14. UNDERWAY GEOPHYSICS[1]

Shipboard Scientific Party[2]

INTRODUCTION

Geophysical data were collected during Leg 108 of the Ocean Drilling Program. Of the 5607 nmi traveled between Marseille, France and Dakar, Senegal, geophysical data were collected for approximately 350 nmi (62 hr) before arriving at Site 657 (Table 1) and when under way between sites. We were under way 19 of the 58 days (32% of the time) spent at sea.

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

NAVIGATION

Navigation data were collected on the bridge by a Magnavox MX702A system. Positions were obtained with this system throughout the entire leg. Approximately 12 satellite fixes were received each day. Latitudes and longitudes of the drill holes were determined by averaging all satellite fixes received while drilling each hole. These locations may differ slightly from locations of the drill holes given in the site chapters, which are the average of only the best fixes received.

A plot of the general navigation from Leg 108 is shown in Figure 1. An enlarged plot of navigation near Leg 108 drill sites is shown in Figures 2A and 2B. These plots were generated from satellite navigation and information from course and speed changes given in Table 2. These data were compiled from (1) the shipboard bridge log, (2) underway geophysical and satellite navigation data sheets, and (3) course and speed information from the digital seismic tape headers. Detailed navigation plots around each drill site were compiled by the co-chief scientists during the cruise; these plots are shown in the individual site chapters (this volume).

BATHYMETRY

Bathymetric data were obtained with both 3.5- and 12-kHz echo sounders, using a Raytheon recorder system for the 3.5-kHz and an EDO 248C recorder for the 12-kHz. Unfortunately, because of poor transducer location, the quality of the recorder data was poor when the ship was travelling at speeds greater than 6 kt. Consequently, pre-site surveys requiring detailed bathymetric data were conducted at speeds slower than 6 kt (see site chapters, this volume). Pertinent portions of these bathymetric data are presented in the site chapters and, thus, are not included here.

MAGNETIC-DATA RECORDING

Magnetic data collected during Leg 108 can be obtained from the ODP data libraries, Ocean Drilling Program, Texas A&M University Research Park, 1000 Discovery Drive, College Station, TX 77840. Magnetic data were collected routinely during each geophysical line.

SEISMIC-REFLECTION DATA

The seismic sources used aboard the *JOIDES Resolution* during Leg 108 were two 80-in.^{3} water guns. One 100-m-long Teledyne streamer was deployed from the ship's fantail. This streamer contained 60 active sections and was towed approximately 500 m behind the vessel. Towing depth was set by external depth depressors (birds). Hydrophone elements were combined to produce a single signal.

Seismic data were displayed in real time in analog format on two EDO 550 dry-paper recorders, using only streamers, an amplifier, and two band-pass filters (Table 3). Seismic data also were recorded using a super-micro 561 Masscomp computer, which functions as the central unit to record, process, and display these data. Data were processed and displayed in real time on a 15-in.-wide Printonix high-resolution graphic printer (160 dots/in.). Raw data were reprocessed while the ship was on station. Final data were displayed on a 22-in.-wide Versatec plotter (200 dots/in.). The reprocessing parameters used are given in Table 3. Twelve seismic lines were collected during the cruise as follows:

1. Seismic line 1 was collected during the approach to Site 657, the first site visited during Leg 108. The digitized Masscomp record of the unprocessed analog data is shown in Figure 3 (Julian Day 58, 1800 UTC, to Julian Day 58, 2200 UTC). (All times are UTC, Universal Time Coordinated, formerly GMT, Greenwich Mean Time.) The unprocessed analog seismic data of line 1, recorded on the EDO-2 recorder, and the navigation on approach to Site 657 are shown in the "Site 657" chapter

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[1] Ruddiman, W., Sarnthein, M., Baldauf, J., et al., 1988. *Proc., Init. Repts. (Pt. A), ODP*, 108.

[2] William Ruddiman (Co-Chief Scientist), Lamont-Doherty Geological Observatory, Palisades, NY 10964; Michael Sarnthein (Co-Chief Scientist), Geologisch-Paläontologisches Institut, Universität Kiel, Olshausenstrasse 40, D-2300 Kiel, Federal Republic of Germany; Jack Baldauf, ODP Staff Scientist, Ocean Drilling Program, Texas A&M University, College Station, TX 77843; Jan Backman, Department of Geology, University of Stockholm, S-106 91 Stockholm, Sweden; Jan Bloemendal, Graduate School of Oceanography, University of Rhode Island, Narragansett, RI 02882-1197; William Curry, Woods Hole Oceanographic Institution, Woods Hole, MA 02543; Paul Farrimond, School of Chemistry, University of Bristol, Cantocks Close, Bristol BS8 1TS, United Kingdom; Jean Claude Faugeres, Laboratoire de Géologie-Océanographie, Université de Bordeaux I, Avenue des Facultés, Talence 33405, France; Thomas Janacek, Lamont-Doherty Geological Observatory, Palisades, NY 10964; Yuzo Katsura, Institute of Geosciences, University of Tsukuba, Ibaraki 305, Japan; Hélène Manivit, Laboratoire de Stratigraphie des Continents et Océans, (UA 319) Université Paris VI, 4 Place Jussieu, 75230 Paris Cedex, France; James Mazzullo, Department of Geology, Texas A&M University, College Station, TX 77840; Jürgen Mienert, Geologisch-Paläontologisches Institut, Universität Kiel, Olshausenstrasse 40, D-2300 Kiel, Federal Republic of Germany, and Woods Hole Oceanographic Institution, Woods Hole, MA 02543; Edward Pokras, Lamont-Doherty Geological Observatory, Palisades, NY 10964; Maureen Raymo, Lamont-Doherty Geological Observatory, Palisades, NY 10964; Peter Schultheiss, Institute of Oceanographic Sciences, Brook Road, Wormley, Godalming, Surrey GU8 5UG, United Kingdom; Rüdiger Stein, Geologisch-Paläontologisches Institut, Universität Giessen, Senckenbergstrasse 3, 6300 Giessen, Federal Republic of Germany; Lisa Tauxe, Scripps Institution of Oceanography, La Jolla, CA 92093; Jean-Pierre Valet, Centre des Faibles Radioactivités, CNRS, Avenue de la Terrasse, 91190 Gif-sur-Yvette, France; Philip Weaver, Institute of Oceanographic Sciences, Brook Road, Wormley, Godalming, Surrey GU8 5UG, United Kingdom; Hisato Yasuda, Department of Geology, Kochi University, Kochi 780, Japan.

Table 1. Latitudes, longitudes, and depths of sites drilled during Leg 108.

Site/ hole	Latitude	Longitude	Water depth (m)	Depth (mbsf)
657A	21°19.89'N	20°56.93'W	4221.1	178.2
657B	21°19.89'N	20°56.93'W	4221.1	166.1
658A	20°44.95'N	18°34.85'W	2263.6	300.4
658B	20°44.95'N	18°34.85'W	2264.2	163.8
658C	20°44.95'N	18°34.85'W	2262.9	72.9
659A	18°04.63'N	21°01.57'W	3071.2	273.8
659B	18°04.63'N	21°01.57'W	3073.4	202.0
659C	18°04.63'N	21°01.57'W	3070.5	196.0
660A	10°00.81'N	19°14.74'W	4332.2	163.7
660B	10°00.81'N	19°14.74'W	4332.3	148.8
661A	09°26.81'N	19°23.17'W	4012.7	296.1
661B	09°26.81'N	19°23.17'W	4013.1	81.7
662A	01°23.41'S	11°44.35'W	3813.8	200.0
662B	01°23.41'S	11°44.35'W	3813.8	188.2
663A	01°11.87'S	11°52.71'W	3697.6	147.2
663B	01°11.87'S	11°52.71'W	3697.4	152.0
664A	0°06.44'N	23°13.65'W	3806.0	28.9
664A	0°06.44'N	23°13.65'W	3806.3	247.0
664A	0°06.44'N	23°13.65'W	3806.8	61.2
664A	0°06.44'N	23°13.65'W	3801.7	296.8
665A	2°57.07'N	19°40.07'W	4740.4	97.9
665B	2°57.07'N	19°40.07'W	4741.8	82.0
666A	3°29.84'N	20°10.03'W	4516.8	150.5
667A	4°34.15'N	21°54.68'W	3535.5	381.3
667B	4°34.15'N	21°54.68'W	3535.5	139.1
668A	4°46.12'N	20°55.62'W	2690.5	8.8
668B	4°46.12'N	20°55.62'W	2693.1	31.2

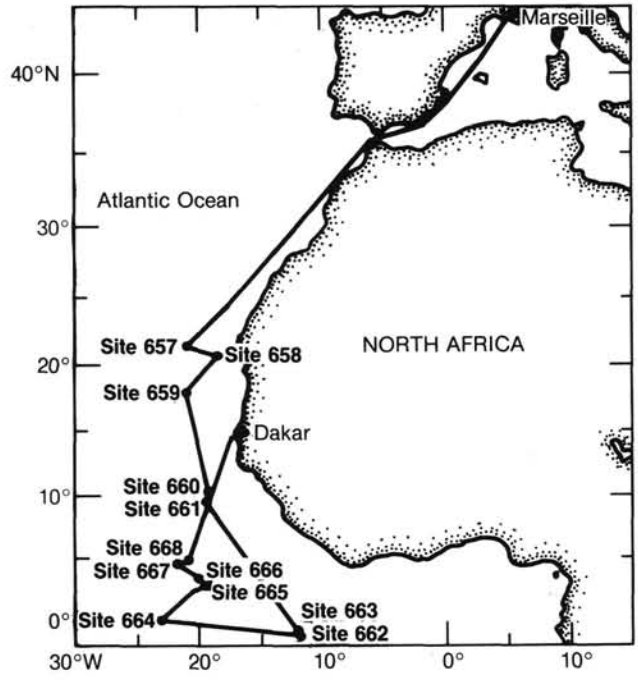

Figure 1. General track-line map of Leg 108 cruise, generated from satellite navigation and data for course and speed changes given in Table 2.

(this volume). Course and speed are indicated on the seismic profiles.

2. Seismic line 2 was collected during the approach to Site 658. The EDO-2 and the digitized Masscomp records of the unprocessed analog data are shown in Figures 4 and 5 (Julian Day 62, 2300 UTC, to Julian Day 63, 0330 UTC), respectively. Navigation on approach to Site 658 is shown in the "Site 658" chapter (this volume). Course and speed changes are indicated on the seismic profiles.

3. Seismic line 3 was collected during the approach to Site 659. The digitized Masscomp record of the unprocessed analog data is shown in Figure 6 (Julian Day 67, 0725 UTC, to Julian Day 68, 0914 UTC). The unprocessed analog seismic data of line 3, recorded on the EDO-2 recorder, and the navigation on approach to Site 659 are shown in the "Site 659" chapter (this volume). Course and speed changes are indicated on the seismic profiles.

4. Seismic line 4 was collected during the approach to Site 660. The digitized Masscomp record of the unprocessed analog data is shown in Figure 7 (Julian Day 73, 2013 UTC, to Julian Day 74, 0034 UTC). The unprocessed analog seismic data of line 4, recorded on the EDO-2 recorder, and the navigation on approach to Site 660 are shown in the "Site 660" chapter (this volume). Course and speed changes are indicated on the seismic profiles.

5. Seismic line 5 was collected during the approach to Site 661. The digitized Masscomp record of the unprocessed analog data is shown in Figure 8 (Julian Day 76, 1240 UTC, to Julian Day 76, 1845 UTC). The unprocessed analog seismic data of line 5, recorded on the EDO-2 recorder, is shown in the "Site 666" chapter (this volume). Navigation on approach to Site 661 is shown in Figure 9., course and speed changes are indicated on the seismic profiles.

6. Seismic line 6 was collected during the approach to Site 662. The EDO-2 and the digitized Masscomp records of the unprocessed analog data are shown in Figures 10 and 11 (Julian Day 82, 2215 UTC, to Julian Day 83, 0255 UTC), respectively. Navigation on approach to Site 662 is shown in the "Site 662" chapter (this volume). Course and speed changes are indicated on the seismic profiles.

7. Seismic line 7 was collected during the approach to Site 663. The EDO-2 and the digitized Masscomp records of the unprocessed analog data are shown in Figures 12 and 13 (Julian Day 85, 1330 UTC, to Julian Day 85, 1738 UTC), respectively. Navigation on approach to Site 663 is shown in the "Site 663" chapter (this volume). Course and speed changes are indicated on the seismic profiles.

8. Seismic line 8 was collected during the approach to Site 664. The EDO-2 and the digitized Masscomp records of the unprocessed analog data are shown in Figures 14 and 15 (Julian Day 89, 1200 UTC, to Julian Day 89, 1600 UTC), respectively. Navigation on approach to Site 664 is shown in the "Site 664" chapter (this volume). Course and speed changes are indicated on the seismic profiles.

9. Seismic line 9 was collected during the approach to Site 665. The EDO-2 and the digitized Masscomp records of the unprocessed analog data are shown in Figures 16 and 17 (Julian Day 93, 1830 UTC, to Julian Day 93, 2100 UTC), respectively. Navigation on approach to Site 665 is shown in the "Site 665" chapter (this volume). Course and speed changes are indicated on the seismic profiles.

10. Seismic line 10 was collected during the approach to Site 666. The EDO-2 and the digitized Masscomp records of the unprocessed analog data are shown in Figures 18 and 19 (Julian Day 95, 1830 UTC, to Julian Day 96, 0745 UTC), respectively. Navigation on approach to Site 666 is shown in the "Site 666" chapter (this volume). Course and speed changes are indicated on the seismic profiles.

11. Seismic line 11 was collected during the approach to Site 667. The EDO-2 record of the unprocessed analog data is shown in Figure 20 (Julian Day 98, 0520 UTC, to Julian Day 98, 1248 UTC). Navigation on approach to Site 667 is shown in the "Site 667" chapter (this volume). Course and speed changes are indicated on the seismic profiles.

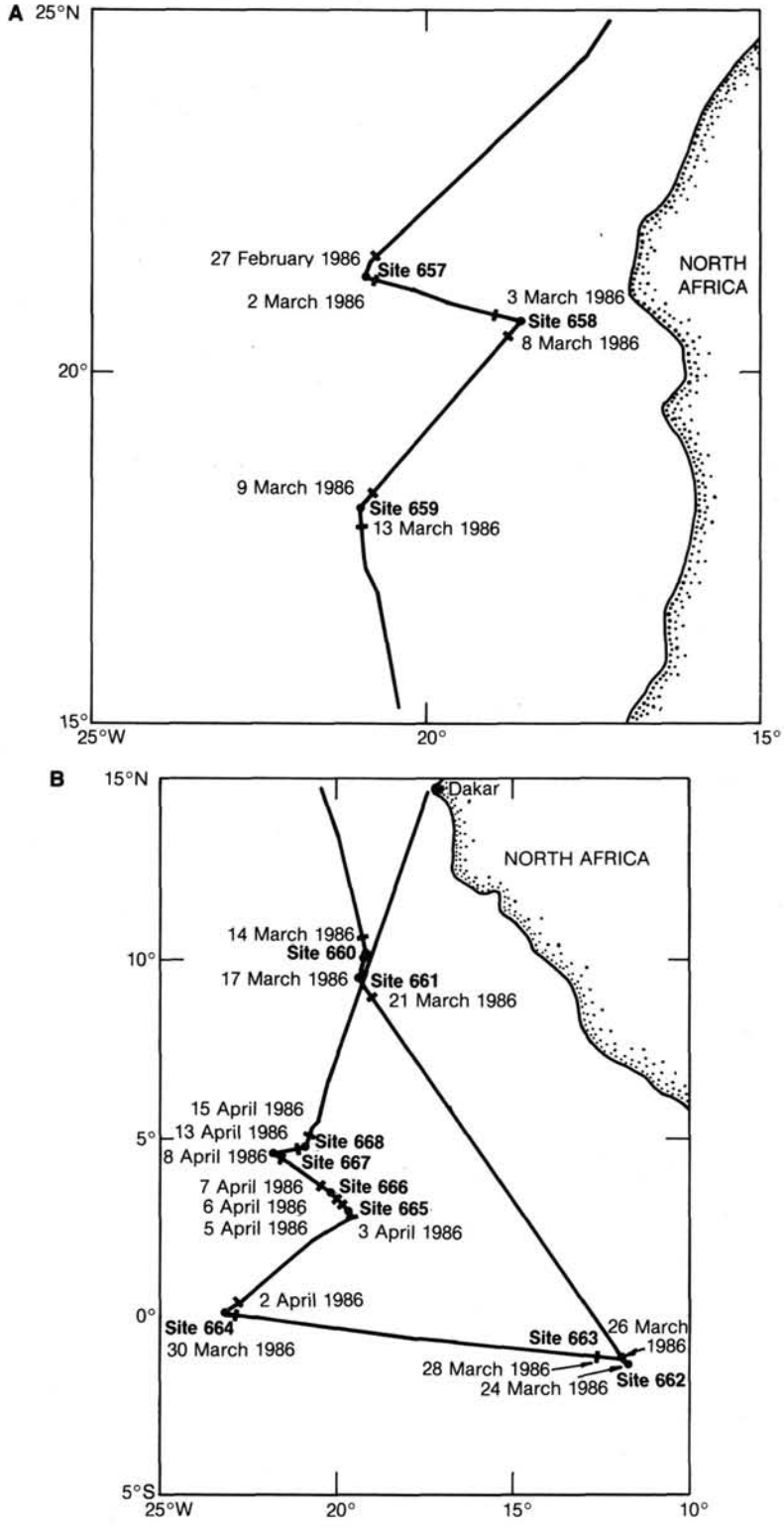

Figure 2. Enlarged track-line map of Leg 108 cruise in the vicinity of drill Sites A) 657 through 659 and B) 660 through 668. More detailed navigation plots around each drill site are shown in the individual site summary chapters (this volume).

12. Seismic line 12 was collected during the approach to Site 668. The EDO-2 and the digitized Masscomp records of the unprocessed analog data are shown in Figures 21 and 22 (Julian Day 103, 0800 UTC, to Julian Day 103, 1600 UTC), respectively. Navigation on approach to Site 668 is shown in the "Site 668" chapter (this volume). Course and speed changes are indicated on the seismic profiles.

Seismic data were not collected after leaving Site 668 during transit to Dakar, Senegal.

Table 2. Real-time recording parameters on board *JOIDES Resolution*.

Site	Satellite error (lat.)	Satellite error (long.)	Satellite frequency	Julian day	Time (UTC)	Latitude	Longitude	Angle of antenna (degrees)	Course (degree)	Ground speed (kt)	Satellite iteration (times)	Elevation (degrees)	Satellite direction
[a]—	0.0111	0.0249	24.287	53	808	40°49.561′N	2°49.498′E	68	217.9	13.5	4	42	S-E
—	0.0579	0.0297	22.939	53	844	40°43.589′N	2°44.163′E	68	217.9	13.5	3	12	S-E
—	0.0145	0.0281	23.623	53	958	40°31.884′N	2°31.189′E	68	217.9	13.5	3	34	S-W
—	0.0267	0.0344	24.179	53	1218	40°9.647′N	2°7.707′E	68	219.9	12.0	3	16	S-W
—	0.0125	0.0205	24.199	53	1246	40°5.293′N	2°3.230′E	68	219.9	12.0	3	24	S-W
—	0.0198	0.0354	24.951	53	1400	39°53.768′N	1°50.979′E	68	219.9	12.0	3	28	N-E
—	0.0141	0.0417	24.892	53	1548	39°36.269′N	1°32.458′E	68	219.9	12.0	4	51	N-W
—	0.0101	0.0451	24.238	53	1808	39°13.383′N	1°8.048′E	68	219.9	12.0	3	65	N-W
—	0.0172	0.0421	24.492	53	2020	38°52.520′N	0°45.859′E	68	219.9	12.0	3	46	N-E
—	0.0088	0.0128	24.042	53	2210	38°34.442′N	0°26.808′E	68	219.9	12.0	3	29	N-W
—	0.0063	0.0355	24.003	53	2232	38°30.932′N	0°23.487′E	68	219.9	12.0	3	69	N-E
—	0.0102	0.0238	23.251	53	2250	38°27.960′N	0°20.169′E	68	219.9	12.5	4	40	N-E
—	0.0121	0.0125	24.033	54	18	38°13.958′N	0°5.368′E	68	219.9	12.5	3	18	N-W
—	0.0132	0.0208	23.730	54	36	38°11.027′N	0°2.181′E	68	219.9	12.5	3	30	N-W
—	0.0344	0.0182	23.896	54	124	38°3.142′N	0°6.394′W	68	219.9	12.5	3	12	S-E
—	0.0172	0.0166	24.570	54	502	37°28.070′N	0°47.769′W	68	219.9	12.5	3	15	S-W
—	0.0142	0.0460	23.525	54	526	37°24.935′N	0°52.386′W	68	219.9	12.5	3	59	S-E
—	0.0090	0.0115	24.003	54	714	37°9.356′N	1°16.109′W	68	219.9	12.5	3	25	S-W
—	0.0177	0.0194	23.330	54	746	37°5.411′N	1°22.246′W	68	219.9	12.5	3	22	S-E
—	0.0129	0.0451	24.208	54	934	36°49.873′N	1°46.923′W	68	219.9	12.5	3	60	S-W
—	0.0220	0.0162	24.707	54	1714	36°20.086′N	3°38.009′W	68	259.0	12.0	4	14	N-W
—	0.0061	0.0166	23.906	54	1734	36°19.262′N	3°42.721′W	68	259.0	12.0	4	49	N-E
—	0.0170	0.0194	23.281	54	1920	36°14.224′N	4°9.461′W	68	259.0	12.0	3	22	N-W
—	0.0108	0.0340	23.261	54	2150	36°6.910′N	4°42.049′W	68	259.0	12.0	3	57	N-W
—	0.0081	0.0088	23.623	55	112	35°58.842′N	5°28.880′W	68	259.0	12.0	3	20	N-W
—	0.0818	0.1108	23.271	55	442	35°41.850′N	6°9.053′W	68	259.0	12.0	3	31	S-W
—	0.0502	0.0452	25.058	55	1030	34°42.485′N	7°12.682′W	68	259.0	12.0	5	18	S-E
—	0.0533	0.0513	23.769	55	1102	34°37.957′N	7°13.809′W	68	259.0	12.0	3	17	S-W
—	0.0221	0.0835	23.554	55	1356	34°8.652′N	7°45.054′W	68	222.0	13.7	4	54	S-E
—	0.0078	0.0158	25.224	55	1500	33°58.021′N	7°56.370′W	68	228.9	13.0	3	43	N-E
—	0.0126	0.0158	25.019	55	1650	33°41.329′N	8°18.152′W	68	228.9	13.0	3	28	N-W
—	0.0315	0.0945	24.052	55	1844	33°21.902′N	8°38.663′W	68	228.9	13.0	3	58	N-W
—	0.0118	0.0130	24.130	56	24	32°23.775′N	9°37.045′W	68	221.0	13.0	5	25	N-W
—	0.0198	0.0160	25.263	56	230	31°59.522′N	9°58.008′W	68	221.0	13.0	3	20	S-E
—	0.0078	0.0212	25.156	56	418	31°43.921′N	10°17.134′W	68	221.0	13.0	3	55	S-W
—	0.0070	0.0310	24.062	56	606	31°26.120′N	10°36.312′W	68	221.0	13.0	3	66	S-E
—	0.0174	0.0144	24.697	56	754	31°7.989′N	10°55.122′W	68	221.0	13.0	3	19	S-W
—	0.0101	0.0124	24.101	56	1044	30°39.556′N	11°23.655′W	68	221.0	13.0	4	30	S-W
—	0.0063	0.0200	24.140	56	1138	30°30.502′N	11°32.323′W	68	221.0	13.0	3	65	S-W
—	0.0052	0.0092	24.091	56	1252	30°18.300′N	11°44.217′W	68	221.0	13.0	3	40	S-W
—	0.0194	0.0191	25.175	56	1438	30°0.866′N	12°1.599′W	68	221.0	13.0	4	21	N-E
—	0.0073	0.0169	25.283	56	1624	29°43.083′N	12°19.234′W	68	221.0	13.5	3	54	N-W
—	0.0054	0.0133	23.994	56	1806	29°25.602′N	12°36.297′W	68	221.0	13.5	3	54	N-E
—	0.0180	0.0300	24.238	56	2058	28°55.053′N	13°6.105′W	68	221.0	13.5	4	37	N-E
—	0.0041	0.0047	24.521	56	2248	28°36.145′N	13°26.066′W	68	222.0	13.7	3	28	N-W
—	0.0091	0.0290	24.277	57	36	28°17.144′N	13°44.862′W	68	222.0	13.7	3	62	N-W
—	0.0141	0.0157	24.746	57	532	27°26.853′N	14°36.530′W	68	222.0	13.7	3	28	S-E
—	0.0069	0.0117	24.599	57	720	27°8.507′N	14°55.296′W	68	222.0	13.7	3	43	S-W
—	0.0034	0.0089	24.658	57	1018	26°37.470′N	15°26.368′W	68	222.0	13.7	3	56	S-W
—	0.0648	0.0914	26.845	57	1146	26°22.369′N	15°40.710′W	68	222.0	13.7	3	43	S-E
—	0.0110	0.0110	24.277	57	1238	26°14.115′N	15°49.286′W	68	222.0	13.7	3	25	S-W
—	0.0097	0.0093	24.257	57	1332	26°5.178′N	15°58.527′W	68	222.0	13.7	3	23	S-W
—	0.0089	0.0093	24.462	57	1546	25°41.982′N	16°21.441′W	68	222.0	13.7	3	26	S-W
—	0.0166	0.0148	24.072	57	1734	25°23.006′N	16°40.474′W	68	222.0	13.7	3	19	N-E
—	0.0552	0.0183	25.673	57	1752	25°20.070′N	16°43.787′W	68	222.0	13.7	5	11	N-W
—	0.0120	0.0213	24.814	57	1918	25°5.229′N	16°59.365′W	68	222.0	13.7	3	45	N-W
—	0.0177	0.0096	23.984	57	2036	24°51.197′N	17°11.562′W	68	222.0	13.7	3	17	N-E
—	0.0249	0.0323	24.257	57	2246	24°28.705′N	17°32.546′W	68	222.9	14.2	3	27	N-E
—	0.0167	0.0301	24.511	58	34	24°11.309′N	17°51.020′W	68	228.0	13.6	3	34	N-W
—	0.0131	0.0211	24.150	58	114	24°5.160′N	17°58.218′W	68	228.0	13.6	3	37	N-W
—	0.0124	0.0186	23.769	58	334	23°43.056′N	18°23.868′W	68	228.0	13.6	3	41	S-E
—	0.0089	0.0083	23.974	58	524	23°25.741′N	18°44.085′W	68	228.0	13.6	3	24	S-W
—	0.0113	0.0154	25.283	58	1536	21°51.525′N	20°30.720′W	68	228.0	13.6	3	38	N-E
—	0.0283	0.0916	25.947	58	1842	21°29.844′N	20°53.522′W	68	231.9	5.0	3	65	N-E
—	0.0503	0.0172	23.681	58	2032	21°18.725′N	20°57.229′W	68	231.9	5.0	5	10	N-W
657	0.0462	0.0250	24.511	59	128	21°19.990′N	20°56.888′W	68	340.0	0	5	10	N-W
657	0.0118	0.0089	23.886	59	150	21°19.951′N	20°56.881′W	68	340.0	0	3	19	N-W
657	0.0092	0.0075	25.126	59	314	21°19.946′N	20°56.933′W	68	340.0	0	3	22	S-E
657	0.0034	0.0051	25.019	59	502	21°19.948′N	20°56.874′W	68	340.0	0	3	41	S-W
657	0.0067	0.0092	24.824	59	610	21°19.943′N	20°56.931′W	68	340.0	0	3	40	S-E
657	0.0056	0.0098	24.492	59	934	21°19.965′N	20°56.915′W	68	340.0	0	3	48	S-E
657	0.0060	0.0073	24.248	59	1102	21°19.966′N	20°56.938′W	68	340.0	0	3	34	S-E
657	0.0082	0.0063	24.521	59	1124	21°19.959′N	20°56.884′W	68	340.0	0	3	20	S-W
657	0.0085	0.0078	24.345	59	1248	21°19.953′N	20°56.871′W	68	340.0	0	3	25	S-W
657	0.0056	0.0052	—	59	1410	21°19.867′N	20°56.751′W	68	340.0	0	3	33	S-E
657	0.0115	0.0104	25.429	59	1514	21°19.964′N	20°56.919′W	68	340.0	0	3	25	N-E
657	0.0171	0.0139	24.023	59	1558	21°19.976′N	20°56.894′W	68	340.0	0	3	26	S-W

[a] — = underway (i.e., not at site).

Table 2 (continued).

Site	Satellite error (lat.)	Satellite error (long.)	Satellite frequency	Julian day	Time (UTC)	Latitude	Longitude	Angle of antenna (degrees)	Course (degree)	Ground speed (kt)	Satellite iteration (times)	Elevation (degrees)	Satellite direction
657	0.0073	0.0098	25.195	59	1702	21°19.948′N	20°56.905′W	68	340.0	0	3	38	N-W
657	0.0087	0.0109	24.453	59	1808	21°19.937′N	20°56.923′W	68	340.0	0	3	32	N-E
657	0.0133	0.0115	24.785	59	1956	21°19.959′N	20°56.897′W	68	340.0	0	2	24	N-W
657	0.0041	0.0082	24.521	59	2136	21°19.962′N	20°56.924′W	68	340.0	0	3	51	N-E
657	0.0080	0.0083	24.287	59	2250	21°19.958′N	20°56.924′W	68	340.0	0	3	27	N-E
657	0.0097	0.0058	24.687	59	2326	21°19.974′N	20°56.889′W	68	340.0	0	3	17	N-W
657	0.0123	0.0182	24.130	60	36	21°19.950′N	20°56.911′W	68	340.0	0	3	31	N-W
657	0.0221	0.0104	25.048	60	250	21°19.966′N	20°56.948′W	68	340.0	0	5	14	S-E
657	0.0037	0.0102	25.087	60	438	21°19.965′N	20°56.891′W	68	340.0	0	3	60	S-W
657	0.0128	0.0096	24.521	60	536	21°19.962′N	20°56.924′W	68	340.0	0	3	21	S-E
657	0.0067	0.0134	24.833	60	722	21°19.946′N	20°56.878′W	68	340.0	0	4	49	S-W
657	0.0074	0.0081	24.296	60	912	21°19.966′N	20°56.920′W	68	340.0	0	3	32	S-E
657	0.0423	0.0166	23.964	60	1014	21°19.977′N	20°56.923′W	68	340.0	0	3	12	S-E
657	0.0055	0.0059	24.550	60	1100	21°19.941′N	20°56.899′W	68	340.0	0	3	29	S-W
657	0.0085	0.0091	24.082	60	1152	21°19.962′N	20°56.919′W	68	340.0	0	3	38	S-E
657	0.0088	0.0081	23.642	60	1338	21°19.983′N	20°56.877′W	68	340.0	0	3	23	S-W
657	0.0207	0.0135	23.886	60	1452	21°19.927′N	20°56.921′W	68	340.0	0	3	16	N-E
657	0.0067	0.0144	24.228	60	1640	21°19.950′N	20°56.874′W	68	340.0	0	3	56	N-W
657	0.0232	0.0156	24.453	60	1732	21°19.963′N	20°56.931′W	68	340.0	0	3	16	N-E
657	0.0036	0.0044	24.423	60	2114	21°19.966′N	20°56.913′W	68	340.0	0	3	34	N-E
657	0.0046	0.0043	24.580	60	2302	21°19.974′N	20°56.887′W	68	340.0	0	3	26	N-W
657	0.0106	0.0099	24.042	60	2330	21°19.952′N	20°56.904′W	68	340.0	0	3	23	N-E
657	0.0103	0.0255	23.847	61	120	21°19.938′N	20°56.890′W	68	340.0	0	3	34	N-W
657	0.0032	0.0049	24.501	61	1036	21°19.940′N	20°56.922′W	68	340.0	0	3	43	S-W
657	0.0052	0.0095	24.384	61	1110	21°19.958′N	20°56.950′W	68	340.0	0	3	49	S-E
657	0.0139	0.0095	24.404	61	1258	21°19.958′N	20°56.897′W	68	340.0	0	3	17	S-W
657	0.0086	0.0074	24.433	61	2052	21°19.955′N	20°56.929′W	68	340.0	0	5	23	N-E
657	0.0436	0.0607	22.978	61	2238	21°19.897′N	20°56.989′W	68	340.0	0	2	39	N-W
657	0.0039	0.0056	24.179	61	2300	21°19.943′N	20°56.931′W	68	340.0	0	3	39	N-E
657	0.0125	0.0097	24.218	62	48	21°19.951′N	20°56.890′W	68	340.0	0	3	22	N-W
657	0.0198	0.0078	23.095	62	154	21°19.906′N	20°56.921′W	68	340.0	0	3	13	N-W
657	0.0122	0.0365	23.789	62	352	21°19.993′N	20°56.987′W	68	340.0	0	3	65	S-E
657	0.0250	0.0135	23.759	62	542	21°19.998′N	20°56.901′W	68	340.0	0	5	13	S-W
657	0.0055	0.0107	24.443	62	612	21°19.965′N	20°56.939′W	68	340.0	0	3	52	S-E
657	0.0152	0.0118	24.433	62	800	21°19.944′N	20°56.862′W	68	340.0	0	3	20	S-W
657	0.0213	0.0101	24.179	62	826	21°19.977′N	20°56.928′W	68	340.0	0	5	14	S-E
657	0.0039	0.0113	24.423	62	1014	21°19.942′N	20°56.838′W	68	340.0	0	3	63	S-W
657	0.0133	0.0078	24.384	62	1120	21°19.930′N	20°56.894′W	68	340.0	0	3	22	S-E
—	0.0227	0.0321	24.228	62	1304	21°17.403′N	20°47.757′W	68	103.9	13.0	3	37	S-W
—	0.0320	0.0518	21.933	62	1512	21°10.688′N	20°19.526′W	68	107.0	13.0	3	48	S-W
—	0.0719	0.0296	23.486	62	1744	21°0.129′N	19°46.538′W	68	107.0	13.0	4	10	N-W
—	0.0106	0.0200	24.287	62	1808	20°58.782′N	19°41.563′W	68	107.0	13.0	3	49	N-E
—	0.0321	0.0210	24.628	62	1958	20°52.997′N	19°17.043′W	68	107.0	13.0	3	15	N-W
—	0.0350	0.0697	24.882	63	330	20°43.021′N	18°36.038′W	68	57.0	0	3	53	S-E
658	0.0168	0.0101	24.316	63	520	20°42.740′N	18°34.977′W	68	57.0	0	5	16	S-W
658	0.0109	0.0127	24.199	63	538	20°42.747′N	18°35.007′W	68	0	0	2	34	S-E
658	0.0112	0.0122	24.267	63	724	20°42.736′N	18°34.970′W	68	0	0	3	31	S-W
658	0.0079	0.0305	23.691	63	1156	20°43.022′N	18°34.809′W	68	0	0	3	66	S-E
658	0.0068	0.0162	24.267	63	1530	20°44.975′N	18°34.934′W	68	0	0	3	58	N-E
658	0.0272	0.0151	23.935	63	1720	20°44.966′N	18°34.871′W	68	0	0	3	15	N-W
658	0.0430	0.0190	24.824	63	2006	20°45.013′N	18°34.882′W	68	0	0	3	11	N-E
658	0.0063	0.0079	24.238	64	306	20°44.971′N	18°34.881′W	68	0	0	3	36	S-E
658	0.0082	0.0075	24.345	64	456	20°44.962′N	18°34.851′W	68	0	0	3	25	S-W
658	0.0047	0.0112	24.619	64	648	20°44.962′N	18°34.877′W	68	0	0	3	57	S-W
658	0.0059	0.0071	24.511	64	1030	20°44.974′N	18°34.874′W	68	0	0	3	32	S-E
658	0.0289	0.0141	24.003	64	1050	20°44.978′N	18°34.882′W	68	0	0	3	15	S-E
658	0.0076	0.0075	24.433	64	1216	20°44.975′N	18°34.838′W	68	0	0	3	26	S-W
658	0.0055	0.0100	23.876	64	1236	20°44.982′N	18°34.829′W	68	0	0	3	52	S-W
658	0.0068	0.0096	24.375	64	1508	20°44.981′N	18°34.891′W	68	0	0	4	39	N-E
658	0.0151	0.0116	24.121	64	1658	20°44.968′N	18°34.855′W	68	0	0	4	24	N-W
658	0.0055	0.0127	24.248	64	1844	20°44.982′N	18°34.813′W	68	0	0	3	58	N-W
658	0.0067	0.0059	24.003	65	244	20°44.992′N	18°34.893′W	68	0	0	3	24	S-E
658	0.0036	0.0071	24.384	65	906	20°44.986′N	18°34.882′W	68	0	0	3	52	S-E
658	0.0437	0.0157	24.648	65	942	20°44.962′N	18°34.905′W	68	0	0	2	11	S-E
658	0.0162	0.0111	24.404	65	1054	20°44.974′N	18°34.826′W	68	0	0	3	18	S-W
658	0.0080	0.0114	23.925	65	1126	20°44.967′N	18°34.867′W	68	0	0	3	38	S-E
658	0.0129	0.0125	23.769	65	1310	20°44.975′N	18°34.824′W	68	0	0	3	21	S-W
658	0.0190	0.0244	24.648	65	1450	20°44.980′N	18°34.881′W	68	0	0	3	27	N-E
658	0.0050	0.0106	24.482	65	2106	20°44.984′N	18°34.874′W	68	0	0	3	55	N-E
658	0.0108	0.0054	24.628	65	2256	20°45.000′N	18°34.834′W	68	0	0	3	15	N-W
658	0.0048	0.0060	23.847	66	46	20°44.967′N	18°34.833′W	68	0	0	3	34	N-W
658	0.0084	0.0130	24.121	66	412	20°44.972′N	18°34.800′W	68	0	0	3	55	S-W
658	0.0081	0.0125	24.355	66	538	20°44.944′N	18°34.849′W	68	0	0	3	44	S-E
658	0.0059	0.0073	24.580	66	842	20°44.947′N	18°34.863′W	68	0	0	3	35	S-E
658	0.0125	0.0101	24.248	66	1034	20°44.962′N	18°34.824′W	68	0	0	3	27	S-W
658	0.0147	0.0102	24.531	66	1224	20°44.949′N	18°34.804′W	68	0	0	3	18	S-W
658	0.0116	0.0252	23.798	66	1338	20°44.896′N	18°34.946′W	68	0	0	3	39	S-E

Table 2 (continued).

Site	Satellite error (lat.)	Satellite error (long.)	Satellite frequency	Julian day	Time (UTC)	Latitude	Longitude	Angle of antenna (degrees)	Course (degree)	Ground speed (kt)	Satellite iteration (times)	Elevation (degrees)	Satellite direction
658	0.0245	0.0150	24.306	66	1424	20°44.956′N	18°34.879′W	68	0	0	4	18	N-E
658	0.0064	0.0135	24.511	66	1610	20°44.968′N	18°34.820′W	68	0	0	4	52	N-W
658	0.0067	0.0091	23.964	66	1734	20°44.952′N	18°34.872′W	68	0	0	3	37	N-E
658	0.0085	0.0069	24.121	66	1924	20°44.962′N	18°34.849′W	68	0	0	3	22	N-W
658	0.0299	0.0399	30.449	66	2046	20°25.429′N	18°32.893′W	68	0	0	4	37	N-E
658	0.0131	0.0172	24.238	66	2226	20°44.962′N	18°34.834′W	68	0	0	4	37	N-E
658	0.0105	0.0091	24.433	67	14	20°44.962′N	18°34.805′W	66.99	0	0	3	23	N-W
658	0.0098	0.0077	23.554	67	506	20°45.012′N	18°34.872′W	66.99	0	0	3	24	S-E
658	0.0084	0.0167	24.423	67	650	20°44.947′N	18°34.826′W	66.99	0	0	3	43	S-W
658	0.0163	0.0102	24.736	67	950	20°44.972′N	18°34.861′W	66.99	0	0	3	17	S-E
658	0.0103	0.0166	24.199	67	1008	20°44.975′N	18°34.808′W	66.99	0	0	4	39	S-W
658	0.0165	0.0101	25.009	67	1052	20°44.979′N	18°34.842′W	66.99	0	0	3	22	S-E
658	0.0030	0.0057	24.570	67	1136	20°44.966′N	18°34.831′W	66.99	0	0	3	48	S-W
658	0.0062	0.0098	25.410	67	1236	20°44.942′N	18°34.812′W	66.99	0	0	3	36	S-W
—	0.0178	0.0106	24.277	67	1700	20°34.720′N	18°43.598′W	66.99	219.9	13.5	3	18	N-E
—	0.0069	0.0112	24.072	67	1846	20°15.906′N	19°0.058′W	66.99	219.9	13.5	3	45	N-W
—	0.0528	0.0452	23.349	67	2022	19°59.509′N	19°15.461′W	66.99	219.9	13.5	3	23	N-E
—	0.0581	0.0653	22.109	67	2142	19°46.298′N	19°27.938′W	66.99	219.9	13.5	5	11	N-E
—	0.0058	0.0078	24.707	67	2208	19°42.117′N	19°31.866′W	66.99	219.9	13.5	3	39	N-W
—	0.0378	0.0241	23.574	67	2234	19°37.614′N	19°36.051′W	66.99	222.0	14.0	3	12	N-E
—	0.0046	0.0145	24.833	68	14	19°20.676′N	19°51.026′W	66.99	222.0	13.7	3	66	N-W
—	0.0064	0.0171	24.326	68	324	18°48.961′N	20°21.107′W	66.99	222.0	13.7	3	62	S-E
—	0.0438	0.0221	24.169	68	514	18°29.534′N	20°37.224′W	66.99	222.0	13.7	3	13	S-W
—	0.1156	0.0657	35.429	72	732	17°49.865′N	20°57.865′W	50	20.0	0	5	14	S-W
—	0.2643	0.1667	30.810	72	1026	17°15.870′N	20°56.800′W	50	347.9	13.0	4	13	S-E
—	0.0048	0.0098	25.458	72	1214	16°55.741′N	20°45.667′W	50	167.9	13.0	4	49	S-W
—	0.0512	0.0216	23.525	72	1354	16°34.305′N	20°41.057′W	50	167.9	13.5	4	11	N-E
—	0.0151	0.0507	24.482	72	1540	16°11.803′N	20°36.250′W	50	167.9	13.0	3	69	N-W
—	0.0123	0.0252	24.824	72	1734	15°47.121′N	20°31.686′W	50	167.9	13.0	3	54	N-E
—	0.1665	0.0793	18.037	72	1926	15°22.414′N	20°26.569′W	50	167.9	13.0	3	13	N-W
—	0.0079	0.0071	24.541	72	2012	15°12.876′N	20°25.671′W	50	167.9	13.0	3	26	N-E
—	0.0038	0.0035	23.935	72	2204	14°49.827′N	20°19.848′W	50	167.0	13.0	3	31	N-W
—	0.0074	0.0087	24.492	73	510	13°19.829′N	19°57.752′W	50	167.0	13.0	3	36	S-E
—	0.0112	0.0094	24.511	73	658	12°56.792′N	19°52.037′W	50	167.0	13.0	3	24	S-W
—	0.0056	0.0089	24.941	73	1016	12°14.243′N	19°41.380′W	50	167.0	13.0	3	46	S-E
—	0.0087	0.0110	25.009	73	1102	12°4.288′N	19°38.863′W	50	167.0	13.0	3	41	S-E
—	0.0186	0.0113	24.541	73	2104	11°50.756′N	19°34.999′W	50	167.0	13.0	3	15	S-W
—	0.0185	0.0133	24.501	73	1250	11°40.750′N	19°32.397′W	50	167.0	13.0	3	15	S-W
—	0.0070	0.0072	24.130	73	1310	11°36.293′N	19°31.425′W	50	167.0	13.0	4	35	S-E
—	0.0082	0.0080	25.185	73	1658	10°46.178′N	19°18.783′W	37	167.0	13.5	3	29	N-E
—	0.0092	0.0079	24.736	73	1846	10°22.334′N	19°13.152′W	37	167.0	13.5	5	26	N-W
—	0.0196	0.0114	24.033	73	1950	10°8.358′N	19°10.286′W	37	172.0	13.5	4	18	N-E
—	0.0088	0.0123	24.482	73	2136	9°59.308′N	19°15.146′W	37	228.0	5.0	3	44	N-W
—	0.0097	0.0119	23.974	73	2200	9°57.746′N	19°16.351′W	37	222.9	5.4	3	34	N-E
—	0.0640	0.0534	26.953	73	2236	9°55.392′N	19°18.721′W	37	222.0	5.0	3	24	N-E
—	0.0676	0.0678	22.041	73	2346	9°56.557′N	19°15.613′W	37	222.0	5.0	3	22	N-W
—	0.0757	0.0591	23.134	74	20	9°59.031′N	19°13.421′W	37	222.0	5.0	3	31	N-W
659	0.0162	0.0147	25.517	74	238	10°20.675′N	19°3.761′W	37	0.0	0	4	31	N-W
659	0.0050	0.0078	24.970	68	1128	18°4.661′N	21°1.647′W	50	20.0	0	3	44	S-E
659	0.0250	0.0167	25.167	68	1234	18°4.622′N	21°1.642′W	50	20.0	0	3	14	S-W
659	0.0183	0.0125	24.775	68	1316	18°4.676′N	21°1.644′W	50	20.0	0	3	17	S-W
659	0.0043	0.0114	24.404	68	1524	18°4.651′N	21°1.633′W	50	20.0	0	3	61	N-E
659	0.0356	0.0160	25.039	68	1716	18°4.693′N	21°1.641′W	50	20.0	0	2	13	N-W
659	0.0337	0.0152	24.404	68	2000	18°4.658′N	21°1.630′W	50	20.0	0	3	12	N-E
659	0.0066	0.0090	24.277	69	302	18°4.651′N	21°1.655′W	50	20.0	0	4	39	S-E
659	0.0099	0.0077	24.443	69	450	18°4.638′N	21°1.621′W	50	20.0	0	3	22	S-W
659	0.0057	0.0094	25.214	69	540	18°4.630′N	21°1.619′W	50	20.0	0	3	48	S-E
659	0.0201	0.0156	25.253	69	730	18°4.617′N	21°1.632′W	50	20.0	0	2	20	S-W
659	0.0114	0.0080	24.707	69	958	18°4.648′N	21°1.664′W	50	20.0	0	3	19	S-E
659	0.0075	0.0108	24.501	69	1144	18°4.659′N	21°1.625′W	50	20.0	0	3	40	S-W
659	0.0074	0.0107	24.443	69	1502	18°4.660′N	21°1.647′W	50	20.0	0	3	41	N-E
659	0.0125	0.0106	24.492	69	1650	18°4.662′N	21°1.641′W	50	20.0	0	3	21	N-W
659	0.0067	0.0095	24.677	69	1736	18°4.635′N	21°1.631′W	50	20.0	0	3	39	N-E
659	0.0239	0.0174	25.400	69	1924	18°4.680′N	21°1.606′W	50	20.0	0	2	20	N-W
659	0.0039	0.0103	24.570	69	2336	18°4.658′N	21°1.659′W	50	20.0	0	3	54	N-W
659	0.0289	0.0223	24.013	70	132	18°4.596′N	21°1.629′W	50	20.0	0	3	11	N-W
659	0.0052	0.0059	24.433	70	428	18°4.635′N	21°1.626′W	50	20.0	0	3	33	S-W
659	0.0098	0.0083	24.619	70	506	18°4.663′N	21°1.641′W	50	20.0	0	3	25	S-E
659	0.0082	0.0112	24.736	70	654	18°4.639′N	21°1.596′W	50	20.0	0	3	38	S-W
659	0.0063	0.0139	24.541	70	900	18°4.652′N	21°1.649′W	50	20.0	0	3	57	S-E
659	0.0236	0.0140	24.658	70	1050	18°4.638′N	21°1.631′W	50	20.0	0	2	15	S-W
659	0.0075	0.0076	25.214	70	1242	18°4.624′N	21°1.639′W	50	20.0	0	3	30	S-W
659	0.0088	0.0088	24.472	70	1438	18°4.648′N	21°1.640′W	50	20.0	0	3	28	N-E
659	0.0353	0.0180	27.783	70	1540	18°4.543′N	21°1.904′W	50	20.0	0	3	12	S-W
659	0.0084	0.0086	24.472	70	1626	18°4.647′N	21°1.644′W	50	20.0	0	3	32	N-W
659	0.0127	0.0109	25.351	70	1700	18°4.691′N	21°1.661′W	50	20.0	0	3	20	N-E
659	0.0054	0.0074	24.658	70	1848	18°4.654′N	21°1.651′W	50	20.0	0	3	40	N-W

Table 2 (continued).

Site	Satellite error (lat.)	Satellite error (long.)	Satellite frequency	Julian day	Time (UTC)	Latitude	Longitude	Angle of antenna (degrees)	Course (degree)	Ground speed (kt)	Satellite iteration (times)	Elevation (degrees)	Satellite direction
659	0.0120	0.0072	24.277	71	216	18°4.653′N	21°1.664′W	50	20.0	0	3	17	S-E
659	0.0053	0.0103	24.462	71	404	18°4.643′N	21°1.630′W	50	20.0	0	4	49	S-W
659	0.0529	0.0232	24.160	71	432	18°4.694′N	21°1.635′W	50	20.0	0	4	12	S-E
659	0.0061	0.0080	24.375	71	838	18°4.662′N	21°1.663′W	50	20.0	0	3	38	S-E
659	0.0079	0.0077	24.941	71	1006	18°4.635′N	21°1.647′W	50	20.0	0	3	28	S-E
659	0.0121	0.0106	24.550	71	1026	18°4.643′N	21°1.638′W	50	20.0	0	3	24	S-W
659	0.0064	0.0104	24.697	71	1132	18°4.677′N	21°1.665′W	50	20.0	0	3	64	S-E
659	0.0075	0.0076	24.667	71	1154	18°4.648′N	21°1.646′W	50	20.0	0	3	28	S-W
659	0.0360	0.0251	19.941	71	1304	18°4.865′N	21°1.536′W	50	20.0	0	3	22	S-E
659	0.0320	0.0135	26.093	71	1320	18°4.540′N	21°4.052′W	50	20.0	0	4	10	S-W
659	0.0258	0.0185	24.433	71	1416	18°4.635′N	21°1.670′W	50	20.0	0	4	18	N-E
659	0.0089	0.0146	24.521	71	1604	18°4.640′N	21°1.637′W	50	20.0	0	3	48	N-W
659	0.0034	0.0046	24.531	71	2038	18°4.652′N	21°1.660′W	50	20.0	0	3	39	N-E
659	0.0138	0.0261	23.437	71	2340	18°4.601′N	21°1.832′W	50	20.0	0	3	37	N-W
659	0.0361	0.0143	25.078	72	156	18°4.607′N	21°1.638′W	50	20.0	0	3	10	S-E
659	0.0061	0.0162	24.541	72	542	18°4.642′N	21°1.685′W	50	20.0	0	3	63	S-E
660	0.0251	0.0127	23.486	74	436	10°0.902′N	19°14.837′W	37	0.0	0	3	19	S-E
660	0.0328	0.0116	24.589	74	732	10°0.809′N	19°14.870′W	37	0.0	0	4	12	S-E
660	0.0037	0.0093	24.638	74	918	10°0.803′N	19°14.861′W	37	0.0	0	2	62	S-W
660	0.0107	0.0149	24.921	74	1114	10°0.800′N	19°14.834′W	37	0.0	0	3	42	S-W
660	0.0068	0.0381	14.208	74	1408	10°50.861′N	19°15.486′W	37	0.0	0	5	59	S-W
660	0.0076	0.0172	24.628	74	1452	10°0.805′N	19°14.841′W	37	0.0	0	5	59	N-E
660	0.0424	0.0192	25.185	74	1626	10°0.851′N	19°14.883′W	37	0.0	0	3	13	N-E
660	0.0521	0.0191	24.042	74	1644	10°0.756′N	19°14.821′W	37	0.0	0	4	12	N-W
660	0.0063	0.0114	24.462	74	1810	10°0.813′N	19°14.836′W	37	0.0	0	3	53	N-W
660	0.0405	0.0135	24.169	74	1928	10°0.785′N	19°14.877′W	37	0.0	0	3	10	N-E
660	0.0258	0.0101	23.740	74	2114	10°0.735′N	19°14.844′W	37	0.0	0	3	11	N-E
660	0.0060	0.0257	24.863	74	2316	10°0.819′N	19°14.795′W	37	0.0	0	4	61	N-E
660	0.0367	0.0139	24.121	75	58	10°0.783′N	19°15.010′W	37	0.0	0	3	11	N-W
660	0.0085	0.0099	24.726	75	234	10°0.789′N	19°14.840′W	37	0.0	0	3	42	S-E
660	0.0135	0.0084	24.658	75	424	10°0.790′N	19°14.844′W	37	0.0	0	3	19	S-W
660	0.0088	0.0108	24.394	75	1430	10°0.798′N	19°14.813′W	37	0.0	0	3	39	N-E
660	0.0148	0.0100	24.921	75	1620	10°0.835′N	19°14.796′W	37	0.0	0	3	20	N-W
660	0.0285	0.0227	23.896	75	2208	10°0.725′N	19°14.744′W	37	0.0	0	3	13	N-E
660	0.0067	0.0060	24.697	76	212	10°0.783′N	19°14.794′W	37	0.0	0	3	28	S-E
660	0.0102	0.0096	24.326	76	402	10°0.794′N	19°14.769′W	37	0.0	0	3	29	S-W
660	0.0090	0.0157	24.306	76	512	10°0.785′N	19°14.820′W	37	0.0	0	4	52	S-E
660	0.0203	0.0118	24.433	76	700	10°0.776′N	19°14.790′W	37	0.0	0	3	16	S-W
660	0.0047	0.0112	24.199	76	834	10°0.813′N	19°14.801′W	37	0.0	0	3	61	S-E
660	0.0090	0.0075	25.019	76	936	10°0.778′N	19°14.797′W	37	0.0	0	3	25	S-E
660	0.0423	0.0173	24.667	76	1024	10°0.790′N	19°14.803′W	37	0.0	0	5	13	S-W
660	0.0049	0.0102	24.736	76	1108	10°0.819′N	19°14.797′W	37	0.0	0	3	63	S-E
660	0.0121	0.0127	24.931	76	1128	10°0.784′N	19°14.770′W	37	0.0	0	3	29	S-W
—	0.0806	0.0637	19.804	76	1408	9°54.576′N	19°17.188′W	37	205.0	10	3	26	N-E
—	0.0096	0.0120	23.496	76	1702	9°30.009′N	19°23.995′W	37	162.0	5.5	3	38	N-E
661	0.0047	0.0094	24.541	76	2028	9°27.268′N	19°23.216′W	37	350.0	0	4	55	N-E
661	0.0068	0.0085	24.423	76	2242	9°26.803′N	19°23.165′W	37	350.0	0	3	35	N-E
661	0.0205	0.0115	24.482	77	150	9°26.848′N	19°23.188′W	37	350.0	0	3	18	S-E
661	0.0103	0.0086	24.111	77	438	9°26.834′N	19°23.184′W	37	350.0	0	3	26	S-E
661	0.0124	0.0128	24.179	77	624	9°26.834′N	19°23.161′W	37	350.0	0	2	32	S-W
661	0.0099	0.0128	24.755	77	812	9°26.811′N	19°23.162′W	37	350.0	0	3	40	S-E
661	0.0166	0.0121	24.609	77	1000	9°26.815′N	19°23.153′W	37	350.0	0	3	21	S-W
661	0.0048	0.0083	24.960	77	1144	9°26.821′N	19°23.137′W	37	350.0	0	3	48	S-W
661	0.0338	0.0191	24.658	77	1346	9°26.838′N	19°23.148′W	37	350.0	0	3	16	N-E
661	0.0087	0.0131	24.453	77	1532	9°26.823′N	19°23.145′W	37	350.0	0	2	48	N-W
661	0.0220	0.0170	23.808	77	1626	9°26.802′N	19°23.184′W	37	350.0	0	3	19	N-E
661	0.0094	0.0114	24.335	77	1812	9°26.817′N	19°23.148′W	37	350.0	0	3	40	N-W
661	0.0071	0.0084	24.677	77	2006	9°26.854′N	19°23.164′W	37	350.0	0	3	36	N-E
661	0.0122	0.0086	24.658	77	2156	9°26.861′N	19°23.177′W	37	350.0	0	2	21	N-W
661	0.0043	0.0128	24.394	78	314	9°26.846′N	19°23.194′W	37	350.0	0	3	66	S-W
661	0.0101	0.0189	23.916	78	554	9°26.842′N	19°23.168′W	37	350.0	0	3	63	S-W
661	0.0184	0.0231	24.287	78	754	9°26.846′N	19°23.177′W	37	350.0	0	3	27	S-E
661	0.0080	0.0081	24.541	78	938	9°26.824′N	19°23.150′W	37	350.0	0	4	31	S-W
661	0.0064	0.0068	25.166	78	1036	9°26.830′N	19°23.178′W	37	350.0	0	3	34	S-E
661	0.0131	0.0090	24.833	78	1132	9°26.837′N	19°23.161′W	37	350.0	0	3	20	S-W
661	0.0124	0.0078	25.312	78	1222	9°26.816′N	19°23.178′W	37	350.0	0	3	17	S-W
661	0.0212	0.0253	23.984	78	1240	9°26.831′N	19°23.149′W	37	350.0	0	3	24	S-E
661	0.0079	0.0062	24.589	78	1944	9°26.849′N	19°23.160′W	37	350.0	0	3	24	N-E
661	0.0075	0.0061	25.068	78	2126	9°26.847′N	19°23.176′W	37	350.0	0	3	25	N-E
661	0.0101	0.0069	24.687	78	2208	9°26.813′N	19°23.188′W	37	350.0	0	3	20	N-E
661	0.0061	0.0180	24.091	79	512	9°26.836′N	19°23.174′W	37	350.0	0	3	68	S-E
661	0.0308	0.0092	24.052	79	858	9°26.899′N	19°23.212′W	37	350.0	0	3	12	S-E
661	0.0081	0.0118	24.394	79	916	9°26.845′N	19°23.161′W	37	350.0	0	3	47	S-W
661	0.0048	0.0108	24.970	79	1042	9°26.836′N	19°23.152′W	37	350.0	0	3	56	S-W
661	0.0073	0.0136	25.087	79	1702	9°26.850′N	19°23.171′W	37	350.0	0	3	53	N-E
661	0.0270	0.0125	25.576	79	1850	9°26.889′N	19°23.143′W	37	350.0	0	2	14	N-W
661	0.0224	0.0106	24.882	80	30	9°26.831′N	19°23.260′W	37	350.0	0	3	15	N-W

Table 2 (continued).

Site	Satellite error (lat.)	Satellite error (long.)	Satellite frequency	Julian day	Time (UTC)	Latitude	Longitude	Angle of antenna (degrees)	Course (degree)	Ground speed (kt)	Satellite iteration (times)	Elevation (degrees)	Satellite direction
661	0.0032	0.0063	24.765	80	228	9°26.815′N	19°23.150′W	37	350.0	0	3	56	S-E
661	0.0439	0.0202	24.667	80	420	9°26.822′N	19°23.172′W	37	350.0	0	2	13	S-W
661	0.0075	0.0082	24.941	80	438	9°26.821′N	19°23.183′W	37	350.0	0	3	35	S-E
661	0.0143	0.0115	24.765	80	626	9°26.834′N	19°23.186′W	37	350.0	0	2	24	S-W
661	0.0034	0.0123	24.775	80	850	9°26.813′N	19°23.179′W	37	350.0	0	3	70	S-W
661	0.0144	0.0087	24.384	80	1006	9°26.850′N	19°23.178′W	37	350.0	0	3	18	S-E
661	0.0325	0.0165	23.955	80	1140	9°26.894′N	19°23.123′W	37	350.0	0	3	13	S-W
—	0.0115	0.0149	23.808	80	1246	9°18.649′N	19°16.900′W	37	145.0	13.0	3	34	S-E
—	0.0046	0.0087	24.638	80	1424	9°1.203′N	19°4.431′W	37	145.0	13.0	3	53	N-E
—	0.0422	0.0173	24.785	80	1614	8°41.655′N	18°50.687′W	37	145.0	13.0	3	14	N-W
—	0.0251	0.0438	24.482	80	1632	8°38.366′N	18°48.445′W	37	145.0	13.0	4	27	N-E
—	0.0162	0.0134	24.277	80	1814	8°20.172′N	18°35.874′W	37	145.0	13.0	3	28	N-W
—	0.0071	0.0241	24.873	80	2044	7°53.432′N	18°16.746′W	37	145.0	13.0	3	69	N-W
—	0.0069	0.0076	25.058	80	2134	7°44.485′N	18°10.479′W	37	145.0	13.0	3	40	N-E
—	0.0066	0.0088	24.941	81	206	6°54.927′N	17°35.793′W	37	145.0	13.0	3	44	S-E
—	0.0164	0.0118	24.521	81	406	6°32.765′N	17°20.278′W	37	145.0	13.0	3	20	S-E
—	0.0090	0.0306	24.824	81	1042	5°19.026′N	16°28.440′W	37	145.0	13.0	3	69	S-E
—	0.0048	0.0068	24.443	81	1402	4°41.350′N	16°2.823′W	37	146.0	13.7	3	44	N-E
—	0.0226	0.0145	25.146	81	1548	4°22.055′N	15°49.146′W	37	146.0	13.7	4	17	N-W
—	0.0193	0.0290	24.667	81	1736	4°2.179′N	15°34.849′W	37	146.0	13.7	3	43	N-W
—	0.0065	0.0094	24.716	81	2208	3°11.288′N	14°59.788′W	37	146.0	13.7	4	41	N-E
—	0.0058	0.0076	25.126	81	2230	3°7.187′N	14°56.843′W	37	146.0	13.7	3	40	N-W
—	0.0201	0.0125	25.244	81	2354	2°48.996′N	14°45.545′W	37	146.0	13.7	3	18	N-W
—	0.069	0.0083	24.921	82	146	2°31.097′N	14°30.379′W	37	146.0	13.7	3	39	S-E
—	0.0415	0.0145	24.179	82	332	2°12.182′N	14°16.022′W	37	146.0	13.7	5	12	S-E
—	0.0137	0.0255	24.794	82	518	1°53.665′N	14°2.313′W	37	146.0	13.7	3	55	S-W
—	0.0147	0.0089	24.775	82	936	1°7.977′N	13°29.897′W	37	146.0	13.7	3	18	S-E
—	0.0103	0.0234	24.052	82	1004	1°3.034′N	13°26.856′W	37	146.0	13.7	3	59	S-W
—	0.0068	0.0065	24.960	82	1120	0°49.603′N	13°17.613′W	37	146.0	13.7	3	29	S-W
—	0.0124	0.0439	24.970	82	1336	0°25.643′N	13°1.465′W	37	146.0	13.3	5	37	N-E
—	0.0115	0.0390	24.990	82	1700	0°9.122′S	12°35.974′W	37	145.0	13.3	4	68	N-W
—	0.0145	0.0328	25.029	82	2244	1°5.177′S	11°56.998′W	37	152.0	5.0	3	64	N-W
—	0.0067	0.0075	24.824	83	124	1°17.113′S	11°48.625′W	37	147.0	5.0	3	33	S-E
662	0.0071	0.0158	24.101	83	916	1°23.400′S	11°44.354′W	37	—	—	4	59	SE
662	0.0036	0.0089	24.980	83	1010	1°23.423′S	11°44.363′W	37	—	—	3	63	SE
662	0.0638	0.0199	23.554	83	1104	1°23.386′S	11°44.356′W	37	—	—	3	10	SW
662	0.0130	0.0111	24.902	83	1312	1°23.398′S	11°44.371′W	37	—	—	4	27	NE
662	0.0074	0.0069	24.863	83	1500	1°23.407′S	11°44.371′W	37	—	—	2	29	NW
662	0.0057	0.0156	24.501	83	1624	1°23.421′S	11°44.338′W	37	—	—	3	65	NE
662	0.0083	0.0177	24.580	83	1934	1°23.393′S	11°44.314′W	37	—	—	3	58	NE
662	0.0093	0.0109	23.583	83	2050	1°23.441′S	11°44.366′W	37	—	—	3	35	NE
662	0.0343	0.0115	24.423	83	2124	1°23.422′S	11°44.305′W	37	—	—	3	12	NW
662	0.0118	0.0070	23.779	83	2238	1°23.438′S	11°44.326′W	37	—	—	3	21	NW
662	0.0389	0.0319	27.412	83	2320	2°5.921′S	11°39.408′W	37	—	—	4	25	NW
662	0.0266	0.0189	24.355	83	102	1°23.404′S	11°44.340′W	37	—	—	4	22	SE
662	0.0051	0.0080	24.785	84	408	1°23.421′S	11°44.355′W	37	—	—	3	47	SE
662	0.0056	0.0089	24.589	84	722	1°23.427′S	11°44.340′W	37	—	—	3	49	SE
662	0.0379	0.0162	24.990	84	904	1°23.423′S	11°44.345′W	37	—	—	3	10	SE
662	0.0039	0.0042	24.033	84	1014	1°23.422′S	11°44.318′W	37	—	—	3	34	SW
662	0.0036	0.0054	24.833	84	1048	1°23.417′S	11°44.324′W	37	—	—	3	46	SW
662	0.0358	0.0210	22.763	84	1116	1°23.333′S	11°44.260′W	37	—	—	5	10	SE
662	0.0210	0.0110	24.541	84	1250	1°23.442′S	11°44.369′W	37	—	—	3	17	NE
662	0.0063	0.0088	24.384	84	1438	1°23.454′S	11°44.359′W	37	—	—	2	45	NW
662	0.0089	0.0090	24.882	84	1550	1°23.413′S	11°44.353′W	37	—	—	3	32	NE
662	0.0115	0.0087	24.472	84	1738	1°23.433′S	11°44.336′W	37	—	—	3	23	NW
662	0.0074	0.0087	24.765	84	1910	1°23.413′S	11°44.333′W	37	—	—	2	38	NE
662	0.0917	0.0364	24.785	84	2002	1°23.390′S	11°44.312′W	37	—	—	5	11	NE
662	0.0097	0.0065	24.638	84	2100	1°23.416′S	11°44.344′W	37	—	—	3	20	NW
662	0.0050	0.0112	24.179	84	2148	1°23.424′S	11°44.352′W	37	—	—	3	59	NW
662	0.0118	0.0088	24.794	85	232	1°23.409′S	11°44.372′W	37	—	—	3	23	SE
662	0.0118	0.0088	24.794	85	334	1°23.431′S	11°44.356′W	37	—	—	3	23	SE
662	0.0094	0.0085	24.912	85	520	1°23.445′S	11°44.332′W	37	—	—	3	32	SW
662	0.0125	0.0120	24.287	85	700	1°23.403′S	11°44.348′W	37	—	—	3	32	SE
662	0.0107	0.0084	24.335	85	848	1°23.415′S	11°44.339′W	37	—	—	3	25	SW
662	0.0174	0.0088	24.765	85	1128	1°23.434′S	11°44.354′W	37	—	—	3	16	SW
—	0.0026	0.0082	24.628	85	1414	1°11.650′S	11°56.143′W	37	—	—	3	68	NW
—	0.0296	0.0150	26.054	85	1514	1°8.696′S	11°54.336′W	37	—	—	3	15	NE
663	0.0091	0.0070	24.082	85	1848	1°12.044′S	11°52.535′W	37	—	—	4	25	NE
663	0.0057	0.0055	24.443	85	2036	1°12.100′S	11°52.699′W	37	—	—	3	31	NW
663	0.0063	0.0117	24.404	85	2058	1°12.101′S	11°52.689′W	37	—	—	3	50	NE
663	0.1246	0.0422	21.113	85	2246	1°12.124′S	11°52.670′W	37	—	—	3	14	NW
663	0.0160	0.0106	24.189	86	638	1°11.882′S	11°52.704′W	37	—	—	3	21	SE
663	0.0060	0.0082	24.218	86	1304	1°11.901′S	11°52.626′W	37	—	—	3	42	SW
663	0.0072	0.0037	24.072	86	2010	1°11.918′S	11°52.708′W	37	—	—	3	17	NE
663	0.0143	0.0129	24.208	86	2140	1°11.942′S	11°52.759′W	37	—	—	3	44	NE
663	0.0106	0.0150	23.837	86	2156	1°11.907′S	11°52.633′W	37	—	—	3	41	NW
663	0.0300	0.0196	24.248	86	2326	1°11.956′S	11°52.667′W	37	—	—	4	17	NW

Table 2 (continued).

Site	Satellite error (lat.)	Satellite error (long.)	Satellite frequency	Julian day	Time (UTC)	Latitude	Longitude	Angle of antenna (degrees)	Course (degree)	Ground speed (kt)	Satellite iteration (times)	Elevation (degrees)	Satellite direction
663	0.0055	0.0165	24.814	87	140	1°11.935′S	11°52.660′W	37	—	—	4	68	SE
663	0.0833	0.0241	24.218	87	332	1°11.906′S	11°52.642′W	37	—	—	3	10	SW
663	0.0045	0.0115	24.687	87	410	1°11.914′S	11°52.710′W	37	—	—	3	63	SE
663	0.0580	0.0209	24.589	87	600	1°11.899′S	11°52.666′W	37	—	—	5	10	SW
663	0.0131	0.0091	24.619	87	908	1°11.895′S	11°52.693′W	37	—	—	3	17	SE
663	0.0021	0.0065	23.681	87	932	1°11.917′S	11°52.561′W	37	—	—	3	67	SW
—	0.0069	0.0067	25.996	87	1052	1°12.353′S	12°7.158′W	37	—	—	5	31	SW
—	0.0113	0.0238	23.652	87	1214	1°9.992′S	12°25.814′W	37	—	—	4	65	SE
—	0.0265	0.0441	24.394	87	1328	1°9.302′S	12°43.602′W	37	—	—	4	50	NE
—	0.0308	0.0153	24.384	87	1518	1°6.623′S	13°6.667′W	37	—	—	3	15	NW
—	0.0145	0.0174	24.882	87	1552	1°5.946′S	13°13.986′W	37	—	—	3	39	NE
—	0.0336	0.0226	25.039	87	1740	1°3.578′S	13°38.586′W	37	269.0	13.3	3	21	NW
—	0.0103	0.0211	24.423	87	2106	1°0.100′S	14°23.508′W	37	277.0	13.3	3	58	NE
—	0.0195	0.0081	23.945	87	2256	0°58.010′S	14°47.930′W	37	277.0	13.3	3	12	NW
—	0.0104	0.0108	24.960	88	118	0°54.596′S	15°19.177′W	37	278.9	13.3	3	33	SE
—	0.0076	0.0059	24.833	88	306	0°51.789′S	15°43.174′W	37	278.9	13.3	3	25	SW
—	0.0140	0.0093	24.804	88	336	0°50.897′S	15°50.124′W	37	278.9	13.3	3	21	SE
—	0.0079	0.0195	24.843	88	738	0°43.679′S	16°43.921′W	37	278.9	13.3	3	64	SE
—	0.0607	0.0210	25.312	88	844	0°41.016′S	16°43.921′W	37	278.9	13.3	5	11	SW
—	0.0230	0.0298	23.574	88	948	0°39.020′S	17°13.252′W	37	278.9	13.3	3	28	SE
—	0.0160	0.0129	23.945	88	1030	0°38.561′S	17°22.399′W	37	278.9	13.3	3	27	SW
—	0.0205	0.0137	25.097	88	1306	0°35.453′S	17°57.716′W	37	275.9	13.3	3	21	NE
—	0.0095	0.0074	23.944	92	2334	0°27.256′N	22°42.461′W	26.99	53.0	13.3	3	22	N-W
—	0.0118	0.0087	25.000	93	112	0°41.119′N	22°26.079′W	26.99	53.0	13.3	3	24	S-E
—	0.0108	0.0104	24.101	93	302	0°56.593′N	22°7.650′W	26.99	53.0	13.3	3	32	S-W
—	0.0057	0.0086	24.111	93	412	1°6.695′N	21°56.025′W	26.99	53.0	13.3	3	46	S-E
—	0.0248	0.0119	25.185	93	602	1°22.169′N	21°38.165′W	26.99	53.0	13.3	3	14	S-W
—	0.0232	0.0458	24.921	93	732	1°34.939′N	21°22.665′W	26.99	53.0	13.3	3	56	S-E
—	0.0433	0.0152	23.681	93	812	1°41.237′N	21°16.211′W	26.99	53.0	13.3	4	12	S-E
—	0.0216	0.0100	22.285	93	916	1°51.105′N	21°5.270′W	26.99	53.0	13.3	3	14	S-E
—	0.0121	0.0120	23.984	93	1102	2°6.745′N	20°46.970′W	26.99	53.0	13.3	3	34	S-W
—	0.0189	0.0140	25.380	93	1302	2°21.883′N	20°24.089′W	26.99	69.0	13.3	3	23	N-E
—	0.0235	0.0234	25.126	93	1450	2°32.775′N	20°1.064′W	26.99	69.0	13.3	3	32	N-W
—	0.0145	0.0189	24.218	93	1556	2°39.216′N	19°47.791′W	26.99	69.0	13.3	3	42	N-E
—	0.0232	0.0140	23.740	93	1744	2°49.378′N	19°33.980′W	26.99	311.0	5.0	3	19	N-W
—	0.0126	0.0238	24.628	93	1922	2°56.337′N	19°40.846′W	26.99	311.0	5.0	3	54	N-E
—	0.0889	0.0366	26.464	93	2114	2°57.142′N	19°36.979′W	26.99	143.0	5.0	5	13	N-W
665	0.0124	0.0080	24.658	94	48	2°57.096′N	19°40.098′W	26.99	142.9	0	4	19	S-E
665	0.0046	0.0062	24.853	94	236	2°57.091′N	19°40.087′W	26.99	142.9	0	3	40	S-W
665	0.0107	0.0097	23.974	94	338	2°57.107′N	19°40.094′W	26.99	142.9	0	3	27	S-E
665	0.0076	0.0064	24.365	94	524	2°57.066′N	19°40.144′W	26.99	142.9	0	3	25	S-W
665	0.0102	0.0139	24.804	94	710	2°57.041′N	19°40.115′W	26.99	142.9	0	3	43	S-E
665	0.0235	0.0141	24.755	94	900	2°56.994′N	19°40.061′W	26.99	142.9	0	3	18	S-W
665	0.0231	0.0124	24.921	94	1240	2°57.027′N	19°40.125′W	26.99	142.9	0	3	16	N-E
665	0.0157	0.0127	24.980	94	1334	2°57.033′N	19°40.168′W	26.99	142.9	0	3	22	S-W
665	0.0056	0.0084	24.902	94	1426	2°57.097′N	19°40.103′W	26.99	142.9	0	3	47	N-W
665	0.0142	0.0097	24.414	94	1520	2°57.124′N	19°40.074′W	26.99	142.9	0	3	21	N-E
665	0.0115	0.0140	24.033	94	1708	2°57.088′N	19°40.085′W	26.99	142.9	0	2	39	N-W
665	0.0078	0.0088	24.726	94	1900	2°57.118′N	19°40.069′W	26.99	142.9	0	3	36	N-E
665	0.0094	0.0102	23.935	94	2046	2°57.081′N	19°40.049′W	26.99	142.9	0	3	41	N-E
665	0.0106	0.0093	24.103	94	2118	2°57.080′N	19°40.079′W	26.99	142.9	0	3	27	N-E
665	0.0444	0.0281	24.140	94	2232	2°57.076′N	19°40.058′W	26.99	142.9	0	2	18	N-W
665	0.0058	0.0053	24.199	94	2302	2°57.088′N	19°40.100′W	26.99	142.9	0	3	29	N-W
665	0.0619	0.0203	22.402	95	26	2°57.232′N	19°39.912′W	26.99	142.9	0	3	11	S-E
665	0.0092	0.0505	24.628	95	106	2°54.117′N	19°40.244′W	26.99	142.9	0	3	37	N-W
665	0.0041	0.0096	24.980	95	212	2°57.076′N	19°40.103′W	26.99	142.9	0	3	61	S-W
665	0.0315	0.0115	24.814	95	302	2°57.048′N	19°40.084′W	26.99	142.9	0	3	11	S-E
665	0.0043	0.0074	24.248	95	450	2°57.087′N	19°40.089′W	26.99	142.9	0	3	53	S-W
665	0.0136	0.0121	24.755	95	646	2°57.072′N	19°40.087′W	26.99	142.9	0	3	28	S-E
665	0.0121	0.0098	24.384	95	838	2°57.101′N	19°40.101′W	26.99	142.9	0	2	28	S-W
665	0.0088	0.0073	24.091	95	1008	2°57.061′N	19°40.050′W	26.99	142.9	0	3	31	S-W
665	0.0034	0.0064	23.974	95	1026	2°57.056′N	19°40.038′W	26.99	142.9	0	3	57	S-W
—	0.0099	0.0077	24.335	95	1838	3°2.708′N	19°44.397′W	26.99	315.9	5.3	3	23	N-E
—	0.0171	0.0067	23.808	95	1958	3°8.706′N	19°48.784′W	26.99	318.0	5.3	3	13	N-E
—	0.0087	0.0091	24.472	95	2026	3°10.655′N	19°50.037′W	26.99	307.9	5.3	3	34	N-W
—	0.0602	0.0189	25.166	95	2340	3°21.413′N	20°3.243′W	26.99	302.9	5.2	5	11	N-W
—	0.0156	0.0084	24.179	96	624	3°32.128′N	20°11.428′W	26.99	144.0	5.2	3	17	S-E
—	0.0072	0.0057	23.740	97	2306	3°41.330′N	20°28.267′W	26.99	301.9	13.3	4	22	N-W
—	0.0140	0.0161	24.648	98	104	3°56.555′N	20°50.583′W	26.99	304.0	13.3	4	36	S-E
—	0.0092	0.0064	24.902	98	254	4°9.741′N	21°11.341′W	26.99	304.0	13.3	3	23	S-W
—	0.0030	0.0053	24.160	98	1030	4°33.825′N	21°54.392′W	26.99	319.9	5.0	5	48	S-W
—	0.0118	0.0103	25.820	98	1444	4°34.640′N	21°54.821′W	26.99	100.0	5.0	3	28	N-W
667	0.0070	0.0160	25.078	98	1916	4°34.196′N	21°54.651′W	26.99	100.0	0	3	61	N-E
667	0.0052	0.0060	25.166	99	230	4°34.151′N	21°54.685′W	26.99	100.0	0	3	37	S-W
667	0.0068	0.0101	24.892	99	702	4°34.166′N	21°54.667′W	26.99	100.0	0	3	47	S-E
667	0.0041	0.0048	24.384	99	834	4°34.174′N	21°54.684′W	26.99	100.0	0	3	39	S-E
667	0.0276	0.0146	23.339	99	856	4°34.261′N	21°54.740′W	26.99	100.0	0	3	16	S-W

Table 2 (continued).

Site	Satellite error (lat.)	Satellite error (long.)	Satellite frequency	Julian day	Time (UTC)	Latitude	Longitude	Angle of antenna (degrees)	Course (degree)	Ground speed (kt)	Satellite iteration (times)	Elevation (degrees)	Satellite direction
667	0.0066	0.0063	24.843	99	922	4°34.194′N	21°54.686′W	26.99	100.0	0	3	30	S-E
667	0.0181	0.0104	24.755	99	1234	4°34.156′N	21°54.683′W	26.99	100.0	0	5	18	N-E
667	0.0045	0.0060	24.912	99	1422	4°34.166′N	21°54.689′W	26.99	100.0	0	2	42	N-W
667	0.0042	0.0108	24.882	99	1558	4°34.179′N	21°54.685′W	26.99	100.0	0	3	64	N-E
667	0.1064	0.0436	24.365	99	1748	4°34.148′N	21°54.665′W	26.99	100.0	0	2	12	N-W
667	0.0068	0.0083	24.775	99	1854	4°34.186′N	21°54.664′W	26.99	100.0	0	3	40	N-E
667	0.0079	0.0065	24.658	99	2014	4°34.186′N	21°54.688′W	26.99	100.0	0	3	25	N-E
667	0.0095	0.0060	24.501	99	2044	4°34.170′N	21°54.693′W	26.99	100.0	0	2	19	N-W
667	0.0102	0.0084	24.687	99	2200	4°34.187′N	21°54.685′W	26.99	100.0	0	4	29	N-W
667	0.0046	0.0059	24.716	99	2238	4°34.149′N	21°54.704′W	26.99	100.0	0	3	42	N-W
667	0.0037	0.0075	24.833	100	206	4°34.185′N	21°54.699′W	26.99	100.0	0	3	56	S-W
667	0.0042	0.0054	24.892	100	340	4°34.166′N	21°54.682′W	26.99	100.0	0	3	40	S-E
667	0.0213	0.0149	24.451	100	528	4°34.180′N	21°54.654′W	26.99	100.0	0	2	16	S-W
667	0.0107	0.0103	24.492	100	640	4°34.176′N	21°54.671′W	26.99	100.0	0	2	31	S-E
667	0.0354	0.0132	24.599	100	748	4°34.172′N	21°54.682′W	26.99	100.0	0	2	13	S-E
667	0.0109	0.0089	24.531	100	828	4°34.161′N	21°54.640′W	26.99	100.0	0	3	26	S-W
667	0.0058	0.0102	24.472	100	932	4°34.183′N	21°54.685′W	26.99	100.0	0	3	51	S-W
667	0.0097	0.0100	24.970	100	1524	4°34.194′N	21°54.703′W	26.99	100.0	0	3	33	N-E
667	0.0111	0.0092	25.019	100	1712	4°34.198′N	21°54.675′W	26.99	100.0	0	2	26	N-W
667	0.0089	0.0078	24.667	100	1832	4°34.204′N	21°54.666′W	26.99	100.0	0	3	27	N-E
667	0.0122	0.0112	24.599	100	2020	4°34.194′N	21°54.698′W	26.99	100.0	0	3	30	N-W
667	0.0047	0.0131	24.824	100	2132	4°34.176′N	21°54.645′W	26.99	100.0	0	3	47	N-E
667	0.0175	0.0116	25.039	100	2316	4°34.171′N	21°54.670′W	26.99	100.0	0	3	16	N-W
667	0.0079	0.0091	24.804	100	2342	4°34.111′N	21°54.668′W	26.99	100.0	0	3	44	N-E
667	0.0106	0.0065	24.482	101	306	4°34.192′N	21°54.696′W	26.99	100.0	0	3	19	S-E
667	0.0062	0.0071	24.814	101	452	4°34.172′N	21°54.696′W	26.99	100.0	0	2	34	S-W
667	0.0120	0.0078	24.404	101	618	4°34.190′N	21°54.675′W	26.99	100.0	0	3	20	S-E
667	0.0091	0.0112	24.628	101	806	4°34.176′N	21°54.680′W	26.99	100.0	0	2	39	S-W
667	0.0043	0.0090	24.658	101	842	4°34.174′N	21°54.672′W	26.99	100.0	0	2	57	S-E
667	0.0626	0.0209	25.166	101	1032	4°34.138′N	21°54.700′W	26.99	100.0	0	3	11	S-W
667	0.0092	0.0085	24.736	101	1300	4°34.603′N	21°54.599′W	26.99	100.0	0	3	29	S-W
667	0.0295	0.0159	24.765	101	1450	4°34.188′N	21°54.700′W	26.99	100.0	0	3	16	N-E
667	0.0173	0.0098	24.287	101	1810	4°34.162′N	21°54.681′W	26.99	100.0	0	3	17	N-E
667	0.0092	0.0131	24.882	101	1956	4°34.194′N	21°54.697′W	26.99	100.0	0	3	45	N-W
667	0.0038	0.0109	25.029	102	120	4°34.168′N	21°54.670′W	26.99	100.0	0	3	67	S-E
667	0.0721	0.0215	24.433	102	312	4°34.212′N	21°54.678′W	26.99	100.0	0	3	10	S-W
667	0.0323	0.0115	25.136	102	556	4°34.139′N	21°54.694′W	26.99	100.0	0	3	12	S-E
667	0.0060	0.0132	24.794	102	742	4°34.171′N	21°54.704′W	26.99	100.0	0	3	59	S-W
667	0.0048	0.0084	25.166	102	926	4°34.176′N	21°54.685′W	26.99	100.0	0	3	46	S-E
667	0.0093	0.0147	24.355	102	946	4°34.182′N	21°54.725′W	26.99	100.0	0	3	35	S-W
667	0.0241	0.0106	25.000	102	1112	4°34.174′N	21°54.710′W	26.99	100.0	0	3	10	S-W
667	0.0048	0.0102	24.931	102	1312	4°34.153′N	21°54.685′W	26.99	100.0	0	3	58	N-E
667	0.0969	0.0336	24.179	102	1504	4°34.103′N	21°54.693′W	26.99	100.0	0	3	12	N-W
667	0.0039	0.0123	24.648	102	1934	4°34.164′N	21°54.694′W	26.99	100.0	0	3	68	N-W
667	0.0067	0.0058	24.755	102	2054	4°34.146′N	21°54.671′W	26.99	100.0	0	3	27	N-E
667	0.0069	0.0129	24.365	102	2120	4°34.153′N	21°54.690′W	26.99	100.0	0	3	56	N-W
667	0.0063	0.0058	24.785	102	2240	4°34.141′N	21°54.696′W	26.99	100.0	0	3	29	N-W
667	0.0056	0.0078	24.863	103	58	4°34.176′N	21°54.686′W	26.99	100.0	0	3	44	S-E
667	0.0232	0.0133	24.492	103	248	4°34.195′N	21°54.639′W	26.99	100.0	0	3	17	S-W
—	0.0282	0.0554	25.615	103	1002	4°36.966′N	21°39.129′W	26.99	82.0	8.0	3	59	S-W
—	0.0170	0.0188	26.005	103	1118	4°39.587′N	21°22.419′W	26.99	82.0	8.0	3	35	S-E
—	0.0088	0.0115	25.224	103	1250	4°43.634′N	21°3.327′W	26.99	82.0	8.0	3	41	N-E
—	0.0254	0.0160	24.804	103	1440	4°47.526′N	20°52.974′W	26.99	82.0	5.0	3	18	N-W
666	0.0047	0.0062	24.355	96	1146	3°29.823′N	20°10.126′W	26.99	155.0	0	3	41	SE
666	0.0260	0.0143	24.667	96	1338	3°29.856′N	20°10.009′W	26.99	155.0	0	3	16	SW
666	0.0069	0.0128	23.925	96	1556	3°29.819′N	20°10.015′W	26.99	155.0	0	3	55	NE
666	0.0339	0.0180	23.183	96	1746	3°29.768′N	20°10.048′W	26.99	155.0	0	2	14	NW
666	0.0231	0.0101	24.814	96	1816	3°29.860′N	20°10.007′W	26.99	155.0	0	3	14	NE
666	0.0058	0.0102	24.687	96	2002	3°29.824′N	20°10.042′W	26.99	155.0	0	3	53	NW
666	0.0240	0.0093	23.964	96	2046	3°29.836′N	20°9.984′W	26.99	155.0	0	3	14	NE
666	0.0048	0.0114	23.759	96	2230	3°29.543′N	20°9.995′W	26.99	155.0	0	3	52	NW
666	0.0078	0.0165	24.794	97	128	3°29.841′N	20°10.004′W	26.99	155.0	0	3	58	SE
666	0.0376	0.0140	22.714	97	320	3°30.065′N	20°10.010′W	26.99	155.0	0	3	12	SW
666	0.0077	0.0102	24.052	97	338	3°29.906′N	20°10.057′W	26.99	155.0	0	3	35	SE
666	0.0127	0.0080	24.150	97	526	3°29.883′N	20°10.022′W	26.99	155.0	0	3	19	SW
666	0.0517	0.0160	25.283	97	602	3°29.858′N	20°10.035′W	26.99	155.0	0	4	10	SE
666	0.0072	0.0221	25.068	97	748	3°29.857′N	20°10.014′W	26.99	155.0	0	2	68	SW
666	0.0058	0.0058	24.697	97	826	3°29.869′N	20°9.987′W	26.99	155.0	0	3	31	SE
666	0.0030	0.0083	23.906	97	954	3°29.899′N	20°9.983′W	26.99	155.0	0	3	70	SE
666	0.0173	0.0138	23.955	97	1016	3°29.910′N	20°9.987′W	26.99	155.0	0	3	22	SW
666	0.0415	0.0181	24.277	97	1102	3°29.926′N	20°9.954′W	26.99	155.0	0	3	13	SE
666	0.0097	0.0159	25.195	97	1318	3°29.855′N	20°9.968′W	26.99	155.0	0	3	50	NE
666	0.0468	0.0185	24.003	97	1508	3°29.765′N	20°10.087′W	26.99	155.0	0	4	15	NW
666	0.0146	0.0162	24.902	97	1526	3°29.826′N	20°10.057′W	26.99	155.0	0	3	28	NE
666	0.0087	0.0084	24.667	97	1710	3°29.821′N	20°10.041′W	26.99	155.0	0	3	31	NW
666	0.0095	0.0059	24.296	97	2004	3°29.850′N	20°10.016′W	26.99	155.0	0	3	20	NE
—	0.0081	0.0087	24.941	97	2150	3°32.149′N	20°13.684′W	26.99	301.9	13.3	3	37	NW

Table 2 (continued).

Site	Satellite error (lat.)	Satellite error (long.)	Satellite frequency	Julian day	Time (UTC)	Latitude	Longitude	Angle of antenna (degrees)	Course (degree)	Ground speed (kt)	Satellite iteration (times)	Elevation (degrees)	Satellite direction
—	0.0263	0.0149	25.449	103	1714	4°46.688′N	20°55.911′W	26.99	82.0	5.0	4	18	N-W
668	0.0042	0.0109	24.443	103	2034	4°46.172′N	20°55.515′W	26.99	82.0	0	4	59	N-E
668	0.0316	0.0110	24.228	103	2218	4°46.162′N	20°55.515′W	26.99	82.0	0	3	11	N-W
668	0.0127	0.0128	25.039	104	36	4°46.182′N	20°55.548′W	26.99	82.0	0	3	32	S-E
668	0.0069	0.0054	25.029	104	224	4°46.182′N	20°55.533′W	26.99	82.0	0	2	25	S-W
668	0.0049	0.0044	24.609	104	306	4°46.180′N	20°55.530′W	26.99	82.0	0	3	28	S-E
668	0.0091	0.0068	24.306	104	454	4°46.190′N	20°55.510′W	26.99	82.0	0	3	22	S-W
668	0.0051	0.0154	24.736	104	656	4°46.188′N	20°55.515′W	26.99	82.0	0	3	68	S-E
668	0.0037	0.0038	24.687	104	802	4°46.183′N	20°55.538′W	26.99	82.0	0	3	32	S-E
668	0.0490	0.0150	21.757	104	848	4°46.413′N	20°55.552′W	26.99	82.0	0	4	10	S-W
668	0.0164	0.0106	25.576	104	1040	4°46.152′N	20°55.521′W	26.99	82.0	0	3	19	S-W
668	0.0033	0.0064	24.765	104	1214	4°46.200′N	20°55.508′W	26.99	82.0	0	3	55	S-W
668	0.0112	0.0101	25.039	104	1416	4°46.187′N	20°55.534′W	26.99	82.0	0	3	29	N-W
668	0.0167	0.0131	24.169	104	1450	4°46.177′N	20°55.529′W	26.99	82.0	0	3	25	N-E
668	0.0089	0.0105	24.501	104	1638	4°46.184′N	20°55.513′W	26.99	82.0	0	3	36	N-W
668	0.0064	0.0143	25.000	104	1848	4°46.202′N	20°55.457′W	26.99	82.0	0	3	59	N-E
668	0.0124	0.0070	24.189	104	1942	4°46.142′N	20°55.505′W	26.99	82.0	0	3	21	N-E
668	0.0161	0.0082	24.697	104	2026	4°46.157′N	20°55.485′W	26.99	82.0	0	3	16	N-E
668	0.0048	0.0064	24.775	104	2126	4°46.173′N	20°55.520′W	26.99	82.0	0	3	35	N-W
668	0.0060	0.0099	24.892	104	2206	4°46.169′N	20°55.526′W	26.99	82.0	0	4	46	N-W
668	0.0261	0.0174	24.980	105	14	4°46.174′N	20°55.531′W	26.99	82.0	0	3	21	S-E
668	0.0138	0.0166	24.521	105	202	4°46.202′N	20°55.530′W	26.99	82.0	0	2	38	S-W
668	0.0557	0.0200	24.287	105	232	4°46.187′N	20°55.447′W	26.99	82.0	0	3	12	S-E
—	0.0124	0.0192	23.701	105	418	4°52.105′N	20°53.831′W	26.99	20.0	12.5	3	47	S-W
—	0.0171	0.0253	24.433	105	634	5°21.368′N	20°43.321′W	26.99	20.0	12.5	3	46	S-E
—	0.1032	0.0289	26.650	105	714	5°29.614′N	20°34.221′W	26.99	199.9	13.0	5	10	S-E
—	0.0225	0.0141	25.761	105	1206	6°32.278′N	20°18.862′W	26.99	20.0	13.3	3	19	N-E
—	0.0074	0.0089	25.625	105	1354	6°54.820′N	20°10.511′W	26.99	21.0	13.3	3	40	N-W
—	0.0113	0.0277	24.140	105	1602	7°21.004′N	20°0.930′W	26.99	21.0	13.3	3	63	N-W
—	0.0098	0.0140	25.166	105	1826	7°50.631′N	19°50.062′W	26.99	21.0	13.3	3	44	N-E
—	0.0126	0.0069	24.501	105	2016	8°13.464′N	19°41.297′W	26.99	21.0	13.3	3	17	N-W
—	0.0039	0.0064	24.736	105	2100	8°22.554′N	19°38.053′W	26.99	21.0	13.3	3	49	N-E
—	0.0298	0.0112	24.218	105	2246	8°44.324′N	19°29.668′W	26.99	21.0	13.3	3	15	N-W
—	0.0425	0.0201	25.253	105	2350	8°57.372′N	19°24.667′W	26.99	21.0	13.3	3	15	S-E
—	0.0117	0.0129	24.179	106	610	10°15.984′N	18°58.637′W	26.99	21.0	13.3	3	35	S-E
—	0.0153	0.0116	24.755	106	758	10°38.349′N	18°51.310′W	26.99	21.0	13.3	3	23	S-W
—	0.0109	0.0066	25.400	106	820	10°43.009′N	18°49.832′W	26.99	21.0	13.3	3	17	S-E
—	0.0476	0.0193	24.482	106	956	11°2.572′N	18°42.612′W	26.99	21.0	13.3	5	12	S-W
—	0.0458	0.0749	27.099	106	1034	11°10.509′N	18°39.495′W	26.99	21.0	13.3	3	21	S-E
—	0.0113	0.0134	24.824	106	1804	12°41.180′N	18°6.354′W	26.99	21.0	12.8	3	36	N-E

[a] — = underway (i.e., not at site).

Table 3. Real-time recording parameters on board *JOIDES Resolution*.

	EDO-1	EDO-2
Line 1: Site Marseille to Site 657		
High Cut:	500 Hz	500 Hz
Low Cut:	20 Hz	20 Hz
Gain:		
Amp:	80 dB	80 dB
Recorder:	Variable	Variable
Line 2: Site 657 to Site 658		
High Cut:	500 Hz	500 Hz
Low Cut:	20 Hz	20 Hz
Gain:		
Amp:	80 dB	80 dB
Recorder:	Full	Full
Line 3: Site 658 to Site 659		
High Cut:	500 Hz	500 Hz
Low Cut:	20 Hz	20 Hz
Gain:		
Amp:	80 dB	80 dB
Recorder:	Full	Full
Line 4: Site 659 to Site 660		
High Cut:	500 Hz	500 Hz
Low Cut:	20 Hz	20 Hz
Gain:		
Amp:	80 dB	80 dB
Recorder:	Full	Full
Line 5: Site 660 to Site 661		
High Cut:	400–500 Hz	400–500 Hz
Low Cut:	20 Hz	20 Hz
Gain:		
Amp:	80 dB	80 dB
Recorder:	Variable	Variable
Line 6: Site 661 to Site 662		
High Cut:	400 Hz	400 Hz
Low Cut:	20 Hz	20 Hz
Gain:		
Amp:	80 dB	80 dB
Recorder:	Full	Full

Table 3 (continued).

	EDO-1	EDO-2
Line 7: Site 662 to Site 663		
High Cut:	400 Hz	400 Hz
Low Cut:	20 Hz	20 Hz
Gain:		
Amp:	80 dB	80 dB
Recorder:	Full	Full
Line 8: Site 663 to Site 664		
High Cut:	500 Hz	500 Hz
Low Cut:	20 Hz	20 Hz
Gain:		
Amp:	80 dB	80 dB
Recorder:	Full	Full
Line 9: Site 664 to Site 665		
High Cut:	400 Hz	400 Hz
Low Cut:	20 Hz	20 Hz
Gain:		
Amp:	80 dB	80 dB
Recorder:	Full	Full
Line 10: Site 665 to Site 666		
High Cut:	400 Hz	400 Hz
Low Cut:	20 Hz	20 Hz
Gain:		
Amp:	80 dB	80 dB
Recorder:	Full	Full
Line 11: Site 666 to Site 667		
High Cut:	400 Hz	400 Hz
Low Cut:	20 Hz	20 Hz
Gain:		
Amp:	80 dB	80 dB
Recorder:	Full	Full
Line 12: Site 667 to Site 668		
High Cut:	400 Hz	400 Hz
Low Cut:	20 Hz	20 Hz
Gain:		
Amp:	80 dB	80 dB
Recorder:	Full	Full

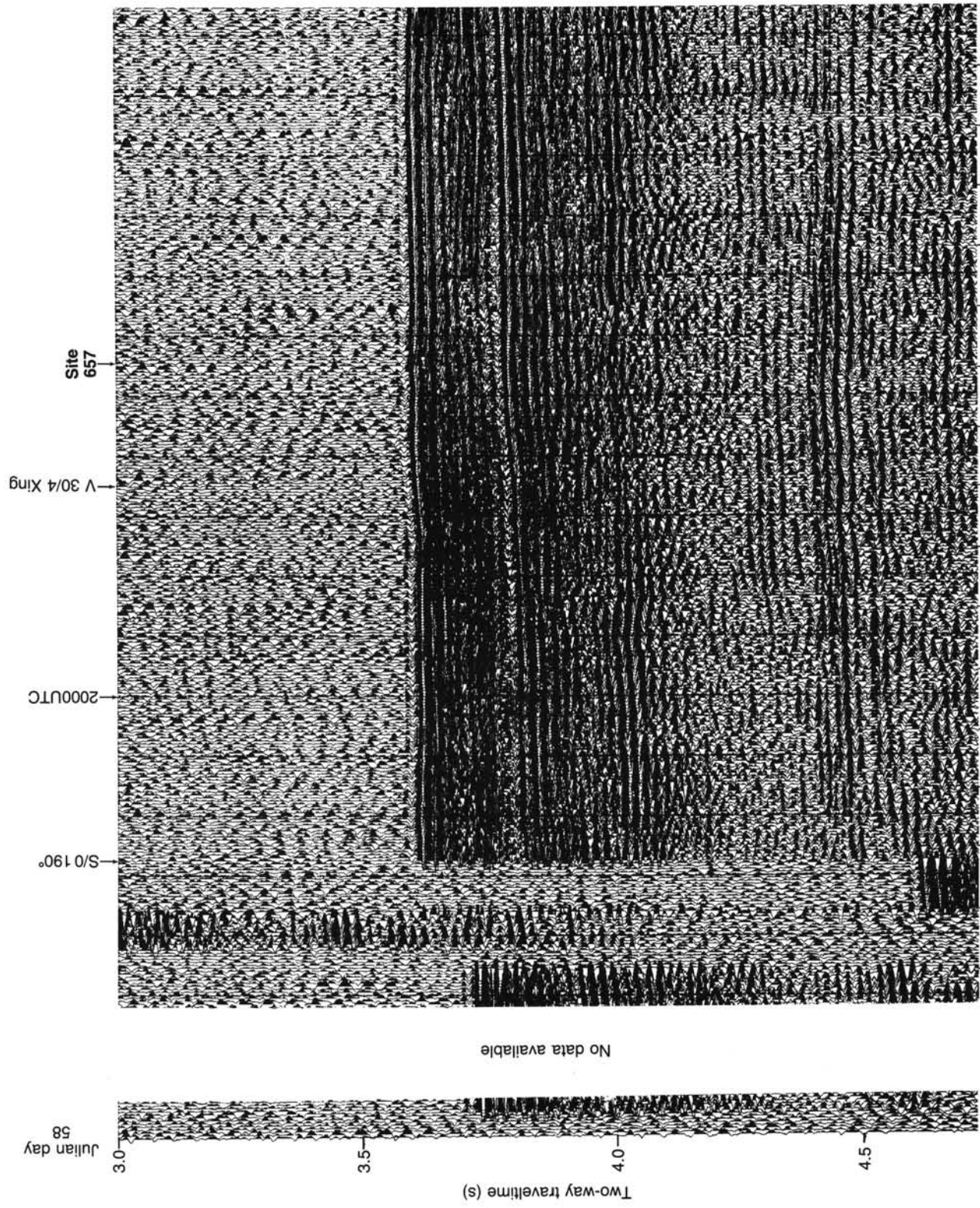

Figure 3. Unprocessed analog seismic data collected from Line 1 en route to Site 657 and recorded using a super-micro 561 Masscomp computer.

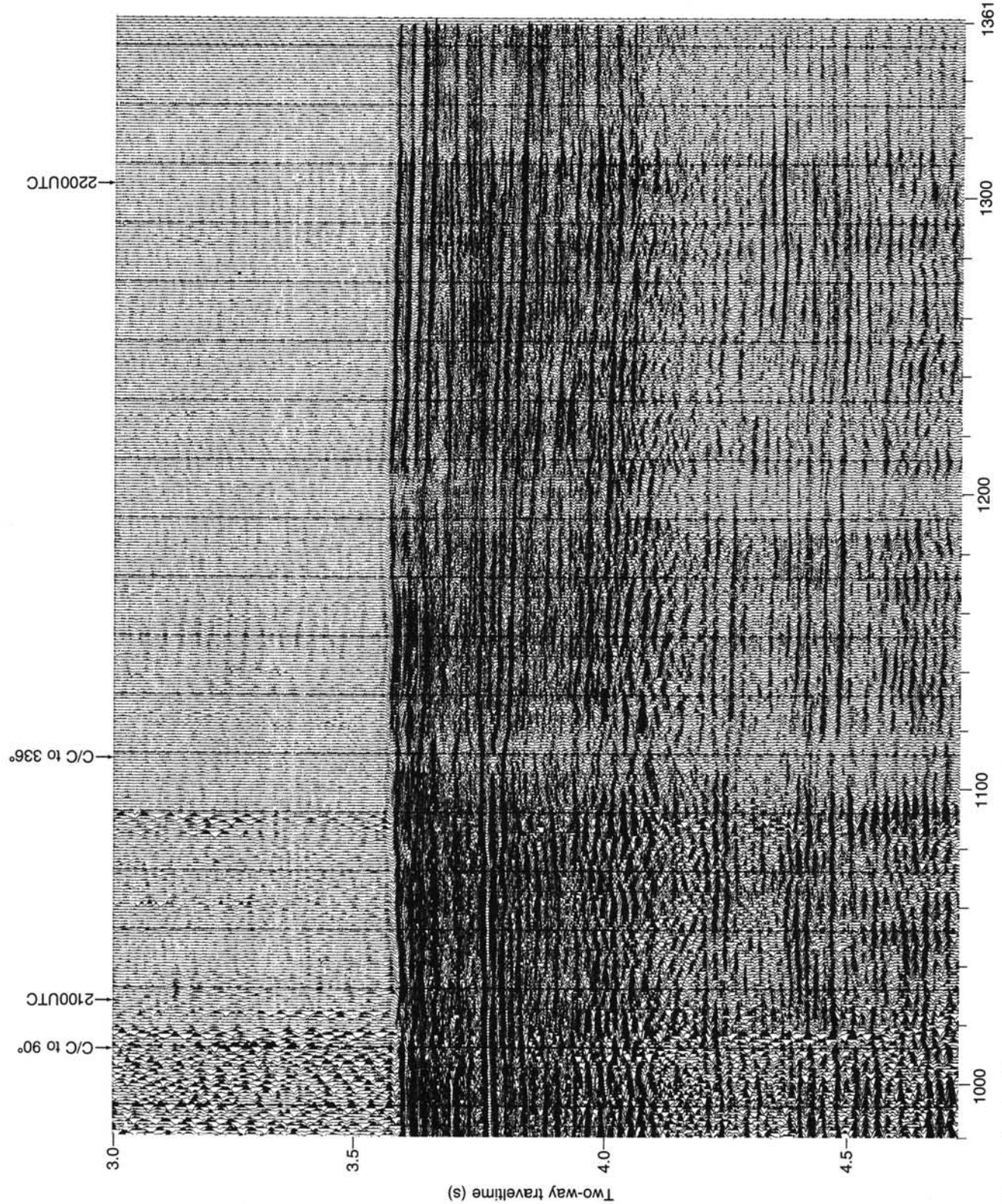

Figure 3 (continued).

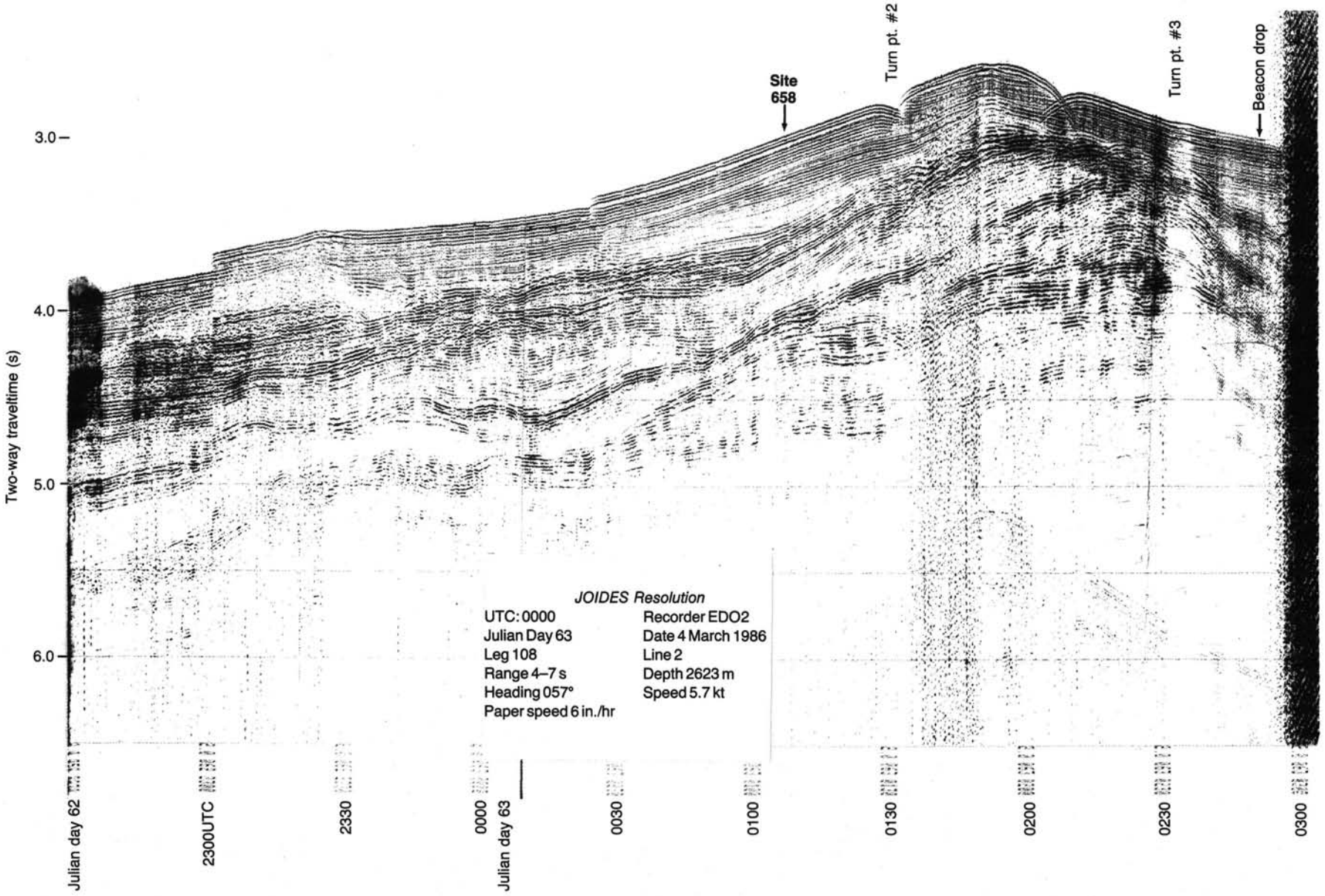

Figure 4. Unprocessed analog seismic data collected from Line 2 en route to Site 658 and recorded using the EDO-2 recorder.

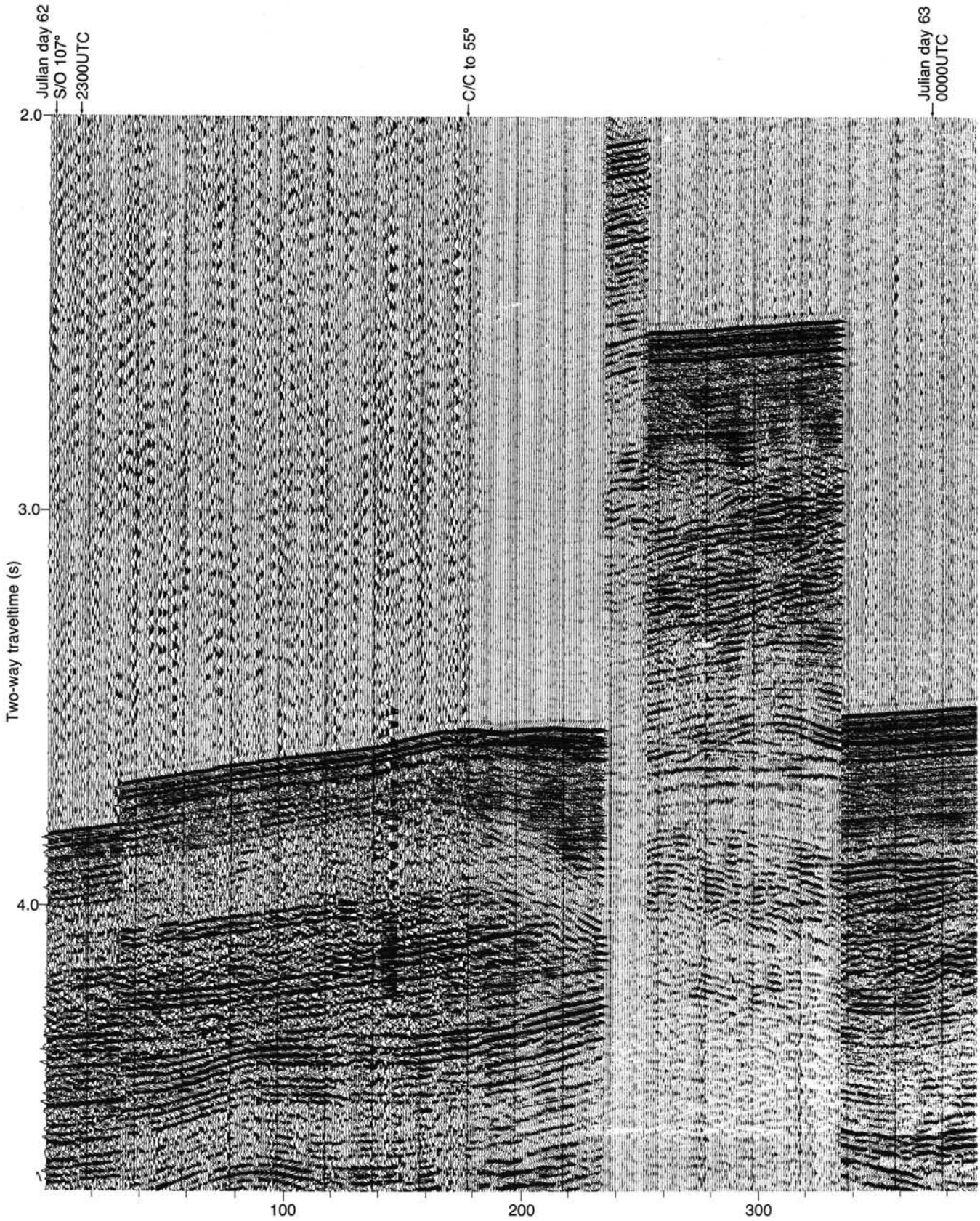

Figure 5. Unprocessed analog seismic data collected from Line 2 en route to Site 658 and recorded using a super-micro 561 Masscomp computer.

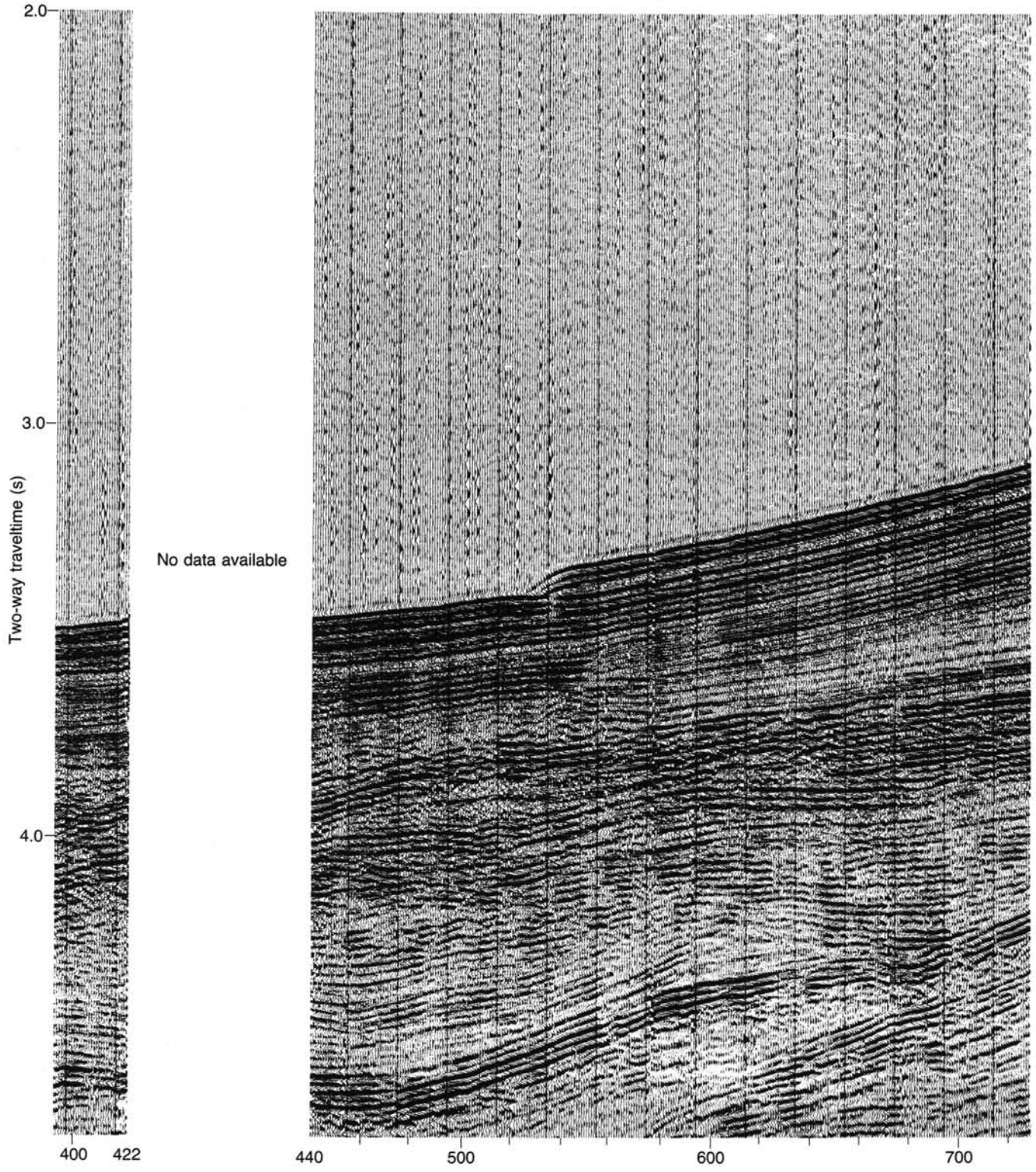

Figure 5 (continued).

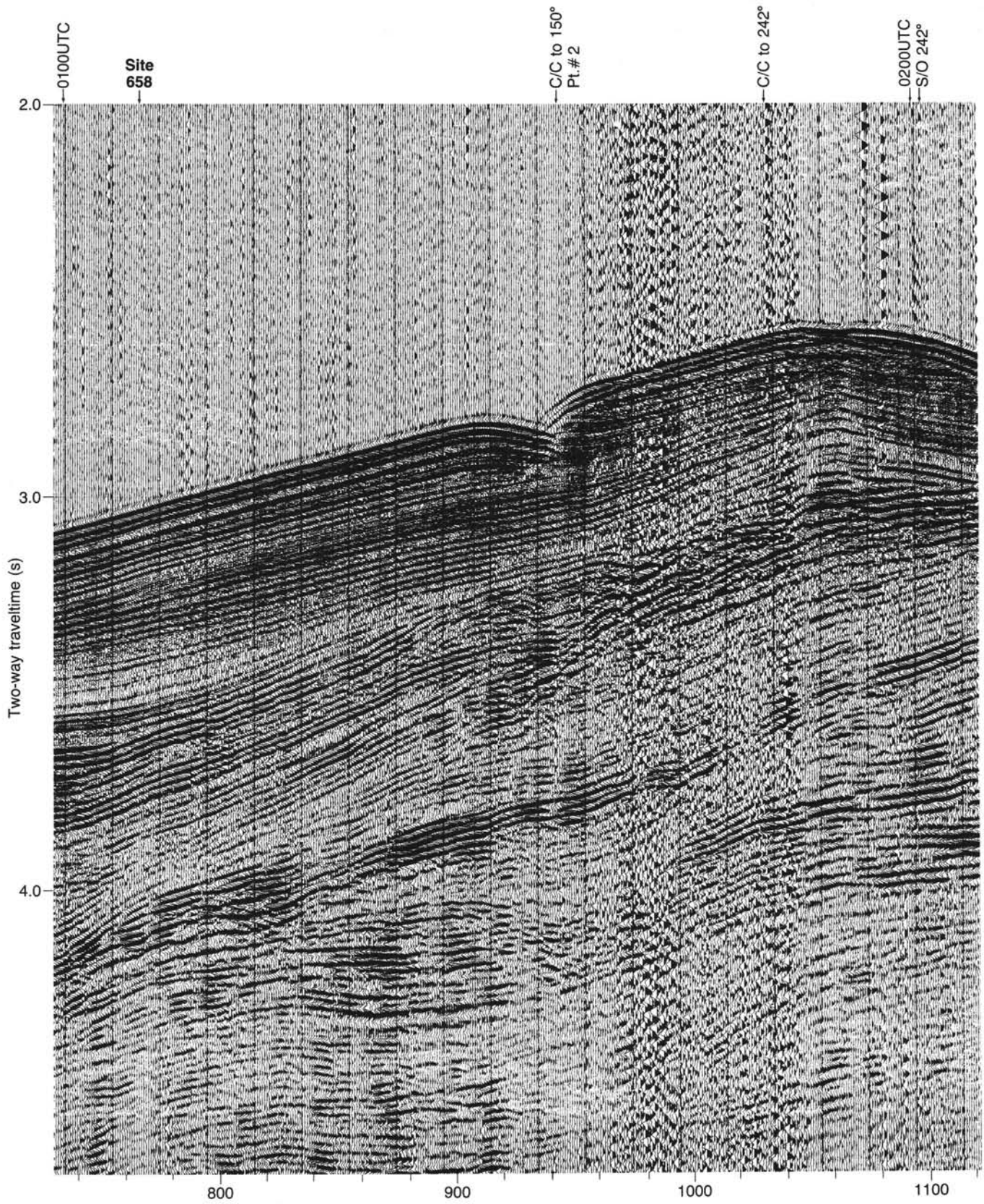

Figure 5 (continued).

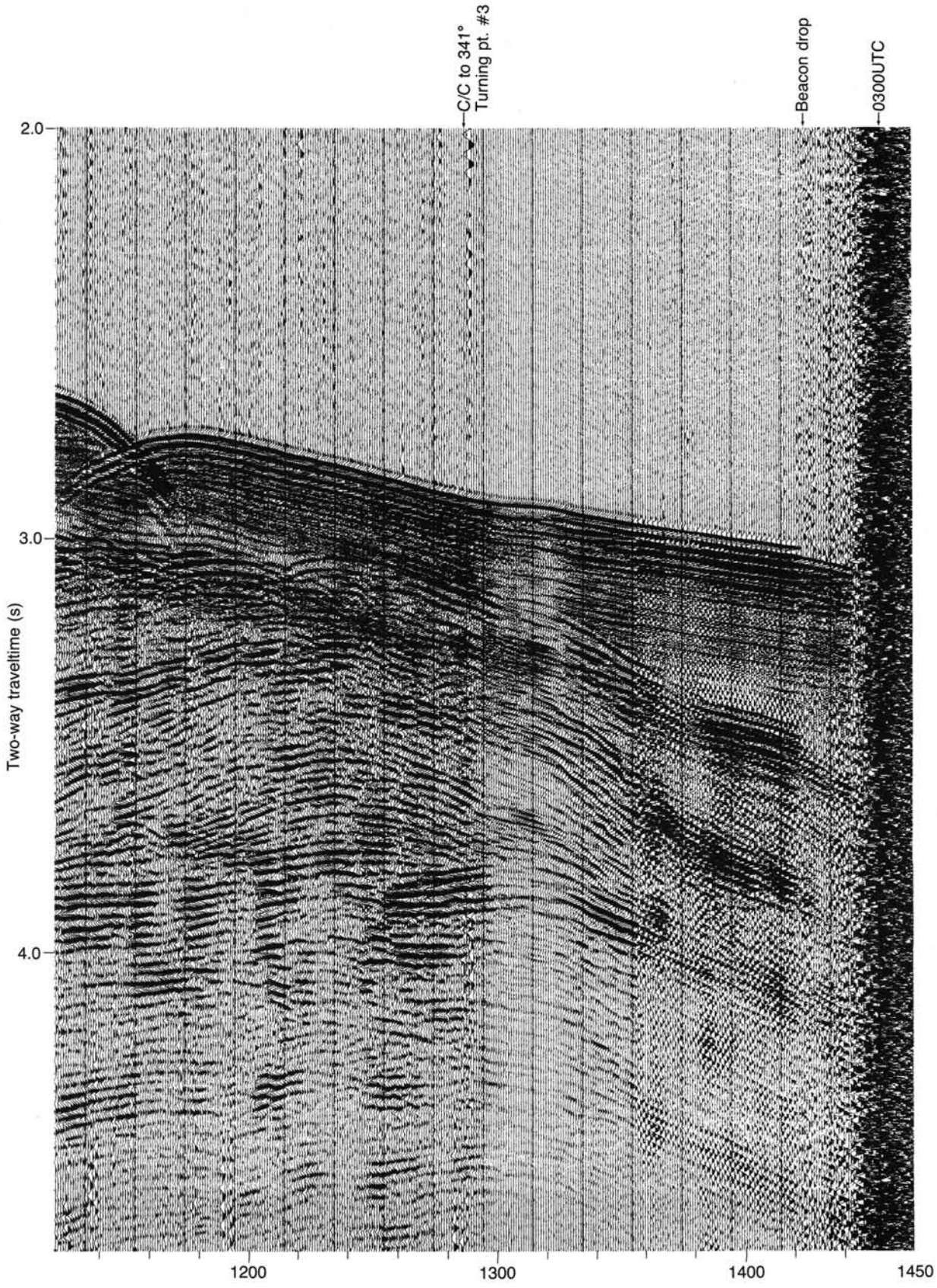

Figure 5 (continued).

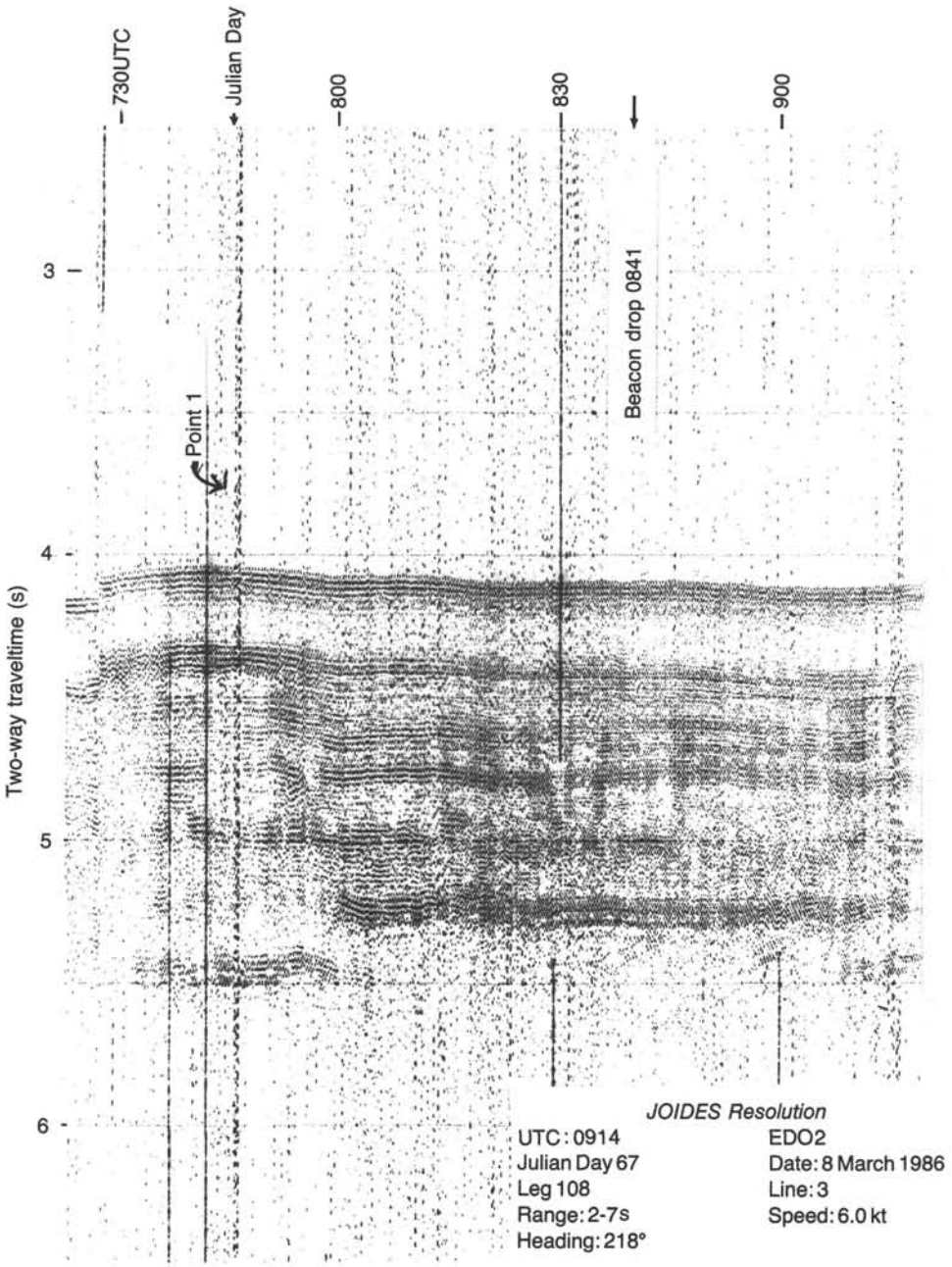

Figure 6. Unprocessed analog seismic data collected from Line 3 en route to Site 659 and recorded using the EDO-2 recorder.

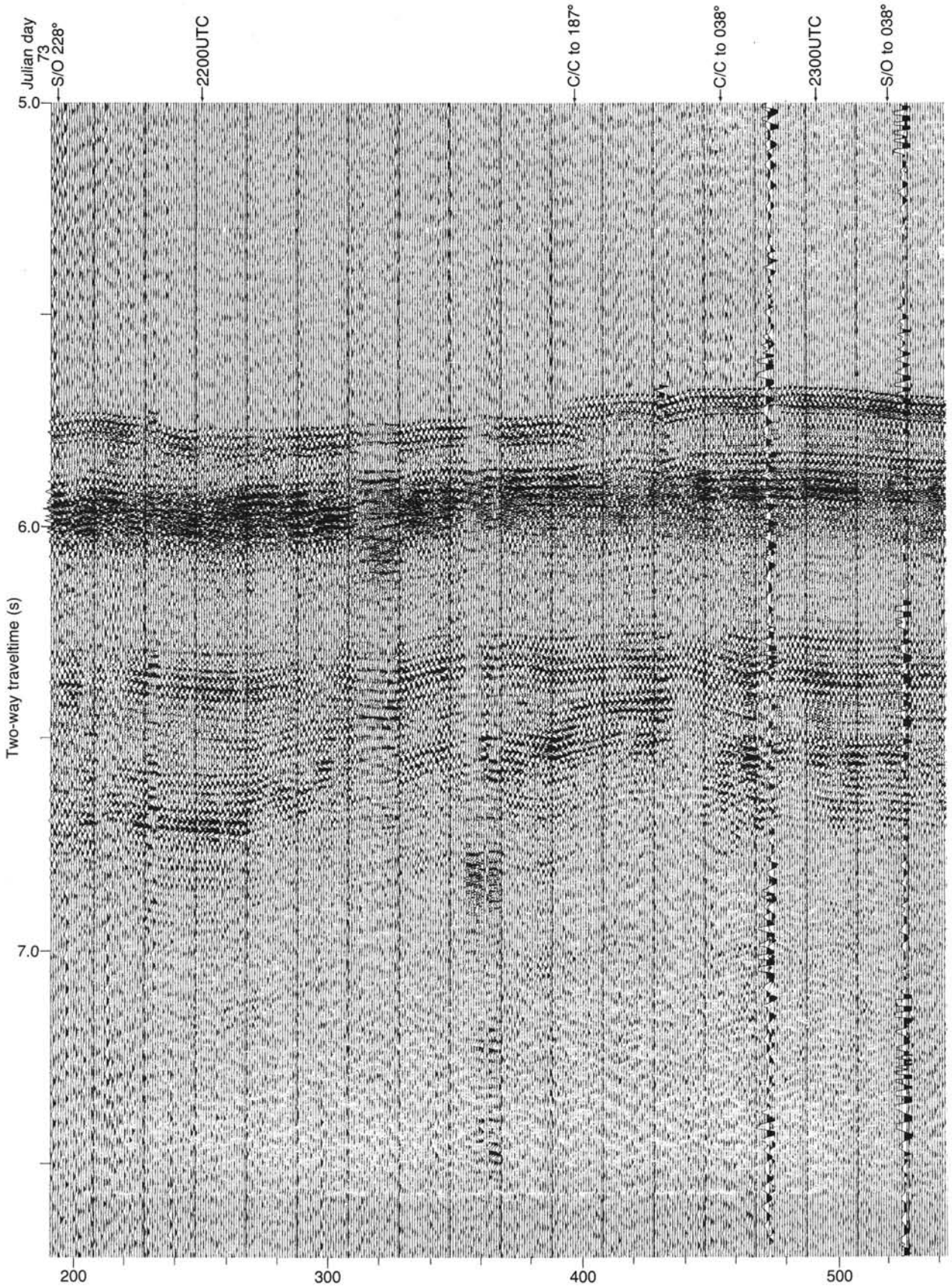

Figure 7. Unprocessed analog seismic data collected from Line 4 en route to Site 660 and recorded using a super-micro 561 Masscomp computer.

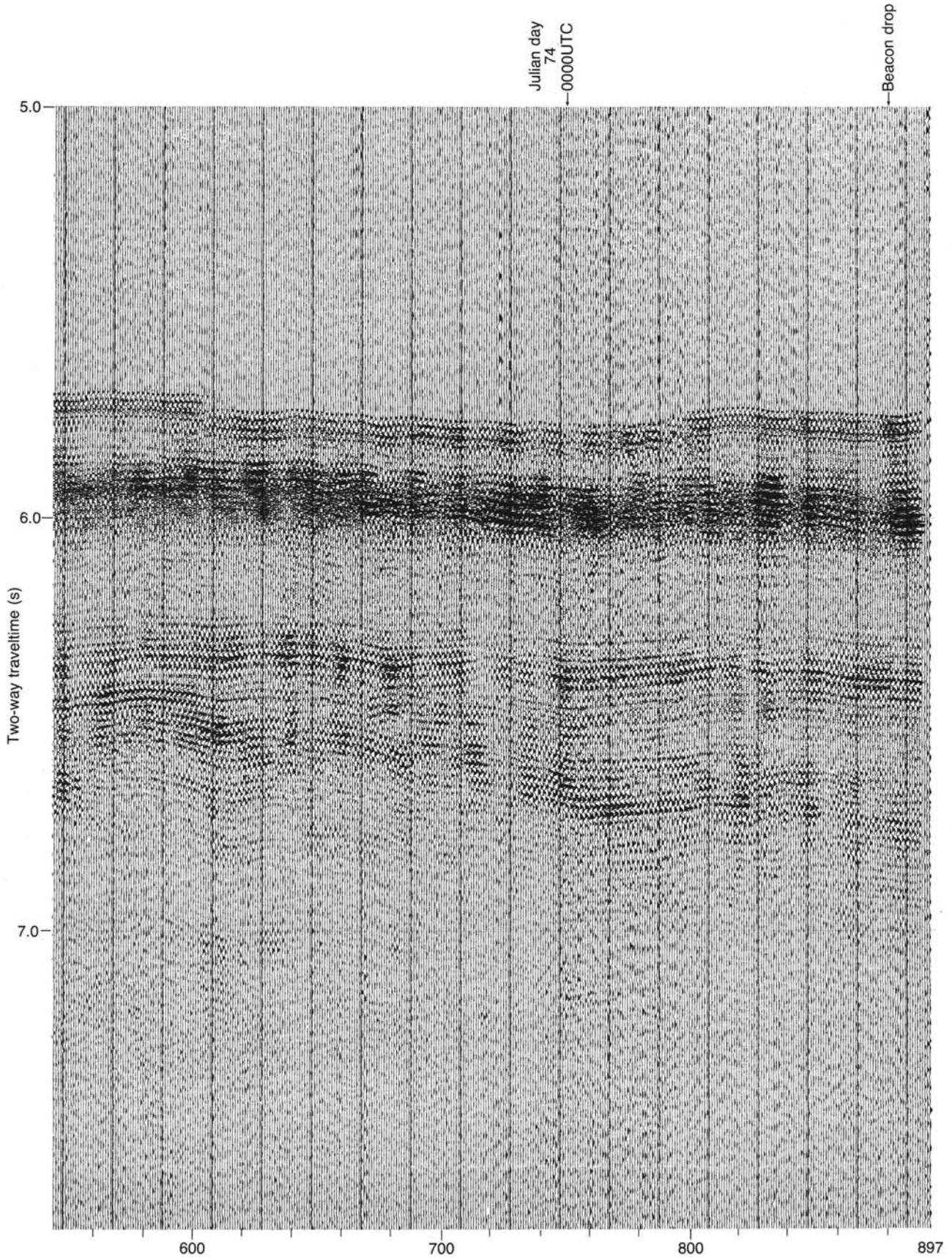

Figure 7 (continued).

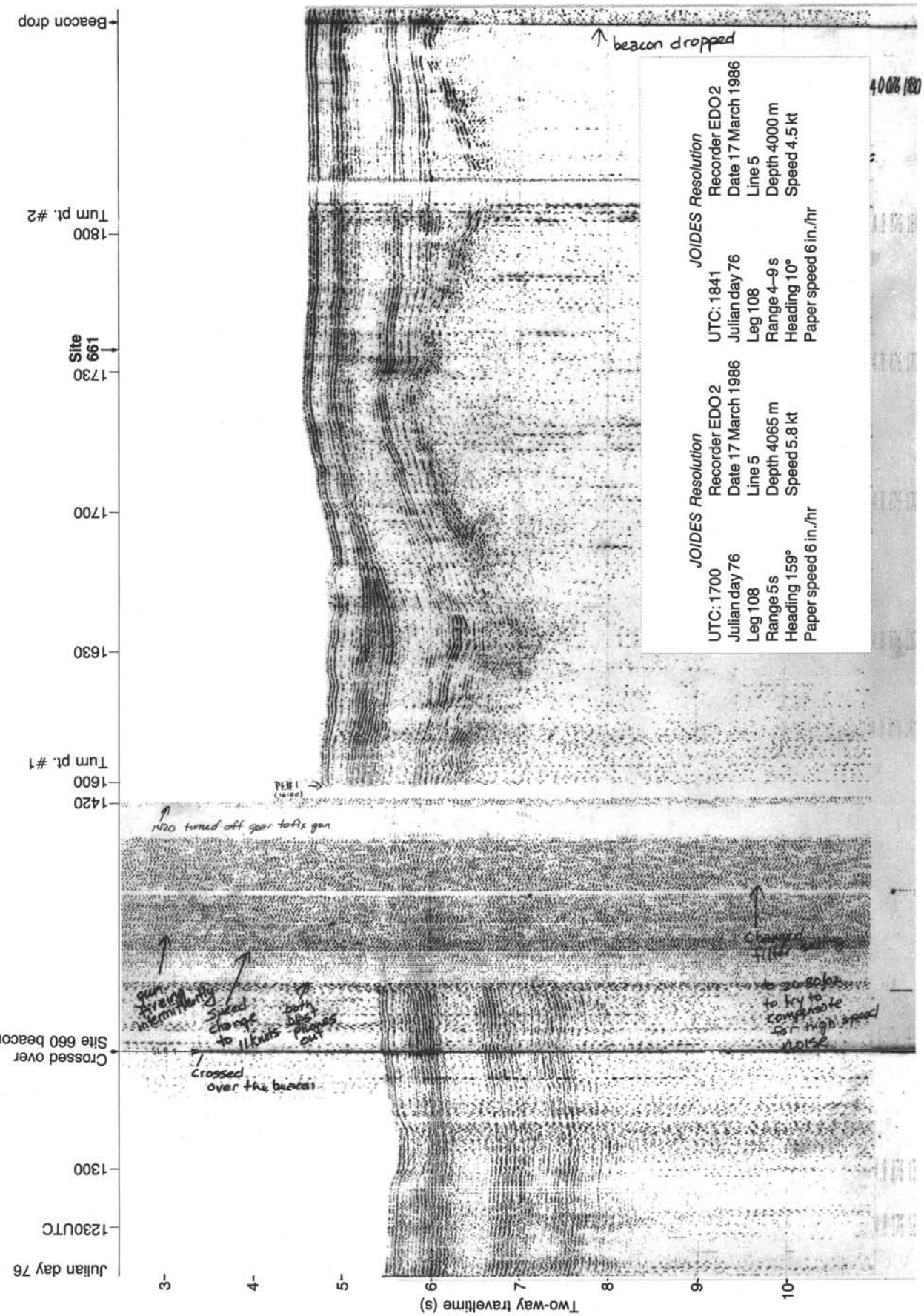

Figure 8. Unprocessed analog seismic data collected from Line 5 en route to Site 661 and recorded using a super-micro 561 Masscomp computer.

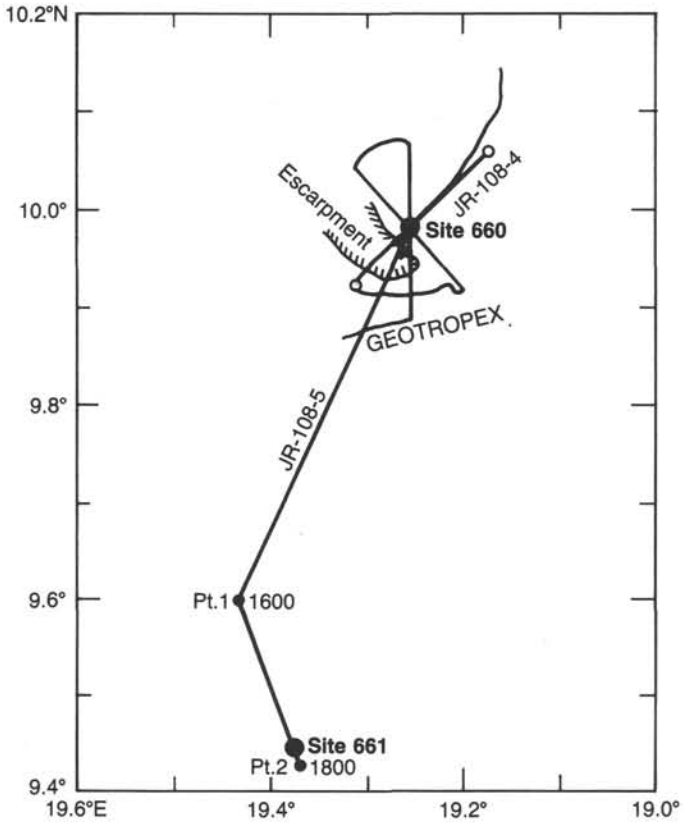

Figure 9. Detailed navigation plot showing track of *JOIDES Resolution* on approach to Site 661 (see "Site 661" chapter, this volume). Course changes are marked on the unprocessed analog (Fig. 8).

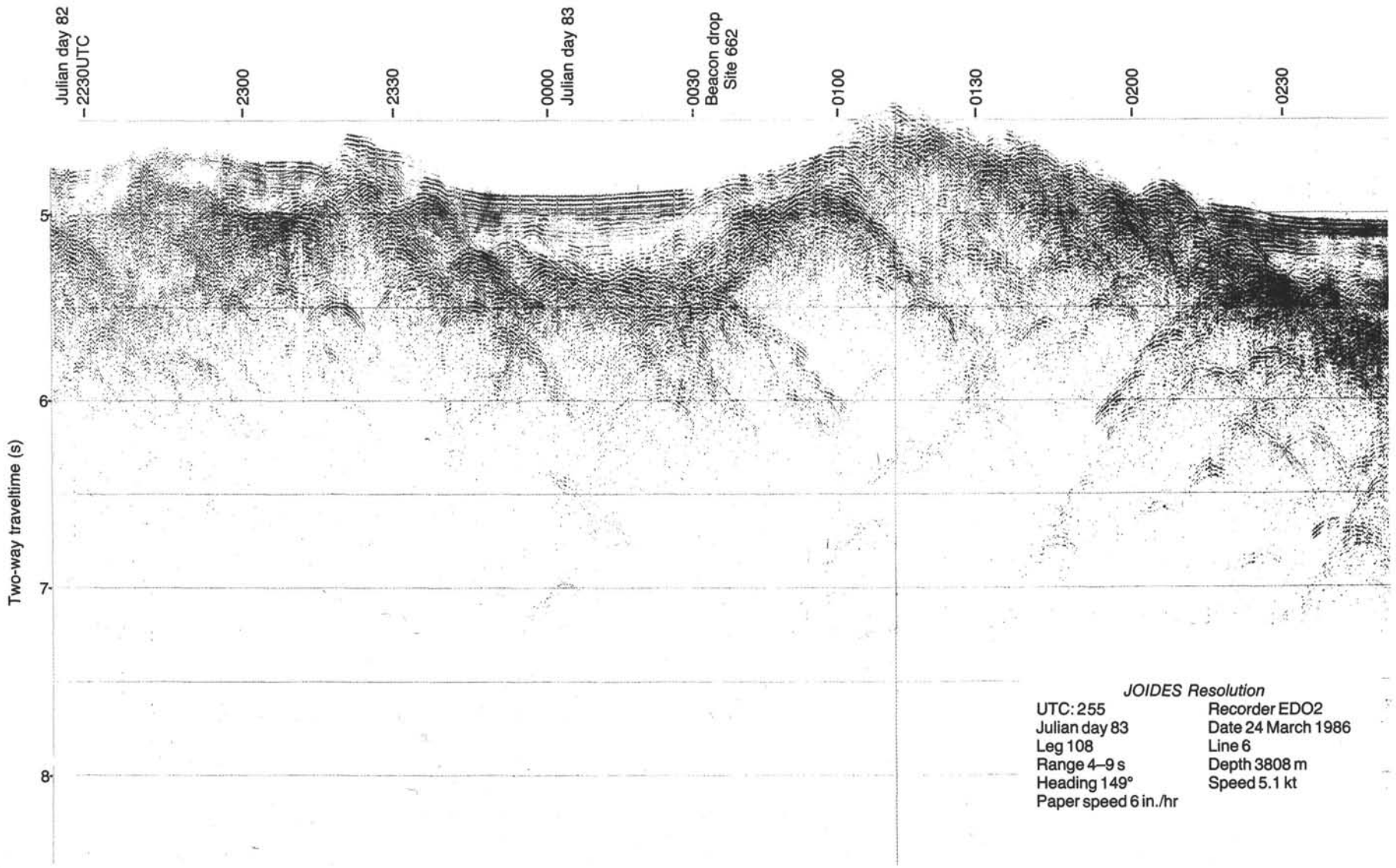

Figure 10. Unprocessed analog seismic data collected from Line 6 en route to Site 662 and recorded using the EDO-2 recorder.

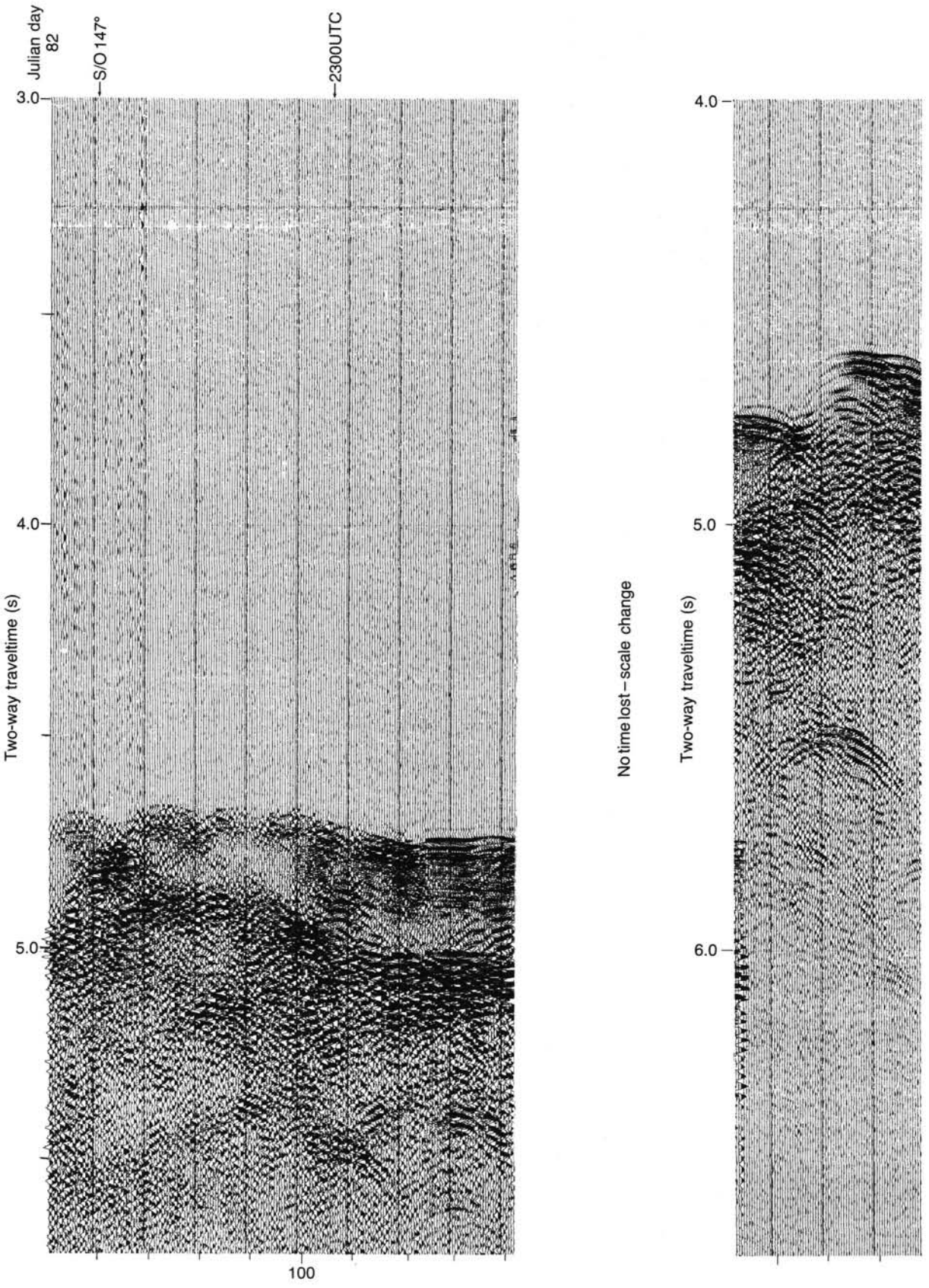

Figure 11. Unprocessed analog seismic data collected from Line 6 en route to Site 662 and recorded using a super-micro 561 Masscomp computer.

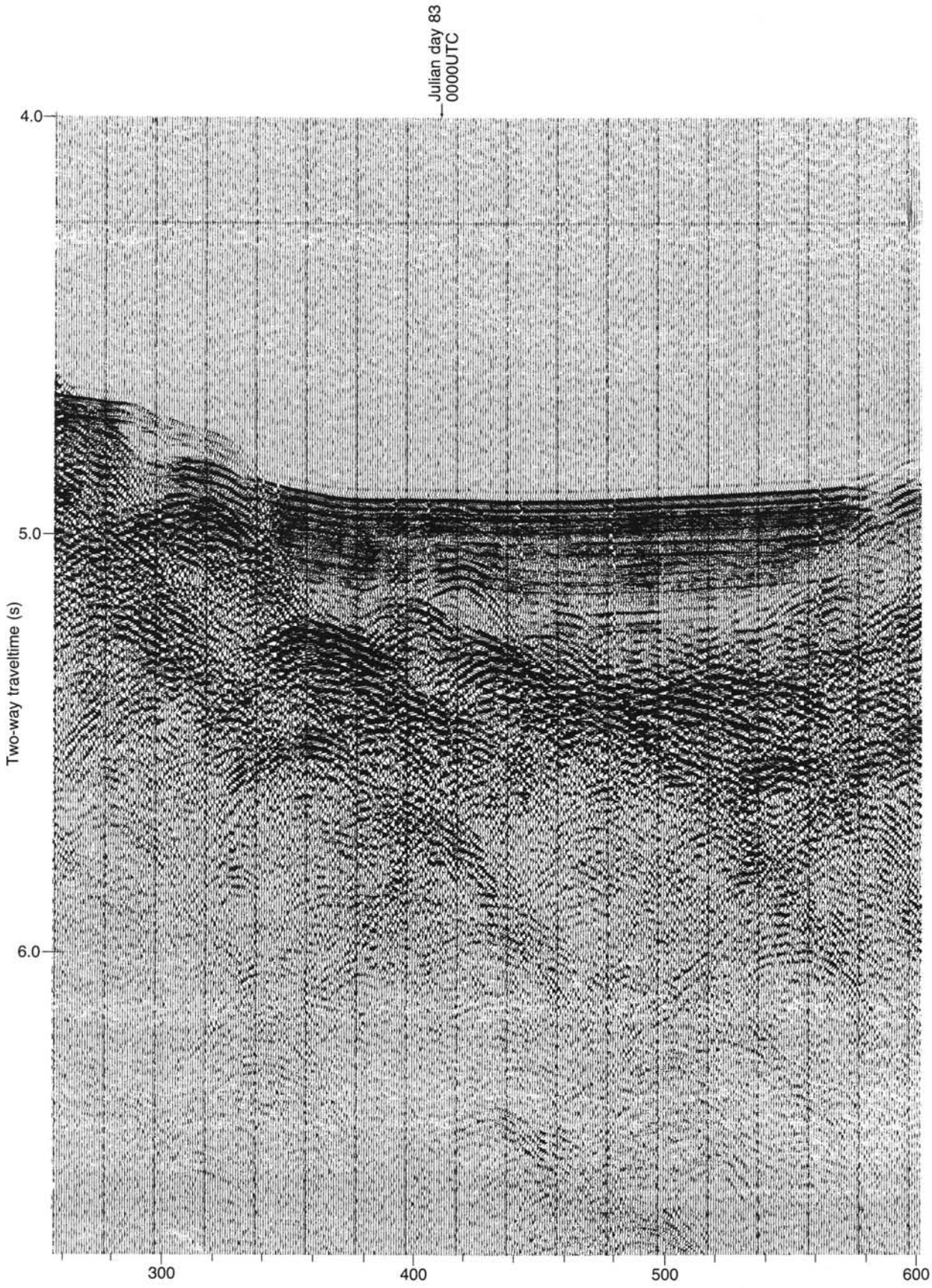

Figure 11 (continued).

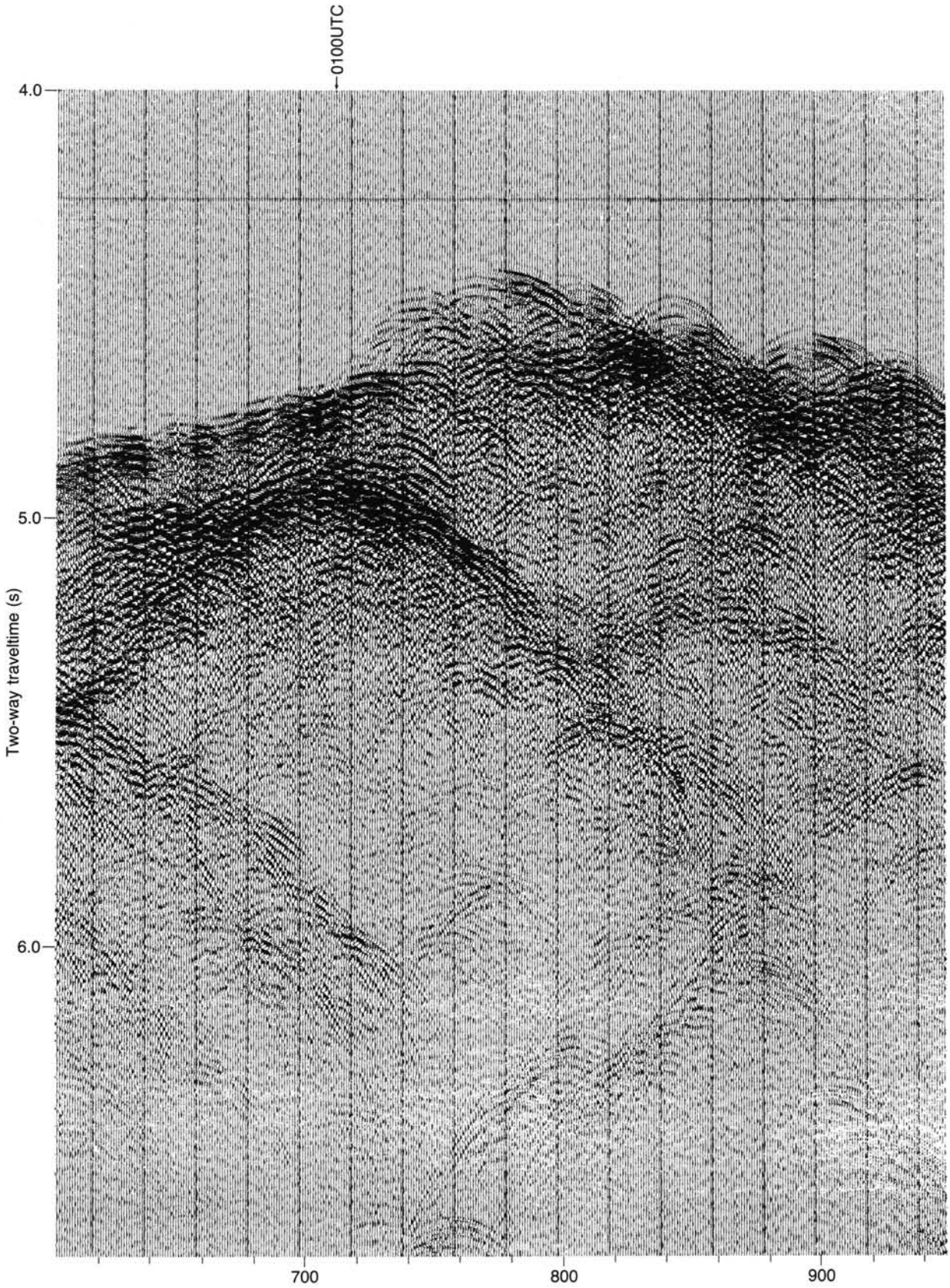

Figure 11 (continued).

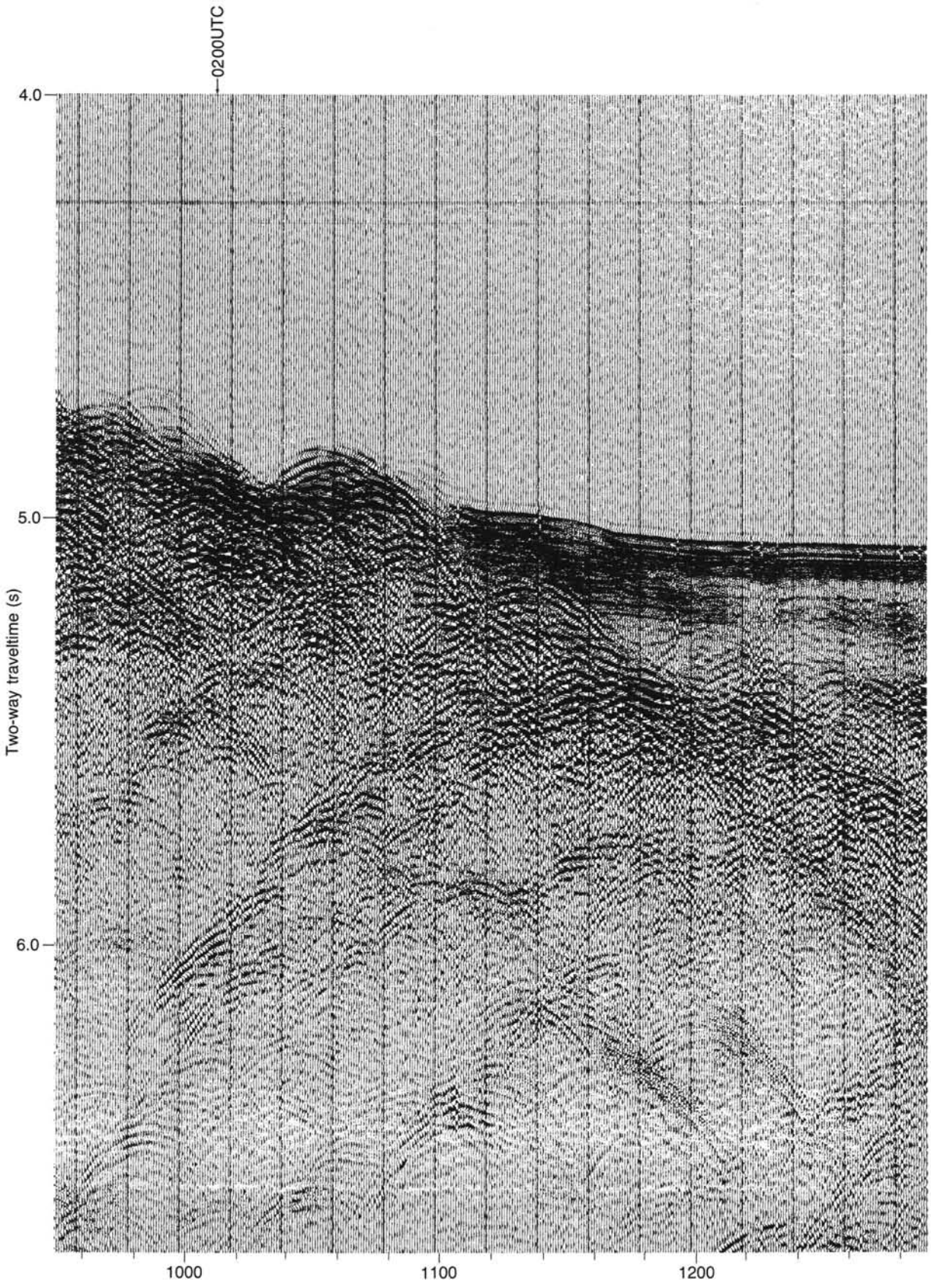

Figure 11 (continued).

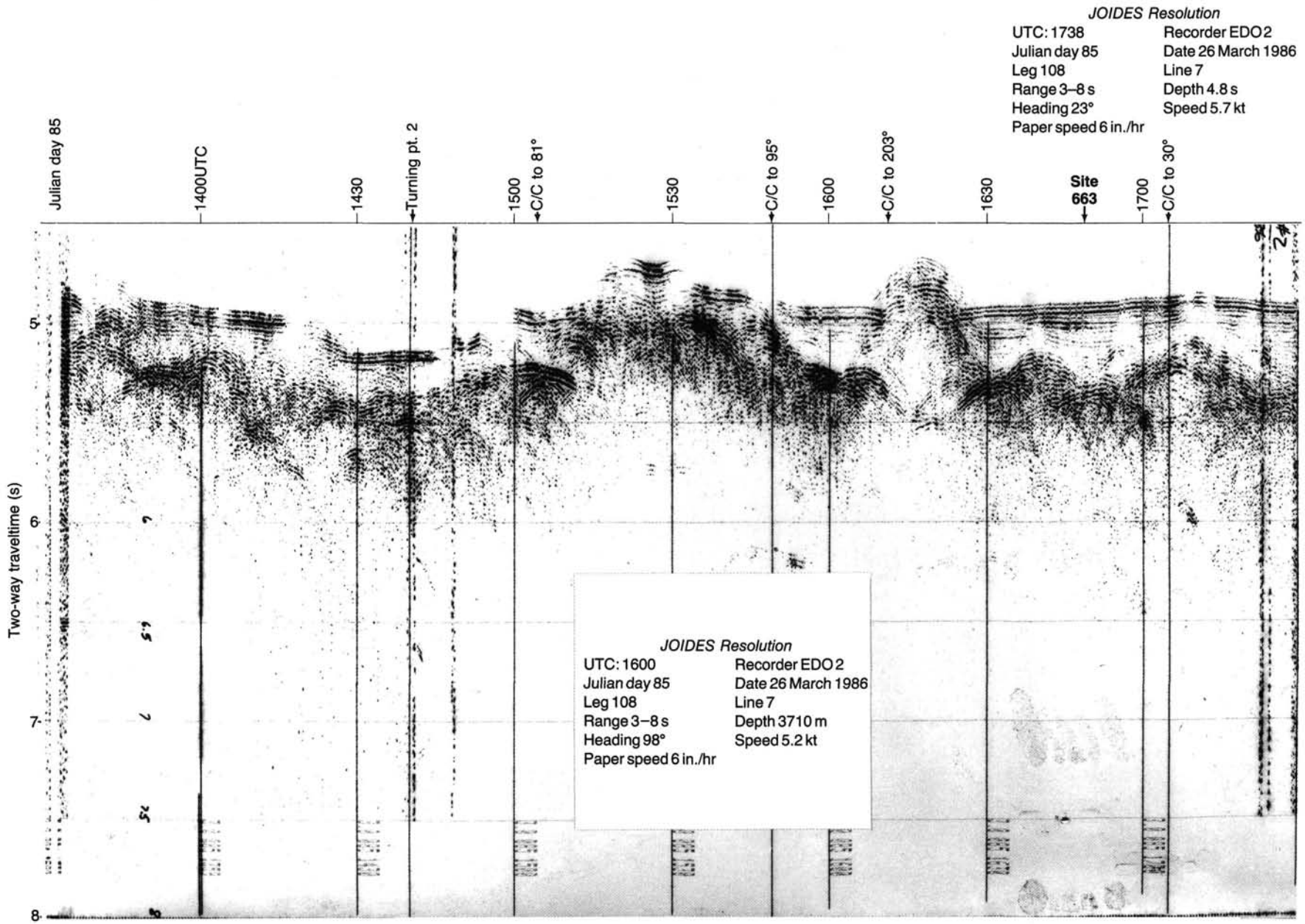

Figure 12. Unprocessed analog seismic data collected from Line 7 en route to Site 663 and recorded using the EDO-2 recorder.

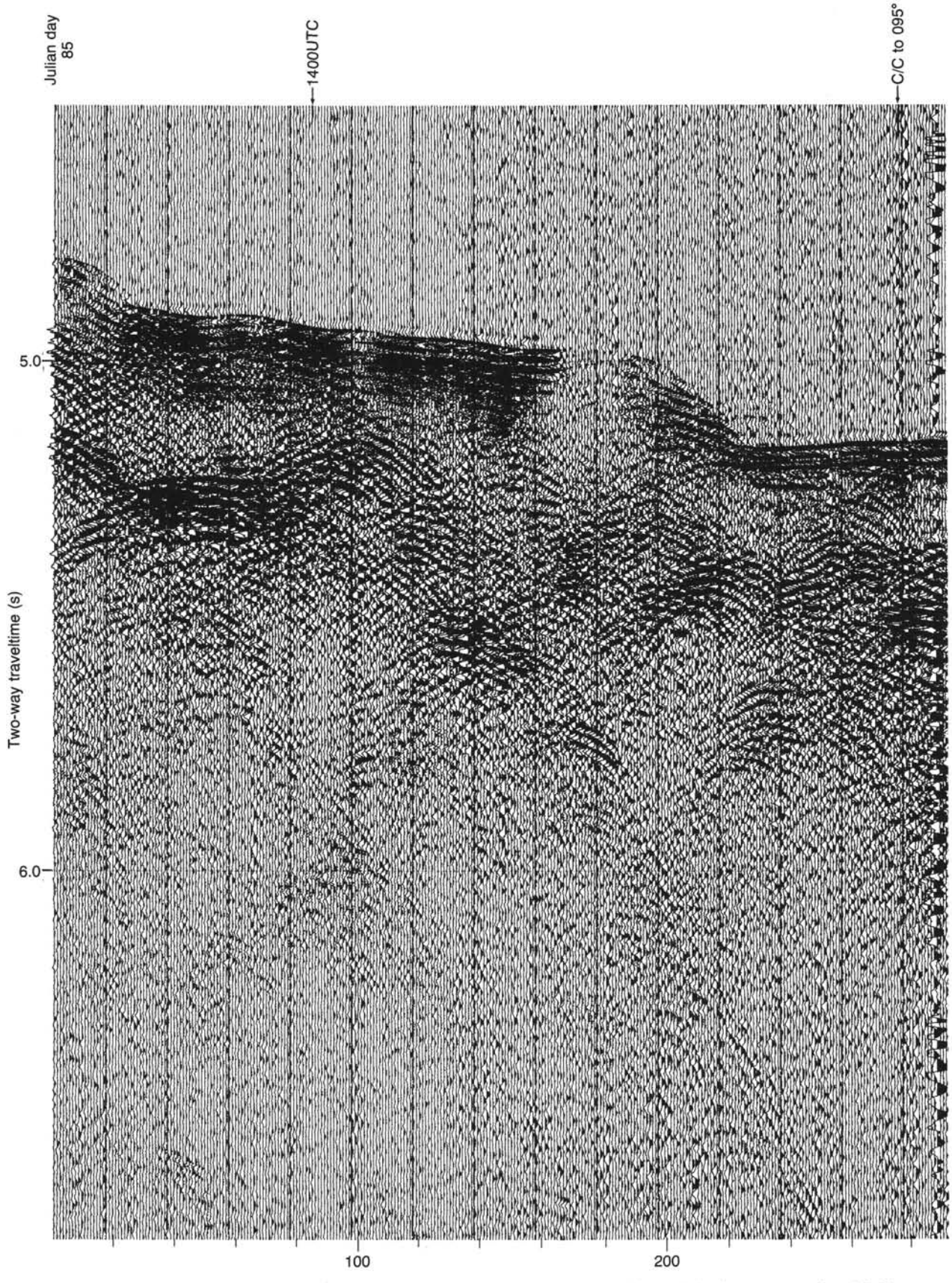

Figure 13. Unprocessed analog seismic data collected from Line 7 en route to Site 663 and recorded using a super-micro 561 Masscomp computer.

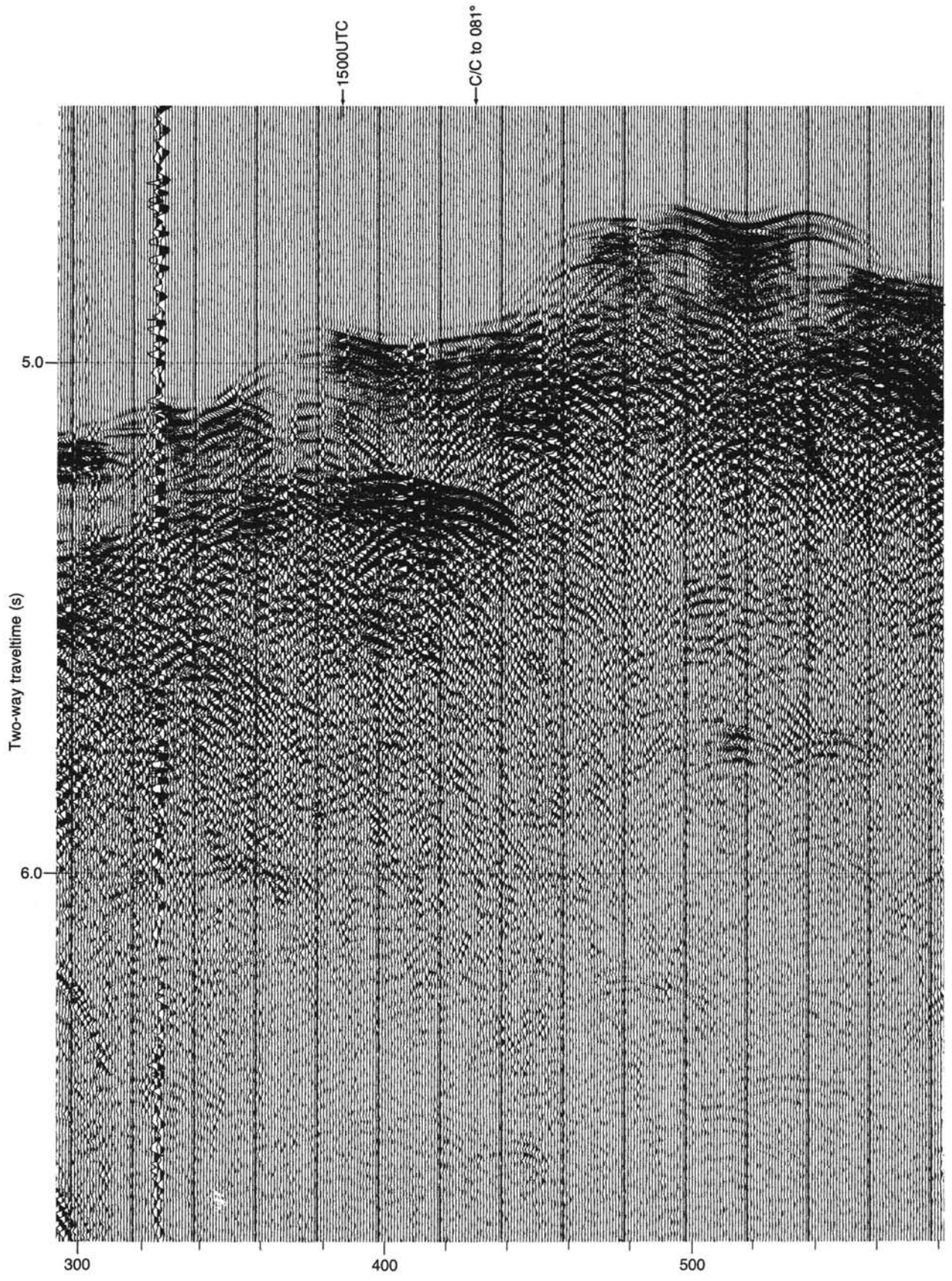

Figure 13 (continued).

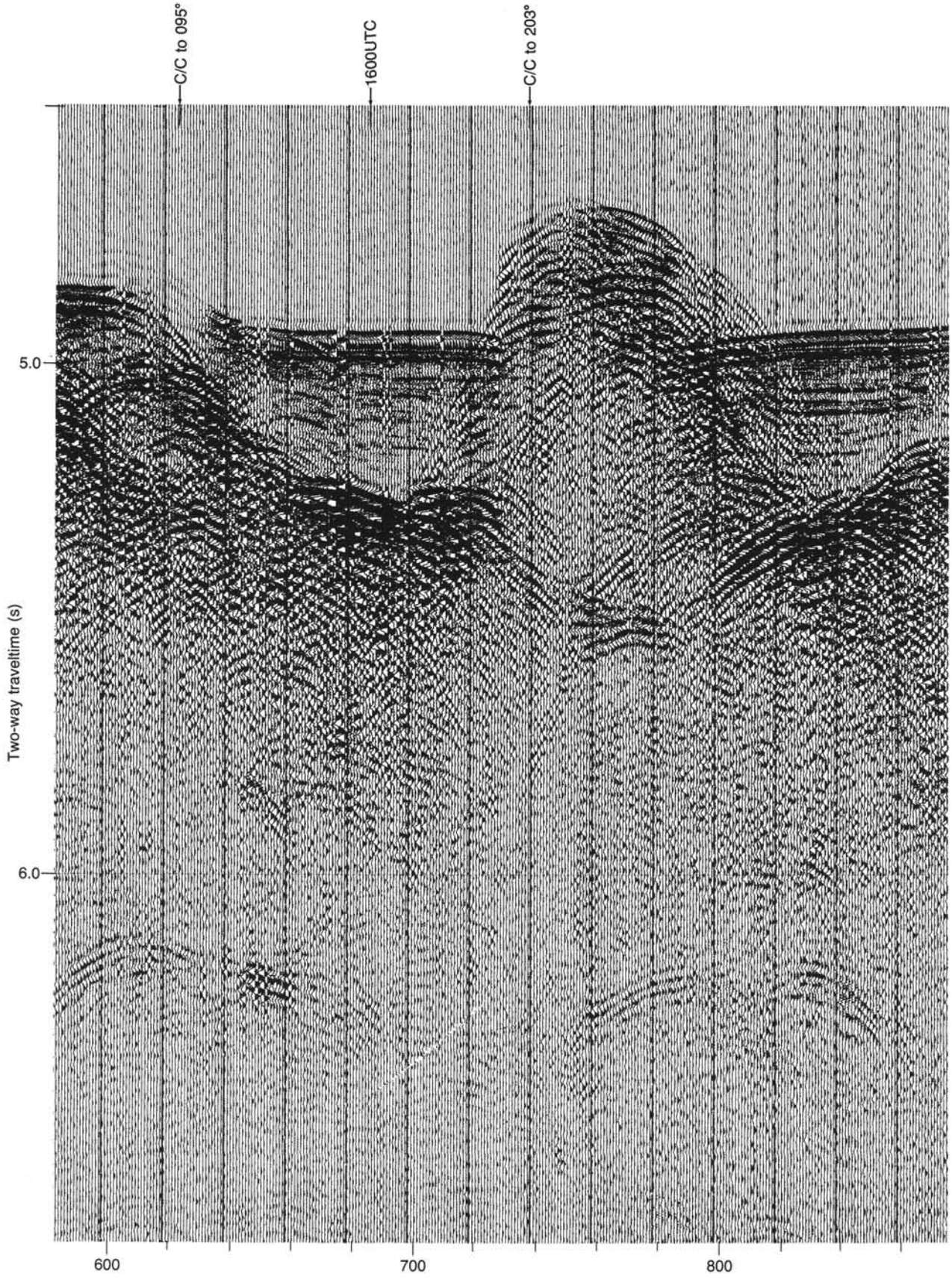

Figure 13 (continued).

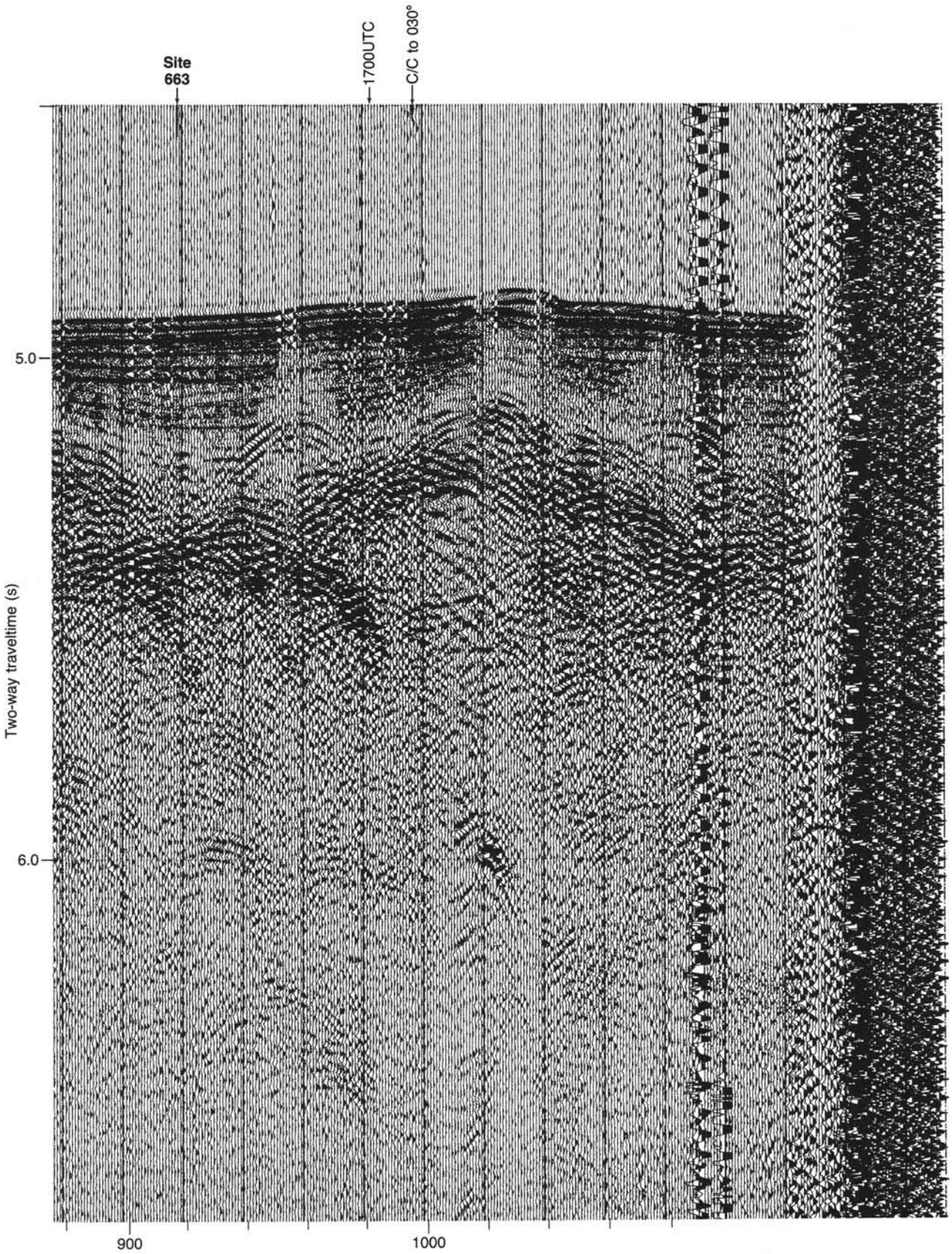

Figure 13 (continued).

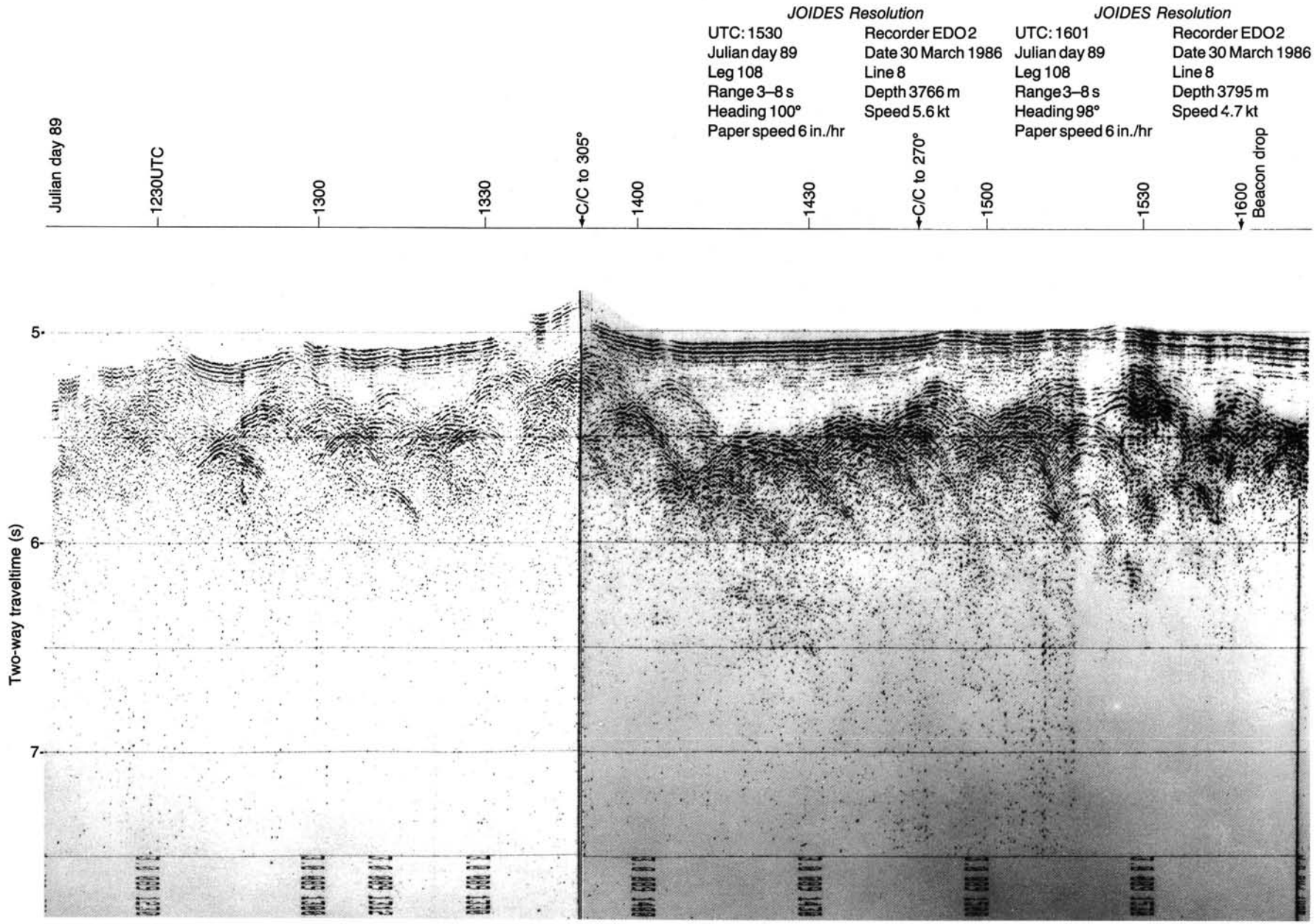

Figure 14. Unprocessed analog seismic data collected from Line 8 en route to Site 664 and recorded using the EDO-2 recorder.

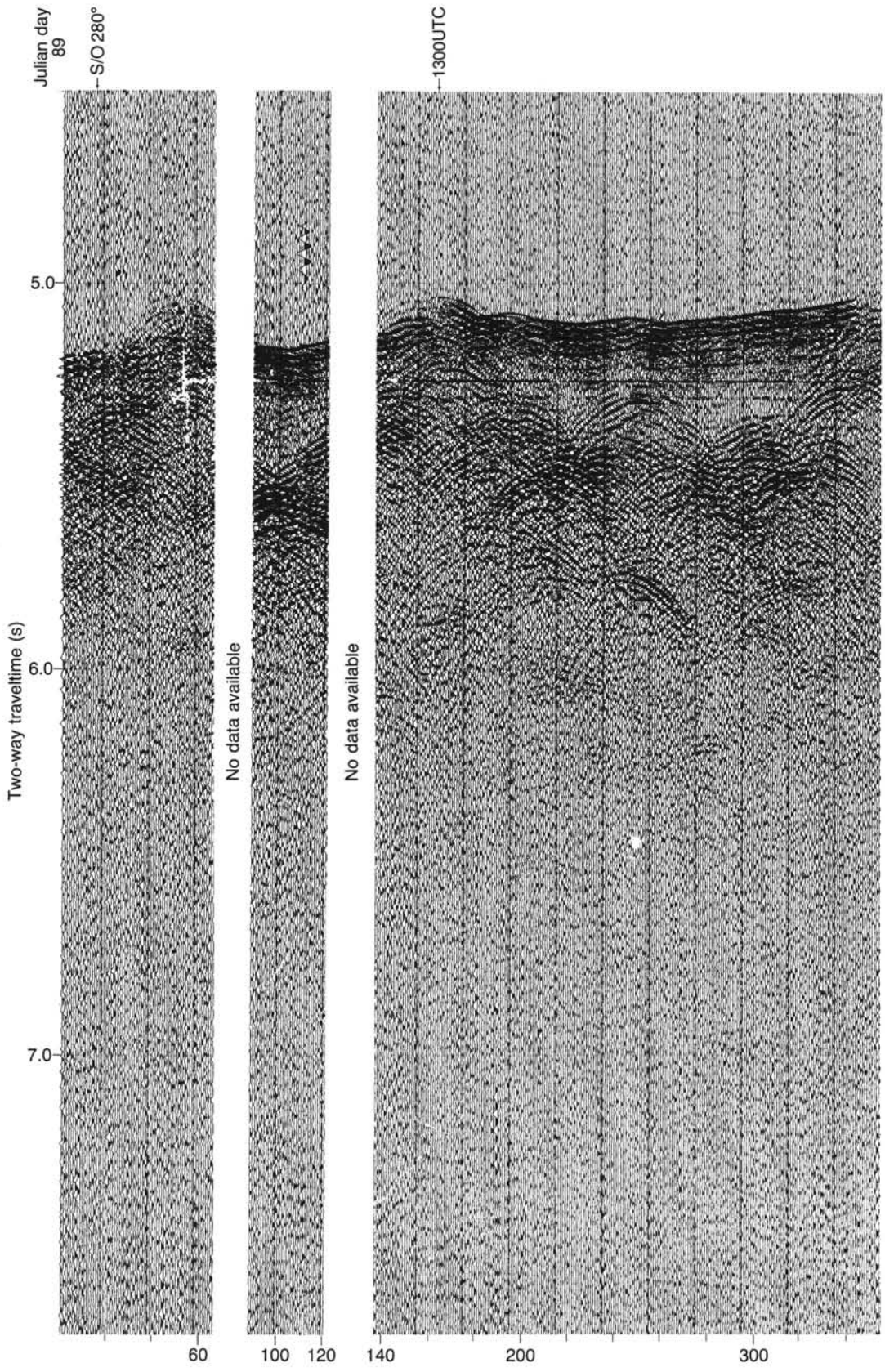

Figure 15. Unprocessed analog seismic data collected from Line 8 en route to Site 664 and recorded using a super-micro 561 Masscomp computer.

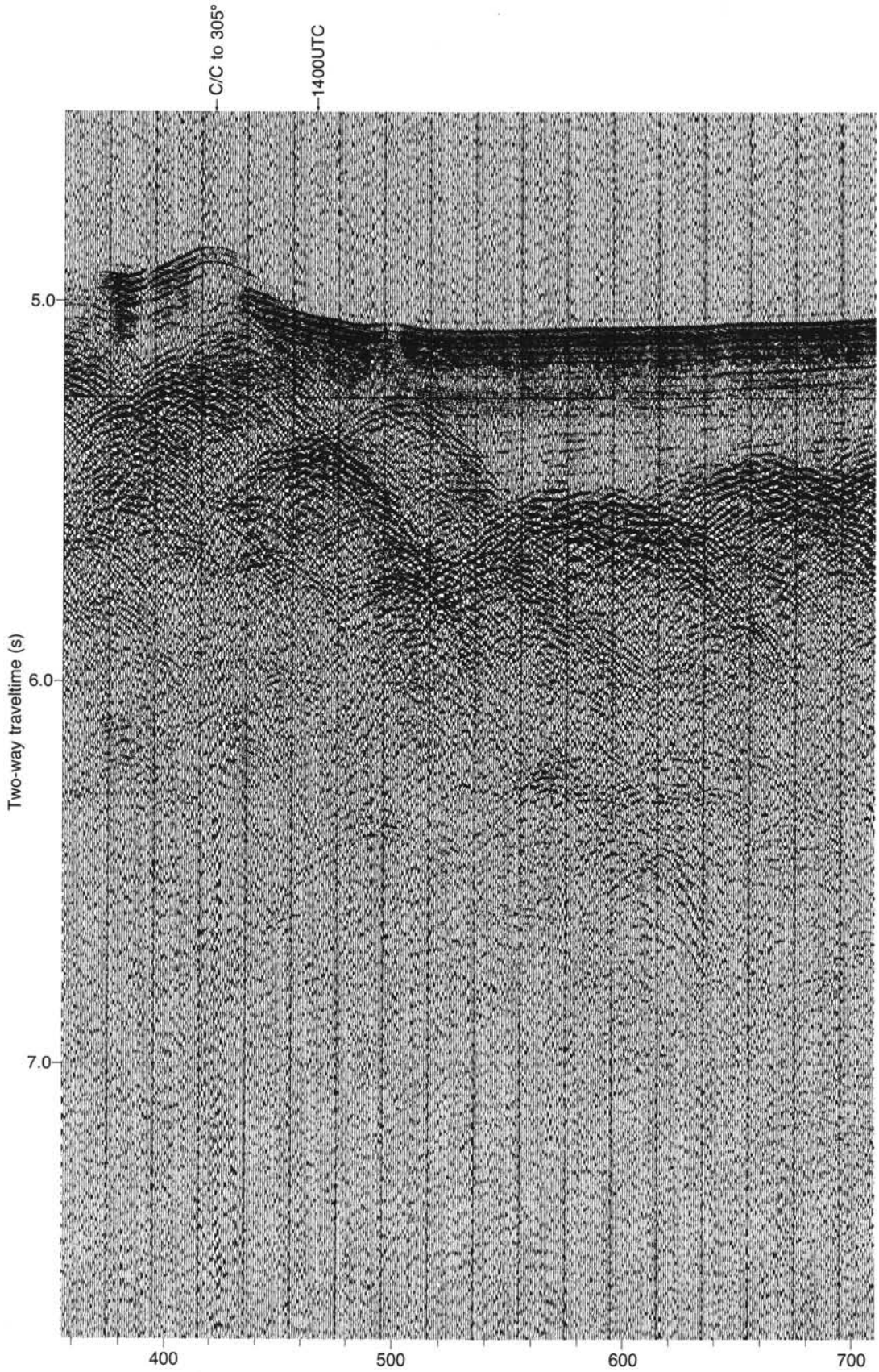

Figure 15 (continued).

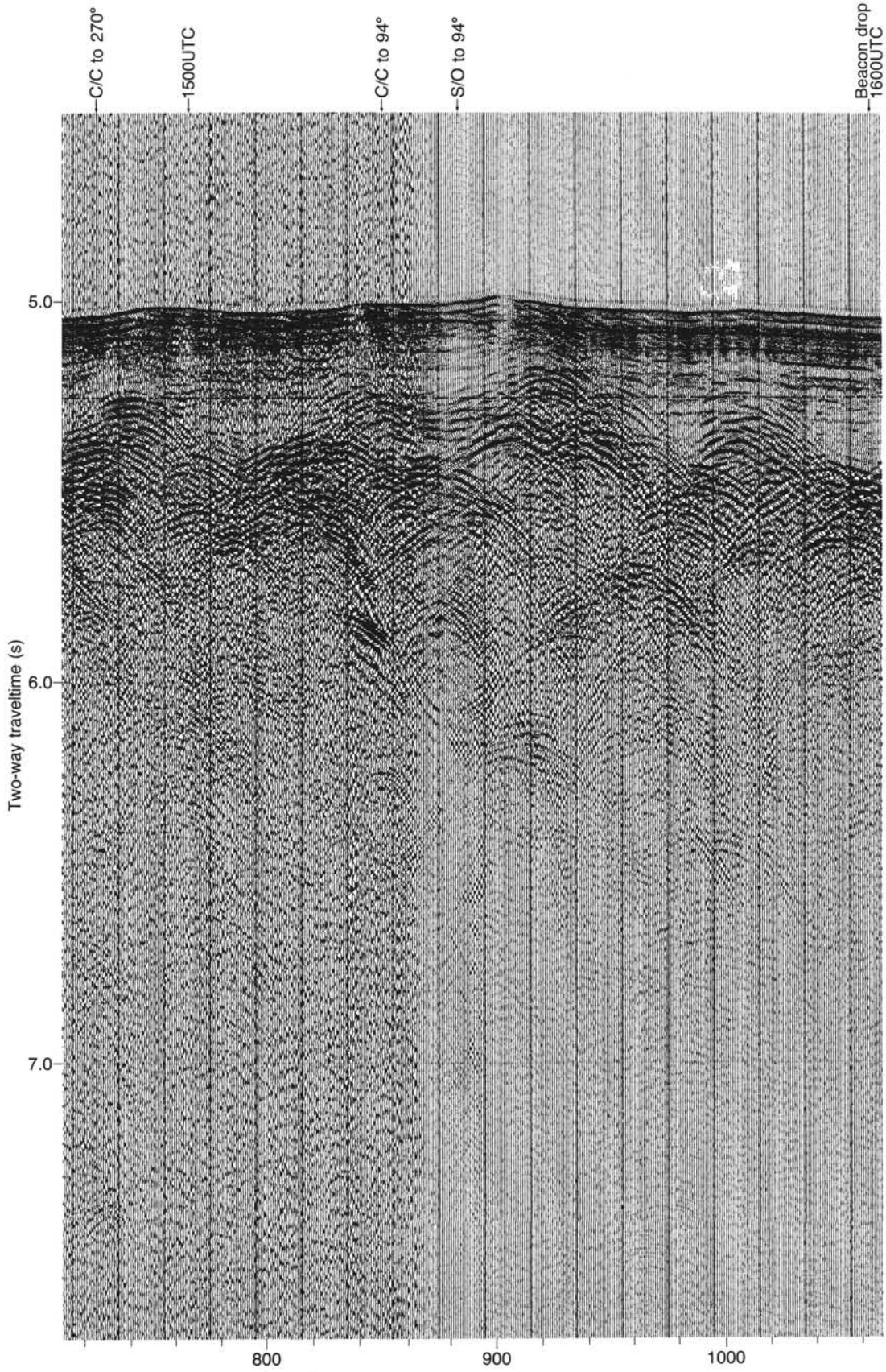

Figure 15 (continued).

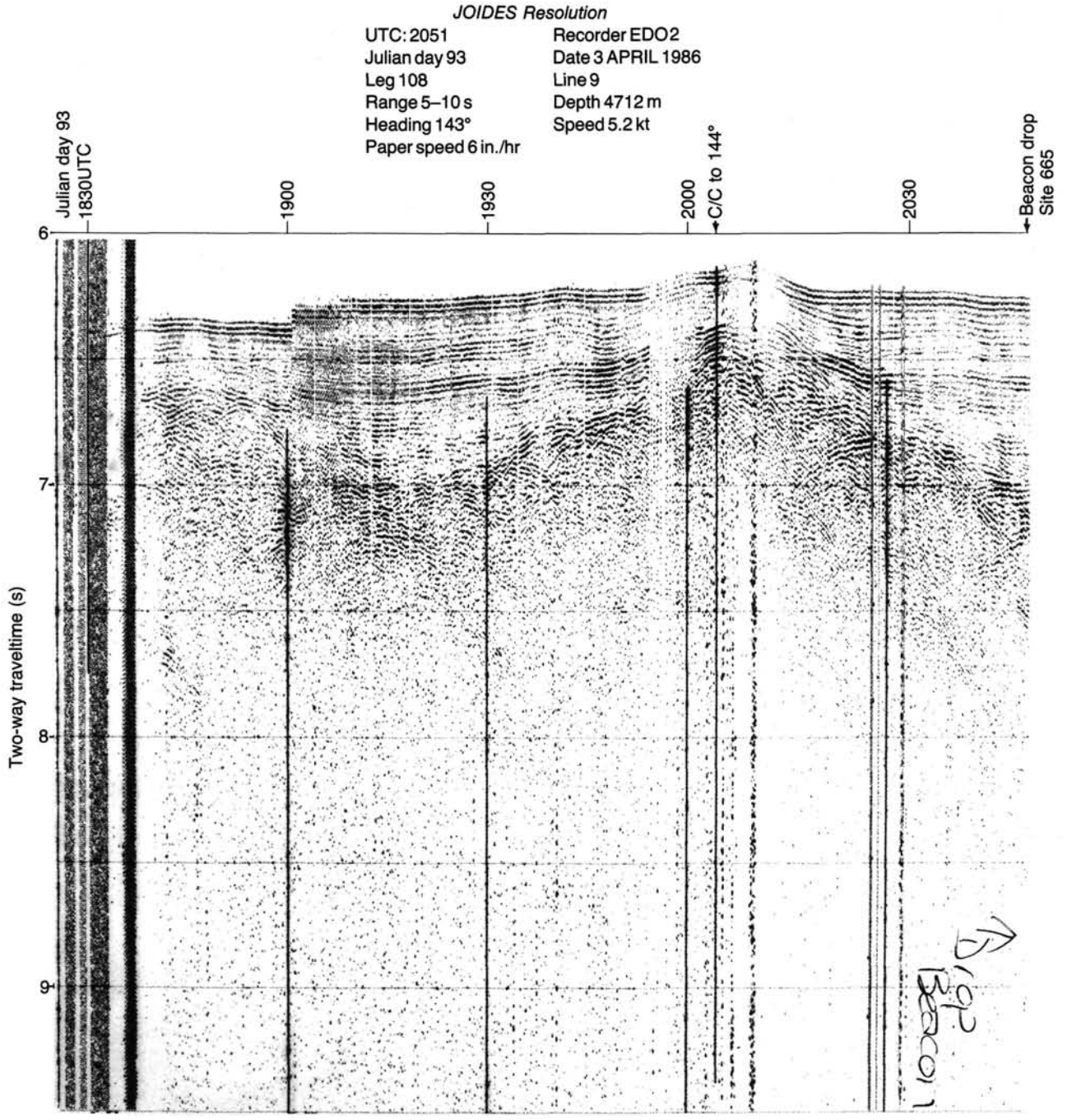

Figure 16. Unprocessed analog seismic data collected from Line 9 en route to Site 665 and recorded using the EDO-2 recorder.

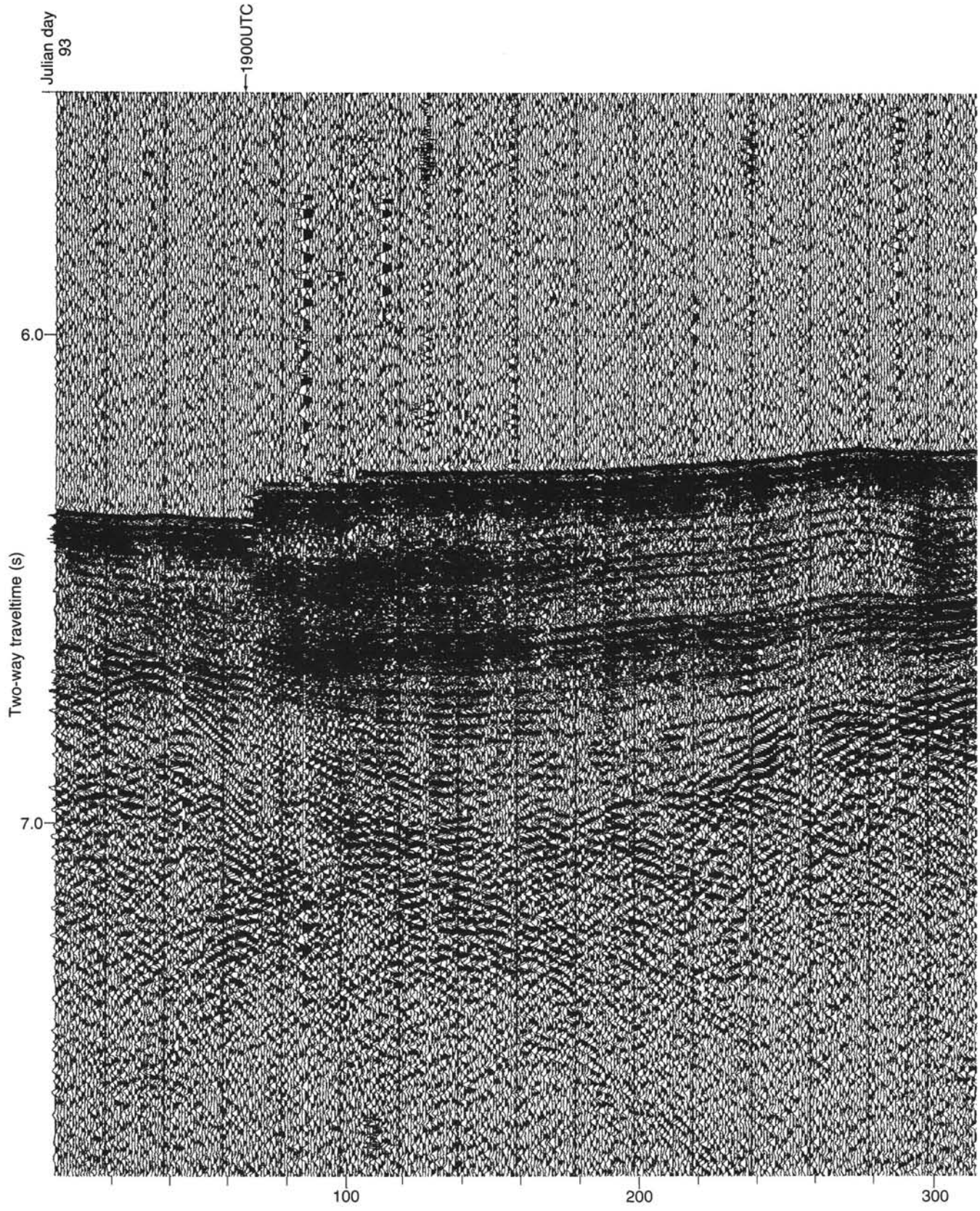

Figure 17. Unprocessed analog seismic data collected from Line 9 en route to Site 665 and recorded using a super-micro 561 Masscomp computer.

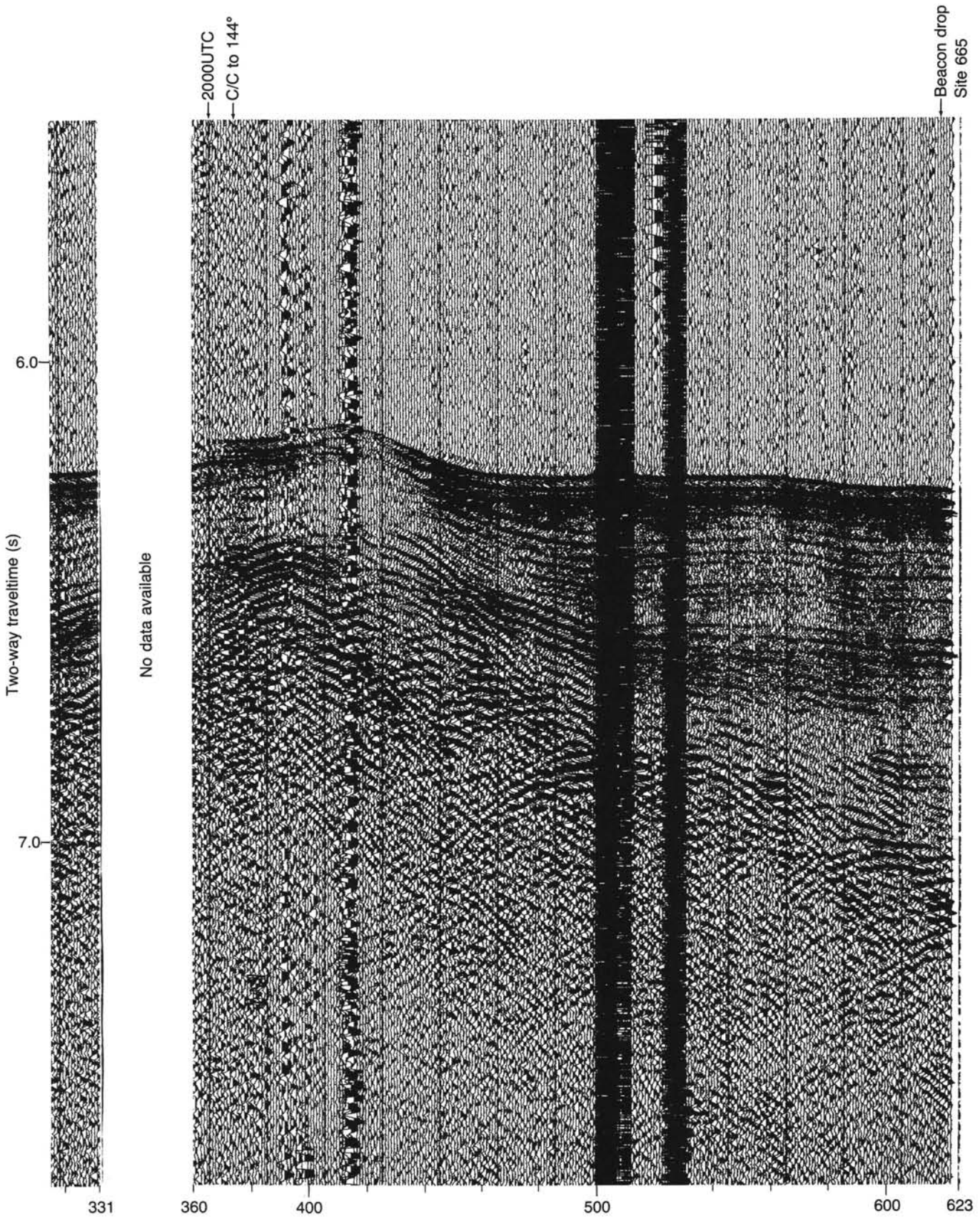

Figure 17 (continued).

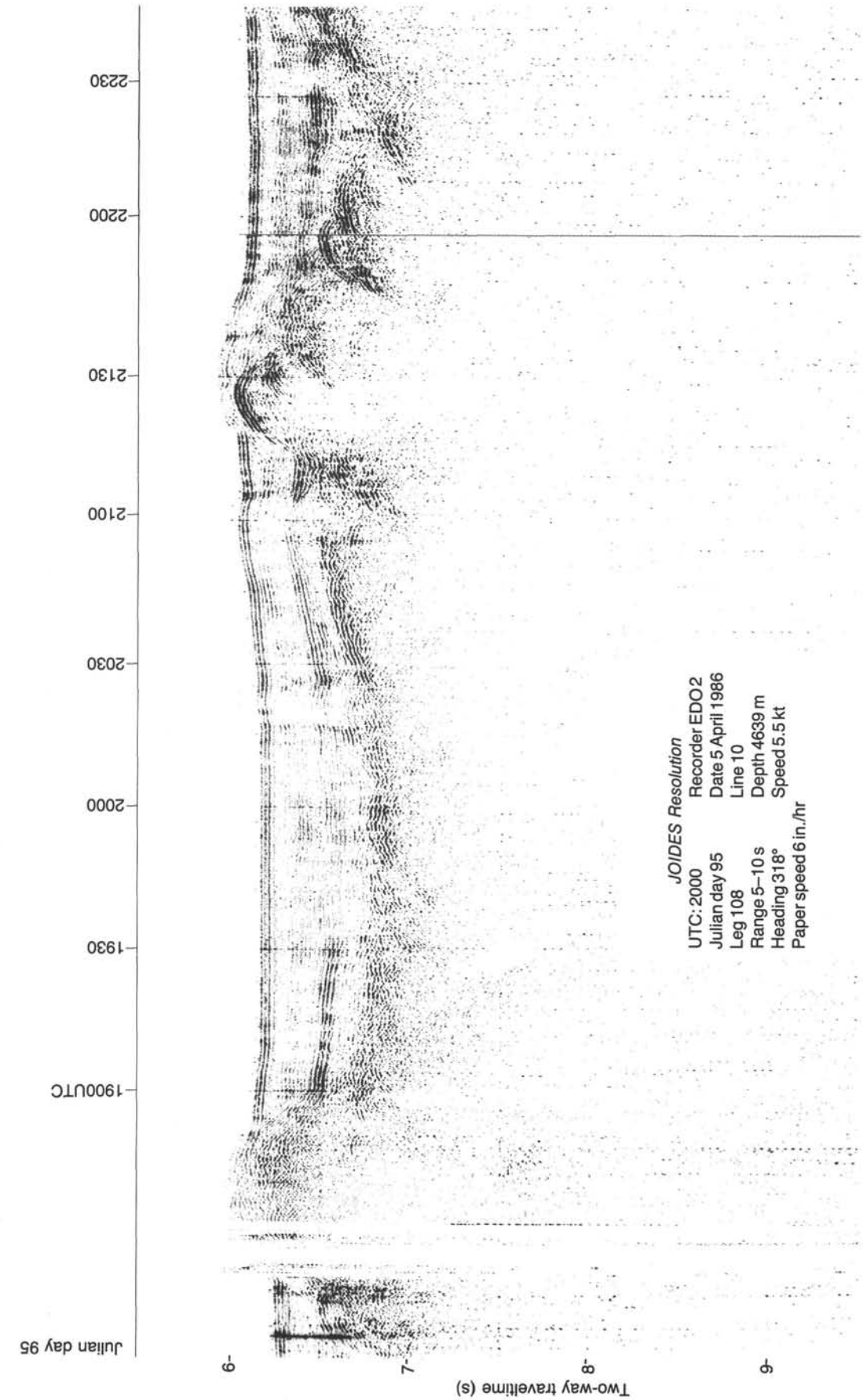

Figure 18. Unprocessed analog seismic data collected from Line 10 en route to Site 666 and recorded using the EDO-2 recorder.

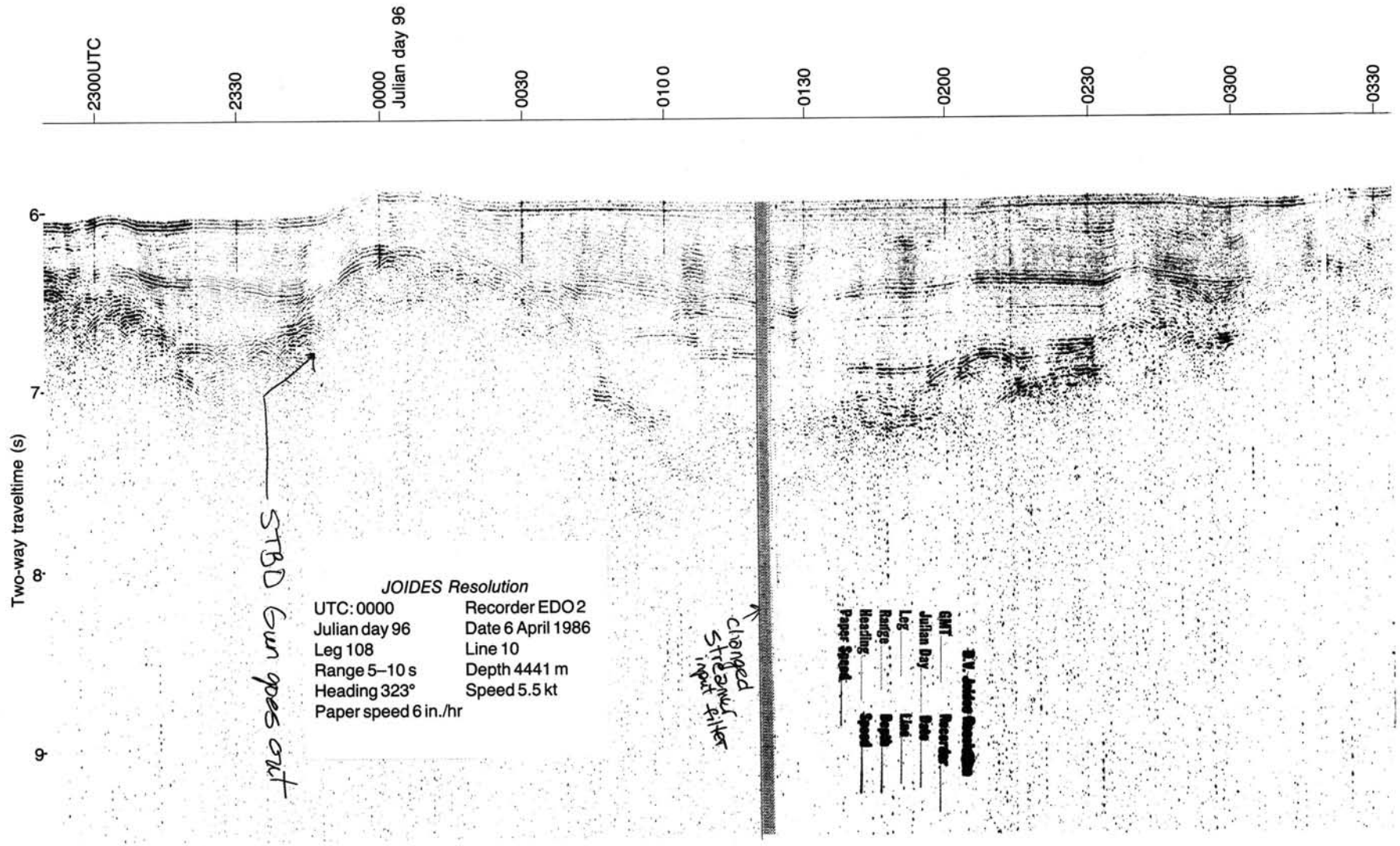

Figure 18 (continued).

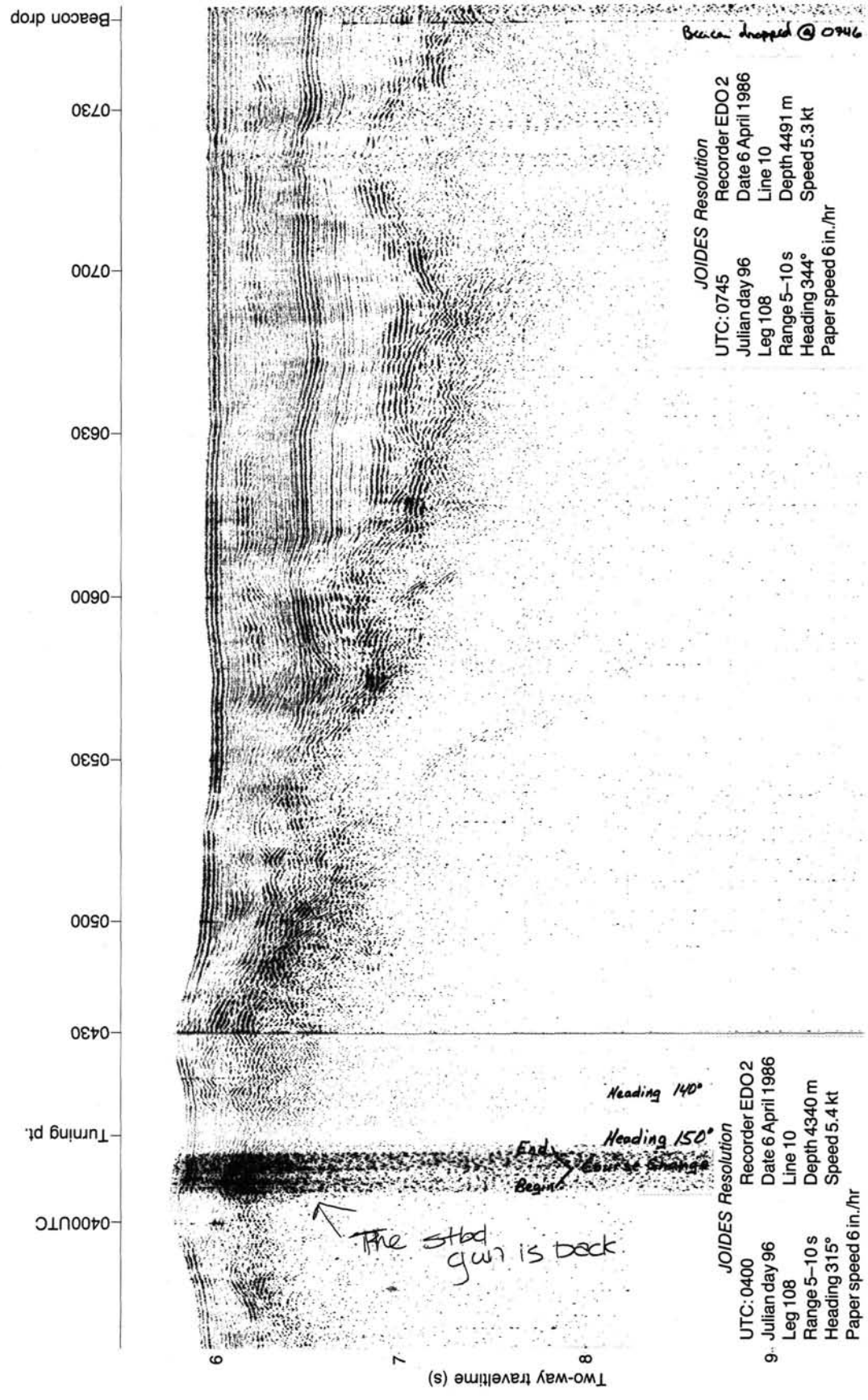

Figure 18 (continued).

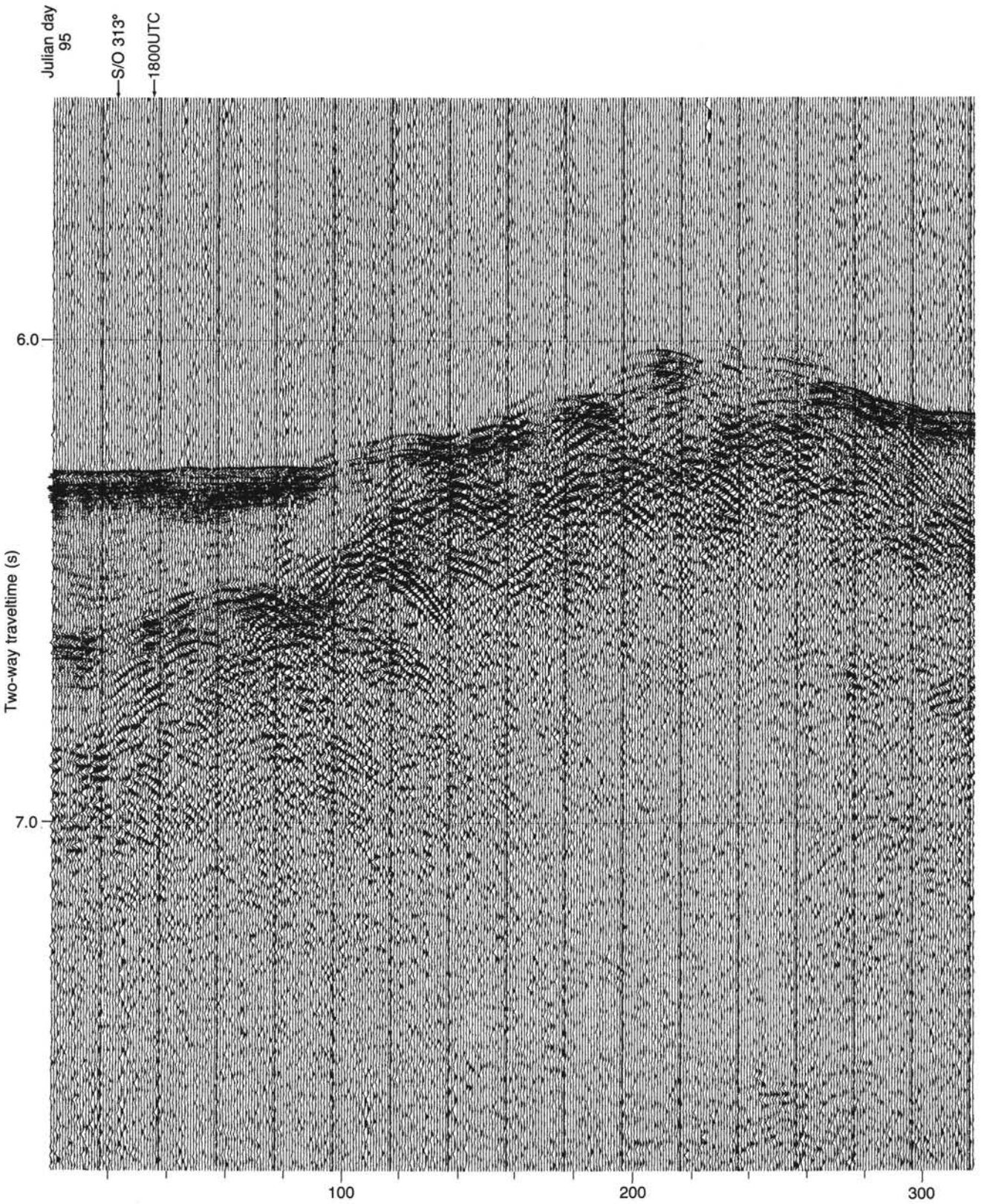

Figure 19. Unprocessed analog seismic data collected from Line 10 en route to Site 666 and recorded using a super-micro 561 Masscomp computer.

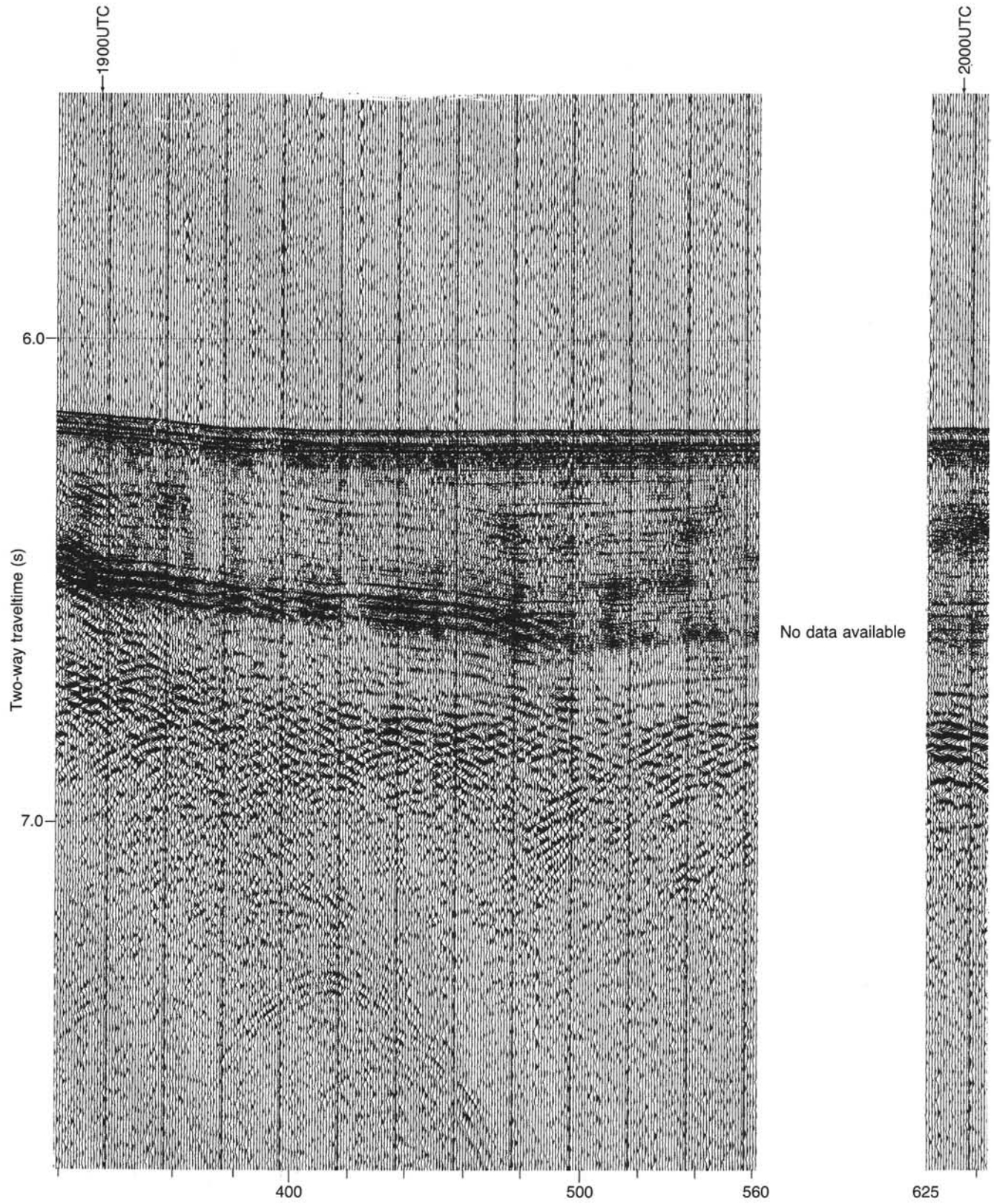

Figure 19 (continued).

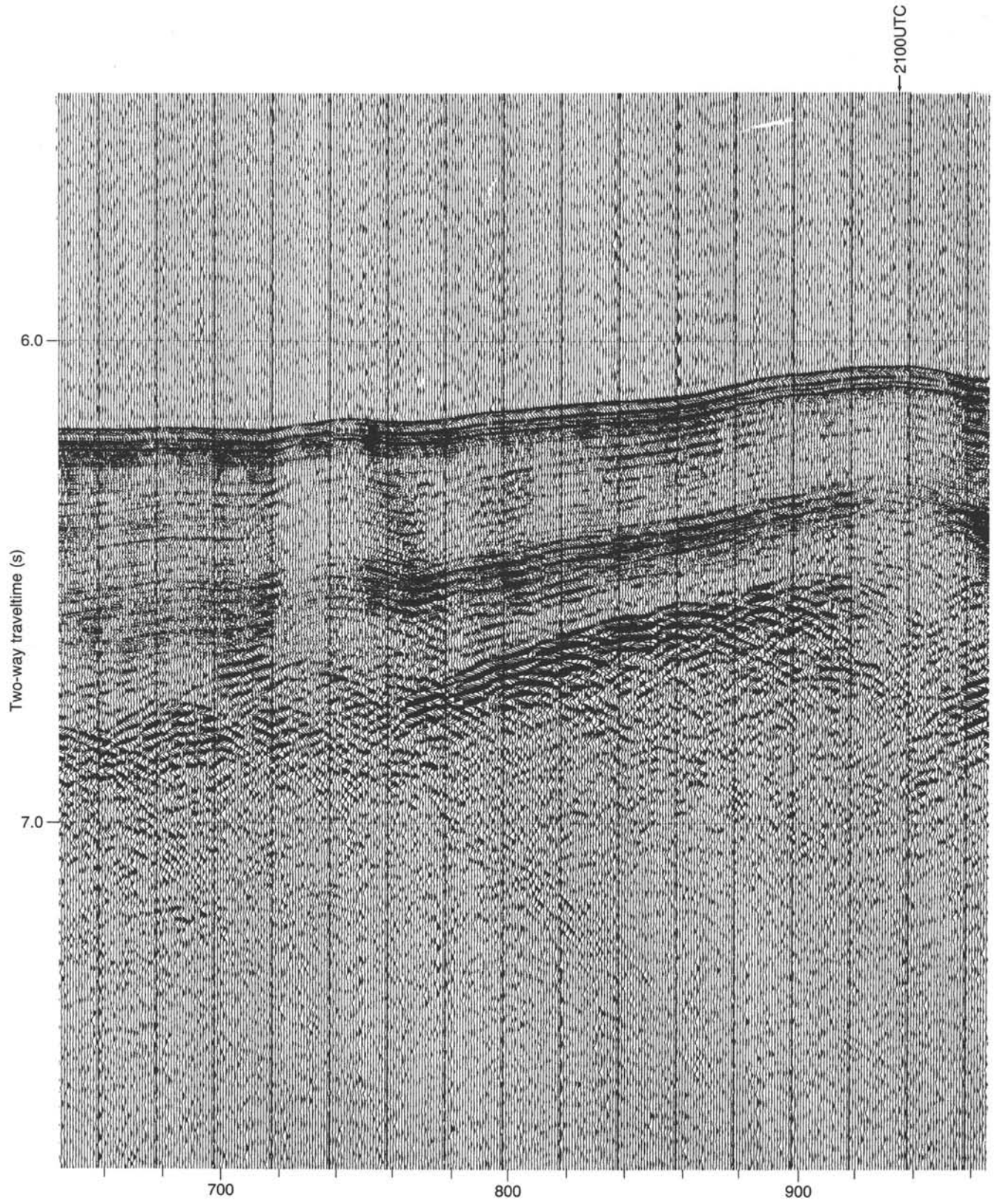

Figure 19 (continued).

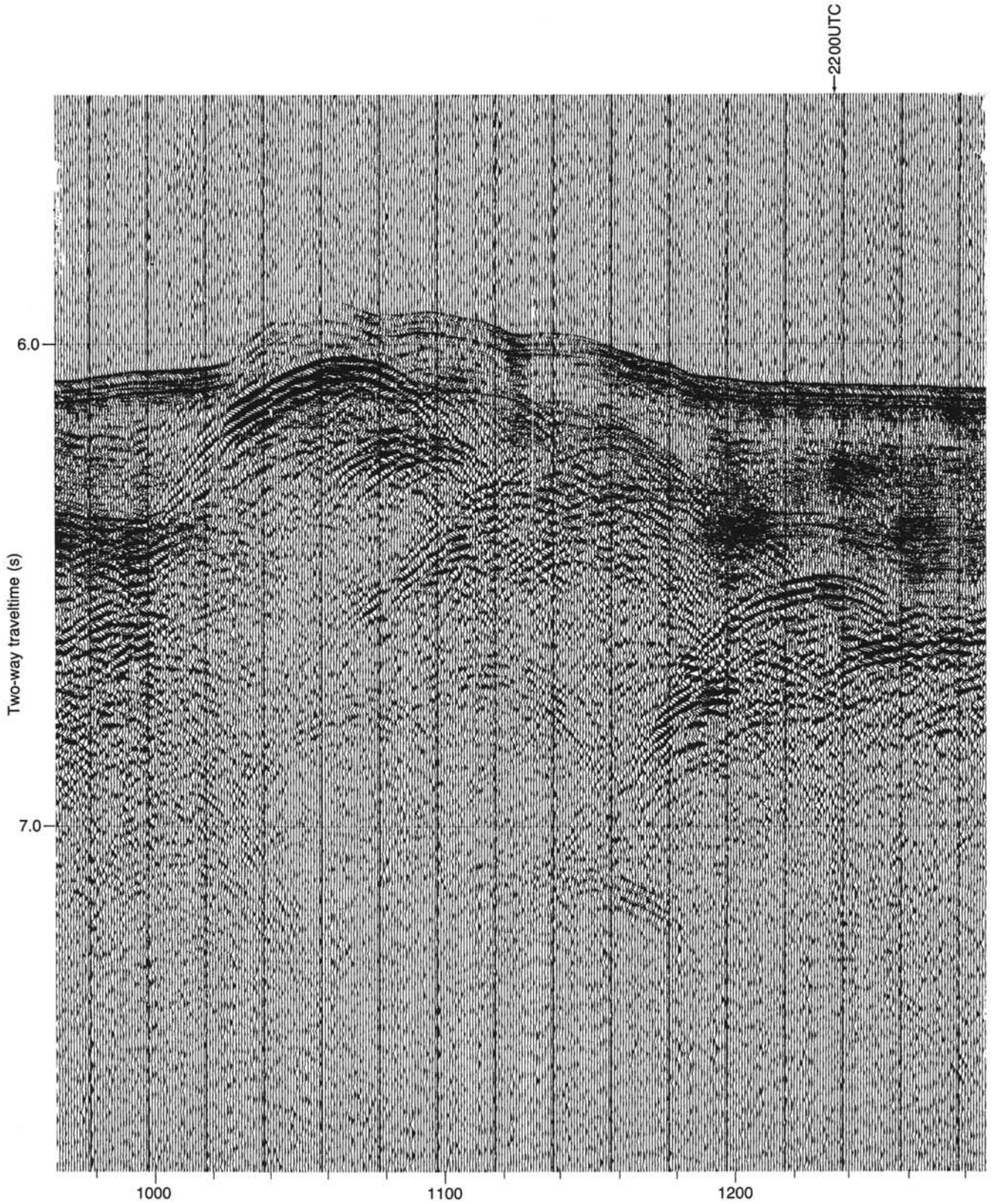

Figure 19 (continued).

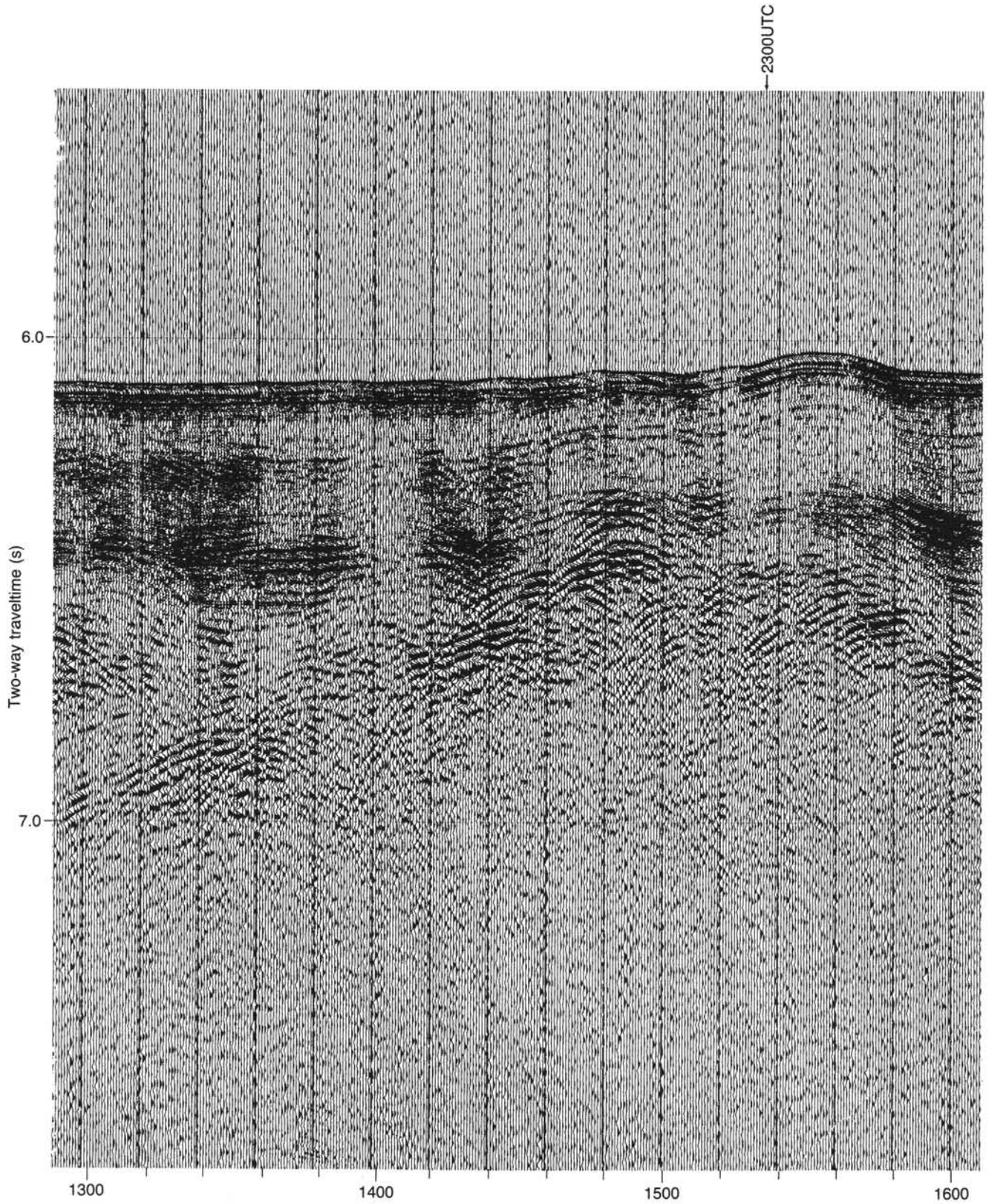

Figure 19 (continued).

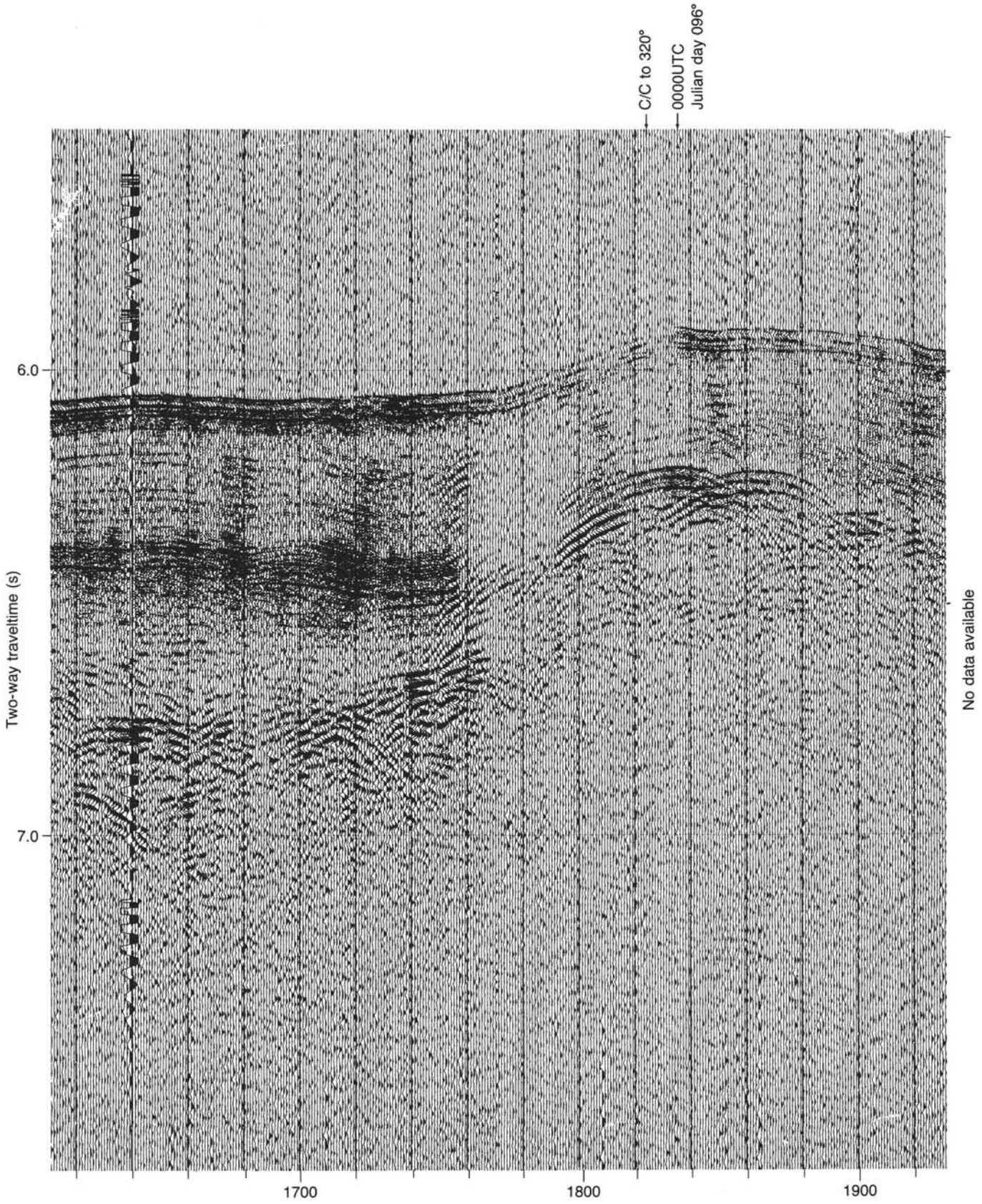

Figure 19 (continued).

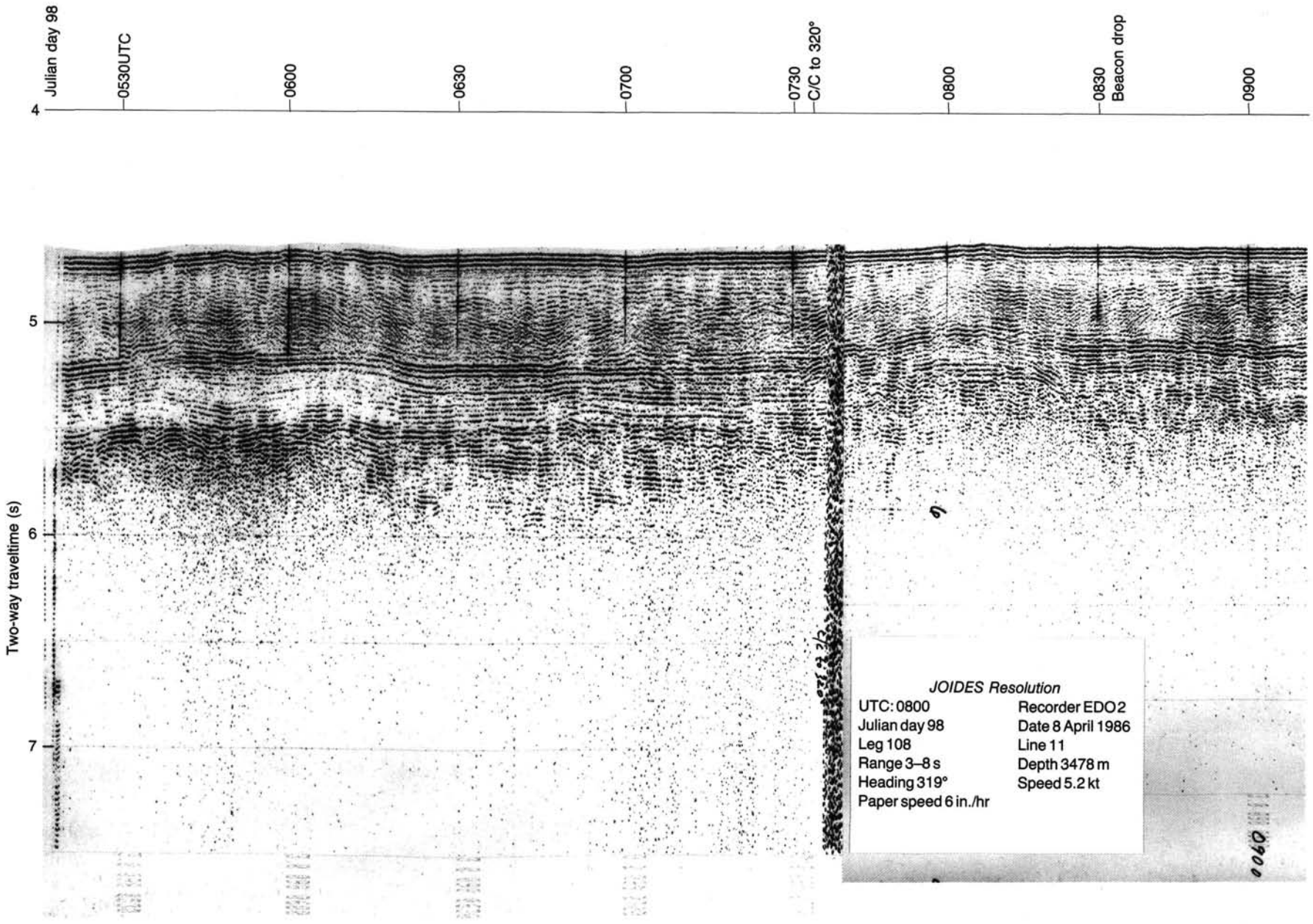

Figure 20. Unprocessed analog seismic data collected from Line 11 en route to Site 667 and recorded using the EDO-2 recorder.

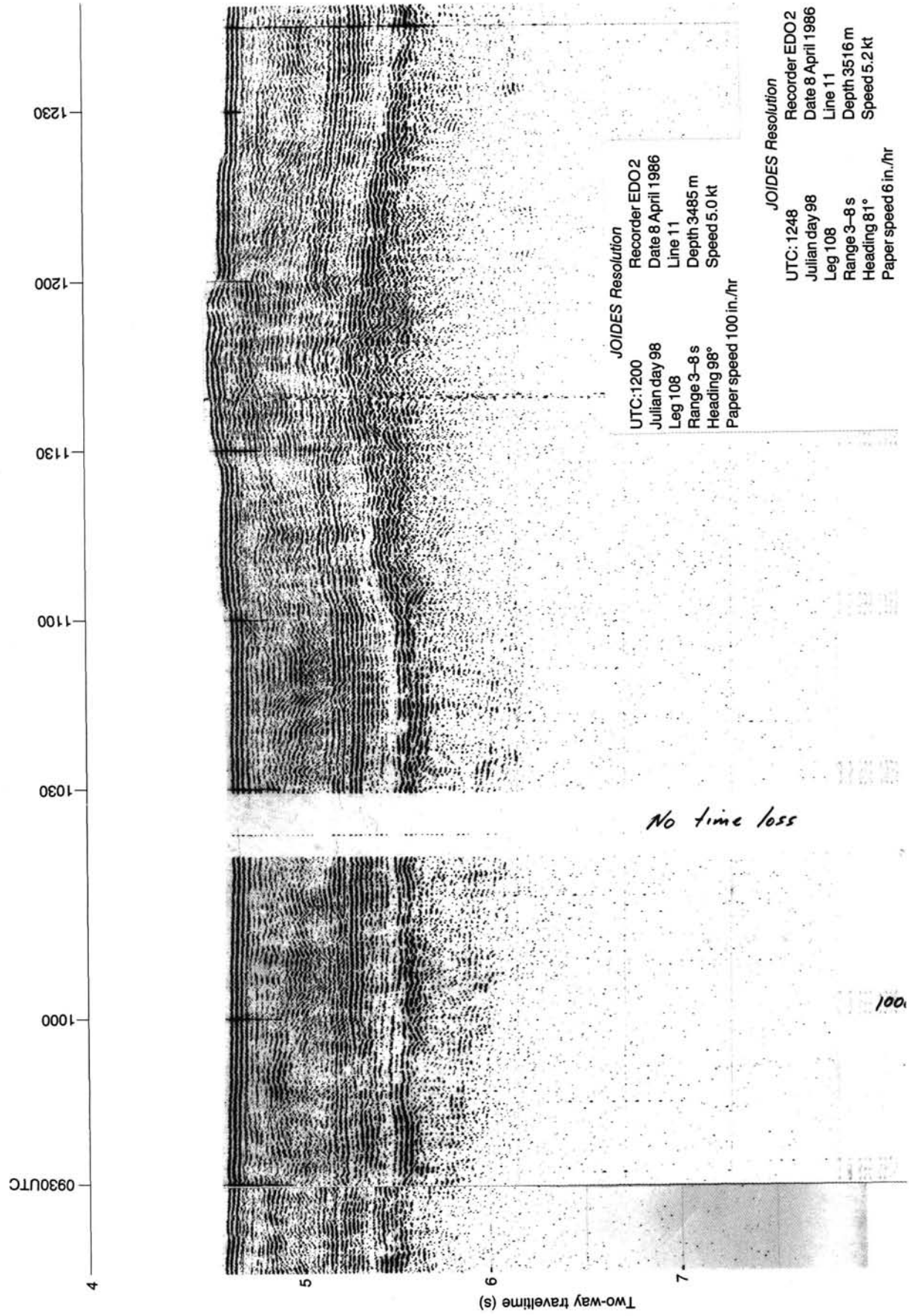

Figure 20 (continued).

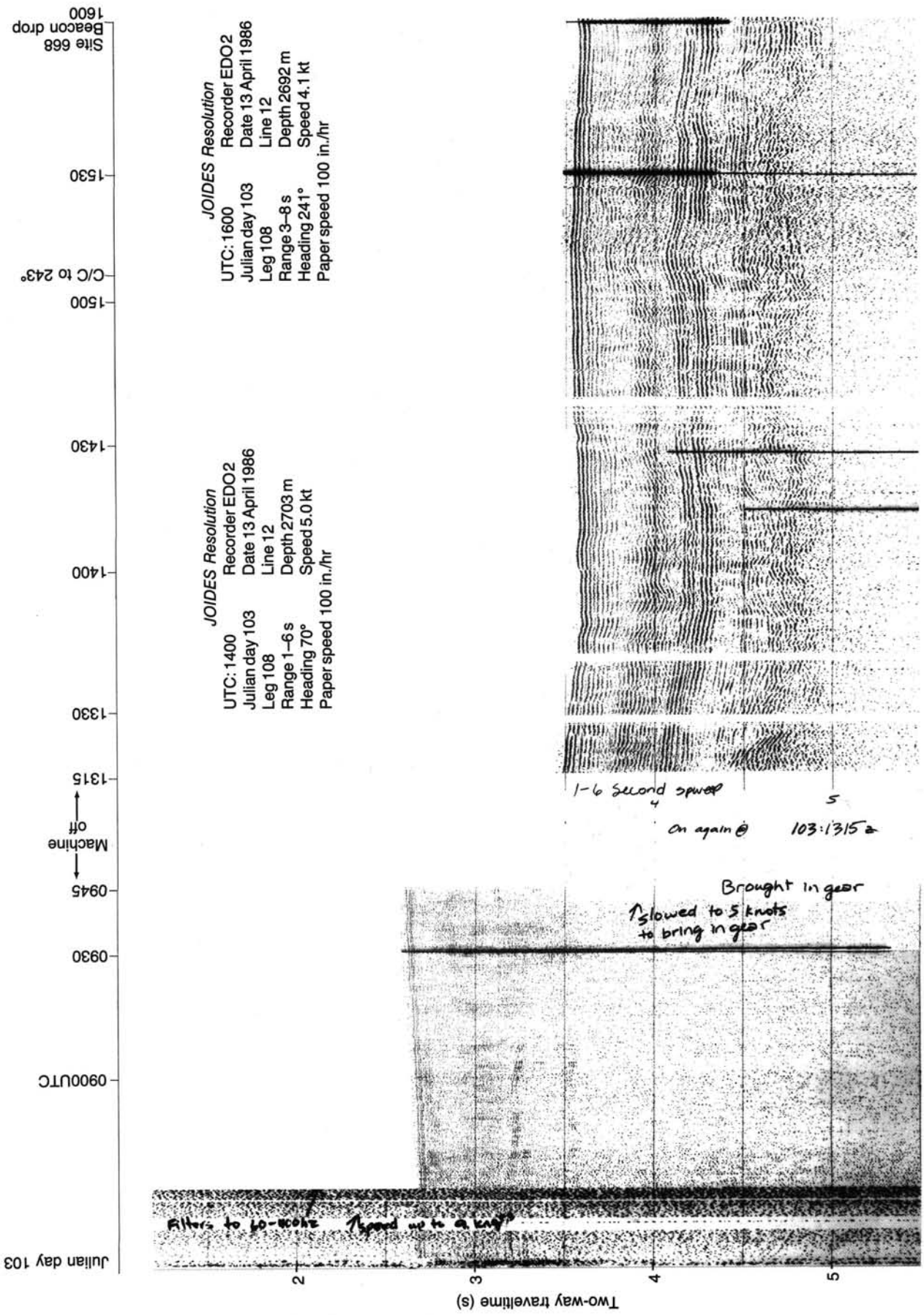

Figure 21. Unprocessed analog seismic data collected from Line 12 en route to Site 668 and recorded using the EDO-2 recorder.

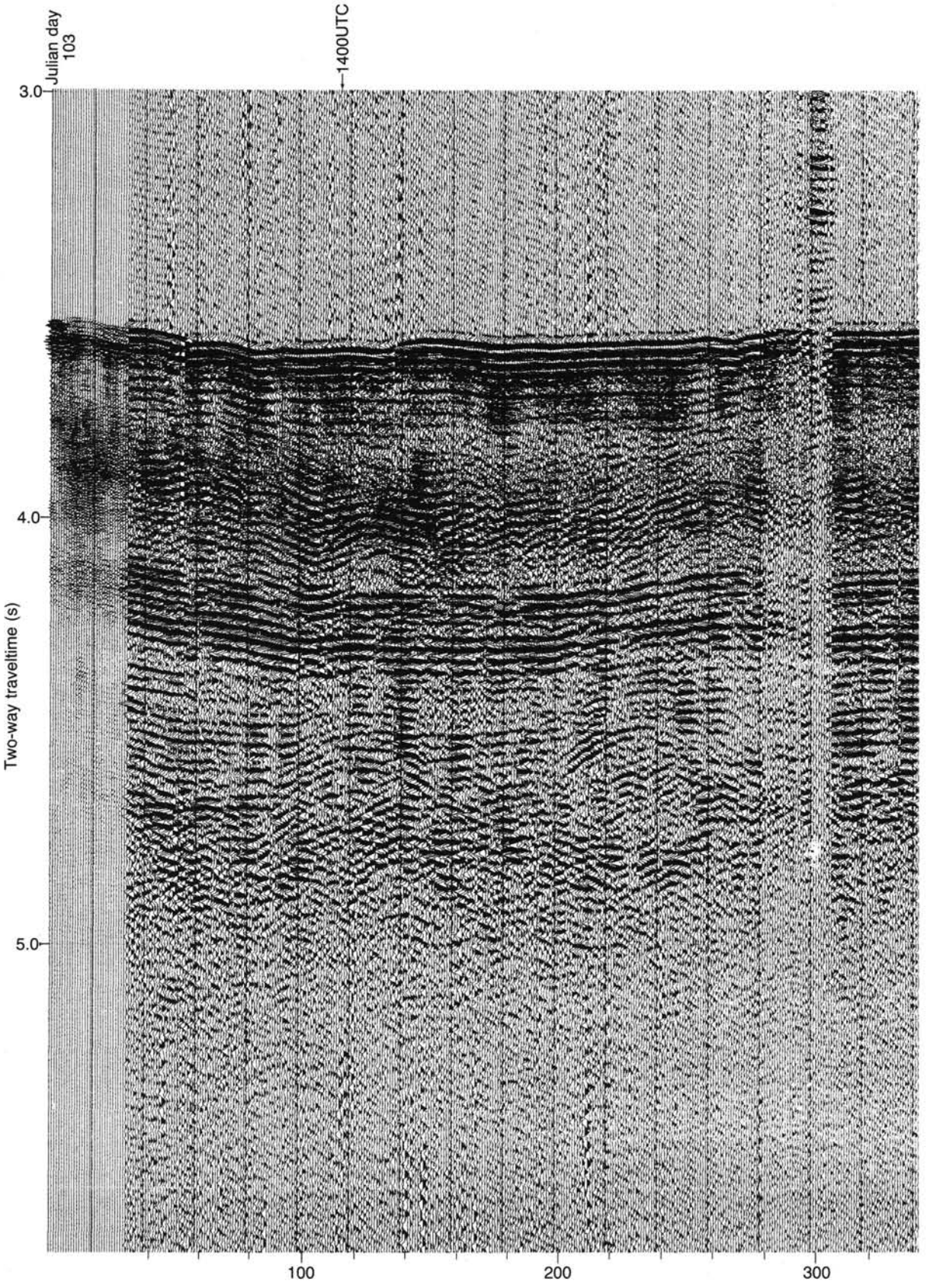

Figure 22. Unprocessed analog seismic data collected from Line 12 en route to Site 668 and recorded using a super-micro 561 Masscomp computer.

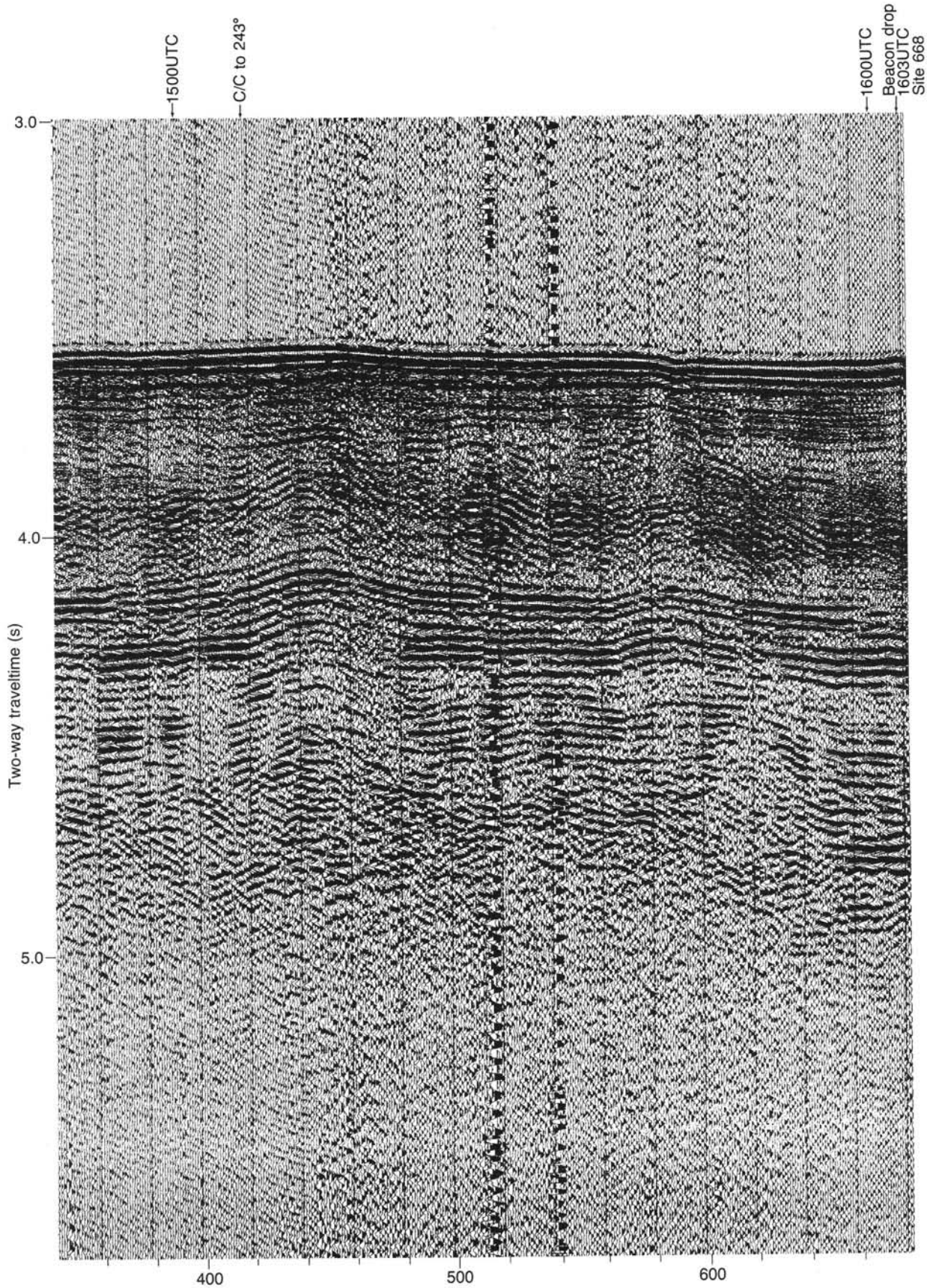

Figure 22 (continued).