

6. UNDERWAY GEOPHYSICS¹

Gregory Simmons² and Shipboard Scientific Party³

INTRODUCTION

Geophysical data presented in this chapter were collected during Leg 117 of the Ocean Drilling Program (ODP). *JOIDES Resolution* was underway for 19 days of the 54.5 days at sea, traveling approximately 4310 nmi between Colombo, Sri Lanka, and Port Louis, Mauritius.

Shipboard geophysical instrumentation included two precision echo-sounders, a magnetometer, single channel seismic-reflection profilers, and satellite navigation systems. The instruments were maintained and operated by ODP marine technicians, in cooperation with the scientific party and the officers and crew of SEDCO-FOREX, Inc.

Navigation and bathymetric data, as well as magnetic data, were routinely collected while under way, with coverage in both categories consisting of approximately 91% of the total distance traveled. Seismic reflection data, on the other hand, were generally collected only during surveys while on approach to sites, with coverage consisting of approximately 7% of the total distance traveled.

NAVIGATION

Navigation data were recorded in the Underway Geophysics Lab by a Magnavox-1107 GPS Transit Satellite Receiver. The previous source of raw data, collected on the bridge by a Magnavox-702A-3 Transit Satellite Receiver, was relegated to backup use. The Global Positioning System (GPS) data are preferred over transit satellite and dead-reckoning positions because of the continually updated, higher-quality data available during a GPS "window." This "window" was a period of 4-5 hr each day when positioning data from three or more GPS satellites could be received. Routine collection of navigation data includes recording course and speed data by HIGHRES, the shipboard seismic data acquisition and processing software package.

A plot of the general navigation from Leg 117 is shown in Figure 1. This plot was generated from GPS transit satellite positions, course- and speed-change data, and on- and off-site information compiled from the bridge log, the underway geophysical log, and the HIGHRES tape headers. The Geological Data Center at Scripps Institution of Oceanography produced the navigation compilation (see Appendix). The final site locations are an average of all positions collected while on site.

Site approach surveys were generally carried out during GPS windows; therefore, the information used to reconstruct the ship's track around each drill site is generally GPS data. The sampling density depends on the nature of the survey, generally one fix per 15-30 min in the initial part of the survey, and increasing to one fix per 1-5 min in more critical parts of the survey. The ship's tracks were assumed to proceed from point to

point unless suggested otherwise by course-change information listed in the HIGHRES tape headers. The density of points illustrated in the ship's track reconstructions does not necessarily conform with the amount of data collected, but is sufficient to ensure an accurate reconstruction of the ship's tracks. A number of problems with the Magnavox-1107 GPS Transit Satellite Receiver contributed to the collection of unreliable navigation data during several site approaches; in particular Line 1 on approach to Site 720, Line 3 on approach to Site 723, Line 4 on approach to Sites 724 and 725, Line 6 on approach to Site 727, and Line 8 on approach to Site 730. In these cases the ship's tracks were reconstructed, primarily using two sources of information, namely GPS and transit satellite positions listed on the bridge log, and course and speed information listed in the HIGHRES tape headers.

BATHYMETRIC DATA RECORDING

Bathymetric data were obtained with both 3.5-kHz (Raytheon recorder system) and 12-kHz (EDO-248C recorder system) echo-sounders. Unfortunately, because of poor transducer location, the quality of the recorded data was poor when the ship was traveling at speeds greater than 6 kt. Consequently, site surveys requiring detailed bathymetric data were conducted at speeds slower than 6 kt (see the site chapters, this volume). A total of 3927 nmi of bathymetric data were collected on Leg 117, and a generalized bathymetric profile, along with the magnetic profile, is presented in Figure 2.

MAGNETICS

A Geometrics-801 proton precession magnetometer was used to collect a total of 3910 nmi of magnetic data on Leg 117. A generalized magnetic record compiled by the Geological Data Center at Scripps Institution of Oceanography is presented in Figure 2. The magnetic values were retrieved at approximately 1-nmi spacing, and the regional field was removed using the 1985 International Geomagnetic Reference Field.

SEISMIC REFLECTION PROFILES

The seismic sources used aboard *JOIDES Resolution* during Leg 117 were two synchronized 80-in.³ Seismic System, Inc. water guns operated at approximately 1900 psi. One 100-m-long Teledyne streamer containing 60 active sections, combined to produce a single signal, was deployed from the fantail and towed about 500 m behind the vessel.

Seismic data were displayed in real time in analog format on two EDO-550 dry-paper recorders, using only streamers, amplifier, and band-pass filters (Table 1). Seismic data were also recorded using a Masscomp-561 computer, which functions as the central unit to record, process, and display the data. Data were processed and displayed in real time on a 15-in.-wide Printronix high-resolution graphic printer (160 dots/in.). Raw data were recorded on magnetic tapes, using a SEG-Y format and a density of 1600 bits/in. Seismic lines recorded with the Masscomp were reprocessed at ODP headquarters according to the parameters listed in Table 2. The final data were displayed on a 22-in.-wide Versatec plotter (200 dots/in.).

¹ Prell, W. L., Niitsuma, N., et al., 1989. *Proc. ODP, Init. Repts.*, 117: College Station, TX (Ocean Drilling Program).

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³ Shipboard Scientific Party is as given in the list of Participants preceding the contents.

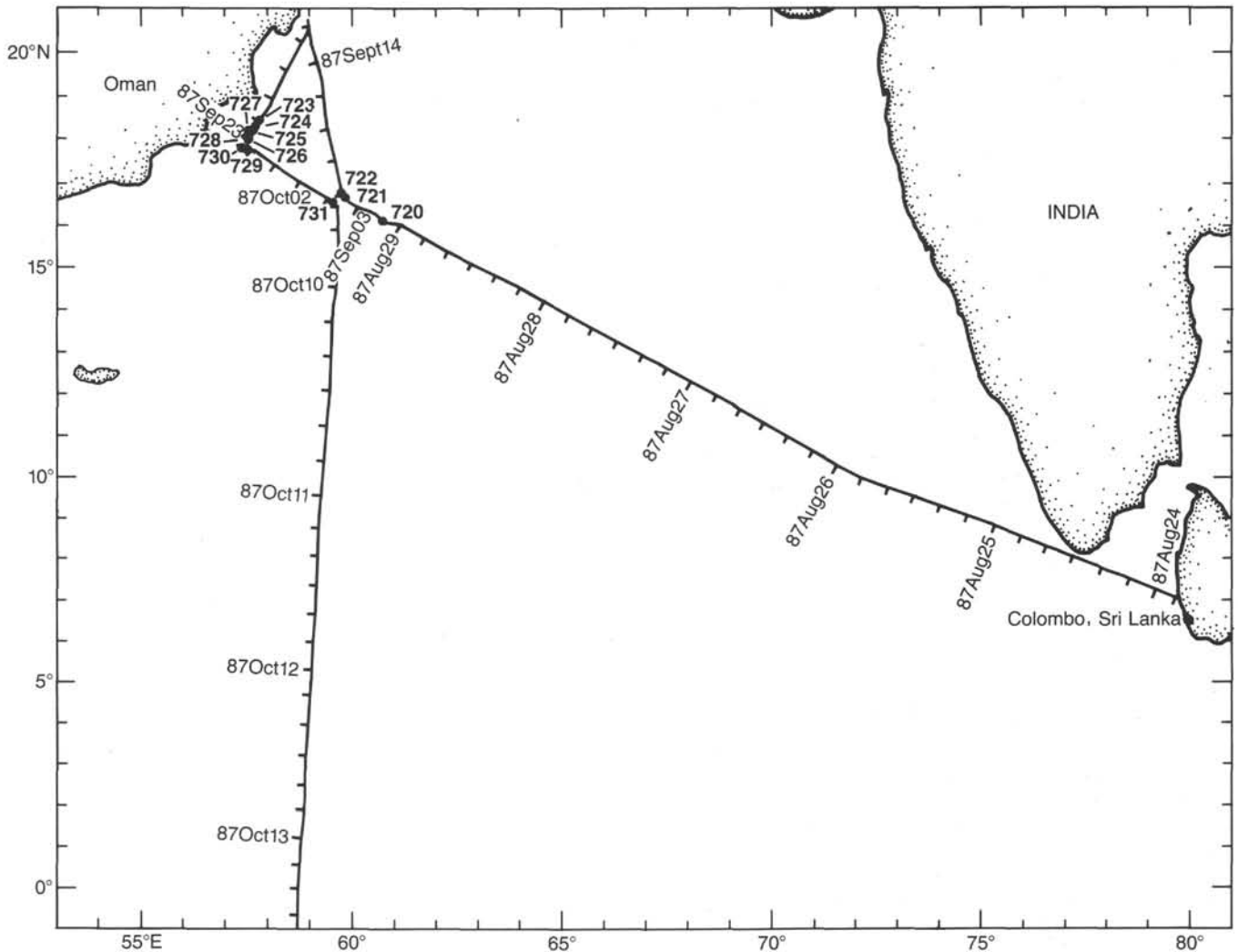


Figure 1. General navigation and site location plot for Leg 117, generated from satellite, course-, and speed-change data given in the Appendix. Detailed ship's tracks for seismic lines/site approaches are shown on Figures 3, 5, 8, 10, 12, 14, 16, 18, and 21.

We recorded nine seismic lines during Leg 117, covering approximately 290 nmi. These profiles are available from the ODP Data Base Supervisor.

1. Seismic line 1 was collected on the approach to Site 720 along the track shown in Figure 3. The processed digital seismic profile is shown in Figure 4 (from Julian Day 241/0241 UTC/shotpoint 4988 to Julian Day 241/0549 UTC/shotpoint 5928).

2. Seismic line 2 was collected en route to and on approach to Sites 721 and 722. While en route to the sites a problem was discovered in collection of digital data, and the line is therefore broken into three parts, line 2A consisting of the processed digital data collected before the problem occurred, line 2B consisting of the analog records collected during the absence of digital data, and line 2C consisting of the processed digital data collected after the problem was corrected. Lines 2A and 2B were collected en route to Sites 721 and 722 along the track shown in Figure 5. The processed digital and analog seismic profiles are shown in Figure 6 (from Julian Day 245/1736 UTC/shotpoint 100 to Julian Day 245/2016 UTC/shotpoint 900) and Figure 7 (from Julian Day 245/2016 UTC/shotpoint 900 to Julian Day

246/0212 UTC/shotpoint 2683), respectively. Line 2C was collected on approach to Sites 721 and 722 along the track shown in Figure 8. The processed digital seismic profile is shown in Figure 9 (from Julian Day 246/0212 UTC/shotpoint 2683 to Julian Day 246/0708 UTC/shotpoint 4160).

3. Seismic line 3 was collected on approach to Site 723 along the track shown in Figure 10. The processed digital seismic profile is shown in Figure 11 (from Julian Day 258/0356 UTC/shotpoint 1863 to Julian Day 258/0554 UTC/shotpoint 2636).

4. Seismic line 4 was collected en route to and on approach to Sites 724 and 725 along the track shown in Figure 12. The processed digital seismic profile is shown in Figure 13 (from Julian Day 262/2052 UTC/shotpoint 23 to Julian Day 263/0535 UTC/shotpoint 2635).

5. Seismic line 5 was collected en route to and on approach to Site 726 along the track shown in Figure 14. The processed digital seismic profile is shown in Figure 15 (from Julian Day 265/2040 UTC/shotpoint 1 to Julian Day 266/0438 UTC/shotpoint 2391).

6. Seismic line 6 was collected en route to and on approach to Site 727 along the track shown in Figure 16. The processed

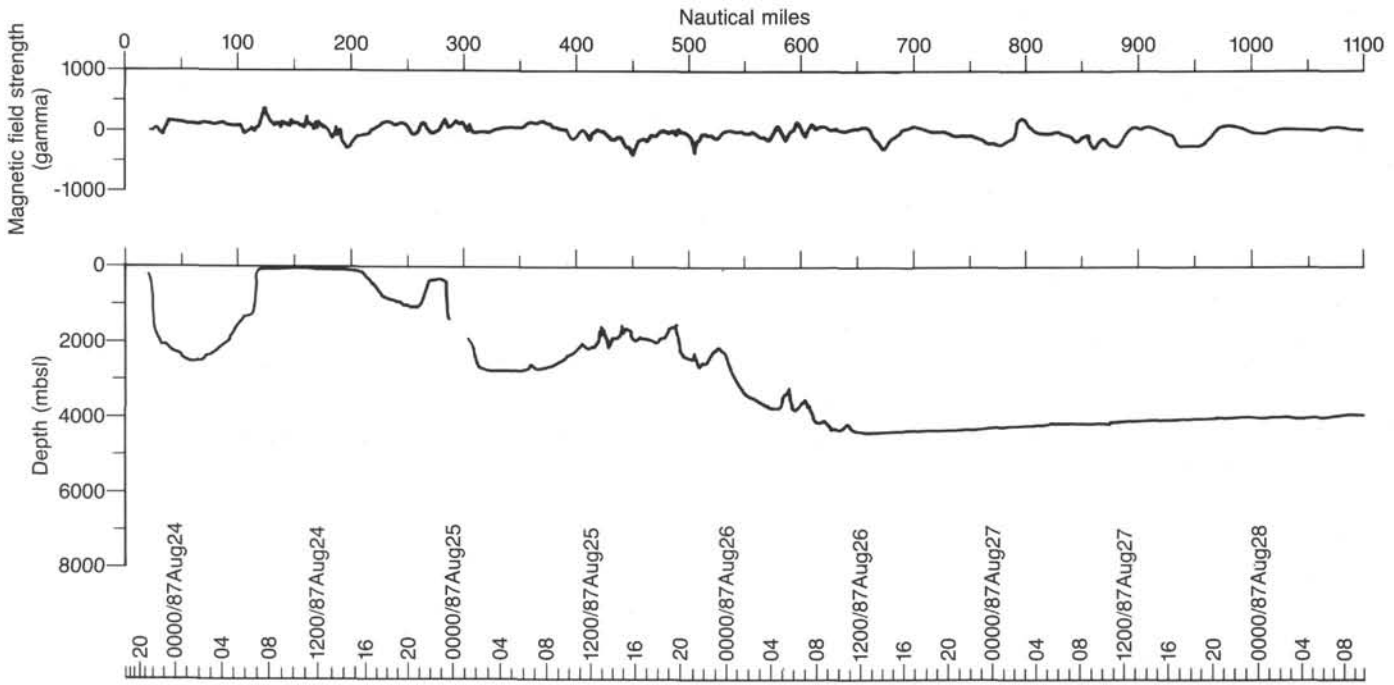


Figure 2. Records of magnetic and bathymetric profiles obtained during Leg 117. Solid bars indicate seismic-reflection coverage. Bottom horizontal scale indicates date and time in hours.

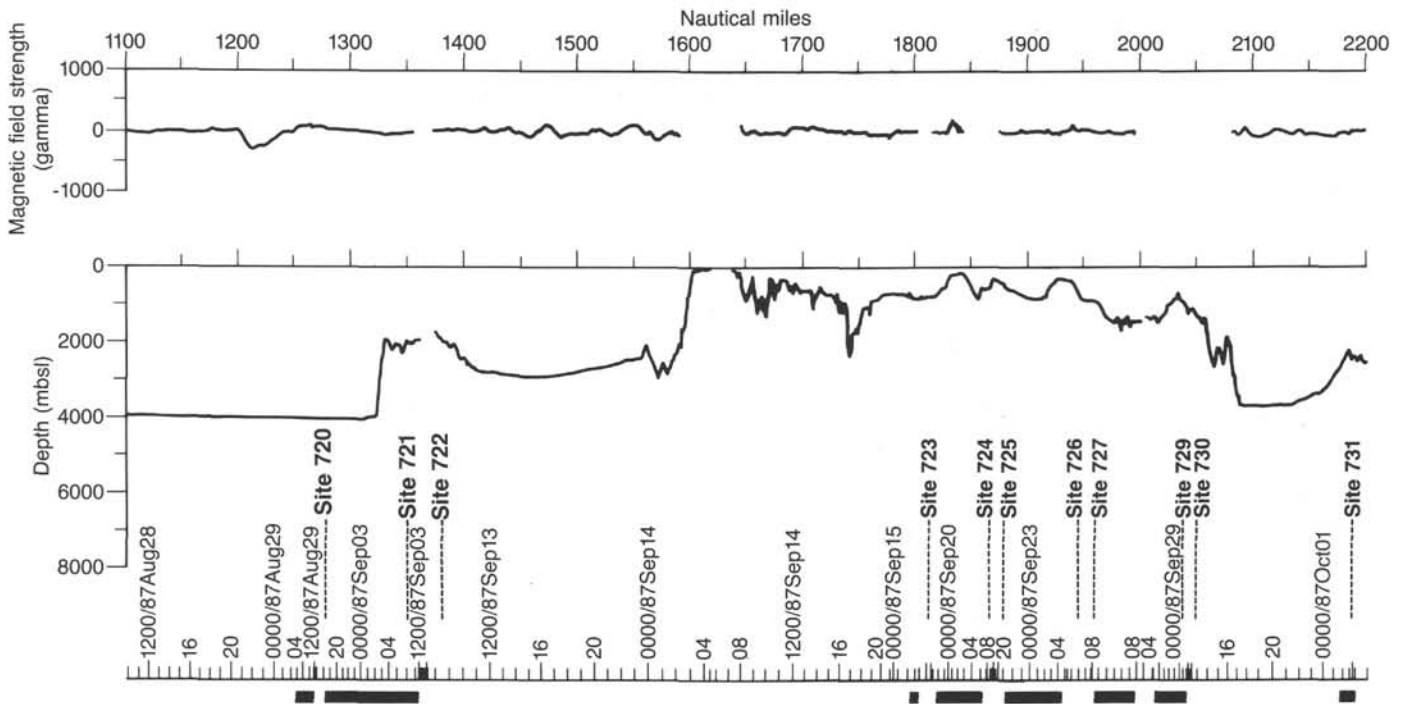


Figure 2 (continued).

digital seismic profile is shown in Figure 17 (from Julian Day 267/0448 UTC/shotpoint 1 to Julian Day 267/0730 UTC/shotpoint 812).

7. Seismic line 7 was collected en route to and on approach to Sites 728 and 729 along the track shown in Figure 18. Because of its close association, the track for line 8 is also shown

in Figure 18. The processed digital seismic profile for line 7 is shown in Figure 19 (from Julian Day 268/0225 UTC/shotpoint 1 to Julian Day 268/0740 UTC/shotpoint 1579).

8. Seismic line 8 was collected en route to and on approach to Site 730 along one of the tracks shown in Figure 18. The processed digital seismic profile is shown in Figure 20 (from Julian

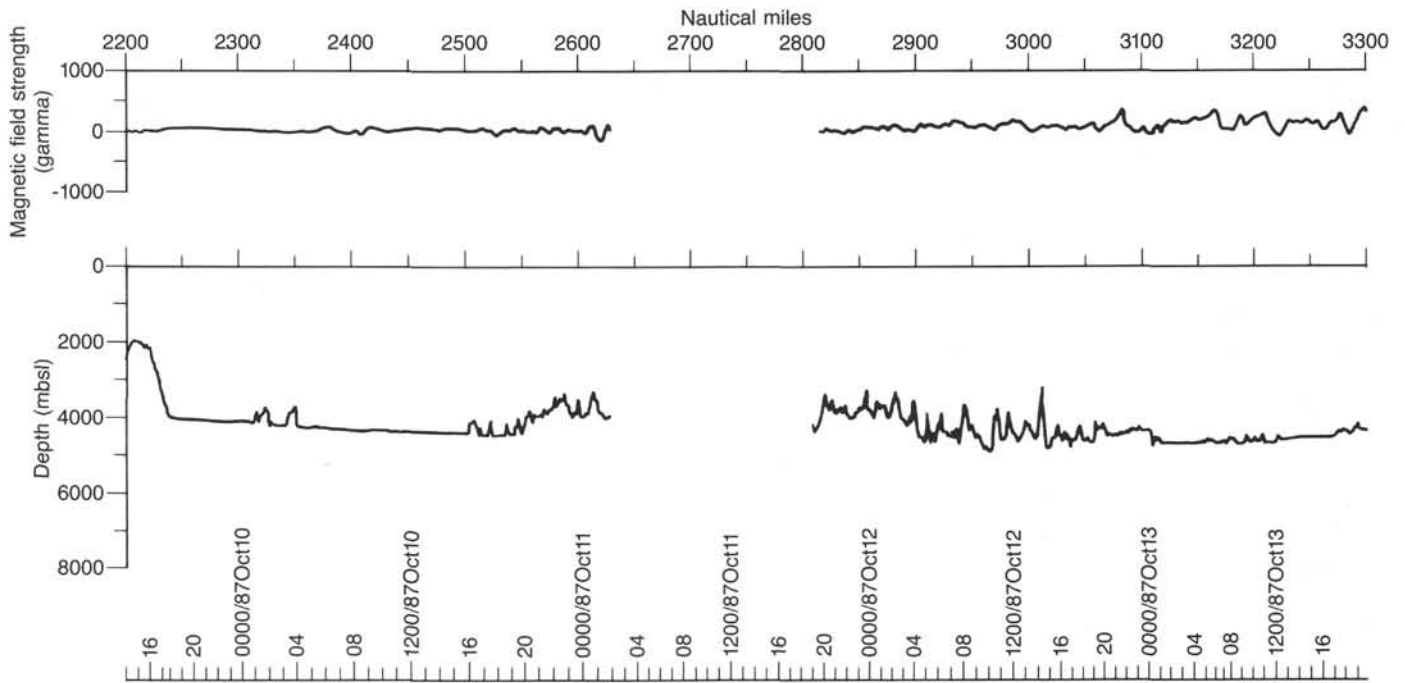


Figure 2 (continued).

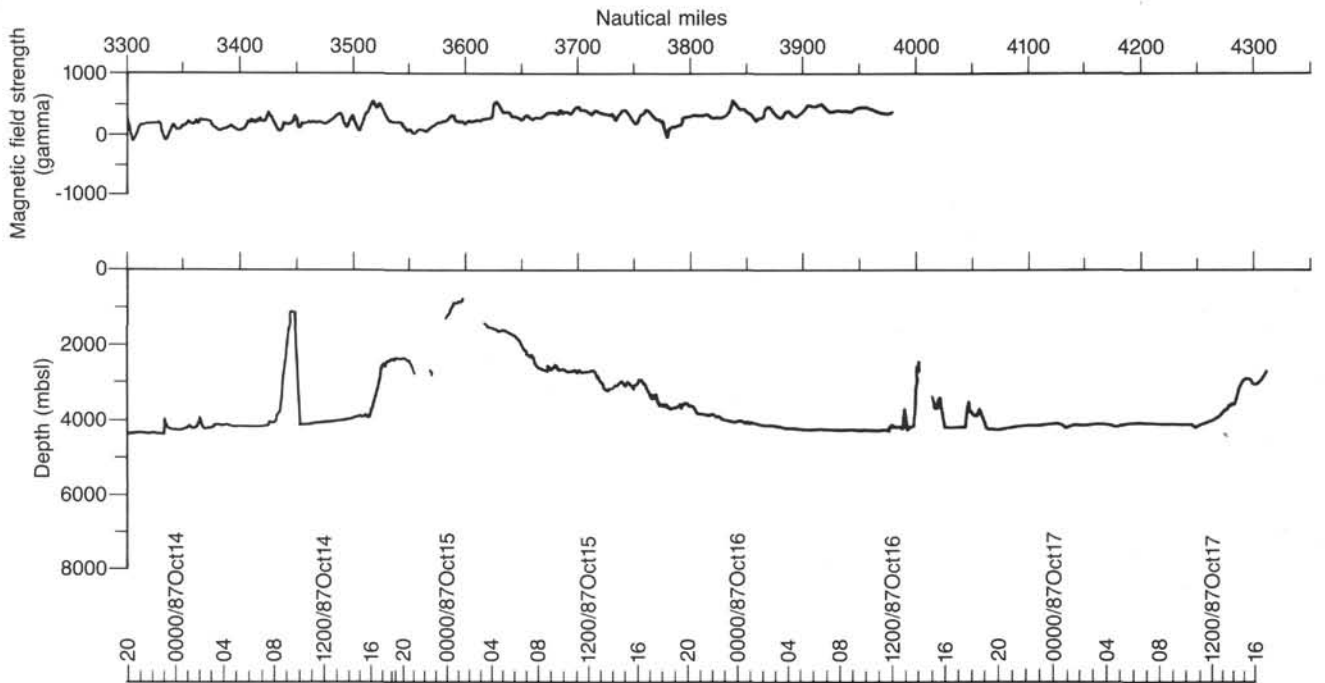


Figure 2 (continued).

Day 271/1855 UTC/shotpoint 1 to Julian Day 272/0208 UTC/shotpoint 2165).

9. Seismic line 9 was collected on approach to approach to Site 731 along the track shown in Figure 21. The processed digital seismic profile is shown in Figure 22 (from Julian Day 274/

0148 UTC/shotpoint 595 to Julian Day 274/0337 UTC/shotpoint 1135).

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Table 1. Seismic-data real-time recording parameters.

	Line 1	Line 2	Line 3	Line 4	Line 5	Line 6	Line 7	Line 8	Line 9
Start at	16°03.71' N 60°49.86' E	Site 720	18°05.25' N 57°37.74' E	Site 723	Site 724/725	Site 726	Site 727	Site 728/729	16°28.39' N 59°39.04' N
End at	Site 720	Site 721/722	Site 723	Site 724/725	Site 726	Site 727	Site 728/729	Site 730	Site 731
Source	Two 80-in. ³ water guns	Two 80-in. ³ water guns	Two 80-in. ³ water guns	Two 80-in. ³ water guns	Two 80-in. ³ water guns	Two 80-in. ³ water guns	Two 80-in. ³ water guns	Two 80-in. ³ water guns	Two 80-in. ³ water guns
Streamer	Port	Port	Port	Port	Port	Port	Port	Port	Port
EDO-1:									
High cut (Hz)	130	130	115	130	115	150	150	150	150
Low cut (Hz)	48	36	46	48	38	40	40	40	40
Gain:									
Amp (db)	90	90	90	90	90	90	90	90	90
EDO-2:									
High cut (Hz)	150	150	150	150	150	150	150	150	150
Low cut (Hz)	40	40	41	41	41	40	40	40	40
Gain:									
Amp (db)	90	90	90	90	90	90	90	90	90

Table 2. Seismic-data processing and reprocessing parameters.

	Line 1	Line 2A	Line 2C	Line 3	Line 4	Line 5	Line 6	Line 7	Line 8	Line 9
Data window (ms):										
From	5000	5200	2400	800	200	200	400	1000	800	2800
To	7000	7000	6400	4500	4200	4000	4200	4800	4700	6400
AGC:										
Response time (ms)	200	200	200	200	200	200	200	200	300	200
Start time (ms)	5000	5200	2400	800	200	200	400	1000	800	2800
Gain (%)	75	75	75	75	75	75	75	75	75	75
Zero-phase band-pass filter:										
High cut (Hz)	150	150	150	150	150	150	150	150	150	150
Taper width	12	12	12	12	12	12	12	12	12	12
Low cut (Hz)	30	30	30	30	30	30	30	30	30	30
Taper width	20	20	20	20	20	20	25	20	20	20
Seafloor mute applied	yes	yes	yes	yes	yes	yes	yes	yes	yes	

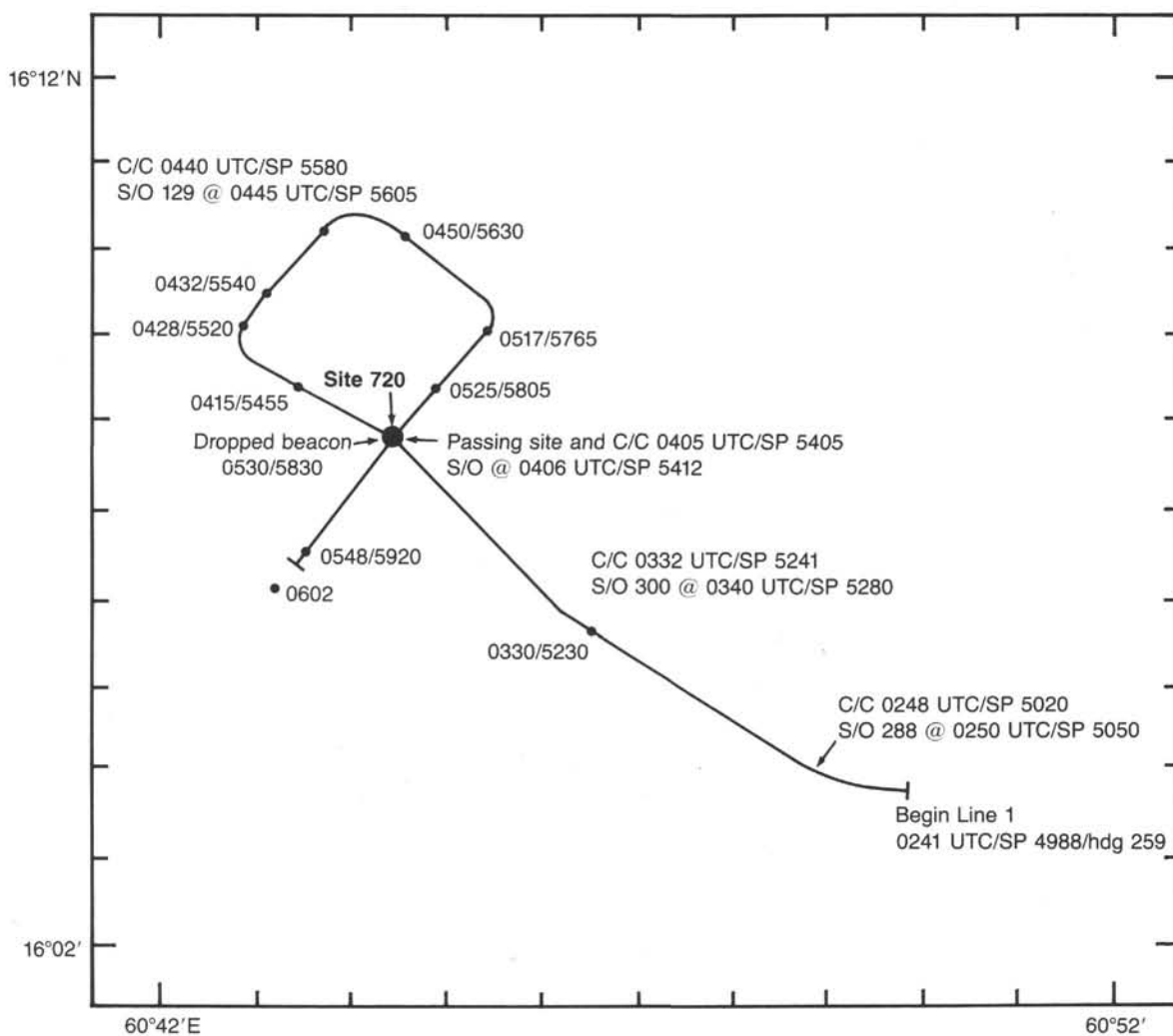


Figure 3. Detailed ship's track for seismic line 1, on approach to Site 720. Satellite fixes are shown as points and are identified by UTC/shotpoint (SP). Extrapolated positions are shown as tick marks. The processed digital seismic profile is shown in Figure 4.

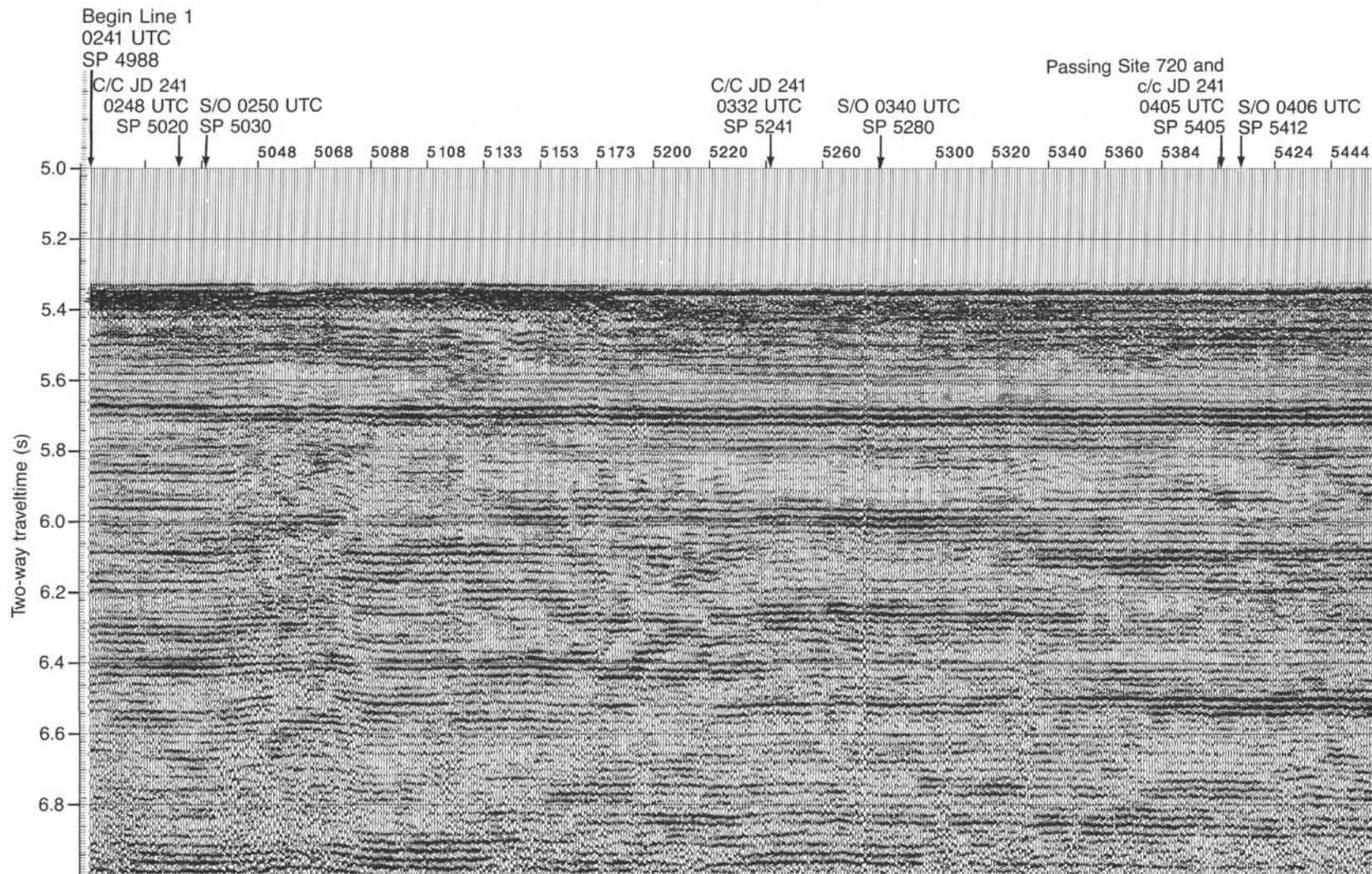


Figure 4. Processed digital seismic profile of line 1, collected on approach to Site 720. The profile was plotted on the Versatec plotter according to the processing parameters given in Table 2. The ship's track is shown in Figure 3.

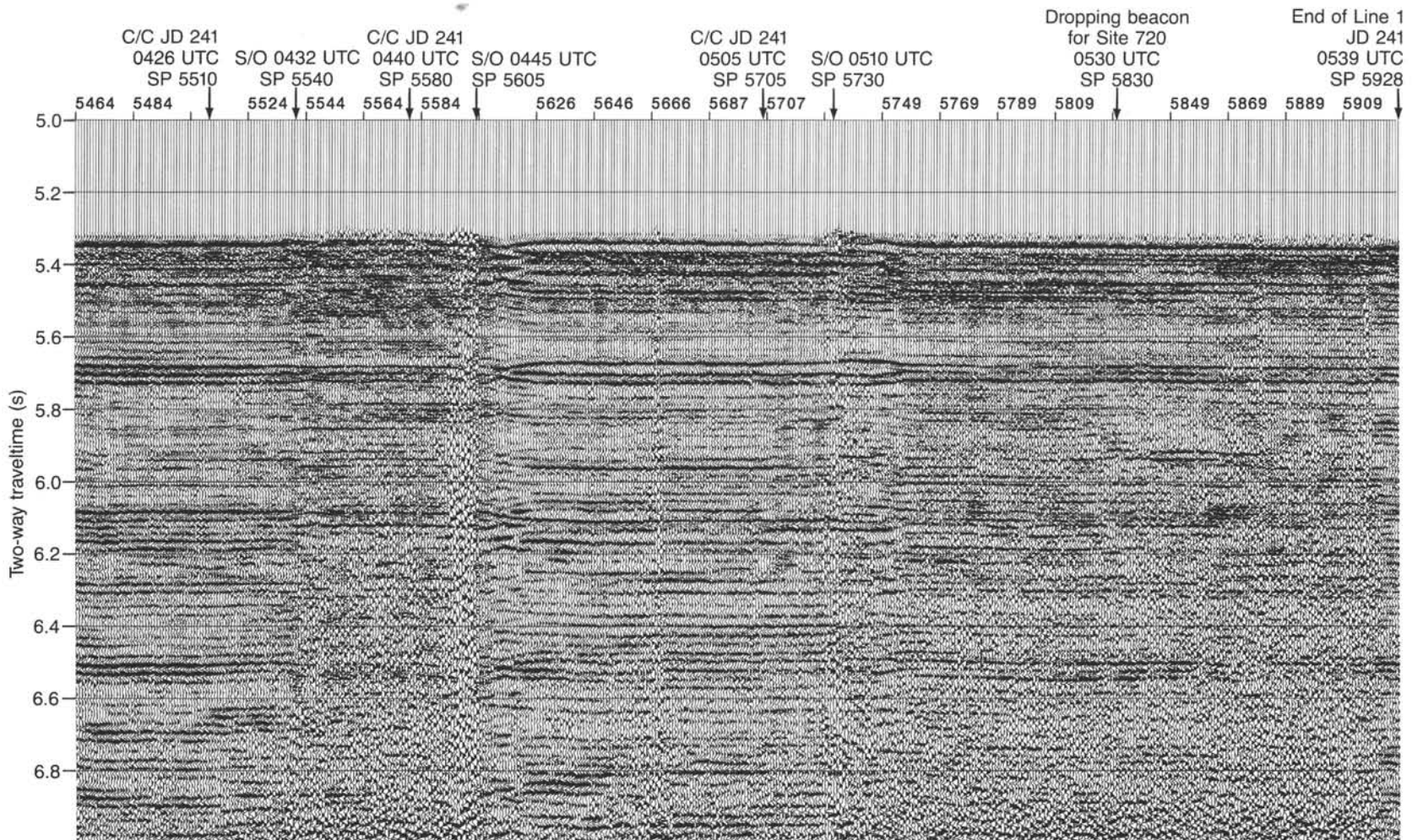


Figure 4 (continued).

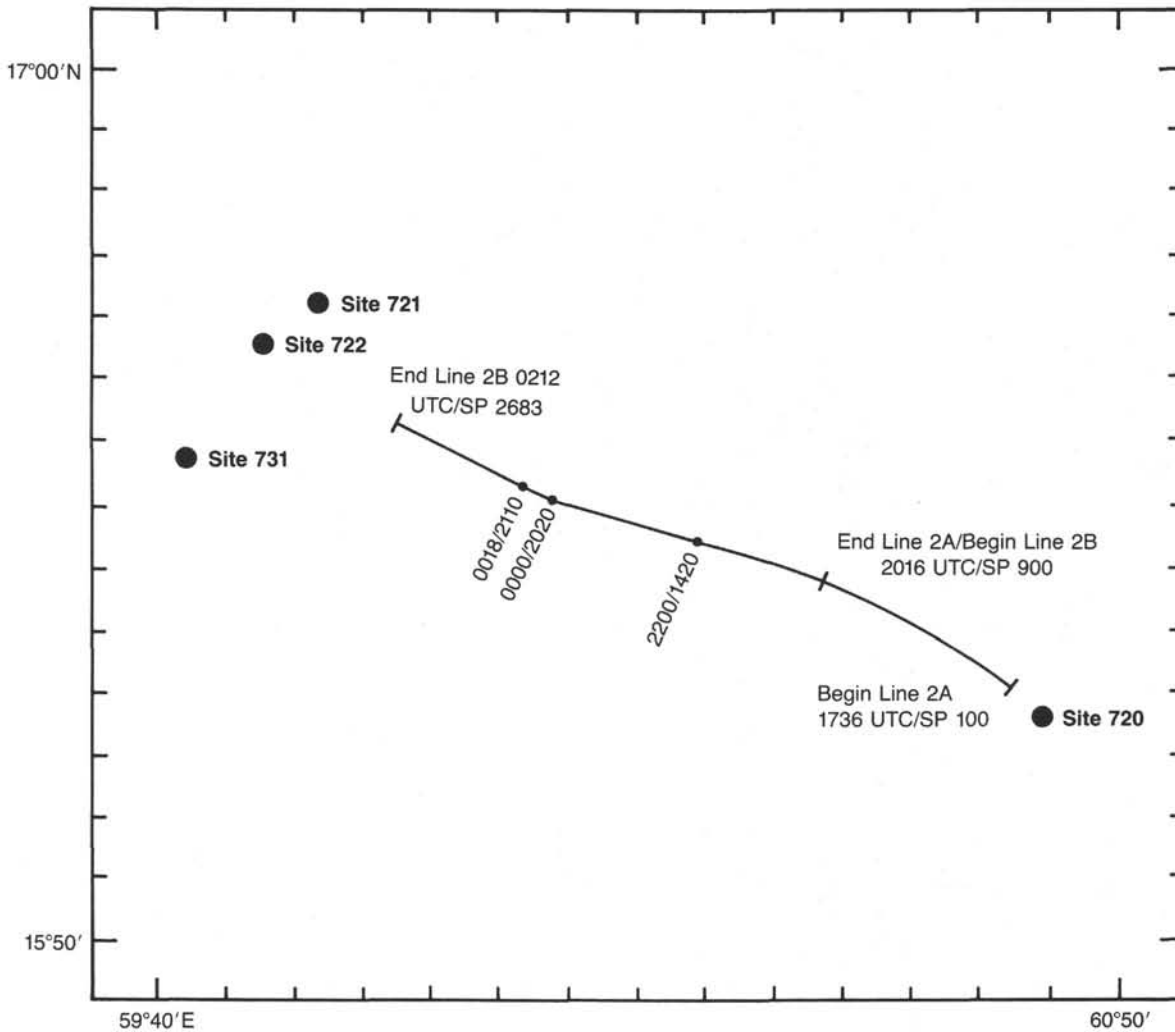


Figure 5. Detailed ship's track for seismic lines 2A and 2B, en route to Sites 721 and 722. Satellite fixes are shown as points and are identified by UTC/shotpoint (SP). Extrapolated positions are shown as tick marks. Line 2B corresponds to the period over which a problem was discovered in the collection of digital data. The processed digital seismic profile for line 2A and the analog seismic profile for line 2B are shown in Figures 6 and 7, respectively.

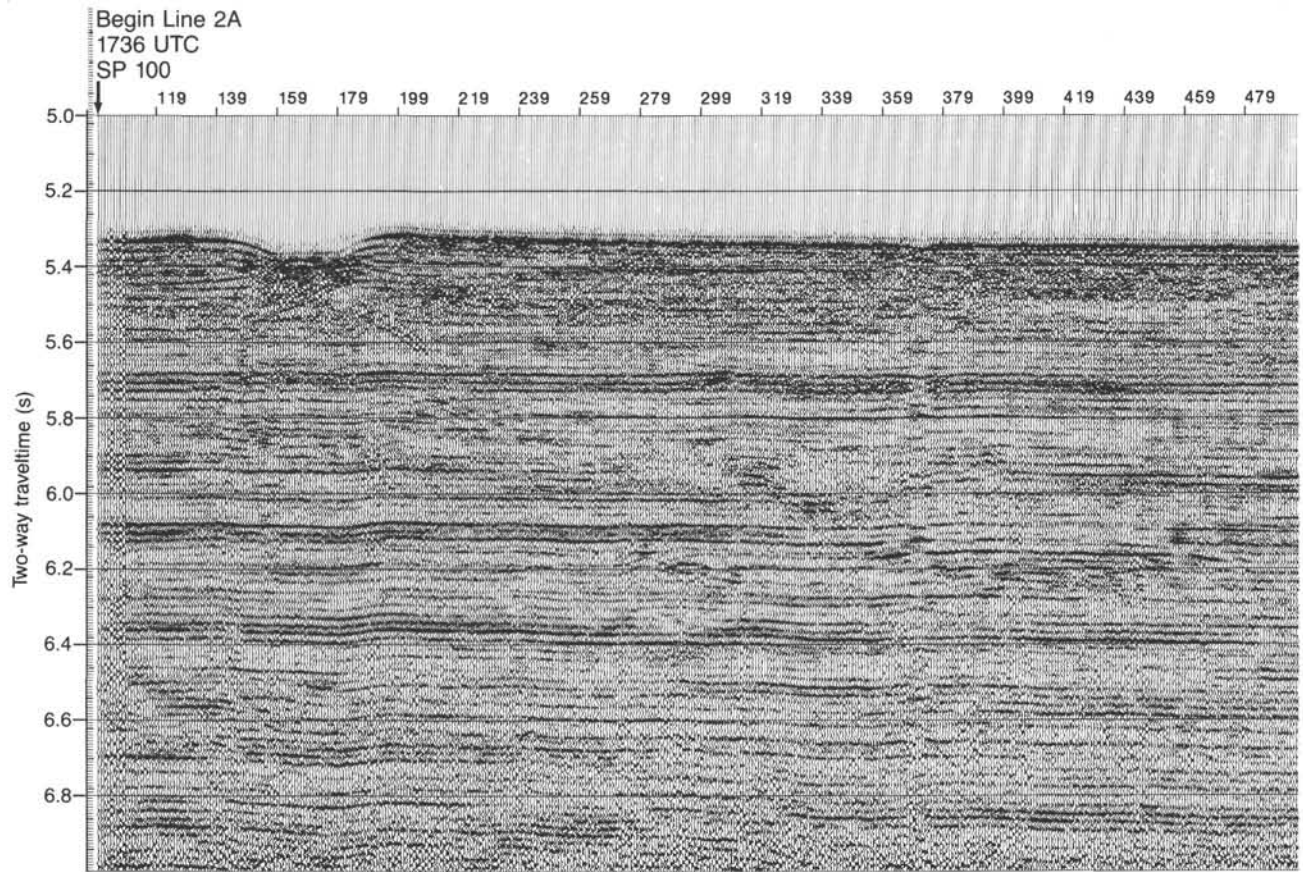


Figure 6. Processed digital seismic profile of line 2A, collected en route to Sites 721 and 722. The profile was plotted on the Versatec plotter according to the processing parameters given in Table 2. The ship's track is shown in Figure 5.

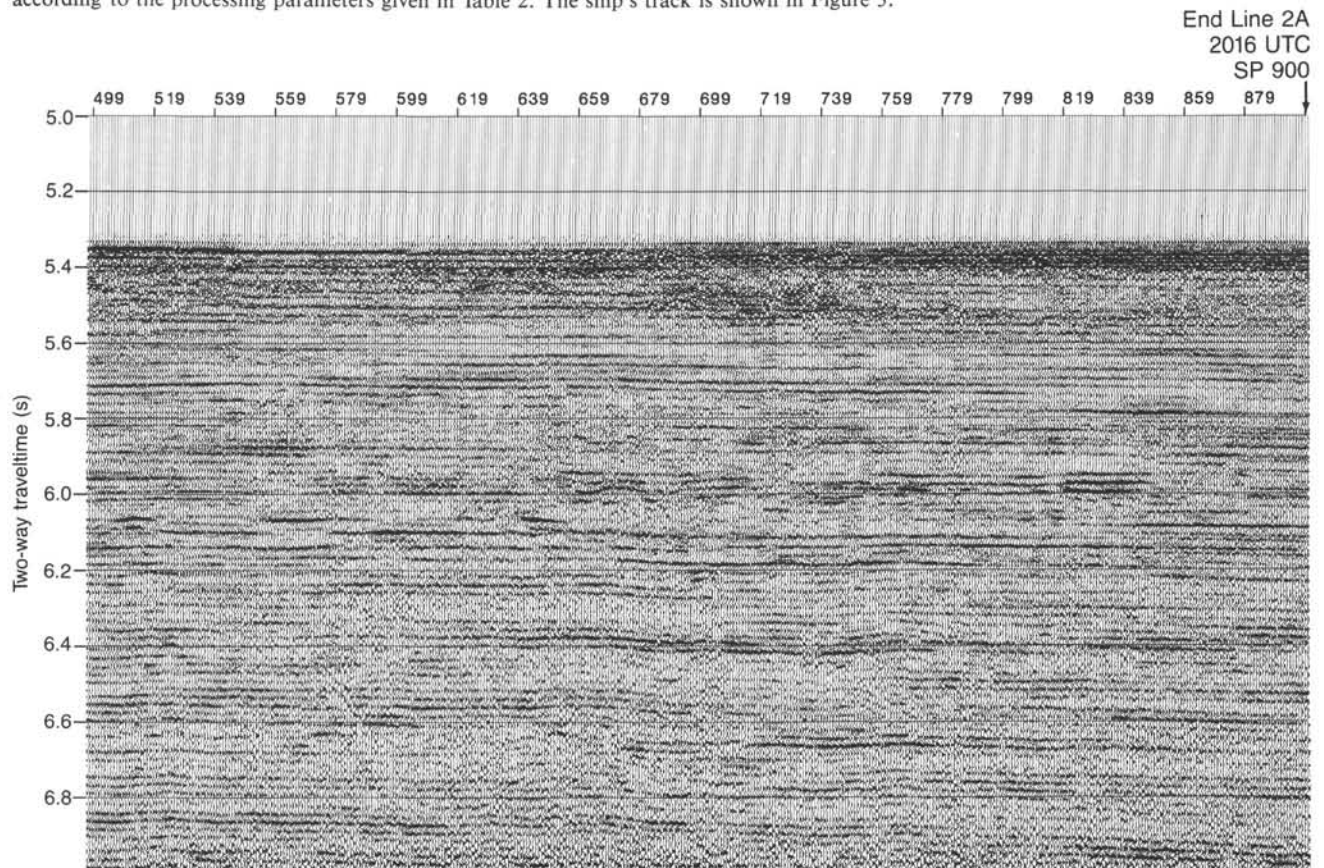


Figure 6 (continued).

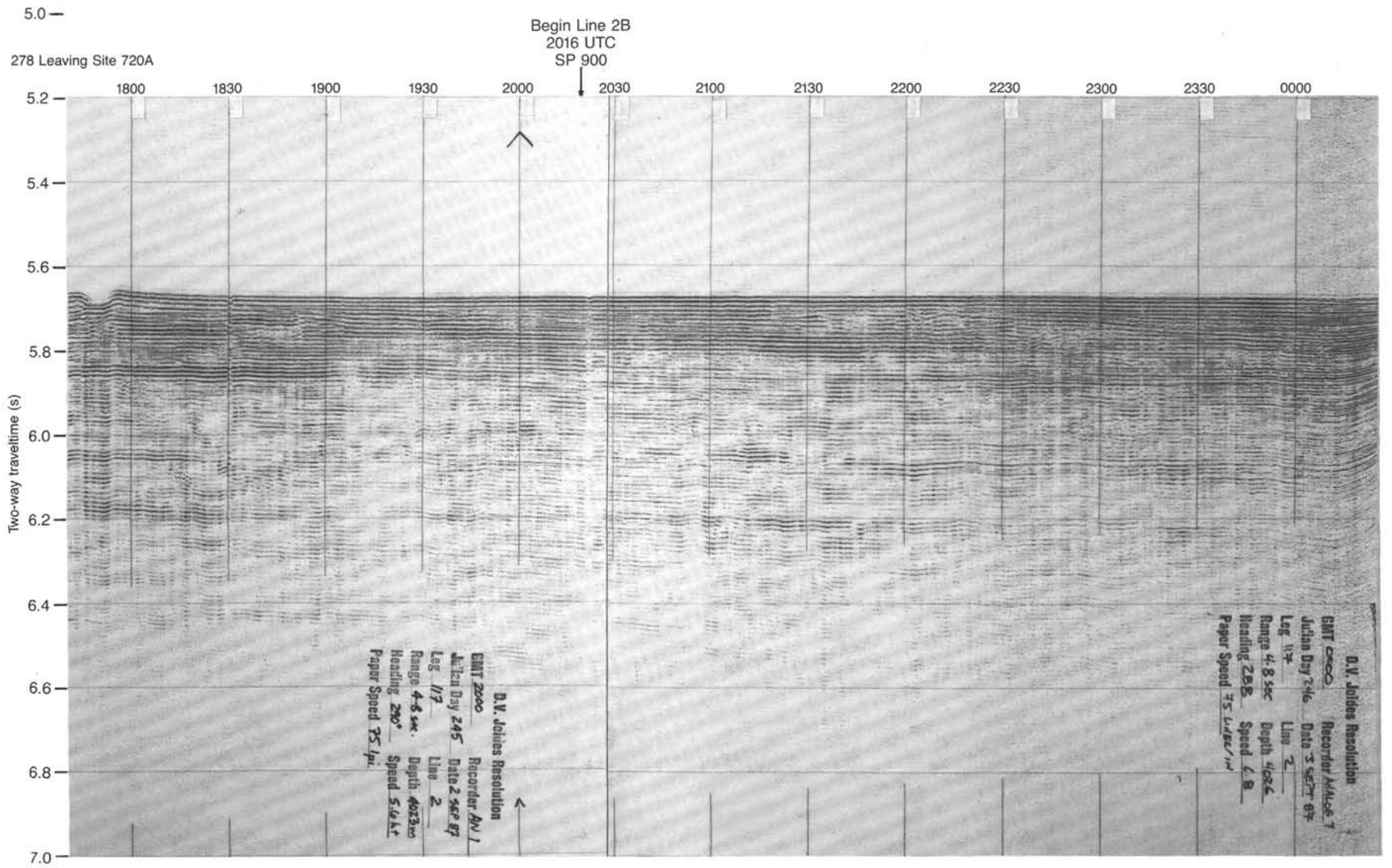


Figure 7. Analog seismic profile of line 2B, collected en route to Sites 721 and 722. The profile was recorded on an EDO-550 dry-paper recorder according to the parameters given in Table 2. The ship's track is shown in Figure 5.

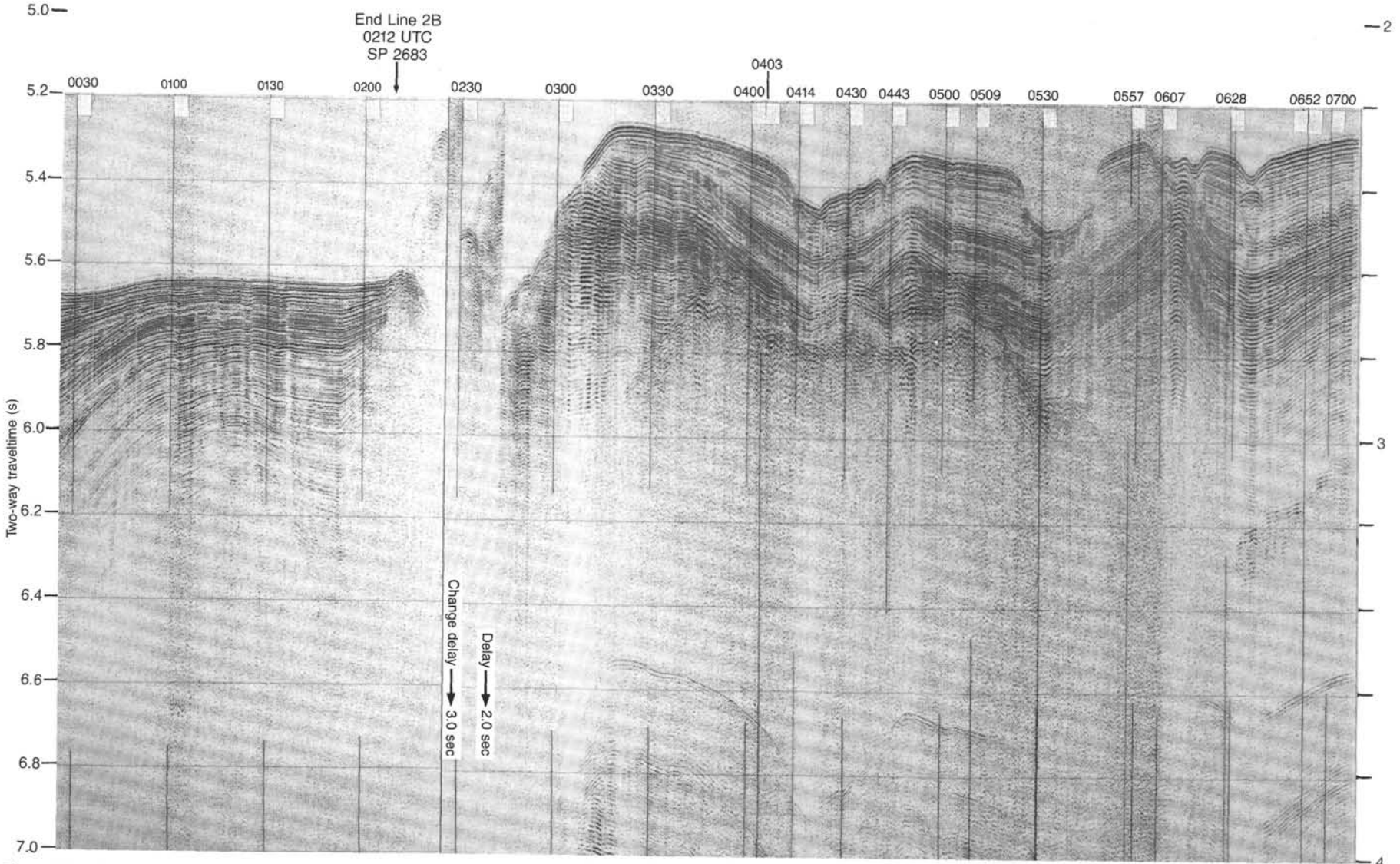


Figure 7 (continued).

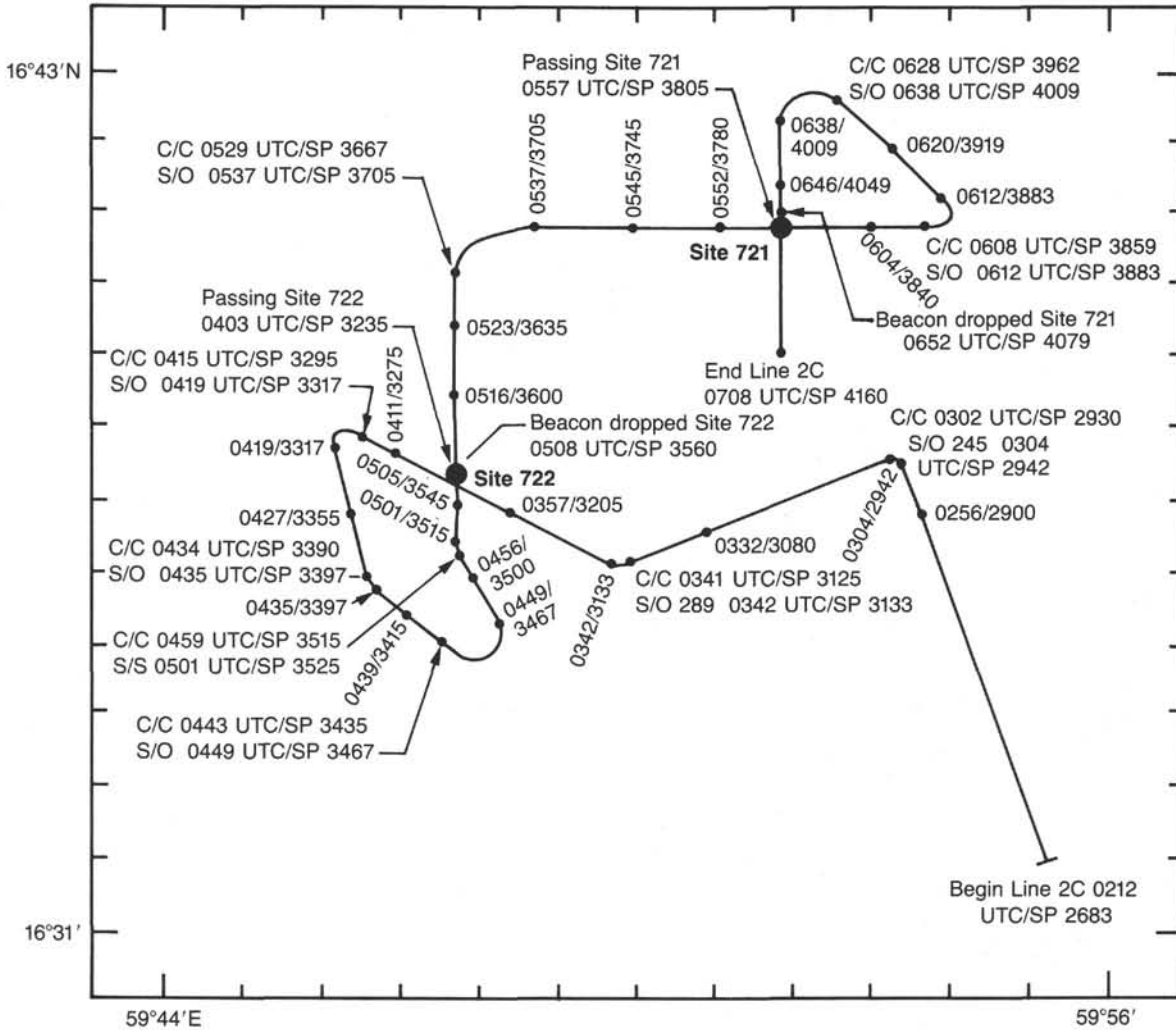


Figure 8. Detailed ship's track for seismic line 2C, on approach to Sites 721 and 722. Satellite fixes are shown as points and are identified by UTC/shotpoint (SP). Extrapolated positions are shown as tick marks. The processed digital seismic profile is shown in Figure 9.

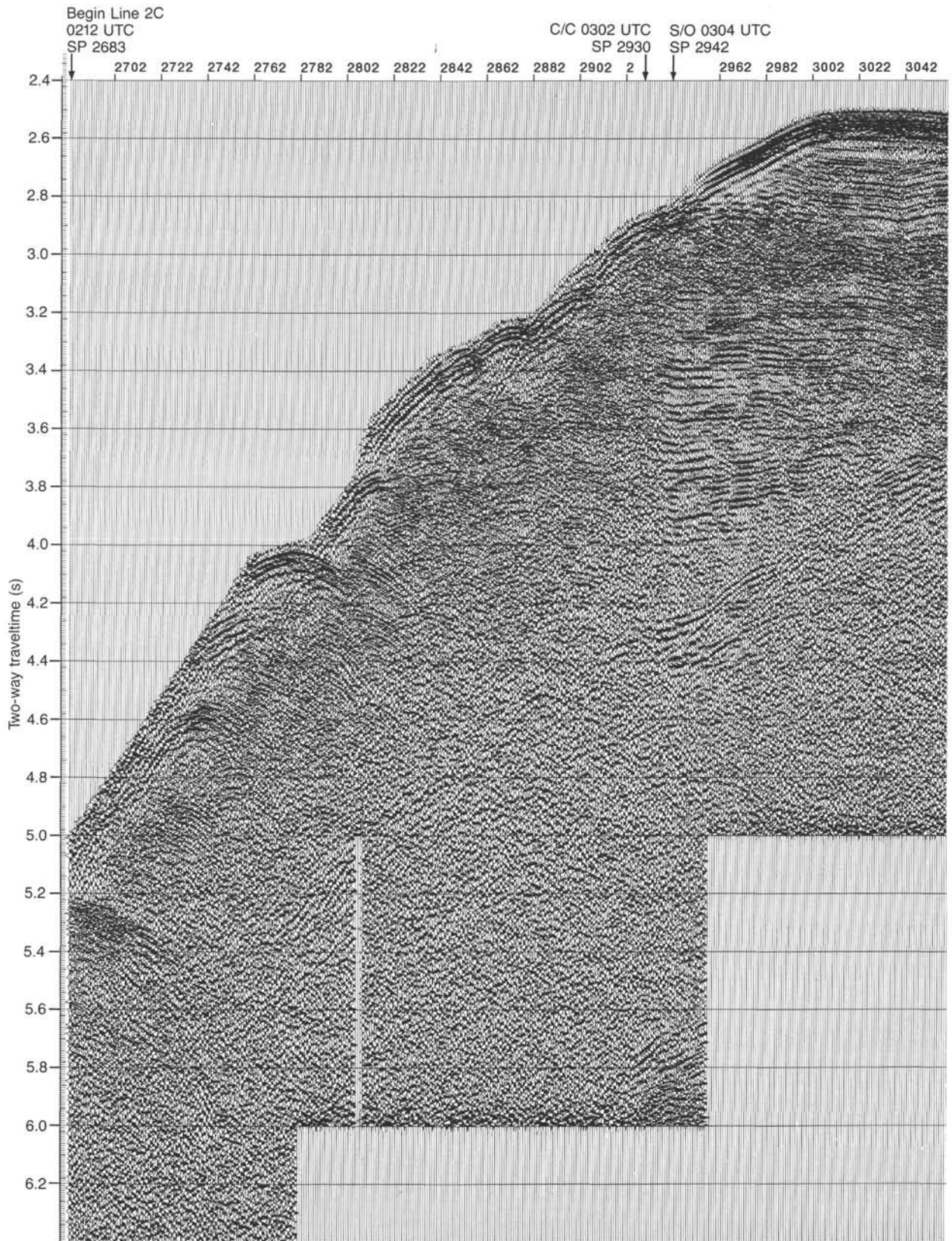


Figure 9. Processed digital seismic profile of line 2C, collected on approach to Sites 721 and 722. The profile was plotted on the Versatec plotter according to the processing parameters given in Table 2. The ship's track is shown in Figure 8.

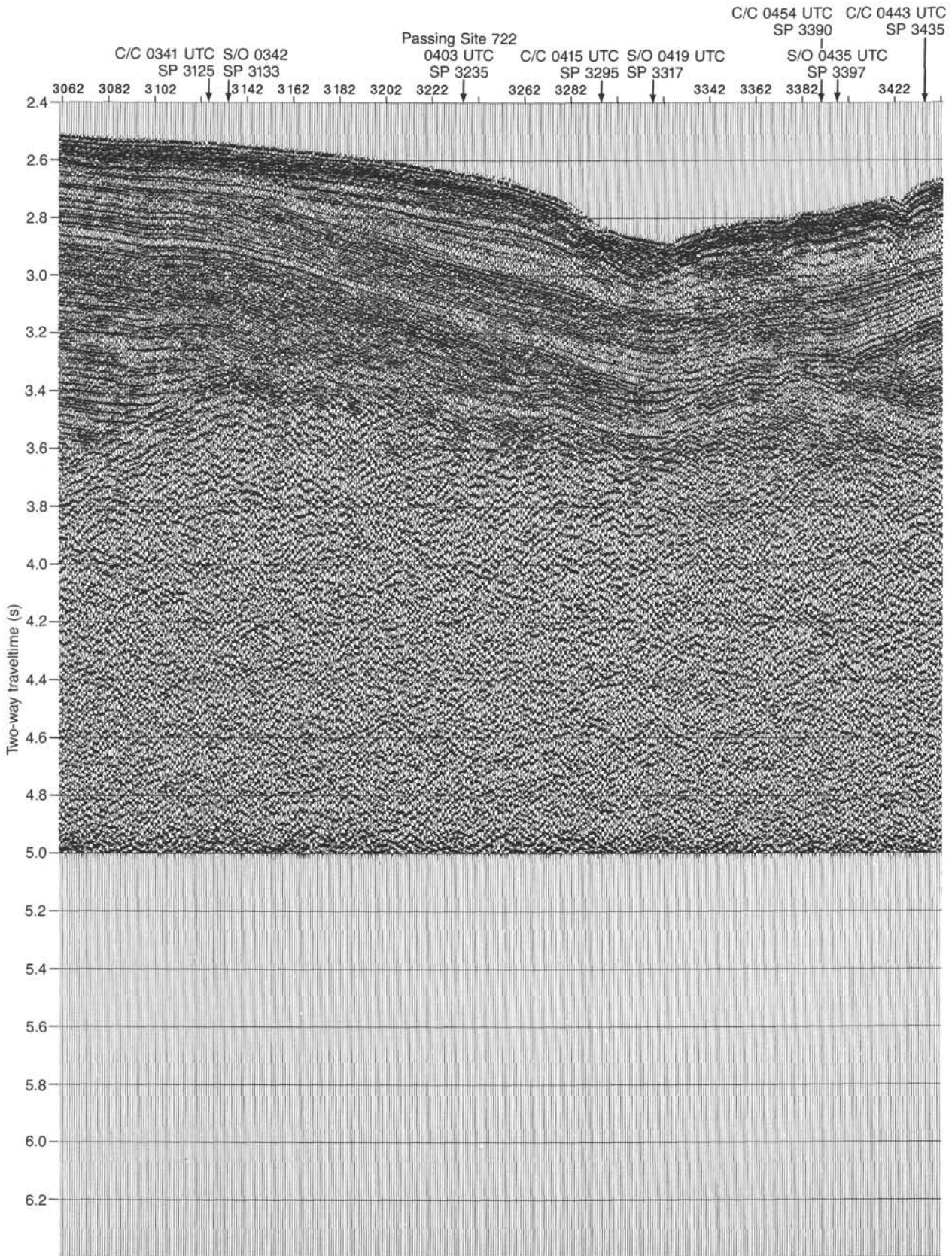


Figure 9 (continued).

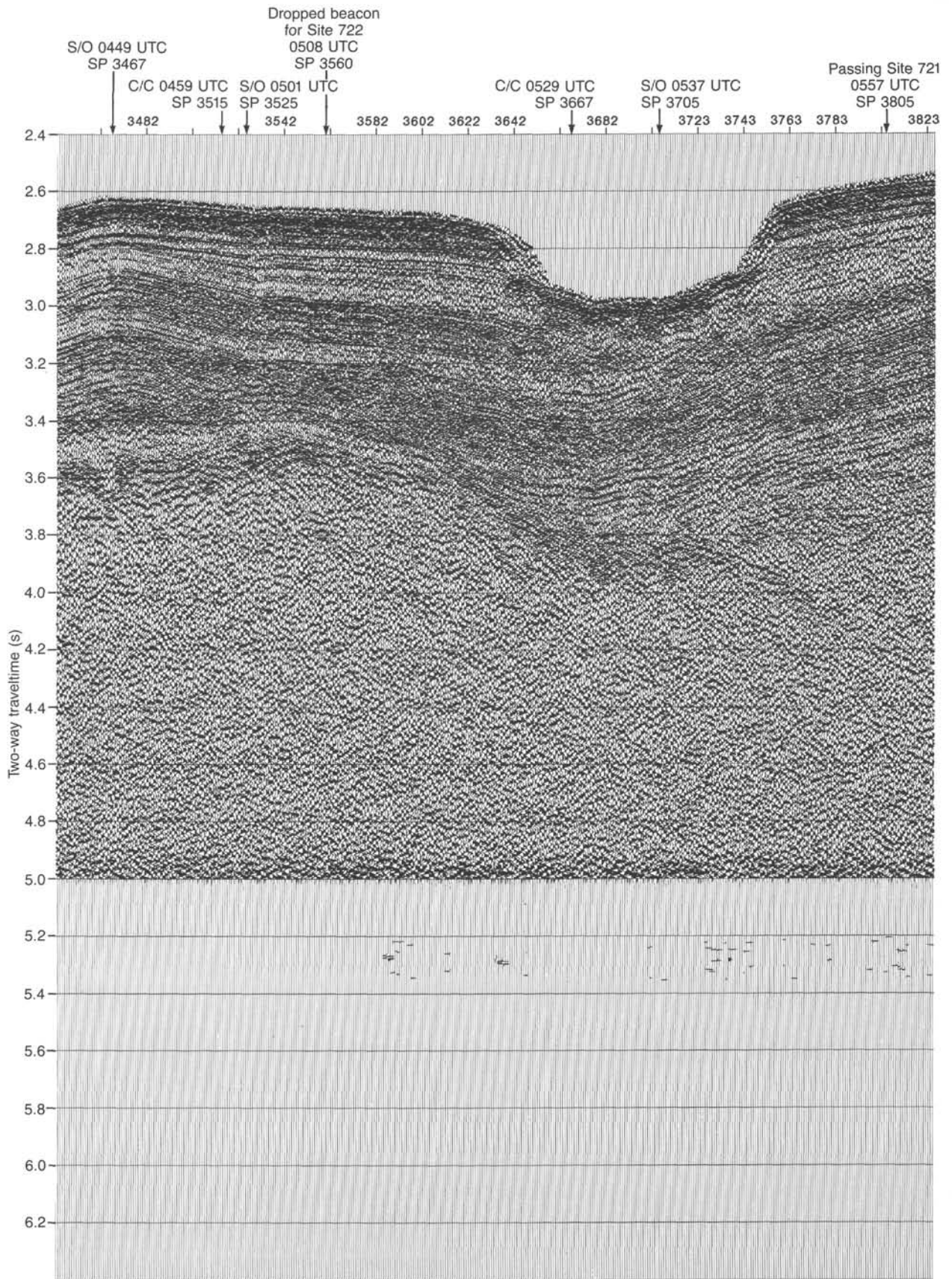


Figure 9 (continued).

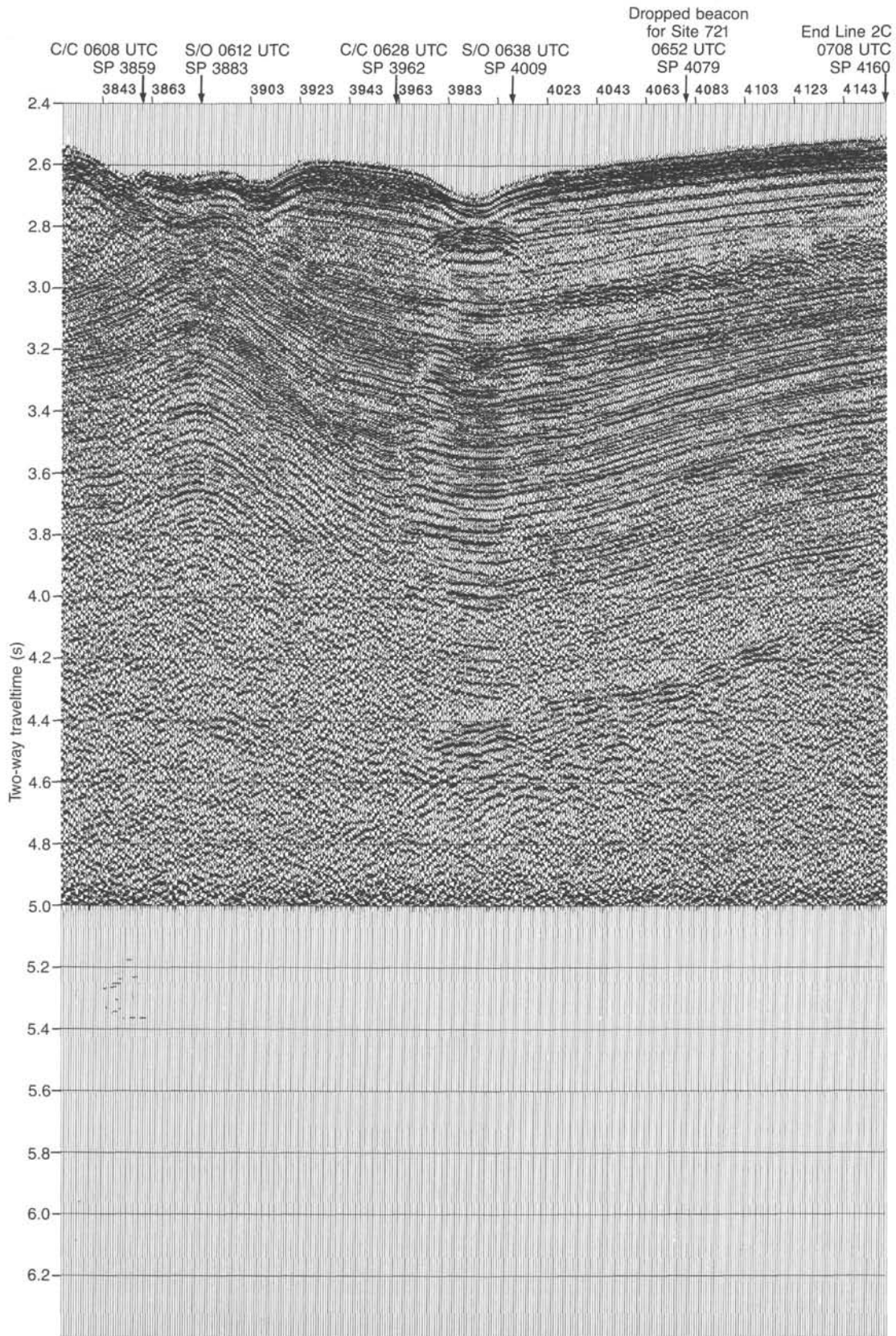


Figure 9 (continued).

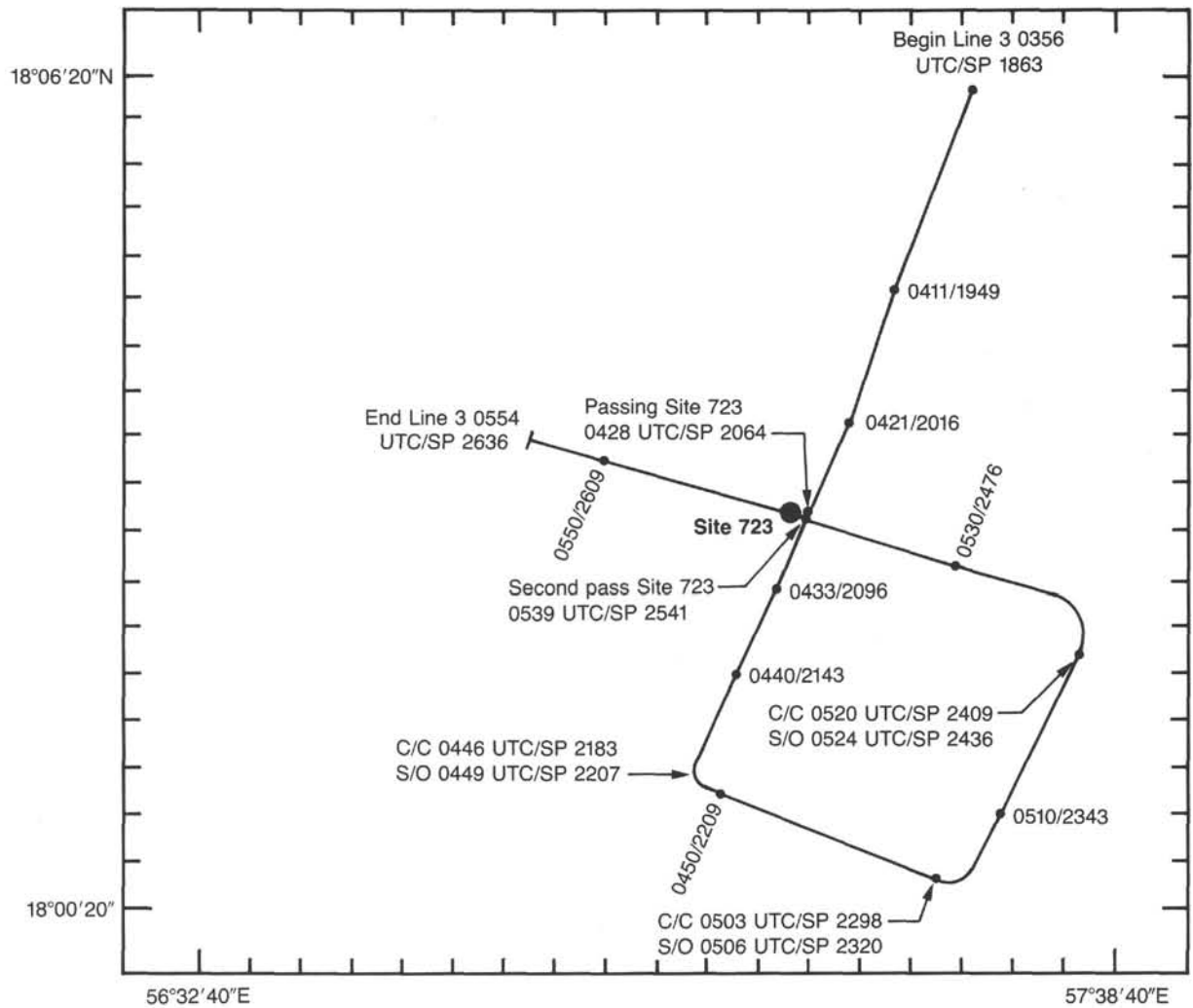


Figure 10. Detailed ship's track for seismic line 3, on approach to Site 723. Satellite fixes are shown as points and are identified by UTC/shotpoint (SP). Extrapolated positions are shown as tick marks. The processed digital seismic profile is shown in Figure 11.

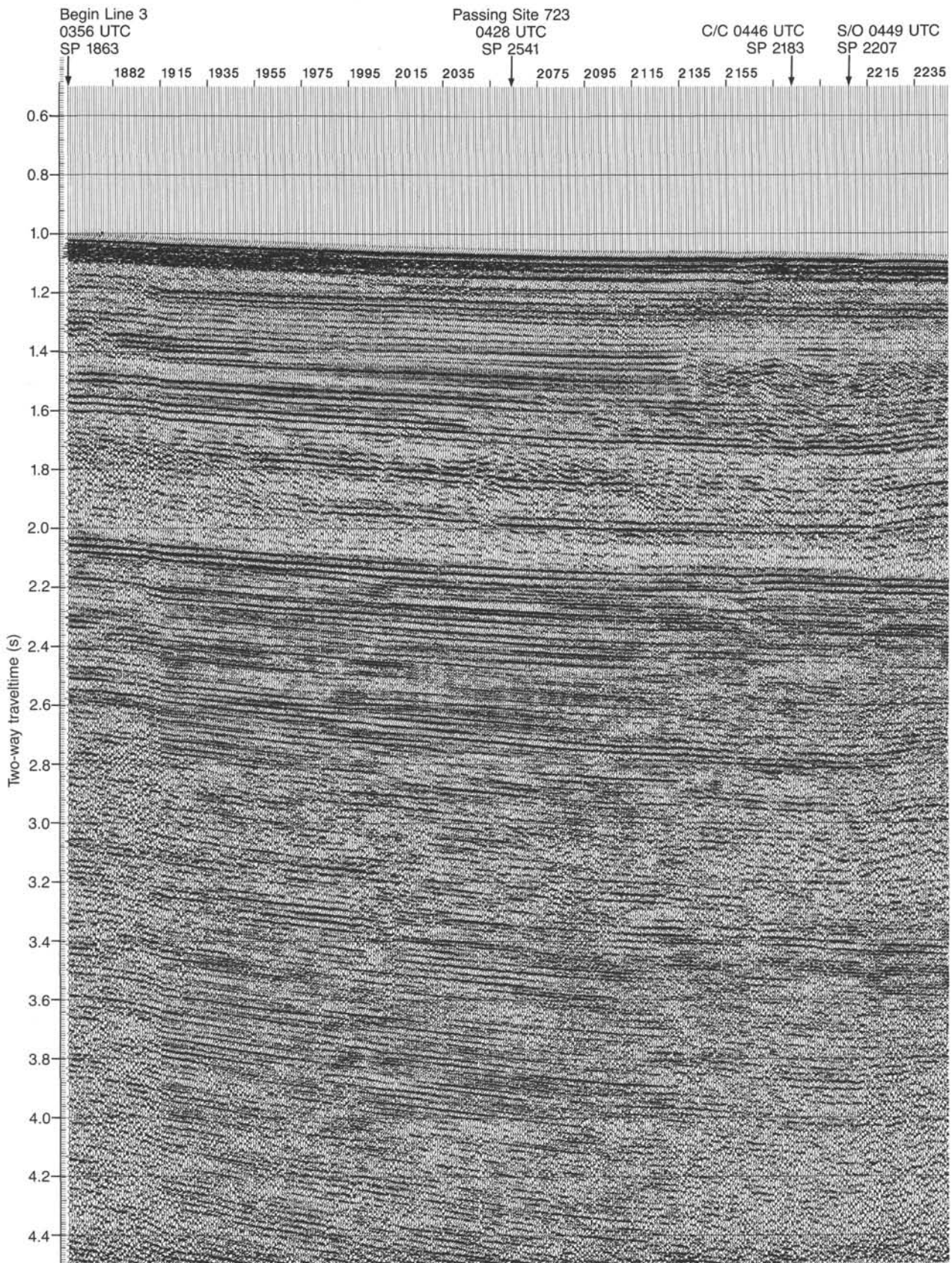


Figure 11. Processed digital seismic profile of line 3, collected on approach to Site 723. The profile was plotted on the Versatec plotter according to the processing parameters given in Table 2. The ship's track is shown in Figure 10.

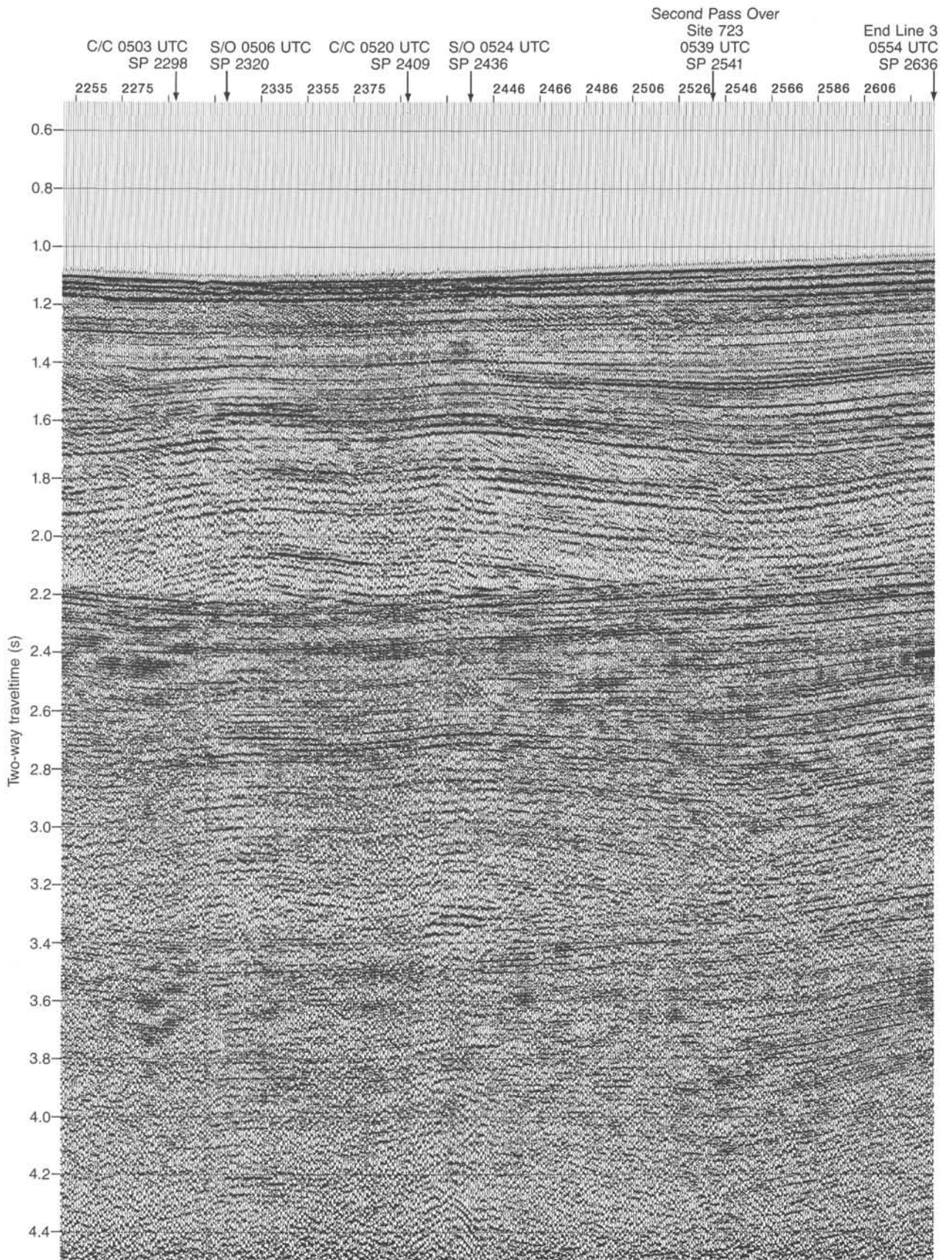


Figure 11 (continued).

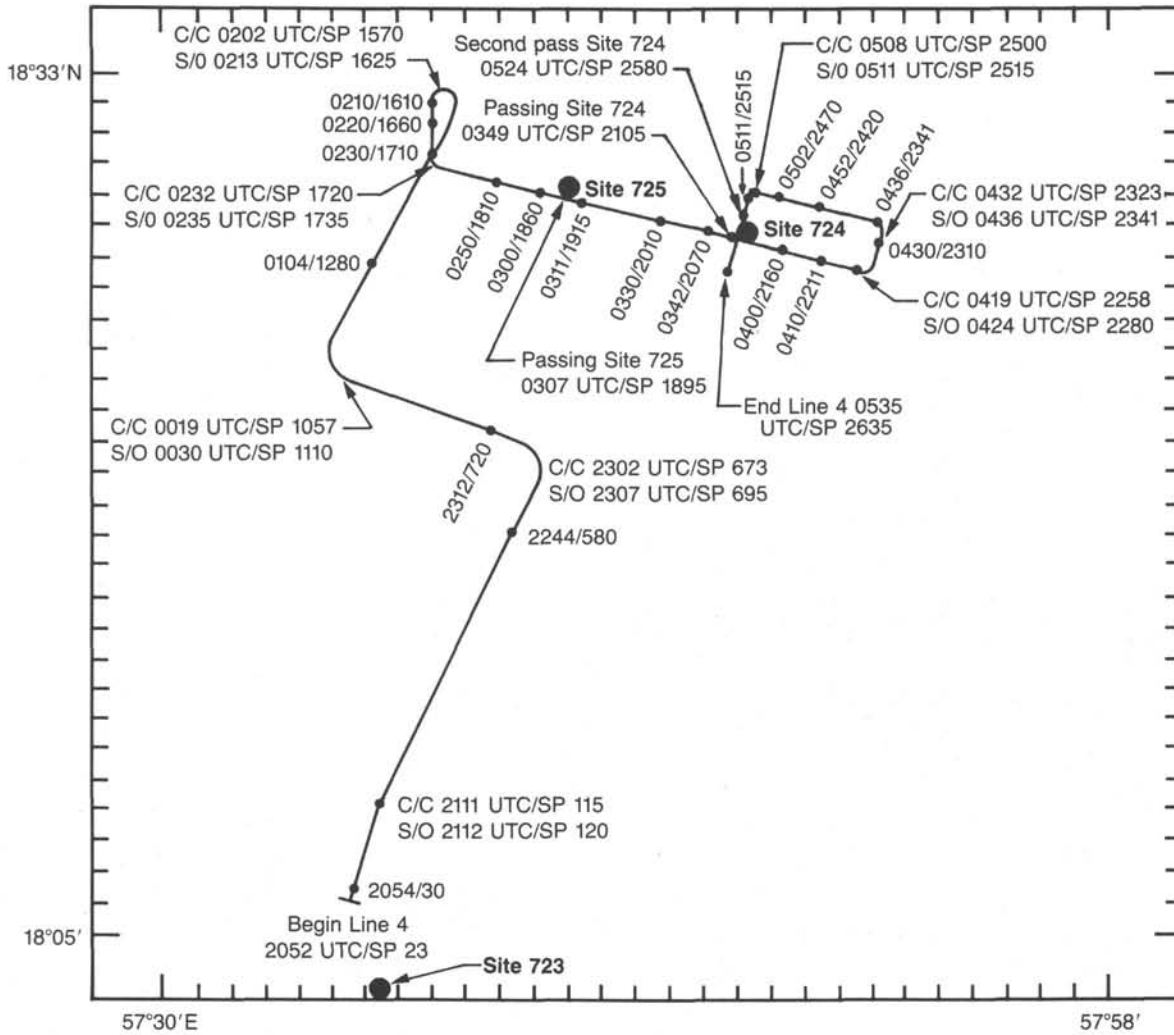


Figure 12. Detailed ship's track for seismic line 4, en route to and on approach to Sites 724 and 725. Satellite fixes are shown as points and are identified by UTC/shotpoint (SP). Extrapolated positions are shown as tick marks. The processed digital seismic profile is shown in Figure 13.

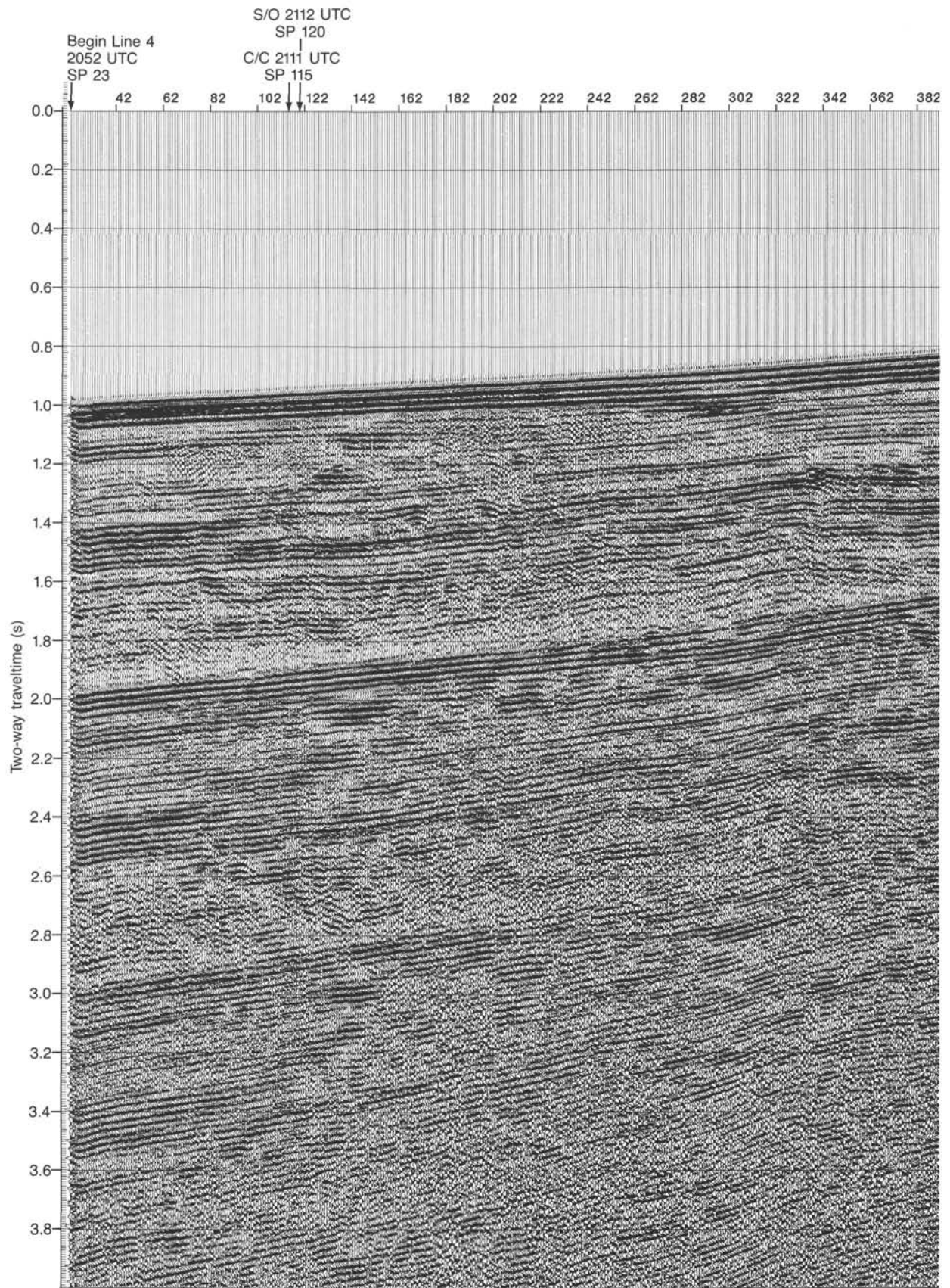


Figure 13. Processed digital seismic profile of line 4, collected en route to and on approach to Sites 724 and 725. The profile was plotted on the Versatec plotter according to the processing parameters given in Table 2. The ship's track is shown in Figure 12.

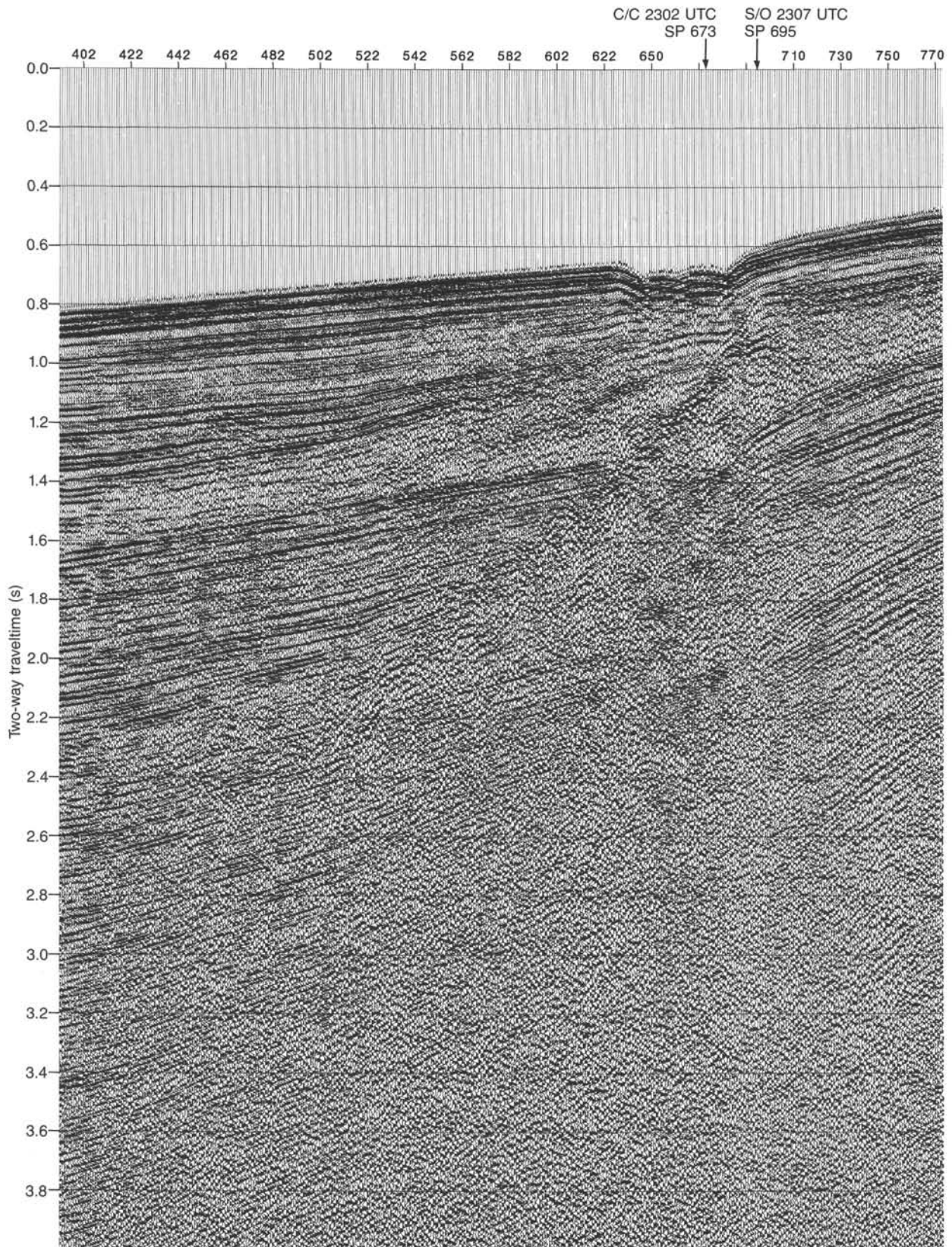


Figure 13 (continued).

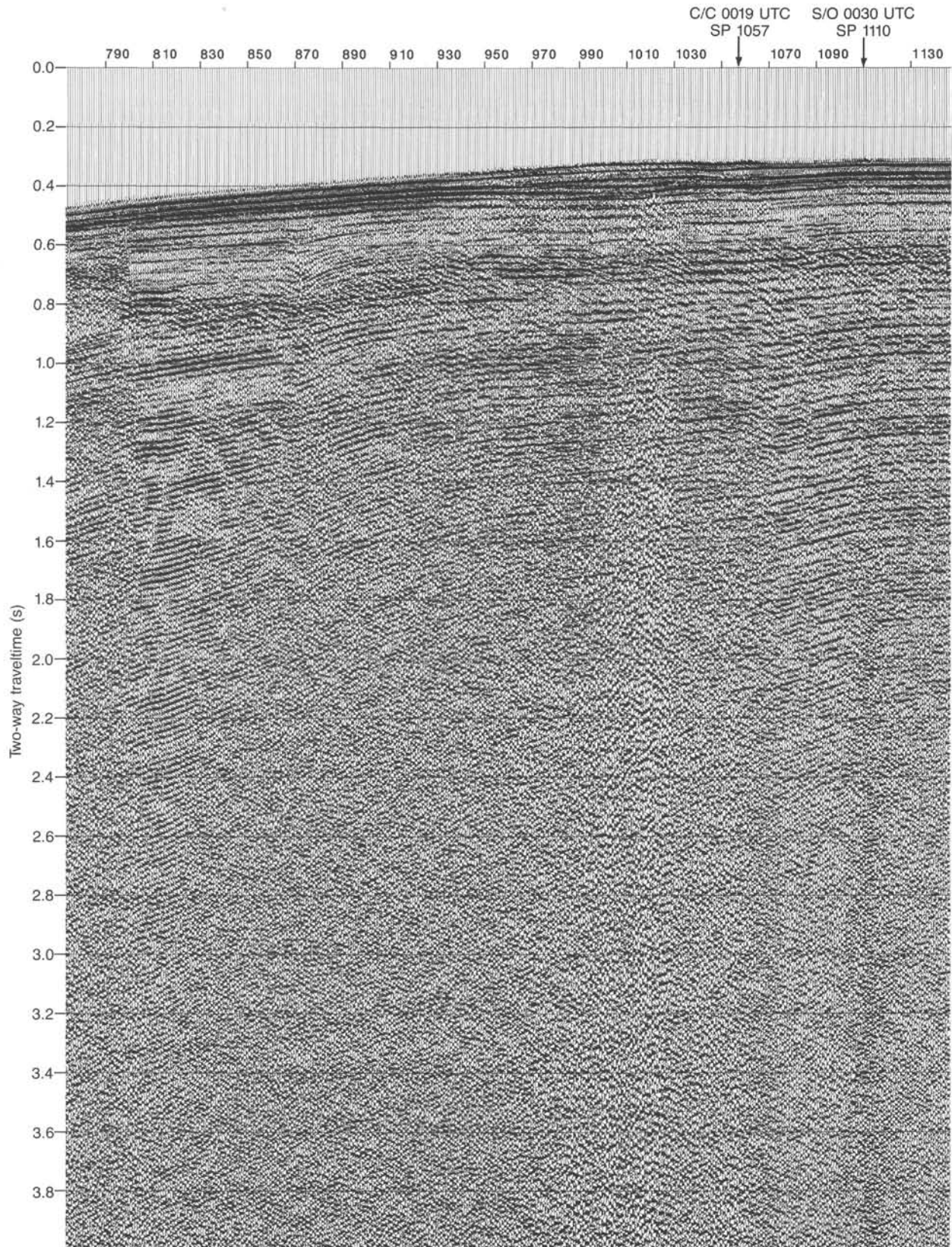


Figure 13 (continued).

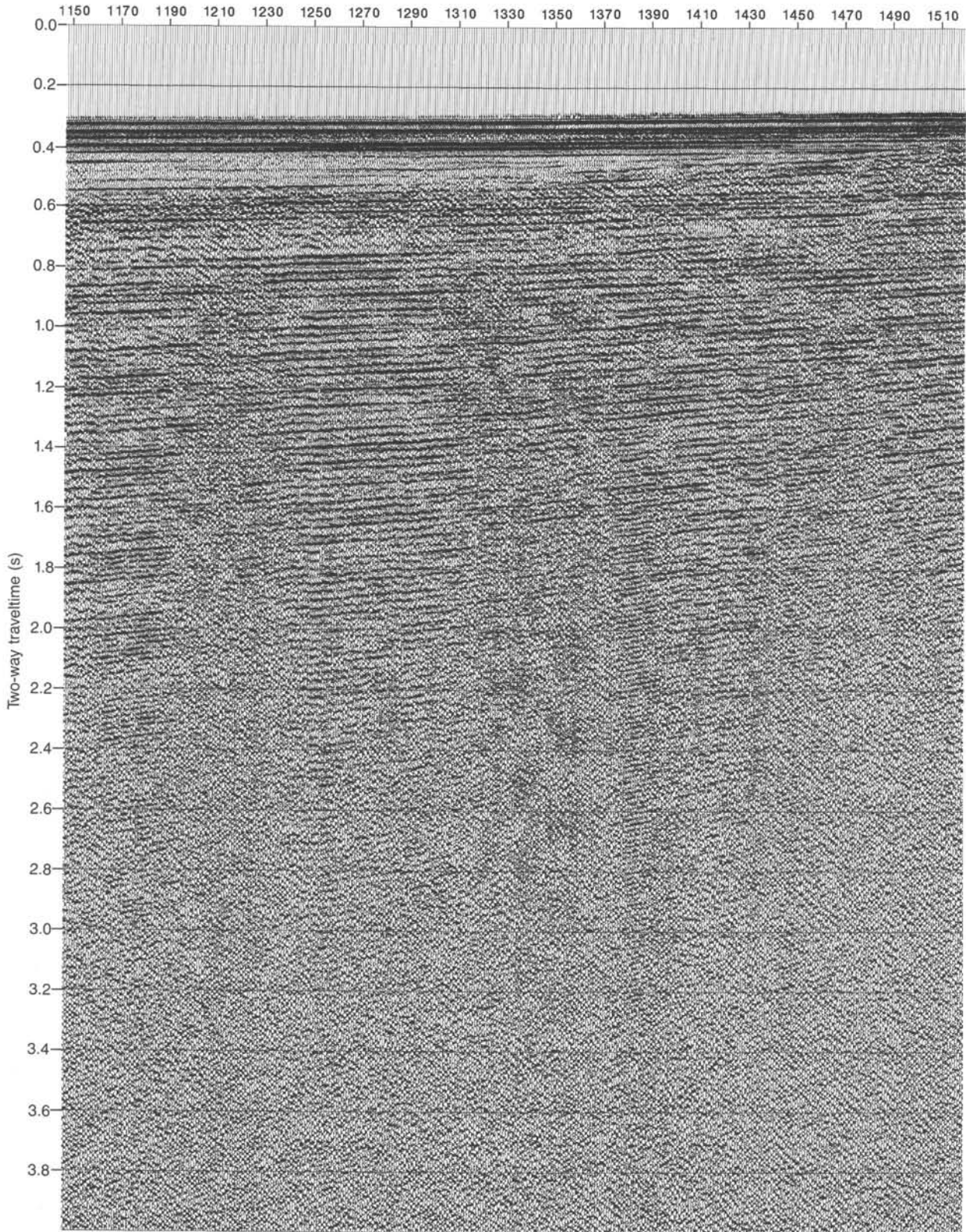


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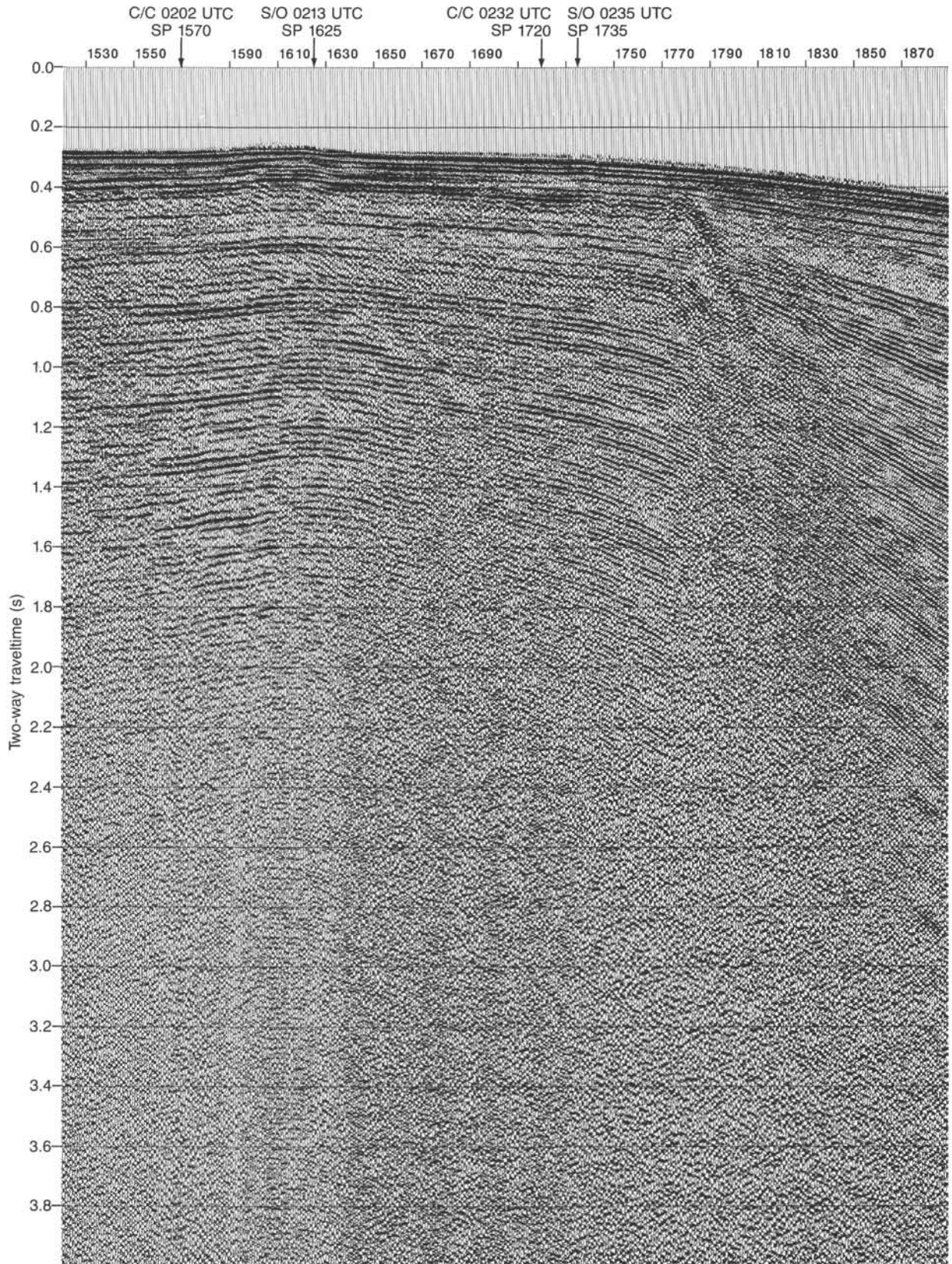


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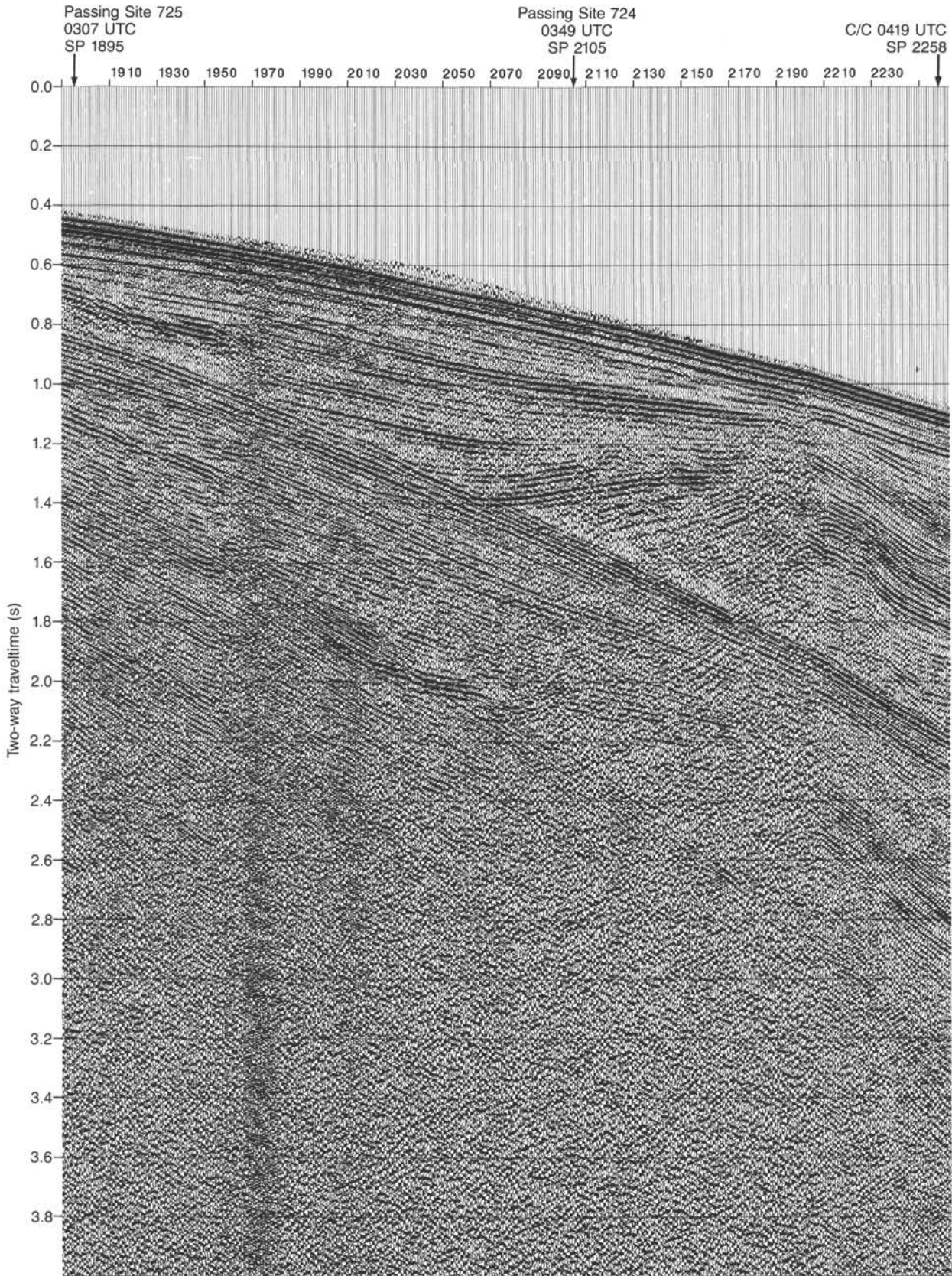


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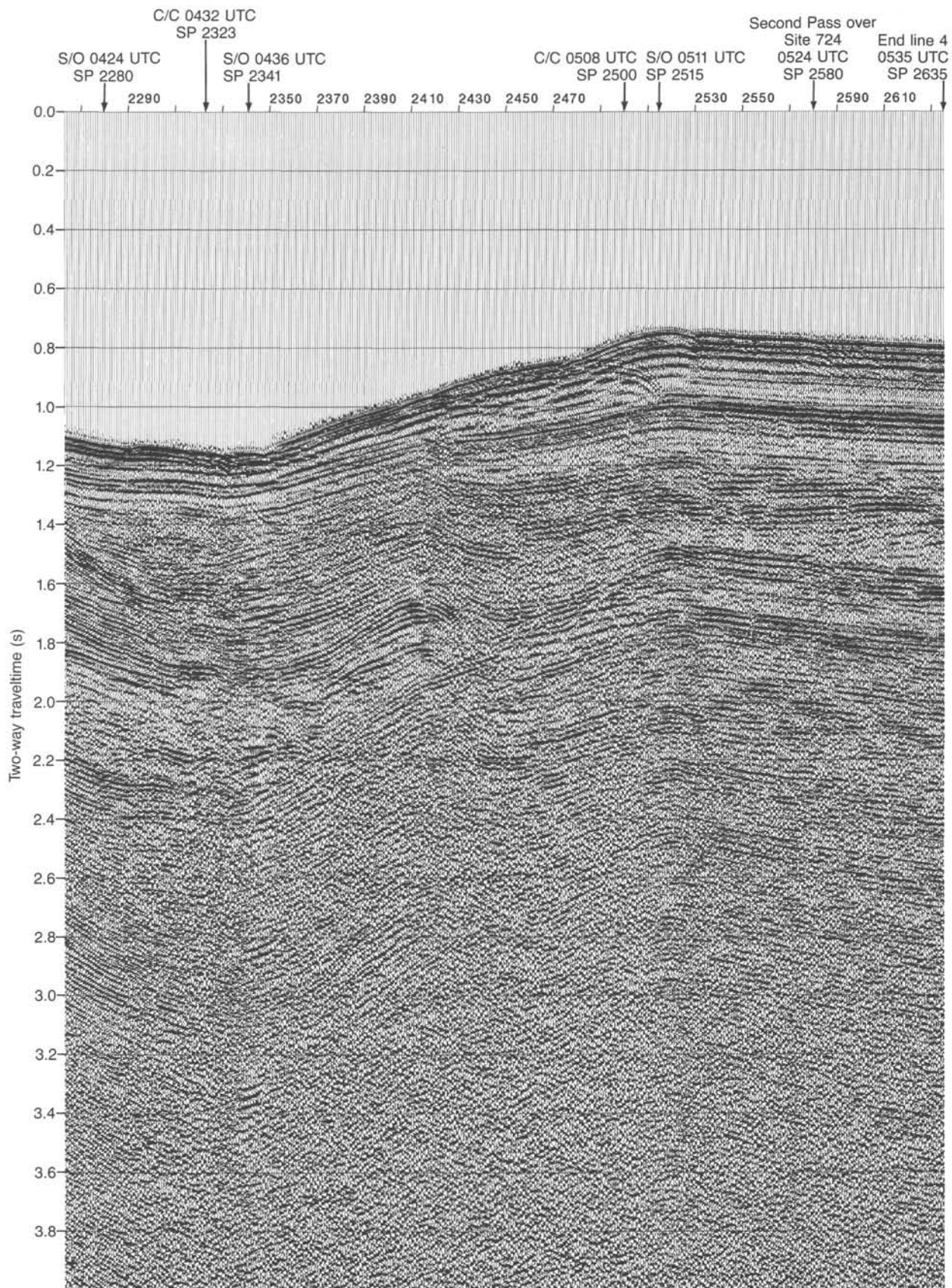


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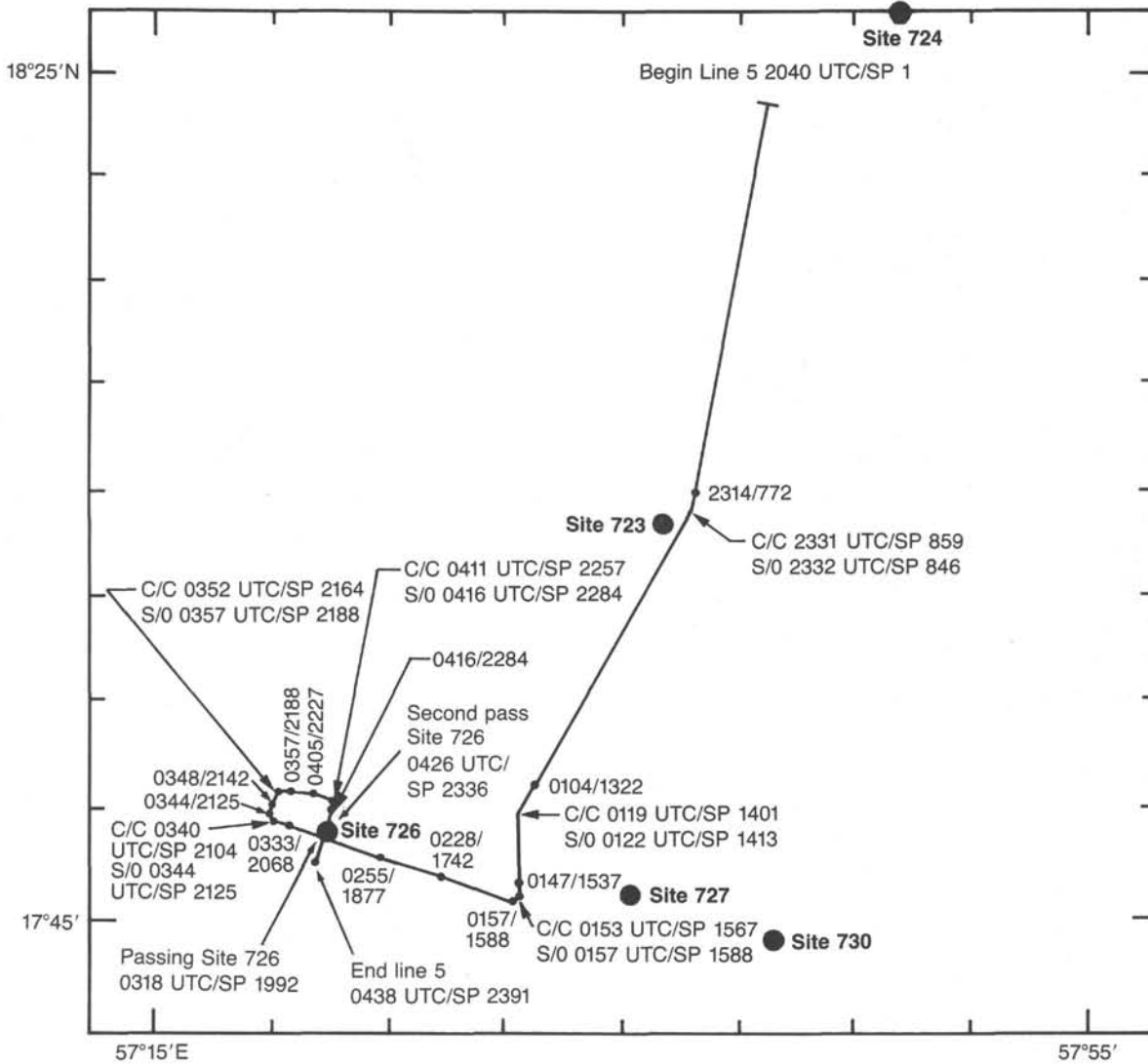


Figure 14. Detailed ship's track for seismic line 5, en route to and on approach to Site 726. Satellite fixes are shown as points and are identified by UTC/shotpoint (SP). Extrapolated positions are shown as tick marks. The processed digital seismic profile is shown in Figure 15.

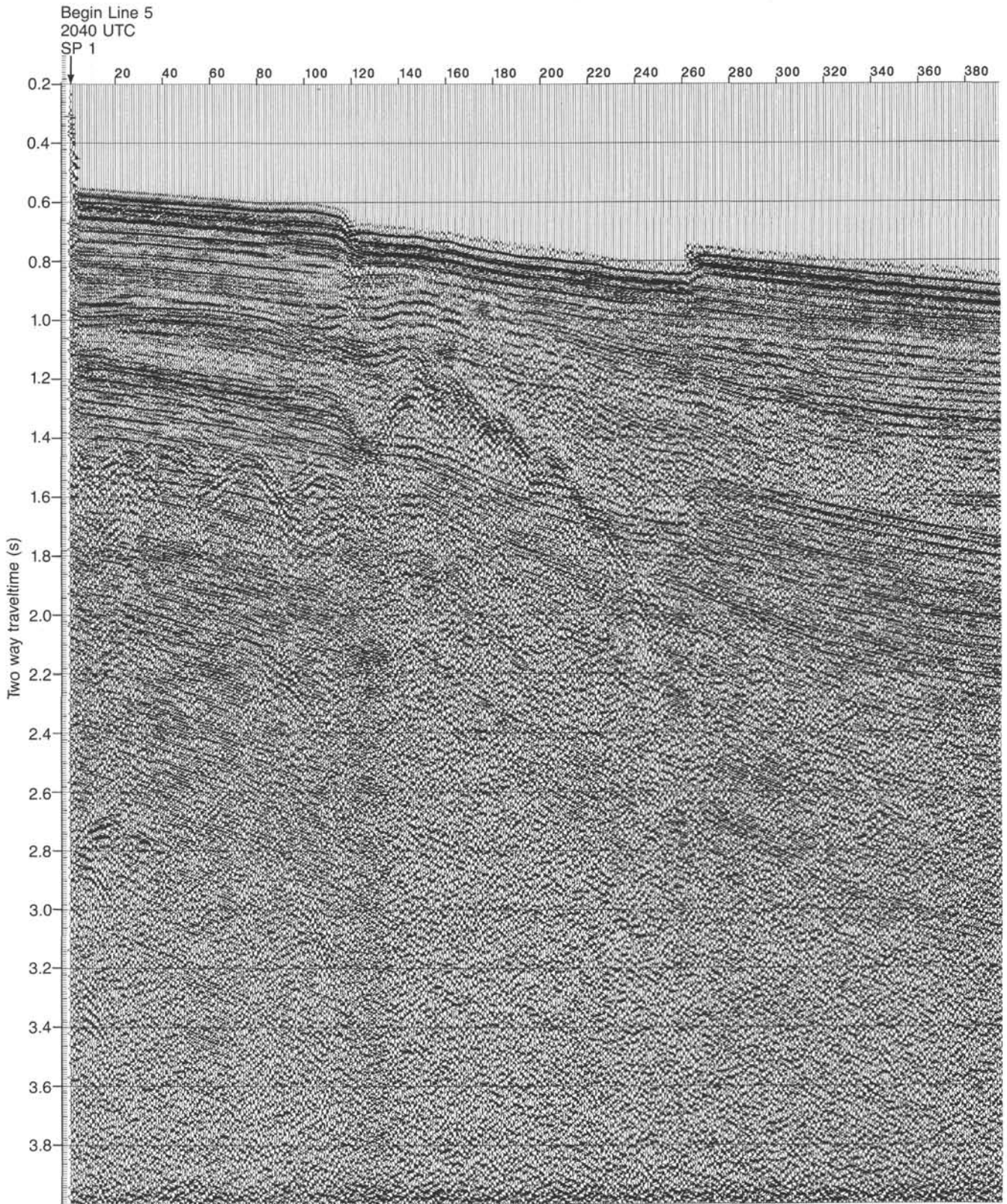


Figure 15. Processed digital seismic profile of line 5, collected en route to and on approach to Site 726. The profile was plotted on the Versatec plotter according to the processing parameters given in Table 2. The ship's track is shown in Figure 14.

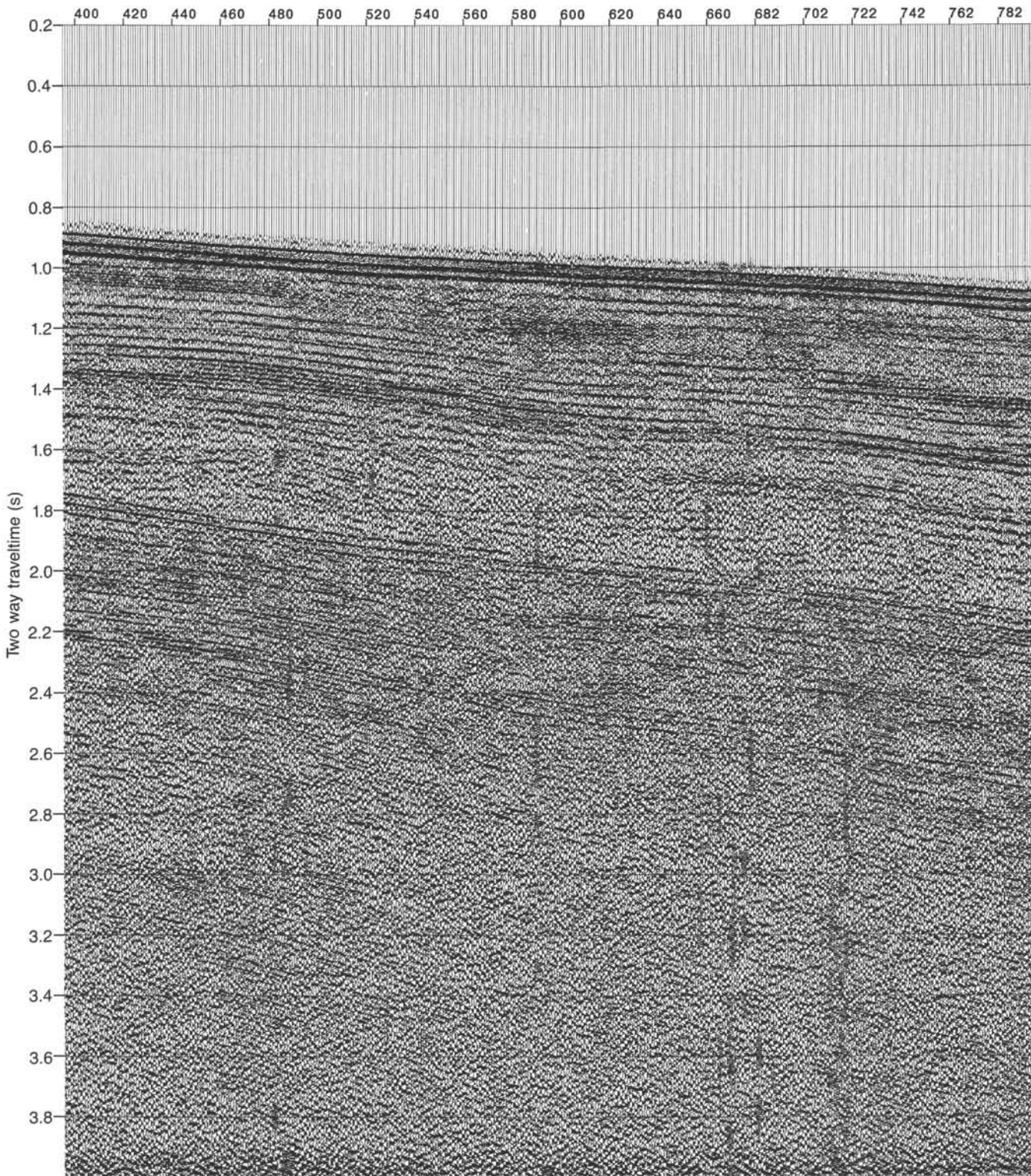


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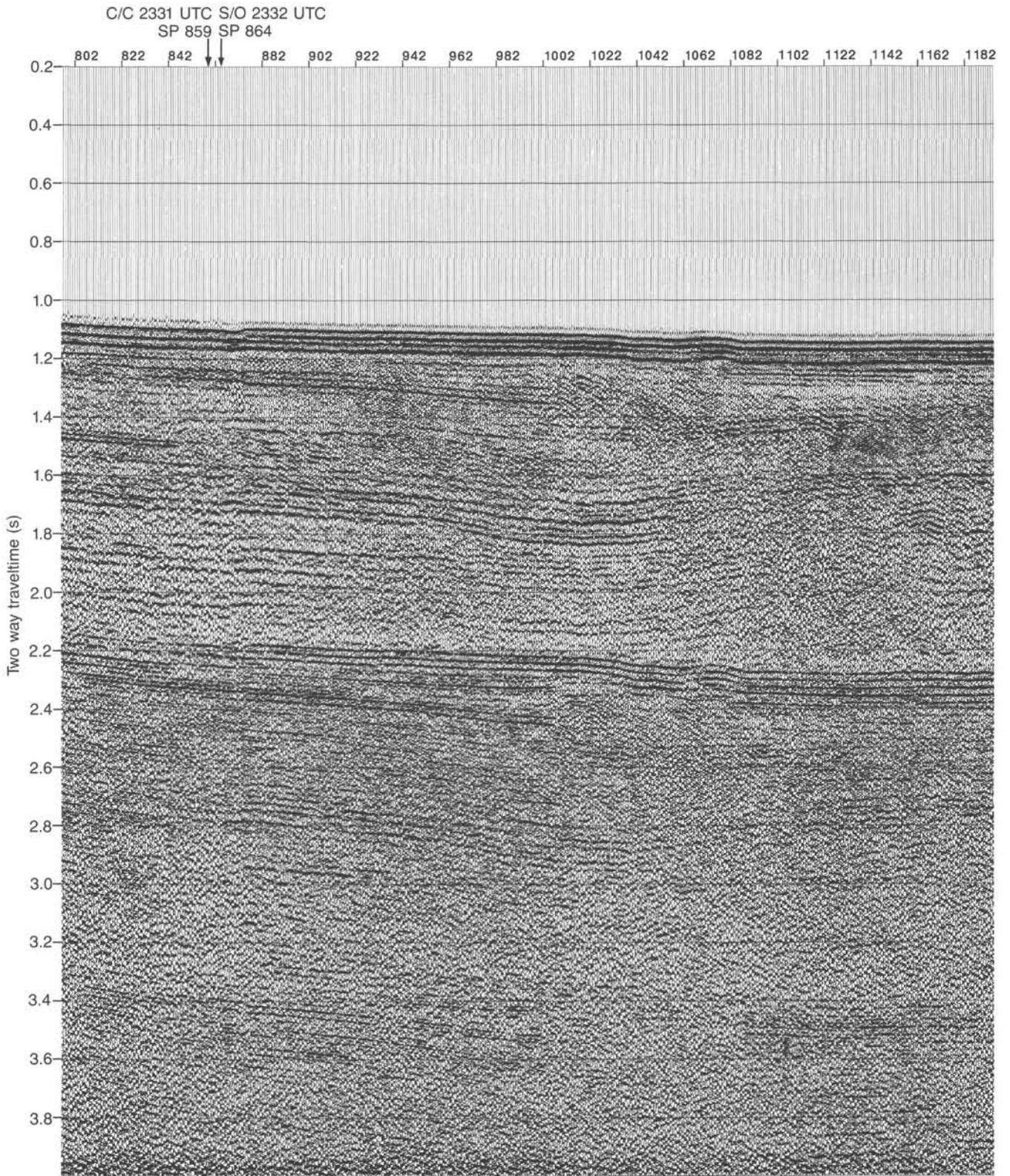


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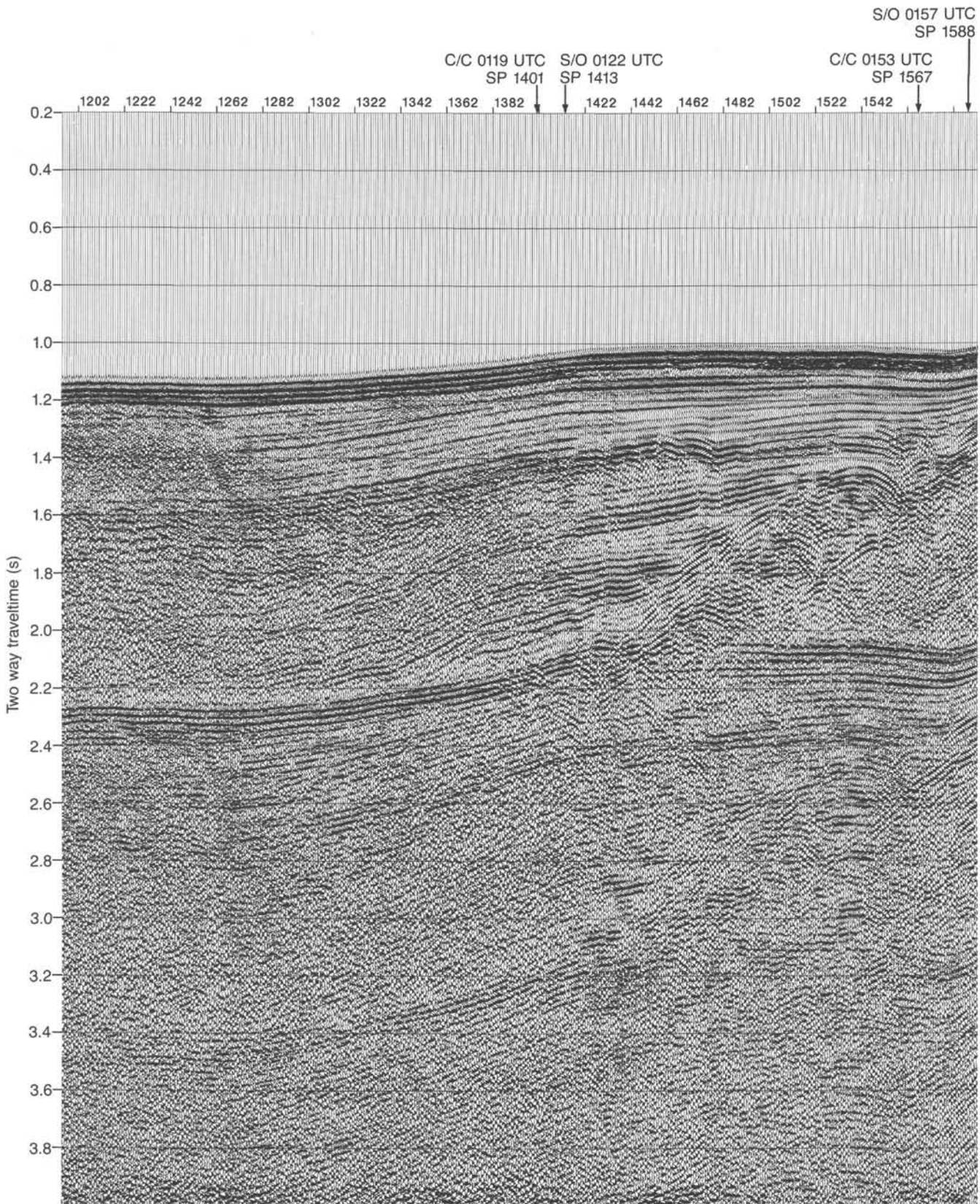


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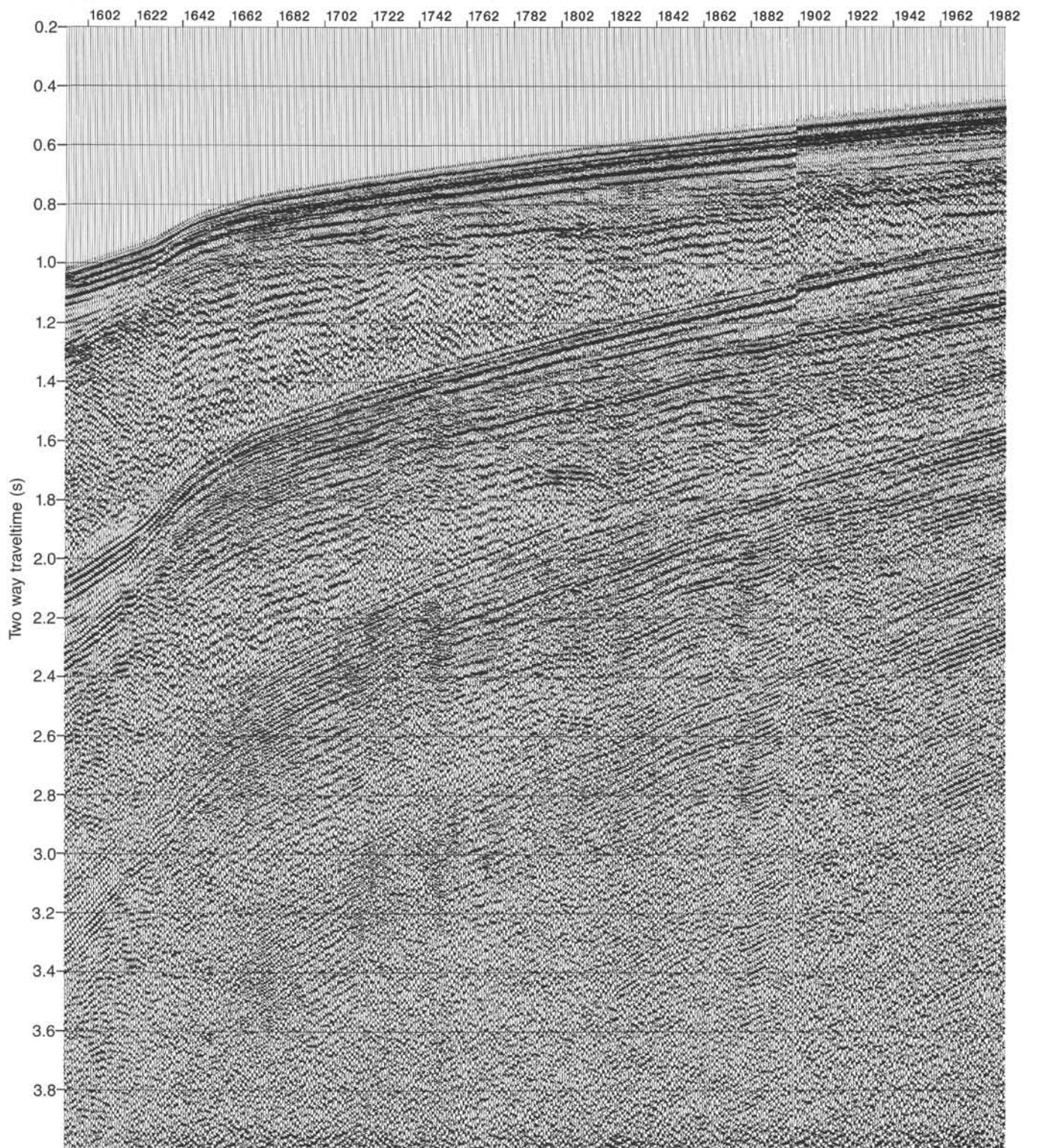


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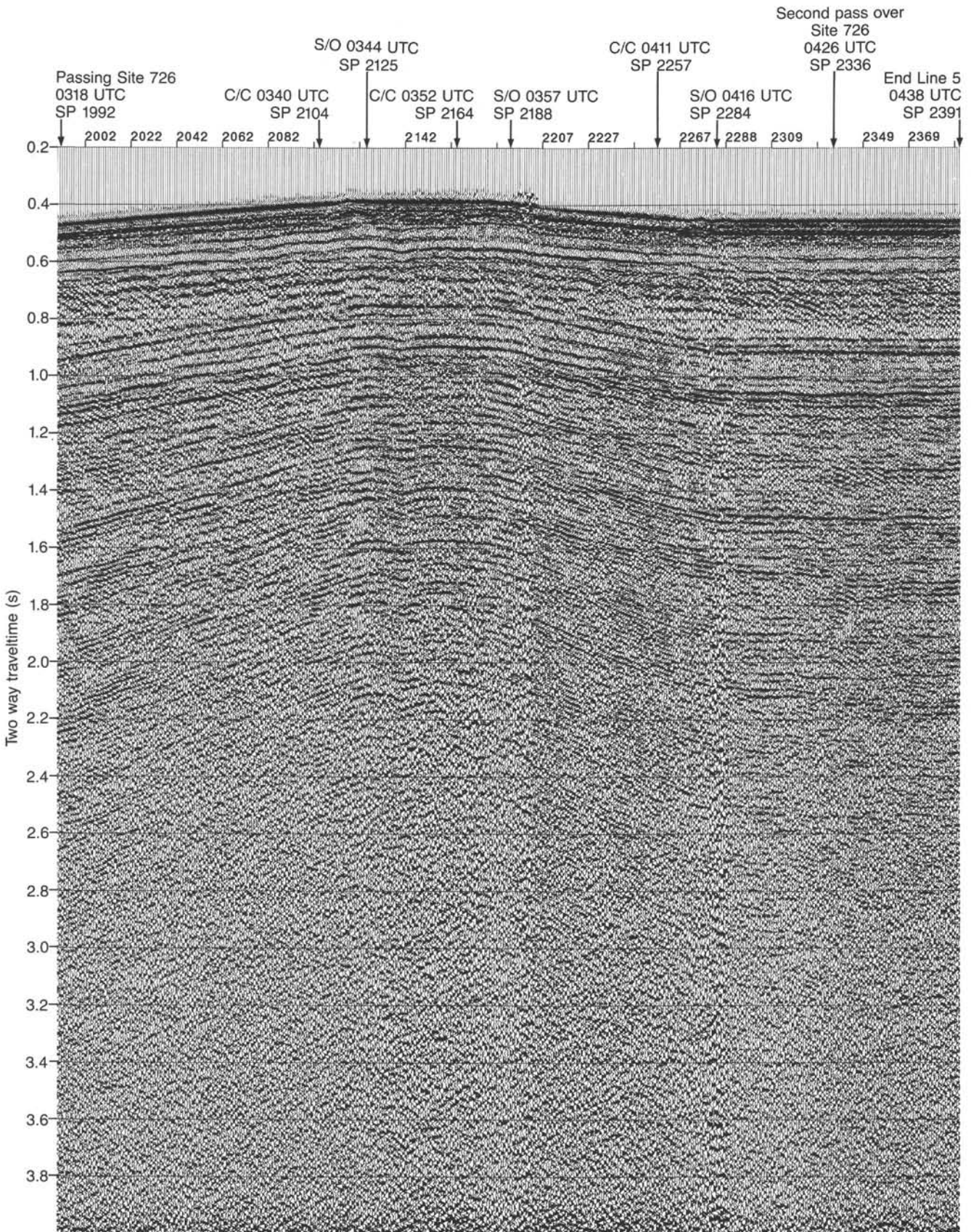


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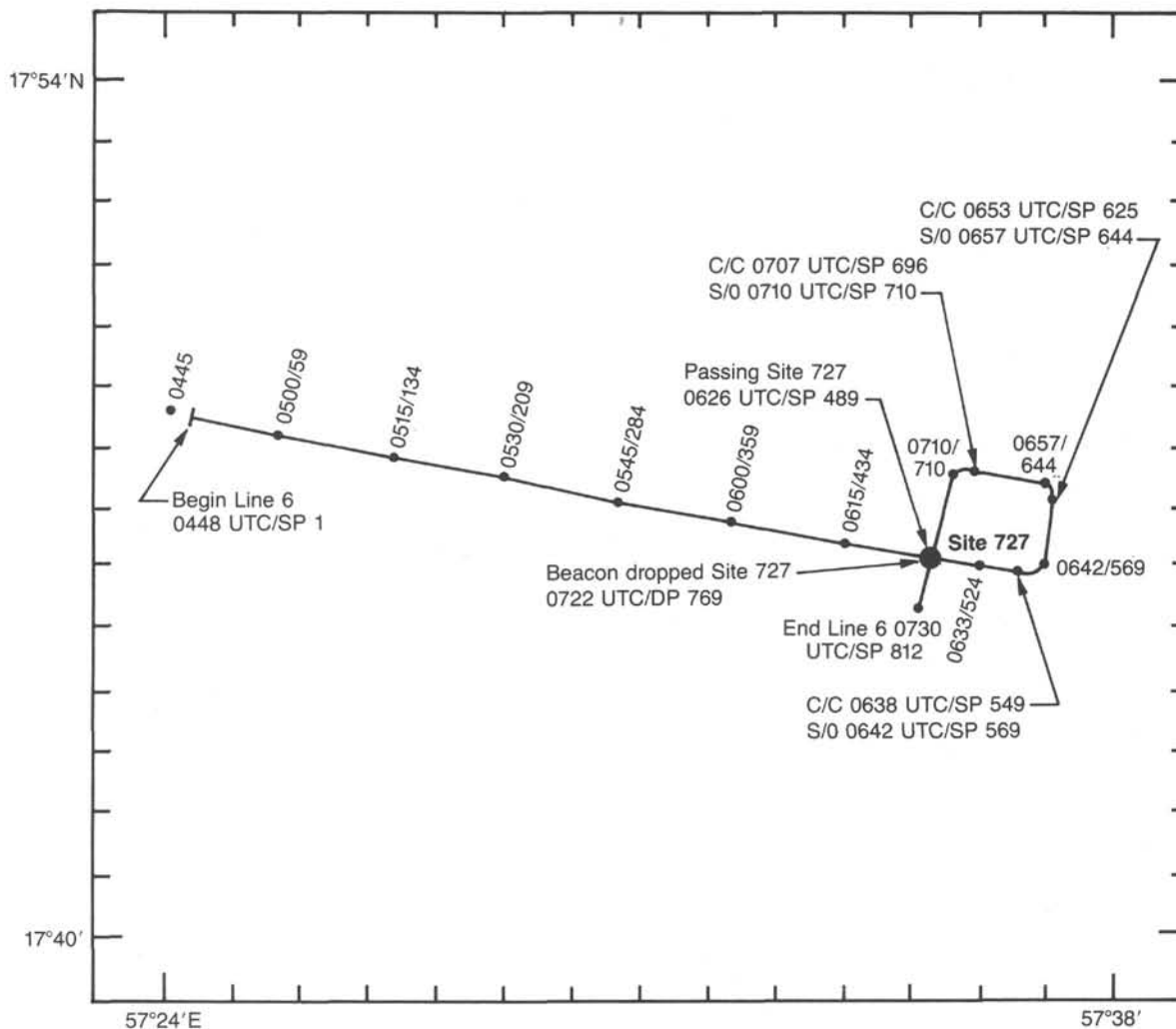


Figure 16. Detailed ship's track for seismic line 6, en route to and on approach to Site 727. Satellite fixes are shown as points and are identified by UTC/shotpoint (SP). Extrapolated positions are shown as tick marks. The processed digital seismic profile is shown in Figure 17.

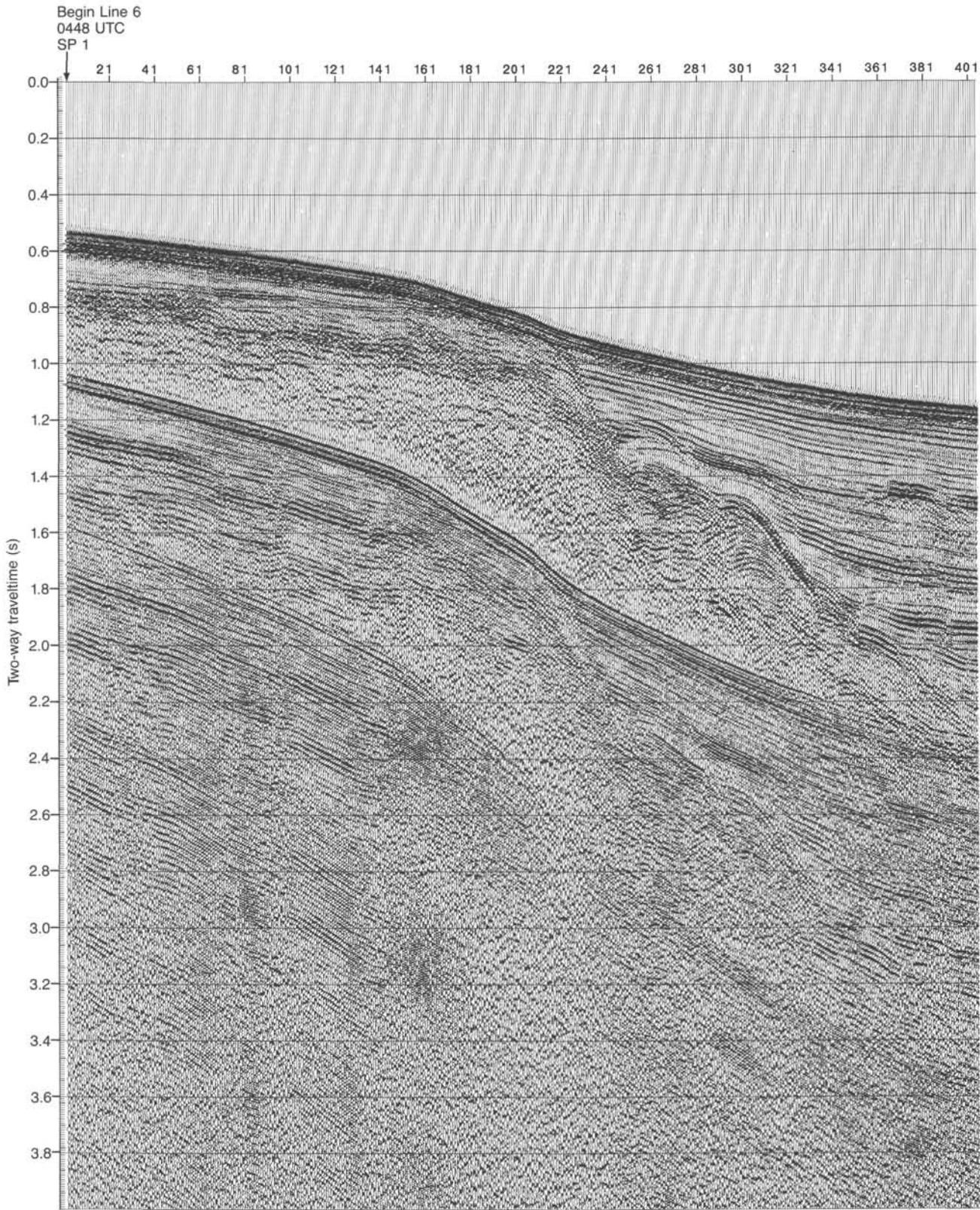


Figure 17. Processed digital seismic profile of line 6, collected en route to and on approach to Site 727. The profile was plotted on the Versatec plotter according to the processing parameters given in Table 2. The ship's track is shown in Figure 16.

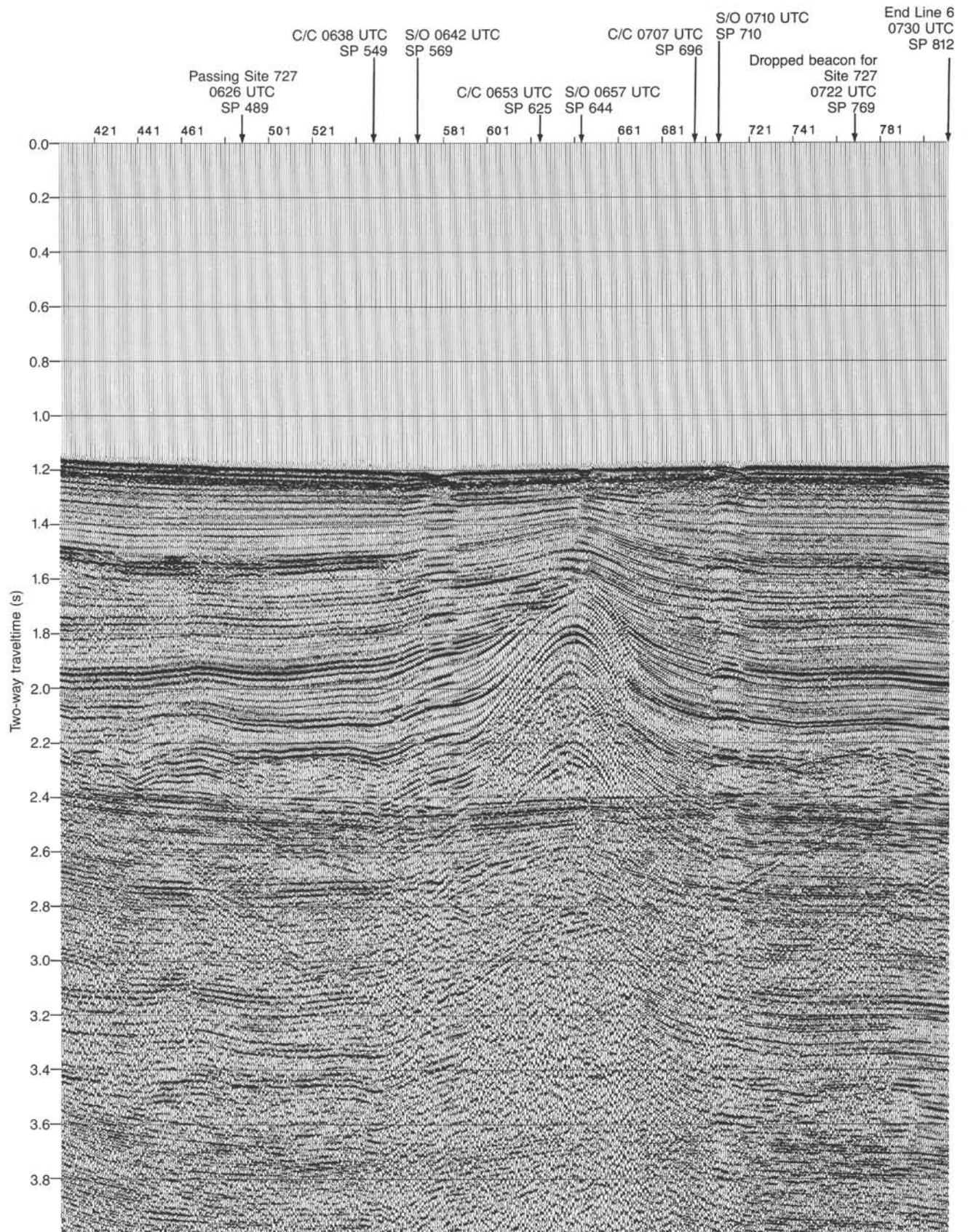


Figure 17 (continued).

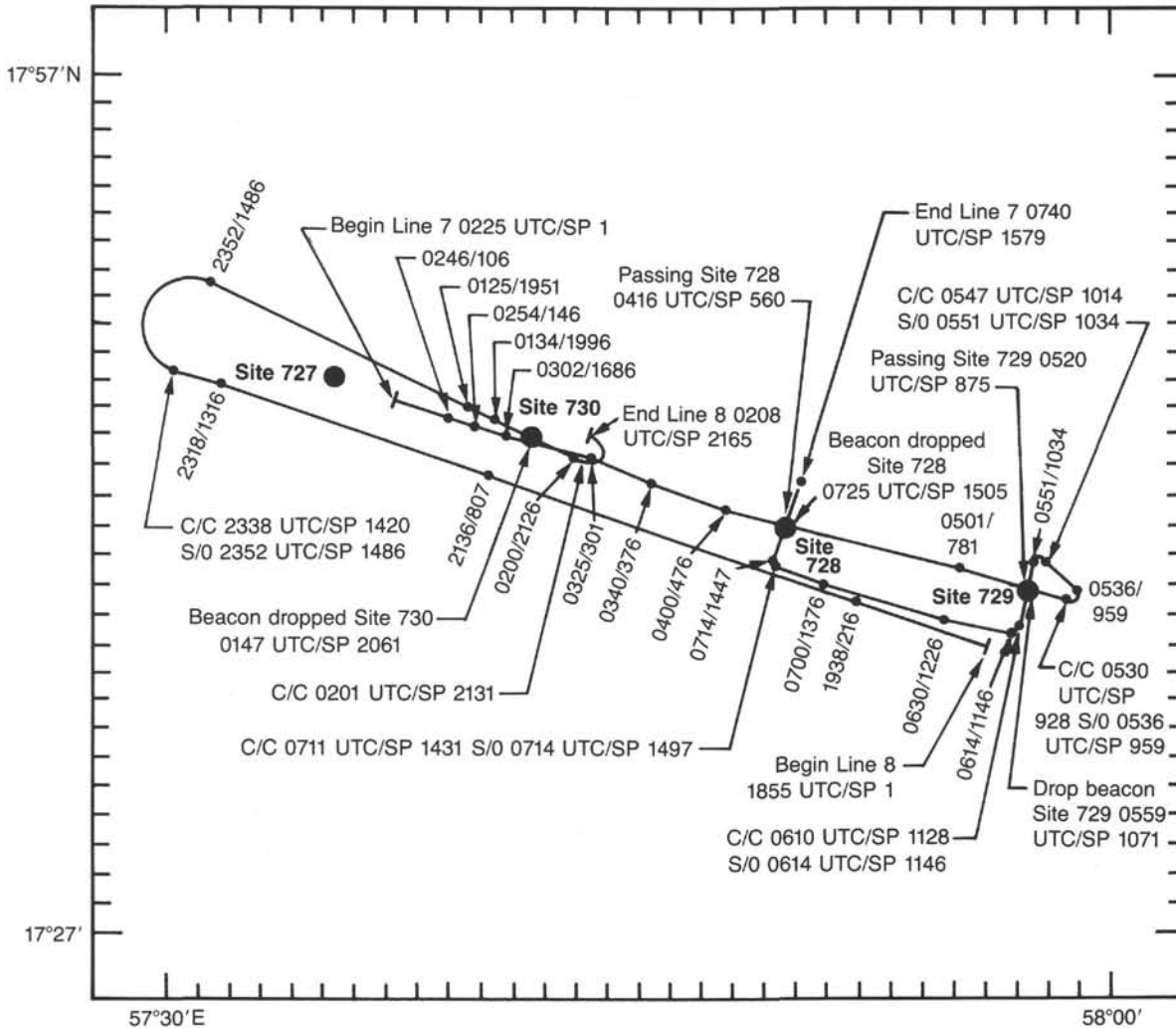


Figure 18. Detailed ship's tracks for seismic line 7, en route to and on approach to Sites 728 and 729, and for seismic line 8, en route to and on approach to Site 730. Satellite fixes are shown as points and are identified by UTC/shotpoint (SP). Extrapolated positions are shown as tick marks. The processed digital seismic profiles for lines 7 and 8 are shown in Figures 19 and 20, respectively.

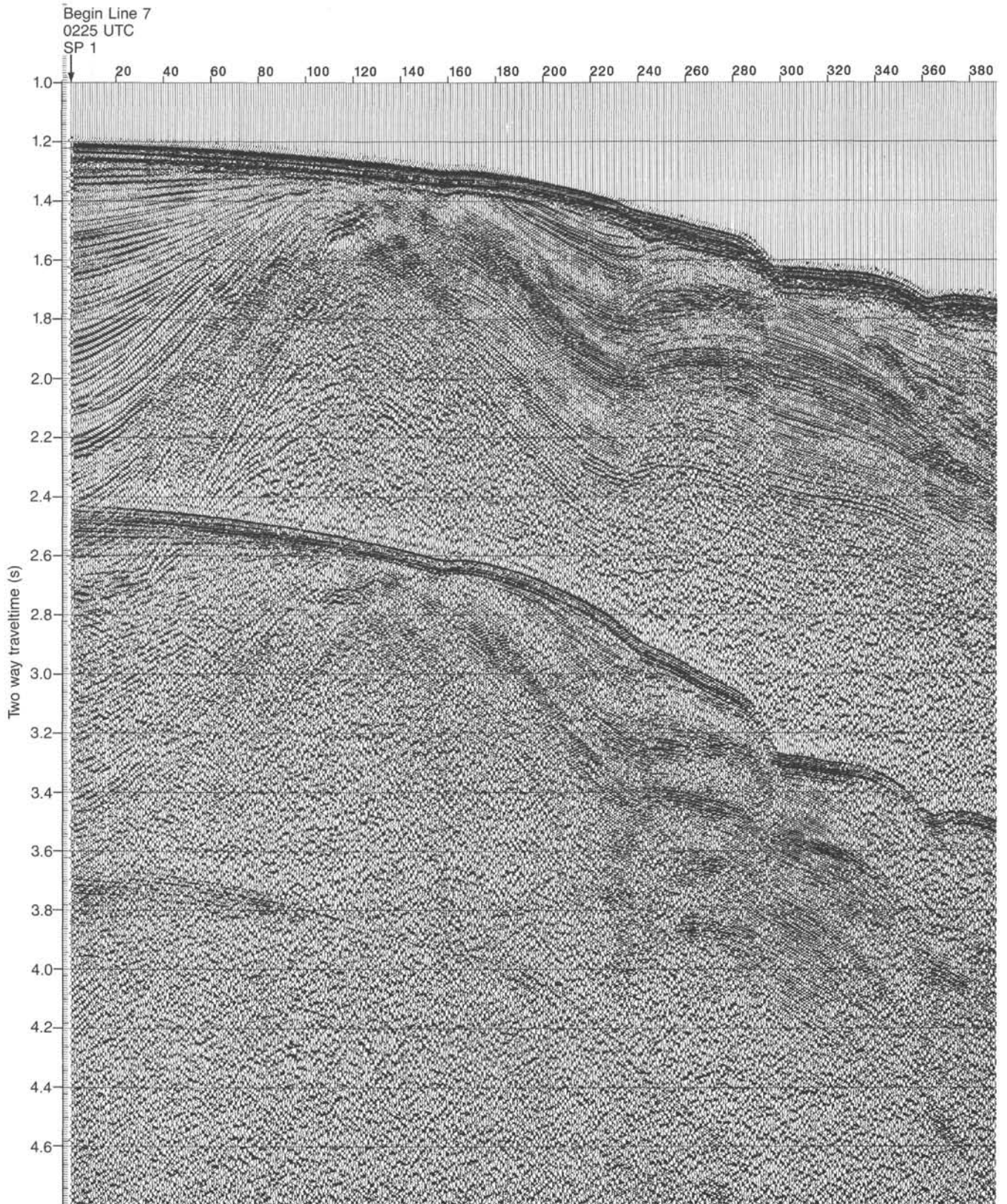


Figure 19. Processed digital seismic profile of line 7, collected en route to and on approach to Sites 728 and 729. The profile was plotted on the Ver-satec plotter according to the processing parameters given in Table 2. The ship's track is shown in Figure 18.

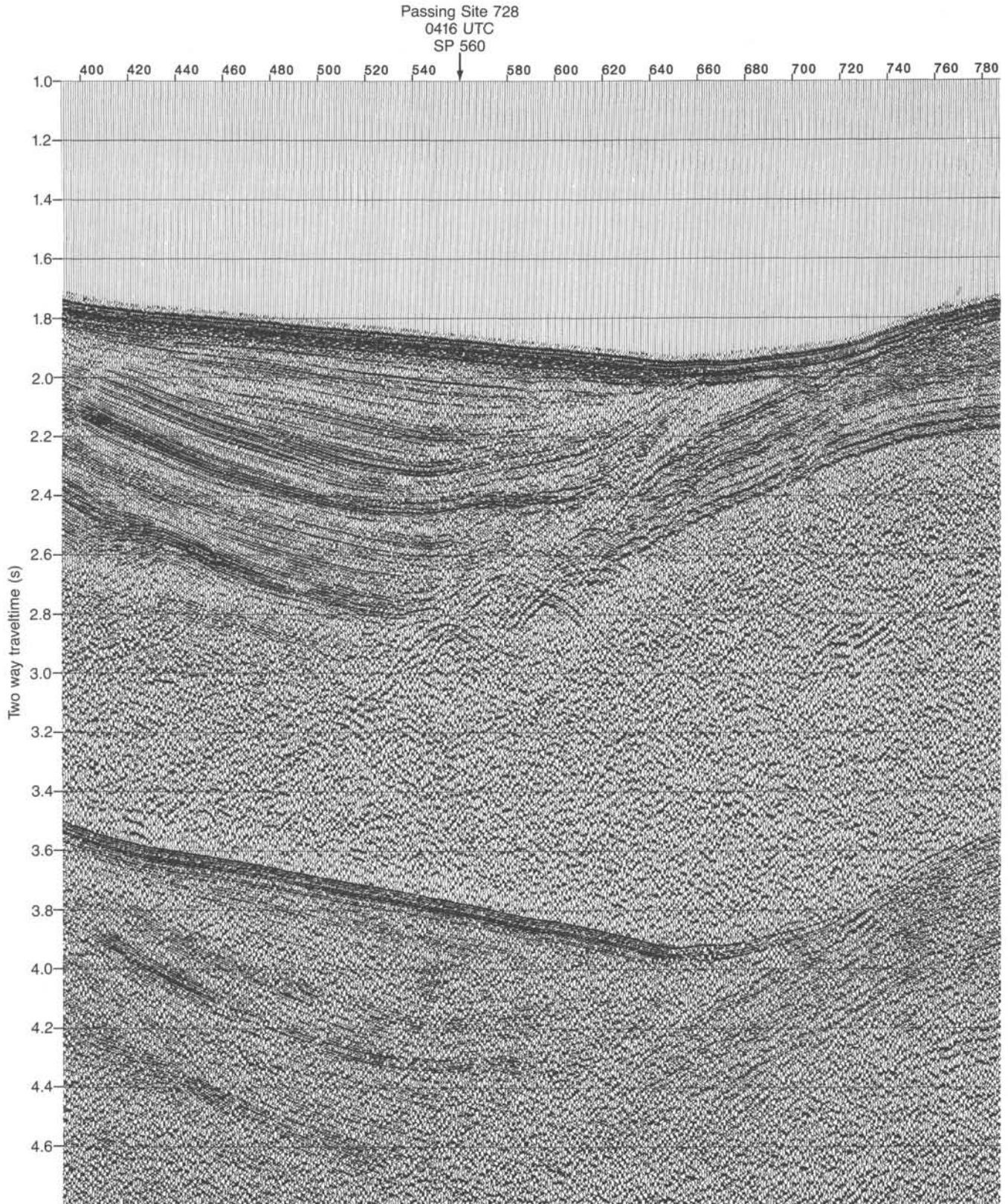


Figure 19 (continued).

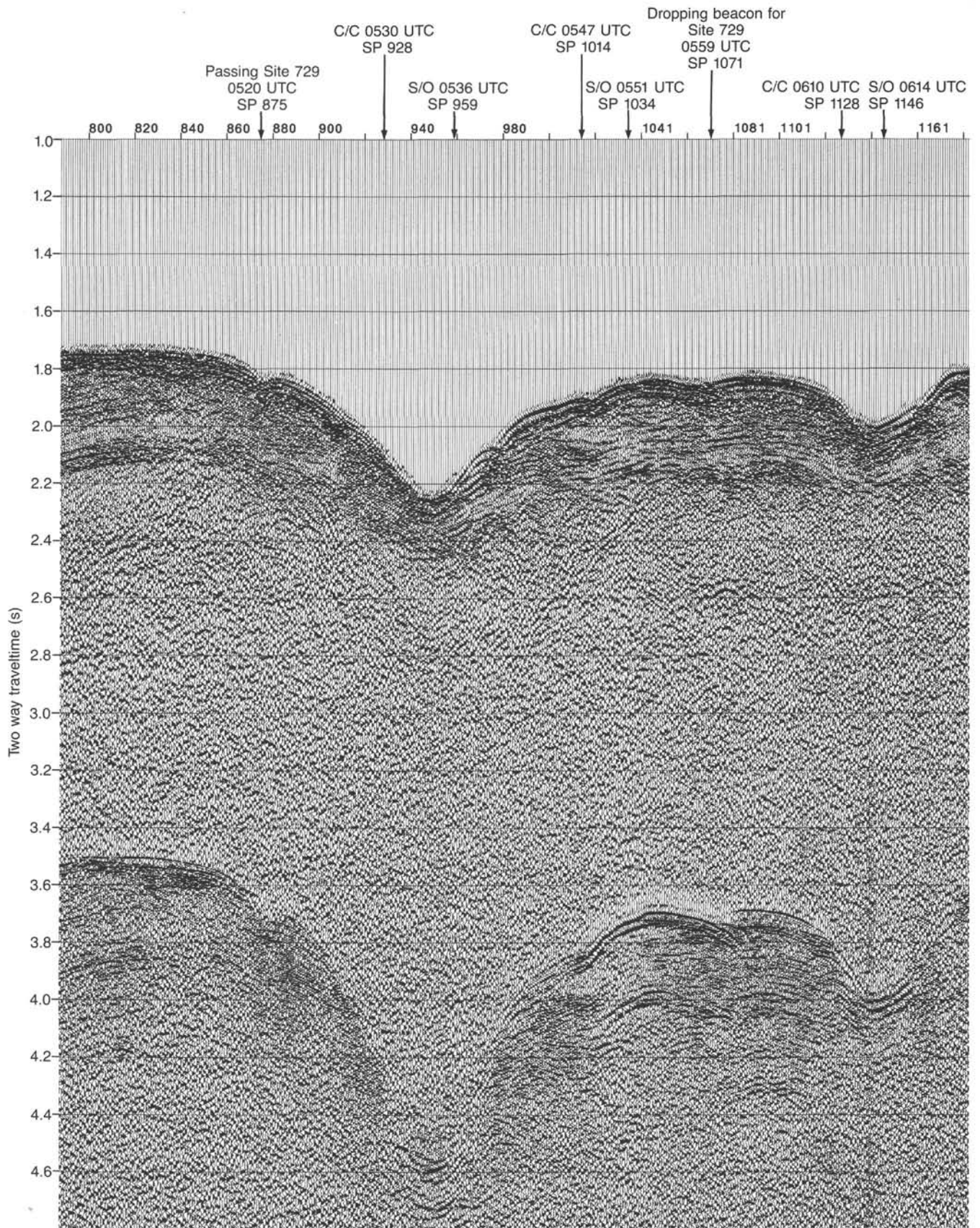


Figure 19 (continued).

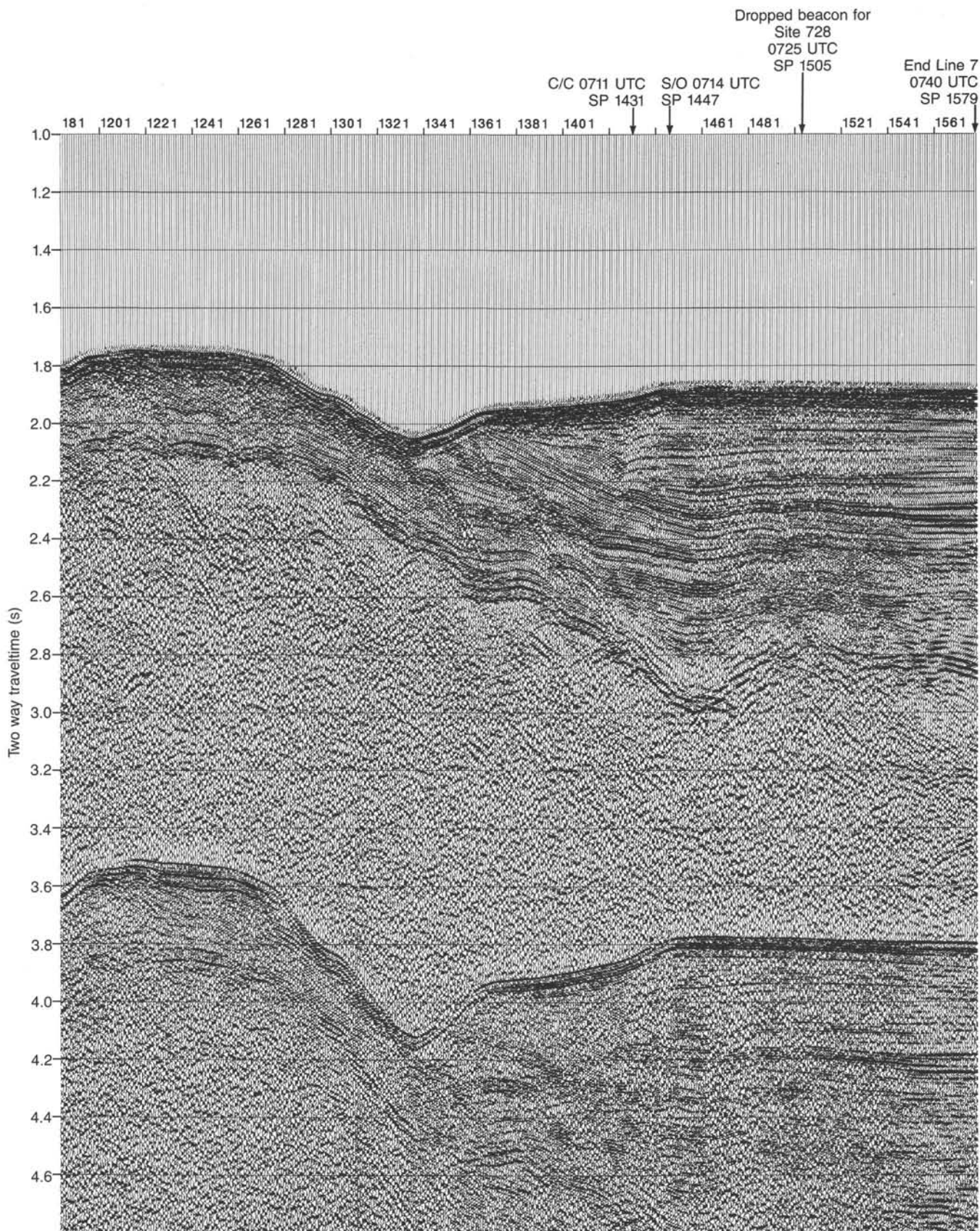


Figure 19 (continued).

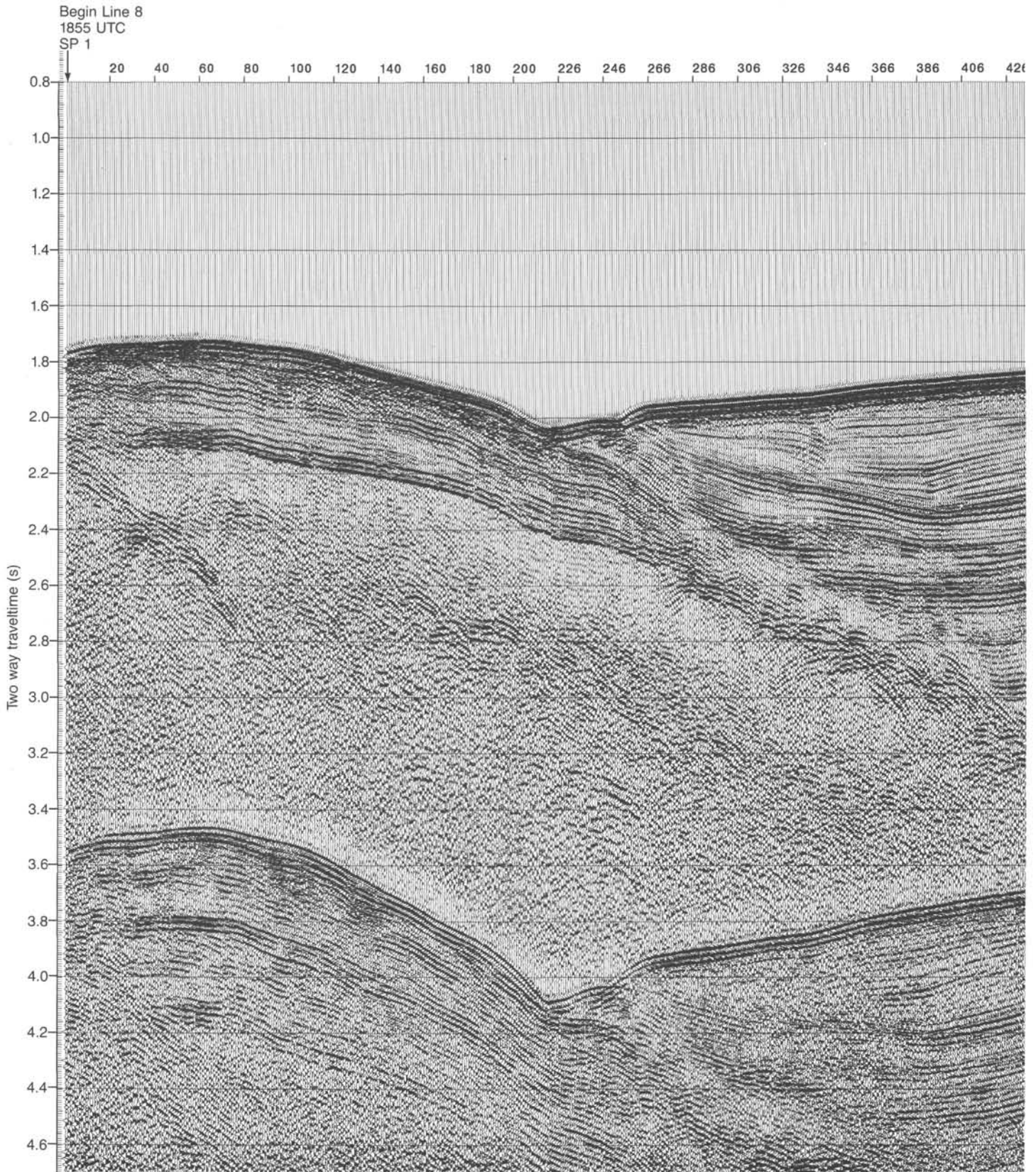


Figure 20. Processed digital seismic profile on line 8, collected en route to and on approach to Site 730. The profile was plotted on the Versatec plotter according to the processing parameters given in Table 2. The ship's track is shown in Figure 18.

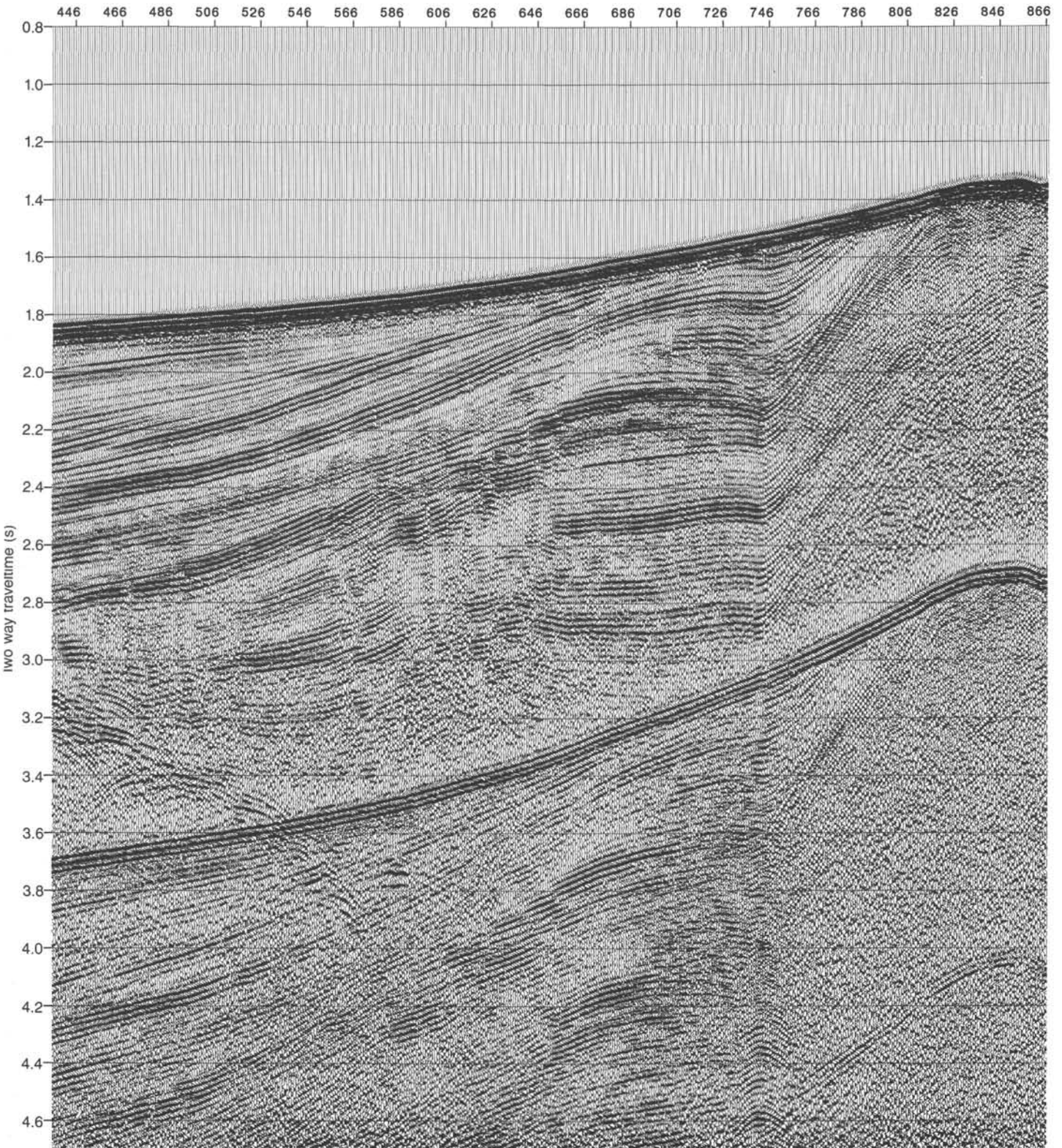


Figure 20 (continued).

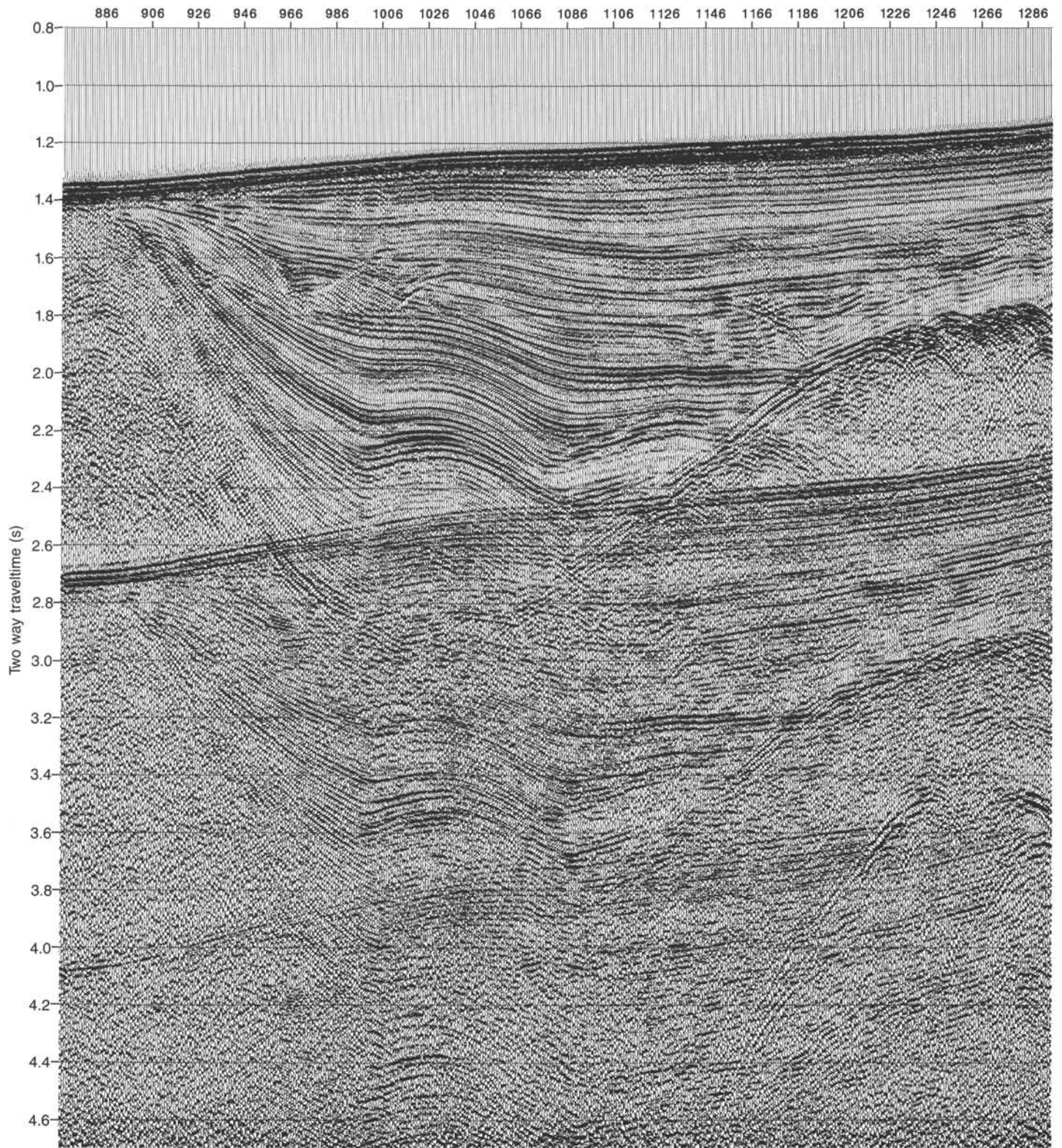


Figure 20 (continued).

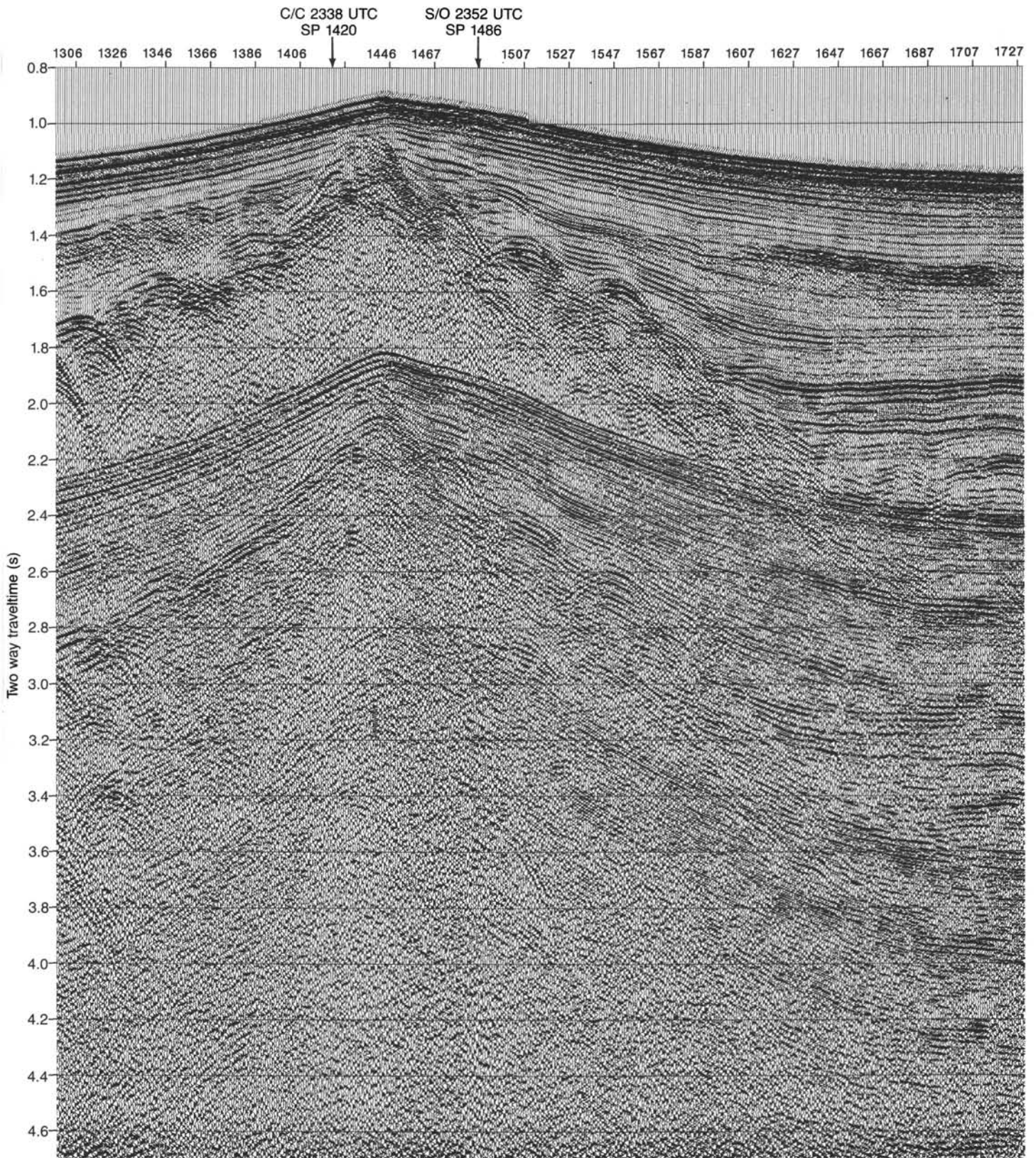


Figure 20 (continued).

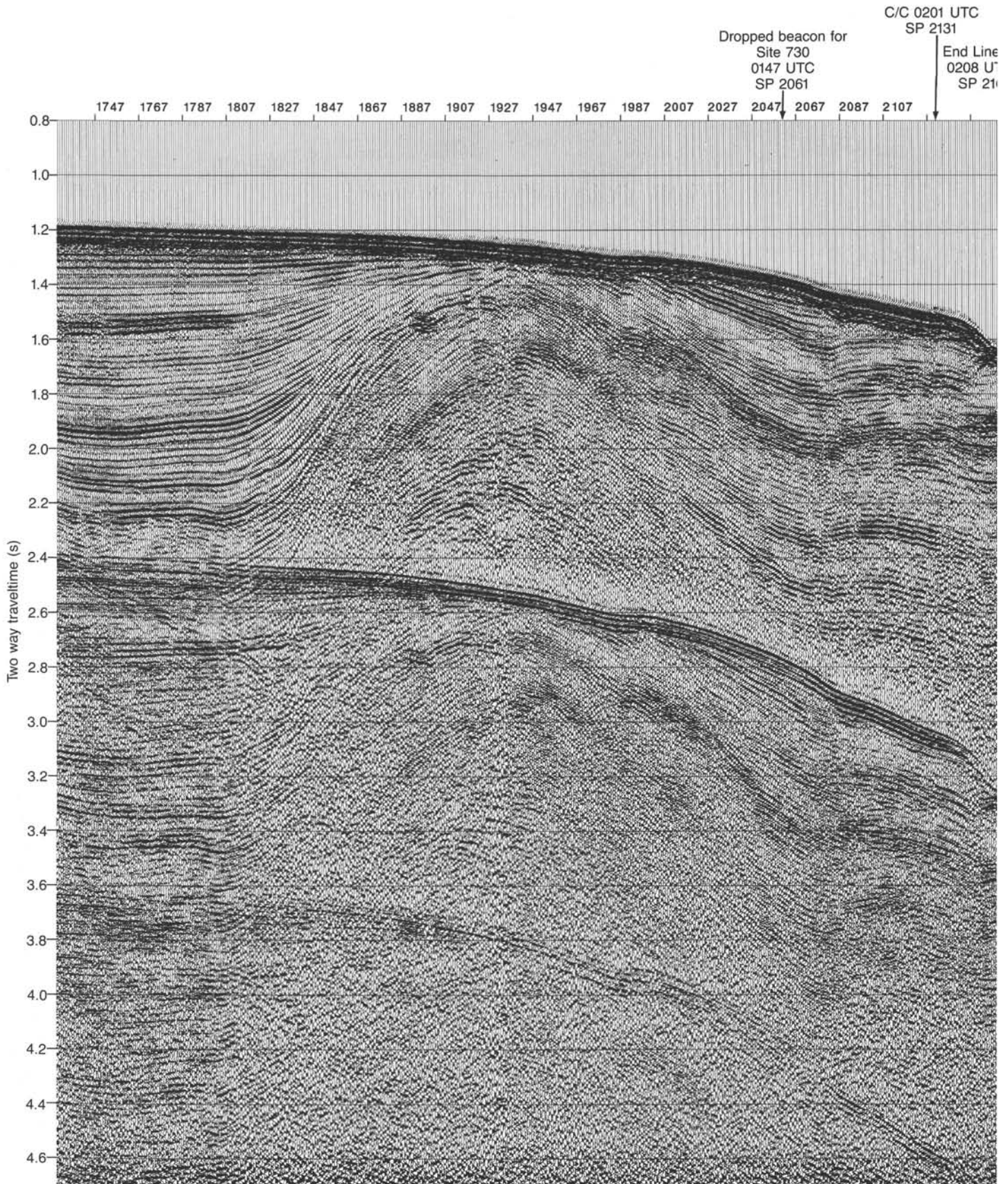


Figure 20 (continued).

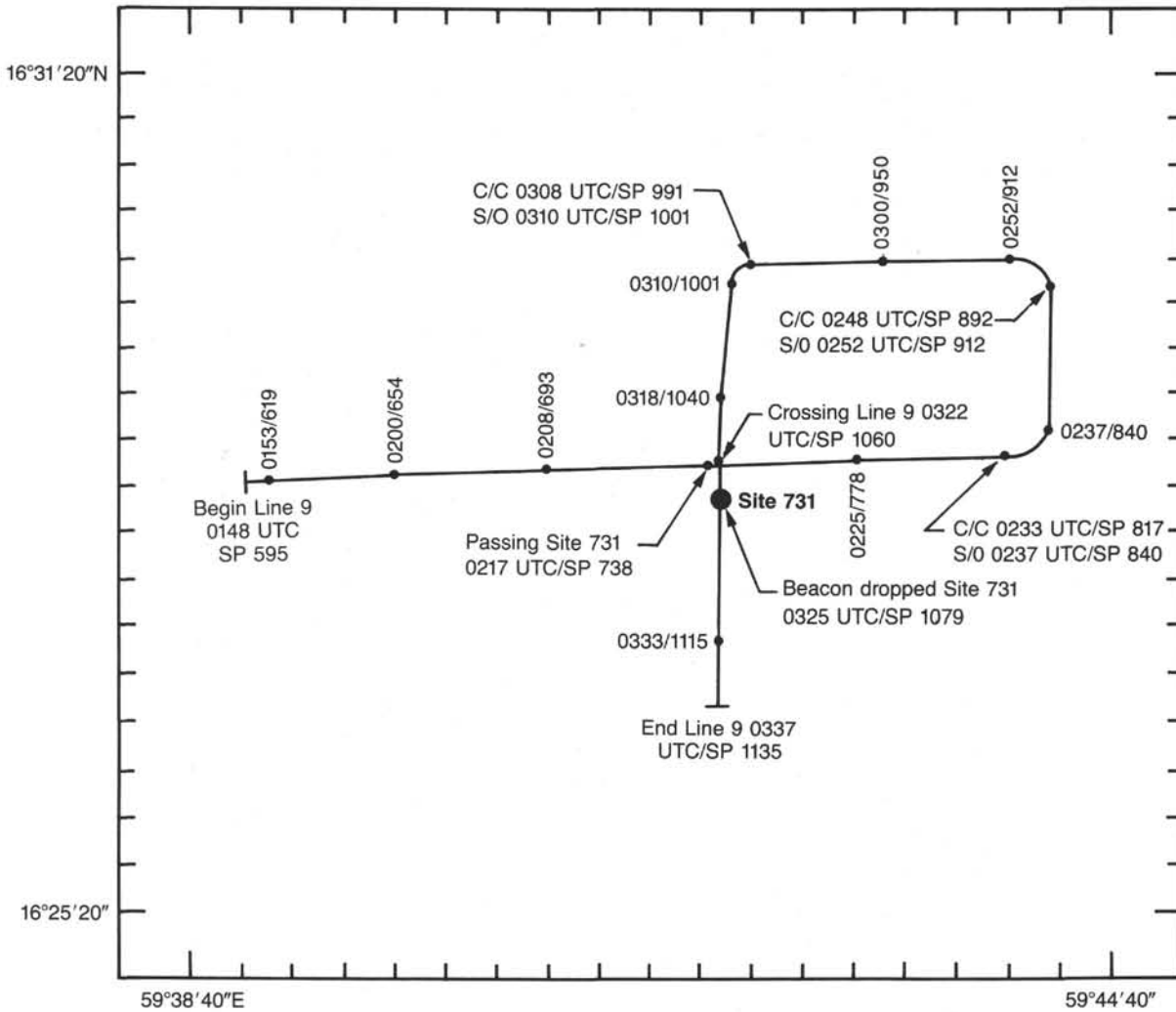


Figure 21. Detailed ship's track for seismic line 9, on approach to Site 731. Satellite fixes are shown as points and are identified by UTC/shotpoint (SP). Extrapolated positions are shown as tick marks. The processed digital seismic profile is shown in Figure 22.

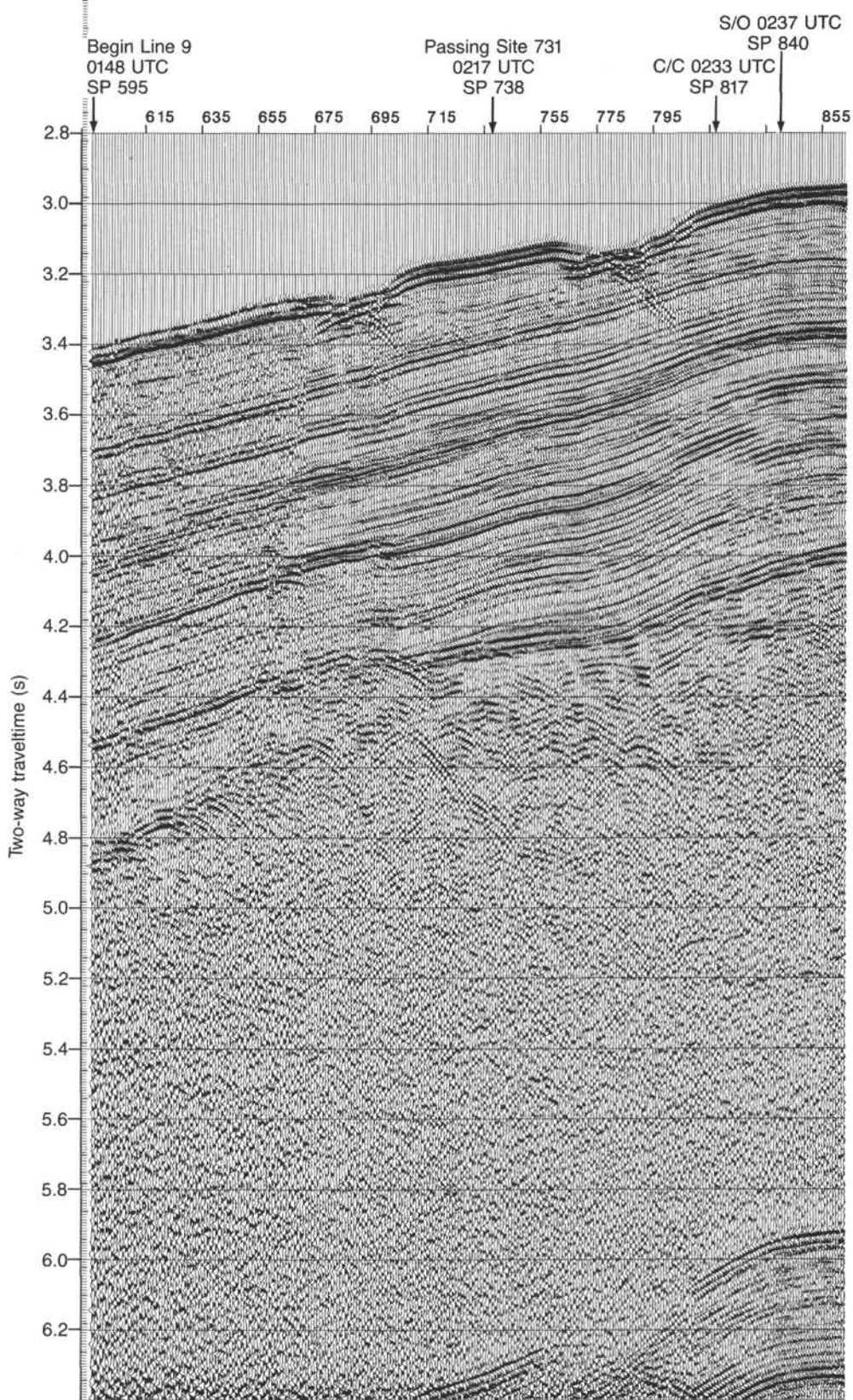


Figure 22. Processed digital seismic profile of line 9, collected on approach to Site 731. The profile was plotted on the Versatec plotter according to the processing parameters given in Table 2. The ship's track is shown in Figure 21.

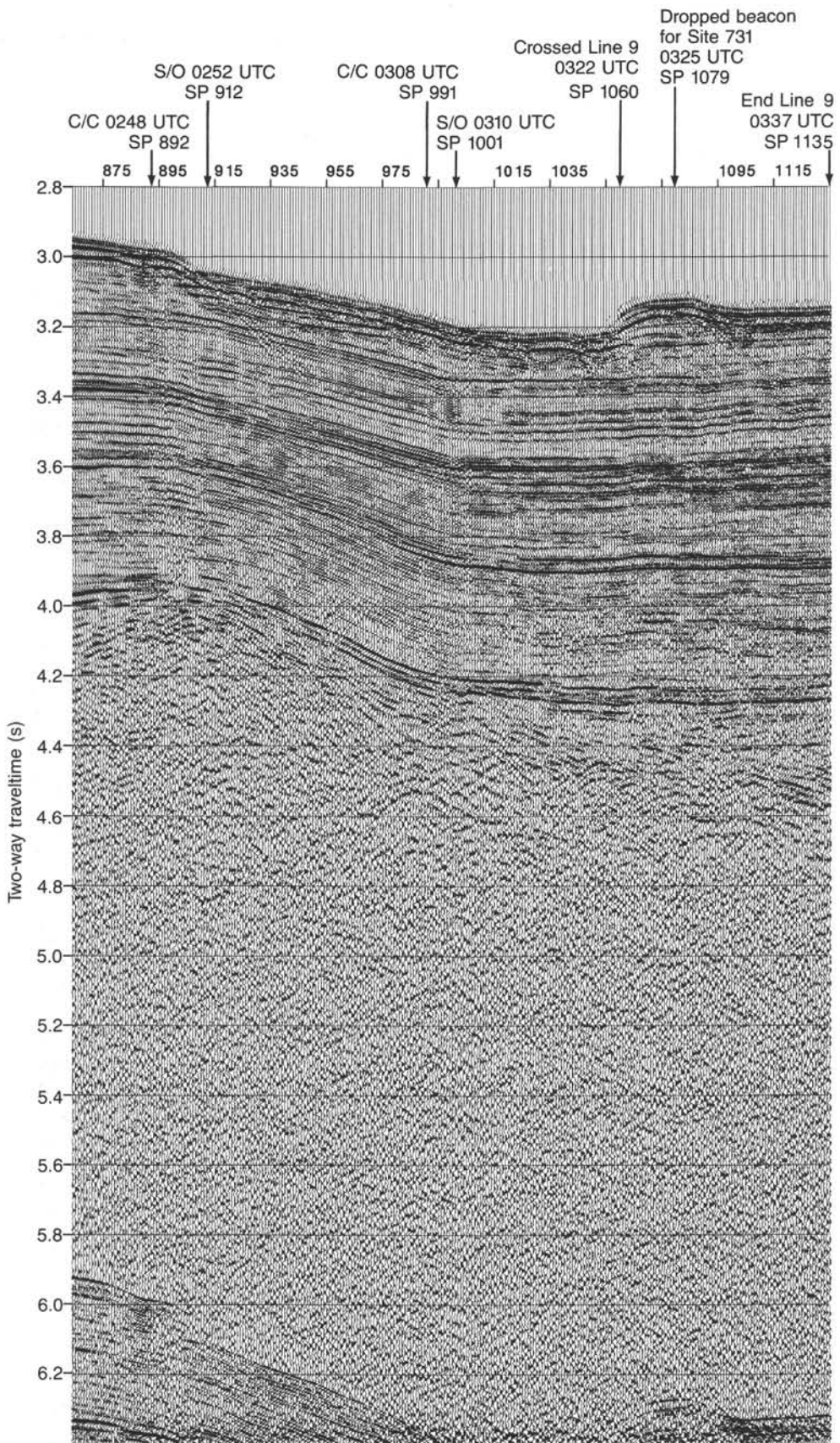


Figure 22 (continued).

APPENDIX

Satellite Navigation And Course- And Speed-change Data Used To Generate The Leg 117 Track-line Plots Shown in Figure 1.

Date (1987)	Julian day	Time (UTC)	North latitude (deg)	(min)	East longitude (deg)	(min)	Distance (nmi)	Actual speed (kt)	Actual course (deg)	Comments ^a
23 Aug	235	1605	6	57.43	79	51.32	0.0	0.0	225	GF
23	235	1635	6	57.42	79	51.31	0.0	1.7	43	GF
23	235	1635	6	57.40	79	51.30	0.0	1.1	301	c/cs
23	235	1638	6	57.40	79	51.30	0.1	2.3	185	c/cs
23	235	1639	6	57.41	79	51.26	0.1	4.2	200	SF
23	235	1641	6	57.30	79	51.20	0.2	4.3	216	c/cs
23	235	1646	6	57.00	79	51.00	0.6	2.1	255	c/cs
23	235	1648	6	57.00	79	50.90	0.7	0.9	285	c/cs
23	235	1651	6	57.00	79	50.90	0.7	1.8	345	c/cs
23	235	1654	6	57.10	79	50.90	0.8	5.9	346	c/cs
23	235	1656	6	57.30	79	50.80	1.0	8.2	346	c/cs
23	235	1658	6	57.50	79	50.70	1.3	9.2	315	c/cs
23	235	1659	6	57.60	79	50.60	1.4	8.6	289	c/cs
23	235	1700	6	57.68	79	50.50	1.6	8.6	293	GF
23	235	1701	6	57.70	79	50.40	1.7	6.2	293	c/cs
23	235	1704	6	57.90	79	50.10	2.0	5.1	296	c/cs
23	235	1711	6	58.10	79	49.50	2.6	6.5	296	c/cs
23	235	1714	6	58.30	79	49.30	2.9	2.8	283	c/cs
23	235	1719	6	58.30	79	49.00	3.2	2.4	299	c/cs
23	235	1742	6	58.80	79	48.20	4.1	4.6	299	c/cs
23	235	1754	6	59.20	79	47.40	5.0	4.8	299	c/cs
23	235	1810	6	59.80	79	46.30	6.3	4.3	273	c/cs
23	235	1812	6	59.80	79	46.10	6.4	3.1	228	c/cs
23	235	1815	6	59.70	79	46.00	6.6	2.6	208	c/cs
23	235	1830	6	59.10	79	45.70	7.2	2.1	212	c/cs
23	235	1833	6	59.10	79	45.60	7.4	1.8	255	c/cs
23	235	1837	6	59.00	79	45.50	7.5	3.1	296	c/cs
23	235	1841	6	59.10	79	45.30	7.7	4.5	297	c/cs
23	235	1850	6	59.40	79	44.70	8.4	4.9	297	c/cs
23	235	1903	6	59.90	79	43.80	9.4	4.5	297	c/cs
23	235	1925	7	0.70	79	42.30	11.1	4.7	295	c/cs
23	235	1949	7	1.50	79	40.60	13.0	4.3	297	c/cs
23	235	2004	7	1.90	79	39.60	14.0	4.7	295	c/cs
23	235	2027	7	2.70	79	37.90	15.9	4.8	295	c/cs
23	235	2047	7	3.40	79	36.50	17.5	4.7	296	c/cs
23	235	2105	7	4.00	79	35.20	18.9	5.0	296	c/cs
23	235	2123	7	4.70	79	33.90	20.4	6.8	295	c/cs
23	235	2130	7	5.00	79	33.10	21.2	7.3	294	c/cs
23	235	2143	7	5.70	79	31.70	22.7	8.8	292	c/cs
23	235	2151	7	6.10	79	30.60	23.9	9.3	292	c/cs
23	235	2208	7	7.10	79	28.10	26.5	9.5	292	c/cs
23	235	2229	7	8.30	79	25.00	29.9	9.9	292	c/cs
23	235	2249	7	9.60	79	21.90	33.2	10.1	292	c/cs
23	235	2309	7	10.90	79	18.80	36.5	10.1	292	c/cs
23	235	2340	7	12.80	79	13.90	41.7	9.9	292	c/cs
24 Aug	236	0000	7	14.10	79	10.90	45.1	9.9	292	c/cs
24	236	0007	7	14.50	79	9.80	46.2	10.2	293	c/cs
24	236	0032	7	16.20	79	5.80	50.5	10.3	293	c/cs
24	236	0043	7	16.90	79	4.10	52.3	10.6	293	c/cs
24	236	0058	7	17.90	79	1.60	55.0	10.4	293	c/cs
24	236	0109	7	18.70	78	59.90	56.9	10.6	293	c/cs
24	236	0116	7	19.20	78	58.70	58.1	10.3	293	c/cs
24	236	0126	7	19.90	78	57.10	59.8	10.6	293	c/cs

APPENDIX (continued).

Date (1987)	Julian day	Time (UTC)	North latitude (deg) (min)		East longitude (deg) (min)		Distance (nmi)	Actual speed (kt)	Actual course (deg)	Comments ^a
24	236	0136	7	20.50	78	55.50	61.6	10.9	293	c/cs
24	236	0142	7	21.00	78	54.50	62.7	10.9	293	c/cs
24	236	0151	7	21.60	78	53.00	64.3	10.7	293	c/cs
24	236	0159	7	22.20	78	51.70	65.7	10.7	293	c/cs
24	236	0202	7	22.40	78	51.20	66.3	10.7	293	c/cs
24	236	0217	7	23.40	78	48.70	68.9	10.2	292	c/cs
24	236	0222	7	23.70	78	47.90	69.8	10.7	292	c/cs
24	236	0227	7	24.10	78	47.10	70.7	9.6	292	c/cs
24	236	0230	7	24.30	78	46.60	71.2	10.7	292	c/cs
24	236	0239	7	24.90	78	45.10	72.8	10.6	292	c/cs
24	236	0255	7	25.90	78	42.50	75.6	10.2	292	c/cs
24	236	0315	7	27.20	78	39.30	79.0	10.2	292	c/cs
24	236	0336	7	28.60	78	35.90	82.6	10.6	293	c/cs
24	236	0341	7	28.90	78	35.10	83.5	10.2	292	c/cs
24	236	0353	7	29.70	78	33.20	85.5	10.6	292	c/cs
24	236	0359	7	30.10	78	32.20	86.6	10.2	291	c/cs
24	236	0411	7	30.80	78	30.30	88.6	10.5	290	c/cs
24	236	0436	7	32.30	78	26.20	93.0	10.1	290	c/cs
24	236	0454	7	33.30	78	23.30	96.0	10.1	290	c/cs
24	236	0514	7	34.50	78	20.10	99.4	9.9	290	c/cs
24	236	0535	7	35.69	78	16.82	102.8	10.3	287	GF
24	236	0542	7	36.00	78	15.70	104.0	10.3	287	c/cs
24	236	0550	7	36.50	78	14.30	105.4	10.4	287	c/cs
24	236	0555	7	36.70	78	13.50	106.3	10.0	287	c/cs
24	236	0600	7	36.95	78	12.70	107.1	10.7	287	GF
24	236	0603	7	37.10	78	12.20	107.6	10.9	287	c/cs
24	236	0621	7	38.10	78	9.00	110.9	10.9	292	c/cs
24	236	0628	7	38.60	78	7.80	112.2	10.4	292	c/cs
24	236	0635	7	39.00	78	6.70	113.4	9.7	291	GF
24	236	0636	7	39.10	78	6.50	113.6	10.2	291	c/cs
24	236	0646	7	39.70	78	4.90	115.3	9.9	291	c/cs
24	236	0700	7	40.50	78	2.76	117.6	10.8	292	GF
24	236	0704	7	40.80	78	2.10	118.3	11.1	292	c/cs
24	236	0714	7	41.50	78	0.40	120.2	11.1	292	c/cs
24	236	0729	7	42.50	77	57.80	122.9	11.7	292	c/cs
24	236	0735	7	42.96	77	56.66	124.1	10.4	294	GF
24	236	0757	7	44.50	77	53.10	127.9	9.9	295	c/cs
24	236	0800	7	44.69	77	52.67	128.4	10.6	296	GF
24	236	0812	7	45.60	77	50.70	130.6	10.9	295	c/cs
24	236	0818	7	46.10	77	49.70	131.7	10.6	295	c/cs
24	236	0828	7	46.90	77	48.10	133.4	11.0	295	c/cs
24	236	0845	7	48.20	77	45.30	136.5	10.8	293	c/cs
24	236	0900	7	49.25	77	42.79	139.2	10.8	293	GF
24	236	0924	7	50.90	77	38.80	143.6	10.8	292	c/cs
24	236	0944	7	52.30	77	35.40	147.2	10.7	292	c/cs
24	236	1000	7	53.39	77	32.75	150.0	10.9	292	GF
24	236	1002	7	53.50	77	32.40	150.4	11.0	293	c/cs
24	236	1024	7	55.10	77	28.70	154.4	11.1	292	c/cs
24	236	1035	7	55.82	77	26.74	156.4	10.8	292	GF
24	236	1044	7	56.40	77	25.20	158.1	10.6	293	c/cs
24	236	1052	7	57.00	77	23.90	159.5	10.5	293	c/cs
24	236	1057	7	57.30	77	23.10	160.3	10.8	293	c/cs
24	236	1100	7	57.50	77	22.58	160.9	11.5	293	GF
24	236	1108	7	58.10	77	21.10	162.4	11.1	292	c/cs

APPENDIX (continued).

Date (1987)	Julian day	Time (UTC)	North latitude (deg) (min)		East longitude (deg) (min)		Distance (nmi)	Actual speed (kt)	Actual course (deg)	Comments ^a
24	236	1117	7	58.70	77	19.60	164.1	11.4	292	c/cs
24	236	1133	7	59.80	77	16.70	167.1	11.3	292	c/cs
24	236	1135	7	59.97	77	16.38	167.5	11.0	291	GF
24	236	1148	8	0.80	77	14.10	169.9	10.9	292	c/cs
24	236	1155	8	1.30	77	12.90	171.2	11.0	292	c/cs
24	236	1200	8	1.67	77	12.09	172.1	11.7	293	GF
24	236	1219	8	3.10	77	8.60	175.8	11.7	293	c/cs
24	236	1235	8	4.30	77	5.73	178.9	11.4	293	GF
24	236	1249	8	5.30	77	3.30	181.6	11.8	293	c/cs
24	236	1300	8	6.18	77	1.26	183.7	11.4	292	GF
24	236	1301	8	6.30	77	1.10	183.9	11.4	292	c/cs
24	236	1309	8	6.80	76	59.70	185.4	11.5	292	c/cs
24	236	1319	8	7.50	76	57.90	187.3	11.1	291	c/cs
24	236	1348	8	9.45	76	52.81	192.7	10.4	289	GF
24	236	1349	8	9.50	76	52.60	192.9	9.7	290	c/cs
24	236	1355	8	9.80	76	51.70	193.8	10.2	289	c/cs
24	236	1400	8	10.12	76	50.91	194.7	11.5	287	GF
24	236	1405	8	10.40	76	50.00	195.7	10.9	288	c/cs
24	236	1418	8	11.14	76	47.73	198.0	9.8	290	GF
24	236	1420	8	11.30	76	47.40	198.3	10.2	289	c/cs
24	236	1428	8	11.70	76	46.10	199.7	9.8	289	c/cs
24	236	1451	8	12.90	76	42.50	203.5	10.1	290	c/cs
24	236	1500	8	13.40	76	41.08	205.0	8.5	297	GF
24	236	1504	8	13.70	76	40.60	205.5	8.5	297	c/cs
24	236	1518	8	14.54	76	38.78	207.5	9.5	289	GF
24	236	1526	8	15.00	76	37.60	208.8	9.2	289	c/cs
24	236	1532	8	15.30	76	36.70	209.7	9.3	292	c/cs
24	236	1542	8	15.80	76	35.20	211.2	9.1	293	c/cs
24	236	1549	8	16.20	76	34.20	212.3	8.8	293	c/cs
24	236	1559	8	16.80	76	32.90	213.8	9.1	293	c/cs
24	236	1619	8	18.00	76	30.10	216.8	9.2	292	c/cs
24	236	1630	8	18.63	76	28.48	218.5	9.6	292	GF
24	236	1645	8	19.50	76	26.20	220.9	10.1	292	c/cs
24	236	1658	8	20.30	76	24.20	223.1	9.7	293	c/cs
24	236	1707	8	20.90	76	22.80	224.5	9.9	293	c/cs
24	236	1715	8	21.43	76	21.59	225.9	9.7	296	GF
24	236	1718	8	21.60	76	21.20	226.3	9.0	296	c/cs
24	236	1723	8	22.00	76	20.50	227.1	9.7	296	c/cs
24	236	1731	8	22.50	76	19.30	228.4	9.3	295	c/cs
24	236	1747	8	23.60	76	17.00	230.9	9.6	296	c/cs
24	236	1759	8	24.40	76	15.30	232.8	9.6	296	c/cs
24	236	1816	8	25.60	76	12.80	235.5	9.5	296	c/cs
24	236	1829	8	26.50	76	10.90	237.6	9.2	293	c/cs
24	236	1839	8	27.10	76	9.50	239.1	9.0	293	c/cs
24	236	1844	8	27.40	76	8.80	239.9	9.5	293	c/cs
24	236	1905	8	28.70	76	5.70	243.2	9.7	293	c/cs
24	236	1922	8	29.80	76	3.20	245.9	9.0	293	c/cs
24	236	1932	8	30.40	76	1.80	247.4	9.5	293	c/cs
24	236	1938	8	30.80	76	0.90	248.4	9.0	293	c/cs
24	236	1950	8	31.50	75	59.20	250.2	9.3	293	c/cs
24	236	2006	8	32.50	75	56.90	252.7	9.5	293	c/cs
24	236	2020	8	33.30	75	54.80	254.9	9.8	293	c/cs
24	236	2043	8	34.80	75	51.40	258.6	10.0	293	c/cs
24	236	2049	8	35.20	75	50.40	259.6	10.1	292	c/cs

APPENDIX (continued).

Date (1987)	Julian day	Time (UTC)	North latitude (deg) (min)	East longitude (deg) (min)	Distance (nmi)	Actual speed (kt)	Actual course (deg)	Comments ^a
24	236	2102	8 36.00	75 48.40	261.8	9.7	293	c/cs
24	236	2116	8 36.90	75 46.30	264.1	9.8	293	c/cs
24	236	2135	8 38.10	75 43.40	267.2	9.4	293	c/cs
24	236	2142	8 38.50	75 42.40	268.2	9.8	293	c/cs
24	236	2147	8 38.86	75 41.64	269.1	10.4	295	SF
24	236	2157	8 39.60	75 40.00	270.8	10.5	294	c/cs
24	236	2208	8 40.40	75 38.30	272.7	10.7	291	c/cs
24	236	2213	8 40.70	75 37.40	273.6	10.3	292	c/cs
24	236	2223	8 41.30	75 35.80	275.3	10.0	292	c/cs
24	236	2228	8 41.60	75 35.00	276.2	10.1	292	c/cs
24	236	2248	8 42.90	75 31.80	279.5	9.3	293	c/cs
24	236	2251	8 43.10	75 31.40	280.0	10.1	292	c/cs
24	236	2314	8 44.50	75 27.80	283.9	10.4	293	c/cs
24	236	2319	8 44.80	75 27.00	284.8	9.6	293	c/cs
24	236	2323	8 45.10	75 26.40	285.4	10.4	292	c/cs
24	236	2341	8 46.20	75 23.40	288.5	10.6	292	c/cs
24	236	2356	8 47.20	75 21.00	291.1	10.2	292	c/cs
25 Aug	237	0000	8 47.50	75 20.30	291.8	10.2	292	c/cs
25	237	0007	8 47.90	75 19.20	293.0	9.6	293	c/cs
25	237	0012	8 48.20	75 18.50	293.8	10.3	292	c/cs
25	237	0027	8 49.20	75 16.00	296.4	10.6	292	c/cs
25	237	0039	8 50.00	75 14.00	298.5	10.4	293	c/cs
25	237	0044	8 50.30	75 13.20	299.4	10.2	292	c/cs
25	237	0053	8 50.90	75 11.80	300.9	10.0	292	c/cs
25	237	0105	8 51.60	75 9.90	302.9	10.5	292	c/cs
25	237	0123	8 52.80	75 7.00	306.1	10.3	292	c/cs
25	237	0133	8 53.40	75 5.40	307.8	10.7	291	c/cs
25	237	0143	8 54.10	75 3.70	309.6	10.4	291	c/cs
25	237	0156	8 54.90	75 1.50	311.8	10.0	291	c/cs
25	237	0201	8 55.20	75 0.80	312.6	10.8	291	c/cs
25	237	0216	8 56.10	74 58.20	315.3	10.5	290	c/cs
25	237	0223	8 56.50	74 57.00	316.6	10.7	291	c/cs
25	237	0229	8 56.90	74 56.00	317.6	10.2	291	c/cs
25	237	0244	8 57.80	74 53.60	320.2	10.3	290	c/cs
25	237	0254	8 58.40	74 52.00	321.9	10.2	291	c/cs
25	237	0301	8 58.80	74 50.90	323.1	10.7	291	c/cs
25	237	0307	8 59.20	74 49.90	324.1	10.5	291	c/cs
25	237	0327	9 0.50	74 46.50	327.6	10.6	290	c/cs
25	237	0340	9 1.30	74 44.40	329.9	10.2	290	c/cs
25	237	0355	9 2.10	74 41.90	332.5	10.1	290	c/cs
25	237	0413	9 3.20	74 39.10	335.5	10.5	291	c/cs
25	237	0423	9 3.80	74 37.40	337.2	10.4	290	c/cs
25	237	0451	9 5.40	74 32.80	342.1	10.3	291	c/cs
25	237	0501	9 6.00	74 31.20	343.8	10.1	291	c/cs
25	237	0506	9 6.30	74 30.40	344.6	10.6	290	c/cs
25	237	0519	9 7.10	74 28.20	347.0	10.4	291	c/cs
25	237	0524	9 7.40	74 27.40	347.8	10.3	290	c/cs
25	237	0530	9 7.79	74 26.39	348.8	10.2	290	GF
25	237	0532	9 7.90	74 26.10	349.2	9.7	292	c/cs
25	237	0547	9 8.80	74 23.80	351.6	10.6	293	c/cs
25	237	0549	9 8.94	74 23.45	352.0	10.3	292	GF
25	237	0600	9 9.63	74 21.68	353.8	10.2	289	GF
25	237	0605	9 9.90	74 20.90	354.7	10.2	289	c/cs
25	237	0619	9 10.70	74 18.60	357.1	9.8	290	GF

APPENDIX (continued).

Date (1987)	Julian day	Time (UTC)	North latitude (deg) (min)		East longitude (deg) (min)		Distance (nmi)	Actual speed (kt)	Actual course (deg)	Comments ^a
25	237	0628	9	11.20	74	17.20	358.5	9.2	290	c/cs
25	237	0630	9	11.31	74	16.91	358.8	9.5	291	GF
25	237	0640	9	11.90	74	15.40	360.4	10.0	291	c/cs
25	237	0649	9	12.41	74	13.99	361.9	9.8	291	GF
25	237	0653	9	12.60	74	13.40	362.6	10.2	291	c/cs
25	237	0658	9	12.90	74	12.60	363.4	11.0	291	c/cs
25	237	0700	9	13.07	74	12.22	363.8	11.0	292	GF
25	237	0701	9	13.10	74	12.00	364.0	10.4	292	c/cs
25	237	0716	9	14.10	74	9.60	366.6	10.8	291	c/cs
25	237	0728	9	14.90	74	7.50	368.8	10.1	291	c/cs
25	237	0730	9	14.99	74	7.23	369.1	10.3	291	GF
25	237	0741	9	15.70	74	5.40	371.0	10.6	291	c/cs
25	237	0746	9	16.00	74	4.60	371.9	10.0	292	c/cs
25	237	0749	9	16.19	74	4.14	372.4	9.8	291	GF
25	237	0800	9	16.82	74	2.44	374.2	9.9	290	GF
25	237	0804	9	17.00	74	1.80	374.8	10.9	290	C/CS
25	237	0822	9	18.20	73	58.70	378.1	10.5	291	C/CS
25	237	0829	9	18.60	73	57.50	379.3	10.3	290	C/CS
25	237	0830	9	18.65	73	57.35	379.5	10.4	291	GF
25	237	0849	9	19.82	73	54.22	382.8	10.3	290	GF
25	237	0855	9	20.20	73	53.20	383.8	10.5	291	C/CS
25	237	0900	9	20.49	73	52.42	384.7	10.3	292	GF
25	237	0900	9	20.50	73	52.40	384.7	9.8	291	C/CS
25	237	0918	9	21.50	73	49.60	387.7	10.0	291	C/CS
25	237	0930	9	22.24	73	47.73	389.7	10.2	290	GF
25	237	0930	9	22.20	73	47.70	389.7	10.0	291	C/CS
25	237	0933	9	22.40	73	47.30	390.1	10.5	291	C/CS
25	237	0937	9	22.70	73	46.60	390.9	9.9	290	C/CS
25	237	0949	9	23.36	73	44.72	392.8	9.8	291	GF
25	237	0956	9	23.80	73	43.60	394.0	10.2	291	C/CS
25	237	1000	9	24.00	73	43.00	394.6	10.2	290	GF
25	237	1011	9	24.60	73	41.20	396.5	9.9	291	C/CS
25	237	1024	9	25.40	73	39.20	398.7	9.8	290	C/CS
25	237	1030	9	25.72	73	38.25	399.6	9.8	289	GF
25	237	1036	9	26.00	73	37.30	400.6	10.1	290	C/CS
25	237	1100	9	27.43	73	33.44	404.7	10.2	290	GF
25	237	1102	9	27.50	73	33.10	405.0	9.9	290	C/CS
25	237	1114	9	28.20	73	31.20	407.0	10.3	289	C/CS
25	237	1119	9	28.48	73	30.41	407.8	9.8	289	GF
25	237	1122	9	28.60	73	29.90	408.3	9.5	289	C/CS
25	237	1130	9	29.05	73	28.73	409.6	9.8	289	GF
25	237	1132	9	29.20	73	28.40	409.9	9.4	290	C/CS
25	237	1153	9	30.30	73	25.30	413.2	9.5	290	C/CS
25	237	1200	9	30.65	73	24.22	414.3	9.7	290	GF
25	237	1202	9	30.80	73	23.90	414.6	9.6	289	C/CS
25	237	1215	9	31.40	73	21.90	416.7	9.3	289	C/CS
25	237	1219	9	31.65	73	21.33	417.3	9.0	289	GF
25	237	1220	9	31.70	73	21.20	417.5	9.6	289	c/cs
25	237	1226	9	32.00	73	20.30	418.4	9.2	289	c/cs
25	237	1230	9	32.20	73	19.68	419.1	9.4	288	GF
25	237	1238	9	32.60	73	18.50	420.3	9.7	289	c/cs
25	237	1251	9	33.30	73	16.40	422.4	9.9	288	c/cs
25	237	1300	9	33.71	73	15.02	423.9	9.9	288	GF
25	237	1306	9	34.00	73	14.10	424.9	9.7	288	c/cs

APPENDIX (continued).

Date (1987)	Julian day	Time (UTC)	North latitude (deg) (min)		East longitude (deg) (min)		Distance (nmi)	Actual speed (kt)	Actual course (deg)	Comments ^a
25	237	1316	9	34.50	73	12.50	426.5	9.9	288	c/cs
25	237	1319	9	34.65	73	12.03	427.0	9.7	288	GF
25	237	1329	9	35.10	73	10.50	428.6	9.9	288	c/cs
25	237	1341	9	35.70	73	8.60	430.6	10.1	290	c/cs
25	237	1349	9	36.20	73	7.27	431.9	9.7	289	GF
25	237	1400	9	36.79	73	5.57	433.7	9.8	289	GF
25	237	1402	9	36.90	73	5.30	434.0	9.6	289	c/cs
25	237	1414	9	37.50	73	3.40	436.0	9.7	288	c/cs
25	237	1425	9	38.10	73	1.70	437.7	9.7	289	c/cs
25	237	1430	9	38.32	73	0.92	438.5	10.0	290	GF
25	237	1430	9	38.30	73	0.90	438.5	9.3	290	c/cs
25	237	1448	9	39.30	72	58.30	441.3	10.0	292	c/cs
25	237	1457	9	39.80	72	56.90	442.8	9.7	291	c/cs
25	237	1500	9	40.01	72	56.41	443.3	9.8	290	GF
25	237	1528	9	41.60	72	52.00	447.9	10.7	291	c/cs
25	237	1531	9	41.80	72	51.50	448.4	9.7	291	c/cs
25	237	1536	9	42.10	72	50.80	449.2	10.0	290	c/cs
25	237	1549	9	42.80	72	48.70	451.4	9.8	290	c/cs
25	237	1600	9	43.40	72	47.00	453.2	10.1	291	GF
25	237	1604	9	43.60	72	46.40	453.9	10.4	291	c/cs
25	237	1617	9	44.50	72	44.20	456.1	9.8	290	c/cs
25	237	1619	9	44.57	72	43.92	456.4	9.5	290	GF
25	237	1624	9	44.80	72	43.20	457.2	9.7	291	c/cs
25	237	1630	9	45.19	72	42.25	458.2	10.1	292	GF
25	237	1654	9	46.70	72	38.50	462.2	9.7	293	c/cs
25	237	1702	9	47.20	72	37.30	463.5	10.3	292	c/cs
25	237	1714	9	48.00	72	35.30	465.6	10.3	292	c/cs
25	237	1725	9	48.70	72	33.60	467.4	10.4	292	c/cs
25	237	1738	9	49.50	72	31.40	469.7	10.0	293	c/cs
25	237	1750	9	50.30	72	29.60	471.7	10.2	291	c/cs
25	237	1803	9	51.10	72	27.50	473.9	9.8	292	c/cs
25	237	1813	9	51.70	72	26.00	475.5	10.3	291	c/cs
25	237	1821	9	52.20	72	24.70	476.9	10.0	291	c/cs
25	237	1836	9	53.10	72	22.30	479.4	9.8	292	c/cs
25	237	1841	9	53.40	72	21.50	480.2	9.9	292	c/cs
25	237	1907	9	55.00	72	17.50	484.5	10.3	292	c/cs
25	237	1919	9	55.80	72	15.50	486.6	9.6	292	c/cs
25	237	1924	9	56.10	72	14.80	487.4	10.3	292	c/cs
25	237	1929	9	56.40	72	14.00	488.3	9.7	292	c/cs
25	237	1935	9	56.80	72	13.00	489.2	10.2	292	c/cs
25	237	1942	9	57.30	72	11.90	490.4	9.7	293	c/cs
25	237	1950	9	57.80	72	10.70	491.7	10.2	292	c/cs
25	237	2005	9	58.70	72	8.30	494.3	9.8	297	c/cs
25	237	2023	10	0.00	72	5.60	497.2	10.0	297	c/cs
25	237	2033	10	0.80	72	4.10	498.9	9.6	297	c/cs
25	237	2046	10	1.70	72	2.20	501.0	10.1	296	c/cs
25	237	2100	10	2.80	72	0.10	503.3	10.2	297	c/cs
25	237	2105	10	3.20	71	59.30	504.2	10.1	297	c/cs
25	237	2116	10	4.00	71	57.60	506.0	9.9	298	c/cs
25	237	2124	10	4.61	71	56.46	507.3	9.8	300	SF
25	237	2136	10	5.60	71	54.70	509.3	10.0	299	c/cs
25	237	2144	10	6.20	71	53.50	510.6	9.8	300	c/cs
25	237	2152	10	6.90	71	52.40	511.9	10.1	299	c/cs
25	237	2159	10	7.40	71	51.30	513.1	10.1	299	c/cs

APPENDIX (continued).

Date (1987)	Julian day	Time (UTC)	North latitude (deg) (min)		East longitude (deg) (min)		Distance (nmi)	Actual speed (kt)	Actual course (deg)	Comments ^a
25	237	2212	10	8.50	71	49.40	515.3	9.5	299	c/cs
25	237	2229	10	9.80	71	47.00	518.0	10.0	299	c/cs
25	237	2245	10	11.10	71	44.60	520.7	10.2	299	c/cs
25	237	2252	10	11.60	71	43.60	521.8	9.6	299	c/cs
25	237	2315	10	13.40	71	40.30	525.5	9.9	300	c/cs
25	237	2333	10	14.90	71	37.70	528.5	9.9	301	c/cs
25	237	2338	10	15.30	71	36.90	529.3	9.4	301	c/cs
25	237	2343	10	15.70	71	36.20	530.1	9.7	301	c/cs
25	237	2350	10	16.30	71	35.30	531.2	10.0	301	c/cs
25	237	2356	10	16.80	71	34.40	532.2	9.9	301	c/cs
26	Aug 238	0000	10	17.10	71	33.80	532.9	9.9	301	c/cs
26	238	0014	10	18.30	71	31.80	535.2	9.3	301	c/cs
26	238	0021	10	18.80	71	30.80	536.3	9.6	301	c/cs
26	238	0036	10	20.10	71	28.80	538.7	10.1	301	c/cs
26	238	0047	10	21.00	71	27.14	540.5	10.3	300	SF
26	238	0057	10	21.90	71	25.60	542.2	9.7	300	c/cs
26	238	0110	10	22.90	71	23.80	544.3	10.1	299	c/cs
26	238	0119	10	23.70	71	22.40	545.9	10.3	299	c/cs
26	238	0123	10	24.00	71	21.83	546.6	10.3	301	SF
26	238	0132	10	24.80	71	20.50	548.1	10.1	302	c/cs
26	238	0200	10	27.30	71	16.40	552.8	9.9	301	c/cs
26	238	0208	10	27.90	71	15.30	554.1	10.3	301	c/cs
26	238	0221	10	29.10	71	13.30	556.3	9.9	302	c/cs
26	238	0228	10	29.70	71	12.30	557.5	10.2	301	c/cs
26	238	0241	10	30.80	71	10.40	559.7	10.4	302	c/cs
26	238	0253	10	31.90	71	8.60	561.8	10.2	301	c/cs
26	238	0311	10	33.40	71	5.90	564.8	10.0	302	c/cs
26	238	0322	10	34.40	71	4.30	566.7	9.5	302	c/cs
26	238	0334	10	35.40	71	2.60	568.6	9.3	302	c/cs
26	238	0344	10	36.20	71	1.30	570.1	9.9	301	c/cs
26	238	0349	10	36.60	71	0.60	571.0	10.5	302	c/cs
26	238	0355	10	37.20	70	59.70	572.0	10.3	301	c/cs
26	238	0404	10	38.00	70	58.30	573.6	10.4	301	c/cs
26	238	0412	10	38.70	70	57.10	574.9	9.8	301	c/cs
26	238	0422	10	39.50	70	55.70	576.6	10.1	301	c/cs
26	238	0438	10	40.90	70	53.30	579.3	10.8	301	c/cs
26	238	0445	10	41.50	70	52.20	580.5	10.0	301	c/cs
26	238	0450	10	41.90	70	51.50	581.3	10.2	302	c/cs
26	238	0455	10	42.40	70	50.80	582.2	10.2	301	c/cs
26	238	0516	10	44.20	70	47.70	585.8	10.8	301	c/cs
26	238	0526	10	45.10	70	46.10	587.6	10.2	301	c/cs
26	238	0530	10	45.49	70	45.49	588.2	10.2	302	GF
26	238	0600	10	48.15	70	41.08	593.3	10.0	299	GF
26	238	0626	10	50.30	70	37.20	597.6	10.0	298	c/cs
26	238	0630	10	50.58	70	36.65	598.3	10.3	299	GF
26	238	0632	10	50.70	70	36.30	598.7	10.5	298	c/cs
26	238	0649	10	52.15	70	33.67	601.6	9.7	298	GF
26	238	0654	10	52.50	70	32.90	602.4	9.9	298	c/cs
26	238	0715	10	54.20	70	29.90	605.9	9.9	303	c/cs
26	238	0728	10	55.30	70	28.00	608.0	9.7	304	c/cs
26	238	0730	10	55.51	70	27.74	608.4	9.8	302	GF
26	238	0735	10	55.90	70	27.00	609.2	10.1	302	c/cs
26	238	0748	10	57.10	70	25.10	611.4	10.0	302	c/cs
26	238	0756	10	57.80	70	24.00	612.7	10.0	302	c/cs

APPENDIX (continued).

Date (1987)	Julian day	Time (UTC)	North latitude (deg) (min)		East longitude (deg) (min)		Distance (nmi)	Actual speed (kt)	Actual course (deg)	Comments ^a
26	238	0806	10	58.70	70	22.50	614.4	9.9	302	c/cs
26	238	0830	11	0.77	70	19.14	618.3	9.7	302	GF
26	238	0834	11	1.10	70	18.60	619.0	10.2	302	c/cs
26	238	0844	11	2.00	70	17.10	620.6	9.9	302	c/cs
26	238	0852	11	2.70	70	16.00	622.0	9.9	303	c/cs
26	238	0857	11	3.20	70	15.30	622.8	9.5	302	c/cs
26	238	0900	11	3.44	70	14.89	623.3	9.9	301	GF
26	238	0902	11	3.60	70	14.60	623.6	10.4	301	c/cs
26	238	0912	11	4.50	70	13.10	625.3	10.1	301	c/cs
26	238	0919	11	5.12	70	12.06	626.5	9.2	301	GF
26	238	0930	11	5.99	70	10.59	628.2	9.6	301	GF
26	238	0932	11	6.20	70	10.30	628.5	9.6	301	c/cs
26	238	0940	11	6.80	70	9.20	629.8	9.8	301	c/cs
26	238	0947	11	7.40	70	8.20	630.9	9.8	301	c/cs
26	238	0958	11	8.30	70	6.60	632.7	10.0	301	c/cs
26	238	1000	11	8.51	70	6.36	633.0	9.9	302	GF
26	238	1018	11	10.10	70	3.80	636.0	9.8	302	c/cs
26	238	1028	11	11.00	70	2.40	637.7	9.6	302	c/cs
26	238	1030	11	11.12	70	2.10	638.0	9.8	302	GF
26	238	1048	11	12.70	69	59.60	640.9	10.2	302	c/cs
26	238	1100	11	13.79	69	57.80	643.0	10.0	302	GF
26	238	1119	11	15.47	69	55.05	646.1	9.1	302	GF
26	238	1130	11	16.35	69	53.61	647.8	10.0	301	GF
26	238	1133	11	16.60	69	53.20	648.3	9.8	301	c/cs
26	238	1209	11	19.70	69	48.00	654.2	9.7	301	c/cs
26	238	1223	11	20.80	69	46.10	656.4	9.4	301	c/cs
26	238	1230	11	21.41	69	45.13	657.5	10.1	300	GF
26	238	1246	11	22.70	69	42.70	660.2	10.2	300	c/cs
26	238	1249	11	23.00	69	42.29	660.7	9.0	300	GF
26	238	1259	11	23.70	69	41.00	662.2	9.1	300	c/cs
26	238	1300	11	23.82	69	40.83	662.4	9.8	300	GF
26	238	1310	11	24.60	69	39.40	664.0	9.8	300	c/cs
26	238	1329	11	26.20	69	36.70	667.1	9.8	300	c/cs
26	238	1330	11	26.27	69	36.52	667.3	9.8	302	GF
26	238	1337	11	26.90	69	35.50	668.4	9.4	302	c/cs
26	238	1350	11	27.90	69	33.80	670.5	9.5	301	c/cs
26	238	1400	11	28.74	69	32.37	672.0	10.0	301	GF
26	238	1400	11	28.70	69	32.40	672.0	9.7	301	c/cs
26	238	1407	11	29.30	69	31.40	673.2	10.3	301	c/cs
26	238	1419	11	30.39	69	29.58	675.2	9.3	301	GF
26	238	1426	11	30.90	69	28.60	676.3	9.1	301	c/cs
26	238	1430	11	31.26	69	28.10	676.9	10.0	302	GF
26	238	1453	11	33.30	69	24.80	680.8	10.0	302	c/cs
26	238	1503	11	34.10	69	23.30	682.4	9.6	301	c/cs
26	238	1519	11	35.50	69	21.10	685.0	10.0	301	c/cs
26	238	1527	11	36.14	69	19.89	686.3	9.6	301	SF
26	238	1532	11	36.60	69	19.20	687.1	9.0	301	c/cs
26	238	1539	11	37.10	69	18.30	688.2	9.3	301	c/cs
26	238	1552	11	38.10	69	16.50	690.2	9.3	301	c/cs
26	238	1555	11	38.40	69	16.10	690.7	9.8	301	c/cs
26	238	1559	11	38.70	69	15.50	691.3	9.9	301	c/cs
26	238	1600	11	38.80	69	15.39	691.5	10.6	300	SF
26	238	1602	11	39.00	69	15.10	691.8	9.6	299	c/cs
26	238	1610	11	39.60	69	13.90	693.1	10.1	299	c/cs

APPENDIX (continued).

Date (1987)	Julian day	Time (UTC)	North		East		Distance (nmi)	Actual		Comments ^a
			latitude (deg)	(min)	longitude (deg)	(min)		speed (kt)	course (deg)	
26	238	1630	11	41.20	69	10.90	696.5	9.7	300	GF
26	238	1637	11	41.80	69	9.90	697.6	9.8	300	c/cs
26	238	1643	11	42.30	69	9.00	698.6	10.5	300	c/cs
26	238	1648	11	42.70	69	8.30	699.5	9.7	300	c/cs
26	238	1701	11	43.70	69	6.40	701.6	10.6	300	c/cs
26	238	1703	11	43.90	69	6.10	701.9	9.7	300	c/cs
26	238	1716	11	45.00	69	4.20	704.0	9.8	300	c/cs
26	238	1728	11	45.90	69	2.50	706.0	9.9	299	c/cs
26	238	1759	11	48.40	68	57.90	711.1	10.0	299	c/cs
26	238	1804	11	48.80	68	57.20	711.9	10.7	300	c/cs
26	238	1807	11	49.10	68	56.70	712.5	9.8	300	c/cs
26	238	1817	11	49.90	68	55.30	714.1	9.4	300	c/cs
26	238	1827	11	50.70	68	53.90	715.7	10.0	300	c/cs
26	238	1840	11	51.70	68	51.90	717.8	9.9	299	c/cs
26	238	1845	11	52.10	68	51.20	718.7	10.3	299	c/cs
26	238	1852	11	52.70	68	50.10	719.9	9.8	299	c/cs
26	238	1905	11	53.80	68	48.20	722.0	10.3	299	c/cs
26	238	1907	11	53.90	68	47.90	722.3	9.5	299	c/cs
26	238	1913	11	54.40	68	47.10	723.3	10.0	299	c/cs
26	238	1925	11	55.30	68	45.30	725.3	9.9	300	c/cs
26	238	1933	11	56.00	68	44.10	726.6	10.1	300	c/cs
26	238	1943	11	56.80	68	42.60	728.3	10.1	300	c/cs
26	238	1951	11	57.50	68	41.40	729.6	9.7	299	c/cs
26	238	2006	11	58.70	68	39.30	732.0	9.9	299	c/cs
26	238	2016	11	59.50	68	37.80	733.7	9.5	300	c/cs
26	238	2019	11	59.70	68	37.40	734.2	10.1	300	c/cs
26	238	2039	12	1.40	68	34.40	737.5	9.7	300	c/cs
26	238	2049	12	2.20	68	33.00	739.1	10.0	300	c/cs
26	238	2057	12	2.90	68	31.80	740.5	10.3	299	c/cs
26	238	2104	12	3.40	68	30.70	741.7	10.3	299	c/cs
26	238	2125	12	5.20	68	27.50	745.3	10.4	300	c/cs
26	238	2134	12	6.00	68	26.10	746.8	9.8	300	c/cs
26	238	2155	12	7.70	68	23.00	750.3	10.2	300	c/cs
26	238	2208	12	8.80	68	21.10	752.5	9.7	300	c/cs
26	238	2223	12	10.00	68	18.90	754.9	10.1	300	c/cs
26	238	2235	12	11.00	68	17.20	756.9	9.2	299	c/cs
26	238	2243	12	11.60	68	16.10	758.1	9.4	300	c/cs
26	238	2248	12	12.00	68	15.40	758.9	9.6	300	c/cs
26	238	2304	12	13.20	68	13.10	761.5	9.9	300	c/cs
26	238	2314	12	14.10	68	11.60	763.1	9.2	300	c/cs
26	238	2319	12	14.40	68	11.00	763.9	9.9	300	c/cs
26	238	2333	12	15.60	68	8.90	766.2	9.5	300	c/cs
26	238	2346	12	16.60	68	7.10	768.3	9.5	300	c/cs
26	238	2354	12	17.20	68	6.00	769.5	9.7	300	c/cs
27	Aug	239	12	17.70	68	5.10	770.5	9.7	300	c/cs
27		239	12	18.70	68	3.40	772.4	9.8	299	c/cs
27		239	12	18.78	68	3.23	772.6	9.7	300	SF
27		239	12	19.70	68	1.50	774.5	9.4	301	c/cs
27		239	12	20.30	68	0.50	775.6	9.6	301	c/cs
27		239	12	21.80	67	58.00	778.5	9.8	301	c/cs
27		239	12	22.90	67	56.10	780.6	9.9	301	c/cs
27		239	12	24.70	67	53.00	784.3	9.9	300	c/cs
27		239	12	26.00	67	50.80	786.7	9.6	300	c/cs
27		239	12	27.10	67	48.80	789.0	9.6	301	c/cs

APPENDIX (continued).

Date (1987)	Julian day	Time (UTC)	North latitude (deg) (min)		East longitude (deg) (min)		Distance (nmi)	Actual speed (kt)	Actual course (deg)	Comments ^a
27	239	0159	12	27.50	67	48.10	789.8	9.8	300	c/cs
27	239	0209	12	28.30	67	46.60	791.4	9.7	301	c/cs
27	239	0224	12	29.60	67	44.50	793.8	9.4	300	c/cs
27	239	0232	12	30.20	67	43.40	795.1	9.5	301	c/cs
27	239	0237	12	30.60	67	42.70	795.9	9.9	300	c/cs
27	239	0254	12	32.00	67	40.20	798.7	9.9	301	c/cs
27	239	0320	12	34.20	67	36.40	803.0	10.0	301	c/cs
27	239	0343	12	36.10	67	33.10	806.8	9.7	301	c/cs
27	239	0353	12	37.00	67	31.60	808.4	9.9	300	c/cs
27	239	0408	12	38.20	67	29.40	810.9	9.7	300	c/cs
27	239	0434	12	40.30	67	25.70	815.1	9.9	301	c/cs
27	239	0451	12	41.70	67	23.20	817.9	9.2	301	c/cs
27	239	0459	12	42.30	67	22.20	819.1	9.9	300	c/cs
27	239	0509	12	43.20	67	20.70	820.7	9.7	299	c/cs
27	239	0513	12	43.47	67	20.12	821.4	9.6	298	SF
27	239	0519	12	43.90	67	19.20	822.4	9.8	297	c/cs
27	239	0536	12	45.20	67	16.70	825.1	9.8	298	c/cs
27	239	0548	12	46.10	67	14.90	827.1	10.1	298	c/cs
27	239	0557	12	46.80	67	13.60	828.6	9.8	297	c/cs
27	239	0612	12	47.90	67	11.30	831.1	9.9	297	c/cs
27	239	0630	12	49.28	67	8.63	834.0	10.0	296	GF
27	239	0638	12	49.90	67	7.40	835.4	9.7	296	c/cs
27	239	0644	12	50.28	67	6.50	836.3	9.6	296	GF
27	239	0658	12	51.30	67	4.40	838.6	10.0	296	c/cs
27	239	0700	12	51.42	67	4.13	838.9	10.0	296	GF
27	239	0706	12	51.90	67	3.20	839.9	9.8	296	c/cs
27	239	0714	12	52.45	67	2.01	841.2	9.6	297	GF
27	239	0724	12	53.20	67	0.50	842.8	9.7	298	c/cs
27	239	0730	12	53.63	66	59.67	843.8	9.7	297	GF
27	239	0731	12	53.70	66	59.50	843.9	9.3	297	c/cs
27	239	0739	12	54.30	66	58.40	845.2	10.1	297	c/cs
27	239	0749	12	55.00	66	56.90	846.9	9.9	297	c/cs
27	239	0800	12	55.85	66	55.19	848.7	9.9	298	GF
27	239	0804	12	56.20	66	54.60	849.3	10.0	297	c/cs
27	239	0812	12	56.80	66	53.40	850.7	9.3	298	c/cs
27	239	0824	12	57.60	66	51.70	852.5	9.6	297	c/cs
27	239	0830	12	58.05	66	50.80	853.5	9.8	297	GF
27	239	0832	12	58.20	66	50.50	853.8	9.9	298	c/cs
27	239	0844	12	59.12	66	48.71	855.8	9.6	298	GF
27	239	0854	12	59.90	66	47.30	857.4	9.6	299	c/cs
27	239	0900	13	0.34	66	46.40	858.4	9.8	298	GF
27	239	0920	13	1.90	66	43.50	861.6	9.8	298	c/cs
27	239	0930	13	2.67	66	41.99	863.2	9.8	298	GF
27	239	0931	13	2.70	66	41.80	863.4	9.6	298	c/cs
27	239	0941	13	3.50	66	40.40	865.0	10.1	298	c/cs
27	239	0958	13	4.90	66	37.80	867.9	9.5	298	c/cs
27	239	1000	13	5.00	66	37.53	868.2	9.5	298	GF
27	239	1001	13	5.10	66	37.40	868.3	10.2	298	c/cs
27	239	1004	13	5.30	66	36.90	868.8	9.6	298	c/cs
27	239	1009	13	5.70	66	36.20	869.6	9.7	298	c/cs
27	239	1024	13	6.90	66	34.00	872.1	9.7	298	c/cs
27	239	1030	13	7.32	66	33.13	873.0	9.9	299	GF
27	239	1041	13	8.20	66	31.50	874.8	10.1	299	c/cs
27	239	1044	13	8.45	66	31.06	875.4	9.8	300	GF

APPENDIX (continued).

Date (1987)	Julian day	Time (UTC)	North latitude (deg) (min)		East longitude (deg) (min)		Distance (nmi)	Actual speed (kt)	Actual course (deg)	Comments ^a
27	239	1057	13	9.50	66	29.20	877.5	9.7	299	c/cs
27	239	1100	13	9.73	66	28.72	878.0	9.8	299	GF
27	239	1114	13	10.80	66	26.70	880.2	9.8	300	c/cs
27	239	1125	13	11.70	66	25.10	882.0	9.5	300	c/cs
27	239	1130	13	12.14	66	24.38	882.8	9.6	300	GF
27	239	1132	13	12.30	66	24.10	883.2	10.0	299	c/cs
27	239	1144	13	13.28	66	22.31	885.1	9.7	300	GF
27	239	1150	13	13.80	66	21.40	886.1	9.8	300	c/cs
27	239	1200	13	14.58	66	19.99	887.8	10.0	300	GF
27	239	1214	13	15.75	66	17.92	890.1	9.6	300	GF
27	239	1215	13	15.80	66	17.80	890.2	9.6	300	c/cs
27	239	1230	13	17.02	66	15.65	892.6	9.9	300	GF
27	239	1243	13	18.10	66	13.70	894.8	10.0	300	c/cs
27	239	1259	13	19.40	66	11.40	897.4	10.2	299	c/cs
27	239	1300	13	19.49	66	11.21	897.6	10.2	299	GF
27	239	1308	13	20.10	66	10.00	899.0	9.9	298	c/cs
27	239	1319	13	21.00	66	8.30	900.8	10.0	299	c/cs
27	239	1330	13	21.89	66	6.70	902.6	10.3	299	GF
27	239	1337	13	22.50	66	5.60	903.8	10.0	300	c/cs
27	239	1344	13	23.05	66	4.58	905.0	9.4	300	GF
27	239	1349	13	23.40	66	3.90	905.8	9.9	300	c/cs
27	239	1400	13	24.33	66	2.27	907.6	10.0	299	GF
27	239	1405	13	24.70	66	1.50	908.4	9.7	299	c/cs
27	239	1430	13	26.72	65	57.89	912.4	9.8	300	GF
27	239	1433	13	27.00	65	57.50	912.9	9.8	300	c/cs
27	239	1442	13	27.70	65	56.10	914.4	9.6	300	c/cs
27	239	1450	13	28.30	65	55.00	915.7	10.1	300	c/cs
27	239	1458	13	29.00	65	53.80	917.0	10.0	300	c/cs
27	239	1513	13	30.20	65	51.50	919.6	10.3	300	c/cs
27	239	1518	13	30.70	65	50.80	920.4	9.8	299	c/cs
27	239	1539	13	32.30	65	47.70	923.8	10.0	299	c/cs
27	239	1553	13	33.40	65	45.60	926.2	10.0	299	c/cs
27	239	1559	13	33.90	65	44.70	927.2	9.5	299	c/cs
27	239	1612	13	34.90	65	42.80	929.2	10.1	299	c/cs
27	239	1617	13	35.30	65	42.00	930.1	9.5	298	c/cs
27	239	1621	13	35.60	65	41.50	930.7	9.6	299	c/cs
27	239	1634	13	36.60	65	39.60	932.8	10.1	299	c/cs
27	239	1650	13	37.90	65	37.20	935.5	9.8	299	c/cs
27	239	1704	13	39.00	65	35.10	937.8	10.0	299	c/cs
27	239	1715	13	39.90	65	33.50	939.6	9.8	300	c/cs
27	239	1735	13	41.50	65	30.50	942.9	9.6	300	c/cs
27	239	1740	13	41.90	65	29.80	943.7	9.8	300	c/cs
27	239	1804	13	43.86	65	26.29	947.6	9.6	301	GF
27	239	1808	13	44.20	65	25.70	948.3	9.4	300	c/cs
27	239	1816	13	44.80	65	24.60	949.5	9.8	301	c/cs
27	239	1821	13	45.30	65	23.90	950.3	9.4	300	c/cs
27	239	1826	13	45.60	65	23.20	951.1	9.8	301	c/cs
27	239	1854	13	48.00	65	19.20	955.7	9.9	301	c/cs
27	239	1912	13	49.60	65	16.50	958.7	9.7	301	c/cs
27	239	1930	13	51.10	65	14.00	961.6	10.0	301	c/cs
27	239	1935	13	51.50	65	13.30	962.4	9.7	301	c/cs
27	239	1945	13	52.30	65	11.80	964.0	9.7	301	c/cs
27	239	2000	13	53.60	65	9.70	966.5	9.5	301	c/cs
27	239	2005	13	54.00	65	9.00	967.2	10.0	300	c/cs

APPENDIX (continued).

Date (1987)	Julian day	Time (UTC)	North		East		Distance (nmi)	Actual		Comments ^a
			latitude (deg)	(min)	longitude (deg)	(min)		speed (kt)	course (deg)	
27	239	2010	13	54.40	65	8.30	968.1	9.6	300	c/cs
27	239	2022	13	55.40	65	6.50	970.0	9.8	299	c/cs
27	239	2036	13	56.50	65	4.50	972.3	9.5	300	c/cs
27	239	2041	13	56.90	65	3.80	973.1	9.8	299	c/cs
27	239	2101	13	58.50	65	0.80	976.4	9.5	299	c/cs
27	239	2119	13	59.90	64	58.30	979.2	9.9	299	c/cs
27	239	2142	14	1.70	64	54.90	983.0	9.8	299	c/cs
27	239	2156	14	2.90	64	52.80	985.3	9.9	299	c/cs
27	239	2225	14	5.20	64	48.50	990.1	10.1	299	c/cs
27	239	2228	14	5.44	64	48.05	990.6	10.0	298	SF
27	239	2248	14	7.00	64	45.00	993.9	9.6	298	c/cs
27	239	2312	14	8.80	64	41.50	997.7	9.7	298	c/cs
27	239	2326	14	9.90	64	39.50	1000.0	9.4	298	c/cs
27	239	2333	14	10.40	64	38.50	1001.1	9.6	298	c/cs
28	Aug	240	14	12.50	64	34.50	1005.4	9.6	298	c/cs
28		240	14	12.80	64	34.00	1006.1	9.6	298	c/cs
28		240	14	13.54	64	32.50	1007.7	9.6	302	SF
28		240	14	14.40	64	31.10	1009.3	9.7	302	c/cs
28		240	14	17.60	64	25.70	1015.4	9.5	302	c/cs
28		240	14	19.31	64	22.96	1018.6	9.5	302	SF
28		240	14	19.50	64	22.70	1018.9	9.4	302	c/cs
28		240	14	21.10	64	20.10	1021.9	9.6	300	c/cs
28		240	14	22.00	64	18.30	1023.8	9.4	300	c/cs
28		240	14	23.80	64	15.10	1027.4	9.8	300	c/cs
28		240	14	24.00	64	14.80	1027.7	9.2	301	c/cs
28		240	14	24.50	64	14.00	1028.7	9.5	300	c/cs
28		240	14	25.90	64	11.50	1031.5	9.7	300	c/cs
28		240	14	26.70	64	10.00	1033.1	10.0	300	c/cs
28		240	14	29.50	64	4.80	1038.9	9.8	300	c/cs
28		240	14	29.90	64	4.10	1039.7	9.3	300	c/cs
28		240	14	31.30	64	1.60	1042.5	9.8	299	c/cs
28		240	14	33.10	63	58.10	1046.3	9.9	299	c/cs
28		240	14	34.20	63	56.20	1048.4	9.8	299	c/cs
28		240	14	34.90	63	54.90	1049.9	9.9	299	c/cs
28		240	14	35.70	63	53.20	1051.7	9.7	299	c/cs
28		240	14	37.10	63	50.60	1054.6	9.6	297	c/cs
28		240	14	37.80	63	49.30	1056.1	9.4	297	c/cs
28		240	14	40.10	63	44.50	1061.2	9.3	297	c/cs
28		240	14	40.79	63	43.07	1062.8	9.8	298	GF
28		240	14	40.90	63	42.90	1062.9	9.6	298	c/cs
28		240	14	41.20	63	42.20	1063.7	9.9	297	c/cs
28		240	14	42.20	63	40.40	1065.7	9.7	295	c/cs
28		240	14	42.99	63	38.55	1067.7	9.4	295	GF
28		240	14	43.10	63	38.30	1068.0	9.5	295	c/cs
28		240	14	43.70	63	36.90	1069.4	9.4	295	c/cs
28		240	14	44.40	63	35.40	1071.0	9.3	295	c/cs
28		240	14	45.09	63	33.85	1072.7	9.4	295	GF
28		240	14	46.60	63	30.50	1076.3	9.4	295	c/cs
28		240	14	47.07	63	29.44	1077.4	9.6	295	GF
28		240	14	47.80	63	27.80	1079.1	9.6	295	c/cs
28		240	14	48.60	63	26.00	1081.1	9.7	295	c/cs
28		240	14	48.97	63	25.23	1081.9	9.5	294	GF
28		240	14	49.70	63	23.60	1083.6	9.6	294	c/cs
28		240	14	50.93	63	20.71	1086.7	9.3	294	GF

APPENDIX (continued).

Date (1987)	Julian day	Time (UTC)	North latitude		East longitude		Distance (nmi)	Actual		Comments ^a
			(deg)	(min)	(deg)	(min)		speed (kt)	course (deg)	
28	240	0834	14	51.30	63	19.80	1087.6	9.8	296	c/cs
28	240	0836	14	51.50	63	19.50	1087.9	9.8	301	c/cs
28	240	0842	14	52.00	63	18.70	1088.9	9.6	299	c/cs
28	240	0851	14	52.70	63	17.40	1090.4	9.4	300	c/cs
28	240	0900	14	53.37	63	16.09	1091.8	9.5	299	GF
28	240	0904	14	53.70	63	15.50	1092.4	9.8	299	c/cs
28	240	0924	14	55.20	63	12.60	1095.6	9.6	299	c/cs
28	240	0930	14	55.70	63	11.69	1096.6	9.4	298	GF
28	240	0932	14	55.80	63	11.40	1096.9	9.0	298	c/cs
28	240	0937	14	56.20	63	10.70	1097.7	9.4	299	c/cs
28	240	0948	14	57.00	63	9.20	1099.4	9.7	301	c/cs
28	240	0958	14	57.90	63	7.70	1101.0	9.4	299	c/cs
28	240	1000	14	58.02	63	7.44	1101.3	9.4	298	GF
28	240	1015	14	59.10	63	5.30	1103.7	9.4	298	c/cs
28	240	1029	15	0.18	63	3.31	1105.9	9.3	299	GF
28	240	1041	15	1.10	63	1.60	1107.7	9.0	299	c/cs
28	240	1051	15	1.80	63	0.20	1109.2	9.2	299	c/cs
28	240	1100	15	2.46	62	58.99	1110.6	9.2	298	GF
28	240	1108	15	3.00	62	57.90	1111.8	9.5	298	c/cs
28	240	1114	15	3.50	62	57.00	1112.8	8.5	298	c/cs
28	240	1119	15	3.80	62	56.30	1113.5	9.0	298	c/cs
28	240	1129	15	4.51	62	54.98	1115.0	9.1	298	GF
28	240	1141	15	5.30	62	53.30	1116.8	9.1	297	c/cs
28	240	1157	15	6.50	62	51.10	1119.3	9.1	296	c/cs
28	240	1159	15	6.61	62	50.79	1119.6	9.1	295	GF
28	240	1212	15	7.40	62	48.90	1121.5	9.2	293	c/cs
28	240	1220	15	7.90	62	47.80	1122.8	8.7	295	c/cs
28	240	1225	15	8.20	62	47.10	1123.5	8.9	295	c/cs
28	240	1230	15	8.53	62	46.38	1124.2	8.8	295	GF
28	240	1245	15	9.50	62	44.30	1126.4	8.8	295	c/cs
28	240	1300	15	10.38	62	42.23	1128.6	8.8	295	GF
28	240	1305	15	10.70	62	41.50	1129.4	9.0	296	c/cs
28	240	1316	15	11.40	62	40.00	1131.0	9.2	296	c/cs
28	240	1326	15	12.10	62	38.60	1132.6	8.8	295	c/cs
28	240	1329	15	12.24	62	38.15	1133.0	9.8	294	GF
28	240	1335	15	12.60	62	37.20	1134.0	10.0	295	c/cs
28	240	1336	15	12.71	62	37.07	1134.1	9.1	296	SF
28	240	1351	15	13.70	62	35.00	1136.4	9.1	297	c/cs
28	240	1404	15	14.60	62	33.10	1138.4	9.0	299	c/cs
28	240	1419	15	15.70	62	31.10	1140.6	9.4	299	c/cs
28	240	1427	15	16.30	62	30.00	1141.9	9.2	298	c/cs
28	240	1449	15	17.90	62	26.90	1145.2	9.5	298	c/cs
28	240	1457	15	18.50	62	25.70	1146.5	9.6	300	c/cs
28	240	1504	15	19.10	62	24.70	1147.6	9.3	298	c/cs
28	240	1532	15	21.10	62	20.80	1152.0	9.2	299	c/cs
28	240	1545	15	22.10	62	19.00	1154.0	9.3	298	c/cs
28	240	1553	15	22.70	62	17.90	1155.2	9.2	298	c/cs
28	240	1626	15	25.11	62	13.22	1160.3	8.9	298	SN
28	240	1631	15	25.50	62	12.50	1161.0	8.8	300	c/cs
28	240	1654	15	27.10	62	9.50	1164.4	9.0	301	c/cs
28	240	1711	15	28.40	62	7.20	1166.9	9.2	301	c/cs
28	240	1716	15	28.82	62	6.54	1167.7	8.9	301	SN
28	240	1722	15	29.30	62	5.70	1168.6	8.9	301	c/cs
28	240	1734	15	30.20	62	4.20	1170.4	8.9	300	c/cs

APPENDIX (continued).

Date (1987)	Julian day	Time (UTC)	North latitude (deg) (min)	East longitude (deg) (min)	Distance (nmi)	Actual speed (kt)	Actual course (deg)	Comments ^a
28	240	1739	15 30.60	62 3.50	1171.1	8.6	302	c/cs
28	240	1744	15 31.00	62 2.90	1171.8	9.0	301	c/cs
28	240	1807	15 32.70	61 59.80	1175.3	8.8	301	c/cs
28	240	1816	15 33.42	61 58.64	1176.6	8.9	299	SN
28	240	1824	15 34.00	61 57.60	1177.8	9.1	299	c/cs
28	240	1846	15 35.62	61 54.55	1181.1	9.2	305	SN
28	240	1847	15 35.70	61 54.40	1181.3	9.3	303	c/cs
28	240	1903	15 37.10	61 52.30	1183.7	9.2	304	c/cs
28	240	1904	15 37.16	61 52.13	1183.9	9.2	300	SN
28	240	1911	15 37.70	61 51.20	1185.0	9.4	300	c/cs
28	240	1938	15 39.80	61 47.40	1189.2	9.6	299	c/cs
28	240	1946	15 40.50	61 46.20	1190.5	9.5	300	c/cs
28	240	2009	15 42.30	61 43.00	1194.1	9.3	300	c/cs
28	240	2037	15 44.50	61 39.00	1198.5	9.6	300	c/cs
28	240	2044	15 45.10	61 38.00	1199.6	9.4	300	c/cs
28	240	2120	15 47.90	61 33.00	1205.2	9.3	300	c/cs
28	240	2145	15 49.90	61 29.50	1209.1	9.4	300	c/cs
28	240	2204	15 51.37	61 26.84	1212.1	9.8	303	SN
28	240	2206	15 51.50	61 26.60	1212.4	9.8	302	c/cs
28	240	2226	15 53.30	61 23.70	1215.7	9.7	300	c/cs
28	240	2241	15 54.50	61 21.50	1218.1	9.7	300	c/cs
28	240	2301	15 56.10	61 18.50	1221.4	9.6	300	c/cs
28	240	2316	15 57.30	61 16.40	1223.8	9.9	300	c/cs
28	240	2330	15 58.40	61 14.30	1226.1	9.8	300	c/cs
28	240	2347	15 59.80	61 11.80	1228.9	9.9	300	c/cs
28	240	2353	16 0.28	61 10.88	1229.8	10.2	301	SF
29 Aug	241	0000	16 0.90	61 9.80	1231.0	10.2	301	c/cs
29	241	0007	16 1.50	61 8.70	1232.2	10.1	294	c/cs
29	241	0008	16 1.60	61 8.60	1232.4	9.1	281	c/cs
29	241	0013	16 1.70	61 7.80	1233.2	7.6	286	c/cs
29	241	0025	16 2.10	61 6.30	1234.7	7.6	288	c/cs
29	241	0028	16 2.30	61 5.90	1235.1	7.3	281	c/cs
29	241	0045	16 2.60	61 3.80	1237.1	7.0	282	c/cs
29	241	0056	16 2.90	61 2.50	1238.4	7.4	281	c/cs
29	241	0111	16 3.20	61 0.60	1240.3	7.4	281	c/cs
29	241	0119	16 3.40	60 59.60	1241.2	7.8	280	c/cs
29	241	0124	16 3.50	60 58.90	1241.9	7.5	281	c/cs
29	241	0127	16 3.61	60 58.55	1242.3	7.9	282	SF
29	241	0138	16 3.90	60 57.10	1243.7	7.4	271	c/cs
29	241	0208	16 4.00	60 53.20	1247.4	7.0	268	c/cs
29	241	0214	16 3.90	60 52.50	1248.1	5.1	269	c/cs
29	241	0217	16 3.90	60 52.20	1248.3	4.6	269	c/cs
29	241	0241	16 3.90	60 50.30	1250.2	4.3	271	c/cs
29	241	0248	16 3.90	60 49.80	1250.7	5.7	297	c/cs
29	241	0254	16 4.10	60 49.30	1251.3	5.7	299	c/cs
29	241	0300	16 4.40	60 48.70	1251.8	5.0	300	c/cs
29	241	0316	16 5.10	60 47.50	1253.2	4.9	301	c/cs
29	241	0330	16 5.67	60 46.53	1254.3	4.5	306	XX
29	241	0333	16 5.80	60 46.30	1254.5	4.9	313	c/cs
29	241	0347	16 6.60	60 45.50	1255.7	5.4	319	c/cs
29	241	0402	16 7.60	60 44.50	1257.0	5.5	319	c/cs
29	241	0407	16 8.00	60 44.20	1257.5	5.0	311	c/cs
29	241	0427	16 9.00	60 42.90	1259.2	5.4	328	c/cs
29	241	0428	16 9.12	60 42.87	1259.3	5.1	330	SF

APPENDIX (continued).

Date (1987)	Julian day	Time (UTC)	North latitude (deg) (min)		East longitude (deg) (min)		Distance (nmi)	Actual speed (kt)	Actual course (deg)	Comments ^a
29	241	0429	16	9.20	60	42.80	1259.3	6.0	3	c/cs
29	241	0430	16	9.30	60	42.80	1259.4	6.8	33	c/cs
29	241	0432	16	9.50	60	43.00	1259.7	8.3	42	c/cs
29	241	0441	16	10.40	60	43.80	1260.9	8.3	59	c/cs
29	241	0442	16	10.50	60	44.00	1261.0	7.3	77	c/cs
29	241	0443	16	10.50	60	44.10	1261.2	6.5	98	c/cs
29	241	0444	16	10.50	60	44.20	1261.3	4.8	125	c/cs
29	241	0450	16	10.21	60	44.60	1261.8	4.5	135	XX
29	241	0451	16	10.20	60	44.70	1261.8	4.8	135	c/cs
29	241	0503	16	9.50	60	45.40	1262.8	4.4	136	c/cs
29	241	0506	16	9.30	60	45.50	1263.0	3.2	169	c/cs
29	241	0508	16	9.20	60	45.50	1263.1	2.4	215	c/cs
29	241	0513	16	9.10	60	45.40	1263.3	4.6	217	c/cs
29	241	0516	16	8.90	60	45.30	1263.5	5.8	217	c/cs
29	241	0530	16	7.79	60	44.43	1264.9	6.2	215	XX
29	241	0531	16	7.70	60	44.40	1265.0	6.3	215	c/cs
29	241	0545	16	6.50	60	43.50	1266.5	0.5	66	c/cs
29	241	0548	16	6.52	60	43.52	1266.5	0.0	39	XX
2	Sept	245	16	7.84	60	44.64	1268.2	1.0	27	720
2		245	16	7.90	60	44.70	1268.2	1.0	21	c/cs
2		245	16	8.20	60	44.80	1268.6	1.5	352	c/cs
2		245	16	8.30	60	44.80	1268.7	2.6	317	c/cs
2		245	16	8.30	60	44.70	1268.7	5.1	305	c/cs
2		245	16	8.60	60	44.40	1269.2	5.6	307	c/cs
2		245	16	9.00	60	43.70	1269.9	5.8	309	c/cs
2		245	16	11.60	60	40.50	1274.0	5.9	310	c/cs
2		245	16	13.50	60	38.10	1276.9	5.8	309	c/cs
2		245	16	14.10	60	37.30	1278.0	5.6	299	c/cs
2		245	16	15.50	60	34.70	1280.8	5.7	300	c/cs
2		245	16	16.90	60	32.20	1283.6	5.6	299	c/cs
2		245	16	18.30	60	29.60	1286.4	5.6	299	c/cs
2		245	16	19.20	60	27.80	1288.4	5.1	288	c/cs
2		245	16	19.70	60	26.30	1289.9	5.2	290	c/cs
2		245	16	20.60	60	23.80	1292.5	5.1	289	c/cs
2		245	16	21.30	60	21.50	1294.8	5.1	289	c/cs
2		245	16	22.01	60	19.33	1297.0	4.7	289	SF
2		245	16	22.10	60	19.00	1297.3	5.0	289	c/cs
2		245	16	22.50	60	17.80	1298.5	5.6	289	c/cs
2		245	16	23.40	60	15.00	1301.3	5.6	288	c/cs
2		245	16	24.10	60	13.00	1303.4	5.5	289	c/cs
2		245	16	24.80	60	10.80	1305.6	5.6	290	c/cs
2		245	16	25.50	60	8.70	1307.7	6.7	297	c/cs
3	Sept	246	16	25.60	60	8.50	1308.0	6.7	297	c/cs
3		246	16	26.00	60	7.60	1309.0	6.9	299	c/cs
3		246	16	26.52	60	6.63	1310.0	6.4	300	SF
3		246	16	27.00	60	5.80	1311.0	5.9	299	c/cs
3		246	16	27.50	60	4.80	1312.0	5.9	299	c/cs
3		246	16	28.50	60	2.90	1314.1	6.6	299	c/cs
3		246	16	29.20	60	1.70	1315.4	6.3	300	c/cs
3		246	16	30.80	59	58.90	1318.5	6.3	301	c/cs
3		246	16	32.20	59	56.40	1321.3	6.6	312	c/cs
3		246	16	32.70	59	55.80	1322.1	6.8	319	c/cs
3		246	16	33.10	59	55.40	1322.6	6.4	329	c/cs
3		246	16	33.80	59	55.00	1323.4	6.5	332	c/cs

APPENDIX (continued).

Date (1987)	Julian day	Time (UTC)	North		East		Distance (nmi)	Actual		Comments ^a
			latitude (deg)	(min)	longitude (deg)	(min)		speed (kt)	course (deg)	
3	246	0243	16	35.40	59	54.10	1325.2	6.8	342	c/cs
3	246	0256	16	36.80	59	53.64	1326.7	7.3	341	GF
3	246	0257	16	36.90	59	53.60	1326.8	7.2	340	c/cs
3	246	0302	16	37.50	59	53.40	1327.4	6.2	311	c/cs
3	246	0303	16	37.50	59	53.30	1327.5	3.6	261	c/cs
3	246	0306	16	37.50	59	53.10	1327.7	4.1	253	c/cs
3	246	0310	16	37.44	59	52.85	1328.0	4.4	246	GF
3	246	0313	16	37.30	59	52.60	1328.2	5.7	247	c/cs
3	246	0320	16	37.09	59	52.00	1328.9	5.7	245	GF
3	246	0328	16	36.80	59	51.30	1329.6	6.2	245	c/cs
3	246	0330	16	36.69	59	51.09	1329.8	6.2	243	GF
3	246	0340	16	36.22	59	50.13	1330.9	6.0	242	GF
3	246	0341	16	36.20	59	50.00	1331.0	5.7	260	c/cs
3	246	0342	16	36.20	59	49.90	1331.1	6.2	293	c/cs
3	246	0349	16	36.40	59	49.20	1331.8	6.6	294	c/cs
3	246	0350	16	36.49	59	49.14	1331.9	6.7	296	GF
3	246	0400	16	36.99	59	48.09	1333.0	6.9	299	GF
3	246	0407	16	37.40	59	47.40	1333.8	7.1	299	c/cs
3	246	0410	16	37.55	59	47.03	1334.2	7.2	297	GF
3	246	0415	16	37.80	59	46.50	1334.8	5.9	275	c/cs
3	246	0416	16	37.80	59	46.40	1334.9	5.3	239	c/cs
3	246	0418	16	37.70	59	46.20	1335.1	4.9	210	c/cs
3	246	0419	16	37.70	59	46.20	1335.2	5.7	172	c/cs
3	246	0420	16	37.58	59	46.18	1335.2	7.1	168	GF
3	246	0425	16	37.00	59	46.30	1335.8	7.7	167	c/cs
3	246	0430	16	36.38	59	46.46	1336.5	7.3	164	GF
3	246	0434	16	35.90	59	46.60	1337.0	8.2	133	c/cs
3	246	0440	16	35.35	59	47.22	1337.8	8.5	130	GF
3	246	0441	16	35.30	59	47.30	1337.9	9.0	124	c/cs
3	246	0444	16	35.00	59	47.70	1338.4	9.6	102	c/cs
3	246	0445	16	35.00	59	47.90	1338.5	9.2	83	c/cs
3	246	0446	16	35.00	59	48.00	1338.7	9.0	60	c/cs
3	246	0447	16	35.10	59	48.20	1338.8	7.9	32	c/cs
3	246	0448	16	35.20	59	48.30	1339.0	5.7	358	c/cs
3	246	0450	16	35.37	59	48.25	1339.2	6.0	349	GF
3	246	0450	16	35.40	59	48.20	1339.2	6.4	329	c/cs
3	246	0457	16	36.00	59	47.90	1339.9	6.8	334	c/cs
3	246	0500	16	36.31	59	47.70	1340.2	7.0	332	GF
3	246	0500	16	36.30	59	47.70	1340.2	7.6	6	c/cs
3	246	0504	16	36.80	59	47.80	1340.7	7.8	355	c/cs
3	246	0510	16	37.59	59	47.69	1341.5	7.7	353	GF
3	246	0510	16	37.60	59	47.70	1341.5	8.3	360	c/cs
3	246	0520	16	38.98	59	47.68	1342.9	8.4	359	GF
3	246	0525	16	39.70	59	47.70	1343.6	8.5	5	c/cs
3	246	0530	16	40.38	59	47.73	1344.3	8.4	6	GF
3	246	0530	16	40.40	59	47.70	1344.3	7.5	43	c/cs
3	246	0531	16	40.50	59	47.80	1344.4	8.6	65	c/cs
3	246	0536	16	40.80	59	48.50	1345.2	8.9	86	c/cs
3	246	0540	16	40.81	59	49.11	1345.7	9.0	88	GF
3	246	0543	16	40.80	59	49.60	1346.2	9.2	90	c/cs
3	246	0549	16	40.80	59	50.50	1347.1	9.3	95	c/cs
3	246	0550	16	40.82	59	50.70	1347.3	9.4	90	GF
3	246	0600	16	40.81	59	52.33	1348.8	9.4	89	GF
3	246	0608	16	40.80	59	53.60	1350.1	9.6	69	c/cs

APPENDIX (continued).

Date (1987)	Julian day	Time (UTC)	North latitude (deg) (min)	East longitude (deg) (min)	Distance (nmi)	Actual speed (kt)	Actual course (deg)	Comments ^a
3	246	0609	16 40.90	59 53.80	1350.2	8.6	41	c/cs
3	246	0610	16 41.00	59 53.89	1350.4	7.8	40	GF
3	246	0610	16 41.00	59 53.90	1350.4	7.8	15	c/cs
3	246	0611	16 41.10	59 53.90	1350.5	7.3	348	c/cs
3	246	0612	16 41.20	59 53.90	1350.6	6.9	318	c/cs
3	246	0619	16 41.80	59 53.30	1351.4	7.4	318	c/cs
3	246	0620	16 41.93	59 53.25	1351.6	7.5	318	GF
3	246	0629	16 42.80	59 52.50	1352.7	6.9	293	c/cs
3	246	0630	16 42.81	59 52.35	1352.8	6.8	287	GF
3	246	0630	16 42.80	59 52.40	1352.8	5.5	246	c/cs
3	246	0633	16 42.70	59 52.10	1353.1	5.6	216	c/cs
3	246	0635	16 42.50	59 52.00	1353.3	5.8	202	c/cs
3	246	0638	16 42.30	59 51.90	1353.6	6.3	188	c/cs
3	246	0640	16 42.07	59 51.83	1353.8	6.1	184	GF
3	246	0642	16 41.90	59 51.80	1354.0	6.3	177	c/cs
3	246	0644	16 41.70	59 51.80	1354.2	6.3	177	c/cs
3	246	0647	16 41.30	59 51.80	1354.5	6.2	184	c/cs
3	246	0650	16 41.03	59 51.82	1354.8	6.3	179	GF
3	246	0655	16 40.50	59 51.80	1355.3	6.5	179	c/cs
3	246	0700	16 39.96	59 51.84	1355.9	6.8	179	GF
3	246	0705	16 39.40	59 51.80	1356.4	6.6	184	c/cs
3	246	0708	16 39.10	59 51.80	1356.8	6.6	183	c/cs
3	246	0710	16 38.85	59 51.81	1357.0	4.5	172	GF
3	246	0720	16 38.10	59 51.92	1357.7	6.2	195	GF
3	246	0735	16 36.60	59 51.50	1359.3	0.1	5	c/cs
6 Sept	249	1641	16 40.67	59 51.87	1363.4	0.9	230	721
6	249	2230	16 37.31	59 47.72	1368.6	0.0	90	722
13 Sept	256	0730	16 37.31	59 47.72	1368.6	4.2	3	722
13	256	0732	16 37.40	59 47.70	1368.7	6.4	354	c/cs
13	256	0734	16 37.70	59 47.70	1368.9	9.7	355	c/cs
13	256	0737	16 38.10	59 47.70	1369.4	12.1	354	c/cs
13	256	0745	16 39.70	59 47.50	1371.0	12.7	353	c/cs
13	256	0800	16 42.90	59 47.10	1374.2	12.2	351	GF
13	256	0825	16 47.90	59 46.20	1379.3	12.4	351	c/cs
13	256	0858	16 54.60	59 45.10	1386.1	12.5	351	c/cs
13	256	0900	16 55.04	59 45.03	1386.5	12.2	350	GF
13	256	0930	17 1.02	59 43.88	1392.6	11.9	350	GF
13	256	0947	17 4.30	59 43.30	1395.9	12.0	350	c/cs
13	256	1000	17 6.89	59 42.77	1398.5	11.9	349	GF
13	256	1020	17 10.80	59 42.00	1402.5	11.8	349	c/cs
13	256	1030	17 12.73	59 41.61	1404.5	11.8	349	GF
13	256	1037	17 14.10	59 41.30	1405.9	12.0	349	c/cs
13	256	1100	17 18.58	59 40.40	1410.4	12.1	348	GF
13	256	1126	17 23.70	59 39.30	1415.7	12.2	349	c/cs
13	256	1130	17 24.52	59 39.13	1416.5	12.2	350	GF
13	256	1154	17 29.30	59 38.20	1421.4	12.3	350	c/cs
13	256	1200	17 30.54	59 38.01	1422.6	12.0	351	GF
13	256	1219	17 34.30	59 37.40	1426.4	12.0	351	c/cs
13	256	1230	17 36.47	59 36.99	1428.6	11.3	347	GF
13	256	1239	17 38.10	59 36.60	1430.3	11.3	347	c/cs
13	256	1319	17 45.50	59 34.80	1437.9	11.5	346	c/cs
13	256	1333	17 48.10	59 34.10	1440.6	11.3	346	c/cs
13	256	1350	17 51.20	59 33.30	1443.8	11.2	346	c/cs
13	256	1413	17 55.40	59 32.20	1448.1	11.2	346	c/cs

APPENDIX (continued).

Date (1987)	Julian day	Time (UTC)	North latitude (deg) (min)		East longitude (deg) (min)		Distance (nmi)	Actual speed (kt)	Actual course (deg)	Comments ^a
13	256	1435	17	59.30	59	31.20	1452.2	11.3	346	c/cs
13	256	1504	18	4.60	59	29.80	1457.6	11.2	346	c/cs
13	256	1539	18	11.00	59	28.10	1464.2	11.3	346	c/cs
13	256	1607	18	16.10	59	26.80	1469.4	11.3	346	c/cs
13	256	1637	18	21.58	59	25.36	1475.1	11.6	351	SF
13	256	1648	18	23.70	59	25.00	1477.2	11.6	351	c/cs
13	256	1738	18	33.20	59	23.40	1486.9	11.6	351	c/cs
13	256	1756	18	36.60	59	22.90	1490.3	11.6	355	c/cs
13	256	1845	18	46.10	59	22.00	1499.8	11.6	355	c/cs
13	256	1908	18	50.60	59	21.60	1504.3	11.7	355	c/cs
13	256	1958	19	0.30	59	20.70	1514.1	11.8	355	c/cs
13	256	2019	19	4.40	59	20.30	1518.2	11.7	355	c/cs
13	256	2057	19	11.80	59	19.60	1525.6	11.7	355	c/cs
13	256	2125	19	17.26	59	19.08	1531.1	12.0	354	SF
13	256	2140	19	20.20	59	18.80	1534.1	12.1	350	c/cs
13	256	2228	19	29.80	59	17.00	1543.8	12.5	350	c/cs
13	256	2253	19	34.90	59	16.00	1549.0	12.3	342	c/cs
13	256	2332	19	42.50	59	13.40	1556.9	12.2	342	c/cs
14	Sept	0000	19	47.90	59	11.50	1562.6	12.2	342	c/cs
14		0002	19	48.30	59	11.40	1563.0	12.2	342	c/cs
14		0014	19	50.60	59	10.60	1565.5	12.3	340	c/cs
14		0038	19	55.20	59	8.80	1570.4	12.4	343	c/cs
14		0103	20	0.10	59	7.20	1575.5	12.4	343	c/cs
14		0113	20	2.10	59	6.50	1577.6	12.4	343	c/cs
14		0131	20	5.60	59	5.40	1581.3	12.6	343	c/cs
14		0139	20	7.20	59	4.80	1583.0	12.5	347	c/cs
14		0156	20	10.70	59	4.00	1586.5	12.6	349	c/cs
14		0206	20	12.70	59	3.50	1588.6	12.2	352	c/cs
14		0226	20	16.80	59	3.00	1592.7	12.1	351	c/cs
14		0230	20	17.56	59	2.83	1593.5	12.3	351	GF
14		0242	20	20.00	59	2.40	1596.0	12.4	350	c/cs
14		0300	20	23.64	59	1.70	1599.7	12.6	352	GF
14		0315	20	26.80	59	1.20	1602.8	12.7	352	c/cs
14		0330	20	29.89	59	0.72	1606.0	12.3	350	GF
14		0358	20	35.50	58	59.70	1611.7	12.2	351	c/cs
14		0400	20	35.94	58	59.62	1612.1	11.3	350	GF
14		0411	20	38.00	58	59.30	1614.2	10.8	350	c/cs
14		0418	20	39.20	58	59.00	1615.4	8.4	350	c/cs
14		0421	20	39.60	58	58.90	1615.9	6.6	351	c/cs
14		0424	20	40.00	58	58.90	1616.2	4.8	353	c/cs
14		0429	20	40.40	58	58.80	1616.6	3.5	336	c/cs
14		0430	20	40.41	58	58.80	1616.7	1.5	330	GF
14		0431	20	40.40	58	58.80	1616.7	0.3	77	c/cs
14		0500	20	40.47	58	58.96	1616.8	0.1	69	GF
14		0521	20	40.50	58	59.00	1616.9	0.1	20	c/cs
14		0529	20	40.50	58	59.00	1616.9	2.1	233	c/cs
14		0530	20	40.47	58	58.97	1616.9	4.3	198	GF
14		0530	20	40.50	58	59.00	1616.9	5.9	162	c/cs
14		0532	20	40.30	58	59.00	1617.1	8.7	167	c/cs
14		0534	20	40.00	58	59.10	1617.4	11.6	169	c/cs
14		0542	20	38.50	58	59.40	1619.0	12.0	169	c/cs
14		0555	20	35.90	58	59.90	1621.6	11.6	178	c/cs
14		0600	20	34.95	58	59.95	1622.5	11.1	180	GF
14		0608	20	33.50	58	59.90	1624.0	11.2	180	c/cs

APPENDIX (continued).

Date (1987)	Julian day	Time (UTC)	North latitude (deg) (min)		East longitude (deg) (min)		Distance (nmi)	Actual speed (kt)	Actual course (deg)	Comments ^a
14	257	0618	20	31.60	58	60.00	1625.9	10.4	190	c/cs
14	257	0620	20	31.30	58	59.90	1626.2	11.0	202	c/cs
14	257	0630	20	29.56	58	59.15	1628.1	10.8	208	GF
14	257	0653	20	25.90	58	57.10	1632.2	10.8	209	c/cs
14	257	0700	20	24.80	58	56.43	1633.5	11.1	209	GF
14	257	0721	20	21.40	58	54.40	1637.4	10.8	208	c/cs
14	257	0730	20	19.95	58	53.62	1639.0	11.0	207	GF
14	257	0739	20	18.50	58	52.80	1640.6	10.9	207	c/cs
14	257	0800	20	15.08	58	50.94	1644.5	10.8	209	GF
14	257	0802	20	14.80	58	50.80	1644.8	11.1	208	c/cs
14	257	0827	20	10.70	58	48.40	1649.5	11.1	208	c/cs
14	257	0830	20	10.19	58	48.15	1650.0	11.2	207	GF
14	257	0853	20	6.40	58	46.10	1654.3	11.2	208	c/cs
14	257	0900	20	5.21	58	45.41	1655.6	11.4	207	GF
14	257	0910	20	3.50	58	44.50	1657.5	11.3	207	c/cs
14	257	0930	20	0.18	58	42.63	1661.3	11.6	208	GF
14	257	1000	19	55.07	58	39.76	1667.1	11.7	209	GF
14	257	1001	19	54.90	58	39.70	1667.3	11.8	209	c/cs
14	257	1030	19	49.91	58	36.74	1673.0	11.8	207	GF
14	257	1032	19	49.60	58	36.50	1673.3	11.9	207	c/cs
14	257	1042	19	47.80	58	35.60	1675.3	11.8	204	c/cs
14	257	1100	19	44.57	58	34.05	1678.9	12.1	204	GF
14	257	1112	19	42.40	58	33.00	1681.3	12.2	205	c/cs
14	257	1119	19	41.10	58	32.40	1682.7	12.3	209	c/cs
14	257	1130	19	39.09	58	31.21	1685.0	12.1	211	GF
14	257	1135	19	38.20	58	30.70	1686.0	12.2	211	c/cs
14	257	1200	19	33.86	58	27.92	1691.0	11.1	210	GF
14	257	1200	19	33.90	58	27.90	1691.0	10.9	210	c/cs
14	257	1230	19	29.15	58	25.04	1696.5	10.7	208	GF
14	257	1236	19	28.20	58	24.50	1697.6	10.6	209	c/cs
14	257	1246	19	26.70	58	23.60	1699.3	10.6	207	c/cs
14	257	1303	19	24.00	58	22.20	1702.3	10.5	206	c/cs
14	257	1327	19	20.20	58	20.20	1706.5	10.7	206	c/cs
14	257	1336	19	18.70	58	19.50	1708.1	10.6	206	c/cs
14	257	1402	19	14.60	58	17.40	1712.7	10.5	206	c/cs
14	257	1412	19	13.00	58	16.60	1714.5	10.6	206	c/cs
14	257	1420	19	11.70	58	15.90	1715.9	10.4	205	c/cs
14	257	1505	19	4.70	58	12.40	1723.7	10.3	205	c/cs
14	257	1524	19	1.70	58	10.90	1727.0	10.4	205	c/cs
14	257	1525	19	1.57	58	10.82	1727.2	9.6	201	SF
14	257	1534	19	0.20	58	10.30	1728.6	9.4	202	c/cs
14	257	1553	18	57.50	58	9.10	1731.6	9.4	203	c/cs
14	257	1616	18	54.10	58	7.60	1735.2	9.3	203	c/cs
14	257	1627	18	52.60	58	6.90	1736.9	9.7	203	c/cs
14	257	1642	18	50.30	58	5.90	1739.3	9.5	203	c/cs
14	257	1700	18	47.70	58	4.80	1742.1	9.7	204	c/cs
14	257	1708	18	46.50	58	4.20	1743.4	9.4	206	c/cs
14	257	1712	18	45.98	58	3.93	1744.1	9.9	213	SF
14	257	1725	18	44.20	58	2.70	1746.2	10.2	213	c/cs
14	257	1735	18	42.70	58	1.80	1747.9	3.1	211	c/cs
14	257	1736	18	42.70	58	1.70	1747.9	10.2	213	c/cs
14	257	1748	18	41.00	58	0.60	1750.0	10.0	213	c/cs
14	257	1808	18	38.20	57	58.70	1753.3	9.9	213	c/cs
14	257	1834	18	34.60	57	56.20	1757.6	10.1	213	c/cs

APPENDIX (continued).

Date (1987)	Julian day	Time (UTC)	North latitude (deg) (min)		East longitude (deg) (min)		Distance (nmi)	Actual speed (kt)	Actual course (deg)	Comments ^a
14	257	1835	18	34.41	57	56.14	1757.8	8.6	215	SF
14	257	1844	18	33.40	57	55.40	1759.1	8.4	215	c/cs
14	257	1856	18	32.00	57	54.40	1760.8	8.3	214	c/cs
14	257	1907	18	30.70	57	53.50	1762.3	8.5	214	c/cs
14	257	1922	18	28.90	57	52.20	1764.4	8.4	214	c/cs
14	257	1945	18	26.30	57	50.30	1767.6	8.0	214	c/cs
14	257	1957	18	24.90	57	49.40	1769.2	8.3	214	c/cs
14	257	2018	18	22.50	57	47.70	1772.1	8.3	214	c/cs
14	257	2033	18	20.80	57	46.50	1774.2	8.4	214	c/cs
14	257	2106	18	17.00	57	43.80	1778.8	6.7	213	c/cs
14	257	2109	18	16.70	57	43.60	1779.1	4.4	222	c/cs
14	257	2114	18	16.40	57	43.30	1779.5	3.0	224	c/cs
14	257	2118	18	16.30	57	43.20	1779.7	1.3	232	c/cs
14	257	2124	18	16.20	57	43.10	1779.8	0.5	266	c/cs
14	257	2137	18	16.20	57	43.00	1779.9	0.4	305	c/cs
14	257	2227	18	16.40	57	42.70	1780.3	0.4	308	c/cs
14	257	2316	18	16.60	57	42.40	1780.6	0.4	311	c/cs
15	Sept	258	18	16.80	57	42.20	1780.9	0.4	311	c/cs
15	258	0006	18	16.80	57	42.10	1780.9	0.4	310	c/cs
15	258	0047	18	17.00	57	41.90	1781.2	0.5	235	c/cs
15	258	0107	18	16.90	57	41.80	1781.4	0.6	221	c/cs
15	258	0156	18	16.50	57	41.40	1781.9	0.5	221	c/cs
15	258	0200	18	16.50	57	41.39	1781.9	2.8	216	GF
15	258	0234	18	15.20	57	40.40	1783.5	2.8	216	c/cs
15	258	0259	18	14.30	57	39.70	1784.7	3.9	208	c/cs
15	258	0300	18	14.20	57	39.64	1784.8	4.3	191	GF
15	258	0302	18	14.10	57	39.60	1784.9	7.3	191	c/cs
15	258	0304	18	13.80	57	39.60	1785.1	8.8	191	c/cs
15	258	0307	18	13.40	57	39.50	1785.6	10.5	191	c/cs
15	258	0314	18	12.18	57	39.24	1786.8	10.4	190	GF
15	258	0324	18	10.47	57	38.91	1788.5	10.4	190	GF
15	258	0334	18	8.76	57	38.58	1790.3	9.7	190	GF
15	258	0335	18	8.60	57	38.50	1790.4	9.3	192	c/cs
15	258	0340	18	7.80	57	38.40	1791.2	8.5	199	c/cs
15	258	0344	18	7.31	57	38.18	1791.8	6.2	202	GF
15	258	0352	18	6.50	57	37.90	1792.6	3.8	201	c/cs
15	258	0354	18	6.42	57	37.81	1792.7	6.1	200	GF
15	258	0404	18	5.46	57	37.44	1793.8	6.2	196	GF
15	258	0407	18	5.20	57	37.40	1794.1	6.2	196	c/cs
15	258	0414	18	4.47	57	37.14	1794.8	6.1	198	GF
15	258	0424	18	3.50	57	36.80	1795.8	6.0	200	GF
15	258	0424	18	3.50	57	36.80	1795.8	6.1	202	c/cs
15	258	0440	18	2.00	57	36.16	1797.4	6.1	199	XX
15	258	0446	18	1.40	57	36.00	1798.0	5.7	177	c/cs
15	258	0448	18	1.20	57	36.00	1798.2	5.2	136	c/cs
15	258	0450	18	1.11	57	36.09	1798.4	7.3	113	XX
15	258	0454	18	0.90	57	36.60	1798.9	8.2	111	c/cs
15	258	0504	18	0.40	57	37.90	1800.3	7.9	86	c/cs
15	258	0505	18	0.50	57	38.00	1800.4	6.5	63	c/cs
15	258	0507	18	0.50	57	38.20	1800.6	6.5	48	c/cs
15	258	0513	18	1.00	57	38.80	1801.3	7.0	47	c/cs
15	258	0521	18	1.60	57	39.50	1802.2	3.7	8	c/cs
15	258	0523	18	1.70	57	39.50	1802.3	1.8	288	c/cs
15	258	0535	18	1.80	57	39.10	1802.7	2.2	292	c/cs

APPENDIX (continued).

Date (1987)	Julian day	Time (UTC)	North latitude (deg) (min)		East longitude (deg) (min)		Distance (nmi)	Actual speed (kt)	Actual course (deg)	Comments ^a
15	258	0553	18	2.10	57	38.50	1803.4	2.4	296	c/cs
15	258	0555	18	2.10	57	38.40	1803.4	2.4	299	c/cs
15	258	0645	18	3.11	57	36.54	1805.5	5.4	290	723
15	258	0645	18	3.10	57	36.50	1805.5	0.0	90	c/cs
19	Sept	262	18	3.11	57	36.54	1805.5	1.1	335	723
19		262	18	12.00	57	32.20	1815.2	4.3	7	c/cs
19		262	18	13.70	57	32.40	1816.9	4.5	12	c/cs
19		262	18	15.80	57	32.90	1819.1	4.5	13	c/cs
19		262	18	17.90	57	33.40	1821.3	5.7	15	c/cs
19		262	18	19.30	57	33.80	1822.7	5.9	15	c/cs
19		262	18	22.00	57	34.60	1825.6	5.9	15	c/cs
19		262	18	22.90	57	34.80	1826.4	6.0	347	c/cs
19		262	18	23.10	57	34.80	1826.6	5.2	308	c/cs
19		262	18	23.30	57	34.50	1826.9	5.6	296	c/cs
19		262	18	23.42	57	34.20	1827.3	3.8	314	XX
19		262	18	23.80	57	33.80	1827.8	3.0	317	c/cs
19		262	18	24.30	57	33.30	1828.5	2.6	320	c/cs
19		262	18	25.00	57	32.70	1829.4	1.5	352	c/cs
20	Sept	263	18	25.10	57	32.70	1829.5	1.5	352	c/cs
20		263	18	25.20	57	32.70	1829.6	1.5	9	c/cs
20		263	18	25.60	57	32.70	1830.0	1.8	356	c/cs
20		263	18	25.70	57	32.70	1830.1	3.2	9	c/cs
20		263	18	25.90	57	32.70	1830.3	4.3	35	c/cs
20		263	18	26.10	57	32.90	1830.6	4.8	40	c/cs
20		263	18	28.00	57	34.50	1833.1	4.9	40	c/cs
20		263	18	29.40	57	35.80	1834.9	4.7	40	c/cs
20		263	18	31.20	57	37.40	1837.2	4.7	40	c/cs
20		263	18	31.80	57	37.90	1838.0	3.7	17	c/cs
20		263	18	32.00	57	38.00	1838.2	1.5	348	c/cs
20		263	18	32.10	57	37.90	1838.3	0.8	144	c/cs
20		263	18	32.05	57	37.95	1838.3	3.3	192	XX
20		263	18	31.90	57	37.90	1838.4	4.4	174	c/cs
20		263	18	31.60	57	38.00	1838.8	5.5	175	c/cs
20		263	18	31.30	57	37.99	1839.0	5.4	177	XX
20		263	18	30.41	57	38.04	1839.9	5.0	154	XX
20		263	18	30.20	57	38.20	1840.2	5.8	127	c/cs
20		263	18	30.10	57	38.30	1840.4	6.3	113	c/cs
20		263	18	29.70	57	39.30	1841.4	6.9	109	c/cs
20		263	18	29.48	57	39.91	1842.0	7.4	106	XX
20		263	18	29.14	57	41.16	1843.2	6.7	106	XX
20		263	18	29.00	57	41.60	1843.7	6.7	106	c/cs
20		263	18	28.80	57	42.41	1844.5	7.1	105	XX
20		263	18	28.23	57	44.72	1846.7	7.1	104	XX
20		263	18	27.88	57	46.17	1848.1	6.9	104	XX
20		263	18	27.69	57	47.00	1849.0	7.0	106	XX
20		263	18	27.33	57	48.29	1850.2	7.3	106	XX
20		263	18	27.00	57	49.52	1851.4	6.8	106	XX
20		263	18	26.71	57	50.56	1852.5	6.5	101	XX
20		263	18	26.70	57	50.70	1852.6	6.3	30	c/cs
20		263	18	27.60	57	51.22	1853.6	7.4	358	XX
20		263	18	27.60	57	51.20	1853.6	7.3	0	c/cs
20		263	18	28.20	57	51.20	1854.2	6.5	297	c/cs
20		263	18	28.26	57	51.12	1854.3	6.2	281	GF
20		263	18	28.45	57	50.05	1855.4	6.6	285	GF

APPENDIX (continued).

Date (1987)	Julian day	Time (UTC)	North latitude		East longitude		Distance (nmi)	Actual speed (kt)	Actual course (deg)	Comments ^a
			(deg)	(min)	(deg)	(min)				
20	263	0456	18	28.73	57	48.93	1856.5	7.2	290	GF
20	263	0505	18	29.10	57	47.90	1857.6	4.2	237	c/cs
20	263	0506	18	29.07	57	47.80	1857.6	4.3	228	GF
20	263	0516	18	28.59	57	47.24	1858.3	6.1	195	GF
20	263	0526	18	27.60	57	46.97	1859.4	6.1	195	GF
20	263	0536	18	26.62	57	46.70	1860.4	6.0	197	GF
20	263	0546	18	25.66	57	46.39	1861.4	8.4	0	GF
20	263	0556	18	27.06	57	46.39	1862.8	1.4	137	GF
20	263	0558	18	27.00	57	46.40	1862.8	10.8	16	c/cs
20	263	0600	18	27.40	57	46.50	1863.2	4.1	34	c/cs
20	263	0606	18	27.71	57	46.77	1863.6	1.2	128	GF
20	263	0616	18	27.59	57	46.93	1863.8	0.2	57	GF
20	263	0800	18	27.75	57	47.19	1864.1	0.0	90	724
21	264	1150	18	27.75	57	47.19	1864.1	0.0	7	724
21	264	1945	18	27.90	57	47.20	1864.3	2.3	273	c/cs
21	264	2030	18	28.00	57	45.40	1866.0	1.7	291	c/cs
21	264	2230	18	29.24	57	42.04	1869.4	1.7	290	725
21	264	2230	18	29.20	57	42.00	1869.4	0.0	90	c/cs
22	265	1810	18	29.24	57	42.04	1869.4	2.3	189	725
22	265	2039	18	23.50	57	41.10	1875.2	7.0	193	c/cs
22	265	2104	18	20.60	57	40.40	1878.2	8.1	193	c/cs
22	265	2114	18	19.30	57	40.00	1879.5	8.4	193	c/cs
22	265	2144	18	15.20	57	39.00	1883.7	8.4	193	c/cs
22	265	2214	18	11.10	57	38.00	1887.9	8.2	193	c/cs
22	265	2244	18	7.20	57	37.00	1892.0	8.1	193	c/cs
22	265	2314	18	3.20	57	36.00	1896.1	8.2	193	c/cs
22	265	2332	18	0.80	57	35.40	1898.5	6.9	201	c/cs
22	265	2342	17	59.70	57	35.00	1899.7	6.7	202	c/cs
23	Sept	266	17	57.90	57	34.20	1901.7	6.7	202	c/cs
23	266	0012	17	56.60	57	33.70	1903.0	6.7	201	c/cs
23	266	0042	17	53.50	57	32.50	1906.4	6.8	201	c/cs
23	266	0110	17	50.50	57	31.30	1909.6	6.7	200	c/cs
23	266	0121	17	49.40	57	30.80	1910.8	6.3	185	c/cs
23	266	0146	17	46.70	57	30.60	1913.4	6.0	190	c/cs
23	266	0147	17	46.65	57	30.54	1913.5	5.7	190	GF
23	266	0154	17	46.00	57	30.40	1914.2	4.5	212	c/cs
23	266	0156	17	45.90	57	30.30	1914.4	3.7	245	c/cs
23	266	0157	17	45.84	57	30.28	1914.4	5.0	280	GF
23	266	0201	17	45.90	57	29.90	1914.8	5.8	286	c/cs
23	266	0207	17	46.06	57	29.35	1915.3	6.0	289	GF
23	266	0209	17	46.10	57	29.20	1915.5	6.4	292	c/cs
23	266	0217	17	46.45	57	28.32	1916.4	6.2	295	GF
23	266	0227	17	46.88	57	27.33	1917.4	5.9	295	GF
23	266	0237	17	47.30	57	26.39	1918.4	6.2	291	GF
23	266	0237	17	47.30	57	26.40	1918.4	6.2	289	c/cs
23	266	0247	17	47.64	57	25.37	1919.4	6.1	291	GF
23	266	0257	17	48.00	57	24.37	1920.5	6.1	290	GF
23	266	0307	17	48.35	57	23.36	1921.5	6.2	292	GF
23	266	0307	17	48.40	57	23.40	1921.5	6.3	289	c/cs
23	266	0317	17	48.70	57	22.32	1922.5	6.4	291	GF
23	266	0327	17	49.08	57	21.28	1923.6	6.2	293	GF
23	266	0337	17	49.48	57	20.28	1924.6	5.3	301	GF
23	266	0337	17	49.50	57	20.30	1924.6	5.3	303	c/cs
23	266	0342	17	49.70	57	19.90	1925.1	5.5	346	c/cs

APPENDIX (continued).

Date (1987)	Julian day	Time (UTC)	North latitude (deg) (min)	East longitude (deg) (min)	Distance (nmi)	Actual speed (kt)	Actual course (deg)	Comments ^a
23	266	0344	17 49.90	57 19.80	1925.3	6.4	12	c/cs
23	266	0347	17 50.21	57 19.91	1925.6	7.1	28	GF
23	266	0351	17 50.60	57 20.10	1926.0	7.3	35	c/cs
23	266	0354	17 50.90	57 20.40	1926.4	6.8	68	c/cs
23	266	0356	17 51.00	57 20.60	1926.6	6.2	94	c/cs
23	266	0357	17 51.00	57 20.70	1926.7	7.4	112	GF
23	266	0405	17 50.60	57 21.70	1927.7	7.7	114	c/cs
23	266	0407	17 50.52	57 21.90	1928.0	6.4	120	GF
23	266	0411	17 50.30	57 22.30	1928.4	5.9	142	c/cs
23	266	0413	17 50.20	57 22.40	1928.6	4.8	182	c/cs
23	266	0417	17 49.83	57 22.41	1928.9	6.0	191	GF
23	266	0417	17 49.80	57 22.40	1928.9	5.9	198	c/cs
23	266	0424	17 49.20	57 22.20	1929.6	6.2	194	c/cs
23	266	0427	17 48.87	57 22.10	1929.9	6.7	196	GF
23	266	0432	17 48.30	57 21.90	1930.5	6.6	197	c/cs
23	266	0437	17 47.81	57 21.77	1931.0	7.0	197	GF
23	266	0438	17 47.70	57 21.70	1931.2	6.9	197	c/cs
23	266	0447	17 46.71	57 21.41	1932.2	2.9	224	GF
23	266	0457	17 46.36	57 21.06	1932.7	9.7	23	GF
23	266	0507	17 47.85	57 21.71	1934.3	3.8	5	GF
23	266	0510	17 48.00	57 21.70	1934.5	7.7	15	c/cs
23	266	0517	17 48.90	57 21.97	1935.4	0.4	79	GF
23	266	0600	17 48.96	57 22.29	1935.7	0.0	90	726
24	Sept 267	0335	17 48.96	57 22.29	1935.7	0.6	77	726
24	267	0430	17 49.08	57 22.83	1936.2	0.6	156	GF
24	267	0430	17 49.10	57 22.80	1936.2	6.4	106	c/cs
24	267	0449	17 48.50	57 24.90	1938.2	4.7	112	c/cs
24	267	0500	17 48.19	57 25.72	1939.1	6.6	104	GF
24	267	0510	17 47.90	57 26.80	1940.2	6.6	102	c/cs
24	267	0515	17 47.80	57 27.40	1940.8	6.3	102	GF
24	267	0530	17 47.48	57 29.02	1942.3	6.5	102	GF
24	267	0540	17 47.30	57 30.10	1943.4	6.5	102	c/cs
24	267	0545	17 47.15	57 30.70	1944.0	6.4	103	GF
24	267	0600	17 46.80	57 32.34	1945.6	6.6	103	GF
24	267	0610	17 46.60	57 33.50	1946.7	6.6	101	c/cs
24	267	0615	17 46.45	57 34.03	1947.2	6.5	102	GF
24	267	0633	17 46.05	57 36.03	1949.2	6.1	99	GF
24	267	0639	17 45.90	57 36.70	1949.8	5.8	86	c/cs
24	267	0640	17 46.00	57 36.80	1949.9	5.0	54	c/cs
24	267	0642	17 46.10	57 36.90	1950.0	4.5	31	c/cs
24	267	0643	17 46.12	57 36.95	1950.1	5.8	8	GF
24	267	0649	17 46.70	57 37.00	1950.7	6.2	10	c/cs
24	267	0653	17 47.10	57 37.11	1951.1	5.2	354	GF
24	267	0654	17 47.20	57 37.10	1951.2	5.3	324	c/cs
24	267	0656	17 47.30	57 37.00	1951.4	5.0	290	c/cs
24	267	0701	17 47.50	57 36.60	1951.8	6.1	287	c/cs
24	267	0703	17 47.53	57 36.38	1952.0	6.3	271	GF
24	267	0708	17 47.50	57 35.80	1952.5	5.6	234	c/cs
24	267	0710	17 47.40	57 35.70	1952.7	5.6	211	c/cs
24	267	0713	17 47.19	57 35.52	1953.0	7.2	192	GF
24	267	0717	17 46.70	57 35.40	1953.4	7.4	192	c/cs
24	267	0723	17 46.00	57 35.25	1954.2	6.5	191	GF
24	267	0726	17 45.70	57 35.20	1954.5	5.1	191	c/cs
24	267	0730	17 45.40	57 35.10	1954.9	4.7	190	c/cs

APPENDIX (continued).

Date (1987)	Julian day	Time (UTC)	North latitude (deg) (min)		East longitude (deg) (min)		Distance (nmi)	Actual speed (kt)	Actual course (deg)	Comments ^a
24	267	0733	17	45.12	57	35.07	1955.1	6.9	193	GF
24	267	0734	17	45.00	57	35.00	1955.2	4.2	191	c/cs
24	267	0743	17	44.39	57	34.92	1955.8	4.1	4	GF
24	267	0754	17	45.14	57	34.97	1956.6	1.7	19	GF
24	267	0830	17	46.08	57	35.31	1957.6	0.0	90	727
25	Sept 268	0200	17	46.08	57	35.31	1957.6	2.8	110	727
25	268	0225	17	45.70	57	36.50	1958.7	6.9	111	c/cs
25	268	0247	17	44.80	57	38.90	1961.3	7.5	110	c/cs
25	268	0256	17	44.38	57	40.03	1962.4	6.9	111	GF
25	268	0306	17	43.97	57	41.16	1963.5	6.9	110	GF
25	268	0309	17	43.90	57	41.50	1963.9	7.4	110	c/cs
25	268	0316	17	43.56	57	42.35	1964.7	7.5	110	GF
25	268	0326	17	43.13	57	43.58	1966.0	7.5	111	GF
25	268	0336	17	42.68	57	44.80	1967.2	7.5	112	GF
25	268	0339	17	42.50	57	45.20	1967.6	7.5	112	c/cs
25	268	0346	17	42.22	57	46.02	1968.5	7.5	111	GF
25	268	0356	17	41.78	57	47.24	1969.7	7.3	111	GF
25	268	0406	17	41.35	57	48.43	1970.9	7.3	111	GF
25	268	0409	17	41.20	57	48.80	1971.3	7.4	110	c/cs
25	268	0416	17	40.92	57	49.64	1972.2	7.3	107	GF
25	268	0421	17	40.70	57	50.20	1972.8	7.3	106	c/cs
25	268	0426	17	40.57	57	50.86	1973.4	7.3	105	GF
25	268	0436	17	40.26	57	52.09	1974.6	7.3	106	GF
25	268	0446	17	39.93	57	53.31	1975.8	7.1	106	GF
25	268	0450	17	39.80	57	53.80	1976.3	7.2	109	c/cs
25	268	0456	17	39.57	57	54.50	1977.0	7.0	107	GF
25	268	0506	17	39.23	57	55.68	1978.2	7.2	106	GF
25	268	0517	17	38.86	57	57.00	1979.5	7.3	107	GF
25	268	0520	17	38.80	57	57.40	1979.8	7.2	106	c/cs
25	268	0527	17	38.52	57	58.22	1980.7	5.6	97	GF
25	268	0531	17	38.50	57	58.60	1981.1	5.8	67	c/cs
25	268	0533	17	38.50	57	58.80	1981.3	5.5	17	c/cs
25	268	0535	17	38.70	57	58.90	1981.4	4.5	328	c/cs
25	268	0537	17	38.85	57	58.77	1981.6	5.5	305	GF
25	268	0539	17	39.00	57	58.60	1981.8	6.0	302	c/cs
25	268	0548	17	39.40	57	57.80	1982.7	5.5	281	c/cs
25	268	0549	17	39.40	57	57.70	1982.8	4.3	245	c/cs
25	268	0551	17	39.40	57	57.60	1982.9	4.5	213	c/cs
25	268	0555	17	39.10	57	57.40	1983.2	5.1	206	c/cs
25	268	0557	17	38.98	57	57.32	1983.4	6.8	189	GF
25	268	0607	17	37.87	57	57.13	1984.5	6.0	205	GF
25	268	0611	17	37.50	57	57.00	1984.9	5.8	237	c/cs
25	268	0613	17	37.40	57	56.80	1985.1	5.9	271	c/cs
25	268	0617	17	37.41	57	56.37	1985.5	7.2	283	GF
25	268	0620	17	37.50	57	56.00	1985.9	7.8	286	c/cs
25	268	0627	17	37.74	57	55.08	1986.8	7.7	285	GF
25	268	0637	17	38.07	57	53.78	1988.1	7.8	287	GF
25	268	0647	17	38.45	57	52.47	1989.4	7.8	286	GF
25	268	0649	17	38.50	57	52.20	1989.6	7.8	287	c/cs
25	268	0657	17	38.83	57	51.16	1990.7	7.9	288	GF
25	268	0707	17	39.23	57	49.85	1992.0	6.5	295	GF
25	268	0712	17	39.50	57	49.30	1992.5	5.4	337	c/cs
25	268	0714	17	39.60	57	49.30	1992.7	6.0	5	c/cs
25	268	0718	17	40.02	57	49.30	1993.1	6.9	18	GF

APPENDIX (continued).

Date (1987)	Julian day	Time (UTC)	North latitude (deg) (min)	East longitude (deg) (min)	Distance (nmi)	Actual speed (kt)	Actual course (deg)	Comments ^a
25	268	0719	17 40.10	57 49.30	1993.2	7.3	22	c/cs
25	268	0728	17 41.15	57 49.76	1994.3	7.1	19	GF
25	268	0728	17 41.10	57 49.80	1994.3	7.0	14	c/cs
25	268	0735	17 41.90	57 50.00	1995.1	5.5	12	c/cs
25	268	0738	17 42.21	57 50.02	1995.4	4.6	12	GF
25	268	0740	17 42.40	57 50.10	1995.5	4.3	14	c/cs
25	268	0748	17 42.92	57 50.20	1996.1	1.6	44	GF
25	268	0758	17 43.11	57 50.39	1996.4	9.3	199	GF
25	268	0808	17 41.65	57 49.85	1997.9	3.5	23	GF
25	268	0841	17 43.40	57 50.60	1999.9	0.1	202	c/cs
27	Sept 270	1007	17 40.81	57 49.54	2002.7	0.0	90	728
27	270	2000	17 40.81	57 49.54	2002.7	0.1	107	728
28	Sept 271	0100	17 40.70	57 49.90	2003.0	6.8	106	c/cs
28	271	0200	17 38.80	57 56.80	2009.8	0.1	107	c/cs
28	271	0848	17 38.68	57 57.28	2010.3	0.0	90	729
28	271	1830	17 38.68	57 57.28	2010.3	0.8	294	729
28	271	1855	17 38.80	57 56.90	2010.7	4.5	285	c/cs
28	271	1925	17 39.40	57 54.70	2012.9	4.5	286	c/cs
28	271	1955	17 40.00	57 52.40	2015.2	4.5	286	c/cs
28	271	2025	17 40.60	57 50.10	2017.5	4.5	286	c/cs
28	271	2055	17 41.30	57 47.80	2019.7	4.5	286	c/cs
28	271	2125	17 41.90	57 45.50	2022.0	4.6	287	c/cs
28	271	2146	17 42.30	57 43.90	2023.6	4.7	291	c/cs
28	271	2216	17 43.20	57 41.60	2025.9	4.7	291	c/cs
28	271	2246	17 44.00	57 39.30	2028.3	4.7	291	c/cs
28	271	2313	17 44.70	57 37.30	2030.4	4.6	292	c/cs
28	271	2340	17 45.50	57 35.20	2032.4	4.6	318	c/cs
28	271	2342	17 45.60	57 35.10	2032.6	4.1	2	c/cs
28	271	2346	17 45.90	57 35.10	2032.9	4.4	11	c/cs
28	271	2349	17 46.10	57 35.20	2033.1	3.1	59	c/cs
28	271	2351	17 46.10	57 35.30	2033.2	3.2	109	c/cs
29	Sept 272	0000	17 46.00	57 35.80	2033.7	3.2	109	c/cs
29	272	0006	17 45.90	57 36.10	2034.0	3.4	107	c/cs
29	272	0036	17 45.40	57 37.80	2035.7	3.4	109	c/cs
29	272	0106	17 44.90	57 39.40	2037.4	3.3	110	c/cs
29	272	0120	17 44.60	57 40.20	2038.1	3.3	127	c/cs
29	272	0150	17 43.60	57 41.60	2039.8	3.4	125	c/cs
29	272	0202	17 43.20	57 42.20	2040.4	3.2	83	c/cs
29	272	0204	17 43.20	57 42.30	2040.6	3.6	22	c/cs
29	272	0206	17 43.30	57 42.30	2040.7	4.0	329	c/cs
29	272	0208	17 43.50	57 42.20	2040.8	4.2	304	c/cs
29	272	0220	17 43.92	57 41.51	2041.6	3.4	306	730
29	272	0220	17 43.90	57 41.50	2041.6	0.0	90	c/cs
30	Sept 273	0935	17 43.92	57 41.51	2041.6	1.2	123	730
30	273	1229	17 42.00	57 44.60	2045.1	5.7	123	c/cs
30	273	1232	17 41.90	57 44.80	2045.4	8.3	123	c/cs
30	273	1240	17 41.30	57 45.80	2046.5	8.9	122	c/cs
30	273	1303	17 39.50	57 48.90	2049.9	9.0	123	c/cs
30	273	1353	17 35.40	57 55.50	2057.4	9.1	123	c/cs
30	273	1359	17 34.90	57 56.30	2058.3	9.7	123	c/cs
30	273	1432	17 32.00	58 1.00	2063.7	9.7	122	c/cs
30	273	1500	17 29.59	58 4.98	2068.2	8.9	124	DR
30	273	1504	17 29.26	58 5.50	2068.8	8.4	124	DR
30	273	1505	17 29.20	58 5.60	2068.9	8.2	124	c/cs

APPENDIX (continued).

Date (1987)	Julian day	Time (UTC)	North		East		Distance (nmi)	Actual		Comments ^a
			latitude (deg)	(min)	longitude (deg)	(min)		speed (kt)	course (deg)	
30	273	1534	17	26.96	58	9.07	2072.9	8.2	124	DR
30	273	1555	17	25.40	58	11.60	2075.8	8.1	124	c/cs
30	273	1601	17	24.90	58	12.30	2076.6	8.0	124	c/cs
30	273	1604	17	24.69	58	12.64	2077.0	8.0	124	DR
30	273	1611	17	24.20	58	13.50	2077.9	8.3	124	c/cs
30	273	1634	17	22.37	58	16.21	2081.1	8.3	124	DR
30	273	1648	17	21.30	58	17.90	2083.1	8.4	125	c/cs
30	273	1704	17	19.98	58	19.80	2085.3	8.4	126	DR
30	273	1714	17	19.20	58	21.00	2086.7	8.5	126	c/cs
30	273	1730	17	17.80	58	22.90	2089.0	8.4	126	c/cs
30	273	1734	17	17.51	58	23.38	2089.5	8.4	126	DR
30	273	1804	17	15.06	58	26.95	2093.7	8.5	125	DR
30	273	1805	17	15.00	58	27.10	2093.9	8.5	126	c/cs
30	273	1834	17	12.55	58	30.54	2098.0	12.9	123	DR
30	273	1850	17	10.70	58	33.60	2101.4	13.0	123	c/cs
30	273	1908	17	8.60	58	37.00	2105.3	8.8	122	c/cs
30	273	1910	17	8.50	58	37.20	2105.6	12.6	123	c/cs
30	273	1941	17	4.90	58	43.00	2112.1	12.5	123	c/cs
30	273	2004	17	2.30	58	47.20	2116.9	12.6	123	c/cs
30	273	2014	17	1.20	58	49.10	2119.0	11.6	122	c/cs
30	273	2049	16	57.50	58	55.00	2125.8	11.6	122	c/cs
30	273	2125	16	53.80	59	1.20	2132.8	11.6	122	c/cs
30	273	2215	16	48.60	59	9.70	2142.4	11.6	122	c/cs
30	273	2233	16	46.80	59	12.80	2145.9	10.4	122	c/cs
30	273	2314	16	43.00	59	19.00	2153.0	10.2	122	c/cs
30	273	2332	16	41.40	59	21.80	2156.0	10.3	122	c/cs
1 Oct	274	0000	16	38.90	59	26.00	2160.8	10.3	122	c/cs
1	274	0005	16	38.40	59	26.80	2161.7	10.1	122	c/cs
1	274	0014	16	37.60	59	28.10	2163.2	10.0	122	c/cs
1	274	0022	16	36.90	59	29.30	2164.5	8.7	122	c/cs
1	274	0037	16	35.70	59	31.20	2166.7	8.6	122	c/cs
1	274	0106	16	33.50	59	34.90	2170.9	8.4	130	c/cs
1	274	0108	16	33.40	59	35.10	2171.1	7.7	143	c/cs
1	274	0111	16	33.10	59	35.40	2171.5	9.6	154	c/cs
1	274	0116	16	32.30	59	35.70	2172.3	9.4	162	c/cs
1	274	0128	16	30.50	59	36.30	2174.2	9.2	163	c/cs
1	274	0131	16	30.10	59	36.50	2174.7	8.6	130	c/cs
1	274	0146	16	28.70	59	38.20	2176.8	8.0	106	c/cs
1	274	0155	16	28.39	59	39.40	2178.0	6.9	91	GF
1	274	0156	16	28.40	59	39.50	2178.2	6.9	87	c/cs
1	274	0205	16	28.44	59	40.60	2179.2	7.0	88	GF
1	274	0215	16	28.48	59	41.81	2180.4	6.9	89	GF
1	274	0225	16	28.51	59	43.01	2181.5	6.7	87	GF
1	274	0226	16	28.50	59	43.10	2181.6	6.8	87	c/cs
1	274	0233	16	28.60	59	44.00	2182.4	6.1	65	c/cs
1	274	0235	16	28.64	59	44.15	2182.6	5.4	42	GF
1	274	0236	16	28.70	59	44.20	2182.7	5.1	12	c/cs
1	274	0242	16	29.20	59	44.30	2183.2	5.4	1	c/cs
1	274	0245	16	29.47	59	44.33	2183.5	5.1	345	GF
1	274	0248	16	29.70	59	44.30	2183.7	5.7	325	c/cs
1	274	0250	16	29.90	59	44.10	2183.9	5.2	298	c/cs
1	274	0252	16	29.90	59	44.00	2184.1	5.3	281	c/cs
1	274	0255	16	30.00	59	43.72	2184.4	6.1	270	GF
1	274	0303	16	30.00	59	42.90	2185.2	6.3	269	c/cs

APPENDIX (continued).

Date (1987)	Julian day	Time (UTC)	North latitude (deg) (min)		East longitude (deg) (min)		Distance (nmi)	Actual speed (kt)	Actual course (deg)	Comments ^a
1	274	0305	16	30.00	59	42.65	2185.4	5.2	253	GF
1	274	0308	16	29.90	59	42.40	2185.6	5.8	234	c/cs
1	274	0309	16	29.90	59	42.30	2185.7	5.5	199	c/cs
1	274	0311	16	29.70	59	42.20	2185.9	5.9	194	c/cs
1	274	0315	16	29.31	59	42.15	2186.3	6.3	183	GF
1	274	0319	16	28.90	59	42.10	2186.7	6.6	181	c/cs
1	274	0325	16	28.23	59	42.12	2187.4	4.8	192	731
1	274	0325	16	28.20	59	42.10	2187.4	0.0	90	c/cs
6 Oct	279	1000	16	28.23	59	42.12	2187.4	0.0	90	731
9 Oct	282	1245	16	28.23	59	42.12	2187.4	4.5	268	731
9	282	1245	16	28.20	59	42.10	2187.4	8.1	215	c/cs
9	282	1251	16	27.60	59	41.60	2188.2	7.5	219	c/cs
9	282	1254	16	27.30	59	41.40	2188.6	8.1	215	c/cs
9	282	1259	16	26.70	59	41.00	2189.3	9.2	211	c/cs
9	282	1304	16	26.06	59	40.57	2190.0	9.7	177	SATL
9	282	1309	16	25.30	59	40.60	2190.8	10.8	178	c/cs
9	282	1331	16	21.30	59	40.80	2194.8	10.9	178	c/cs
9	282	1347	16	18.40	59	40.90	2197.7	11.0	178	c/cs
9	282	1433	16	9.90	59	41.20	2206.2	11.1	178	c/cs
9	282	1506	16	3.80	59	41.40	2212.3	11.0	178	c/cs
9	282	1549	15	55.90	59	41.70	2220.2	10.4	178	c/cs
9	282	1604	15	53.40	59	41.80	2222.8	10.3	178	c/cs
9	282	1635	15	48.00	59	42.00	2228.1	10.3	178	c/cs
9	282	1652	15	45.10	59	42.10	2231.0	10.2	178	c/cs
9	282	1722	15	40.00	59	42.30	2236.1	9.6	171	c/cs
9	282	1723	15	39.90	59	42.30	2236.3	3.7	109	c/cs
9	282	1725	15	39.80	59	42.50	2236.4	1.5	146	c/cs
9	282	1730	15	39.70	59	42.50	2236.5	1.8	165	c/cs
9	282	1746	15	39.20	59	42.70	2237.0	4.5	211	c/cs
9	282	1748	15	39.10	59	42.60	2237.2	7.4	181	c/cs
9	282	1750	15	38.90	59	42.60	2237.4	10.3	178	c/cs
9	282	1755	15	38.00	59	42.60	2238.3	10.9	179	c/cs
9	282	1841	15	29.70	59	42.80	2246.6	11.0	179	c/cs
9	282	1902	15	25.80	59	42.90	2250.5	10.9	184	c/cs
9	282	1924	15	21.80	59	42.60	2254.5	10.9	184	c/cs
9	282	2003	15	14.70	59	42.10	2261.6	11.0	184	c/cs
9	282	2041	15	7.80	59	41.60	2268.5	10.9	185	c/cs
9	282	2131	14	58.80	59	40.80	2277.6	11.0	184	c/cs
9	282	2207	14	52.20	59	40.40	2284.2	10.9	184	c/cs
9	282	2240	14	46.20	59	40.00	2290.1	10.9	184	c/cs
9	282	2330	14	37.10	59	39.30	2299.2	11.0	184	c/cs
10 Oct	283	0000	14	31.70	59	38.90	2304.7	11.0	184	c/cs
10	283	0019	14	28.20	59	38.70	2308.2	11.0	184	c/cs
10	283	0035	14	25.27	59	38.49	2311.1	12.2	192	GPS
10	283	0041	14	24.10	59	38.20	2312.4	12.1	192	c/cs
10	283	0125	14	15.40	59	36.30	2321.2	12.1	192	c/cs
10	283	0200	14	8.49	59	34.78	2328.3	12.3	191	GPS
10	283	0201	14	8.30	59	34.70	2328.5	12.5	191	c/cs
10	283	0205	14	7.50	59	34.60	2329.4	12.3	185	c/cs
10	283	0254	13	57.40	59	33.60	2339.4	12.3	185	c/cs
10	283	0319	13	52.30	59	33.10	2344.6	12.4	185	c/cs
10	283	0350	13	46.00	59	32.60	2350.9	12.3	185	c/cs
10	283	0400	13	43.92	59	32.43	2353.0	12.4	183	GPS
10	283	0413	13	41.20	59	32.30	2355.7	12.4	183	c/cs

APPENDIX (continued).

Date (1987)	Julian day	Time (UTC)	North latitude (deg) (min)		East longitude (deg) (min)		Distance (nmi)	Actual speed (kt)	Actual course (deg)	Comments ^a
10	283	0453	13	33.00	59	31.90	2363.9	12.4	183	c/cs
10	283	0511	13	29.30	59	31.70	2367.7	12.4	183	c/cs
10	283	0552	13	20.80	59	31.20	2376.2	12.6	183	c/cs
10	283	0600	13	19.10	59	31.13	2377.8	12.7	181	GPS
10	283	0627	13	13.40	59	31.00	2383.6	12.7	181	c/cs
10	283	0702	13	6.00	59	30.90	2390.9	12.7	181	c/cs
10	283	0740	12	58.00	59	30.70	2399.0	12.7	181	c/cs
10	283	0800	12	53.73	59	30.59	2403.2	12.8	180	GPS
10	283	0804	12	52.90	59	30.60	2404.1	12.7	182	c/cs
10	283	0852	12	42.80	59	30.20	2414.2	12.7	182	c/cs
10	283	0900	12	41.06	59	30.11	2415.9	12.8	182	GPS
10	283	0930	12	34.70	59	29.90	2422.3	12.5	182	c/cs
10	283	0958	12	28.80	59	29.70	2428.1	12.6	183	c/cs
10	283	1000	12	28.42	59	29.67	2428.5	12.3	179	GPS
10	283	1011	12	26.20	59	29.70	2430.8	12.1	180	c/cs
10	283	1036	12	21.10	59	29.70	2435.9	12.0	181	c/cs
10	283	1054	12	17.50	59	29.60	2439.4	12.1	182	c/cs
10	283	1100	12	16.32	59	29.56	2440.6	12.9	186	GPS
10	283	1114	12	13.30	59	29.30	2443.7	13.0	185	c/cs
10	283	1134	12	9.01	59	28.88	2448.0	12.6	184	SATL
10	283	1142	12	7.30	59	28.80	2449.7	12.7	185	c/cs
10	283	1207	12	2.00	59	28.30	2455.0	12.8	185	c/cs
10	283	1233	11	56.50	59	27.80	2460.5	12.8	185	c/cs
10	283	1242	11	54.62	59	27.67	2462.4	12.6	185	SATL
10	283	1306	11	49.60	59	27.20	2467.4	12.5	185	c/cs
10	283	1356	11	39.20	59	26.30	2477.9	12.6	185	c/cs
10	283	1404	11	37.55	59	26.16	2479.6	12.6	185	SATL
10	283	1430	11	32.11	59	25.70	2485.0	12.5	187	SATL
10	283	1445	11	29.00	59	25.30	2488.2	12.5	187	c/cs
10	283	1506	11	24.65	59	24.81	2492.5	12.6	187	SATL
10	283	1522	11	21.30	59	24.40	2495.9	12.5	186	c/cs
10	283	1551	11	15.30	59	23.70	2502.0	12.3	186	c/cs
10	283	1608	11	11.80	59	23.40	2505.5	12.5	184	c/cs
10	283	1638	11	5.50	59	23.00	2511.7	12.6	184	c/cs
10	283	1648	11	3.45	59	22.83	2513.8	12.7	186	SATL
10	283	1659	11	1.10	59	22.60	2516.2	12.8	186	c/cs
10	283	1737	10	53.10	59	21.80	2524.2	12.7	186	c/cs
10	283	1823	10	43.40	59	20.80	2534.0	12.6	186	c/cs
10	283	1840	10	39.84	59	20.50	2537.5	12.4	185	SATL
10	283	1846	10	38.60	59	20.40	2538.8	12.1	185	c/cs
10	283	1853	10	37.20	59	20.30	2540.2	10.2	186	c/cs
10	283	1859	10	36.20	59	20.20	2541.2	9.9	185	c/cs
10	283	1918	10	33.10	59	19.90	2544.3	12.3	185	c/cs
10	283	1929	10	30.80	59	19.70	2546.6	12.5	185	c/cs
10	283	2001	10	24.20	59	19.10	2553.3	12.5	184	c/cs
10	283	2002	10	23.95	59	19.10	2553.5	12.8	185	SATL
10	283	2022	10	19.70	59	18.70	2557.8	12.7	185	c/cs
10	283	2040	10	15.90	59	18.30	2561.6	12.7	185	c/cs
10	283	2108	10	10.00	59	17.80	2567.5	12.8	185	c/cs
10	283	2134	10	4.49	59	17.27	2573.0	13.0	186	SATL
10	283	2143	10	2.60	59	17.10	2575.0	12.9	186	c/cs
10	283	2156	9	59.80	59	16.70	2577.8	12.9	185	c/cs
10	283	2246	9	49.10	59	15.80	2588.5	12.8	185	c/cs
10	283	2320	9	41.80	59	15.20	2595.8	13.1	185	c/cs

APPENDIX (continued).

Date (1987)	Julian day	Time (UTC)	North latitude (deg) (min)		East longitude (deg) (min)		Distance (nmi)	Actual speed (kt)	Actual course (deg)	Comments ^a
10	283	2324	9	40.96	59	15.10	2596.7	13.1	183	SATL
10	283	2335	9	38.60	59	15.00	2599.1	13.0	183	c/cs
11	Oct	284	9	32.90	59	14.70	2604.7	12.9	183	c/cs
11	284	0026	9	27.60	59	14.40	2610.1	12.9	183	c/cs
11	284	0056	9	21.10	59	14.10	2616.6	12.8	183	c/cs
11	284	0100	9	20.24	59	14.08	2617.4	12.8	183	GPS
11	284	0137	9	12.40	59	13.70	2625.3	12.9	183	c/cs
11	284	0154	9	8.70	59	13.50	2628.9	12.8	184	c/cs
11	284	0200	9	7.45	59	13.38	2630.2	11.4	183	GPS
11	284	0400	8	44.70	59	12.29	2653.0	10.4	182	GPS
11	284	0600	8	24.00	59	11.51	2673.7	10.3	182	GPS
11	284	0800	8	3.40	59	10.67	2694.3	10.8	180	GPS
11	284	0900	7	52.60	59	10.63	2705.1	7.8	177	GPS
11	284	0912	7	51.04	59	10.70	2706.7	9.8	183	SATL
11	284	0936	7	47.12	59	10.47	2710.6	11.2	182	SATL
11	284	1000	7	42.63	59	10.31	2715.1	10.7	182	GPS
11	284	1100	7	31.90	59	9.86	2725.8	10.6	183	SATL
11	284	1542	6	42.23	59	7.32	2775.6	10.2	185	SATL
11	284	1935	6	2.80	59	3.80	2815.2	8.6	188	c/cs
11	284	1938	6	2.36	59	3.76	2815.6	9.6	183	SATL
11	284	2002	5	58.50	59	3.50	2819.5	9.9	182	c/cs
11	284	2033	5	53.40	59	3.40	2824.6	10.1	182	c/cs
11	284	2114	5	46.50	59	3.10	2831.5	10.2	183	c/cs
11	284	2141	5	41.90	59	2.90	2836.1	10.3	184	c/cs
11	284	2222	5	34.90	59	2.30	2843.1	10.3	184	c/cs
11	284	2246	5	30.75	59	2.08	2847.3	9.8	179	GPS
11	284	2250	5	30.10	59	2.10	2847.9	9.9	179	c/cs
11	284	2310	5	26.80	59	2.10	2851.2	9.9	179	c/cs
11	284	2341	5	21.70	59	2.20	2856.3	9.9	179	c/cs
12	Oct	285	5	18.50	59	2.20	2859.5	9.9	179	c/cs
12	285	0019	5	15.40	59	2.20	2862.6	9.9	182	c/cs
12	285	0044	5	11.30	59	2.10	2866.8	9.9	182	c/cs
12	285	0100	5	8.63	59	1.99	2869.4	9.8	183	GPS
12	285	0125	5	4.50	59	1.80	2873.5	9.9	183	c/cs
12	285	0147	5	0.90	59	1.60	2877.1	10.0	183	c/cs
12	285	0200	4	58.74	59	1.48	2879.3	10.0	184	GPS
12	285	0216	4	56.10	59	1.30	2882.0	10.0	184	c/cs
12	285	0300	4	48.80	59	0.70	2889.3	10.3	185	GPS
12	285	0306	4	47.80	59	0.60	2890.3	10.1	184	c/cs
12	285	0341	4	41.90	59	0.20	2896.2	10.1	184	c/cs
12	285	0400	4	38.70	59	0.00	2899.4	10.1	185	GPS
12	285	0405	4	37.90	58	59.90	2900.2	10.0	185	c/cs
12	285	0430	4	33.70	58	59.60	2904.4	10.0	185	c/cs
12	285	0506	4	27.70	58	59.00	2910.4	10.9	185	c/cs
12	285	0534	4	22.70	58	58.60	2915.5	11.2	185	c/cs
12	285	0544	4	20.80	58	58.40	2917.3	11.0	183	c/cs
12	285	0607	4	16.60	58	58.20	2921.6	11.5	183	GPS
12	285	0607	4	16.60	58	58.20	2921.6	11.5	183	c/cs
12	285	0631	4	12.00	58	57.90	2926.2	11.6	183	c/cs
12	285	0700	4	6.40	58	57.60	2931.8	11.3	185	GPS
12	285	0709	4	4.70	58	57.40	2933.5	11.2	185	c/cs
12	285	0747	3	57.70	58	56.80	2940.6	11.4	185	c/cs
12	285	0800	3	55.20	58	56.57	2943.0	11.4	185	GPS

APPENDIX (continued).

Date (1987)	Julian day	Time (UTC)	North latitude (deg) (min)		East longitude (deg) (min)		Distance (nmi)	Actual speed (kt)	Actual course (deg)	Comments ^a
12	285	0815	3	52.40	58	56.30	2945.9	11.4	182	c/cs
12	285	0851	3	45.50	58	56.10	2952.7	11.5	182	c/cs
12	285	0912	3	41.53	58	55.89	2956.7	11.1	185	SATL
12	285	0913	3	41.30	58	55.90	2956.9	11.1	185	c/cs
12	285	0943	3	35.80	58	55.40	2962.4	11.1	185	c/cs
12	285	1000	3	32.72	58	55.18	2965.6	10.7	186	GPS
12	285	1002	3	32.40	58	55.10	2965.9	10.8	186	c/cs
12	285	1019	3	29.30	58	54.80	2969.0	10.7	186	c/cs
12	285	1026	3	28.08	58	54.66	2970.2	11.0	184	SATL
12	285	1047	3	24.20	58	54.40	2974.1	11.2	184	c/cs
12	285	1100	3	21.81	58	54.23	2976.5	10.8	182	GPS
12	285	1136	3	15.40	58	54.00	2983.0	10.7	182	c/cs
12	285	1226	3	6.40	58	53.80	2991.9	10.8	183	c/cs
12	285	1246	3	2.80	58	53.60	2995.5	10.8	183	c/cs
12	285	1319	2	56.90	58	53.30	3001.4	10.8	183	c/cs
12	285	1346	2	52.07	58	53.11	3006.3	10.0	179	SATL
12	285	1352	2	51.10	58	53.10	3007.3	9.9	179	c/cs
12	285	1441	2	43.00	58	53.30	3015.4	9.9	179	c/cs
12	285	1531	2	34.70	58	53.50	3023.7	9.9	179	c/cs
12	285	1552	2	31.20	58	53.60	3027.1	9.8	182	c/cs
12	285	1640	2	23.40	58	53.30	3035.0	9.8	182	c/cs
12	285	1708	2	18.80	58	53.22	3039.6	9.5	180	SATL
12	285	1726	2	16.00	58	53.20	3042.4	9.5	183	c/cs
12	285	1803	2	10.10	58	52.90	3048.2	9.6	183	c/cs
12	285	1845	2	3.40	58	52.50	3055.0	9.4	183	c/cs
12	285	1856	2	1.69	58	52.44	3056.7	9.7	186	SATL
12	285	1925	1	57.10	58	51.90	3061.4	9.7	186	c/cs
12	285	1953	1	52.50	58	51.40	3065.9	9.8	186	c/cs
12	285	2013	1	49.30	58	51.10	3069.2	9.7	186	c/cs
12	285	2036	1	45.60	58	50.70	3072.9	9.7	186	c/cs
12	285	2104	1	41.09	58	50.18	3077.4	10.1	186	SATL
12	285	2126	1	37.40	58	49.80	3081.1	10.0	186	c/cs
12	285	2210	1	30.10	58	49.10	3088.4	9.8	185	c/cs
12	285	2243	1	24.70	58	48.60	3093.8	9.9	185	c/cs
12	285	2308	1	20.60	58	48.20	3098.0	9.9	185	c/cs
12	285	2357	1	12.60	58	47.40	3106.0	9.9	185	c/cs
13 Oct	286	0000	1	12.09	58	47.40	3106.5	9.6	186	GPS
13	286	0000	1	12.10	58	47.40	3106.5	9.6	186	c/cs
13	286	0025	1	8.10	58	47.00	3110.5	9.7	187	c/cs
13	286	0050	1	4.10	58	46.40	3114.6	9.6	186	c/cs
13	286	0140	0	56.20	58	45.50	3122.6	9.7	187	c/cs
13	286	0158	0	53.30	58	45.20	3125.5	9.7	186	c/cs
13	286	0200	0	52.94	58	45.12	3125.8	10.4	185	GPS
13	286	0214	0	50.50	58	44.90	3128.2	10.2	180	c/cs
13	286	0231	0	47.60	58	44.90	3131.1	10.4	180	c/cs
13	286	0302	0	42.30	58	44.80	3136.5	10.4	180	c/cs
13	286	0348	0	34.30	58	44.80	3144.5	10.4	182	c/cs
13	286	0400	0	32.20	58	44.70	3146.6	10.2	183	GPS
13	286	0408	0	30.80	58	44.60	3147.9	10.2	183	c/cs
13	286	0426	0	27.80	58	44.50	3151.0	10.1	183	c/cs
13	286	0448	0	24.10	58	44.30	3154.7	9.9	182	c/cs
13	286	0509	0	20.60	58	44.20	3158.2	9.8	183	c/cs
13	286	0529	0	17.30	58	44.00	3161.5	9.2	183	c/cs
13	286	0539	0	15.80	58	43.90	3163.0	8.8	184	c/cs
13	286	0549	0	14.30	58	43.80	3164.5	7.9	184	c/cs

APPENDIX (continued).

Date (1987)	Julian day	Time (UTC)	North latitude (deg) (min)		East longitude (deg) (min)		Distance (nmi)	Actual speed (kt)	Actual course (deg)	Comments ^a
13	286	0600	0	12.90	58	43.73	3165.9	7.3	185	GPS
13	286	0607	0	12.00	58	43.70	3166.8	7.1	184	c/cs
13	286	0650	0	7.00	58	43.30	3171.8	7.1	185	c/cs
13	286	0711	0	4.50	58	43.10	3174.3	6.0	183	c/cs
13	286	0741	0	1.50	58	42.90	3177.3	6.1	182	c/cs
13	286	0756	0	0.00	58	42.90	3178.8	7.4	184	c/cs
13	286	0800	0	-0.50	58	42.82	3179.3	8.8	180	GPS
13	286	0808	0	-1.70	58	42.80	3180.5	9.9	180	c/cs
13	286	0834	0	-6.00	58	42.80	3184.8	10.3	181	c/cs
13	286	0840	0	-7.00	58	42.80	3185.8	10.9	180	c/cs
13	286	0848	0	-8.40	58	42.80	3187.3	10.8	180	c/cs
13	286	0850	0	-8.80	58	42.81	3187.6	9.2	186	SATL
13	286	0901	0	10.50	58	42.60	3189.3	9.1	175	c/cs
13	286	0910	0	11.80	58	42.80	3190.7	9.1	180	c/cs
13	286	0922	0	13.70	58	42.80	3192.5	9.3	184	c/cs
13	286	0938	0	16.10	58	42.60	3195.0	9.5	184	c/cs
13	286	0952	0	18.34	58	42.45	3197.2	10.6	179	SATL
13	286	1008	0	21.20	58	42.50	3200.0	10.6	179	c/cs
13	286	1026	0	24.40	58	42.50	3203.2	10.6	179	c/cs
13	286	1041	0	27.00	58	42.50	3205.9	10.6	179	c/cs
13	286	1051	0	28.80	58	42.60	3207.6	5.7	176	c/cs
13	286	1053	0	29.00	58	42.60	3207.8	10.7	179	c/cs
13	286	1101	0	30.40	58	42.60	3209.2	10.7	179	c/cs
13	286	1124	0	34.50	58	42.60	3213.3	10.7	179	c/cs
13	286	1207	0	42.10	58	42.70	3221.0	3.6	173	c/cs
13	286	1209	0	42.20	58	42.70	3221.1	10.7	179	c/cs
13	286	1237	0	47.20	58	42.80	3226.1	7.3	179	c/cs
13	286	1238	0	47.40	58	42.80	3226.2	10.5	179	c/cs
13	286	1251	0	49.60	58	42.80	3228.5	10.6	183	c/cs
13	286	1313	0	53.50	58	42.60	3232.4	7.1	182	c/cs
13	286	1315	0	53.70	58	42.60	3232.6	10.5	184	c/cs
13	286	1324	0	55.32	58	42.51	3234.2	10.4	187	SATL
13	286	1348	0	59.40	58	42.00	3238.4	10.5	187	c/cs
13	286	1407	-1	2.70	58	41.60	3241.7	10.5	187	c/cs
13	286	1440	-1	8.50	58	40.90	3247.5	10.4	187	c/cs
13	286	1508	-1	13.30	58	40.30	3252.3	10.4	187	c/cs
13	286	1540	-1	18.80	58	39.60	3257.8	10.4	187	c/cs
13	286	1556	-1	21.50	58	39.20	3260.6	10.3	187	c/cs
13	286	1644	-1	29.70	58	38.20	3268.8	10.1	187	c/cs
13	286	1656	-1	31.71	58	37.96	3270.9	10.0	186	SATL
13	286	1657	-1	31.90	58	37.90	3271.0	9.8	185	c/cs
13	286	1712	-1	34.30	58	37.70	3273.5	9.7	181	c/cs
13	286	1725	-1	36.40	58	37.70	3275.6	9.8	181	c/cs
13	286	1743	-1	39.30	58	37.70	3278.5	9.9	181	c/cs
13	286	1755	-1	41.30	58	37.60	3280.5	9.9	181	c/cs
13	286	1807	-1	43.30	58	37.60	3282.5	9.9	181	c/cs
13	286	1808	-1	43.47	58	37.62	3282.6	10.5	182	SATL
13	286	1831	-1	47.50	58	37.40	3286.7	10.5	182	c/cs
13	286	1846	-1	50.10	58	37.30	3289.3	10.7	182	c/cs
13	286	1911	-1	54.60	58	37.10	3293.7	10.6	182	c/cs
13	286	1932	-1	58.30	58	37.00	3297.4	10.8	182	c/cs
13	286	1937	-1	59.20	58	36.90	3298.3	6.2	184	c/cs
13	286	1939	-1	59.40	58	36.90	3298.6	10.6	182	c/cs
13	286	2007	-2	4.30	58	36.70	3303.5	8.4	183	c/cs

APPENDIX (continued).

Date (1987)	Julian day	Time (UTC)	North latitude		East longitude		Distance (nmi)	Actual		Comments ^a	
			(deg)	(min)	(deg)	(min)		speed (kt)	course (deg)		
13	286	2009	-2	4.60	58	36.70	3303.8	10.6	182	c/cs	
13	286	2014	-2	5.50	58	36.70	3304.7	4.4	183	c/cs	
13	286	2015	-2	5.50	58	36.70	3304.7	10.5	182	c/cs	
13	286	2040	-2	9.90	58	36.50	3309.1	10.5	182	c/cs	
13	286	2106	-2	14.50	58	36.30	3313.6	10.5	182	c/cs	
13	286	2116	-2	16.20	58	36.20	3315.4	8.0	183	c/cs	
13	286	2118	-2	16.50	58	36.20	3315.7	10.4	182	c/cs	
13	286	2138	-2	19.90	58	36.10	3319.1	6.3	184	c/cs	
13	286	2139	-2	20.00	58	36.00	3319.2	10.3	182	c/cs	
13	286	2154	-2	22.60	58	35.90	3321.8	10.2	182	c/cs	
13	286	2204	-2	24.30	58	35.90	3323.5	10.4	182	c/cs	
13	286	2217	-2	26.60	58	35.80	3325.8	10.6	182	c/cs	
13	286	2237	-2	30.10	58	35.60	3329.3	10.5	182	c/cs	
13	286	2257	-2	33.60	58	35.50	3332.8	10.7	182	c/cs	
13	286	2300	-2	34.10	58	35.40	3333.3	8.3	183	c/cs	
13	286	2302	-2	34.40	58	35.40	3333.6	10.5	183	c/cs	
13	286	2313	-2	36.30	58	35.30	3335.6	10.6	182	c/cs	
13	286	2322	-2	37.92	58	35.25	3337.1	10.7	182	SATL	
14	Oct	287	0001	-2	44.90	58	35.00	3344.1	10.4	183	c/cs
14		287	0005	-2	45.60	58	35.00	3344.8	7.2	183	c/cs
14		287	0006	-2	45.70	58	35.00	3344.9	10.6	182	c/cs
14		287	0019	-2	48.00	58	34.90	3347.2	10.6	182	c/cs
14		287	0044	-2	52.40	58	34.70	3351.6	10.7	182	c/cs
14		287	0107	-2	56.50	58	34.50	3355.7	10.5	183	c/cs
14		287	0118	-2	58.42	58	34.45	3357.7	10.6	183	SATL
14		287	0132	-3	0.90	58	34.30	3360.1	10.6	183	c/cs
14		287	0145	-3	3.20	58	34.20	3362.4	10.9	183	c/cs
14		287	0220	-3	9.50	58	33.80	3368.8	10.8	183	c/cs
14		287	0233	-3	11.90	58	33.70	3371.1	10.9	183	c/cs
14		287	0250	-3	15.00	58	33.50	3374.2	11.1	183	c/cs
14		287	0256	-3	16.10	58	33.40	3375.3	4.9	184	c/cs
14		287	0258	-3	16.20	58	33.40	3375.5	10.9	183	c/cs
14		287	0305	-3	17.50	58	33.40	3376.8	6.4	184	c/cs
14		287	0306	-3	17.60	58	33.30	3376.9	10.9	183	c/cs
14		287	0354	-3	26.30	58	32.90	3385.6	10.9	183	c/cs
14		287	0400	-3	27.38	58	32.79	3386.7	11.2	183	GPS
14		287	0409	-3	29.10	58	32.70	3388.3	11.1	182	c/cs
14		287	0425	-3	32.00	58	32.60	3391.3	4.8	183	c/cs
14		287	0427	-3	32.20	58	32.60	3391.5	11.2	182	c/cs
14		287	0440	-3	34.60	58	32.50	3393.9	11.2	182	c/cs
14		287	0450	-3	36.50	58	32.40	3395.8	11.1	182	c/cs
14		287	0513	-3	40.70	58	32.30	3400.0	11.5	182	c/cs
14		287	0526	-3	43.20	58	32.20	3402.5	11.2	183	c/cs
14		287	0533	-3	44.50	58	32.10	3403.8	11.5	182	c/cs
14		287	0554	-3	48.50	58	31.90	3407.8	11.3	182	c/cs
14		287	0600	-3	49.64	58	31.90	3408.9	11.2	182	GPS
14		287	0614	-3	52.30	58	31.80	3411.6	11.3	182	c/cs
14		287	0632	-3	55.60	58	31.60	3414.9	11.5	182	c/cs
14		287	0707	-4	2.30	58	31.40	3421.6	11.0	189	c/cs
14		287	0710	-4	2.90	58	31.30	3422.2	11.1	192	c/cs
14		287	0712	-4	3.20	58	31.20	3422.6	11.3	183	c/cs
14		287	0737	-4	7.90	58	30.90	3427.3	4.2	184	c/cs
14		287	0738	-4	8.00	58	30.90	3427.3	11.4	183	c/cs
14		287	0800	-4	12.18	58	30.69	3431.5	11.2	181	GPS

APPENDIX (continued).

Date (1987)	Julian day	Time (UTC)	North latitude (deg) (min)		East longitude (deg) (min)		Distance (nmi)	Actual speed (kt)	Actual course (deg)	Comments ^a
14	287	0816	-4	15.20	58	30.60	3434.5	11.2	181	c/cs
14	287	0823	-4	16.50	58	30.60	3435.8	10.8	181	c/cs
14	287	0826	-4	17.00	58	30.60	3436.4	11.3	181	c/cs
14	287	0828	-4	17.39	58	30.57	3436.7	11.6	183	SATL
14	287	0833	-4	18.40	58	30.50	3437.7	5.9	183	c/cs
14	287	0835	-4	18.60	58	30.50	3437.9	11.5	183	c/cs
14	287	0900	-4	23.33	58	30.24	3442.7	11.4	181	GPS
14	287	0904	-4	24.10	58	30.20	3443.4	11.8	181	c/cs
14	287	0906	-4	24.50	58	30.20	3443.8	10.9	181	c/cs
14	287	0918	-4	26.67	58	30.18	3446.0	10.9	187	SATL
14	287	0924	-4	27.80	58	30.10	3447.1	11.1	187	c/cs
14	287	0929	-4	28.70	58	29.90	3448.0	5.4	191	c/cs
14	287	0931	-4	28.80	58	29.90	3448.2	11.2	187	c/cs
14	287	0945	-4	31.40	58	29.60	3450.8	11.3	187	c/cs
14	287	1000	-4	34.24	58	29.28	3453.6	11.1	180	GPS
14	287	1005	-4	35.20	58	29.30	3454.6	10.8	180	c/cs
14	287	1022	-4	38.20	58	29.30	3457.6	10.9	180	c/cs
14	287	1100	-4	45.13	58	29.25	3464.5	11.2	187	GPS
14	287	1106	-4	46.24	58	29.12	3465.7	11.0	183	SATL
14	287	1108	-4	46.60	58	29.10	3466.0	11.0	183	c/cs
14	287	1134	-4	51.40	58	28.80	3470.8	11.2	183	c/cs
14	287	1149	-4	54.20	58	28.70	3473.6	10.8	182	c/cs
14	287	1209	-4	57.80	58	28.50	3477.2	5.8	183	c/cs
14	287	1211	-4	58.00	58	28.50	3477.4	11.0	183	c/cs
14	287	1242	-5	3.60	58	28.20	3483.1	11.0	183	c/cs
14	287	1300	-5	6.90	58	28.00	3486.4	10.8	183	c/cs
14	287	1304	-5	7.63	58	27.98	3487.1	10.7	182	SATL
14	287	1310	-5	8.70	58	27.90	3488.1	10.8	182	c/cs
14	287	1325	-5	11.40	58	27.80	3490.8	11.0	182	c/cs
14	287	1346	-5	15.20	58	27.70	3494.7	10.8	182	c/cs
14	287	1405	-5	18.70	58	27.60	3498.1	10.7	182	c/cs
14	287	1424	-5	22.04	58	27.46	3501.5	10.4	180	SATL
14	287	1428	-5	22.70	58	27.50	3502.2	7.3	179	c/cs
14	287	1429	-5	22.90	58	27.50	3502.3	10.5	180	c/cs
14	287	1449	-5	26.40	58	27.50	3505.8	10.5	179	c/cs
14	287	1504	-5	29.00	58	27.50	3508.4	10.3	174	c/cs
14	287	1507	-5	29.50	58	27.60	3509.0	6.6	174	c/cs
14	287	1509	-5	29.70	58	27.60	3509.2	10.1	174	c/cs
14	287	1515	-5	30.70	58	27.70	3510.2	2.8	168	c/cs
14	287	1517	-5	30.80	58	27.70	3510.3	10.2	174	c/cs
14	287	1535	-5	33.90	58	28.00	3513.3	10.0	174	c/cs
14	287	1550	-5	36.30	58	28.30	3515.8	9.6	174	c/cs
14	287	1558	-5	37.60	58	28.50	3517.1	9.8	174	c/cs
14	287	1617	-5	40.70	58	28.80	3520.2	10.0	173	c/cs
14	287	1630	-5	42.80	58	29.10	3522.4	9.9	170	c/cs
14	287	1651	-5	46.20	58	29.70	3525.8	10.0	169	c/cs
14	287	1706	-5	48.70	58	30.20	3528.3	9.8	169	c/cs
14	287	1721	-5	51.10	58	30.70	3530.8	9.0	140	c/cs
14	287	1723	-5	51.30	58	30.90	3531.1	8.6	123	c/cs
14	287	1724	-5	51.40	58	31.00	3531.2	6.5	130	c/cs
14	287	1726	-5	51.50	58	31.10	3531.4	3.5	138	c/cs
14	287	1727	-5	51.60	58	31.20	3531.5	9.3	127	c/cs
14	287	1732	-5	52.10	58	31.80	3532.3	9.1	127	c/cs
14	287	1742	-5	53.00	58	33.00	3533.8	9.4	126	c/cs

APPENDIX (continued).

Date (1987)	Julian day	Time (UTC)	North latitude (deg) (min)	East longitude (deg) (min)	Distance (nmi)	Actual speed (kt)	Actual course (deg)	Comments ^a
14	287	1752	-5 53.90	58 34.30	3535.4	7.4	127	c/cs
14	287	1754	-5 54.00	58 34.50	3535.6	5.0	139	c/cs
14	287	1756	-5 54.20	58 34.60	3535.8	2.4	184	c/cs
14	287	1802	-5 54.40	58 34.60	3536.0	1.9	180	c/cs
14	287	1807	-5 54.60	58 34.60	3536.2	7.1	212	c/cs
14	287	1809	-5 54.80	58 34.50	3536.4	1.7	175	c/cs
14	287	1835	-5 55.50	58 34.50	3537.1	2.8	177	c/cs
14	287	1840	-5 55.70	58 34.50	3537.4	3.2	165	c/cs
14	287	1845	-5 56.00	58 34.60	3537.6	4.3	167	c/cs
14	287	1853	-5 56.50	58 34.70	3538.2	2.7	163	c/cs
14	287	1900	-5 56.80	58 34.80	3538.5	4.4	166	c/cs
14	287	1903	-5 57.10	58 34.90	3538.8	6.1	167	c/cs
14	287	1911	-5 57.90	58 35.10	3539.6	6.9	167	c/cs
14	287	1920	-5 58.90	58 35.30	3540.6	7.8	168	c/cs
14	287	1921	-5 59.00	58 35.30	3540.7	1.9	163	c/cs
14	287	1923	-5 59.10	58 35.30	3540.8	8.4	168	c/cs
14	287	1931	-6 0.10	58 35.60	3541.9	9.0	168	c/cs
14	287	1943	-6 1.90	58 36.00	3543.7	4.0	166	c/cs
14	287	1944	-6 2.00	58 36.00	3543.8	9.1	168	c/cs
14	287	1949	-6 2.70	58 36.20	3544.6	9.6	168	c/cs
14	287	2001	-6 4.60	58 36.60	3546.5	9.8	169	c/cs
14	287	2006	-6 5.40	58 36.70	3547.3	9.2	168	c/cs
14	287	2014	-6 6.60	58 37.00	3548.5	9.7	168	c/cs
14	287	2036	-6 10.10	58 37.70	3552.1	5.4	167	c/cs
14	287	2037	-6 10.20	58 37.80	3552.2	9.6	168	c/cs
14	287	2052	-6 12.50	58 38.30	3554.6	5.6	168	c/cs
14	287	2054	-6 12.70	58 38.30	3554.7	9.6	168	c/cs
14	287	2056	-6 13.00	58 38.37	3555.1	10.0	169	SATL
14	287	2107	-6 14.80	58 38.70	3556.9	9.7	169	c/cs
14	287	2138	-6 19.70	58 39.70	3561.9	9.7	169	c/cs
14	287	2145	-6 20.80	58 39.90	3563.0	9.7	169	c/cs
14	287	2158	-6 22.90	58 40.30	3565.1	9.8	169	c/cs
14	287	2216	-6 25.80	58 40.90	3568.1	10.1	169	c/cs
14	287	2233	-6 28.60	58 41.40	3570.9	9.6	169	c/cs
14	287	2244	-6 30.30	58 41.78	3572.7	9.3	172	SATL
14	287	2244	-6 30.30	58 41.80	3572.7	9.8	172	c/cs
14	287	2259	-6 32.70	58 42.10	3575.1	9.4	172	c/cs
14	287	2321	-6 36.10	58 42.60	3578.6	9.6	172	c/cs
14	287	2334	-6 38.20	58 43.00	3580.7	10.0	185	c/cs
15 Oct	288	0000	-6 42.50	58 42.60	3585.0	10.0	185	c/cs
15	288	0003	-6 43.00	58 42.60	3585.5	9.9	184	c/cs
15	288	0028	-6 47.10	58 42.30	3589.6	9.5	184	c/cs
15	288	0048	-6 50.30	58 42.00	3592.8	10.0	184	c/cs
15	288	0050	-6 50.62	58 42.02	3593.1	10.3	184	SATL
15	288	0106	-6 53.40	58 41.80	3595.9	10.3	184	c/cs
15	288	0156	-7 1.91	58 41.13	3604.5	10.1	184	SATL
15	288	0300	-7 12.60	58 40.40	3615.2	10.4	186	c/cs
15	288	0330	-7 17.80	58 39.80	3620.4	9.5	181	c/cs
15	288	0400	-7 22.52	58 39.77	3625.1	9.2	186	GPS
15	288	0400	-7 22.50	58 39.80	3625.1	9.5	181	c/cs
15	288	0500	-7 32.10	58 39.60	3634.7	10.5	190	c/cs
15	288	0600	-7 42.42	58 37.77	3645.2	10.7	190	GPS
15	288	0800	-8 3.53	58 34.09	3666.6	10.8	190	GPS
15	288	0848	-8 12.02	58 32.64	3675.2	11.3	188	SATL

APPENDIX (continued).

Date (1987)	Julian day	Time (UTC)	North latitude (deg) (min)		East longitude (deg) (min)		Distance (nmi)	Actual speed (kt)	Actual course (deg)	Comments ^a
15	288	1100	-8	36.68	58	29.20	3700.1	10.9	186	GPS
15	288	1242	-8	55.08	58	27.34	3718.6	10.7	187	SATL
15	288	1336	-9	4.62	58	26.13	3728.2	11.0	187	SATL
15	288	1430	-9	14.47	58	24.96	3738.1	11.0	186	SATL
15	288	1524	-9	24.29	58	23.98	3748.0	10.9	185	SATL
15	288	1628	-9	35.91	58	22.86	3759.7	10.7	188	SATL
15	288	1730	-9	46.90	58	21.40	3770.7	11.2	187	c/cs
15	288	1824	-9	56.88	58	20.22	3780.8	11.3	186	SATL
15	288	1950	-10	13.00	58	18.50	3797.0	11.0	184	SATL
15	288	2206	-10	37.95	58	16.65	3822.0	11.0	185	SATL
16	Oct 289	0000	-10	58.70	58	14.70	3842.9	11.5	186	c/cs
16	289	0026	-11	3.64	58	14.17	3847.8	11.2	185	SATL
16	289	0108	-11	11.45	58	13.41	3855.7	11.4	185	SATL
16	289	0400	-11	44.00	58	10.41	3888.4	10.6	188	GPS
16	289	0500	-11	54.53	58	8.91	3899.0	11.7	190	GPS
16	289	0600	-12	6.04	58	6.94	3910.7	11.9	189	GPS
16	289	0700	-12	17.80	58	5.14	3922.6	11.7	190	GPS
16	289	0800	-12	29.37	58	3.11	3934.3	11.3	187	GPS
16	289	0936	-12	47.38	58	0.90	3952.4	11.6	188	SATL
16	289	1100	-13	3.41	57	58.48	3968.6	11.9	188	GPS
16	289	1200	-13	15.18	57	56.88	3980.5	14.8	185	GPS
16	289	1220	-13	20.10	57	56.50	3985.4	10.9	184	c/cs
16	289	1400	-13	38.20	57	55.20	4003.6	13.9	185	c/cs
16	289	1408	-13	40.05	57	55.00	4005.4	12.1	185	SATL
16	289	1500	-13	50.50	57	54.00	4016.0	10.4	184	c/cs
16	289	1520	-13	53.98	57	53.78	4019.4	11.8	184	SATL
16	289	1706	-14	14.72	57	52.27	4040.2	11.9	184	SATL
16	289	1926	-14	42.31	57	50.42	4067.9	12.1	184	SATL
17	Oct 290	0100	-15	49.35	57	45.32	4135.1	11.4	185	GPS
17	290	0200	-16	0.69	57	44.30	4146.5	12.0	183	GPS
17	290	0400	-16	24.55	57	42.86	4170.4	11.9	184	GPS
17	290	0600	-16	48.33	57	41.25	4194.2	11.9	185	GPS
17	290	0800	-17	12.02	57	39.26	4218.0	11.9	182	GPS
17	290	0914	-17	26.68	57	38.67	4232.6	12.1	186	SATL
17	290	1000	-17	35.87	57	37.59	4241.9	12.2	186	GPS
17	290	1100	-17	48.00	57	36.19	4254.1	13.0	184	GPS
17	290	1110	-17	50.16	57	36.02	4256.3	9.6	186	SATL
17	290	1650	-18	44.17	57	30.28	4310.5	9.6	186	SATL

^a GF = global fix; SF, SATL, SN = satellite navigation fixes; c/cs = change of course; DR = dead reckoning; XX = extra; 720, etc. = Site 720, etc.