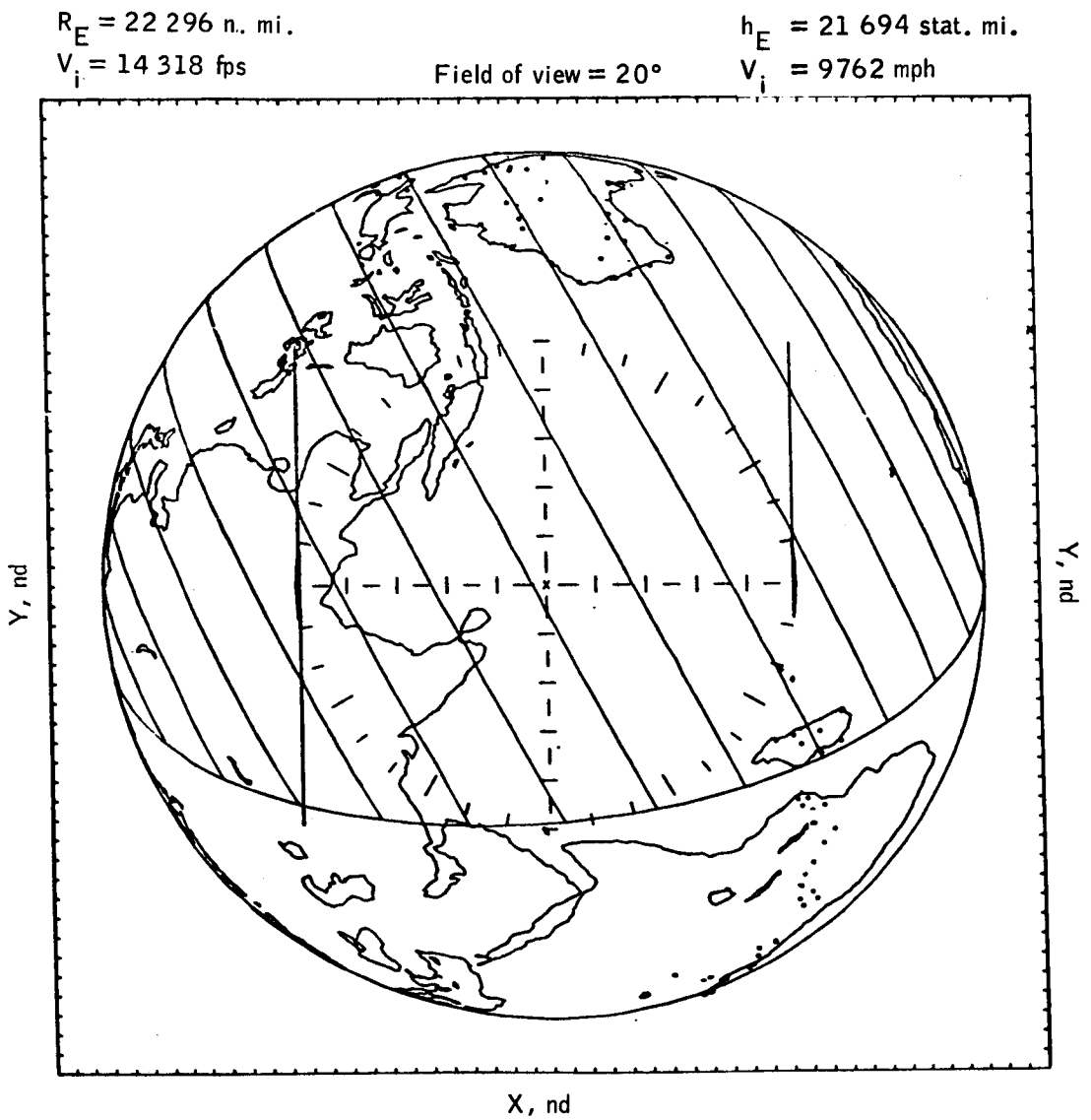


(yy) G.e.t. = 188 hours.



(zz) G.e.t. = 189 hours.

Figure 18.- Continued.



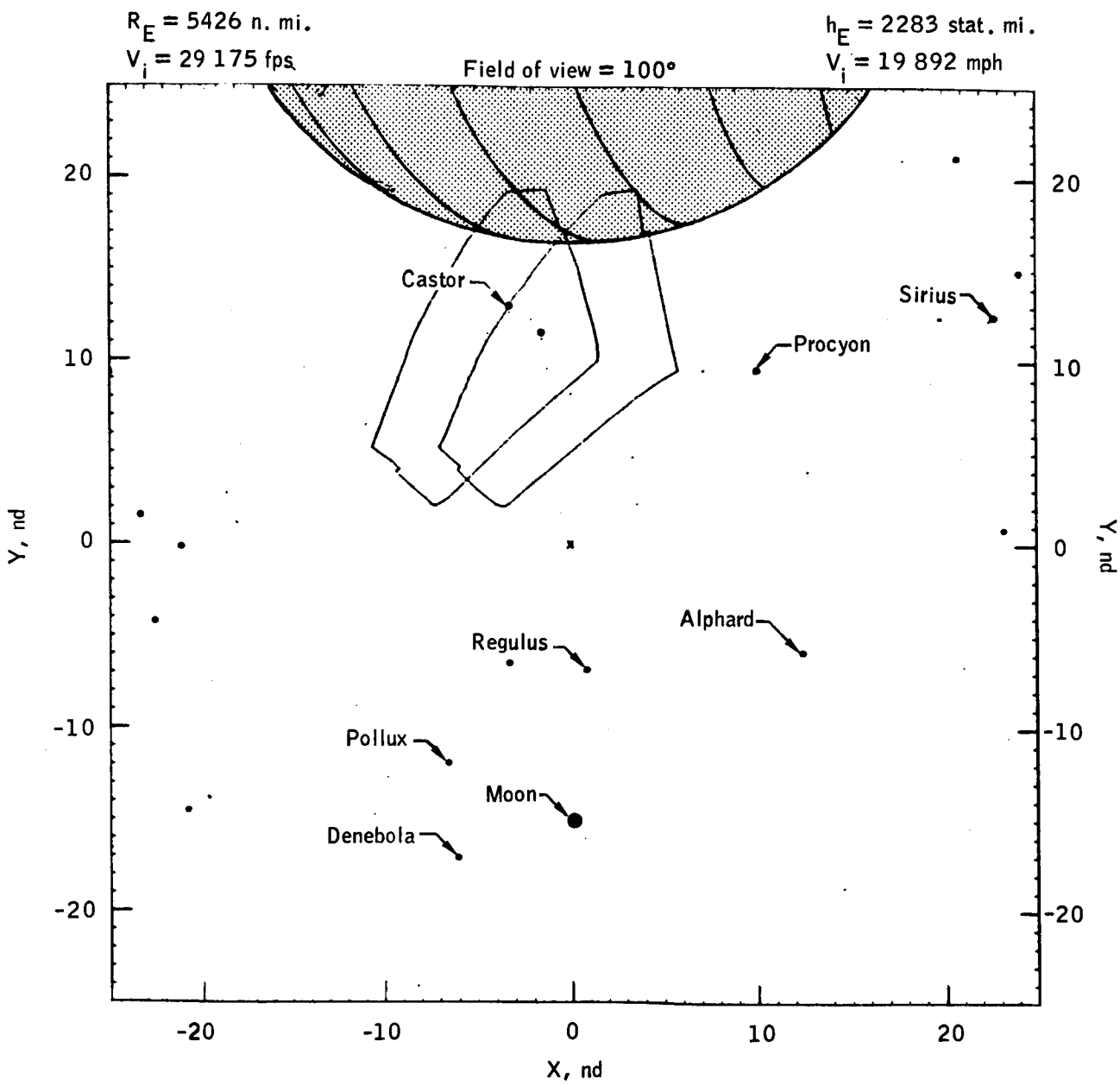
(aaa) G.e.t. = 190 hours.

Figure 18.- Concluded.

ENTRY PHASE

SEQ	284	290	308	349	356	362	377	440	473	480	507	509
X	30	24	22	-3	10	-1	23	12	0	-3	-21	-23
Y	21	15	12	13	9	11	1	-5	-6	-6	0	1

SEQ	515	535	540	580
X	-6	-6	-22	-20
Y	-11	-16	-4	-14

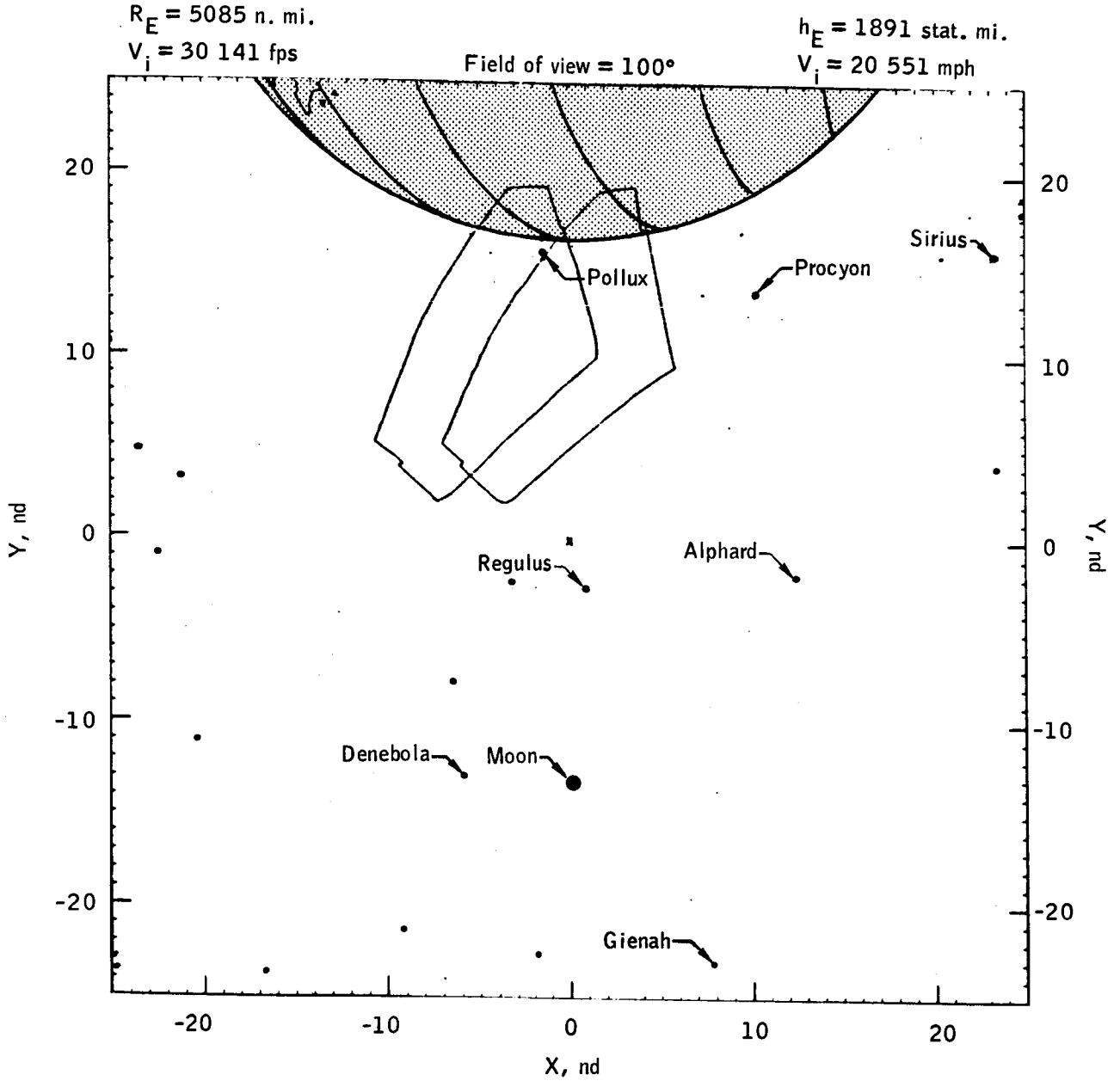


(a) 15 min prior to entry (g.e.t. = 191:35:32.2).

Figure 19.- Entry phase.

SEQ	290	308	356	362	377	440	473	480	507	509	515	535	540
X	24	23	10	-1	23	12	0	-3	-21	-23	-6	-5	-22
Y	18	15	13	15	4	-1	-2	-2	3	4	-7	-12	0

SEQ	551	570	580	582	610	651
X	7	-1	-20	-9	-16	-24
Y	-22	-22	-10	-21	-23	-23

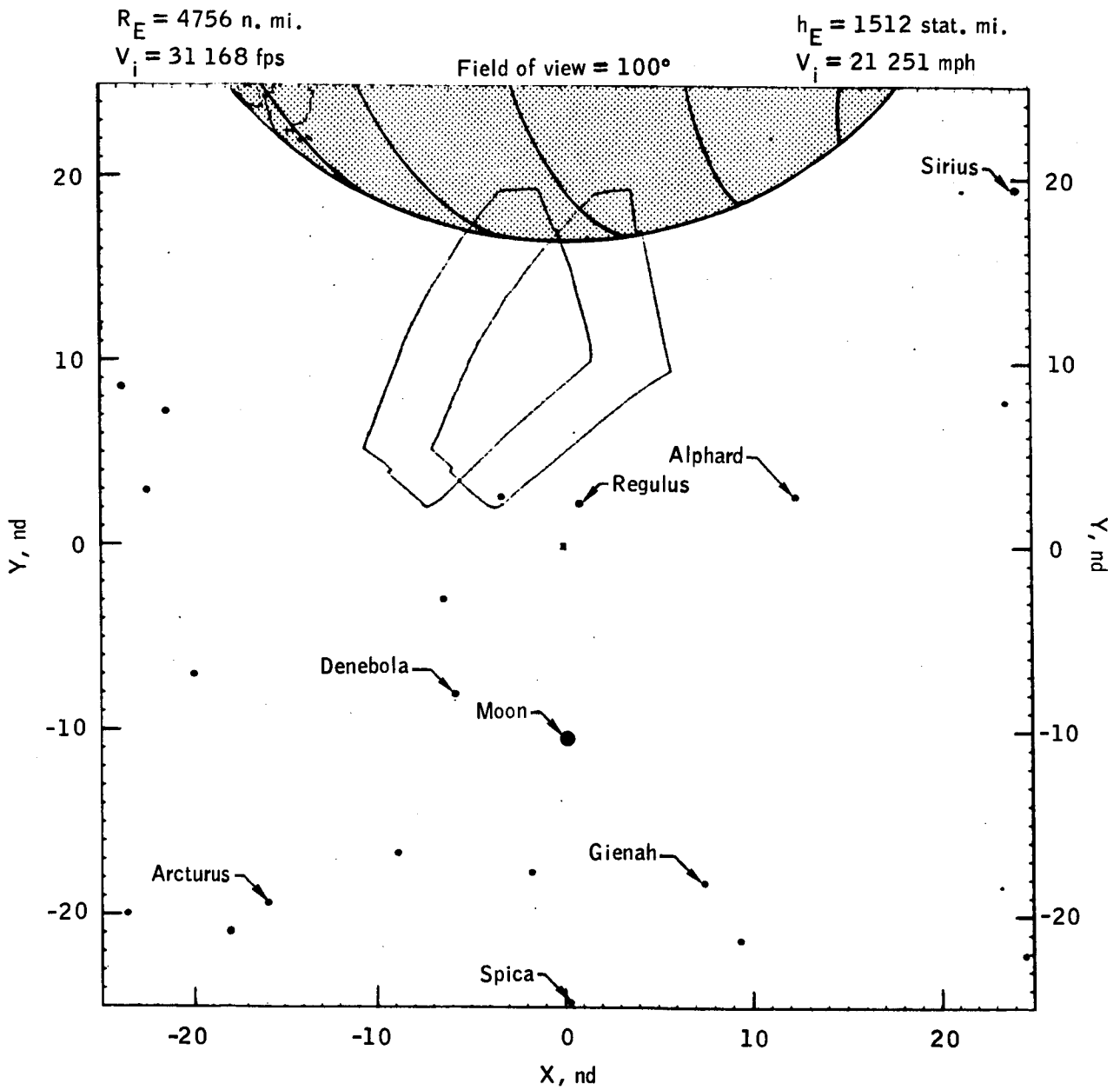


(b) 13 min prior to entry (g.e.t. = 191:39:32.2).

Figure 19. - Continued.

SEQ	308	377	440	473	480	507	509	515	535	540	545	561	566
X	24	23	12	0	-3	-21	-23	-6	-5	-22	24	7	9
Y	19	8	2	2	2	7	-8	-2	-7	3	-21	-18	-21

SEQ	570	580	582	583	610	624	651
X	-1	-19	-8	0	-15	-17	-23
Y	-17	-6	-16	-24	-19	-20	-19

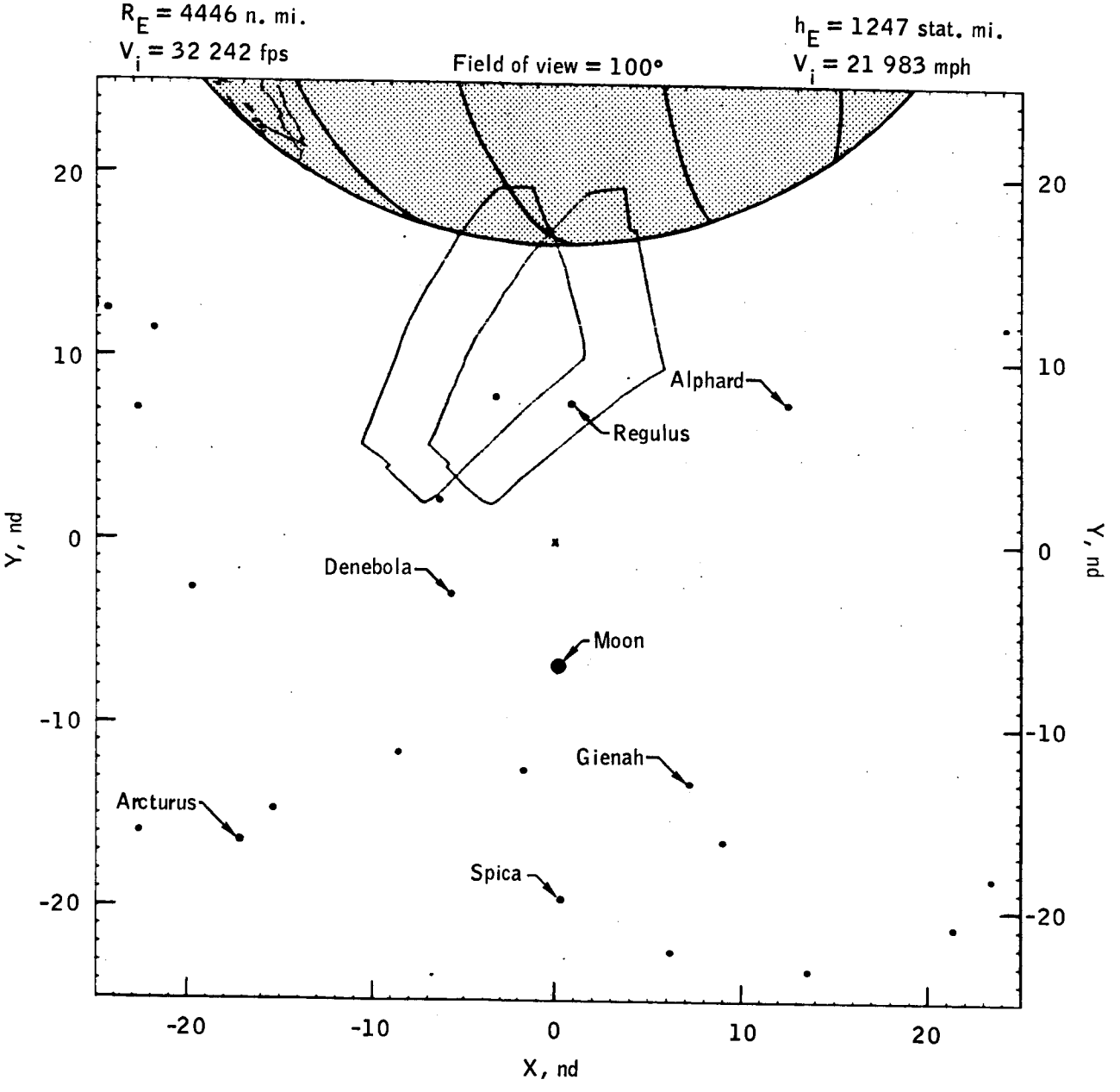


(c) 11 min prior to entry (g.e.t. = 191:39:32.2).

Figure 19.- Continued.

SEQ	397	440	473	480	507	509	515	535	540	545	551	566	569
X	24	12	0	-3	-21	-24	-6	-5	-22	23	7	9	21
Y	12	7	7	8	11	12	2	-2	7	-18	-12	-06	-20

SEQ	570	580	582	589	593	595	610	624	651
X	-1	-19	-8	13	0	6	-15	-17	-22
Y	-12	-2	-11	-23	-19	-22	-14	-16	-15

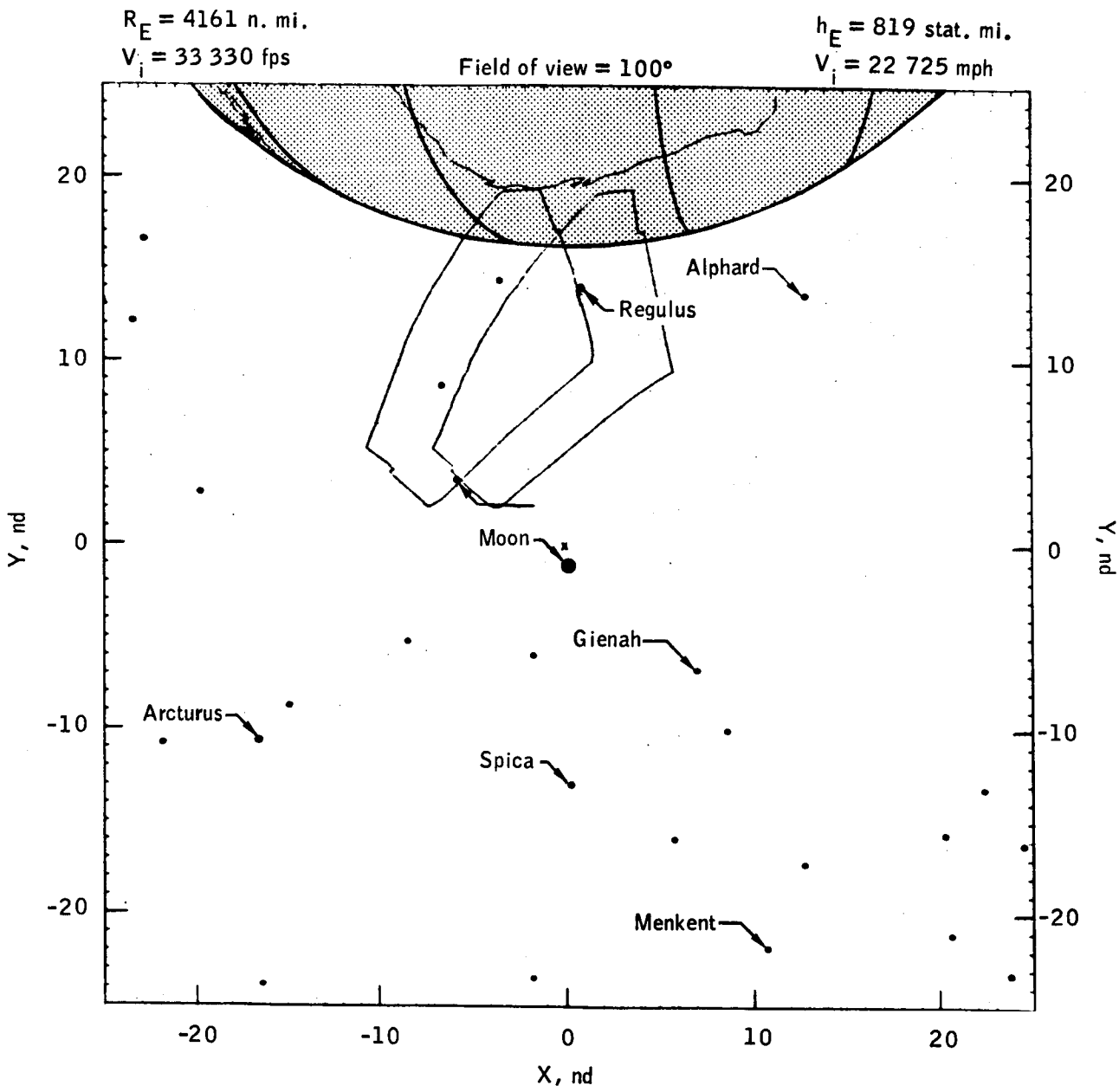


(d) 9 min prior to entry (g.e.t. = 191:41:32.2).

Figure 19.- Continued.

SEC	440	473	480	507	515	535	540	545	551	561	566	569	570
X	12	0	-3	-22	-6	-5	-23	22	7	24	8	20	-1
Y	13	14	14	16	8	3	12	-13	-6	-16	-9	-15	-5

SEC	580	582	589	593	595	599	610	617	621	624	651	655	700
X	-19	-8	12	0	5	20	-14	23	10	-16	-21	-1	-16
Y	2	-5	-17	-12	-15	-20	-8	-23	-21	-10	-10	-23	-23

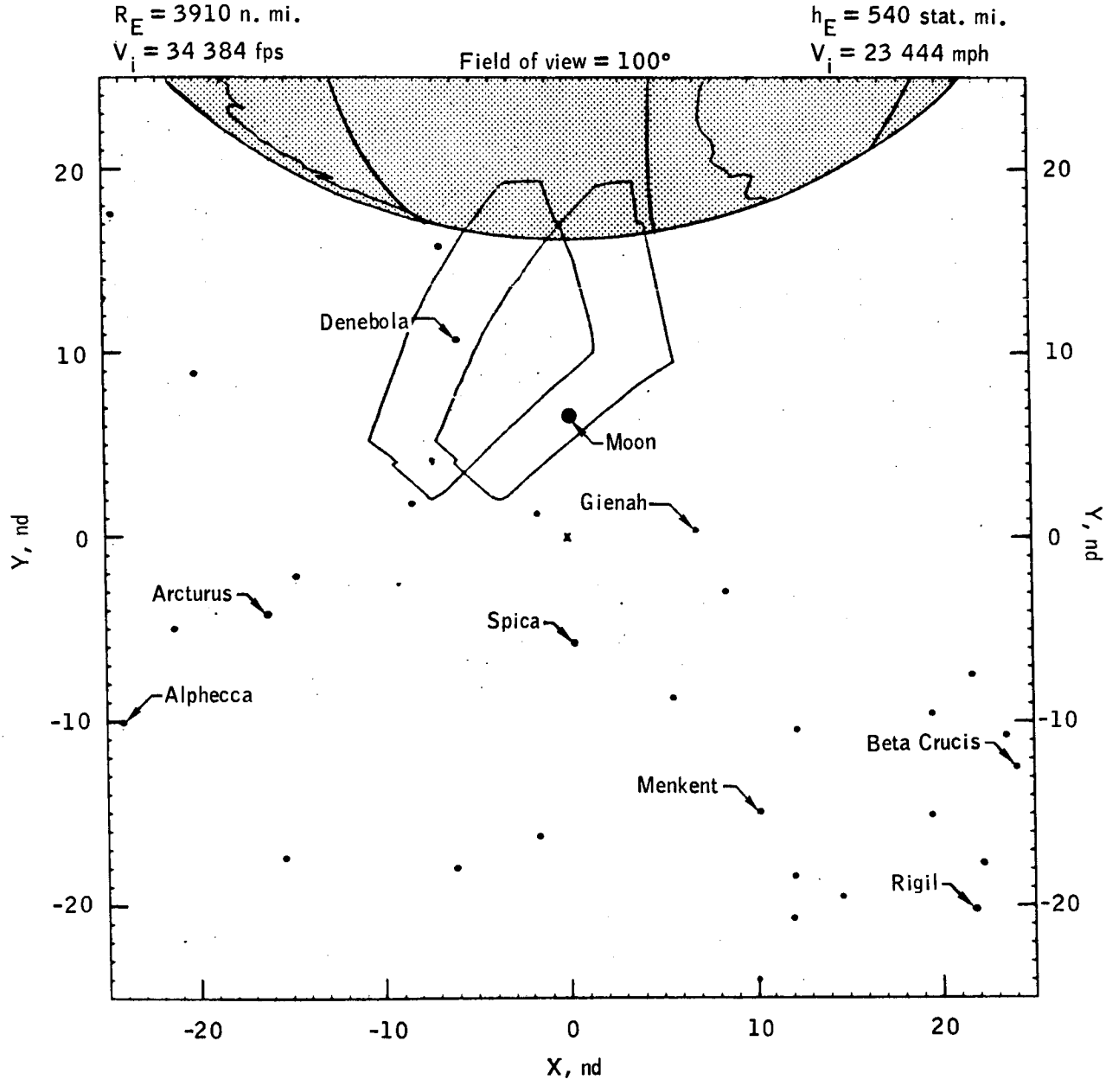


(e) 7 min prior to entry (g.e.t. = 191:43:32.2).

Figure 19.- Continued.

SEQ	515	535	540	545	551	561	566	569	570	574	580	582	589	593	595
X	-6	-5	-24	21	8	23	8	19	-1	24	-20	-8	12	0	5
Y	15	10	17	-7	0	-10	-2	-9	1	-12	9	1	-10	-5	-8

SEQ	599	610	617	621	624	641	643	645	651	655	660	673	688	690	700
X	19	-14	22	10	-16	12	21	14	-21	-1	12	-6	10	-24	15
Y	-14	-1	-17	-14	-4	-18	-20	-19	-4	-16	-20	-17	-23	-9	-17



(f) 5 min prior to entry (g.e.t. = 191:45:32.2).

Figure 19.- Continued.

SEQ	545	551	561	566	569	570	574	580	582	589	593	595	599
X	21	7	22	8	19	-1	23	-20	-8	12	0	5	18
Y	0	8	-4	5	-2	9	-5	16	10	-2	2	0	-7

SEQ	610	617	621	624	641	643	645	651	655	660	673	688
X	-14	21	9	-16	11	20	13	-21	-1	11	-5	9
Y	5	-10	-6	3	-10	-13	-11	2	-7	-12	-9	-15

SEQ	690	700	717	719	724	736	743	745	751	753	757	759	770
X	-23	-14	1	0	-2	0	0	-23	1	-8	23	4	-6
Y	-3	-9	-16	-16	-16	-19	-20	-11	-20	-19	-20	-22	-23

SEQ	795	803
X	-22	-18
Y	-21	-24

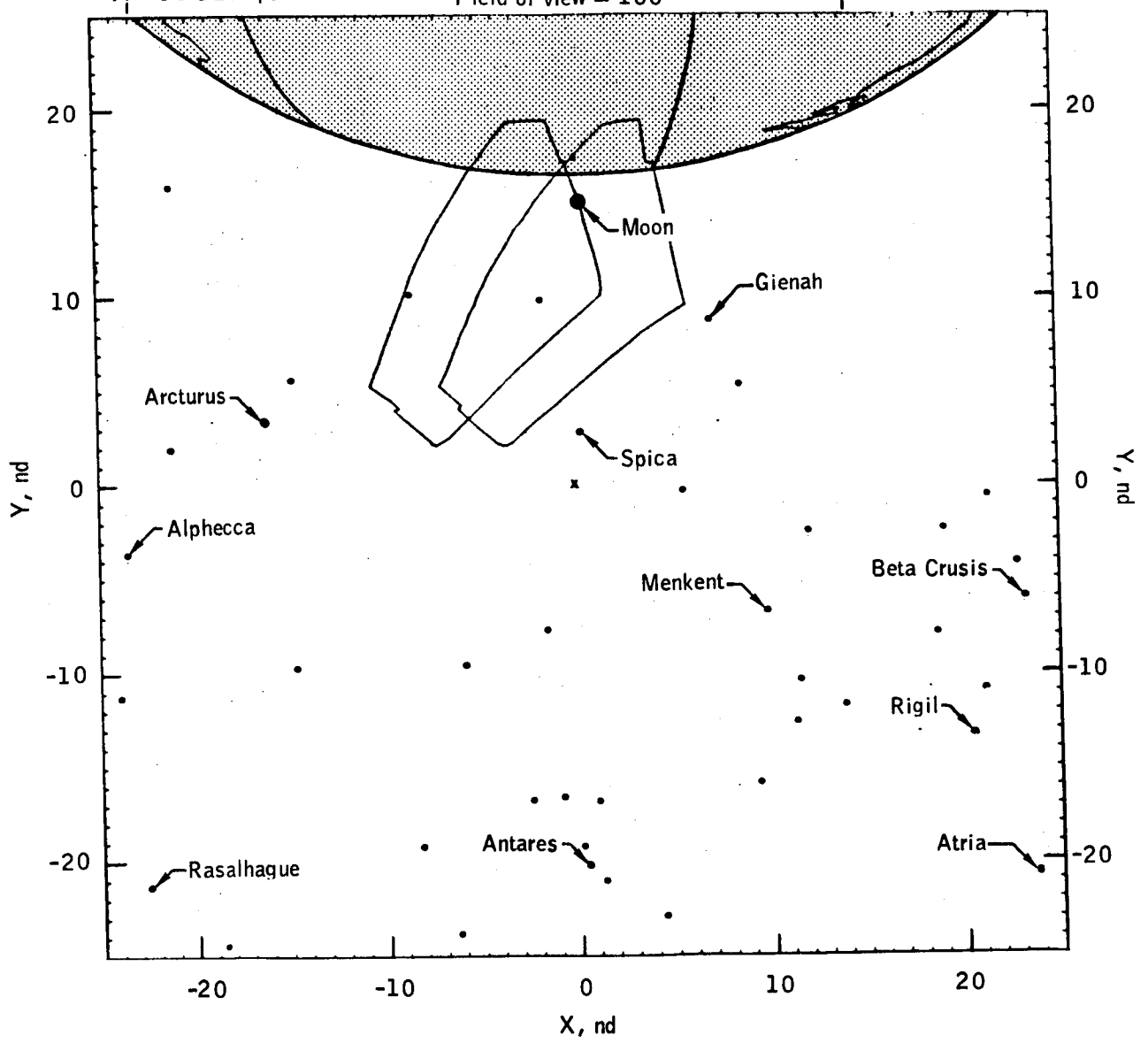
R_E = 3706 n. mi.

V_i = 35 325 fps

Field of view = 100°

h_E = 304 stat. mi.

V_i = 24 085 mph



(g) 3 min prior to entry (g.e.t. = 191:47:32.2).

Figure 19.- Continued.

SEQ	545	561	566	569	574	589	593	595	599	610	617	621	629	641	643
X	21	22	8	19	23	12	0	5	18	-15	20	9	-16	11	19
Y	6	2	13	5	0	5	11	8	0	13	-3	1	11	-1	-5

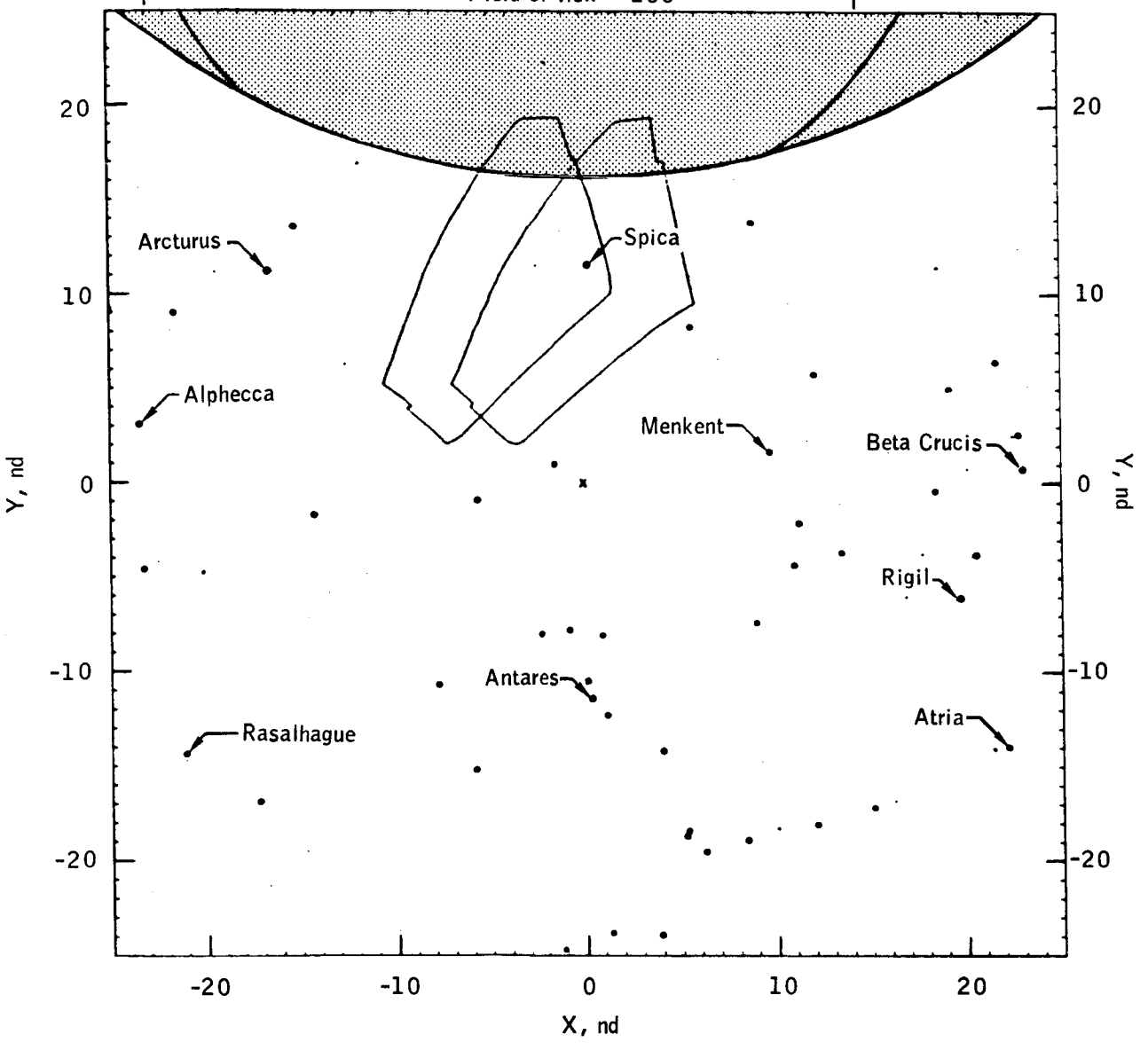
SEQ	645	651	655	660	673	688	690	700	712	719	724	736	743	745	751
X	13	-21	-1	10	-5	8	-23	-14	8	8	-2	0	0	-23	1
Y	-3	9	1	-4	0	-7	3	-1	-7	-7	-7	-10	-11	-4	-12

SEQ	753	757	769	770	781	789	790	793	795	797	802	803	836	841	844
X	-7	22	4	-5	15	5	12	5	-21	8	6	-17	1	3	-1
Y	-10	-13	-14	-15	-17	-18	-17	-18	-14	-18	-19	-16	-23	-23	-24

R_E = 3557 n. mi.
V_i = 36 055 fps

h_E = 132 stat. mi.
V_i = 24 583 mph

Field of view = 100°



(h) 1 min prior to entry (g.e.t. = 191:49:32.2).

Figure 19.- Continued.

SEQ	545	561	569	574	589	593	595	599	617	621	641	643	645
X	21	22	19	23	12	0	5	18	20	9	11	19	13
Y	10	6	8	4	10	16	12	3	0	6	2	-2	0

SEQ	651	655	660	673	688	690	700	717	719	724	736	743
X	-21	-1	10	-5	8	-23	-14	0	0	-2	0	0
Y	12	5	0	3	-2	6	2	-3	-3	-3	-5	-6

SEQ	746	751	753	757	759	770	781	789	790	793	795	797	802
X	-23	1	-7	21	4	-5	14	5	11	5	-20	8	6
Y	0	-7	-6	-10	-9	-10	-12	-13	-13	-14	-10	-14	-14

SEQ	803	836	841	844	861	871	933
X	-16	1	3	-1	0	1	18
Y	-12	-19	-19	-19	-22	-23	-24

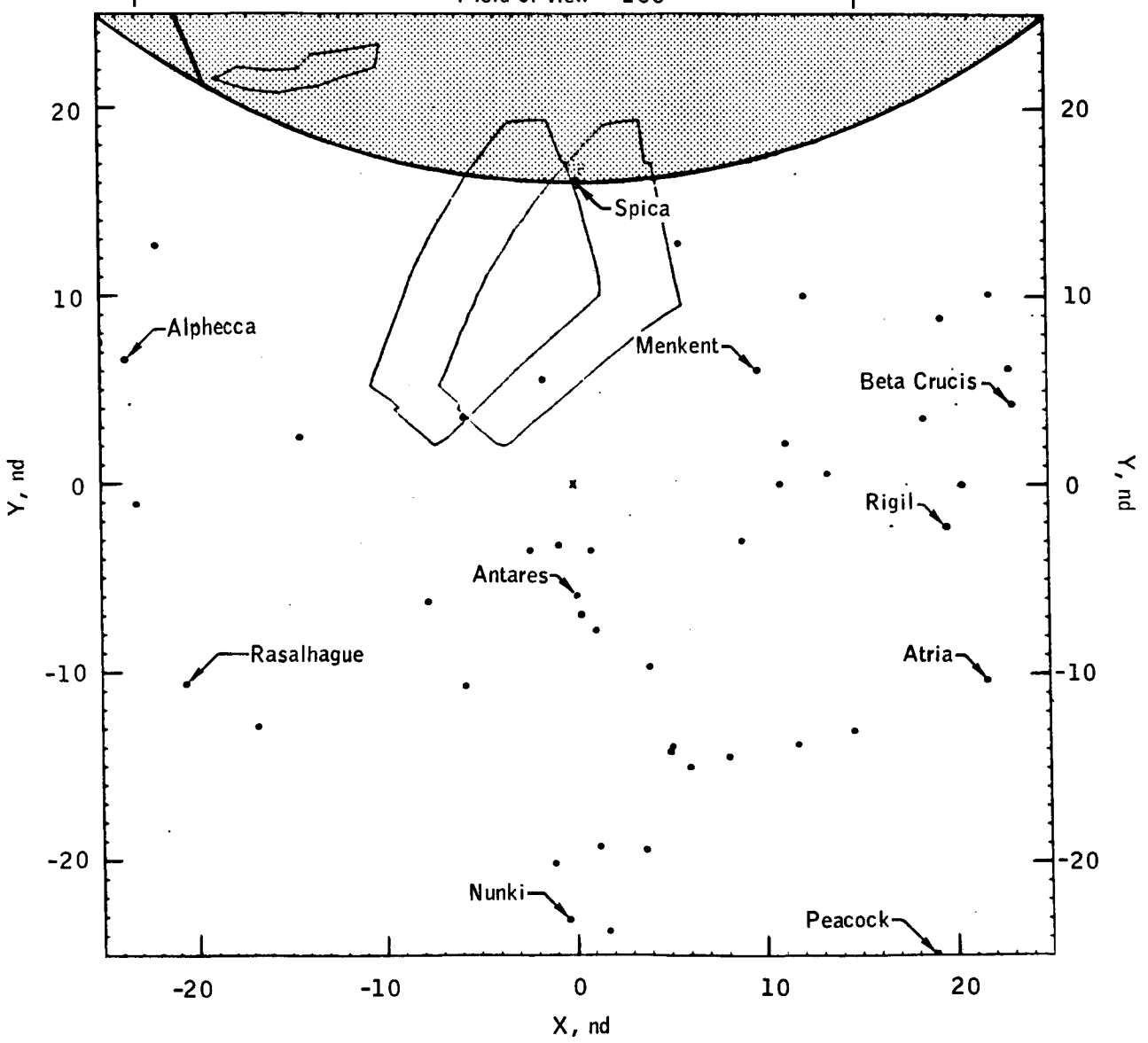
R_E = 3508 n. mi.

V_i = 36 309 fps

Field of view = 100°

h_E = 76 stat. mi.

V_i = 24 756 mph



(i) Entry interface (g.e.t. = 191:50:32.2).

Figure 19.- Concluded.

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2. Rogers, Joseph E.; and Burton, John K.: Apollo 8 Reentry Crew Charts. MSC memo 68-FM23-216, December 12, 1968.

3. OMAB; LMAB; and LAB: The Spacecraft Operational Trajectory for Apollo 10 (Mission F), Volume II. MSC IN 69-FM-97,