36. GEOPHYSICAL DATA ON THE CALIFORNIA CONTINENTAL BORDERLAND: SITES 467 THROUGH 470, DEEP SEA DRILLING PROJECT LEG 63[1]

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INTRODUCTION

During Leg 63 of the Deep Sea Drilling Project (October–November 1978), the *Glomar Challenger* continuously cored eleven holes at seven sites, three off southern California, and four off Baja California (Fig. 1). The underway magnetic, bathymetric, and seismic data acquired during the transect on the outer California Continental Borderland from Long Beach to Site 467 and between Sites 467 and 470 are presented here. The underway geophysical data between Sites 471 and 473, off Baja California are reported elsewhere (see Ness et al., this volume).

The geophysical data from the California Continental Borderland transect of Leg 63 are presented in three groups of profiles. Figure 2 contains the magnetic anomaly and bathymetric data. Figure 3 contains the cruise track of the entire leg, as well as a detailed navigation mercator chart covering the California Continental Borderland sites. Figures 4 and 5 contain the continuous seismic profile records from the beginning of the leg through Site 470. Table 1 contains the navigational data along with regional magnetic field values calculated for each navigation point from the coefficients of Cain and others (1968).

METHODS

The underway magnetics were recorded continuously on a Geometrics magnetometer, and in Figure 3 they are presented along the magnetic anomaly scale and annotated every four hours, GMT, when possible. The underway bathymetric data were recorded from echo sounders (1500 m/s calibrated sound velocity) every five minutes, later digitized, and reproduced here in corrected fathoms with time annotation every twelve hours. The DSDP magnetic and bathymetric data were converted to Woods Hole Oceanographic Institution time series format. The Matthews' table correction was applied to depth data, and the navigation data were merged with depth and magnetics data by computing positions between satellite fixes using linear interpolation by time.

The navigation was achieved mainly by satellite fixes, supplemented by Loran A and C when available. The navigation data are listed in Table 1, as well as the distance along the track in nautical miles and the speed and course maintained between navigation points.

The underway seismic profiles were acquired mostly by the use of two 40-in.^{3} Bolt air guns fired every 20 s, Bolt amplifiers, two bandpass filters, and two EDO recorders. A 120-in.^{3} air gun was used occasionally to obtain deeper penetration. Recordings were made on EDO #1 at 10-s sweep and on EDO #2 at 5-s sweep (see Figs. 4 and 5). Filter setting varied. Both 3.5 kHz and 12 kHz profiles were recorded on Gifft Precision Depth Recorders for water-depth readings. The original records are stored at the Deep Sea Drilling Project, and microfilm copies are available to investigators.

SITE 467 THROUGH SITE 470

The *Glomar Challenger* left the port of Long Beach, California, on 9 October, 1978, for Site 467 in the San Miguel Gap. Because of problems with the gearbox of one of the forward thrusters, the ship had to return to Long Beach for two days of repairs after the completion of drilling at Site 467. On the 20th of October the *Challenger* sailed towards Sites 468 and 469 on the Patton Escarpment.

The primary objectives of Sites 467 through 470 were paleoenvironmental, i.e., to find clues to the late Cenozoic paleoceanographic–paleoclimatic history of the region, which is presently dominated by the California Current system. Site 469 had the additional objective of determining precisely when the Farallon-Pacific Ridge intersected the trench off southern California.

The underway measurements and profiling began as soon as the *Challenger* left San Pedro Channel, 7.9 nautical miles from port. Site 467 was reached on 10 October at 0056 hours GMT. A good air-gun record was obtained approaching the site. The profiles (see Fig. 4) approaching and leaving the site show a north-northeast–trending syncline west of the site. The resolution of the younger sequence on the profiles is poor due to the long bubble pulse on the air-gun record. However, the seismic profiles show several angular unconformities at the site. The upper part of the sequence is characterized by a poorly stratified unit on a slight angular unconformity, which is underlain by strong, continuous, evenly spaced reflectors that correlate well with lithified claystones.

After repairs to the forward thruster, the *Challenger* left Long Beach once again on 20 October and headed towards Site 468. The course took the ship over the southern part of the Santa Rosa-Cortez Ridge and Patton Ridge; Site 468 was located just off the Patton Ridge on the Patton Escarpment and occupied on 22 October, 1978. The *Challenger* seismic profiles (see Figs. 4 and 5) do not show much detail in the acoustic stratigraphy of Site 468 because of the steepness of the escarpment and the high vertical exaggeration.

The coring operations at Site 468 ended on 26 October, and after a short post-cruise run over the beacon the *Challenger* headed towards Site 469, a short distance

[1] *Initial Reports of the Deep Sea Drilling Project*, Volume 63.

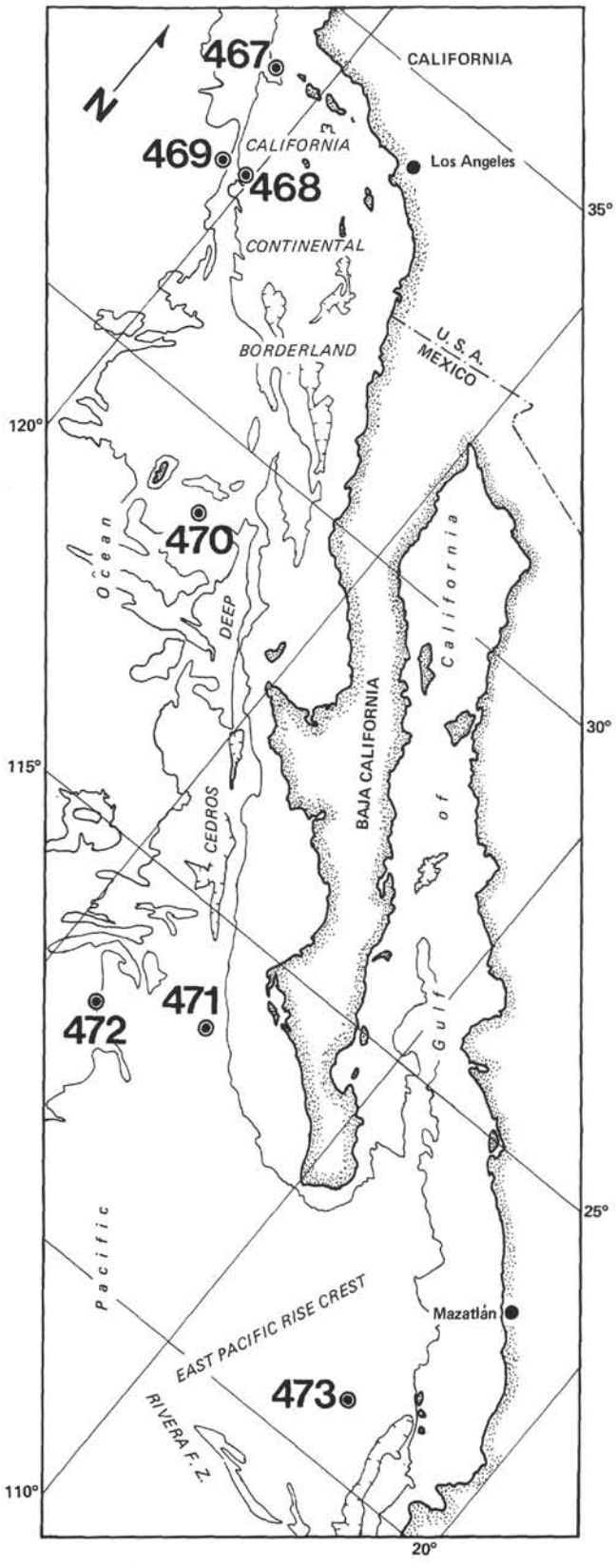


Figure 1. Location of Leg 63 sites.

away at the base of the Patton Escarpment. An excellent air-gun record was obtained in the vicinity at a reduced speed of 5.5 knots. This record shows an indistinct basement reflector dipping gently eastward towards the escarpment and some deeper reflectors that turned out to be artifacts. The survey was continued some distance beyond the site point, and the site was occupied on 27 October. The *Challenger* profiles show four easily distinguishable reflector sequences. The uppermost sequence of strong, widely spaced reflectors correlates with a lithologic unit that consists of clays. The next sequence of closely spaced reflectors correlates with nannofossil ooze, and the change from this sequence to another widely spaced reflector sequence correlates with an upper Miocene hiatus. Below these sequences, a sequence of indistinct reflectors correlates with the lithologic unit of clastic and volcaniclastic sediments, underlain by a prominent reflector that represents a diabase sill (see Site 469 report).

The drilling operations at Site 469 were terminated on 1 November, and a postsite survey on an east-northeastern heading was attempted at 5.5 knots with a 120-in.^{3} air gun to obtain a better record across the abyssal plain and the Patton Escarpment. The basement reflector, however, could only be traced part way up to the escarpment, and the *Challenger* headed south-southeast on 2 November towards Site 470, about 80 km east of Guadalupe Island. The underway survey was accomplished with a 40-in.^{3} air gun at an average cruising speed of 9.5 knots to a point just north of Popcorn Ridge, where speed was reduced to 5.5 knots to obtain a better seismic record. An excellent record was obtained in the vicinity of the proposed site, and Site 470 was occupied at 0300 GMT on 3 November, about 8 km south-southwest of the Experimental Mohole site. At this site, the reflector record shows two sets of strong, continuous reflectors above acoustic basement and a zone of weak, indistinct, reflectors above these that correlate well with different lithologic units cored at the site (see Site 470 report).

The coring operations at Site 470 came to an end on 6 November, and after a short postsite survey the *Challenger* headed towards Site 471 (see Ness et al., this volume, for geophysical records beyond Site 470).

ACKNOWLEDGMENTS

I thank T. Gustafson, lab officer on Leg 63, and his technical staff for the smooth handling and operation of the geophysical and laboratory equipment. R. Groman (WHOI) processed the underway magnetics, bathymetric, and navigational data into the format shown in Figures 2 and 3. The author's research is supported by a grant from National Science Foundation, Submarine Geology and Geophysics Division, Grant No. OCE 78-19769.

REFERENCES

Cain, J. C., Henricks, S., Daniels, W. E., et al., 1968. Computation of the main geomagnetic field from spherical lasmonic expansions. *Data User's Note NSSDG68-11*, Greenbelt, Md.

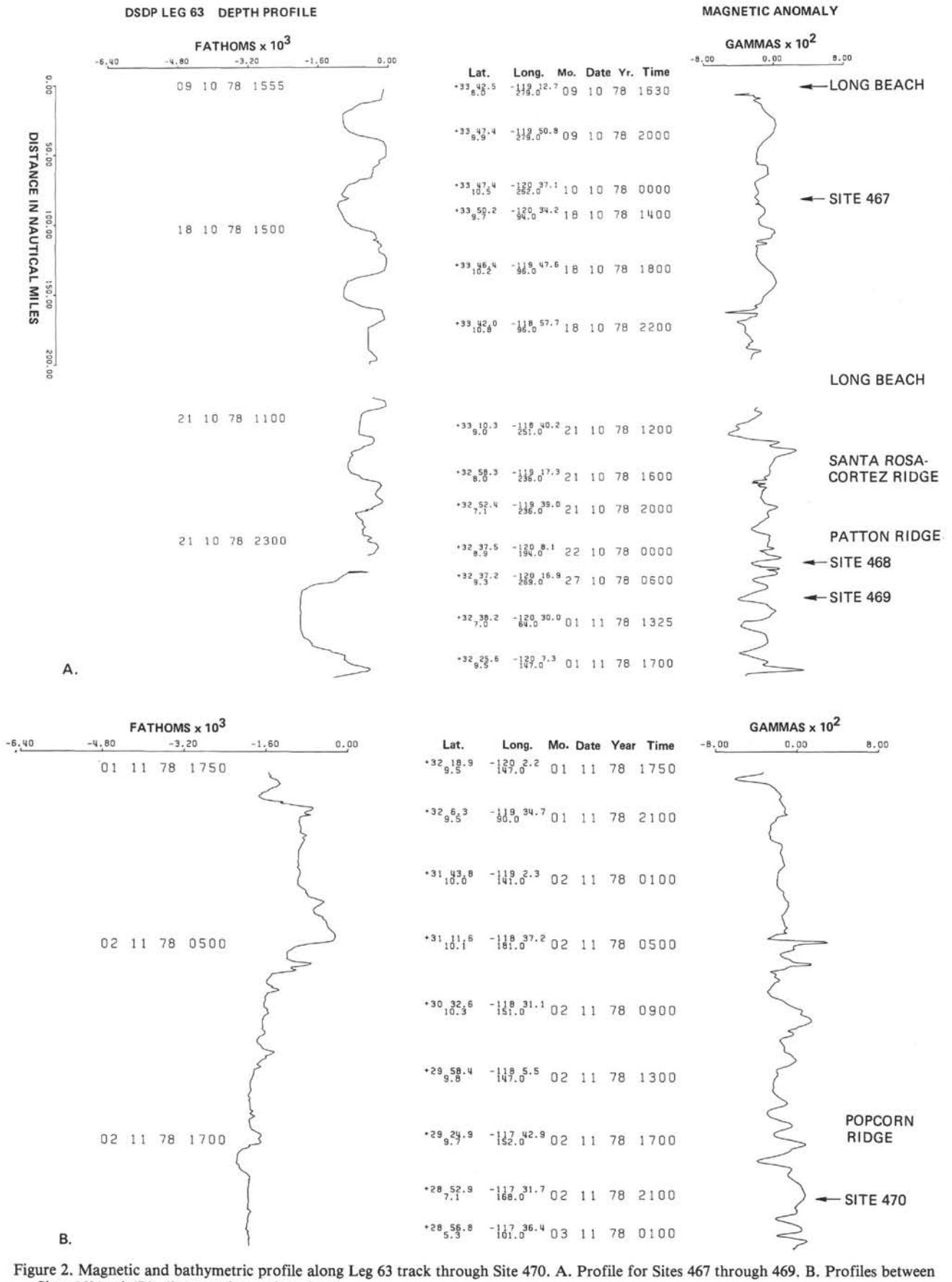
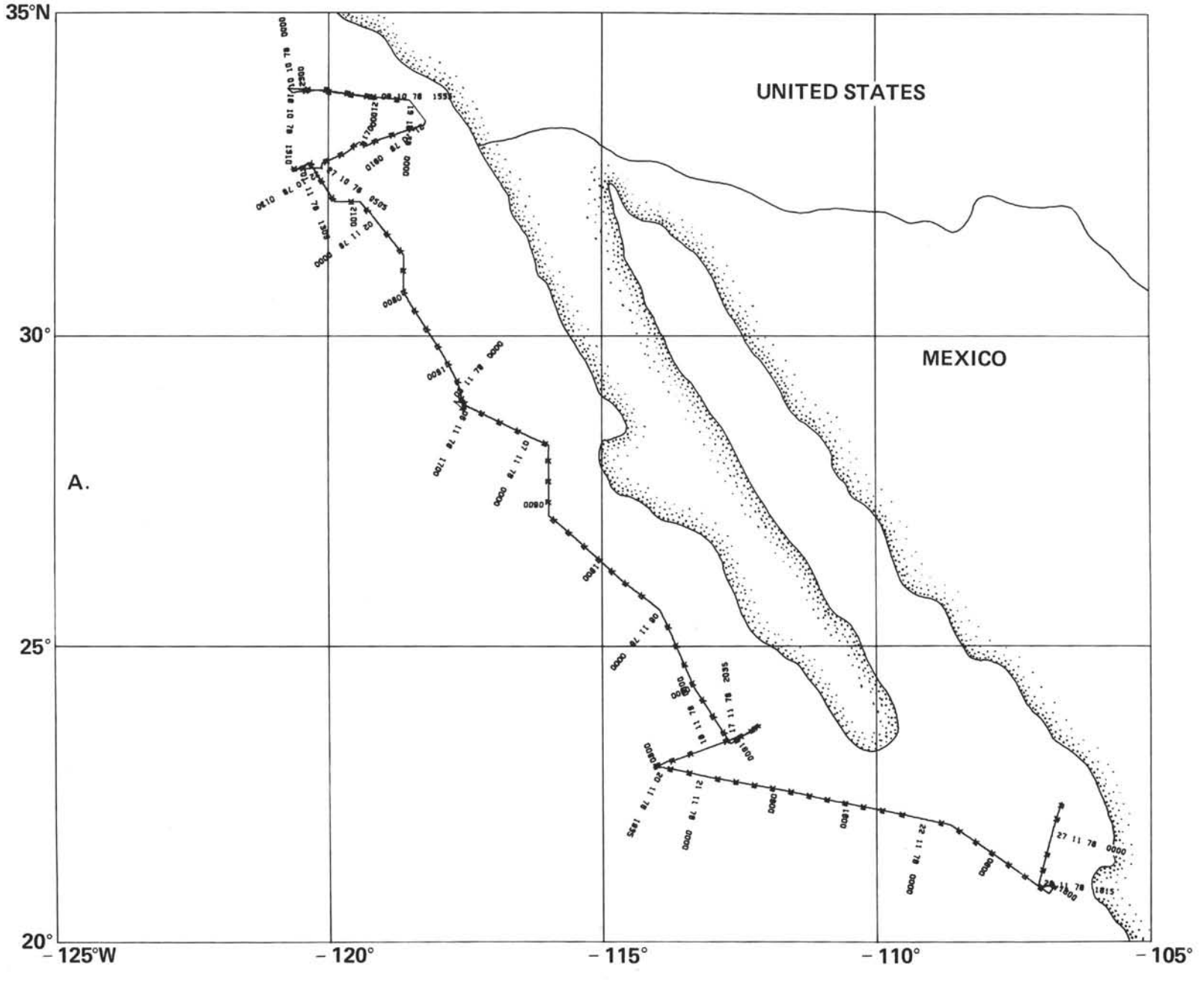


Figure 2. Magnetic and bathymetric profile along Leg 63 track through Site 470. A. Profile for Sites 467 through 469. B. Profiles between Sites 469 and 470. (See text for explanation.)


35°N
30°
25°
20°
– 125°W
– 120°
– 115°
– 110°
– 105°
UNITED STATES
MEXICO
A.

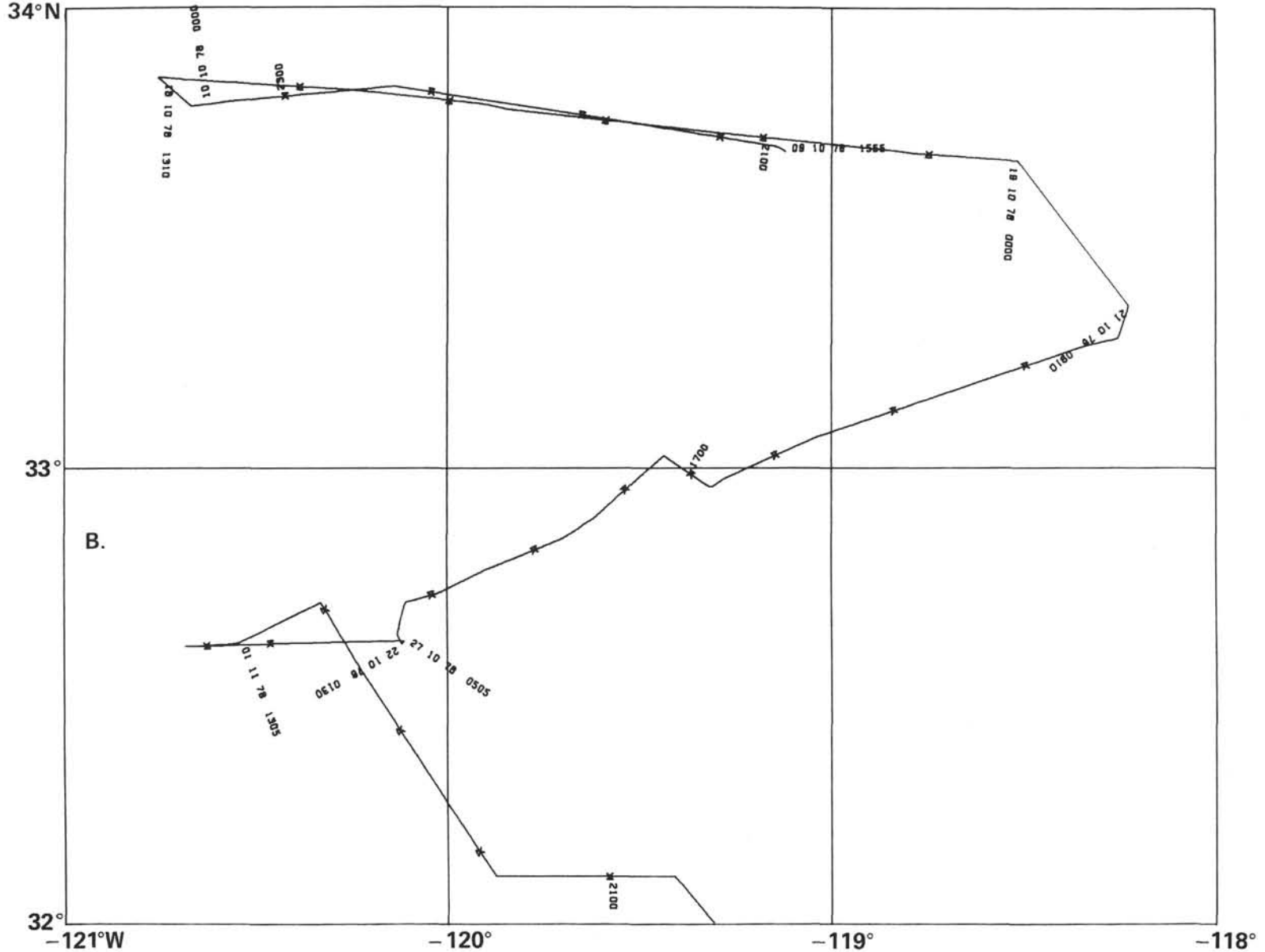
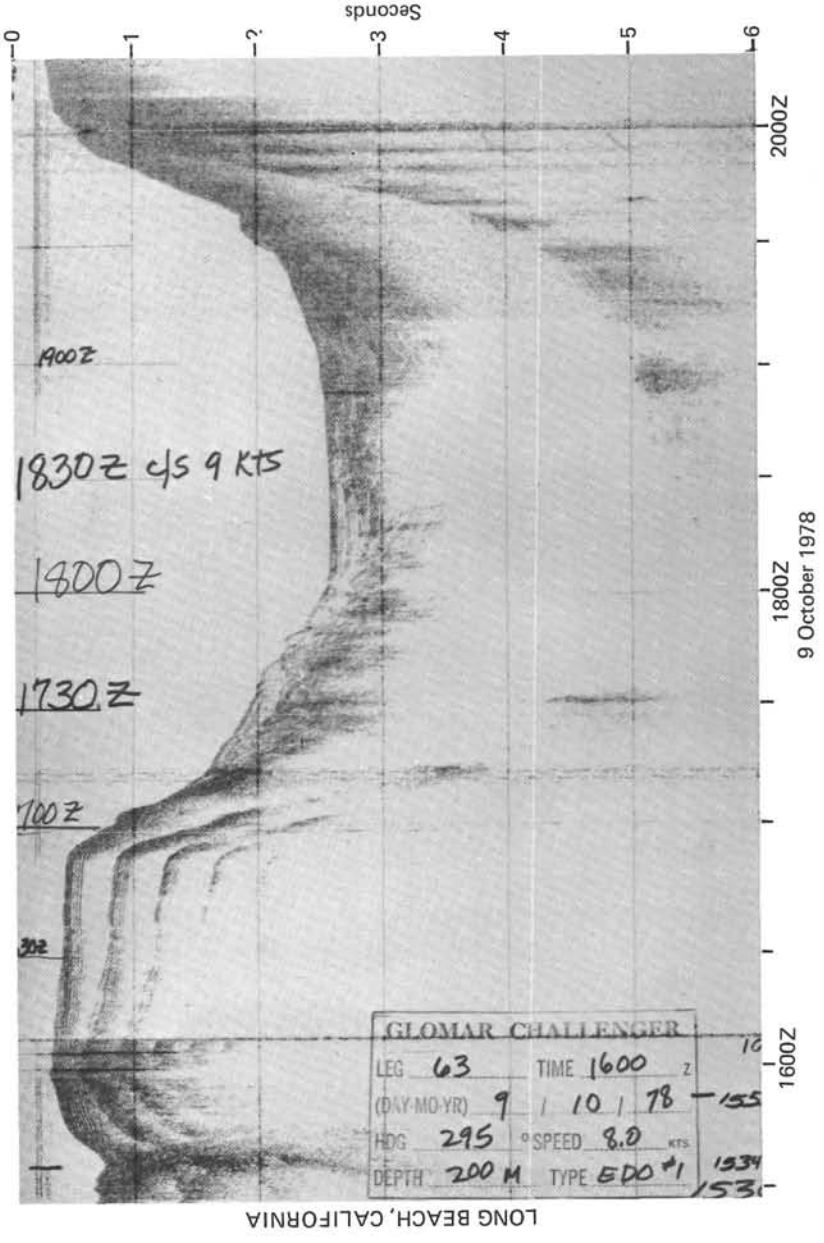


Figure 3. A. Cruise track of Leg 63, annotated every two hours (with asterisk). B. Detailed cruise track from 9 October to 1 November 1978, covering California Continental Borderland sites (467–469).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2
3
4
5
6
2000Z
1800Z
1600Z
9 October 1978
1900Z
1830Z c/s 9 KTS
1800Z
1730Z
1700Z
GLOMAR CHALLENGER
LEG 63
TIME 1600 Z
(DAY-MO-YR) 9 / 10 / 78
HDG 295 °
SPEED 8.0 KTS
DEPTH 200 M
TYPE EDO #1
LONG BEACH, CALIFORNIA

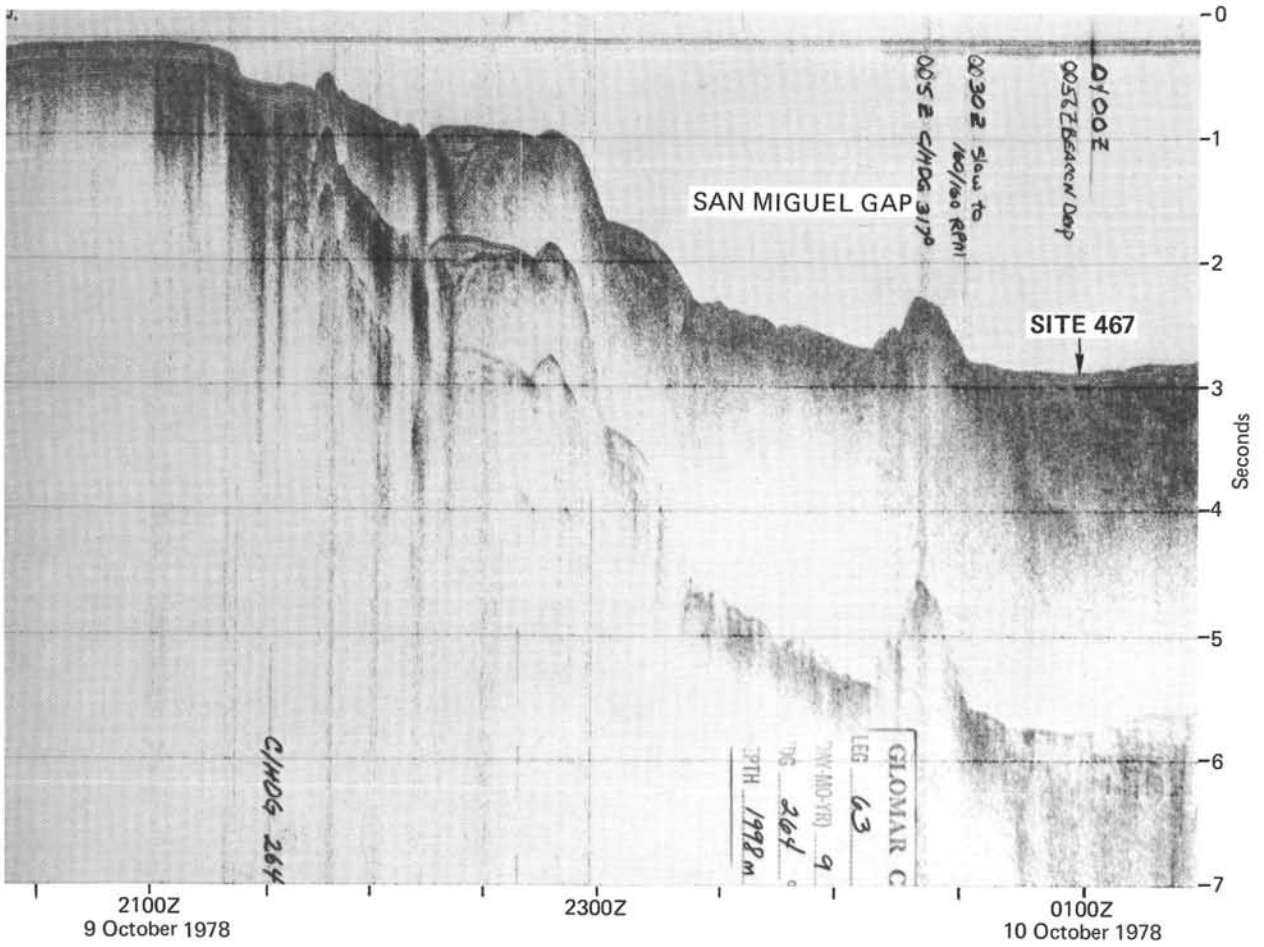
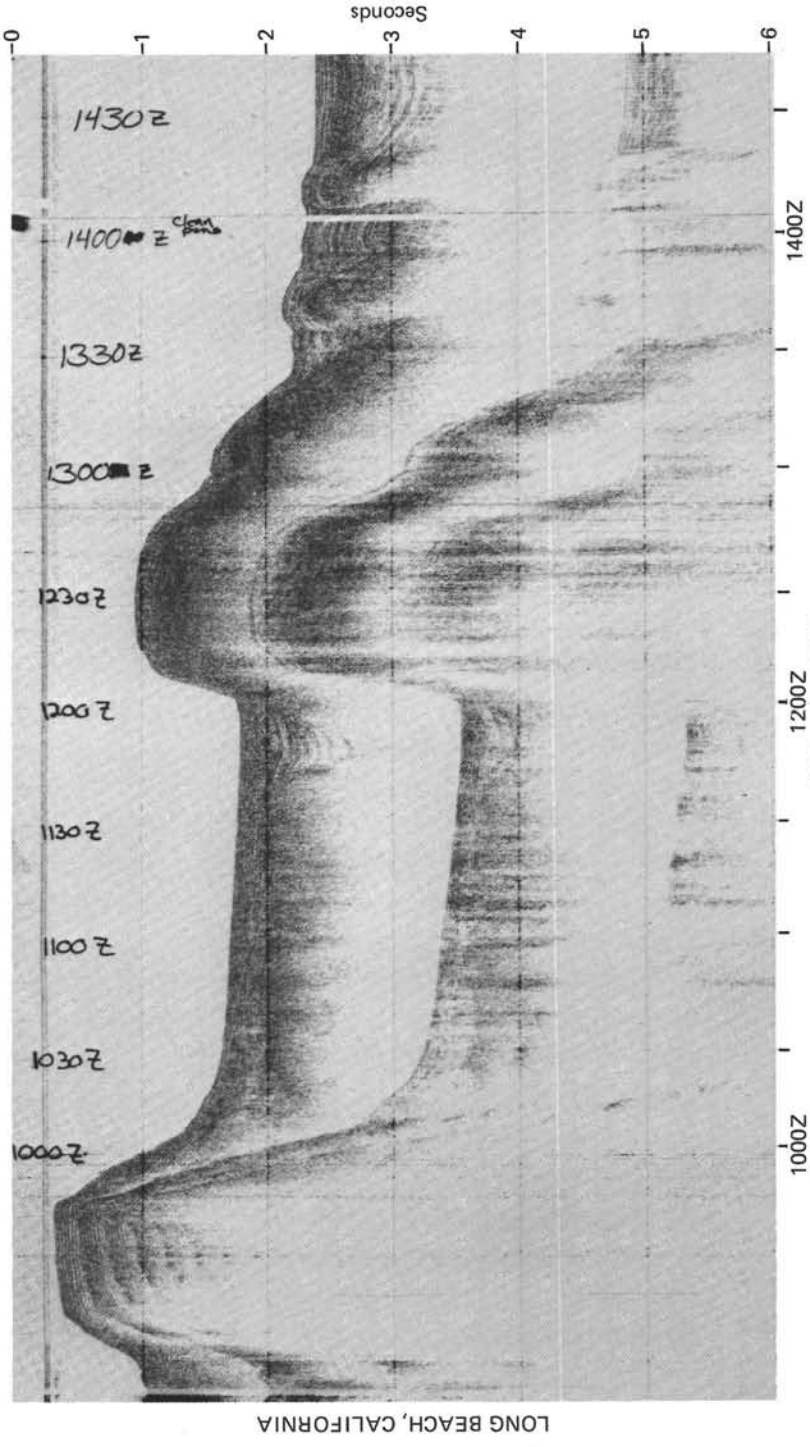


Figure 4. Continuous seismic profile from EDO #1, recorded at 10-s sweep (two-way travel time). (Divisions on vertical scale represent 1, and the horizontal scale is in Zulu time.)


Seconds
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1
2
3
4
5
6
1430Z
1400Z
1330Z
1300Z
1230Z
1200Z
1130Z
1100Z
1030Z
1000Z
1000Z
1200Z
1400Z
21 October 1978
LONG BEACH, CALIFORNIA

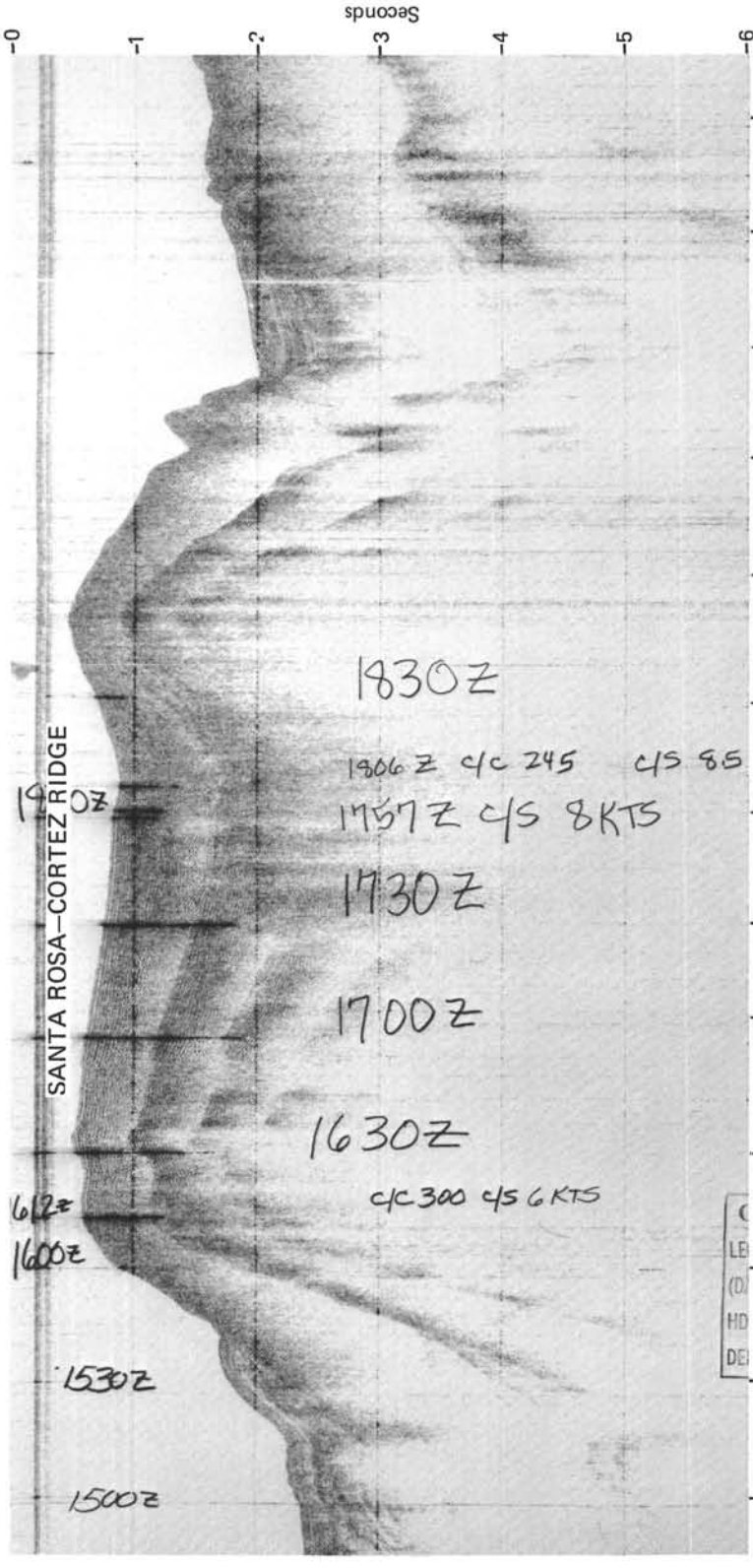
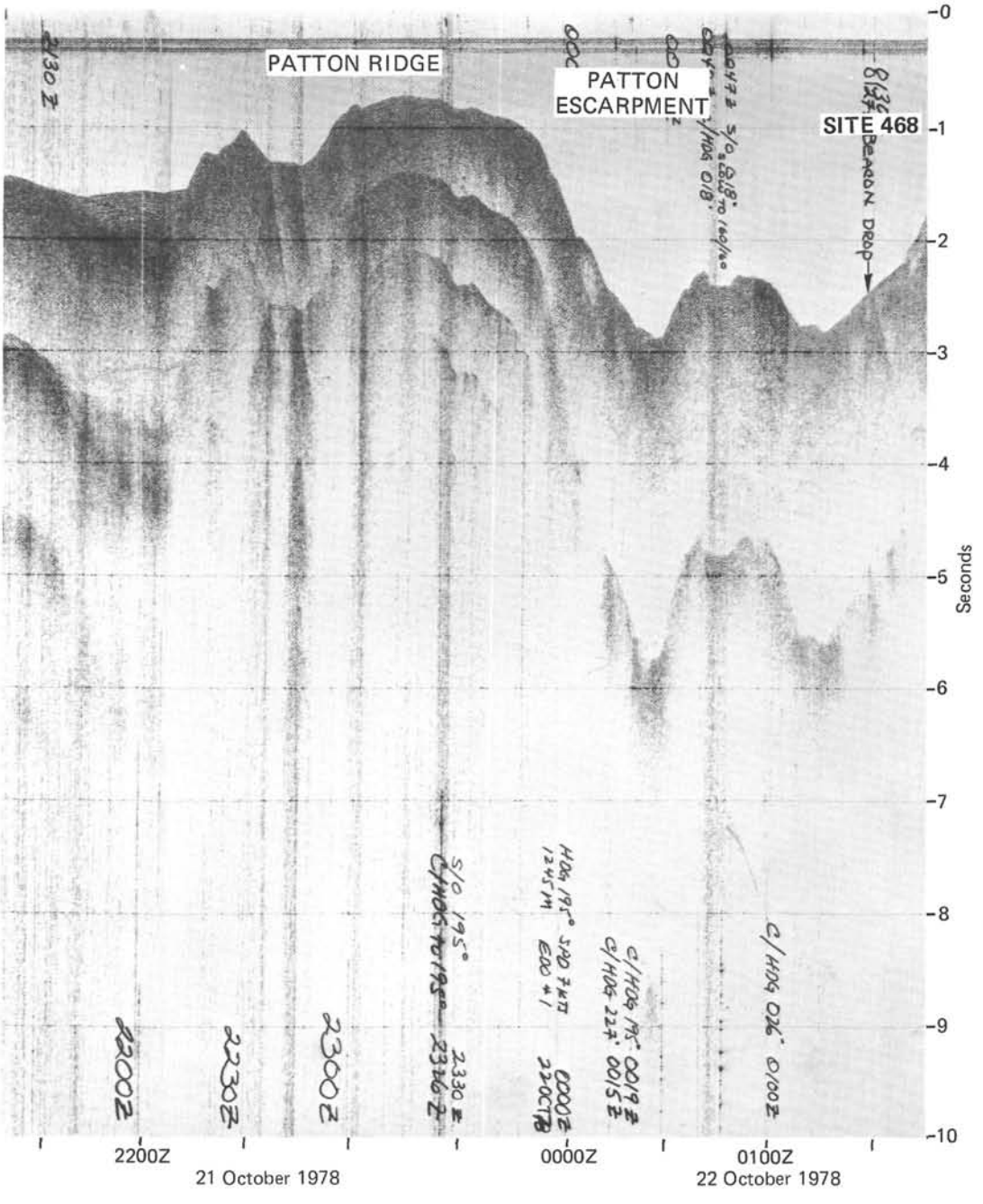


Figure 4. (Continued).


PATTON RIDGE
PATTON ESCARPMENT
SITE 468
Beacon Drop
2130 Z
2200Z
2230Z
2300Z
2330 Z
0000Z
0100Z
21 October 1978
22 October 1978
Seconds
0
1
2
3
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5
6
7
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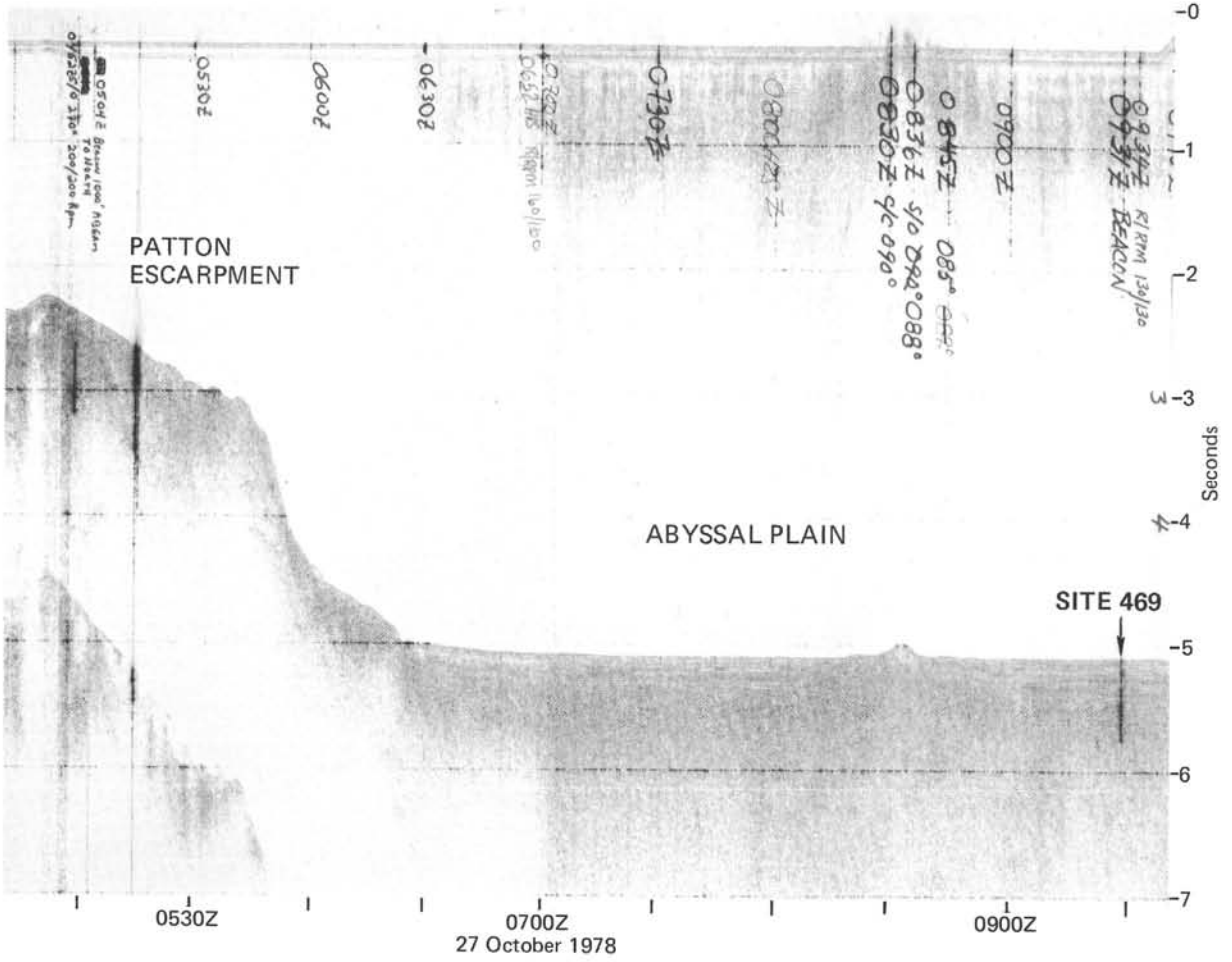
9
10



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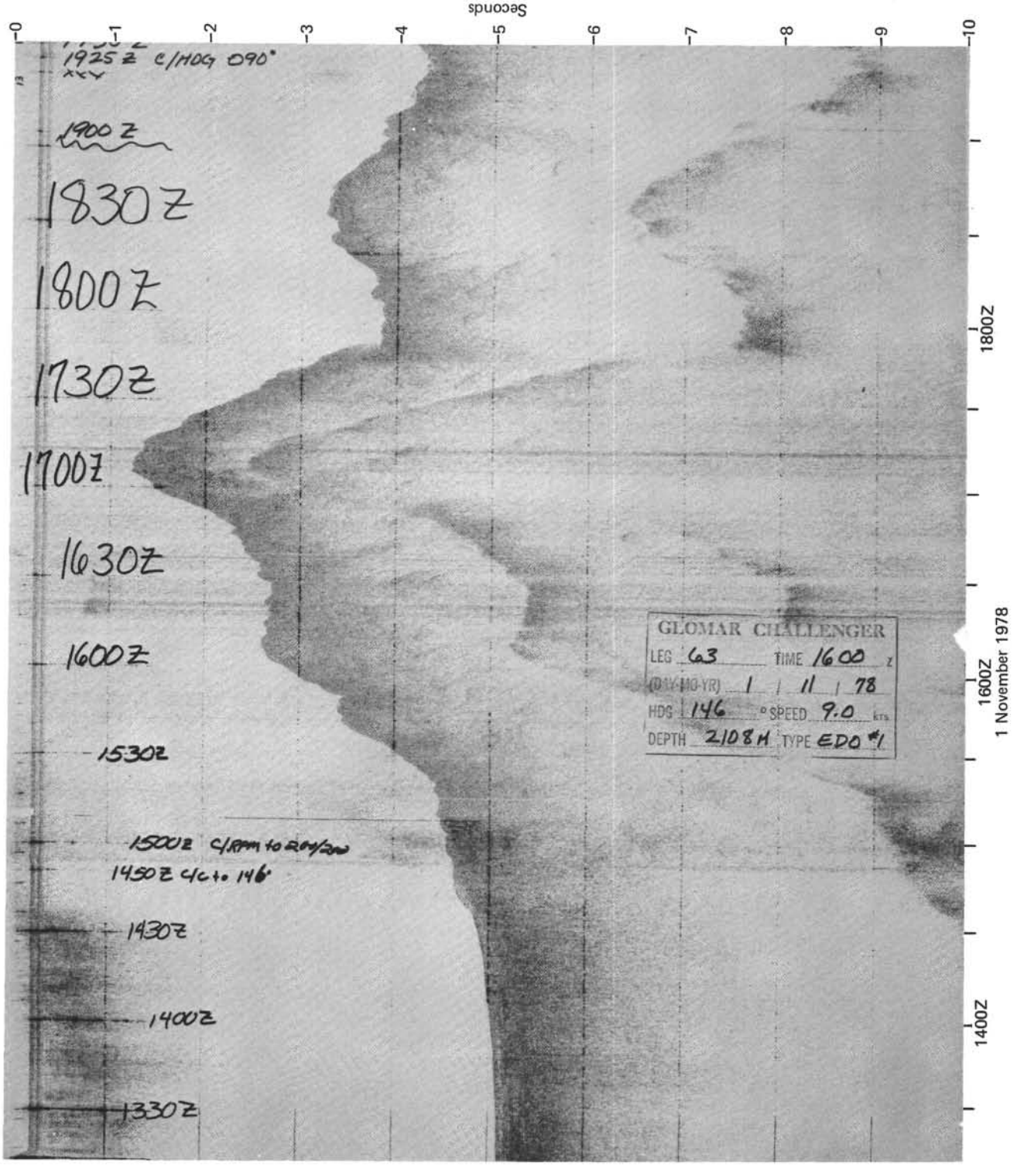
Seconds
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2
3
4
5
6
7
8
9
10
1925 Z C/HDG 090°
1900 Z
1830 Z
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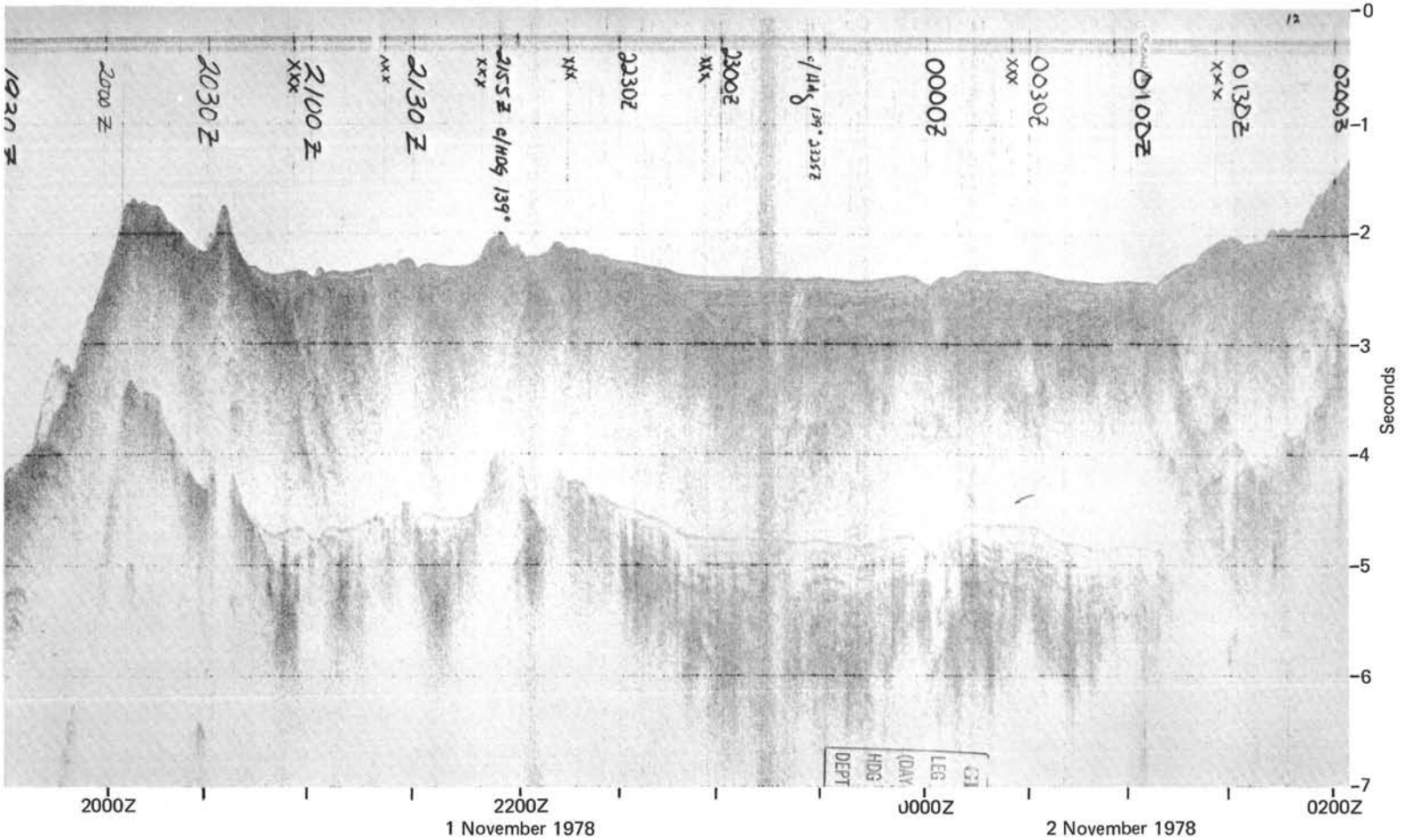
1730 Z
1700 Z
1630 Z
1600 Z
1530 Z
1500 Z C/RPM to 204/20W
1450 Z C/C to 146°
1430 Z
1400 Z
1330 Z
GLOMAR CHALLENGER
LEG 63 TIME 1600 Z
(DAY-MO-YR) 1 / 11 / 78
HDG 146 ° SPEED 9.0 kts
DEPTH 2108M TYPE EDO #1
1800Z
1600Z
1400Z
1 November 1978



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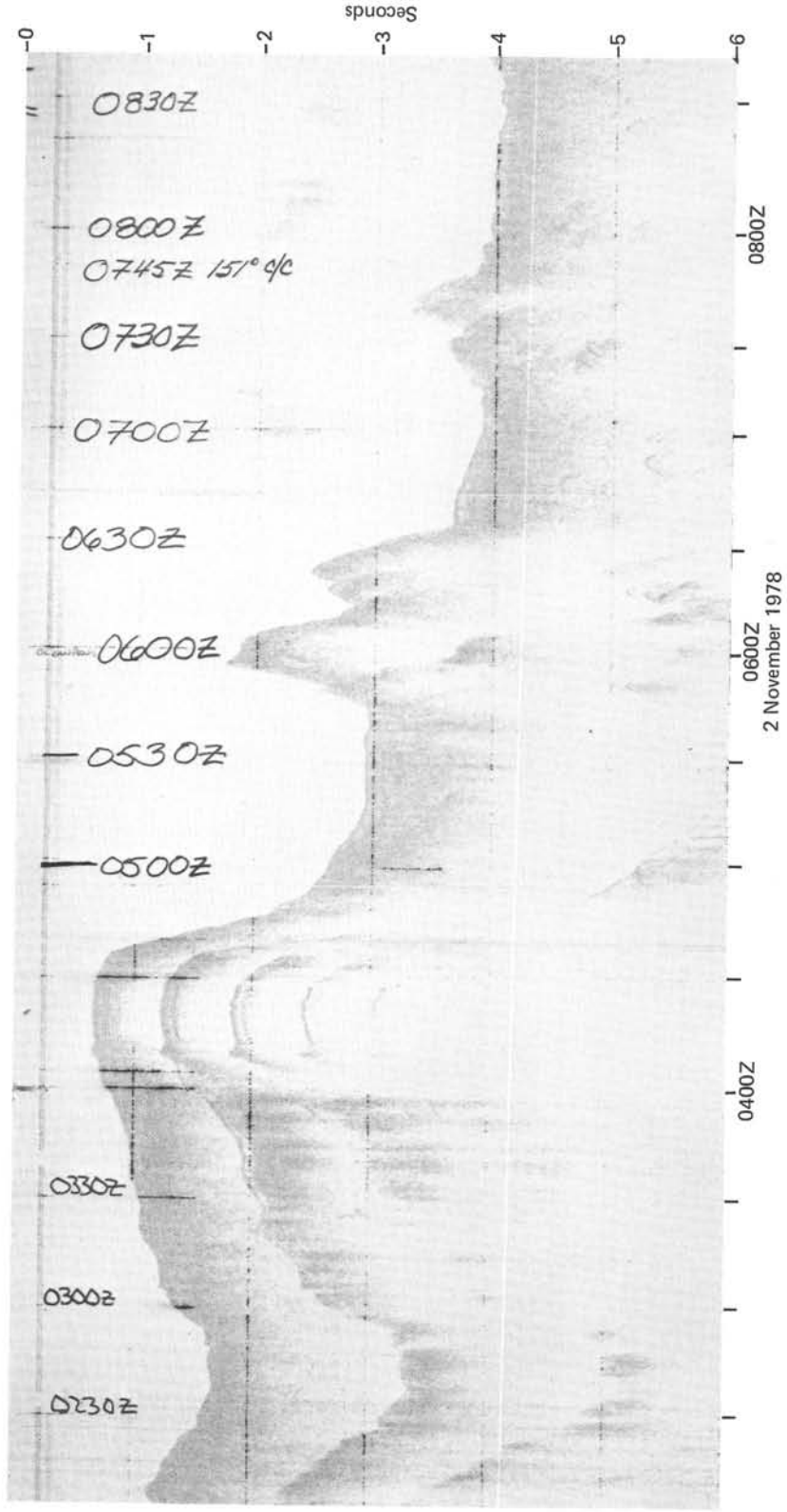
Seconds
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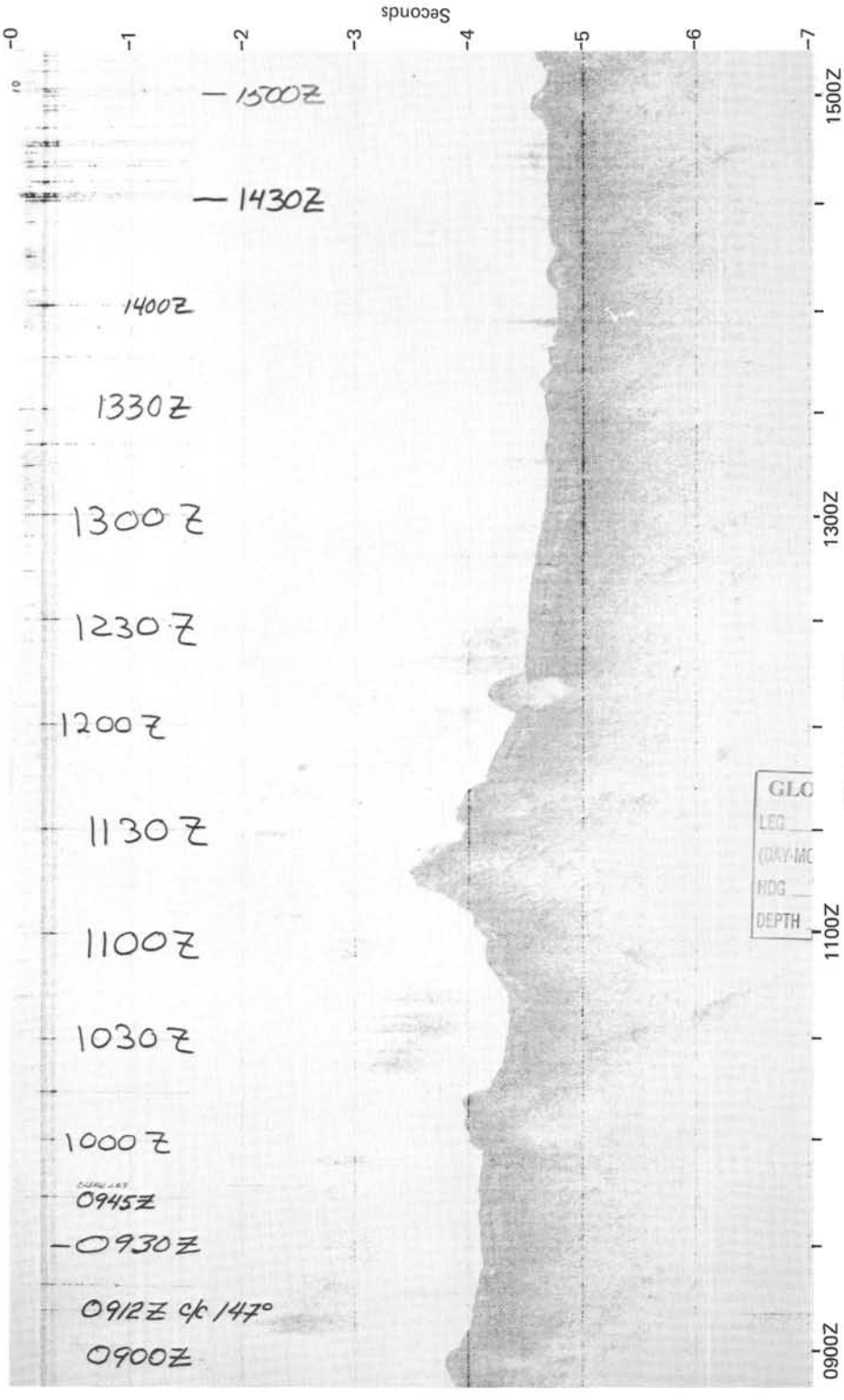
3
4
5
6
0830Z
0800Z
0745Z 151° c/c
0730Z
0700Z
0630Z
0600Z
0530Z
0500Z
0330Z
0300Z
0230Z
0800Z
0600Z
2 November 1978
0400Z



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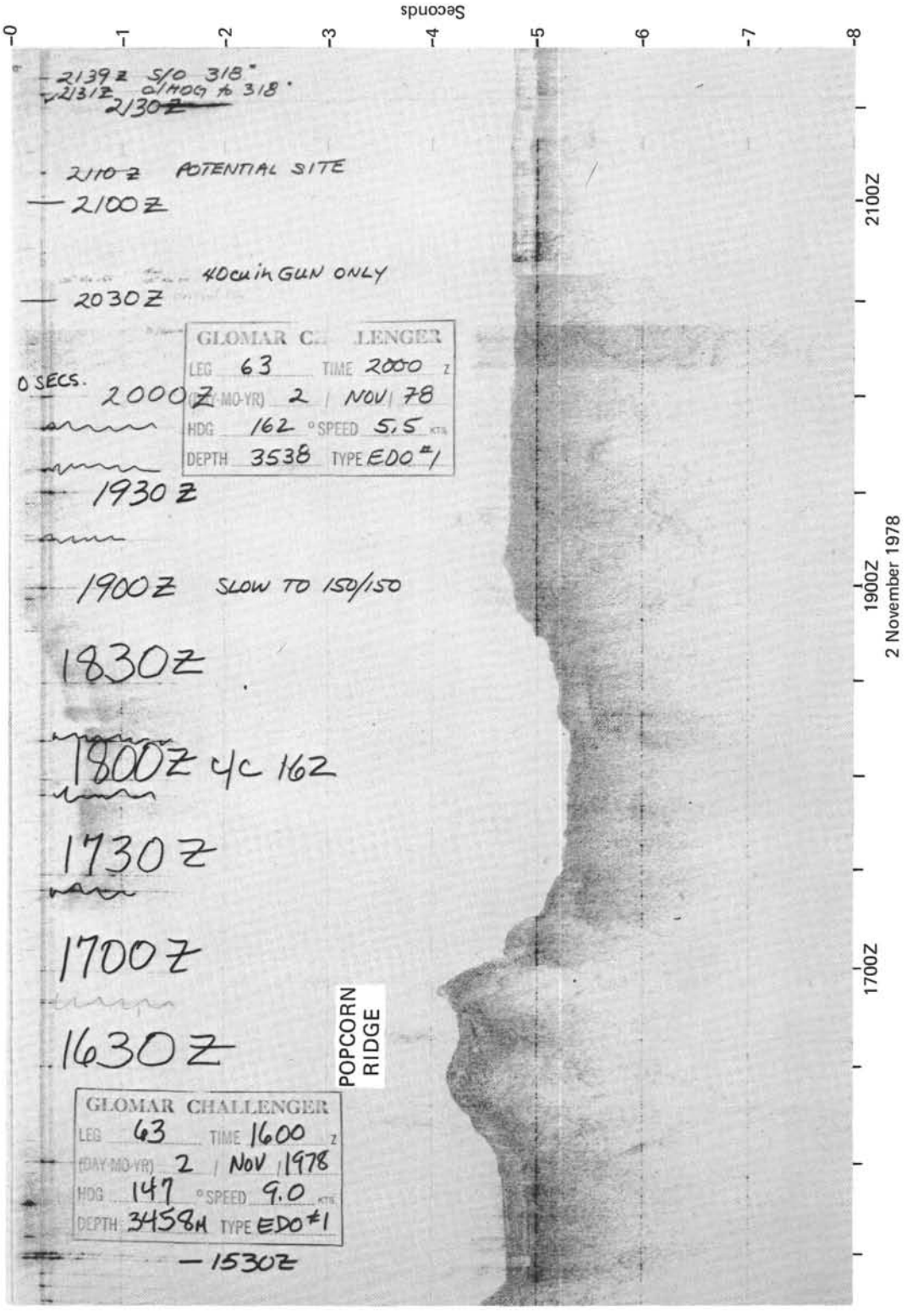
Seconds
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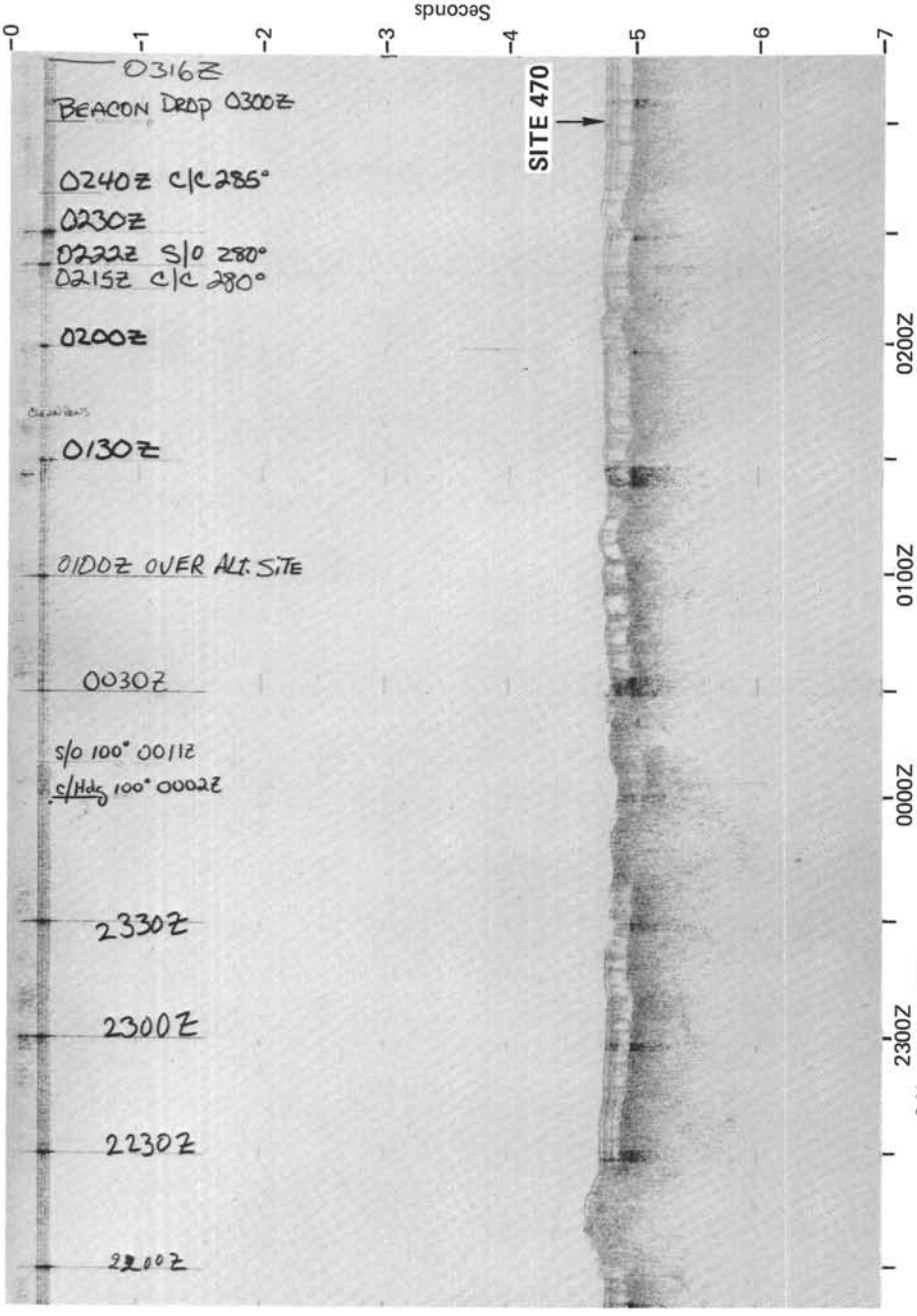
1
2
3
4
5
6
7
8
2139 Z S/O 318°
2131 Z o/HOG to 318°
2130 Z
2110 Z POTENTIAL SITE
2100 Z
40cu in GUN ONLY
2030 Z
GLOMAR C. LENGER
LEG 63 TIME 2000 Z
(DAY-MO-YR) 2 / NOV / 78
HDG 162 °SPEED 5.5 KTS
DEPTH 3538 TYPE EDO #1
0 SECS.
2000 Z
1930 Z
1900 Z SLOW TO 150/150
1830 Z
1800 Z 4c 162
1730 Z
1700 Z
1630 Z
POPCORN RIDGE
GLOMAR CHALLENGER
LEG 63 TIME 1600 Z
(DAY-MO-YR) 2 / NOV / 1978
HDG 147 °SPEED 9.0 KTS
DEPTH 3458M TYPE EDO #1
1530 Z
2100Z
1900Z
2 November 1978
1700Z



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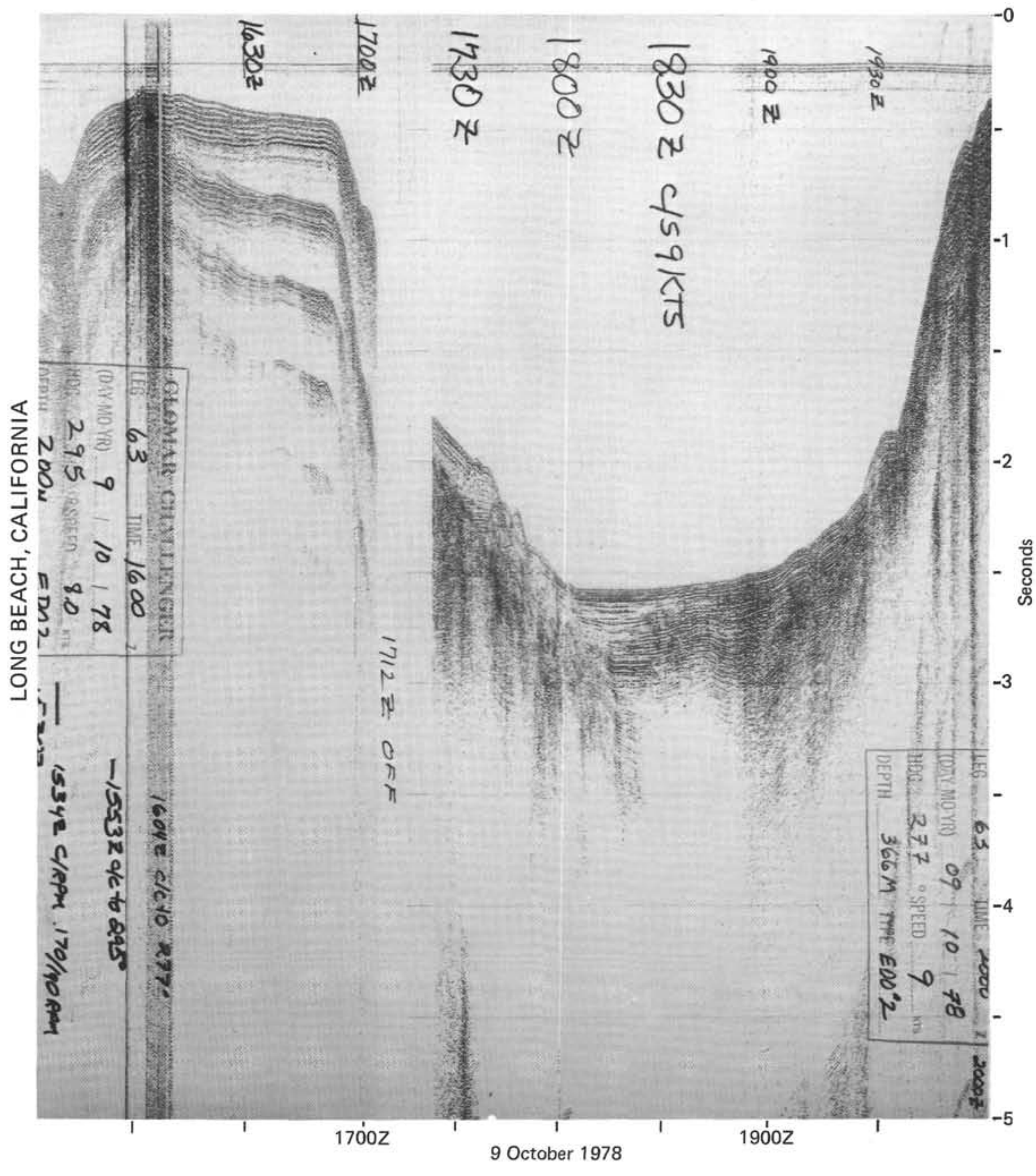

LONG BEACH, CALIFORNIA
GLOMAR CHALLENGER
Seconds
0
1
2
3
4
5
1700Z
1900Z
9 October 1978

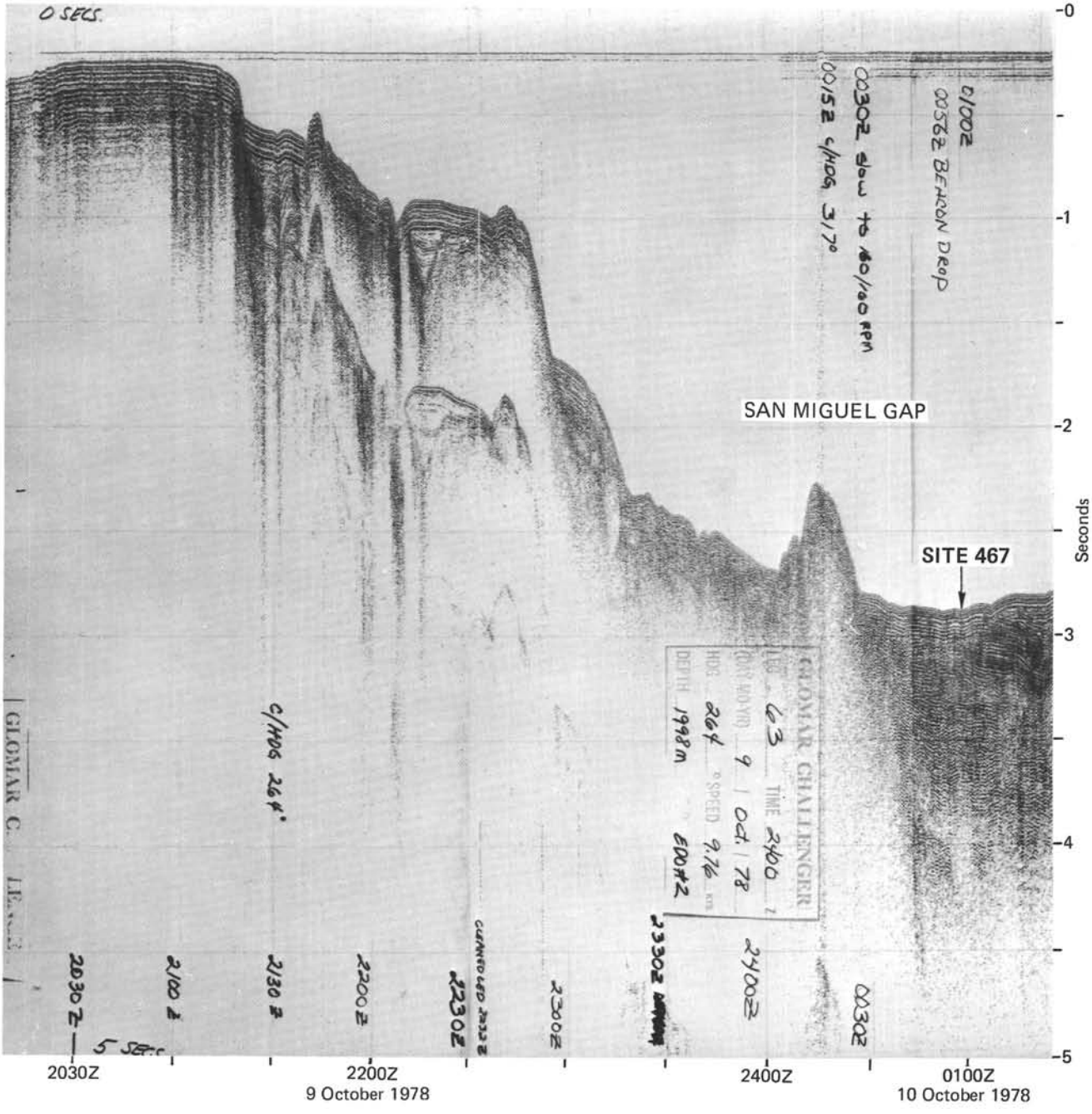
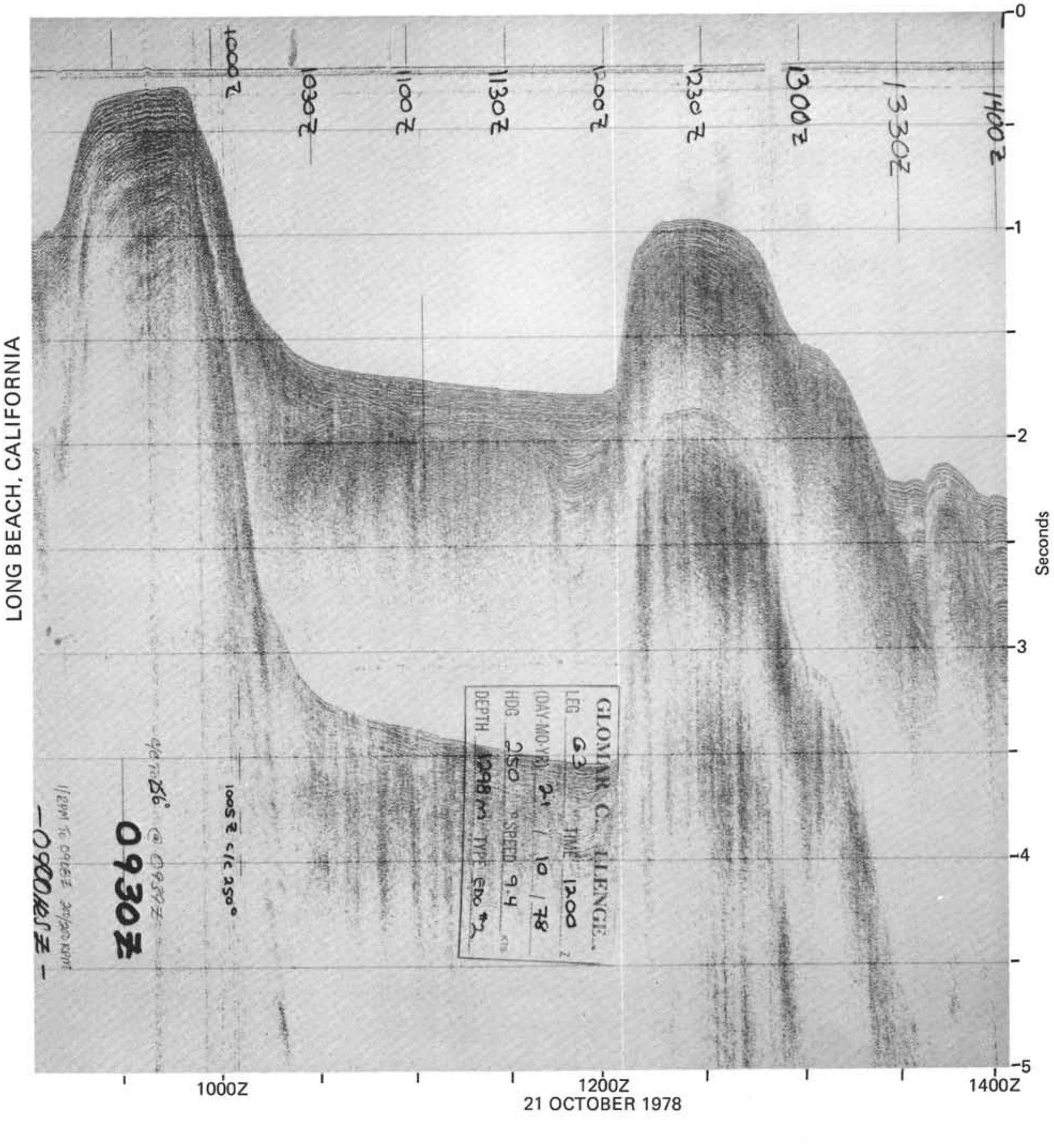
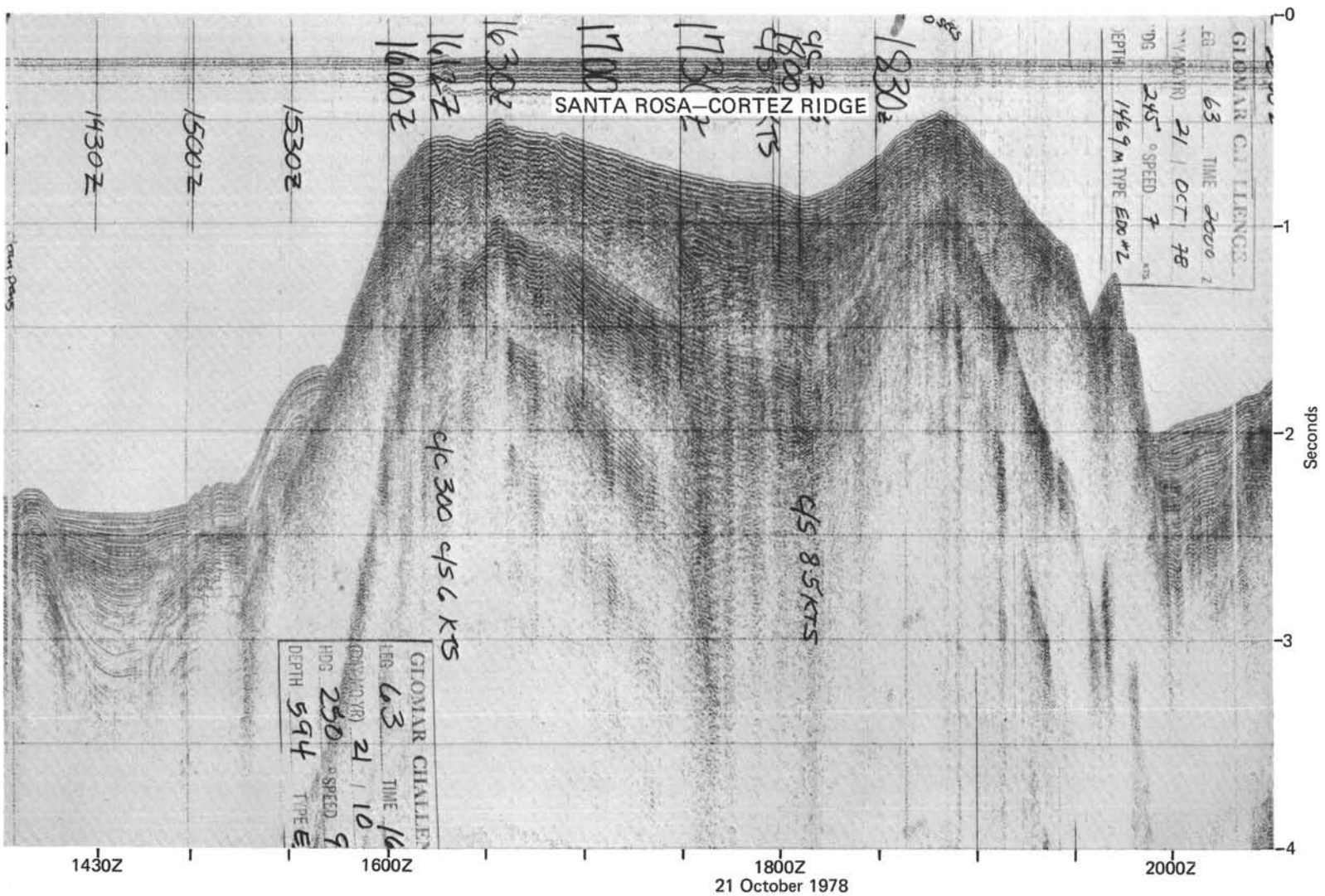


Figure 5. Continuous seismic profile record from EDO #2, recorded at a 5-s sweep (two-way travel time). (Divisions on vertical scale represent half-seconds, and horizontal scale is in Zulu time.)


LONG BEACH, CALIFORNIA
Seconds
0
1
2
3
4
5
1000Z
1200Z
21 OCTOBER 1978
1400Z



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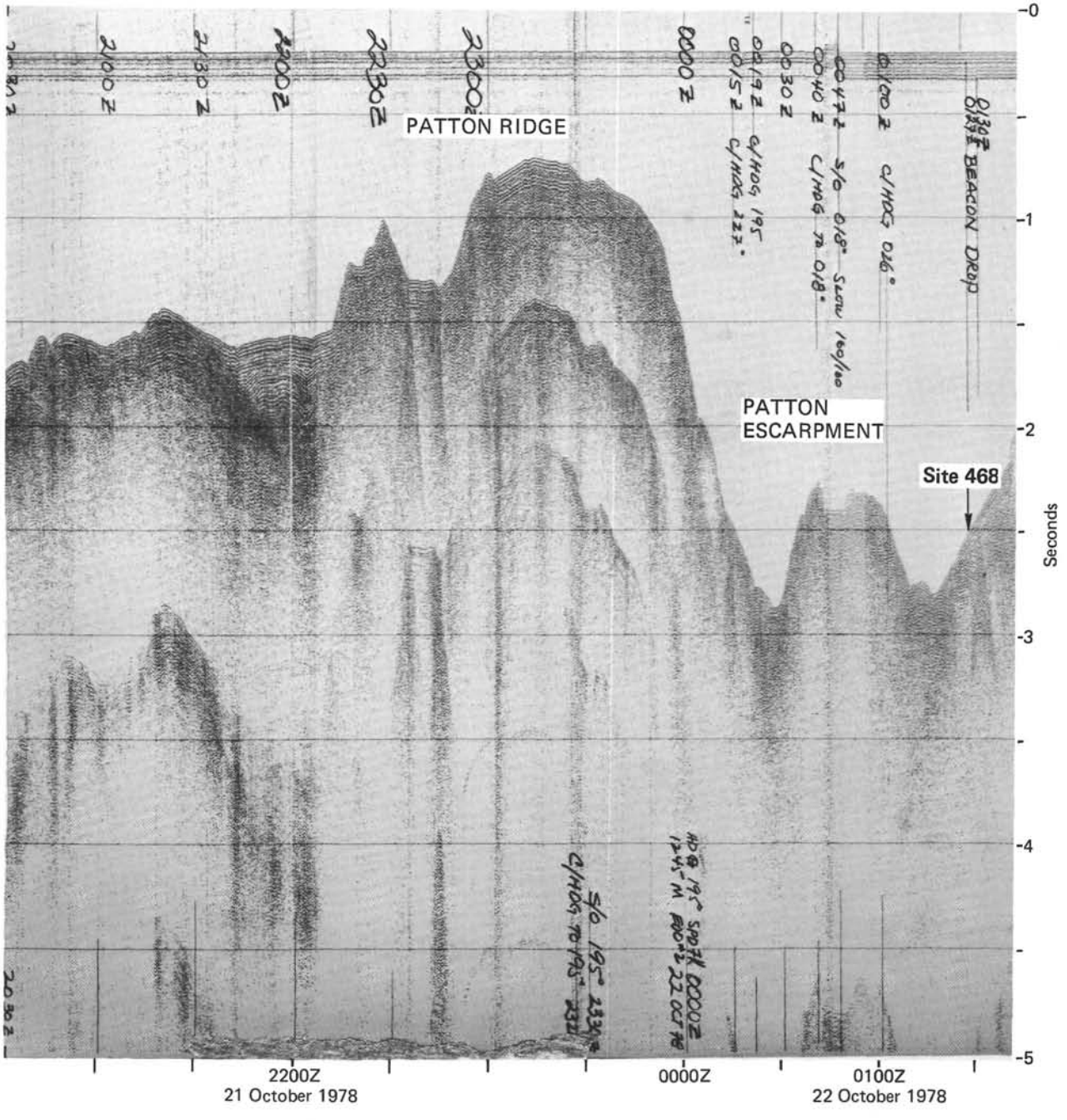
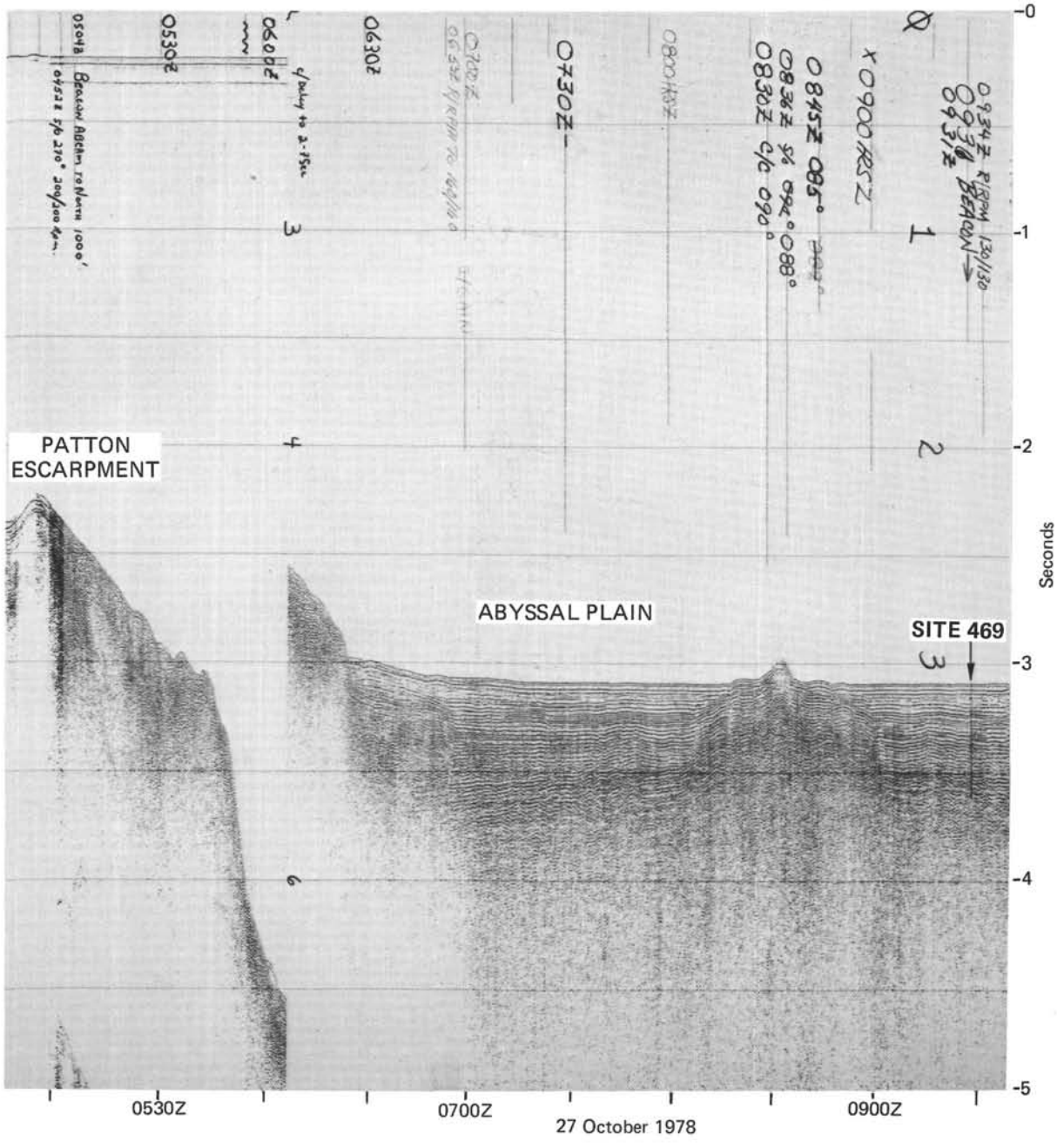

PATTON RIDGE
PATTON ESCARPMENT
Site 468
Seconds
0
1
2
3
4
5
2200Z
21 October 1978
0000Z
0100Z
22 October 1978



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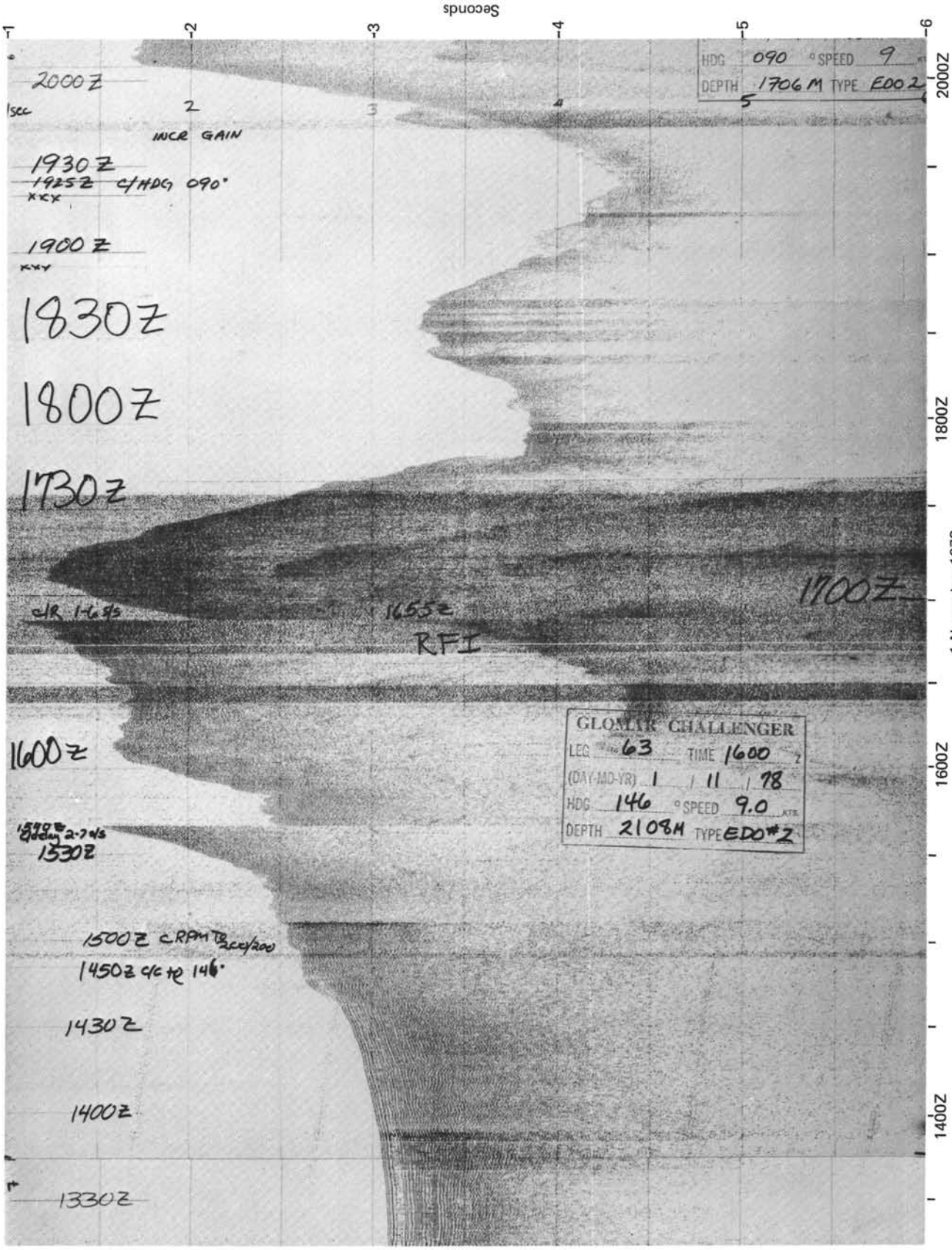
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-3
-4
-5
-6
HDG 090 °SPEED 9 KT
DEPTH 1706 M TYPE EDO 2
2000Z
1sec
2
3
4
5
INCR GAIN
1930Z
1925Z C/HDG 090°
1900Z
1830Z
1800Z
1730Z
1700Z
1655Z
RFI
1600Z
1530Z
1500Z
1450Z C/C to 146°
1430Z
1400Z
1330Z
1 November 1978
GLOMAR CHALLENGER
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(DAY-MO-YR) 1 / 11 / 78
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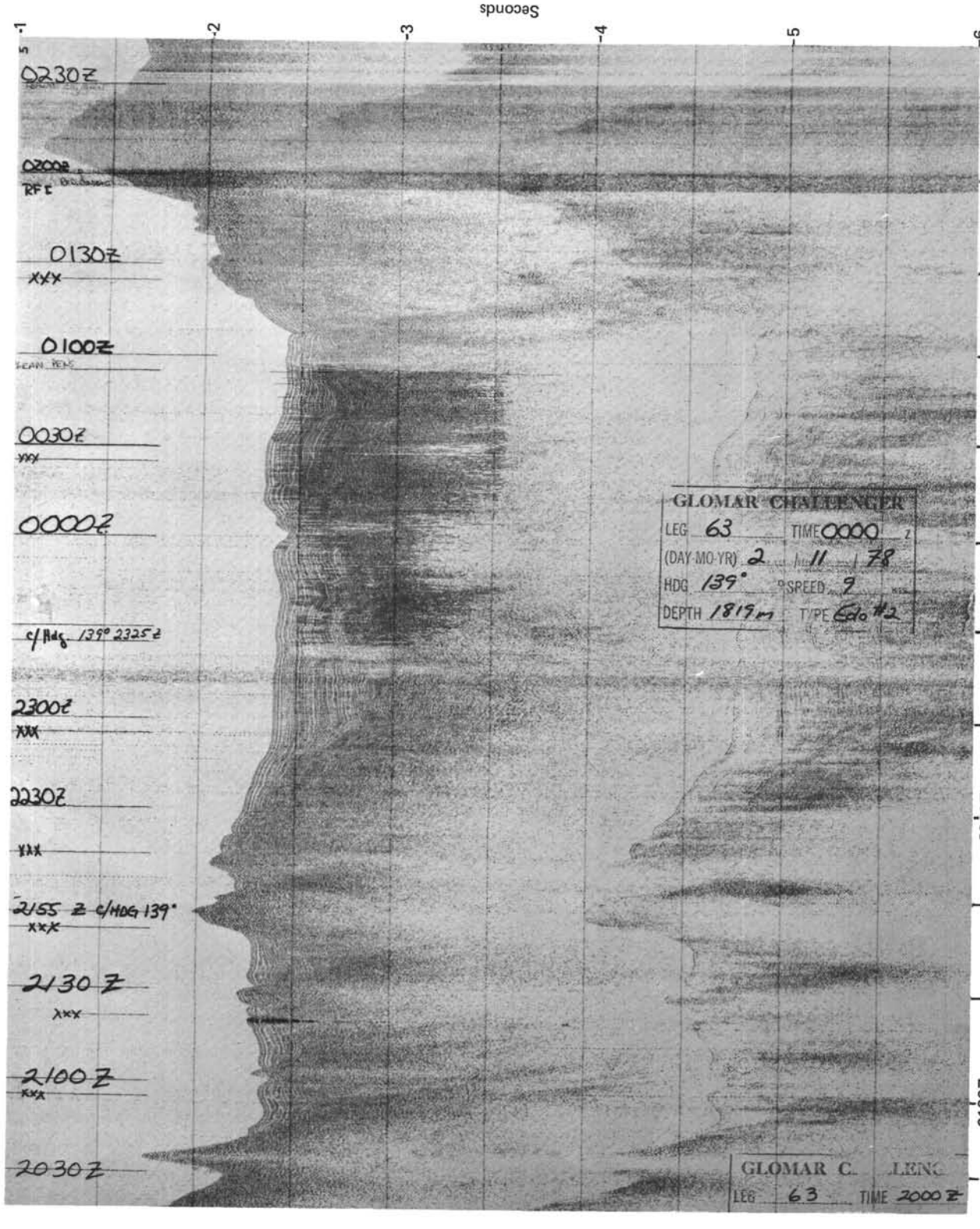
DEPTH 2108M TYPE EDO #2



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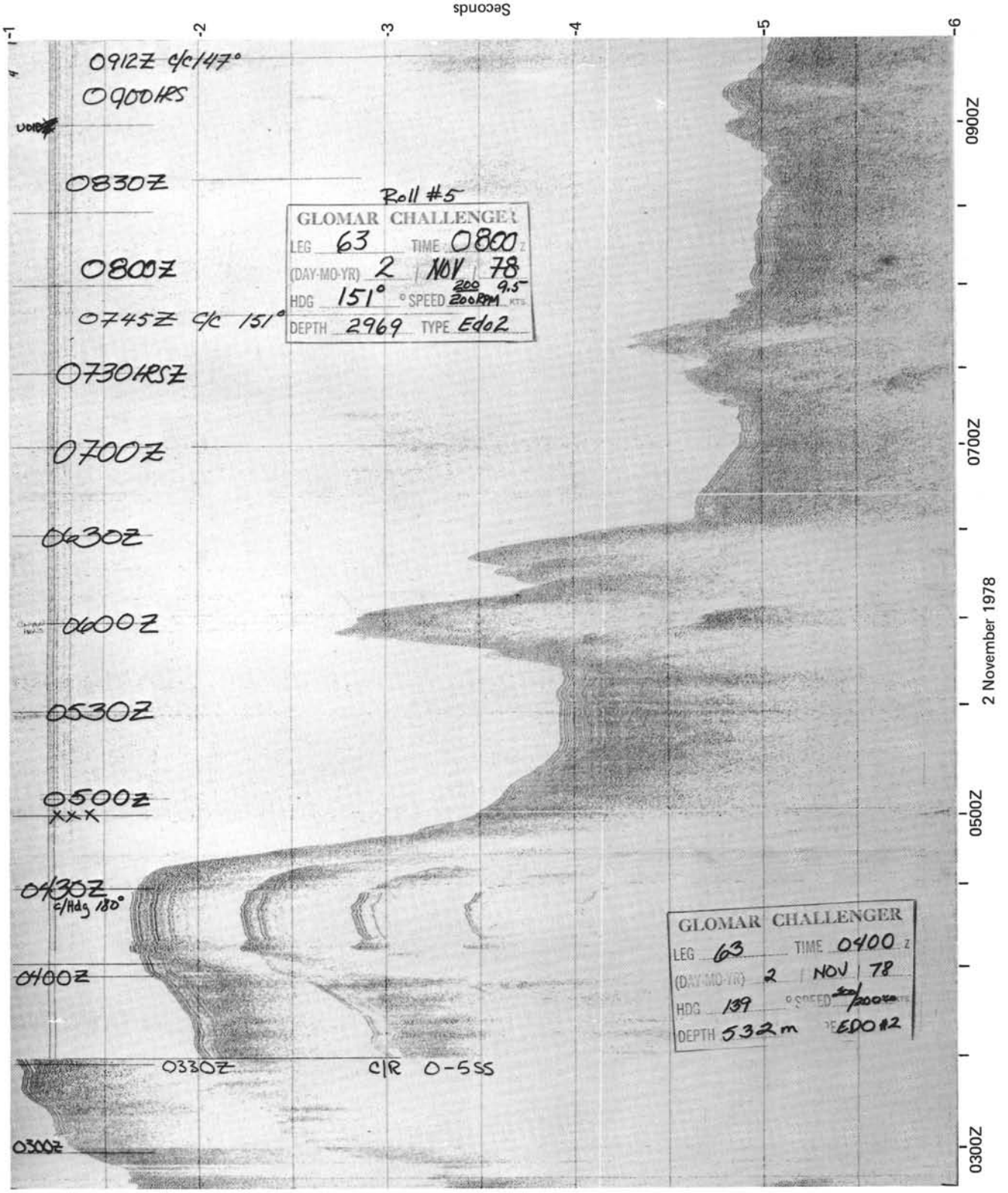
Seconds
-1
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-6
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0900HRS
0830Z
0800Z
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0730HRSZ
0700Z
0630Z
0600Z
0530Z
0500Z
XXX
0430Z
C/Hdg 180°
0400Z
0330Z
C/R 0-555
0300Z
Roll #5
GLOMAR CHALLENGER
LEG 63 TIME 0800 Z
(DAY-MO-YR) 2 NOV 78
HDG 151° SPEED 200 200RPM 9.5 KTS
DEPTH 2969 TYPE EDO2
GLOMAR CHALLENGER
LEG 63 TIME 0400 Z
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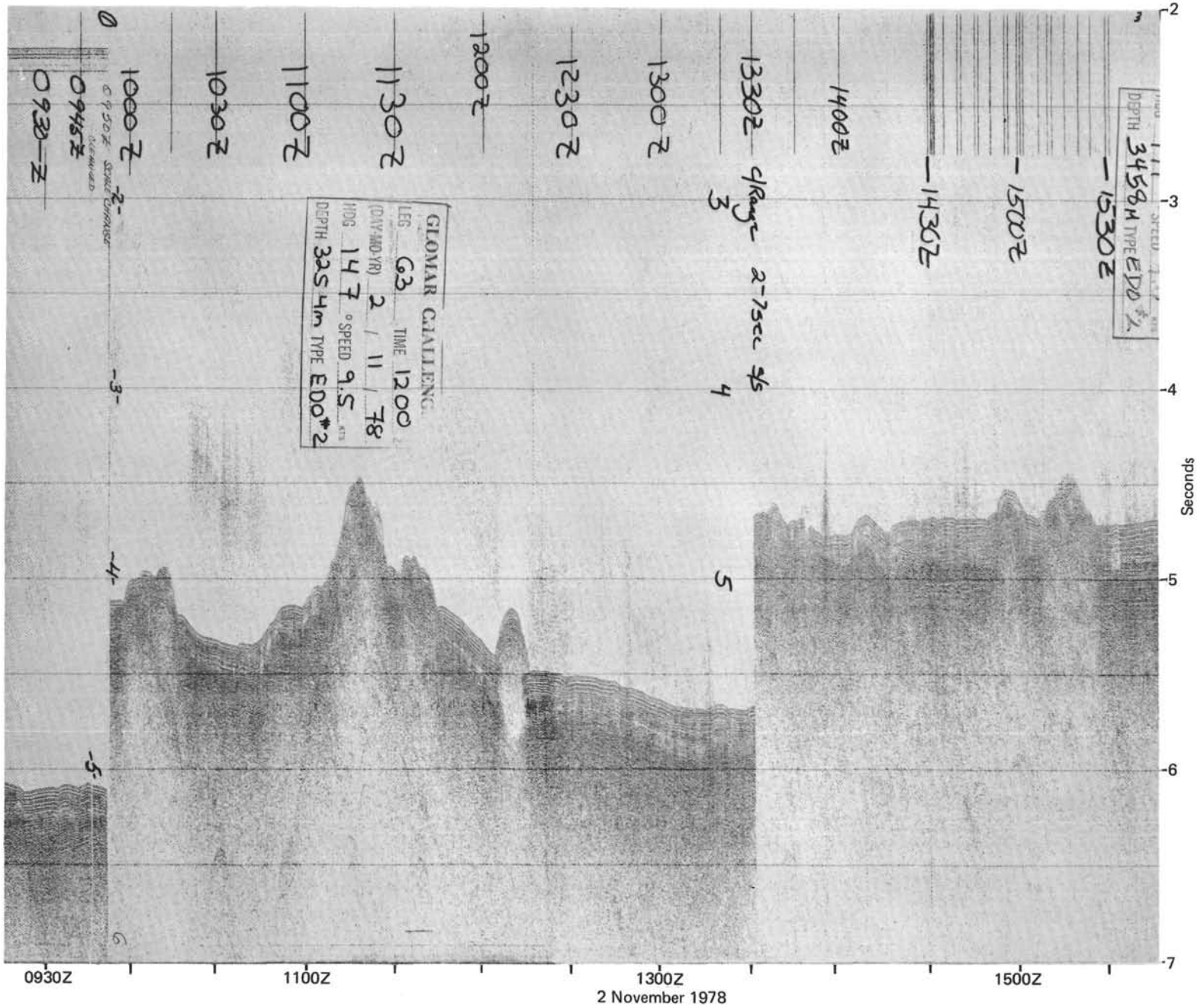
0900Z
0700Z
0500Z
0300Z
2 November 1978



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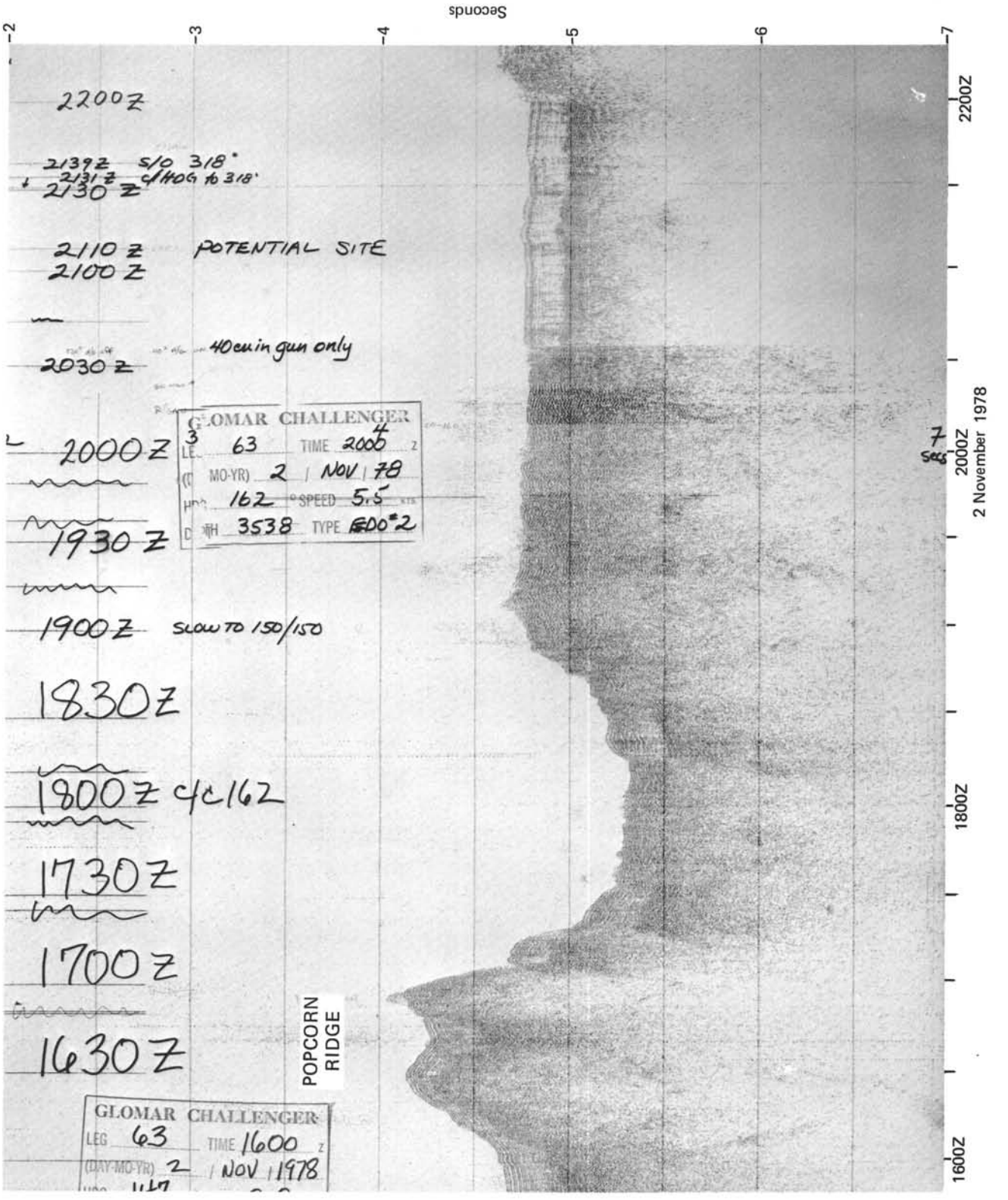
Seconds
-2
-3
-4
-5
-6
-7
2200Z
2139Z S/O 318°
2131Z C/HOG to 318°
2130Z
2110Z POTENTIAL SITE
2100Z
2030Z 40cu in gun only
2000Z
1930Z
1900Z SLOW TO 150/150
1830Z
1800Z C/C 162
1730Z
1700Z
1630Z
GLOMAR CHALLENGER
LEG 3 63 TIME 2000 Z
(DAY-MO-YR) 2 / NOV / 78
162 SPEED 5.5
3538 TYPE GEO*2
POPCORN RIDGE
GLOMAR CHALLENGER
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(DAY-MO-YR) 2 / NOV / 1978
2200Z
2000Z
1800Z
1600Z
7 secs
2 November 1978

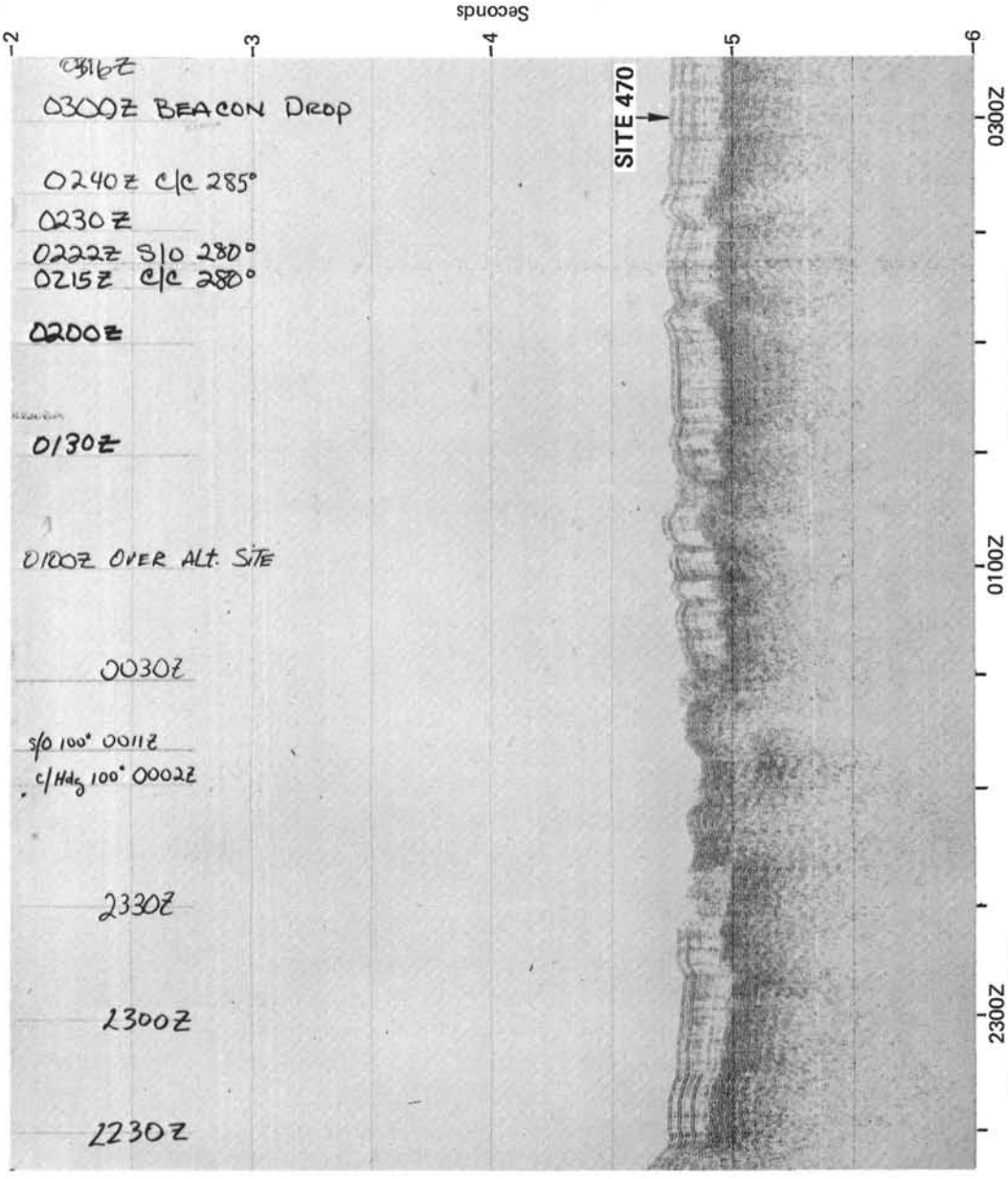

Figure 5. (Continued).

Table 1. Underway data from Leg 63: navigation points, distance in nautical miles from beginning of the cruise, course and speed (in knots) maintained between navigation points, and regional magnetic field values.

Day	Month	Year	Time	Latitude	Longitude	Distance (n. mi.)	Speed (kt.)	Course	Regional (mag.)
9	10	1978	1630	33 42.5'N	119 12.7'W	7.9	8.0	279	49448
9	10	1978	1635	33 42.6'N	119 13.5'W	8.6	8.0	279	49446
9	10	1978	1640	33 42.7'N	119 14.3'W	9.3	8.0	279	49444
9	10	1978	1645	33 42.8'N	119 15.1'W	9.9	8.0	279	49443
9	10	1978	1650	33 42.9'N	119 15.9'W	10.6	8.0	279	49441
9	10	1978	1655	33 43.0'N	119 16.7'W	11.3	8.0	279	49439
9	10	1978	1700	33 43.1'N	119 17.5'W	11.9	8.0	279	49437
9	10	1978	1705	33 43.2'N	119 18.3'W	12.6	8.9	279	49435
9	10	1978	1710	33 43.3'N	119 19.1'W	13.4	8.9	279	49433
9	10	1978	1715	33 43.5'N	119 20.0'W	14.1	8.9	279	49431
9	10	1978	1720	33 43.6'N	119 20.9'W	14.8	8.9	279	49429
9	10	1978	1725	33 43.7'N	119 21.8'W	15.6	8.9	279	49427
9	10	1978	1730	33 43.8'N	119 22.7'W	16.3	8.9	279	49425
9	10	1978	1735	33 43.9'N	119 23.5'W	17.1	8.9	279	49423
9	10	1978	1740	33 44.0'N	119 24.4'W	17.8	8.9	279	49421
9	10	1978	1745	33 44.2'N	119 25.3'W	18.5	8.9	279	49419
9	10	1978	1750	33 44.3'N	119 26.2'W	19.3	8.9	279	49417
9	10	1978	1755	33 44.4'N	119 27.0'W	20.0	8.9	279	49415
9	10	1978	1800	33 44.5'N	119 27.9'W	20.7	8.9	279	49413
9	10	1978	1805	33 44.6'N	119 28.8'W	21.5	8.9	279	49411
9	10	1978	1810	33 44.7'N	119 29.7'W	22.2	8.9	279	49409
9	10	1978	1815	33 44.8'N	119 30.6'W	23.0	8.9	279	49407
9	10	1978	1820	33 45.0'N	119 31.4'W	23.7	8.9	279	49405
9	10	1978	1825	33 45.1'N	119 32.3'W	24.4	8.9	279	49403
9	10	1978	1830	33 45.2'N	119 33.2'W	25.2	8.9	279	49401
9	10	1978	1835	33 45.3'N	119 34.2'W	26.0	9.9	279	49398
9	10	1978	1840	33 45.4'N	119 35.2'W	26.8	9.9	279	49396
9	10	1978	1845	33 45.6'N	119 36.1'W	27.7	9.9	279	49394
9	10	1978	1850	33 45.7'N	119 37.1'W	28.5	9.9	279	49391
9	10	1978	1855	33 45.8'N	119 38.1'W	29.3	9.9	279	49389
9	10	1978	1900	33 45.9'N	119 39.1'W	30.1	9.9	279	49387
9	10	1978	1905	33 46.1'N	119 40.0'W	31.0	9.9	279	49384
9	10	1978	1910	33 46.2'N	119 41.0'W	31.8	9.9	279	49382
9	10	1978	1915	33 46.3'N	119 42.0'W	32.6	9.9	279	49380
9	10	1978	1920	33 46.4'N	119 43.0'W	33.4	9.9	279	49377
9	10	1978	1925	33 46.6'N	119 44.0'W	34.2	9.9	279	49375
9	10	1978	1930	33 46.7'N	119 44.9'W	35.1	9.9	279	49373
9	10	1978	1935	33 46.8'N	119 45.9'W	35.9	9.9	279	49370
9	10	1978	1940	33 46.9'N	119 46.9'W	36.7	9.9	279	49368
9	10	1978	1945	33 47.1'N	119 47.9'W	37.5	9.9	279	49366
9	10	1978	1950	33 47.2'N	119 48.9'W	38.4	9.9	279	49363
9	10	1978	1955	33 47.3'N	119 49.8'W	39.2	9.9	279	49361
9	10	1978	2000	33 47.4'N	119 50.8'W	40.0	9.9	279	49359
9	10	1978	2005	33 47.6'N	119 51.8'W	40.8	9.9	279	49356
9	10	1978	2010	33 47.7'N	119 52.8'W	41.7	9.9	279	49354

Table 1. (Continued).

Day	Month	Year	Time	Latitude	Longitude	Distance (n. mi.)	Speed (kt.)	Course	Regional (mag.)
9	10	1978	2015	33 47.8'N	119 53.8'W	42.5	9.9	279	49352
9	10	1978	2020	33 47.9'N	119 54.7'W	43.3	9.9	279	49349
9	10	1978	2025	33 48.1'N	119 55.7'W	44.1	9.9	279	49347
9	10	1978	2030	33 48.2'N	119 56.7'W	45.0	9.9	279	49345
9	10	1978	2035	33 48.3'N	119 57.7'W	45.8	9.9	279	49342
9	10	1978	2040	33 48.4'N	119 58.7'W	46.6	9.9	279	49340
9	10	1978	2045	33 48.6'N	119 59.6'W	47.4	9.9	279	49338
9	10	1978	2050	33 48.7'N	120 .6'W	48.3	9.9	279	49335
9	10	1978	2055	33 48.8'N	120 1.6'W	49.1	9.9	279	49333
9	10	1978	2100	33 48.9'N	120 2.6'W	49.9	9.9	279	49331
9	10	1978	2105	33 49.0'N	120 3.6'W	50.7	9.9	279	49328
9	10	1978	2110	33 49.2'N	120 4.5'W	51.5	9.9	279	49326
9	10	1978	2115	33 49.3'N	120 5.5'W	52.4	9.9	279	49323
9	10	1978	2120	33 49.4'N	120 6.5'W	53.2	9.9	279	49321
9	10	1978	2125	33 49.6'N	120 7.5'W	54.0	9.4	280	49319
9	10	1978	2130	33 49.7'N	120 8.4'W	54.8	9.4	280	49317
9	10	1978	2135	33 49.6'N	120 9.3'W	55.6	9.5	265	49312
9	10	1978	2140	33 49.6'N	120 10.3'W	56.4	9.5	265	49308
9	10	1978	2145	33 49.5'N	120 11.2'W	57.2	9.5	265	49304
9	10	1978	2150	33 49.4'N	120 12.2'W	58.0	9.5	265	49299
9	10	1978	2155	33 49.3'N	120 13.1'W	58.7	9.5	265	49295
9	10	1978	2200	33 49.3'N	120 14.1'W	59.5	9.5	265	49291
9	10	1978	2205	33 49.2'N	120 15.0'W	60.3	9.5	265	49287
9	10	1978	2210	33 49.1'N	120 16.0'W	61.1	9.5	265	49282
9	10	1978	2215	33 49.0'N	120 16.9'W	61.9	9.5	265	49278
9	10	1978	2220	33 49.0'N	120 17.9'W	62.7	9.5	265	49274
9	10	1978	2225	33 48.9'N	120 18.8'W	63.5	9.5	265	49269
9	10	1978	2230	33 48.8'N	120 19.8'W	64.3	9.5	265	49265
9	10	1978	2235	33 48.8'N	120 20.7'W	65.1	9.5	265	49261
9	10	1978	2240	33 48.7'N	120 21.7'W	65.9	9.5	265	49256
9	10	1978	2245	33 48.6'N	120 22.6'W	66.7	9.5	265	49252
9	10	1978	2250	33 48.5'N	120 23.6'W	67.5	9.5	265	49248
9	10	1978	2255	33 48.5'N	120 24.5'W	68.2	9.5	265	49243
9	10	1978	2300	33 48.4'N	120 25.5'W	69.0	9.5	265	49239
9	10	1978	2305	33 48.3'N	120 26.4'W	69.8	9.5	265	49235
9	10	1978	2310	33 48.2'N	120 27.4'W	70.6	9.5	265	49230
9	10	1978	2315	33 48.2'N	120 28.3'W	71.4	9.5	265	49226
9	10	1978	2320	33 48.1'N	120 29.3'W	72.2	9.5	265	49222
9	10	1978	2325	33 48.0'N	120 30.2'W	73.0	9.5	265	49217
9	10	1978	2330	33 48.0'N	120 31.2'W	73.8	9.5	265	49213
9	10	1978	2335	33 47.9'N	120 32.1'W	74.6	9.5	265	49209
9	10	1978	2340	33 47.8'N	120 33.1'W	75.4	9.5	265	49204
9	10	1978	2345	33 47.7'N	120 34.0'W	76.2	9.5	265	49200
9	10	1978	2350	33 47.6'N	120 35.0'W	77.0	10.5	262	49195
9	10	1978	2355	33 47.5'N	120 36.1'W	77.9	10.5	262	49190

Table 1. (Continued).

Day	Month	Year	Time	Latitude	Longitude	Distance (n. mi.)	Speed (kt.)	Course	Regional (mag.)
10	10	1978	0	33 47.4'N	120 37.1'W	78.7	10.5	262	49185
10	10	1978	5	33 47.3'N	120 38.1'W	79.6	10.4	263	49180
10	10	1978	10	33 47.2'N	120 39.2'W	80.5	10.4	263	49175
10	10	1978	15	33 47.1'N	120 40.2'W	81.3	10.4	263	49170
10	10	1978	20	33 47.7'N	120 40.9'W	82.2	10.0	313	49173
10	10	1978	25	33 48.2'N	120 41.7'W	83.0	10.0	313	49177
10	10	1978	30	33 48.8'N	120 42.4'W	83.8	10.0	313	49180
10	10	1978	35	33 49.2'N	120 43.0'W	84.5	7.8	310	49182
10	10	1978	40	33 49.6'N	120 43.6'W	85.1	7.8	310	49184
10	10	1978	45	33 50.1'N	120 44.2'W	85.8	7.8	310	49186
10	10	1978	50	33 50.5'N	120 44.8'W	86.4	7.8	310	49188
10	10	1978	55	33 50.9'N	120 45.4'W	87.1	7.8	310	49190
10	10	1978	100	33 51.0'N	120 45.5'W	87.2	.0	90	49191
10	10	1978	105	33 51.0'N	120 45.5'W	87.2	.0	90	49191
18	10	1978	1200	33 51.0'N	120 45.5'W	87.2	.0	90	49191
18	10	1978	1205	33 51.0'N	120 45.5'W	87.2	.0	90	49191
18	10	1978	1210	33 51.0'N	120 45.5'W	87.2	.0	90	49191
18	10	1978	1215	33 51.0'N	120 45.5'W	87.2	.0	90	49191
18	10	1978	1220	33 51.0'N	120 45.5'W	87.2	.0	90	49191
18	10	1978	1225	33 51.0'N	120 45.5'W	87.2	.0	90	49191
18	10	1978	1230	33 51.0'N	120 45.5'W	87.2	.0	90	49191
18	10	1978	1235	33 51.0'N	120 45.5'W	87.2	.0	90	49191
18	10	1978	1240	33 51.0'N	120 45.5'W	87.2	.0	90	49191
18	10	1978	1245	33 51.0'N	120 45.5'W	87.2	.0	90	49191
18	10	1978	1250	33 51.0'N	120 45.5'W	87.2	.0	90	49191
18	10	1978	1255	33 51.0'N	120 45.5'W	87.2	.0	90	49191
18	10	1978	1300	33 51.0'N	120 45.5'W	87.2	.0	90	49191
18	10	1978	1305	33 51.0'N	120 45.1'W	87.6	10.3	97	49192
18	10	1978	1310	33 50.9'N	120 44.1'W	88.4	10.3	97	49195
18	10	1978	1315	33 50.8'N	120 43.0'W	89.3	10.3	97	49198
18	10	1978	1320	33 50.7'N	120 42.0'W	90.1	10.3	97	49201
18	10	1978	1325	33 50.6'N	120 41.0'W	91.0	9.7	94	49204
18	10	1978	1330	33 50.5'N	120 40.0'W	91.8	9.7	94	49207
18	10	1978	1335	33 50.5'N	120 39.0'W	92.6	9.7	94	49210
18	10	1978	1340	33 50.4'N	120 38.1'W	93.4	9.7	94	49213
18	10	1978	1345	33 50.4'N	120 37.1'W	94.2	9.7	94	49216
18	10	1978	1350	33 50.3'N	120 36.1'W	95.0	9.7	94	49219
18	10	1978	1355	33 50.3'N	120 35.2'W	95.8	9.7	94	49222
18	10	1978	1400	33 50.2'N	120 34.2'W	96.7	9.7	94	49225
18	10	1978	1405	33 50.2'N	120 33.2'W	97.4	9.2	94	49228
18	10	1978	1410	33 50.1'N	120 32.3'W	98.2	9.2	94	49231
18	10	1978	1415	33 50.1'N	120 31.4'W	99.0	9.2	94	49234
18	10	1978	1420	33 50.0'N	120 30.5'W	99.7	9.2	94	49237
18	10	1978	1425	33 50.0'N	120 29.6'W	100.5	9.2	94	49240
18	10	1978	1430	33 49.9'N	120 28.6'W	101.3	9.2	94	49243

Table 1. (Continued).

Day	Month	Year	Time	Latitude	Longitude	Distance (n. mi.)	Speed (kt.)	Course	Regional (mag.)
18	10	1978	1435	33 49.9'N	120 27.7'W	102.0	9.2	94	49246
18	10	1978	1440	33 49.8'N	120 26.8'W	102.8	9.2	94	49249
18	10	1978	1445	33 49.8'N	120 25.9'W	103.6	9.2	94	49252
18	10	1978	1450	33 49.7'N	120 25.0'W	104.3	9.2	94	49255
18	10	1978	1455	33 49.7'N	120 24.1'W	105.1	9.2	94	49258
18	10	1978	1500	33 49.6'N	120 23.1'W	105.8	9.2	94	49261
18	10	1978	1505	33 49.6'N	120 22.2'W	106.6	9.2	94	49264
18	10	1978	1510	33 49.5'N	120 21.3'W	107.4	9.2	94	49267
18	10	1978	1515	33 49.5'N	120 20.4'W	108.1	9.2	94	49270
18	10	1978	1520	33 49.4'N	120 19.5'W	108.9	9.2	94	49273
18	10	1978	1525	33 49.4'N	120 18.6'W	109.7	9.2	94	49276
18	10	1978	1530	33 49.3'N	120 17.6'W	110.4	9.2	94	49278
18	10	1978	1535	33 49.3'N	120 16.7'W	111.2	9.2	94	49281
18	10	1978	1540	33 49.3'N	120 15.8'W	112.0	9.2	94	49284
18	10	1978	1545	33 49.2'N	120 14.9'W	112.7	9.2	94	49287
18	10	1978	1550	33 49.1'N	120 13.9'W	113.5	10.0	96	49290
18	10	1978	1555	33 49.0'N	120 12.9'W	114.4	10.0	96	49293
18	10	1978	1600	33 48.9'N	120 11.9'W	115.2	10.0	96	49296
18	10	1978	1605	33 48.9'N	120 10.9'W	116.1	10.0	96	49299
18	10	1978	1610	33 48.8'N	120 9.9'W	116.9	10.0	96	49301
18	10	1978	1615	33 48.7'N	120 8.9'W	117.7	10.0	96	49304
18	10	1978	1620	33 48.6'N	120 7.9'W	118.6	10.0	96	49307
18	10	1978	1625	33 48.5'N	120 6.9'W	119.4	10.0	96	49310
18	10	1978	1630	33 48.4'N	120 5.9'W	120.2	10.0	96	49313
18	10	1978	1635	33 48.3'N	120 4.9'W	121.1	10.2	96	49315
18	10	1978	1640	33 48.2'N	120 3.9'W	121.9	10.2	96	49318
18	10	1978	1645	33 48.1'N	120 2.8'W	122.8	10.2	96	49321
18	10	1978	1650	33 48.0'N	120 1.8'W	123.6	10.2	96	49324
18	10	1978	1655	33 47.9'N	120 .8'W	124.5	10.2	96	49327
18	10	1978	1700	33 47.8'N	119 59.8'W	125.3	10.2	96	49329
18	10	1978	1705	33 47.8'N	119 58.8'W	126.2	10.2	96	49332
18	10	1978	1710	33 47.7'N	119 57.7'W	127.0	10.2	96	49335
18	10	1978	1715	33 47.6'N	119 56.7'W	127.9	10.2	96	49337
18	10	1978	1720	33 47.5'N	119 55.7'W	128.7	10.2	96	49340
18	10	1978	1725	33 47.4'N	119 54.7'W	129.6	10.2	96	49343
18	10	1978	1730	33 47.2'N	119 53.7'W	130.4	10.2	102	49345
18	10	1978	1735	33 47.1'N	119 52.7'W	131.3	10.2	102	49347
18	10	1978	1740	33 46.9'N	119 51.7'W	132.1	10.2	102	49349
18	10	1978	1745	33 46.7'N	119 50.7'W	133.0	10.2	102	49351
18	10	1978	1750	33 46.6'N	119 49.7'W	133.8	10.2	96	49353
18	10	1978	1755	33 46.5'N	119 48.7'W	134.7	10.2	96	49356
18	10	1978	1800	33 46.4'N	119 47.6'W	135.5	10.2	96	49358
18	10	1978	1805	33 46.3'N	119 46.6'W	136.4	10.2	96	49361
18	10	1978	1810	33 46.2'N	119 45.6'W	137.3	10.2	96	49364
18	10	1978	1815	33 46.1'N	119 44.6'W	138.1	10.2	96	49367

Table 1. (Continued).

Day	Month	Year	Time	Latitude	Longitude	Distance (n. mi.)	Speed (kt.)	Course	Regional (mag.)
18	10	1978	1820	33 46.0'N	119 43.6'W	139.0	10.2	96	49370
18	10	1978	1825	33 45.9'N	119 42.5'W	139.8	10.2	96	49373
18	10	1978	1830	33 45.8'N	119 41.5'W	140.7	10.2	96	49375
18	10	1978	1835	33 45.7'N	119 40.5'W	141.5	10.2	96	49378
18	10	1978	1840	33 45.6'N	119 39.5'W	142.4	10.2	96	49381
18	10	1978	1845	33 45.6'N	119 38.5'W	143.2	10.2	96	49384
18	10	1978	1850	33 45.5'N	119 37.4'W	144.1	10.2	96	49387
18	10	1978	1855	33 45.4'N	119 36.4'W	144.9	10.2	96	49390
18	10	1978	1900	33 45.3'N	119 35.4'W	145.8	10.2	96	49392
18	10	1978	1905	33 45.2'N	119 34.4'W	146.6	10.2	96	49395
18	10	1978	1910	33 45.1'N	119 33.4'W	147.5	10.2	96	49398
18	10	1978	1915	33 45.0'N	119 32.3'W	148.3	10.2	96	49401
18	10	1978	1920	33 44.9'N	119 31.3'W	149.2	10.2	96	49404
18	10	1978	1925	33 44.8'N	119 30.3'W	150.1	10.2	96	49406
18	10	1978	1930	33 44.7'N	119 29.3'W	150.9	10.2	96	49409
18	10	1978	1935	33 44.6'N	119 28.3'W	151.8	10.2	96	49412
18	10	1978	1940	33 44.5'N	119 27.2'W	152.6	10.2	96	49415
18	10	1978	1945	33 44.4'N	119 26.2'W	153.5	10.2	96	49418
18	10	1978	1950	33 44.4'N	119 25.2'W	154.3	10.2	96	49421
18	10	1978	1955	33 44.3'N	119 24.2'W	155.2	10.2	96	49423
18	10	1978	2000	33 44.2'N	119 23.2'W	156.0	10.2	96	49426
18	10	1978	2005	33 44.1'N	119 22.1'W	156.9	10.2	96	49429
18	10	1978	2010	33 44.0'N	119 21.1'W	157.7	10.2	96	49432
18	10	1978	2015	33 43.9'N	119 20.1'W	158.6	10.2	96	49435
18	10	1978	2020	33 43.8'N	119 19.1'W	159.4	10.2	96	49437
18	10	1978	2025	33 43.7'N	119 18.1'W	160.3	10.2	96	49440
18	10	1978	2030	33 43.6'N	119 17.0'W	161.1	10.2	96	49443
18	10	1978	2035	33 43.5'N	119 16.0'W	162.0	10.2	96	49446
18	10	1978	2040	33 43.4'N	119 15.0'W	162.8	10.2	96	49449
18	10	1978	2045	33 43.3'N	119 13.9'W	163.7	10.8	96	49452
18	10	1978	2050	33 43.3'N	119 12.9'W	164.6	10.8	96	49455
18	10	1978	2055	33 43.2'N	119 11.8'W	165.5	10.8	96	49458
18	10	1978	2105	33 43.0'N	119 9.6'W	167.3	10.8	96	49464
18	10	1978	2110	33 42.9'N	119 8.5'W	168.2	10.8	96	49467
18	10	1978	2120	33 42.7'N	119 6.4'W	170.1	10.8	96	49473
18	10	1978	2125	33 42.6'N	119 5.3'W	171.0	10.8	96	49476
18	10	1978	2130	33 42.5'N	119 4.2'W	171.9	10.8	96	49479
18	10	1978	2135	33 42.4'N	119 3.1'W	172.8	10.8	96	49482
18	10	1978	2140	33 42.4'N	119 2.1'W	173.7	10.8	96	49485
18	10	1978	2145	33 42.3'N	119 1.0'W	174.6	10.8	96	49488
18	10	1978	2150	33 42.2'N	118 59.9'W	175.5	10.8	96	49492
18	10	1978	2155	33 42.1'N	118 58.8'W	176.4	10.8	96	49495
18	10	1978	2200	33 42.0'N	118 57.7'W	177.3	10.8	96	49498
18	10	1978	2205	33 41.9'N	118 56.7'W	178.2	10.8	96	49501
18	10	1978	2210	33 41.8'N	118 55.6'W	179.1	10.8	96	49504

Table 1. (Continued).

Day	Month	Year	Time	Latitude	Longitude	Distance (n. mi.)	Speed (kt.)	Course	Regional (mag.)
18	10	1978	2215	33 41.7'N	118 54.5'W	180.0	10.8	96	49507
18	10	1978	2220	33 41.6'N	118 53.4'W	180.9	10.8	96	49510
18	10	1978	2225	33 41.5'N	118 52.3'W	181.8	10.8	96	49513
18	10	1978	2230	33 41.5'N	118 51.3'W	182.7	10.8	97	49516
18	10	1978	2235	33 41.3'N	118 50.2'W	183.6	10.8	97	49519
18	10	1978	2240	33 41.2'N	118 49.1'W	184.5	10.8	97	49521
18	10	1978	2245	33 41.1'N	118 48.1'W	185.4	10.8	97	49524
18	10	1978	2250	33 41.0'N	118 47.0'W	186.3	10.8	97	49527
18	10	1978	2255	33 40.9'N	118 45.9'W	187.2	10.8	94	49530
18	10	1978	2300	33 40.9'N	118 44.8'W	188.1	10.8	94	49533
18	10	1978	2305	33 40.8'N	118 43.8'W	189.0	10.8	94	49537
18	10	1978	2310	33 40.7'N	118 42.7'W	189.9	10.8	94	49540
18	10	1978	2315	33 40.7'N	118 41.6'W	190.8	10.8	94	49543
18	10	1978	2320	33 40.6'N	118 40.5'W	191.7	10.8	94	49547
18	10	1978	2325	33 40.5'N	118 39.4'W	192.6	10.8	94	49550
18	10	1978	2330	33 40.5'N	118 38.4'W	193.5	10.8	94	49553
18	10	1978	2335	33 40.4'N	118 37.3'W	194.4	10.8	94	49557
18	10	1978	2340	33 40.4'N	118 36.2'W	195.3	10.8	94	49560
18	10	1978	2345	33 40.3'N	118 35.1'W	196.2	10.8	94	49563
18	10	1978	2350	33 40.2'N	118 34.0'W	197.1	10.8	94	49566
18	10	1978	2355	33 40.2'N	118 33.0'W	198.0	10.8	94	49570
21	10	1978	1005	33 16.0'N	118 20.0'W	232.2	9.3	257	49364
21	10	1978	1010	33 15.8'N	118 20.9'W	233.0	9.3	252	49358
21	10	1978	1015	33 15.5'N	118 21.8'W	233.8	9.3	252	49352
21	10	1978	1020	33 15.3'N	118 22.6'W	234.6	9.3	252	49346
21	10	1978	1025	33 15.0'N	118 23.5'W	235.3	9.3	252	49340
21	10	1978	1030	33 14.8'N	118 24.4'W	236.1	9.3	252	49335
21	10	1978	1035	33 14.5'N	118 25.3'W	236.9	9.3	252	49329
21	10	1978	1040	33 14.3'N	118 26.2'W	237.7	9.3	252	49323
21	10	1978	1045	33 14.0'N	118 27.0'W	238.4	9.3	252	49317
21	10	1978	1050	33 13.8'N	118 27.9'W	239.2	9.3	252	49311
21	10	1978	1055	33 13.5'N	118 28.8'W	240.0	9.3	252	49306
21	10	1978	1100	33 13.3'N	118 29.7'W	240.8	9.3	252	49300
21	10	1978	1105	33 13.0'N	118 30.6'W	241.5	9.3	251	49294
21	10	1978	1110	33 12.8'N	118 31.4'W	242.3	9.3	251	49288
21	10	1978	1115	33 12.5'N	118 32.3'W	243.1	9.3	251	49282
21	10	1978	1120	33 12.3'N	118 33.2'W	243.9	9.3	251	49276
21	10	1978	1125	33 12.0'N	118 34.1'W	244.7	9.3	251	49270
21	10	1978	1130	33 11.8'N	118 35.0'W	245.4	9.3	251	49265
21	10	1978	1135	33 11.5'N	118 35.8'W	246.2	9.3	251	49259
21	10	1978	1140	33 11.3'N	118 36.7'W	247.0	9.3	251	49253
21	10	1978	1145	33 11.0'N	118 37.6'W	247.8	9.3	251	49247
21	10	1978	1150	33 10.8'N	118 38.5'W	248.5	9.3	251	49241
21	10	1978	1155	33 10.5'N	118 39.4'W	249.3	9.0	251	49235
21	10	1978	1200	33 10.3'N	118 40.2'W	250.1	9.0	251	49230

Table 1. (Continued).

Day	Month	Year	Time	Latitude	Longitude	Distance (n. mi.)	Speed (kt.)	Course	Regional (mag.)
21	10	1978	1205	33 10.1'N	118 41.1'W	250.8	9.0	251	49224
21	10	1978	1210	33 9.8'N	118 41.9'W	251.6	9.0	251	49218
21	10	1978	1215	33 9.6'N	118 42.8'W	252.3	9.0	251	49213
21	10	1978	1220	33 9.3'N	118 43.6'W	253.1	9.0	251	49207
21	10	1978	1225	33 9.1'N	118 44.5'W	253.8	9.0	251	49202
21	10	1978	1230	33 8.9'N	118 45.3'W	254.6	9.0	251	49196
21	10	1978	1235	33 8.6'N	118 46.2'W	255.3	9.0	251	49190
21	10	1978	1240	33 8.4'N	118 47.0'W	256.1	9.0	251	49185
21	10	1978	1245	33 8.2'N	118 47.9'W	256.8	8.6	251	49179
21	10	1978	1250	33 7.9'N	118 48.7'W	257.5	8.6	251	49174
21	10	1978	1255	33 7.7'N	118 49.5'W	258.3	8.6	251	49168
21	10	1978	1300	33 7.5'N	118 50.3'W	259.0	8.6	251	49163
21	10	1978	1305	33 7.2'N	118 51.1'W	259.7	8.6	251	49158
21	10	1978	1310	33 7.0'N	118 51.9'W	260.4	8.6	251	49152
21	10	1978	1315	33 6.8'N	118 52.7'W	261.1	8.6	251	49147
21	10	1978	1320	33 6.6'N	118 53.5'W	261.8	8.6	251	49142
21	10	1978	1325	33 6.3'N	118 54.3'W	262.5	8.6	251	49136
21	10	1978	1330	33 6.1'N	118 55.1'W	263.2	8.6	251	49131
21	10	1978	1335	33 5.9'N	118 55.9'W	264.0	8.6	251	49126
21	10	1978	1340	33 5.7'N	118 56.7'W	264.7	8.6	251	49120
21	10	1978	1345	33 5.4'N	118 57.5'W	265.4	8.6	251	49115
21	10	1978	1350	33 5.2'N	118 58.3'W	266.1	8.6	251	49110
21	10	1978	1355	33 5.0'N	118 59.2'W	266.8	8.6	251	49104
21	10	1978	1400	33 4.7'N	118 60.0'W	267.5	8.6	251	49099
21	10	1978	1405	33 4.5'N	119 .8'W	268.2	8.6	251	49094
21	10	1978	1410	33 4.3'N	119 1.6'W	268.9	8.6	251	49088
21	10	1978	1415	33 4.0'N	119 2.3'W	269.6	7.9	246	49083
21	10	1978	1420	33 3.8'N	119 3.0'W	270.3	7.9	246	49077
21	10	1978	1425	33 3.5'N	119 3.8'W	270.9	7.9	246	49072
21	10	1978	1430	33 3.2'N	119 4.5'W	271.6	7.9	246	49066
21	10	1978	1435	33 3.0'N	119 5.2'W	272.3	7.9	246	49061
21	10	1978	1440	33 2.7'N	119 5.9'W	272.9	7.9	246	49055
21	10	1978	1445	33 2.4'N	119 6.6'W	273.6	7.9	246	49050
21	10	1978	1450	33 2.2'N	119 7.3'W	274.2	7.9	246	49045
21	10	1978	1455	33 1.9'N	119 8.1'W	274.9	7.9	246	49039
21	10	1978	1500	33 1.6'N	119 8.8'W	275.5	7.9	246	49034
21	10	1978	1505	33 1.3'N	119 9.5'W	276.2	7.9	246	49028
21	10	1978	1510	33 1.1'N	119 10.2'W	276.9	7.9	246	49023
21	10	1978	1515	33 .8'N	119 10.9'W	277.5	7.9	246	49017
21	10	1978	1520	33 .5'N	119 11.6'W	278.2	7.9	246	49012
21	10	1978	1525	33 .3'N	119 12.4'W	278.8	7.9	246	49006
21	10	1978	1530	33 .0'N	119 13.1'W	279.5	7.9	246	49001
21	10	1978	1535	32 59.7'N	119 13.8'W	280.2	7.9	246	48995
21	10	1978	1540	32 59.5'N	119 14.5'W	280.8	7.9	246	48990
21	10	1978	1545	32 59.2'N	119 15.2'W	281.5	7.9	246	48984

Table 1. (Continued).

Day	Month	Year	Time	Latitude	Longitude	Distance (n. mi.)	Speed (kt.)	Course	Regional (mag.)
21	10	1978	1550	32 58.9'N	119 15.9'W	282.1	7.9	246	48979
21	10	1978	1555	32 58.6'N	119 16.6'W	282.8	7.9	246	48973
21	10	1978	1600	32 58.3'N	119 17.3'W	283.5	8.0	236	48967
21	10	1978	1605	32 57.9'N	119 18.0'W	284.1	8.0	236	48961
21	10	1978	1610	32 57.5'N	119 18.6'W	284.8	8.0	236	48954
21	10	1978	1615	32 57.5'N	119 19.1'W	285.2	3.9	304	48952
21	10	1978	1620	32 57.7'N	119 19.4'W	285.6	3.9	304	48953
21	10	1978	1625	32 57.9'N	119 19.7'W	285.9	3.9	304	48954
21	10	1978	1630	32 58.1'N	119 20.1'W	286.2	3.9	304	48955
21	10	1978	1635	32 58.2'N	119 20.4'W	286.6	3.9	304	48955
21	10	1978	1640	32 58.4'N	119 20.7'W	286.9	3.9	304	48956
21	10	1978	1645	32 58.6'N	119 21.0'W	287.2	3.9	304	48957
21	10	1978	1650	32 58.8'N	119 21.4'W	287.6	3.9	304	48958
21	10	1978	1655	32 59.0'N	119 21.7'W	287.9	3.9	304	48958
21	10	1978	1700	32 59.2'N	119 22.0'W	288.2	3.9	304	48959
21	10	1978	1705	32 59.4'N	119 22.3'W	288.5	3.9	304	48960
21	10	1978	1710	32 59.5'N	119 22.7'W	288.9	3.9	304	48961
21	10	1978	1715	32 59.7'N	119 23.0'W	289.2	3.9	304	48961
21	10	1978	1720	32 59.9'N	119 23.3'W	289.5	3.9	304	48962
21	10	1978	1725	33 .1'N	119 23.6'W	289.8	3.9	304	48963
21	10	1978	1730	33 .3'N	119 24.0'W	290.2	3.9	304	48964
21	10	1978	1735	33 .5'N	119 24.3'W	290.5	3.9	304	48964
21	10	1978	1740	33 .6'N	119 24.6'W	290.8	3.9	304	48965
21	10	1978	1745	33 .8'N	119 24.9'W	291.2	3.9	304	48966
21	10	1978	1750	33 1.0'N	119 25.3'W	291.5	3.9	304	48967
21	10	1978	1755	33 1.2'N	119 25.6'W	291.8	3.9	304	48967
21	10	1978	1800	33 1.4'N	119 25.9'W	292.2	3.9	304	48968
21	10	1978	1805	33 1.6'N	119 26.2'W	292.5	3.9	304	48969
21	10	1978	1810	33 1.3'N	119 26.7'W	293.0	7.4	228	48964
21	10	1978	1815	33 .9'N	119 27.3'W	293.7	7.4	228	48957
21	10	1978	1820	33 .4'N	119 27.8'W	294.3	7.4	228	48951
21	10	1978	1825	33 .0'N	119 28.4'W	294.9	7.4	228	48945
21	10	1978	1830	32 59.6'N	119 28.9'W	295.5	7.4	228	48938
21	10	1978	1835	32 59.2'N	119 29.5'W	296.1	7.4	228	48932
21	10	1978	1840	32 58.8'N	119 30.0'W	296.8	7.4	228	48926
21	10	1978	1845	32 58.4'N	119 30.6'W	297.4	7.4	228	48919
21	10	1978	1850	32 58.0'N	119 31.1'W	298.0	7.4	228	48913
21	10	1978	1855	32 57.5'N	119 31.7'W	298.6	7.4	228	48906
21	10	1978	1900	32 57.1'N	119 32.2'W	299.2	7.4	228	48900
21	10	1978	1905	32 56.7'N	119 32.8'W	299.9	7.4	228	48894
21	10	1978	1910	32 56.3'N	119 33.3'W	300.5	7.4	228	48887
21	10	1978	1915	32 55.9'N	119 33.9'W	301.1	7.4	228	48881
21	10	1978	1920	32 55.5'N	119 34.5'W	301.7	7.4	228	48874
21	10	1978	1925	32 55.1'N	119 35.0'W	302.3	7.4	228	48868
21	10	1978	1930	32 54.7'N	119 35.6'W	303.0	7.4	228	48862

Table 1. (Continued).

Day	Month	Year	Time	Latitude	Longitude	Distance (n. mi.)	Speed (kt.)	Course	Regional (mag.)
21	10	1978	1935	32 54.2'N	119 36.1'W	303.6	7.4	228	48855
21	10	1978	1940	32 53.8'N	119 36.7'W	304.2	7.4	228	48849
21	10	1978	1945	32 53.4'N	119 37.2'W	304.8	7.1	236	48843
21	10	1978	1950	32 53.1'N	119 37.8'W	305.4	7.1	236	48837
21	10	1978	1955	32 52.8'N	119 38.4'W	306.0	7.1	236	48831
21	10	1978	2000	32 52.4'N	119 39.0'W	306.6	7.1	236	48826
21	10	1978	2005	32 52.1'N	119 39.5'W	307.2	7.1	236	48820
21	10	1978	2010	32 51.8'N	119 40.1'W	307.8	7.1	236	48815
21	10	1978	2015	32 51.5'N	119 40.7'W	308.4	7.1	236	48809
21	10	1978	2020	32 51.1'N	119 41.3'W	309.0	7.1	236	48803
21	10	1978	2025	32 50.8'N	119 41.9'W	309.6	7.1	236	48798
21	10	1978	2030	32 50.6'N	119 42.5'W	310.1	7.0	248	48793
21	10	1978	2035	32 50.4'N	119 43.2'W	310.7	7.0	248	48788
21	10	1978	2040	32 50.1'N	119 43.8'W	311.3	7.0	248	48784
21	10	1978	2045	32 49.9'N	119 44.4'W	311.9	7.0	248	48779
21	10	1978	2050	32 49.7'N	119 45.1'W	312.4	7.0	248	48774
21	10	1978	2055	32 49.5'N	119 45.7'W	313.0	7.0	248	48770
21	10	1978	2100	32 49.3'N	119 46.4'W	313.6	7.0	248	48765
21	10	1978	2105	32 49.1'N	119 47.0'W	314.2	7.0	248	48761
21	10	1978	2110	32 48.9'N	119 47.6'W	314.8	7.0	248	48756
21	10	1978	2115	32 48.6'N	119 48.3'W	315.3	7.0	248	48751
21	10	1978	2120	32 48.4'N	119 48.9'W	315.9	7.0	248	48747
21	10	1978	2125	32 48.2'N	119 49.6'W	316.5	7.0	248	48742
21	10	1978	2130	32 48.0'N	119 50.2'W	317.1	7.0	248	48737
21	10	1978	2135	32 47.8'N	119 50.8'W	317.7	7.0	248	48733
21	10	1978	2140	32 47.5'N	119 51.5'W	318.2	7.0	248	48728
21	10	1978	2145	32 47.3'N	119 52.1'W	318.8	7.0	248	48724
21	10	1978	2150	32 47.1'N	119 52.8'W	319.4	7.0	248	48719
21	10	1978	2155	32 46.9'N	119 53.4'W	320.0	7.0	248	48714
21	10	1978	2200	32 46.7'N	119 54.0'W	320.6	7.0	248	48710
21	10	1978	2205	32 46.4'N	119 54.7'W	321.2	7.8	244	48704
21	10	1978	2210	32 46.1'N	119 55.4'W	321.8	7.8	244	48699
21	10	1978	2215	32 45.8'N	119 56.1'W	322.5	7.8	244	48693
21	10	1978	2220	32 45.6'N	119 56.8'W	323.1	7.8	244	48688
21	10	1978	2225	32 45.3'N	119 57.5'W	323.8	7.8	244	48682
21	10	1978	2230	32 45.0'N	119 58.2'W	324.4	7.8	244	48677
21	10	1978	2235	32 44.7'N	119 58.9'W	325.1	7.8	244	48671
21	10	1978	2240	32 44.4'N	119 59.6'W	325.7	7.8	244	48665
21	10	1978	2245	32 44.1'N	120 .2'W	326.4	7.8	244	48660
21	10	1978	2250	32 43.8'N	120 .9'W	327.0	7.8	244	48654
21	10	1978	2255	32 43.6'N	120 1.7'W	327.7	8.5	255	48649
21	10	1978	2300	32 43.4'N	120 2.5'W	328.4	8.5	255	48644
21	10	1978	2305	32 43.2'N	120 3.3'W	329.1	8.5	255	48639
21	10	1978	2310	32 43.0'N	120 4.1'W	329.8	8.5	255	48634
21	10	1978	2315	32 42.8'N	120 4.9'W	330.5	8.5	255	48629

Table 1. (Continued).

Day	Month	Year	Time	Latitude	Longitude	Distance (n. mi.)	Speed (kt.)	Course	Regional (mag.)
21	10	1978	2320	32 42.6'N	120 5.7'W	331.2	8.5	255	48624
21	10	1978	2325	32 42.4'N	120 6.5'W	331.9	8.5	255	48619
21	10	1978	2330	32 41.8'N	120 6.9'W	332.7	8.9	194	48611
21	10	1978	2335	32 41.1'N	120 7.1'W	333.4	8.9	194	48603
21	10	1978	2340	32 40.4'N	120 7.3'W	334.2	8.9	194	48594
21	10	1978	2345	32 39.7'N	120 7.5'W	334.9	8.9	194	48586
21	10	1978	2350	32 38.9'N	120 7.7'W	335.6	8.9	194	48578
21	10	1978	2355	32 38.2'N	120 7.9'W	336.4	8.9	194	48569
22	10	1978	0	32 37.5'N	120 8.1'W	337.1	8.9	194	48561
22	10	1978	5	32 36.8'N	120 8.3'W	337.8	8.6	191	48553
22	10	1978	10	32 36.1'N	120 8.4'W	338.6	8.6	191	48545
22	10	1978	15	32 35.4'N	120 8.6'W	339.3	8.6	191	48537
22	10	1978	20	32 34.8'N	120 9.1'W	340.1	8.5	193	48528
22	10	1978	25	32 34.1'N	120 9.3'W	340.8	8.5	193	48520
22	10	1978	30	32 33.4'N	120 9.5'W	341.5	8.5	193	48512
22	10	1978	35	32 32.7'N	120 9.7'W	342.2	8.5	193	48504
22	10	1978	40	32 32.0'N	120 9.9'W	342.9	8.5	193	48497
22	10	1978	45	32 32.5'N	120 9.6'W	343.5	7.1	21	48503
22	10	1978	50	32 33.1'N	120 9.4'W	344.1	7.1	21	48510
22	10	1978	55	32 33.6'N	120 9.1'W	344.7	7.1	21	48517
22	10	1978	100	32 34.2'N	120 8.9'W	345.3	7.1	21	48523
22	10	1978	105	32 34.7'N	120 8.6'W	345.8	7.1	28	48530
22	10	1978	110	32 35.2'N	120 8.2'W	346.4	7.1	28	48537
22	10	1978	115	32 35.8'N	120 7.9'W	347.0	7.1	28	48543
22	10	1978	120	32 36.3'N	120 7.6'W	347.6	7.1	28	48550
22	10	1978	125	32 36.8'N	120 7.2'W	348.2	7.1	28	48557
22	10	1978	130	32 37.0'N	120 7.1'W	348.4	.0	46	48559
22	10	1978	135	32 37.0'N	120 7.1'W	348.4	.0	46	48559
22	10	1978	140	32 37.0'N	120 7.1'W	348.4	.0	46	48560
22	10	1978	145	32 37.0'N	120 7.1'W	348.4	.0	46	48560
27	10	1978	445	32 37.4'N	120 6.6'W	349.0	.0	90	48566
27	10	1978	450	32 37.4'N	120 6.6'W	349.0	.0	90	48566
27	10	1978	455	32 37.4'N	120 6.6'W	349.0	.0	90	48566
27	10	1978	500	32 37.4'N	120 6.6'W	349.0	.0	90	48566
27	10	1978	505	32 37.4'N	120 6.8'W	349.2	9.3	269	48565
27	10	1978	510	32 37.4'N	120 7.7'W	349.9	9.3	269	48561
27	10	1978	515	32 37.4'N	120 8.6'W	350.7	9.3	269	48558
27	10	1978	520	32 37.3'N	120 9.5'W	351.5	9.3	269	48554
27	10	1978	525	32 37.3'N	120 10.5'W	352.3	9.3	269	48550
27	10	1978	530	32 37.3'N	120 11.4'W	353.1	9.3	269	48547
27	10	1978	535	32 37.3'N	120 12.3'W	353.8	9.3	269	48543
27	10	1978	540	32 37.3'N	120 13.2'W	354.6	9.3	269	48540
27	10	1978	545	32 37.2'N	120 14.2'W	355.4	9.3	269	48536
27	10	1978	550	32 37.2'N	120 15.1'W	356.2	9.3	269	48532
27	10	1978	555	32 37.2'N	120 16.0'W	356.9	9.3	269	48529

Table 1. (Continued).

Day	Month	Year	Time	Latitude	Longitude	Distance (n. mi.)	Speed (kt.)	Course	Regional (mag.)
27	10	1978	600	32 37.2'N	120 16.9'W	357.7	9.3	269	48525
27	10	1978	605	32 37.2'N	120 17.8'W	358.5	9.3	269	48522
27	10	1978	610	32 37.2'N	120 18.8'W	359.3	9.3	269	48518
27	10	1978	615	32 37.1'N	120 19.7'W	360.0	9.3	269	48514
27	10	1978	620	32 37.1'N	120 20.6'W	360.8	9.3	269	48511
27	10	1978	625	32 37.1'N	120 21.5'W	361.6	9.3	269	48507
27	10	1978	630	32 37.1'N	120 22.4'W	362.4	9.3	269	48504
27	10	1978	635	32 37.1'N	120 23.4'W	363.2	9.3	269	48500
27	10	1978	640	32 37.0'N	120 24.3'W	363.9	9.3	269	48496
27	10	1978	645	32 37.0'N	120 25.2'W	364.7	9.3	269	48493
27	10	1978	650	32 37.0'N	120 26.1'W	365.5	9.3	269	48489
27	10	1978	655	32 37.0'N	120 27.0'W	366.2	7.1	268	48486
27	10	1978	700	32 37.0'N	120 27.7'W	366.8	7.1	268	48483
27	10	1978	705	32 36.9'N	120 28.4'W	367.4	7.1	268	48480
27	10	1978	710	32 36.9'N	120 29.1'W	368.0	7.1	268	48477
27	10	1978	715	32 36.9'N	120 29.8'W	368.5	7.1	268	48475
27	10	1978	720	32 36.9'N	120 30.5'W	369.1	7.1	268	48472
27	10	1978	725	32 36.8'N	120 31.2'W	369.7	7.1	268	48469
27	10	1978	730	32 36.8'N	120 31.9'W	370.3	7.1	268	48466
27	10	1978	735	32 36.8'N	120 32.6'W	370.9	7.1	268	48463
27	10	1978	740	32 36.8'N	120 33.3'W	371.5	7.1	268	48460
27	10	1978	745	32 36.7'N	120 34.0'W	372.1	7.1	268	48458
27	10	1978	750	32 36.7'N	120 34.7'W	372.7	7.1	268	48455
27	10	1978	755	32 36.7'N	120 35.4'W	373.3	7.1	268	48452
27	10	1978	800	32 36.7'N	120 36.1'W	373.9	7.1	268	48449
27	10	1978	805	32 36.7'N	120 36.8'W	374.4	7.1	268	48446
27	10	1978	810	32 36.6'N	120 37.5'W	375.0	7.1	268	48443
27	10	1978	815	32 36.6'N	120 38.2'W	375.6	7.1	268	48441
27	10	1978	820	32 36.6'N	120 38.9'W	376.2	7.3	270	48438
27	10	1978	825	32 36.6'N	120 39.6'W	376.8	7.3	270	48435
27	10	1978	830	32 36.6'N	120 40.3'W	377.4	7.3	270	48432
27	10	1978	835	32 36.6'N	120 41.0'W	378.1	7.3	270	48430
27	10	1978	840	32 36.6'N	120 40.6'W	378.7	7.9	90	48431
27	10	1978	845	32 36.6'N	120 39.8'W	379.4	7.9	90	48434
27	10	1978	850	32 36.6'N	120 39.0'W	380.0	7.6	86	48438
27	10	1978	855	32 36.7'N	120 38.3'W	380.6	7.6	86	48441
27	10	1978	900	32 36.7'N	120 37.5'W	381.3	7.6	86	48444
27	10	1978	905	32 36.8'N	120 36.8'W	381.9	7.6	86	48447
27	10	1978	910	32 36.8'N	120 36.0'W	382.5	7.6	86	48451
27	10	1978	915	32 36.9'N	120 35.3'W	383.2	7.6	86	48454
27	10	1978	920	32 36.9'N	120 34.5'W	383.8	7.6	86	48457
27	10	1978	925	32 36.9'N	120 33.8'W	384.4	7.6	86	48460
27	10	1978	930	32 37.0'N	120 33.0'W	385.0	7.6	86	48463
27	10	1978	935	32 37.0'N	120 32.9'W	385.2	.0	90	48464
27	10	1978	940	32 37.0'N	120 32.9'W	385.2	.0	90	48464

Table 1. (Continued).

Day	Month	Year	Time	Latitude	Longitude	Distance (n. mi.)	Speed (kt.)	Course	Regional (mag.)
1	11	1978	1325	32 38.2'N	120 30.0'W	387.9	7.0	64	48487
1	11	1978	1330	32 38.4'N	120 29.4'W	388.4	7.0	64	48492
1	11	1978	1335	32 38.7'N	120 28.8'W	389.0	7.0	64	48497
1	11	1978	1340	32 38.9'N	120 28.1'W	389.6	7.0	64	48502
1	11	1978	1345	32 39.2'N	120 27.5'W	390.2	7.0	64	48507
1	11	1978	1350	32 39.4'N	120 26.9'W	390.8	7.0	64	48512
1	11	1978	1355	32 39.7'N	120 26.3'W	391.4	7.0	64	48517
1	11	1978	1400	32 40.0'N	120 25.6'W	392.0	7.0	64	48522
1	11	1978	1405	32 40.2'N	120 25.0'W	392.6	7.0	64	48527
1	11	1978	1410	32 40.5'N	120 24.4'W	393.1	7.0	64	48532
1	11	1978	1415	32 40.7'N	120 23.8'W	393.7	7.0	64	48537
1	11	1978	1420	32 41.0'N	120 23.1'W	394.3	7.0	64	48542
1	11	1978	1425	32 41.2'N	120 22.5'W	394.9	7.0	64	48547
1	11	1978	1430	32 41.5'N	120 21.9'W	395.5	7.0	64	48552
1	11	1978	1435	32 41.7'N	120 21.3'W	396.0	6.2	64	48556
1	11	1978	1440	32 41.9'N	120 20.8'W	396.5	6.2	64	48561
1	11	1978	1445	32 42.2'N	120 20.2'W	397.0	6.2	64	48565
1	11	1978	1450	32 42.4'N	120 19.7'W	397.5	6.2	64	48570
1	11	1978	1455	32 41.9'N	120 19.4'W	398.0	6.2	151	48566
1	11	1978	1500	32 41.5'N	120 19.1'W	398.6	6.2	151	48562
1	11	1978	1505	32 40.8'N	120 18.6'W	399.3	9.3	149	48557
1	11	1978	1510	32 40.2'N	120 18.2'W	400.1	9.3	149	48552
1	11	1978	1515	32 39.5'N	120 17.7'W	400.9	9.3	149	48547
1	11	1978	1520	32 38.8'N	120 17.2'W	401.6	9.3	149	48541
1	11	1978	1525	32 38.2'N	120 16.8'W	402.4	9.3	149	48536
1	11	1978	1530	32 37.5'N	120 16.3'W	403.2	9.3	149	48531
1	11	1978	1535	32 36.9'N	120 15.8'W	404.0	9.3	149	48526
1	11	1978	1540	32 36.2'N	120 15.4'W	404.7	9.3	149	48520
1	11	1978	1545	32 35.5'N	120 14.9'W	405.5	9.3	149	48515
1	11	1978	1550	32 34.9'N	120 14.4'W	406.3	9.3	149	48510
1	11	1978	1555	32 34.2'N	120 14.0'W	407.0	9.3	149	48505
1	11	1978	1600	32 33.5'N	120 13.5'W	407.8	9.5	147	48499
1	11	1978	1605	32 32.9'N	120 13.0'W	408.6	9.5	147	48494
1	11	1978	1610	32 32.2'N	120 12.5'W	409.4	9.5	147	48489
1	11	1978	1615	32 31.5'N	120 11.9'W	410.2	9.5	147	48484
1	11	1978	1620	32 30.9'N	120 11.4'W	411.0	9.5	147	48479
1	11	1978	1625	32 30.2'N	120 10.9'W	411.8	9.5	147	48474
1	11	1978	1630	32 29.5'N	120 10.4'W	412.6	9.5	147	48469
1	11	1978	1635	32 28.9'N	120 9.9'W	413.4	9.5	147	48464
1	11	1978	1640	32 28.2'N	120 9.4'W	414.2	9.5	147	48459
1	11	1978	1645	32 27.6'N	120 8.9'W	415.0	9.5	147	48454
1	11	1978	1650	32 26.9'N	120 8.3'W	415.8	9.5	147	48448
1	11	1978	1655	32 26.2'N	120 7.8'W	416.6	9.5	147	48443
1	11	1978	1700	32 25.6'N	120 7.3'W	417.4	9.5	147	48438
1	11	1978	1705	32 24.9'N	120 6.8'W	418.1	9.5	147	48433

Table 1. (Continued).

Day	Month	Year	Time	Latitude	Longitude	Distance (n. mi.)	Speed (kt.)	Course	Regional (mag.)
1	11	1978	1710	32 24.2'N	120 6.3'W	418.9	9.5	147	48428
1	11	1978	1715	32 23.6'N	120 5.8'W	419.7	9.5	147	48423
1	11	1978	1720	32 22.9'N	120 5.3'W	420.5	9.5	147	48418
1	11	1978	1725	32 22.2'N	120 4.7'W	421.3	9.5	147	48413
1	11	1978	1730	32 21.6'N	120 4.2'W	422.1	9.5	147	48408
1	11	1978	1735	32 20.9'N	120 3.7'W	422.9	9.5	147	48403
1	11	1978	1740	32 20.2'N	120 3.2'W	423.7	9.5	147	48397
1	11	1978	1745	32 19.6'N	120 2.7'W	424.5	9.5	147	48392
1	11	1978	1750	32 18.9'N	120 2.2'W	425.3	9.5	147	48387
1	11	1978	1755	32 18.3'N	120 1.7'W	426.1	9.5	147	48382
1	11	1978	1800	32 17.6'N	120 1.1'W	426.9	9.5	147	48377
1	11	1978	1805	32 16.9'N	120 .6'W	427.7	9.5	147	48372
1	11	1978	1810	32 16.3'N	120 .1'W	428.5	9.5	147	48367
1	11	1978	1815	32 15.6'N	119 59.6'W	429.3	9.5	147	48361
1	11	1978	1820	32 14.9'N	119 59.1'W	430.1	9.5	147	48356
1	11	1978	1825	32 14.3'N	119 58.6'W	430.8	9.5	147	48351
1	11	1978	1830	32 13.6'N	119 58.1'W	431.6	9.5	147	48345
1	11	1978	1835	32 12.9'N	119 57.5'W	432.4	9.5	147	48340
1	11	1978	1840	32 12.3'N	119 57.0'W	433.2	9.5	147	48335
1	11	1978	1845	32 11.6'N	119 56.5'W	434.0	9.5	147	48330
1	11	1978	1850	32 10.9'N	119 56.0'W	434.8	9.5	147	48325
1	11	1978	1855	32 10.3'N	119 55.5'W	435.6	9.5	147	48320
1	11	1978	1900	32 9.6'N	119 55.0'W	436.4	9.5	147	48315
1	11	1978	1905	32 9.0'N	119 54.4'W	437.2	9.5	147	48310
1	11	1978	1910	32 8.3'N	119 53.9'W	438.0	9.5	147	48304
1	11	1978	1915	32 7.6'N	119 53.4'W	438.8	9.5	147	48299
1	11	1978	1920	32 7.0'N	119 52.9'W	439.6	9.5	147	48294
1	11	1978	1925	32 6.3'N	119 52.4'W	440.4	9.5	147	48289
1	11	1978	1930	32 6.3'N	119 51.5'W	441.2	9.5	90	48292
1	11	1978	1935	32 6.3'N	119 50.5'W	442.0	9.5	90	48296
1	11	1978	1940	32 6.3'N	119 49.6'W	442.7	9.5	90	48299
1	11	1978	1945	32 6.3'N	119 48.7'W	443.5	9.5	90	48303
1	11	1978	1950	32 6.3'N	119 47.7'W	444.3	9.5	90	48306
1	11	1978	1955	32 6.3'N	119 46.8'W	445.1	9.5	90	48309
1	11	1978	2000	32 6.3'N	119 45.9'W	445.9	9.5	90	48313
1	11	1978	2005	32 6.3'N	119 44.9'W	446.7	9.5	90	48316
1	11	1978	2010	32 6.3'N	119 44.0'W	447.5	9.5	90	48319
1	11	1978	2015	32 6.3'N	119 43.1'W	448.3	9.5	90	48323
1	11	1978	2020	32 6.3'N	119 42.2'W	449.0	9.5	90	48326
1	11	1978	2025	32 6.3'N	119 41.2'W	449.8	9.5	90	48330
1	11	1978	2030	32 6.3'N	119 40.3'W	450.6	9.5	90	48333
1	11	1978	2035	32 6.3'N	119 39.4'W	451.4	9.5	90	48336
1	11	1978	2040	32 6.3'N	119 38.4'W	452.2	9.5	90	48340
1	11	1978	2045	32 6.3'N	119 37.5'W	453.0	9.5	90	48343
1	11	1978	2050	32 6.3'N	119 36.6'W	453.8	9.5	90	48347

Table 1. (Continued).

Day	Month	Year	Time	Latitude	Longitude	Distance (n. mi.)	Speed (kt.)	Course	Regional (mag.)
1	11	1978	2055	32 6.3'N	119 35.6'W	454.6	9.5	90	48350
1	11	1978	2100	32 6.3'N	119 34.7'W	455.3	9.5	90	48353
1	11	1978	2105	32 6.3'N	119 33.8'W	456.1	9.5	90	48357
1	11	1978	2110	32 6.3'N	119 32.9'W	456.9	9.5	90	48360
1	11	1978	2115	32 6.3'N	119 31.9'W	457.7	9.5	90	48363
1	11	1978	2120	32 6.3'N	119 31.0'W	458.5	9.5	90	48367
1	11	1978	2125	32 6.3'N	119 30.1'W	459.3	9.5	90	48370
1	11	1978	2130	32 6.3'N	119 29.1'W	460.1	9.5	90	48374
1	11	1978	2135	32 6.3'N	119 28.2'W	460.9	9.5	90	48377
1	11	1978	2140	32 6.3'N	119 27.3'W	461.6	9.5	90	48380
1	11	1978	2145	32 6.3'N	119 26.4'W	462.4	9.5	90	48384
1	11	1978	2150	32 6.3'N	119 25.4'W	463.2	9.5	90	48387
1	11	1978	2155	32 6.3'N	119 24.5'W	464.0	9.5	90	48391
1	11	1978	2200	32 5.7'N	119 23.9'W	464.8	9.6	140	48386
1	11	1978	2205	32 5.1'N	119 23.3'W	465.6	9.6	140	48382
1	11	1978	2210	32 4.5'N	119 22.7'W	466.4	9.6	140	48378
1	11	1978	2215	32 3.9'N	119 22.1'W	467.2	9.6	140	48374
1	11	1978	2220	32 3.3'N	119 21.4'W	468.0	9.6	140	48369
1	11	1978	2225	32 2.6'N	119 20.8'W	468.8	9.6	140	48365
1	11	1978	2230	32 2.0'N	119 20.2'W	469.6	9.6	140	48361
1	11	1978	2235	32 1.4'N	119 19.6'W	470.4	9.6	140	48357
1	11	1978	2240	32 .8'N	119 19.0'W	471.2	9.6	140	48353
1	11	1978	2245	32 .2'N	119 18.4'W	472.0	9.6	140	48348
1	11	1978	2250	31 59.6'N	119 17.8'W	472.8	9.6	140	48344
1	11	1978	2255	31 59.0'N	119 17.3'W	473.5	8.8	145	48340
1	11	1978	2300	31 58.4'N	119 16.8'W	474.3	8.8	145	48335
1	11	1978	2305	31 58.0'N	119 16.1'W	475.0	8.8	125	48333
1	11	1978	2310	31 57.6'N	119 15.4'W	475.7	8.8	125	48331
1	11	1978	2315	31 57.1'N	119 14.6'W	476.5	9.1	123	48329
1	11	1978	2320	31 56.6'N	119 14.0'W	477.3	9.7	143	48327
1	11	1978	2325	31 56.0'N	119 13.4'W	478.1	9.7	143	48322
1	11	1978	2330	31 55.4'N	119 12.8'W	478.9	9.7	143	48317
1	11	1978	2335	31 54.7'N	119 12.2'W	479.7	9.7	143	48312
1	11	1978	2340	31 54.1'N	119 11.7'W	480.5	9.7	143	48307
1	11	1978	2345	31 53.4'N	119 11.1'W	481.3	9.7	143	48303
1	11	1978	2350	31 52.8'N	119 10.5'W	482.1	9.7	143	48298
1	11	1978	2355	31 52.1'N	119 10.0'W	482.9	9.7	143	48293
2	11	1978	0	31 51.5'N	119 9.4'W	483.7	9.7	143	48288
2	11	1978	5	31 50.9'N	119 8.8'W	484.5	9.6	142	48284
2	11	1978	10	31 50.2'N	119 8.2'W	485.3	9.6	142	48279
2	11	1978	15	31 49.6'N	119 7.7'W	486.1	9.6	142	48274
2	11	1978	20	31 49.0'N	119 7.1'W	486.9	9.6	142	48270
2	11	1978	25	31 48.3'N	119 6.5'W	487.7	9.6	142	48265
2	11	1978	30	31 47.7'N	119 6.0'W	488.5	9.6	142	48260
2	11	1978	35	31 47.1'N	119 5.4'W	489.3	10.0	141	48256

Table 1. (Continued).

Day	Month	Year	Time	Latitude	Longitude	Distance (n. mi.)	Speed (kt.)	Course	Regional (mag.)
2	11	1978	40	31 46.4'N	119 4.8'W	490.1	10.0	141	48251
2	11	1978	45	31 45.8'N	119 4.1'W	491.0	10.0	141	48246
2	11	1978	50	31 45.1'N	119 3.5'W	491.8	10.0	141	48242
2	11	1978	55	31 44.5'N	119 2.9'W	492.6	10.0	141	48237
2	11	1978	100	31 43.8'N	119 2.3'W	493.4	10.0	141	48232
2	11	1978	105	31 43.2'N	119 1.7'W	494.3	10.0	141	48228
2	11	1978	110	31 42.5'N	119 1.1'W	495.1	10.0	141	48223
2	11	1978	115	31 41.9'N	119 .5'W	495.9	10.0	141	48218
2	11	1978	120	31 41.2'N	118 59.9'W	496.8	9.9	142	48214
2	11	1978	125	31 40.6'N	118 59.3'W	497.6	9.9	142	48209
2	11	1978	130	31 39.9'N	118 58.7'W	498.4	9.9	142	48204
2	11	1978	135	31 39.3'N	118 58.1'W	499.2	9.9	142	48200
2	11	1978	140	31 38.7'N	118 57.5'W	500.1	9.9	142	48195
2	11	1978	145	31 38.0'N	118 56.9'W	500.9	9.9	142	48190
2	11	1978	150	31 37.4'N	118 56.3'W	501.7	9.9	142	48185
2	11	1978	155	31 36.7'N	118 55.7'W	502.5	9.9	142	48181
2	11	1978	200	31 36.1'N	118 55.1'W	503.4	9.9	142	48176
2	11	1978	205	31 35.4'N	118 54.5'W	504.2	9.9	142	48171
2	11	1978	210	31 34.8'N	118 53.9'W	505.0	9.9	142	48166
2	11	1978	215	31 34.1'N	118 53.3'W	505.8	9.9	142	48162
2	11	1978	220	31 33.5'N	118 52.7'W	506.7	9.9	142	48157
2	11	1978	225	31 32.8'N	118 52.1'W	507.5	9.9	142	48152
2	11	1978	230	31 32.2'N	118 51.5'W	508.3	9.9	142	48148
2	11	1978	235	31 31.6'N	118 50.9'W	509.1	9.9	142	48143
2	11	1978	240	31 30.9'N	118 50.3'W	509.9	9.9	142	48138
2	11	1978	245	31 30.3'N	118 49.7'W	510.8	9.9	142	48133
2	11	1978	250	31 29.6'N	118 49.1'W	511.6	9.9	142	48129
2	11	1978	255	31 29.0'N	118 48.5'W	512.4	9.9	142	48124
2	11	1978	300	31 28.3'N	118 47.9'W	513.2	9.9	142	48119
2	11	1978	305	31 27.7'N	118 47.3'W	514.1	9.9	142	48114
2	11	1978	310	31 27.0'N	118 46.7'W	514.9	9.9	142	48110
2	11	1978	315	31 26.4'N	118 46.1'W	515.7	9.9	142	48105
2	11	1978	320	31 25.7'N	118 45.5'W	516.5	9.9	142	48100
2	11	1978	325	31 25.1'N	118 44.9'W	517.4	9.9	142	48095
2	11	1978	330	31 24.4'N	118 44.3'W	518.2	9.9	142	48091
2	11	1978	335	31 23.8'N	118 43.7'W	519.0	9.9	142	48086
2	11	1978	340	31 23.2'N	118 43.1'W	519.8	9.9	142	48081
2	11	1978	345	31 22.5'N	118 42.5'W	520.7	9.9	142	48076
2	11	1978	350	31 21.9'N	118 41.9'W	521.5	9.9	142	48072
2	11	1978	355	31 21.2'N	118 41.3'W	522.3	9.9	142	48067
2	11	1978	400	31 20.6'N	118 40.7'W	523.1	9.9	142	48062
2	11	1978	405	31 19.9'N	118 40.1'W	523.9	9.9	142	48057
2	11	1978	410	31 19.3'N	118 39.5'W	524.8	9.9	142	48053
2	11	1978	415	31 18.6'N	118 38.9'W	525.6	9.9	142	48048
2	11	1978	420	31 18.0'N	118 38.3'W	526.4	9.9	142	48043

Table 1. (Continued).

Day	Month	Year	Time	Latitude	Longitude	Distance (n. mi.)	Speed (kt.)	Course	Regional (mag.)
2	11	1978	425	31 17.3'N	118 37.7'W	527.2	9.9	142	48038
2	11	1978	430	31 16.7'N	118 37.1'W	528.1	9.9	142	48034
2	11	1978	435	31 15.9'N	118 37.1'W	528.9	10.1	181	48025
2	11	1978	440	31 15.0'N	118 37.1'W	529.7	10.1	181	48015
2	11	1978	445	31 14.2'N	118 37.1'W	530.6	10.1	181	48006
2	11	1978	450	31 13.3'N	118 37.2'W	531.4	10.1	181	47997
2	11	1978	455	31 12.5'N	118 37.2'W	532.3	10.1	181	47988
2	11	1978	500	31 11.6'N	118 37.2'W	533.1	10.1	181	47979
2	11	1978	505	31 10.8'N	118 37.2'W	534.0	10.1	181	47970
2	11	1978	510	31 9.9'N	118 37.2'W	534.8	10.1	181	47961
2	11	1978	515	31 9.1'N	118 37.2'W	535.7	10.1	181	47952
2	11	1978	520	31 8.3'N	118 37.2'W	536.5	10.1	181	47943
2	11	1978	525	31 7.4'N	118 37.3'W	537.3	10.1	181	47934
2	11	1978	530	31 6.6'N	118 37.3'W	538.2	10.1	181	47925
2	11	1978	535	31 5.7'N	118 37.3'W	539.0	10.1	181	47916
2	11	1978	540	31 4.9'N	118 37.3'W	539.9	10.1	181	47907
2	11	1978	545	31 4.0'N	118 37.3'W	540.7	10.1	181	47898
2	11	1978	550	31 3.2'N	118 37.3'W	541.6	10.1	181	47889
2	11	1978	555	31 2.4'N	118 37.4'W	542.4	10.1	181	47880
2	11	1978	600	31 1.5'N	118 37.4'W	543.2	10.1	181	47870
2	11	1978	605	31 .7'N	118 37.4'W	544.1	10.1	181	47861
2	11	1978	610	30 59.8'N	118 37.4'W	544.9	10.1	181	47852
2	11	1978	615	30 59.0'N	118 37.4'W	545.8	10.1	181	47843
2	11	1978	620	30 58.1'N	118 37.4'W	546.6	10.1	181	47834
2	11	1978	625	30 57.3'N	118 37.4'W	547.5	10.1	181	47825
2	11	1978	630	30 56.5'N	118 37.5'W	548.3	10.1	181	47816
2	11	1978	635	30 55.6'N	118 37.5'W	549.2	10.1	181	47807
2	11	1978	640	30 54.8'N	118 37.5'W	550.0	10.1	181	47798
2	11	1978	645	30 53.9'N	118 37.5'W	550.8	10.1	181	47789
2	11	1978	650	30 53.1'N	118 37.5'W	551.7	10.1	181	47780
2	11	1978	655	30 52.2'N	118 37.5'W	552.5	10.1	181	47770
2	11	1978	700	30 51.4'N	118 37.6'W	553.4	10.1	181	47761
2	11	1978	705	30 50.5'N	118 37.6'W	554.2	10.1	181	47752
2	11	1978	710	30 49.7'N	118 37.6'W	555.1	10.1	181	47743
2	11	1978	715	30 48.9'N	118 37.6'W	555.9	10.1	181	47734
2	11	1978	720	30 48.0'N	118 37.6'W	556.7	10.1	181	47725
2	11	1978	725	30 47.2'N	118 37.6'W	557.6	10.1	181	47716
2	11	1978	730	30 46.3'N	118 37.6'W	558.4	10.1	181	47707
2	11	1978	735	30 45.5'N	118 37.7'W	559.3	10.1	181	47698
2	11	1978	740	30 44.6'N	118 37.7'W	560.1	10.1	181	47689
2	11	1978	745	30 43.8'N	118 37.7'W	561.0	10.1	181	47679
2	11	1978	750	30 43.1'N	118 37.3'W	561.8	10.0	154	47673
2	11	1978	755	30 42.3'N	118 36.8'W	562.6	10.0	154	47666
2	11	1978	800	30 41.6'N	118 36.4'W	563.5	10.0	154	47660
2	11	1978	805	30 40.8'N	118 36.0'W	564.3	10.0	154	47654

Table 1. (Continued).

Day	Month	Year	Time	Latitude	Longitude	Distance (n. mi.)	Speed (kt.)	Course	Regional (mag.)
2	11	1978	810	30 40.1'N	118 35.5'W	565.1	10.0	154	47647
2	11	1978	815	30 39.3'N	118 35.1'W	566.0	10.0	154	47641
2	11	1978	820	30 38.6'N	118 34.7'W	566.8	10.0	154	47634
2	11	1978	825	30 37.8'N	118 34.3'W	567.6	10.0	154	47628
2	11	1978	830	30 37.1'N	118 33.8'W	568.5	10.0	154	47621
2	11	1978	835	30 36.3'N	118 33.4'W	569.3	10.0	154	47615
2	11	1978	840	30 35.6'N	118 33.0'W	570.1	10.0	154	47608
2	11	1978	845	30 34.8'N	118 32.5'W	571.0	10.3	151	47602
2	11	1978	850	30 34.1'N	118 32.0'W	571.8	10.3	151	47595
2	11	1978	855	30 33.3'N	118 31.5'W	572.7	10.3	151	47589
2	11	1978	900	30 32.6'N	118 31.1'W	573.5	10.3	151	47583
2	11	1978	905	30 31.8'N	118 30.6'W	574.4	10.3	151	47576
2	11	1978	910	30 31.1'N	118 30.1'W	575.3	10.3	151	47570
2	11	1978	915	30 30.4'N	118 29.6'W	576.1	10.4	147	47564
2	11	1978	920	30 29.6'N	118 29.0'W	577.0	10.4	147	47558
2	11	1978	925	30 28.9'N	118 28.5'W	577.9	10.4	147	47552
2	11	1978	930	30 28.2'N	118 27.9'W	578.7	10.4	147	47546
2	11	1978	935	30 27.5'N	118 27.4'W	579.6	10.4	147	47541
2	11	1978	940	30 26.7'N	118 26.8'W	580.5	10.4	147	47535
2	11	1978	945	30 26.0'N	118 26.3'W	581.3	10.4	147	47529
2	11	1978	950	30 25.3'N	118 25.7'W	582.2	10.4	147	47523
2	11	1978	955	30 24.6'N	118 25.2'W	583.1	10.4	147	47517
2	11	1978	1000	30 23.8'N	118 24.6'W	583.9	10.4	147	47511
2	11	1978	1005	30 23.1'N	118 24.1'W	584.8	10.4	147	47505
2	11	1978	1010	30 22.4'N	118 23.5'W	585.6	10.4	147	47500
2	11	1978	1015	30 21.7'N	118 23.0'W	586.5	10.3	147	47494
2	11	1978	1020	30 20.9'N	118 22.4'W	587.4	10.3	147	47488
2	11	1978	1025	30 20.2'N	118 21.9'W	588.2	10.3	147	47482
2	11	1978	1030	30 19.5'N	118 21.3'W	589.1	10.3	147	47476
2	11	1978	1035	30 18.8'N	118 20.8'W	589.9	10.3	147	47470
2	11	1978	1040	30 18.1'N	118 20.3'W	590.8	10.3	147	47465
2	11	1978	1045	30 17.4'N	118 19.7'W	591.7	10.3	147	47459
2	11	1978	1050	30 16.6'N	118 19.2'W	592.5	10.3	147	47453
2	11	1978	1055	30 15.9'N	118 18.6'W	593.4	10.3	147	47447
2	11	1978	1100	30 15.2'N	118 18.1'W	594.2	10.3	147	47441
2	11	1978	1105	30 14.5'N	118 17.6'W	595.1	10.3	147	47435
2	11	1978	1110	30 13.8'N	118 17.0'W	596.0	10.3	147	47430
2	11	1978	1115	30 13.0'N	118 16.5'W	596.8	10.3	147	47424
2	11	1978	1120	30 12.3'N	118 15.9'W	597.7	10.3	147	47418
2	11	1978	1125	30 11.6'N	118 15.4'W	598.5	10.3	147	47412
2	11	1978	1130	30 10.9'N	118 14.9'W	599.4	10.3	147	47406
2	11	1978	1135	30 10.2'N	118 14.3'W	600.2	10.3	147	47400
2	11	1978	1140	30 9.4'N	118 13.8'W	601.1	10.3	147	47394
2	11	1978	1145	30 8.7'N	118 13.2'W	602.0	10.3	147	47389
2	11	1978	1150	30 8.0'N	118 12.7'W	602.8	10.3	147	47383

Table 1. (Continued).

Day	Month	Year	Time	Latitude	Longitude	Distance (n. mi.)	Speed (kt.)	Course	Regional (mag.)
2	11	1978	1155	30 7.3'N	118 12.2'W	603.6	9.8	147	47377
2	11	1978	1200	30 6.6'N	118 11.7'W	604.4	9.8	147	47372
2	11	1978	1205	30 5.9'N	118 11.2'W	605.3	9.8	147	47366
2	11	1978	1210	30 5.3'N	118 10.6'W	606.1	9.8	147	47360
2	11	1978	1215	30 4.6'N	118 10.1'W	606.9	9.8	147	47355
2	11	1978	1220	30 3.9'N	118 9.6'W	607.7	9.8	147	47349
2	11	1978	1225	30 3.2'N	118 9.1'W	608.5	9.8	147	47344
2	11	1978	1230	30 2.5'N	118 8.6'W	609.3	9.8	147	47338
2	11	1978	1235	30 1.8'N	118 8.1'W	610.2	9.8	147	47332
2	11	1978	1240	30 1.1'N	118 7.6'W	611.0	9.8	147	47327
2	11	1978	1245	30 .5'N	118 7.1'W	611.8	9.8	147	47321
2	11	1978	1250	29 59.8'N	118 6.6'W	612.6	9.8	147	47316
2	11	1978	1255	29 59.1'N	118 6.0'W	613.4	9.8	147	47310
2	11	1978	1300	29 58.4'N	118 5.5'W	614.2	9.8	147	47304
2	11	1978	1305	29 57.7'N	118 5.0'W	615.1	9.8	147	47299
2	11	1978	1310	29 57.0'N	118 4.5'W	615.9	9.8	147	47293
2	11	1978	1315	29 56.3'N	118 4.0'W	616.7	9.8	147	47288
2	11	1978	1320	29 55.7'N	118 3.5'W	617.5	9.8	147	47282
2	11	1978	1325	29 55.0'N	118 3.0'W	618.3	9.8	147	47276
2	11	1978	1330	29 54.3'N	118 2.5'W	619.1	9.8	147	47271
2	11	1978	1335	29 53.6'N	118 2.0'W	620.0	9.8	147	47265
2	11	1978	1340	29 52.9'N	118 1.4'W	620.8	9.8	147	47260
2	11	1978	1345	29 52.2'N	118 .9'W	621.6	9.8	147	47254
2	11	1978	1350	29 51.5'N	118 .4'W	622.4	9.8	147	47248
2	11	1978	1355	29 50.9'N	117 59.9'W	623.2	9.8	147	47243
2	11	1978	1400	29 50.2'N	117 59.4'W	624.0	9.8	147	47237
2	11	1978	1405	29 49.5'N	117 58.9'W	624.8	9.8	147	47231
2	11	1978	1410	29 48.8'N	117 58.4'W	625.7	9.8	147	47226
2	11	1978	1415	29 48.1'N	117 57.9'W	626.5	9.8	147	47220
2	11	1978	1420	29 47.4'N	117 57.4'W	627.3	9.8	147	47214
2	11	1978	1425	29 46.8'N	117 56.8'W	628.1	9.8	147	47209
2	11	1978	1430	29 46.1'N	117 56.3'W	628.9	9.8	147	47203
2	11	1978	1435	29 45.4'N	117 55.8'W	629.7	9.8	147	47198
2	11	1978	1440	29 44.7'N	117 55.3'W	630.6	9.8	147	47192
2	11	1978	1445	29 44.0'N	117 54.8'W	631.4	9.8	147	47186
2	11	1978	1450	29 43.3'N	117 54.3'W	632.2	9.7	152	47180
2	11	1978	1455	29 42.6'N	117 53.9'W	633.0	9.7	152	47174
2	11	1978	1500	29 41.9'N	117 53.4'W	633.8	9.7	152	47168
2	11	1978	1505	29 41.2'N	117 53.0'W	634.6	9.7	152	47162
2	11	1978	1510	29 40.5'N	117 52.6'W	635.4	9.7	152	47156
2	11	1978	1515	29 39.8'N	117 52.1'W	636.2	9.7	152	47150
2	11	1978	1520	29 39.1'N	117 51.7'W	637.0	9.7	152	47144
2	11	1978	1525	29 38.4'N	117 51.3'W	637.8	9.7	152	47137
2	11	1978	1530	29 37.6'N	117 50.8'W	638.6	9.7	152	47131
2	11	1978	1535	29 36.9'N	117 50.4'W	639.4	9.7	152	47125

Table 1. (Continued).

Day	Month	Year	Time	Latitude	Longitude	Distance (n. mi.)	Speed (kt.)	Course	Regional (mag.)
2	11	1978	1540	29 36.2'N	117 49.9'W	640.2	9.7	152	47119
2	11	1978	1545	29 35.5'N	117 49.5'W	641.0	9.7	152	47113
2	11	1978	1550	29 34.8'N	117 49.1'W	641.8	9.7	152	47107
2	11	1978	1555	29 34.1'N	117 48.6'W	642.6	9.7	152	47100
2	11	1978	1600	29 33.4'N	117 48.2'W	643.4	9.7	152	47094
2	11	1978	1605	29 32.7'N	117 47.8'W	644.3	9.7	152	47088
2	11	1978	1610	29 32.0'N	117 47.3'W	645.1	9.7	152	47082
2	11	1978	1615	29 31.3'N	117 46.9'W	645.9	9.7	152	47076
2	11	1978	1620	29 30.6'N	117 46.4'W	646.7	9.7	152	47070
2	11	1978	1625	29 29.9'N	117 46.0'W	647.5	9.7	152	47064
2	11	1978	1630	29 29.1'N	117 45.6'W	648.3	9.7	152	47057
2	11	1978	1635	29 28.4'N	117 45.1'W	649.1	9.7	152	47051
2	11	1978	1640	29 27.7'N	117 44.7'W	649.9	9.7	152	47045
2	11	1978	1645	29 27.0'N	117 44.3'W	650.7	9.7	152	47039
2	11	1978	1650	29 26.3'N	117 43.8'W	651.5	9.7	152	47033
2	11	1978	1655	29 25.6'N	117 43.4'W	652.3	9.7	152	47027
2	11	1978	1700	29 24.9'N	117 42.9'W	653.1	9.7	152	47020
2	11	1978	1705	29 24.2'N	117 42.5'W	653.9	9.7	152	47014
2	11	1978	1710	29 23.5'N	117 42.1'W	654.7	9.7	152	47008
2	11	1978	1715	29 22.8'N	117 41.6'W	655.5	9.7	152	47002
2	11	1978	1720	29 22.1'N	117 41.2'W	656.3	9.7	152	46996
2	11	1978	1725	29 21.4'N	117 40.8'W	657.1	9.7	152	46990
2	11	1978	1730	29 20.6'N	117 40.3'W	657.9	9.7	152	46983
2	11	1978	1735	29 19.9'N	117 39.9'W	658.7	9.7	152	46977
2	11	1978	1740	29 19.2'N	117 39.4'W	659.5	9.7	152	46971
2	11	1978	1745	29 18.5'N	117 39.0'W	660.3	9.7	152	46965
2	11	1978	1750	29 17.8'N	117 38.6'W	661.1	9.7	152	46959
2	11	1978	1755	29 17.1'N	117 38.1'W	661.9	9.7	152	46953
2	11	1978	1800	29 16.4'N	117 37.7'W	662.7	9.7	152	46946
2	11	1978	1805	29 15.6'N	117 37.5'W	663.6	9.9	166	46938
2	11	1978	1810	29 14.8'N	117 37.2'W	664.4	9.9	166	46931
2	11	1978	1815	29 14.0'N	117 37.0'W	665.2	9.9	166	46923
2	11	1978	1820	29 13.2'N	117 36.8'W	666.0	9.9	166	46915
2	11	1978	1825	29 12.4'N	117 36.6'W	666.9	9.9	166	46907
2	11	1978	1830	29 11.6'N	117 36.3'W	667.7	9.9	166	46899
2	11	1978	1835	29 10.8'N	117 36.1'W	668.5	9.9	166	46891
2	11	1978	1840	29 10.0'N	117 35.9'W	669.3	9.9	166	46883
2	11	1978	1845	29 9.2'N	117 35.7'W	670.2	9.9	166	46875
2	11	1978	1850	29 8.4'N	117 35.4'W	671.0	9.9	166	46867
2	11	1978	1855	29 7.6'N	117 35.2'W	671.8	9.9	166	46860
2	11	1978	1900	29 6.8'N	117 35.0'W	672.6	9.9	166	46852
2	11	1978	1905	29 6.2'N	117 34.9'W	673.2	7.1	168	46846
2	11	1978	1910	29 5.6'N	117 34.7'W	673.8	7.1	168	46840
2	11	1978	1915	29 5.1'N	117 34.6'W	674.4	7.1	168	46834
2	11	1978	1920	29 4.5'N	117 34.4'W	675.0	7.1	168	46829

Table 1. (Continued).

Day	Month	Year	Time	Latitude	Longitude	Distance (n. mi.)	Speed (kt.)	Course	Regional (mag.)
2	11	1978	1925	29 3.9'N	117 34.3'W	675.6	7.1	168	46823
2	11	1978	1930	29 3.3'N	117 34.2'W	676.2	7.1	168	46817
2	11	1978	1935	29 2.8'N	117 34.0'W	676.8	7.1	168	46811
2	11	1978	1940	29 2.2'N	117 33.9'W	677.3	7.1	168	46805
2	11	1978	1945	29 1.6'N	117 33.7'W	677.9	7.1	168	46800
2	11	1978	1950	29 1.0'N	117 33.6'W	678.5	7.1	168	46794
2	11	1978	1955	29 .4'N	117 33.5'W	679.1	7.1	168	46788
2	11	1978	2000	28 59.9'N	117 33.3'W	679.7	7.1	168	46782
2	11	1978	2005	28 59.3'N	117 33.2'W	680.3	7.1	168	46777
2	11	1978	2010	28 58.7'N	117 33.1'W	680.9	7.1	168	46771
2	11	1978	2015	28 58.1'N	117 32.9'W	681.5	7.1	168	46765
2	11	1978	2020	28 57.6'N	117 32.8'W	682.1	7.1	168	46759
2	11	1978	2025	28 57.0'N	117 32.6'W	682.7	7.1	168	46753
2	11	1978	2030	28 56.4'N	117 32.5'W	683.2	7.1	168	46748
2	11	1978	2035	28 55.8'N	117 32.4'W	683.8	7.1	168	46742
2	11	1978	2040	28 55.3'N	117 32.2'W	684.4	7.1	168	46736
2	11	1978	2045	28 54.7'N	117 32.1'W	685.0	7.1	168	46730
2	11	1978	2050	28 54.1'N	117 31.9'W	685.6	7.1	168	46724
2	11	1978	2055	28 53.5'N	117 31.8'W	686.2	7.1	168	46719
2	11	1978	2100	28 52.9'N	117 31.7'W	686.8	7.1	168	46713
2	11	1978	2105	28 52.4'N	117 31.5'W	687.4	7.1	168	46707
2	11	1978	2110	28 51.8'N	117 31.4'W	688.0	7.1	168	46701
2	11	1978	2115	28 51.1'N	117 31.2'W	688.6	8.2	165	46695
2	11	1978	2120	28 50.5'N	117 31.0'W	689.3	8.2	165	46688
2	11	1978	2125	28 49.8'N	117 30.8'W	690.0	8.2	165	46682
2	11	1978	2130	28 49.2'N	117 30.6'W	690.7	8.2	165	46675
2	11	1978	2135	28 48.5'N	117 30.4'W	691.4	8.2	165	46669
2	11	1978	2140	28 48.8'N	117 30.8'W	691.8	5.7	310	46671
2	11	1978	2145	28 49.1'N	117 31.2'W	692.3	5.7	310	46673
2	11	1978	2150	28 49.4'N	117 31.6'W	692.8	5.7	310	46675
2	11	1978	2155	28 49.7'N	117 32.0'W	693.3	5.7	310	46676
2	11	1978	2200	28 50.0'N	117 32.4'W	693.7	5.1	314	46678
2	11	1978	2205	28 50.3'N	117 32.8'W	694.2	5.1	314	46681
2	11	1978	2210	28 50.6'N	117 33.1'W	694.6	5.1	314	46683
2	11	1978	2215	28 50.9'N	117 33.5'W	695.0	5.1	314	46685
2	11	1978	2220	28 51.2'N	117 33.8'W	695.4	5.4	312	46687
2	11	1978	2225	28 51.5'N	117 34.2'W	695.9	5.4	312	46689
2	11	1978	2230	28 51.8'N	117 34.6'W	696.3	5.4	312	46691
2	11	1978	2235	28 52.1'N	117 35.0'W	696.8	5.4	312	46693
2	11	1978	2240	28 52.4'N	117 35.4'W	697.2	5.4	312	46695
2	11	1978	2245	28 52.7'N	117 35.7'W	697.7	5.4	312	46697
2	11	1978	2250	28 53.0'N	117 36.1'W	698.1	5.4	312	46699
2	11	1978	2255	28 53.3'N	117 36.5'W	698.6	5.4	312	46701
2	11	1978	2300	28 53.6'N	117 36.9'W	699.0	5.4	312	46702
2	11	1978	2305	28 53.9'N	117 37.3'W	699.5	5.4	312	46704

Table 1. (Continued).

Day	Month	Year	Time	Latitude	Longitude	Distance (n. mi.)	Speed (kt.)	Course	Regional (mag.)
2	11	1978	2310	28 54.2'N	117 37.6'W	699.9	5.4	312	46706
2	11	1978	2315	28 54.5'N	117 38.0'W	700.4	5.4	312	46708
2	11	1978	2320	28 54.8'N	117 38.4'W	700.8	5.4	312	46710
2	11	1978	2325	28 55.1'N	117 38.8'W	701.3	5.4	312	46712
2	11	1978	2330	28 55.4'N	117 39.2'W	701.7	5.4	312	46714
2	11	1978	2335	28 55.7'N	117 39.6'W	702.2	5.4	312	46716
2	11	1978	2340	28 56.0'N	117 39.9'W	702.6	5.4	312	46718
2	11	1978	2345	28 56.3'N	117 40.3'W	703.1	5.4	312	46720
2	11	1978	2350	28 56.7'N	117 40.9'W	703.7	7.9	311	46723
2	11	1978	2355	28 57.2'N	117 41.4'W	704.4	7.9	311	46725
3	11	1978	0	28 57.6'N	117 42.0'W	705.0	7.9	311	46728
3	11	1978	5	28 57.7'N	117 41.9'W	705.5	5.3	101	46730
3	11	1978	10	28 57.7'N	117 41.4'W	706.0	5.3	101	46731
3	11	1978	15	28 57.6'N	117 40.9'W	706.4	5.3	101	46732
3	11	1978	20	28 57.5'N	117 40.4'W	706.9	5.3	101	46732
3	11	1978	25	28 57.4'N	117 39.9'W	707.3	5.3	101	46733
3	11	1978	30	28 57.3'N	117 39.4'W	707.8	5.3	101	46734
3	11	1978	35	28 57.2'N	117 38.9'W	708.2	5.3	101	46735
3	11	1978	40	28 57.2'N	117 38.4'W	708.6	5.3	101	46736
3	11	1978	45	28 57.1'N	117 37.9'W	709.1	5.3	101	46736
3	11	1978	50	28 57.0'N	117 37.4'W	709.5	5.3	101	46737
3	11	1978	55	28 56.9'N	117 36.9'W	710.0	5.3	101	46738
3	11	1978	100	28 56.8'N	117 36.4'W	710.4	5.3	101	46739
3	11	1978	105	28 56.7'N	117 35.9'W	710.9	5.3	101	46739
3	11	1978	110	28 56.6'N	117 35.4'W	711.3	5.3	101	46740
3	11	1978	115	28 56.6'N	117 34.9'W	711.7	5.3	101	46741
3	11	1978	120	28 56.5'N	117 34.4'W	712.2	5.3	101	46742
3	11	1978	125	28 56.4'N	117 34.0'W	712.6	5.3	101	46742
3	11	1978	130	28 56.3'N	117 33.5'W	713.1	5.3	101	46743
3	11	1978	135	28 56.2'N	117 33.0'W	713.5	5.3	101	46744
3	11	1978	140	28 56.1'N	117 32.5'W	714.0	5.3	101	46745
3	11	1978	145	28 56.1'N	117 32.0'W	714.4	5.3	101	46746
3	11	1978	150	28 56.0'N	117 31.5'W	714.8	5.3	101	46746
3	11	1978	155	28 55.9'N	117 31.0'W	715.3	5.3	101	46747
3	11	1978	200	28 55.8'N	117 30.5'W	715.7	5.3	101	46748
3	11	1978	205	28 55.7'N	117 30.0'W	716.2	5.3	101	46749
3	11	1978	210	28 55.6'N	117 29.5'W	716.6	5.3	101	46749
3	11	1978	215	28 55.5'N	117 29.0'W	717.1	5.3	101	46750
3	11	1978	220	28 55.5'N	117 29.0'W	717.6	8.2	280	46750
3	11	1978	225	28 55.7'N	117 29.8'W	718.3	8.2	280	46749
3	11	1978	230	28 55.8'N	117 30.5'W	719.0	8.2	280	46747
3	11	1978	235	28 55.9'N	117 31.3'W	719.7	8.2	280	46746
3	11	1978	240	28 56.0'N	117 32.1'W	720.3	8.2	280	46744
3	11	1978	245	28 55.6'N	117 31.8'W	720.8	5.2	150	46741
3	11	1978	250	28 55.2'N	117 31.6'W	721.2	5.2	150	46738
3	11	1978	255	28 54.9'N	117 31.3'W	721.6	5.2	150	46735
3	11	1978	300	28 54.5'N	117 31.1'W	722.1	5.2	150	46732
3	11	1978	305	28 54.5'N	117 31.1'W	722.1	.0	116	46732
3	11	1978	310	28 54.5'N	117 31.1'W	722.1	.0	116	46732
3	11	1978	315	28 54.5'N	117 31.1'W	722.1	.0	116	46732