3. UNDERWAY GEOPHYSICS: ODP LEG 103[1]

Shipboard Scientific Party[2]

INTRODUCTION

Geophysical data were collected during Leg 103 of the Ocean Drilling Program (ODP). Of the 1741 n. mi traveled between Ponta Delgada, Azores, and Bremerhaven, Federal Republic of Germany, geophysical data were collected for approximately 250 n. mi (28 hr) before arrival at Site 637, when under way between the sites, and for approximately 30 n. mi (3 hr) after we departed final Site 641. We were under way 8 days during the 54.8 days spent at sea.

Shipboard geophysical instrumentation included two precision echo-sounders, a magnetometer, seismic-reflection profilers, and a satellite navigation system. 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 DATA

Navigation data were collected on the bridge by a Magnavox MX702A. Positions were obtained with this system during the entire 54.8 days spent at sea. Approximately nine satellite fixes were received each day. Latitudes and longitudes of the drill holes were determined by averaging *all* the satellite fixes received while drilling each hole. These locations may differ slightly from the locations of the drill holes given in site chapters, which are the average of only the 20 *best* fixes received.

A plot of the general navigation from Leg 103 is shown in Figure 1A; an enlarged plot of the navigation around Leg 103 drill sites is shown in Figure 1B. The plots were generated from satellite navigation and course- and speed-change information (Table 1). These data were compiled from the shipboard bridge log, underway geophysical log, and satellite-navigation data sheets; course and speed information were from the digital seismic tape headers. The Geological Data Center at Scripps Institution of Oceanography produced this navigation compilation.

More detailed navigation plots around each drill site were compiled by the Co-Chief Scientists during the cruise. These plots for Sites 637, 638, 639, and 640 are shown in Figures 2, 3, 4, and 5, respectively.

BATHYMETRIC DATA

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 site chapters, this volume). Pertinent segments of these bathymetric data are presented in the site chapters and are not included in this chapter.

MAGNETIC DATA

Because of technical and electronic problems, no magnetic data were collected during Leg 103.

SEISMIC-REFLECTION DATA

The seismic sources used aboard the *JOIDES Resolution* during Leg 103 were two 80-in.[3] water guns. One 100-m-long Teledyne streamer, deployed from the fantail and containing 60 active sections, was towed approximately 500 m behind the vessel. Towing depth was set by external depth depressors (birds). The 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, amplifier, and two band-pass filters (Table 2).

Seismic data were also recorded using a super-micro 561 Masscomp 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 Cipher tapes, using a SEG-Y format and a density of 1600 bytes/in. Seismic lines recorded with the Masscomp were reprocessed while the ship was on station. The final data were displayed on a 22-in.-wide Versatec plotter (200 dots/in.). Table 3 gives the reprocessing parameters.

---

[1] Boillot, G., Winterer, E. L., Meyer, A. W., et al., *Proc. Init. Repts. (Pt. A), ODP*, 103.

[2] Gilbert Boillot (Co-Chief Scientist), Laboratoire de Géodynamique Sous-Marine, Université Pierre et Marie Curie, B.P. 48, 06230, Villefranche-sur-Mer, France; Edward L. Winterer (Co-Chief Scientist), Graduate Research Division A-012-W, Scripps Institution of Oceanography, La Jolla, CA 92093; Audrey W. Meyer (ODP Staff Scientist), Ocean Drilling Program, Texas A&M University, College Station, TX 77843-3469; Joseph Applegate, Department of Geology, Florida State University, Tallahassee, FL 32306; Miriam Baltuck, Department of Geology, Tulane University, New Orleans, LA 70118 (current address: NASA Headquarters, Code EEL, Washington, D.C. 20546); James A. Bergen, Department of Geology, Florida State University, Tallahassee, FL 32306; M. C. Comas, Departamento Estratigrafia y Paleontologia, Facultad de Ciencias, Universidad de Granada, 18001 Granada, Spain; Thomas A. Davies, Institute for Geophysics, University of Texas at Austin, 4920 North IH 35, Austin, TX 78751; Keith Dunham, Department of Atmospheric and Oceanic Sciences, University of Michigan, 2455 Hayward Avenue, Ann Arbor, MI 48109 (current address: P.O. Box 13, Pequat Lakes, MN 56478); Cynthia A. Evans, Department of Geology, Colgate University, Hamilton, NY 13346 (current address: Lamont-Doherty Geological Observatory, Palisades, NY 10964); Jacques Girardeau, Laboratoire de Materiaux Terrestres, I.P.G., 4 Place Jussieu, 75252 Paris Cedex 05, France; David Goldberg, Lamont-Doherty Geological Observatory, Palisades, NY 10964; Janet Haggerty, Department of Geology, University of Tulsa, 600 S. College Avenue, Tulsa, OK 74104; Lubomir F. Jansa, Atlantic Geoscience Center, Bedford Institute of Oceanography, Dartmouth, Nova Scotia B2Y 4A2, Canada; Jeffrey A. Johnson, Department of Earth and Space Sciences, University of California, Los Angeles, CA 90024 (current address: 9449 Briar Forest Drive, No. 3544, Houston, TX 77063); Junzo Kasahara, Earthquake Research Institute, University of Tokyo, 1,1,1 Yayoi, Bunkyo, Tokyo 113, Japan (current address: Nippon Schlumberger K.K., 2-1 Fuchinobe, 2-Chome, Sagamihara-shi, Kanagawa-ken, 229, Japan); Jean-Paul Loreau, Laboratoire de Géologie, Museum National D'Histoire Naturelle, 43 Rue Buffon, 75005 Paris, France; Emilio Luna, Hispanoil, Pez Volador No. 2, 28007 Madrid, Spain; Michel Moullade, Laboratoire de Géologie et Micropaleontologie Marines, Université de Nice, Parc Valrose, 06034 Nice Cedex, France; James Ogg, Geological Research Division A-012, Scripps Institution of Oceanography, La Jolla, CA 92093 (current address: Dept. Earth and Atmospheric Sciences, Purdue University, W. Lafayette, IN 47907); Massimo Sarti, Istituto di Geologia, Universitá di Ferrara, Corso Ercole d'Este, 32, 44100 Ferrara, Italy; Jürgen Thurow, Institut und Museum für Geologie und Paleontologie, Universität Tuebingen, Sigwartstr. 10, D-7400 Tuebingen, Federal Republic of Germany; Mark A. Williamson, Atlantic Geoscience Centre, Geological Survey of Canada, Bedford Institute of Oceanography, Box 1006, Dartmouth, Nova Scotia B2Y 4A2, Canada (current address: Shell Canada Ltd., P.O. Box 100, Stn. M, Calgary, Alberta T2P 2H5, Canada).

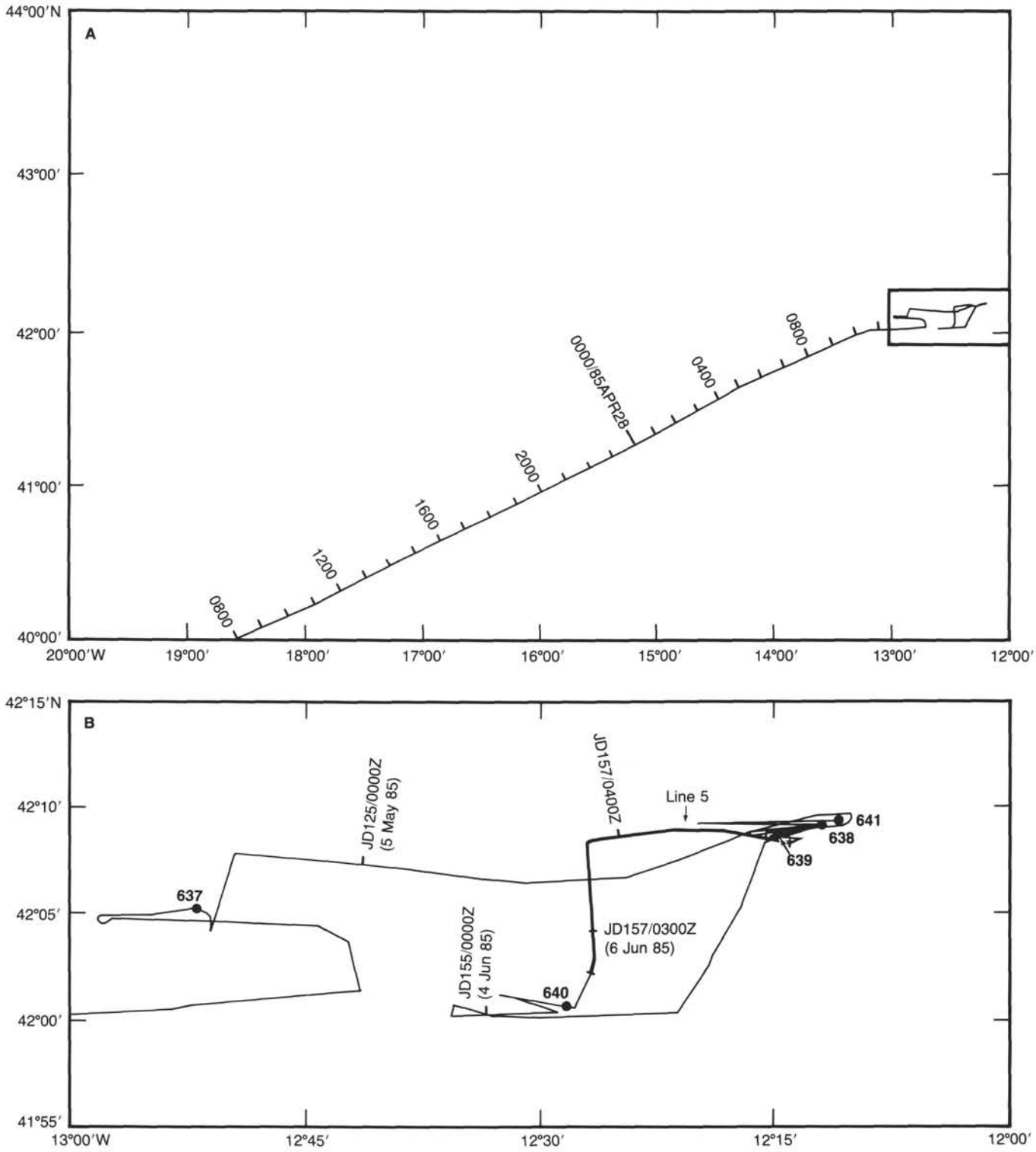


Figure 1. A General trackline map of ODP Leg 103 cruise, generated from satellite-navigation and course- and speed-change data given in Table 1. Area of enlarged map shown in Figure 1B is outlined. B Enlarged trackline map of Leg 103 cruise near drill sites. See Figure 1A for location. More detailed navigation plots around each drill site are shown in Figures 2 through 5. Location of seismic line 5 (see Figs. 13 and 14) is shown by heavy line.

Table 1. Satellite navigation and course- and speed-change data used to generate Leg 103 trackline plots shown in Figure 1.

Day	Month	Year	Time[a]	North latitude		West longitude		Dist	Actual		Drift		Dead reckoning		Comments[b]
				deg	min	deg	min		speed (kt)	course (deg)	speed (kt)	hed (deg)	speed (kt)	course (deg)	
27	4	1985	0512	39	48.50	−19	9.60	0.0	10.9	66	2.5	73	8.5	64	satl
27	4	1985	0700	39	56.46	−18	46.17	19.7	9.9	62	1.5	54	8.5	64	satl
27	4	1985	0824	40	2.88	−18	30.09	33.6	11.3	67	2.9	75	8.5	64	satl
27	4	1985	1108	40	15.11	−17	52.99	64.4	11.1	62	2.6	57	8.5	64	satl
27	4	1985	1256	40	24.36	−17	29.76	84.4	10.7	65	2.2	68	8.5	64	satl
27	4	1985	1720	40	44.4	−16	33.8	131.5	10.7	65	2.2	68	8.5	64	c/cs
27	4	1985	1750	40	46.7	−16	27.4	136.8	10.8	65	2.2	68	8.6	64	c/cs
27	4	1985	1814	40	48.57	−16	22.21	141.1	11.1	65	2.5	66	8.6	64	satl
27	4	1985	1816	40	48.7	−16	21.8	141.5	11.3	65	2.5	66	8.8	64	c/cs
27	4	1985	1843	40	50.9	−16	15.7	146.6	11.2	63	2.5	66	8.7	62	c/cs
27	4	1985	1905	40	52.8	−16	10.9	150.7	11.2	62	2.5	66	8.7	61	c/cs
27	4	1985	1914	40	53.57	−16	8.90	152.4	10.8	63	2.2	72	8.7	61	satl
27	4	1985	1934	40	55.2	−16	4.6	156.0	10.7	63	2.2	72	8.5	61	c/cs
27	4	1985	1959	40	57.2	−15	59.4	160.4	10.6	62	2.2	72	8.5	60	c/cs
27	4	1985	2021	40	59.0	−15	54.8	164.3	10.7	63	2.2	72	8.5	61	c/cs
27	4	1985	2038	41	0.4	−15	51.2	167.4	10.5	63	2.2	72	8.4	61	c/cs
27	4	1985	2058	41	2.0	−15	47.1	170.9	10.4	63	2.2	72	8.3	61	c/cs
27	4	1985	2120	41	3.7	−15	42.5	174.7	10.1	63	2.2	72	8.0	61	c/cs
27	4	1985	2137	41	5.0	−15	39.1	177.6	10.1	64	2.2	72	7.9	62	c/cs
27	4	1985	2158	41	6.5	−15	34.9	181.1	10.5	64	2.2	72	8.3	62	c/cs
27	4	1985	2203	41	6.9	−15	33.9	182.0	10.7	64	2.2	72	8.5	62	c/cs
27	4	1985	2219	41	8.1	−15	30.5	184.8	10.0	63	2.2	72	7.9	61	c/cs
27	4	1985	2225	41	8.6	−15	29.3	185.8	9.6	63	2.2	72	7.4	61	c/cs
27	4	1985	2242	41	9.8	−15	26.1	188.5	9.7	64	2.2	72	7.6	62	c/cs
27	4	1985	2311	41	11.8	−15	20.5	193.2	9.1	64	2.2	72	7.0	62	c/cs
27	4	1985	2322	41	12.6	−15	18.4	194.9	9.1	64	2.2	72	6.9	62	c/cs
27	4	1985	2328	41	13.0	−15	17.4	195.8	9.1	64	2.2	72	6.9	62	c/cs
27	4	1985	2349	41	14.3	−15	13.5	199.0	9.4	64	2.2	72	7.3	62	c/cs
28	4	1985	0000	41	15.1	−15	11.5	200.7	9.4	64	2.2	72	7.3	62	c/cs
28	4	1985	0004	41	15.4	−15	10.7	201.4	8.9	64	2.2	72	6.8	62	c/cs
28	4	1985	0017	41	16.2	−15	8.4	203.3	8.9	64	2.2	72	6.8	62	c/cs
28	4	1985	0020	41	16.40	−15	7.86	203.7	9.2	59	2.4	51	6.8	62	satl
28	4	1985	0032	41	17.3	−15	5.8	205.6	9.9	59	2.4	51	7.5	62	c/cs
28	4	1985	0042	41	18.2	−15	3.9	207.2	9.3	60	2.4	51	6.9	63	c/cs
28	4	1985	0210	41	25.06	−14	48.10	220.9	9.2	63	2.2	64	6.9	63	satl
28	4	1985	0212	41	25.2	−14	47.7	221.2	9.4	61	2.2	64	7.2	60	c/cs
28	4	1985	0223	41	26.0	−14	45.7	222.9	9.2	72	2.2	64	7.1	74	c/cs
28	4	1985	0229	41	26.3	−14	44.6	223.9	9.5	65	2.2	64	7.3	65	c/cs
28	4	1985	0233	41	26.6	−14	43.8	224.5	9.0	59	2.2	64	6.8	58	c/cs
28	4	1985	0239	41	27.1	−14	42.8	225.4	8.9	60	2.2	64	6.7	58	c/cs
28	4	1985	0254	41	28.2	−14	40.2	227.6	9.4	59	2.2	64	7.2	58	c/cs
28	4	1985	0314	41	29.8	−14	36.6	230.8	9.3	59	2.2	64	7.1	58	c/cs
28	4	1985	0331	41	31.1	−14	33.6	233.4	9.1	59	2.2	64	6.9	58	c/cs
28	4	1985	0334	41	32.1	−14	31.3	235.4	9.2	59	2.2	64	7.0	58	c/cs
28	4	1985	0350	41	32.6	−14	30.2	236.3	9.7	59	2.2	64	7.5	58	c/cs
28	4	1985	0355	41	33.0	−14	29.3	237.1	9.2	59	2.2	64	7.0	58	c/cs
28	4	1985	0405	41	33.8	−14	27.5	238.6	9.6	59	2.2	64	7.4	58	c/cs
28	4	1985	0423	41	35.2	−14	24.2	241.5	9.6	60	2.2	64	7.4	59	c/cs
28	4	1985	0448	41	37.22	−14	19.61	245.5	9.4	61	2.1	70	7.4	59	satl
28	4	1985	0453	41	37.6	−14	18.7	246.3	9.4	61	2.1	70	7.3	59	c/cs
28	4	1985	0510	41	38.9	−14	15.6	248.9	9.5	65	2.1	70	7.4	64	c/cs
28	4	1985	0532	41	40.3	−14	11.3	252.4	9.6	66	2.1	70	7.5	65	c/cs
28	4	1985	0542	41	41.0	−14	9.3	254.0	9.4	66	2.1	70	7.3	65	c/cs
28	4	1985	0559	41	42.1	−14	6.1	256.7	9.7	66	2.1	70	7.6	65	c/cs
28	4	1985	0611	41	42.8	−14	3.7	258.6	9.5	66	2.1	70	7.3	65	c/cs
28	4	1985	0629	41	44.0	−14	0.2	261.5	9.5	66	2.1	70	7.4	65	c/cs
28	4	1985	0636	41	44.4	−13	58.9	262.6	9.3	66	2.1	70	7.2	65	c/cs
28	4	1985	0638	41	44.56	−13	58.51	262.9	9.2	67	2.1	73	7.2	65	satl
28	4	1985	0644	41	44.9	−13	57.4	263.8	9.6	67	2.1	73	7.6	65	c/cs
28	4	1985	0702	41	46.1	−13	53.8	266.7	9.5	67	2.1	73	7.5	65	c/cs
28	4	1985	0710	41	46.57	−13	52.24	268.0	10.1	66	2.6	69	7.5	65	satl
28	4	1985	0712	41	46.7	−13	51.8	268.3	10.4	66	2.6	69	7.8	65	c/cs
28	4	1985	0724	41	47.5	−13	49.3	270.4	10.0	66	2.6	69	7.4	65	c/cs
28	4	1985	0750	41	49.3	−13	44.0	274.7	10.2	66	2.6	69	7.6	65	c/cs
28	4	1985	0814	41	50.9	−13	39.0	278.8	10.6	66	2.6	69	8.0	65	c/cs
28	4	1985	0824	41	51.7	−13	36.8	280.6	10.6	66	2.6	69	8.0	65	c/cs
28	4	1985	0847	41	53.3	−13	31.8	284.6	10.5	67	2.6	69	7.9	66	c/cs
28	4	1985	0856	41	53.94	−13	29.85	286.2	9.6	66	1.7	69	7.9	66	satl
28	4	1985	0857	41	54.0	−13	29.7	286.4	9.8	66	1.7	69	8.1	65	c/cs
28	4	1985	0911	41	54.9	−13	26.9	288.6	9.4	66	1.7	69	7.8	65	c/cs
28	4	1985	0927	41	56.0	−13	23.8	291.2	9.7	66	1.7	69	8.0	65	c/cs
28	4	1985	0943	41	57.0	−13	20.6	293.7	9.9	66	1.7	69	8.2	65	c/cs
28	4	1985	1002	41	58.34	−13	16.78	296.9	10.6	72	2.7	93	8.2	65	satl
28	4	1985	1003	41	58.4	−13	16.6	297.1	10.6	72	2.7	93	8.2	65	c/cs
28	4	1985	1026	41	59.7	−13	11.4	301.1	10.4	72	2.7	93	8.0	65	c/cs
28	4	1985	1032	41	60.0	−13	10.0	302.2	9.0	84	2.7	93	6.4	80	c/cs
28	4	1985	1034	42	0.0	−13	9.6	302.5	7.0	88	2.7	93	4.3	84	c/cs
28	4	1985	1046	42	0.07	−13	7.75	303.9	5.6	91	1.4	114	4.3	84	satl
28	4	1985	1049	42	0.1	−13	7.4	304.1	6.0	91	1.4	114	4.7	84	c/cs
28	4	1985	1107	42	0.0	−13	4.9	305.9	6.0	88	1.4	114	4.8	81	c/cs

Table 1 (continued).

Day	Month	Year	Time[a]	North latitude deg	North latitude min	West longitude deg	West longitude min	Dist	Actual speed (kt)	Actual course (deg)	Drift speed (kt)	Drift hed (deg)	Dead reckoning speed (kt)	Dead reckoning course (deg)	Comments[b]
28	4	1985	1134	42	0.1	−13	1.3	308.6	6.0	90	1.5	123	4.8	80	c/cs
28	4	1985	1154	42	0.1	−12	58.6	310.7	5.6	90	1.4	127	4.6	80	c/cs
28	4	1985	1218	42	0.1	−12	55.4	313.0	6.2	90	1.7	119	4.8	80	c/cs
28	4	1985	1246	42	0.2	−12	52.0	315.6	3.5	81	1.2	273	4.7	84	c/cs
28	4	1985	1254	42	0.2	−12	51.4	316.1	3.6	84	1.2	273	4.8	86	c/cs
28	4	1985	1320	42	0.4	−12	49.3	317.6	3.8	84	1.2	273	4.9	86	c/cs
28	4	1985	1344	42	0.6	−12	47.3	319.1	4.0	84	1.2	273	5.1	86	c/cs
28	4	1985	1414	42	0.8	−12	44.6	321.1	3.8	84	1.2	273	4.9	86	c/cs
28	4	1985	1430	42	0.9	−12	43.2	322.1	4.0	86	1.2	273	5.2	88	c/cs
28	4	1985	1455	42	1.0	−12	41.0	323.8	3.5	86	1.2	273	4.7	88	c/cs
28	4	1985	1456	42	1.0	−12	40.9	323.8	5.0	350	1.2	273	4.9	3	c/cs
28	4	1985	1500	42	1.3	−12	41.0	324.2	5.2	345	1.2	273	5.0	358	c/cs
28	4	1985	1524	42	3.4	−12	41.7	326.3	6.6	300	1.2	273	5.6	305	c/cs
28	4	1985	1529	42	3.6	−12	42.4	326.8	7.3	297	1.2	273	6.3	301	c/cs
28	4	1985	1538	42	4.1	−12	43.7	327.9	7.5	275	1.2	273	6.3	275	c/cs
28	4	1985	1545	42	4.2	−12	44.9	328.8	7.8	271	1.2	273	6.6	271	c/cs
28	4	1985	1556	42	4.2	−12	46.8	330.2	6.3	274	1.2	273	5.2	274	c/cs
28	4	1985	1609	42	4.3	−12	48.6	331.6	5.8	273	1.2	273	4.6	273	c/cs
28	4	1985	1639	42	4.5	−12	52.5	334.5	5.8	271	1.2	273	4.6	271	c/cs
28	4	1985	1709	42	4.5	−12	56.4	337.4	5.7	270	1.2	273	4.6	269	c/cs
28	4	1985	1714	42	4.5	−12	57.0	337.8	5.0	231	1.2	273	4.3	220	c/cs
28	4	1985	1718	42	4.3	−12	57.4	338.2	5.0	262	1.2	273	3.9	259	c/cs
28	4	1985	1720	42	4.3	−12	57.6	338.3	4.2	300	1.2	273	3.3	309	c/cs
28	4	1985	1723	42	4.4	−12	57.8	338.6	2.8	326	1.2	273	2.3	350	c/cs
28	4	1985	1727	42	4.6	−12	58.0	338.7	1.9	13	1.2	273	2.4	42	c/cs
28	4	1985	1730	42	4.7	−12	58.0	338.8	2.7	67	1.2	273	3.8	75	c/cs
28	4	1985	1734	42	4.7	−12	57.7	339.0	3.1	87	1.2	273	4.2	89	c/cs
28	4	1985	1759	42	4.8	−12	56.0	340.3	2.7	89	1.2	273	3.9	90	c/cs
28	4	1985	1818	42	4.8	−12	54.9	341.2	1.7	81	1.2	273	2.8	86	c/cs
28	4	1985	1820	42	4.8	−12	54.8	341.2	1.4	78	1.2	273	2.5	85	c/cs
28	4	1985	2000	42	5.30	−12	51.80	343.5	2.5	85	0.0	90	2.5	85	S637
28	4	1985	2000	42	5.3	−12	51.8	343.5	0.0	90	0.0	90	0.0	500	c/cs
29	4	1985	1615	42	5.30	−12	51.80	343.5	0.0	90	0.0	90	0.0	500	637A
4	5	1985	2105	42	5.30	−12	51.80	343.5	1.4	127	1.4	127	0.0	500	637A
4	5	1985	2139	42	4.8	−12	51.0	344.3	3.3	101	1.4	127	2.2	85	c/cs
4	5	1985	2140	42	4.8	−12	50.9	344.3	4.8	172	1.4	127	4.0	186	c/cs
4	5	1985	2146	42	4.3	−12	50.8	344.8	2.7	210	1.4	127	2.8	239	c/cs
4	5	1985	2149	42	4.2	−12	50.9	344.9	0.7	277	1.4	127	2.1	297	c/cs
4	5	1985	2153	42	4.2	−12	50.9	345.0	1.5	25	1.4	127	2.3	348	c/cs
4	5	1985	2157	42	4.3	−12	50.9	345.1	2.7	20	1.4	127	3.3	357	c/cs
4	5	1985	2202	42	4.5	−12	50.8	345.3	3.9	18	1.4	127	4.6	1	c/cs
4	5	1985	2217	42	5.5	−12	50.4	346.3	3.4	15	1.4	127	4.1	357	c/cs
4	5	1985	2222	42	5.7	−12	50.3	346.6	2.5	23	1.4	127	3.2	358	c/cs
4	5	1985	2231	42	6.1	−12	50.1	347.0	3.6	15	1.4	127	4.3	358	c/cs
4	5	1985	2259	42	7.7	−12	49.5	348.7	4.4	61	1.4	127	4.0	43	c/cs
4	5	1985	2301	42	7.8	−12	49.3	348.8	6.1	92	1.4	127	5.0	83	c/cs
4	5	1985	2308	42	7.8	−12	48.4	349.5	6.2	95	1.4	127	5.1	86	c/cs
4	5	1985	2334	42	7.5	−12	44.8	352.2	6.1	96	1.4	127	4.9	87	c/cs
5	5	1985	0001	42	7.3	−12	41.1	354.9	6.1	95	1.4	127	5.0	87	c/cs
5	5	1985	0017	42	7.1	−12	38.9	356.5	5.9	97	1.4	127	4.8	89	c/cs
5	5	1985	0047	42	6.7	−12	35.0	359.5	5.8	95	1.4	127	4.7	86	c/cs
5	5	1985	0105	42	6.6	−12	32.6	361.2	5.9	97	1.4	127	4.7	88	c/cs
5	5	1985	0112	42	6.5	−12	31.7	361.9	5.9	97	1.4	127	4.7	89	c/cs
5	5	1985	0118	42	6.44	−12	30.91	362.5	5.5	87	0.8	74	4.7	89	satl
5	5	1985	0210	42	6.7	−12	24.5	367.3	5.4	75	0.8	74	4.6	75	c/cs
5	5	1985	0219	42	6.9	−12	23.4	368.1	5.4	71	0.8	74	4.6	70	c/cs
5	5	1985	0239	42	7.5	−12	21.1	369.9	5.0	67	0.8	74	4.2	65	c/cs
5	5	1985	0251	42	7.9	−12	19.9	370.9	5.3	71	0.8	74	4.5	70	c/cs
5	5	1985	0305	42	8.3	−12	18.3	372.2	5.2	66	0.8	74	4.4	65	c/cs
5	5	1985	0314	42	8.6	−12	17.3	372.9	5.2	67	0.8	74	4.4	66	c/cs
5	5	1985	0319	42	8.8	−12	16.8	373.4	5.4	76	0.8	74	4.6	76	c/cs
5	5	1985	0330	42	9.0	−12	15.5	374.4	5.4	77	0.8	74	4.6	77	c/cs
5	5	1985	0334	42	9.1	−12	15.0	374.7	5.3	72	0.8	74	4.5	71	c/cs
5	5	1985	0343	42	9.4	−12	14.0	375.5	5.2	72	0.8	74	4.3	72	c/cs
5	5	1985	0347	42	9.5	−12	13.6	375.9	5.3	85	0.8	74	4.5	87	c/cs
5	5	1985	0352	42	9.5	−12	13.0	376.3	5.7	79	0.8	74	4.9	80	c/cs
5	5	1985	0358	42	9.63	−12	12.21	376.9	3.3	86	1.7	247	4.9	80	satl
5	5	1985	0411	42	9.7	−12	11.3	377.6	3.2	88	1.7	247	4.8	81	c/cs
5	5	1985	0427	42	9.7	−12	10.1	378.4	2.9	112	1.7	247	4.3	96	c/cs
5	5	1985	0428	42	9.7	−12	10.0	378.5	3.9	173	1.7	247	3.8	148	c/cs
5	5	1985	0430	42	9.6	−12	10.0	378.6	5.5	206	1.7	247	4.4	191	c/cs
5	5	1985	0433	42	9.3	−12	10.2	378.9	5.6	228	1.7	247	4.1	220	c/cs
5	5	1985	0435	42	9.2	−12	10.4	379.1	5.1	250	1.7	247	3.4	252	c/cs
5	5	1985	0438	42	9.1	−12	10.7	379.3	5.3	266	1.7	247	3.7	274	c/cs
5	5	1985	0457	42	9.0	−12	12.9	381.0	4.8	265	1.7	247	3.3	274	c/cs
5	5	1985	0516	42	8.8	−12	15.0	382.5	4.4	258	1.7	247	2.8	265	c/cs
5	5	1985	0520	42	8.8	−12	15.4	382.8	4.9	218	1.7	247	3.6	205	c/cs
5	5	1985	0522	42	8.7	−12	15.5	383.0	4.4	171	1.7	247	4.3	149	c/cs
5	5	1985	0524	42	8.5	−12	15.5	383.1	2.8	105	1.7	247	4.3	91	c/cs
5	5	1985	0526	42	8.5	−12	15.3	383.2	2.7	65	1.7	247	4.3	66	c/cs

Table 1 (continued).

Day	Month	Year	Time[a]	North latitude deg	North latitude min	West longitude deg	West longitude min	Dist	Actual speed (kt)	Actual course (deg)	Drift speed (kt)	Drift hed (deg)	Dead reckoning speed (kt)	Dead reckoning course (deg)	Comments[b]
5	5	1985	0532	42	8.6	−12	15.0	383.5	3.2	73	1.7	247	4.8	71	c/cs
5	5	1985	0541	42	8.7	−12	14.4	384.0	2.9	37	1.7	247	4.4	48	c/cs
5	5	1985	0543	42	8.8	−12	14.3	384.1	2.8	305	1.7	247	2.4	342	c/cs
5	5	1985	0546	42	8.9	−12	14.5	384.2	4.2	268	1.7	247	2.7	281	c/cs
5	5	1985	0553	42	8.9	−12	15.1	384.7	4.7	267	1.7	247	3.2	277	c/cs
5	5	1985	0605	42	8.8	−12	16.4	385.6	4.9	227	1.7	247	3.4	218	c/cs
5	5	1985	0607	42	8.7	−12	16.5	385.8	3.7	168	1.7	247	3.8	143	c/cs
5	5	1985	0609	42	8.6	−12	16.5	385.9	2.2	86	1.7	247	3.8	78	c/cs
5	5	1985	0612	42	8.6	−12	16.4	386.0	2.9	79	1.7	247	4.5	75	c/cs
5	5	1985	0619	42	8.7	−12	15.9	386.4	3.4	79	1.7	247	5.0	75	c/cs
5	5	1985	0624	42	8.7	−12	15.6	386.6	3.3	80	1.7	247	4.9	76	c/cs
5	5	1985	0715	42	9.20	−12	11.80	389.5	4.9	76	0.0	90	4.9	76	S638
5	5	1985	0715	42	9.2	−12	11.8	389.5	0.0	90	0.0	90	0.0	500	c/cs
5	5	1985	0845	42	9.20	−12	11.80	389.5	0.0	90	0.0	90	0.0	500	638A
6	5	1985	0015	42	9.20	−12	11.80	389.5	0.0	90	0.0	90	0.0	500	638A
6	5	1985	0145	42	9.20	−12	11.80	389.5	0.0	90	0.0	90	0.0	500	638B
12	5	1985	1329	42	9.20	−12	11.80	389.5	0.0	90	0.0	90	0.0	500	638B
12	5	1985	2145	42	9.20	−12	11.80	389.5	0.0	255	0.0	255	0.0	500	638C
23	5	1985	2000	42	8.60	−12	14.90	391.8	0.0	90	0.0	90	0.0	500	639A
25	5	1985	1245	42	8.60	−12	14.90	391.8	0.0	270	0.0	270	0.0	500	639A
26	5	1985	1340	42	8.60	−12	15.00	391.9	0.0	90	0.0	90	0.0	500	639B
27	5	1985	0545	42	8.60	−12	15.00	391.9	0.0	270	0.0	270	0.0	500	639B
27	5	1985	1230	42	8.60	−12	15.10	392.0	0.0	90	0.0	90	0.0	500	639C
27	5	1985	2230	42	8.60	−12	15.10	392.0	0.1	270	0.1	270	0.0	500	639C
28	5	1985	0000	42	8.60	−12	15.30	392.1	0.0	90	0.0	90	0.0	500	639D
1	6	1985	0130	42	8.60	−12	15.30	392.1	0.1	76	0.1	76	0.0	500	639D
1	6	1985	2307	42	9.04	−12	12.85	394.0	0.0	78	0.0	78	0.0	500	638C
3	6	1985	0945	42	9.20	−12	11.80	394.8	0.3	253	0.3	253	0.0	500	638C
3	6	1985	2027	42	8.4	−12	15.6	397.7	4.4	75	0.3	253	4.7	75	c/cs
3	6	1985	2028	42	8.4	−12	15.5	397.8	4.5	202	0.3	253	4.4	199	c/cs
3	6	1985	2034	42	8.0	−12	15.7	398.3	4.9	202	0.3	253	4.8	199	c/cs
3	6	1985	2045	42	7.1	−12	16.2	399.2	5.5	201	0.3	253	5.3	199	c/cs
3	6	1985	2106	42	5.32	−12	17.13	401.1	5.0	212	1.2	309	5.3	199	satl
3	6	1985	2115	42	4.7	−12	17.7	401.9	5.0	211	1.2	309	5.3	198	c/cs
3	6	1985	2131	42	3.5	−12	18.6	403.2	5.1	209	1.2	309	5.4	196	c/cs
3	6	1985	2138	42	3.0	−12	19.0	403.8	4.9	201	1.2	309	5.4	189	c/cs
3	6	1985	2144	42	2.57	−12	19.20	404.3	6.7	214	3.0	265	5.4	189	satl
3	6	1985	2208	42	0.3	−12	21.2	407.0	7.9	268	3.0	265	4.9	270	c/cs
3	6	1985	2211	42	0.3	−12	21.8	407.3	8.3	268	3.0	265	5.3	270	c/cs
3	6	1985	2241	42	0.2	−12	27.4	411.5	8.3	268	3.0	265	5.3	270	c/cs
3	6	1985	2256	42	0.12	−12	30.15	413.6	6.5	272	1.2	281	5.3	270	satl
3	6	1985	2315	42	0.2	−12	32.9	415.6	6.2	276	1.2	281	5.0	275	c/cs
3	6	1985	2317	42	0.2	−12	33.2	415.8	6.5	287	1.2	281	5.4	289	c/cs
3	6	1985	2326	42	0.5	−12	34.4	416.8	6.0	287	1.2	281	4.8	289	c/cs
3	6	1985	2334	42	0.7	−12	35.5	417.6	5.9	191	1.2	281	6.0	180	c/cs
3	6	1985	2340	42	0.2	−12	35.6	418.2	5.1	88	1.2	281	6.2	90	c/cs
4	6	1985	0040	42	0.4	−12	28.8	423.2	6.5	288	1.2	281	5.3	290	c/cs
4	6	1985	0055	42	0.9	−12	30.9	424.9	6.7	288	1.2	281	5.5	290	c/cs
4	6	1985	0100	42	1.1	−12	31.6	425.4	1.2	281	1.2	281	0.0	500	c/cs
4	6	1985	0136	42	1.20	−12	32.56	426.1	0.4	100	0.4	100	0.0	500	satl
4	6	1985	1015	42	0.60	−12	27.80	429.7	0.0	90	0.0	90	0.0	500	640A
6	6	1985	0100	42	0.60	−12	27.80	429.7	1.1	28	1.1	28	0.0	500	640A
6	6	1985	0240	42	2.3	−12	26.6	431.6	5.1	286	1.1	28	5.5	274	c/cs
6	6	1985	0241	42	2.3	−12	26.7	431.7	5.1	8	1.1	28	4.1	3	c/cs
6	6	1985	0248	42	2.9	−12	26.6	432.3	6.0	4	1.1	28	5.0	359	c/cs
6	6	1985	0256	42	3.7	−12	26.5	433.1	5.9	355	1.1	28	5.0	348	c/cs
6	6	1985	0326	42	6.6	−12	26.9	436.1	6.0	355	1.1	28	5.1	348	c/cs
6	6	1985	0342	42	8.2	−12	27.0	437.7	5.5	6	1.1	28	4.4	1	c/cs
6	6	1985	0343	42	8.3	−12	27.0	437.8	5.5	33	1.1	28	4.3	34	c/cs
6	6	1985	0344	42	8.4	−12	27.0	437.9	4.9	75	1.1	28	4.3	86	c/cs
6	6	1985	0347	42	8.5	−12	26.6	438.1	6.0	83	1.1	28	5.4	93	c/cs
6	6	1985	0358	42	8.6	−12	25.2	439.2	6.0	83	1.1	28	5.4	93	c/cs
6	6	1985	0426	42	8.95	−12	21.43	442.0	6.6	90	1.2	78	5.4	93	satl
6	6	1985	0428	42	8.9	−12	21.1	442.2	6.7	90	1.2	78	5.5	93	c/cs
6	6	1985	0445	42	8.9	−12	18.6	444.1	6.5	98	1.2	78	5.3	103	c/cs
6	6	1985	0448	42	8.89	−12	18.13	444.5	5.9	100	0.6	73	5.3	103	satl
6	6	1985	0502	42	8.7	−12	16.3	445.8	6.0	101	0.6	73	5.4	104	c/cs
6	6	1985	0520	42	8.3	−12	13.9	447.6	0.6	73	0.6	73	0.0	500	c/cs
6	6	1985	0626	42	8.52	−12	13.04	448.3	0.3	273	0.3	273	0.0	500	satl
6	6	1985	1208	42	8.60	−12	15.40	450.1	0.0	90	0.0	90	0.0	500	639E
7	6	1985	1340	42	8.60	−12	15.40	450.1	0.1	270	0.1	270	0.0	500	639E
7	6	1985	1450	42	8.60	−12	15.50	450.1	0.0	90	0.0	90	0.0	500	639F
8	6	1985	0200	42	8.60	−12	15.50	450.1	0.2	78	0.2	78	0.0	500	639F
8	6	1985	1406	42	9.19	−12	11.76	453.0	1.7	270	1.7	270	0.0	500	satl
8	6	1985	1736	42	9.24	−12	19.92	459.0	0.5	89	0.5	89	0.0	500	satl
9	6	1985	0630	42	9.30	−12	10.90	465.7	0.0	90	0.0	90	0.0	500	641A
15	6	1985	1200	42	9.30	−12	10.90	465.7	0.0	90	0.0	0	0.0	500	641C

[a] Universal Coordinated Time.
[b] Satl = satellite navigation; c/cs = change of course.

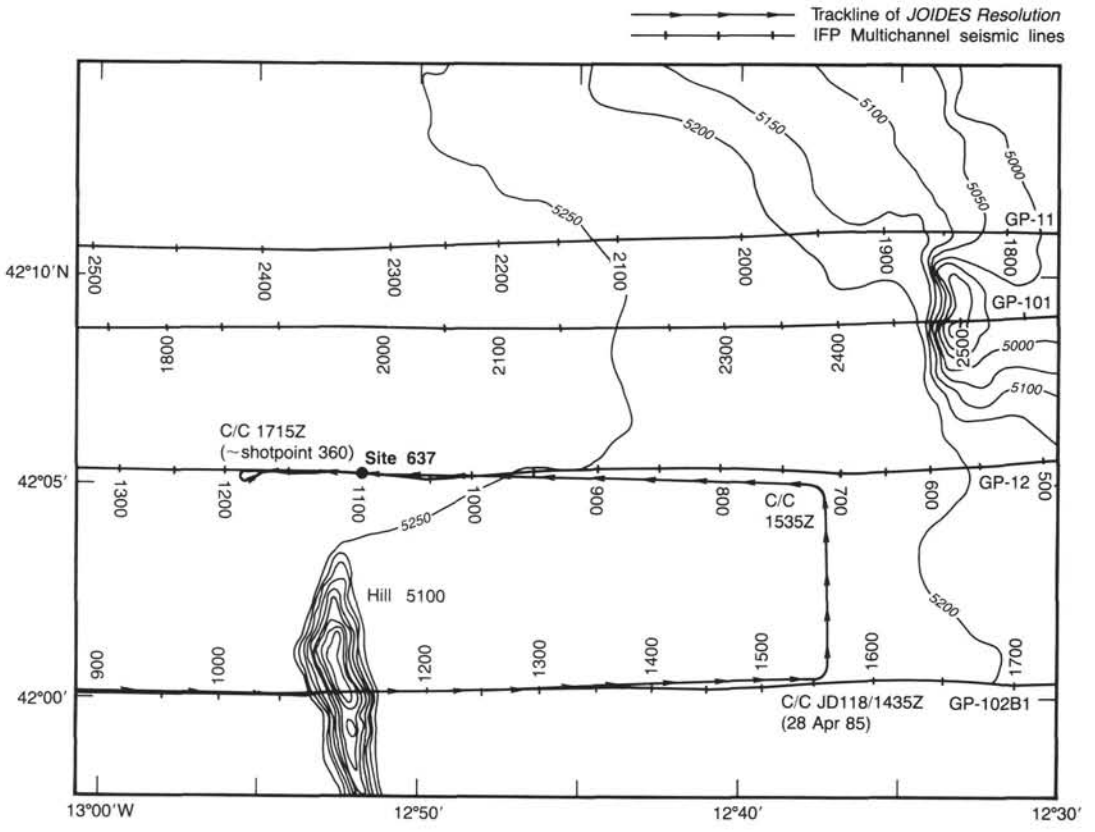


Figure 2. Detailed navigation plot showing track of *JOIDES Resolution* on approach to Site 637 (see Site 637 chapter, this volume). Course changes are marked on unprocessed analog and processed digital seismic profiles (Figs. 6 and 7). Sea Beam bathymetry courtesy of J. C. Sibuet (see Sibuet et al., this volume).

Five seismic lines were collected during the cruise, as follows:

1. *Seismic line 1* was collected en route to Site 637, the first site visited during Leg 103. The EDO 2 record of the unprocessed analog data is shown in Figure 6 (from Julian Day 117/1400Z to Julian Day 118/1813Z). The Versatec plot of the part of these data that were reprocessed is shown in Figure 7 (approximately from Julian Day 118/1645Z to 118/1810Z). Navigation on approach to Site 637 is shown in Figure 2; course and speed changes are indicated on both the EDO 2 records and the Versatec plot.

2. *Seismic line 2* was collected during the transit from Site 637 to Site 638. The EDO 2 record of the unprocessed analog data is shown in Figure 8 (from Julian Day 124/2135Z to Julian Day 125/0625Z). The Versatec plot of the part of these data near Site 638 that were reprocessed is shown in Figure 9 (Shotpoints 1352–2621; from Julian Day 125/0210Z to 125/0624Z). Navigation on approach to Site 638 is shown in Figure 3; course and speed changes are indicated on both the EDO 2 record and the Versatec plot.

3. *Seismic line 3* was collected during the transit between Site 638 and Site 639. The EDO 2 record is shown in Figure 10 (from Julian Day 143/0646Z to 143/0958Z). The data were not reprocessed, so no Versatec plots are available. Navigation on approach to Site 639 is shown in Figure 4; course changes are indicated on the EDO profile.

4. *Seismic line 4* was collected during the transit from Site 638 to Site 640, which occurred after logging Hole 638C. The EDO 2 record is shown in Figure 11 (from Julian Day 154/2032Z to 155/0122Z). The Versatec plot of the reprocessed data is shown in Figure 12 (shotpoints 0–1472; from Julian Day 154/2027Z to 155/0121Z). Navigation on approach to Site 640 is shown in Figure 5; course and speed changes are indicated on both the EDO 2 record and the Versatec plot.

5. *Seismic line 5* was collected during the transit from Site 640 to Site 639. We returned to Site 639 to drill Holes 639E and 639F (see Site 639 chapter, this volume). The EDO 2 record is shown in Figure 13 (from Julian Day 157/0240Z to 157/0525Z). The Versatec plot of the reprocessed data is shown in Figure 14 (shotpoints 0–800; from Julian Day 157/0240Z to 157/0520Z). Course changes are indicated on both the EDO 2 record and the Versatec plot. Navigation on approach to Site 639 is shown in Figure 1B.

Seismic data were not collected after leaving Site 639 during the transit to Site 641 because of the short transit time and distances involved. In addition, the 3 hr of seismic data collected after leaving Site 641 were not reprocessed and are not presented here.

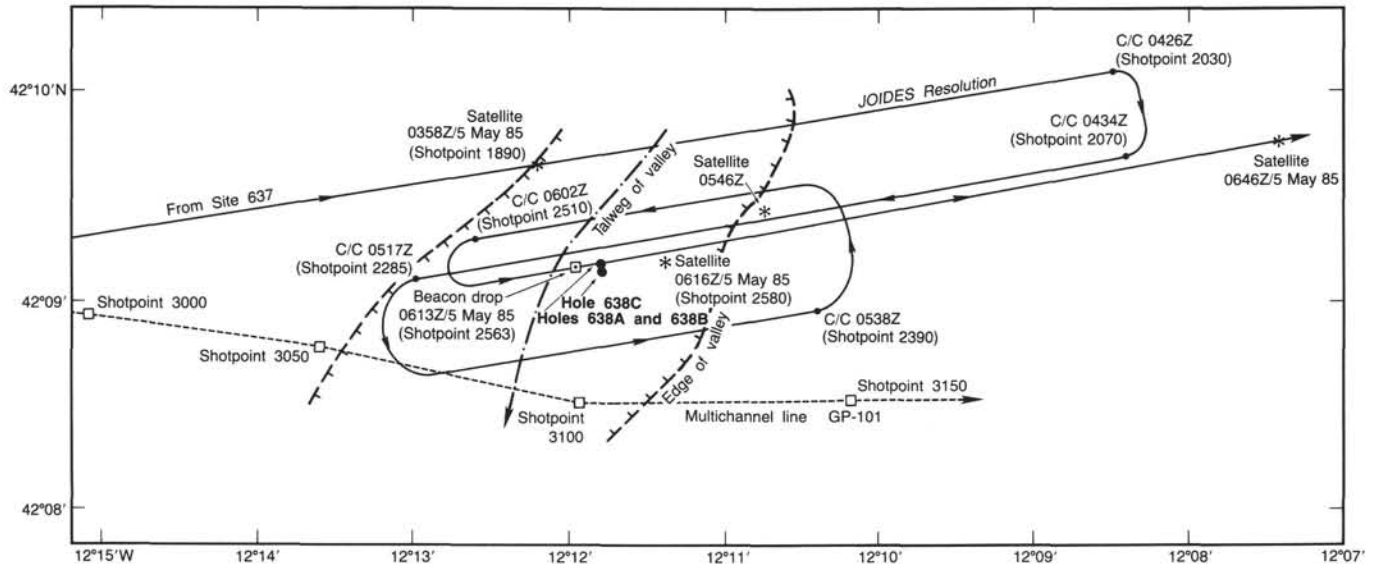


Figure 3. Detailed navigation plot showing track of *JOIDES Resolution* on approach to Site 638 (see Site 638 chapter, this volume). Course changes are marked on unprocessed analog and processed digital seismic profiles (Figs. 8 and 9). Location of edge of valley determined from shipboard seismic data.

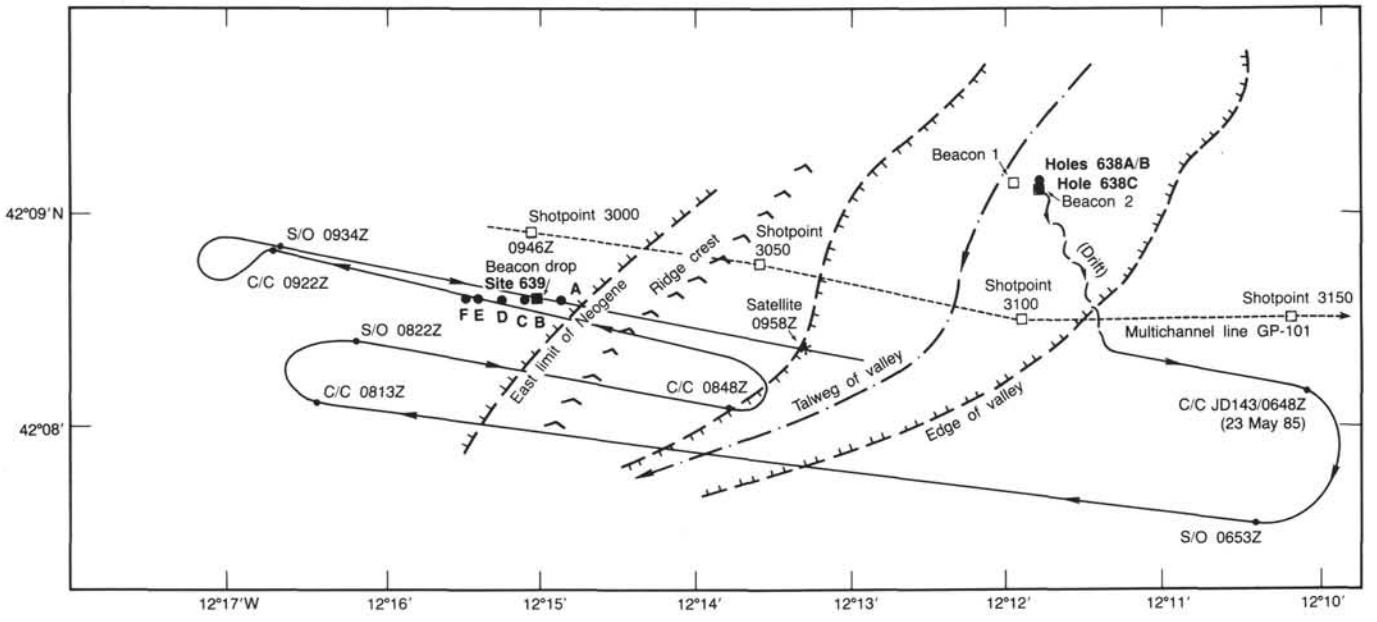


Figure 4. Detailed navigation plot showing track of *JOIDES Resolution* on approach to Site 639 (see Site 639 chapter, this volume). Course changes are marked on unprocessed analog seismic profile (Fig. 10). Location of edge of valley determined from shipboard seismic data.

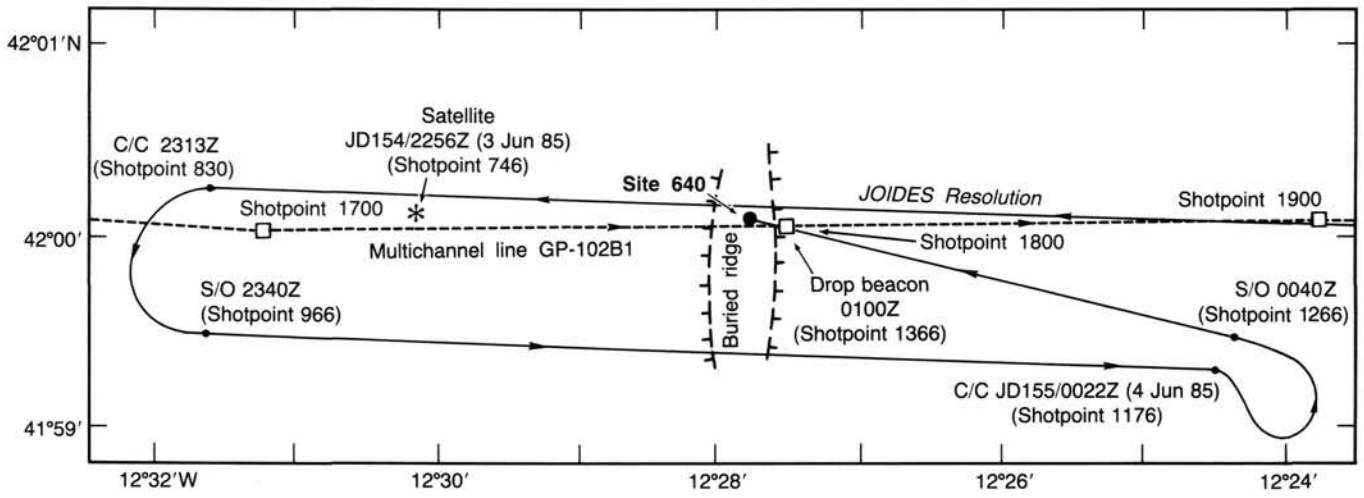


Figure 5. Detailed navigation plot showing track of *JOIDES Resolution* on approach to Site 640 (see Site 640 chapter, this volume). Course changes are marked on unprocessed analog and processed digital seismic profiles (Figs. 11 and 12). Location of buried ridge determined from shipboard seismic data.

Table 2. Seismic data real-time recording parameters.[a]

	Line 1	Line 2	Line 3	Line 4	Line 5
Start at:	40°30′N 17°13′W	Site 637	Site 638	Site 638	Site 640
End at:	Site 637	Site 638	Site 639	Site 640	Site 639
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
Streamer:	Port	Port	Port	Port	Port
EDO 1:					
High cut:	200 to 300 Hz	200 Hz	200 Hz	200 Hz	200 Hz
Low cut:	70 to 80 Hz	70 to 80 Hz	60 Hz	60 to 70 Hz	70 Hz
Gain:					
Amp:	80 to 85 dB	80 to 90 dB	90 dB	90 dB	90 dB
Recorder:	Full	Full	Full	Full	Full
EDO 2:					
High cut:	200 to 320 Hz	200 Hz	200 Hz	200 Hz	200 Hz
Low cut:	80 Hz	60 to 80 Hz	60 Hz	60 to 70 Hz	70 Hz
Gain:					
Amp:	80 dB	80 to 90 dB	90 dB	90 dB	90 dB
Recorder:	Full	Full	Full	Full	Full

[a] Unprocessed analog EDO 2 seismic data from lines 1 through 5 are shown in Figures 6, 8, 10, 11, and 13, respectively.

Table 3. Seismic-data-processing and -reprocessing parameters.[a]

	Line 1	Line 2	Line 3	Line 4	Line 5
Data window:	6000 to 8000 ms	5000 to 8000 ms	—	6000 to 8000 ms	6000 to 8000 ms
AGC:					
Response time:	500 ms	500 ms	—	500 ms	500 ms
Start time:	0 ms	0 ms		0 ms	0 ms
Gain:	100%	100%		100%	100%
Zero-phase band-pass filter:					
High cut:	250 Hz	None	—	None	None
Low cut:	60 Hz	None	—	None	None

[a] Processed digital seismic data plotted on the Versatec plotter for lines 1, 2, 4, and 5 are shown in Figures 7, 9, 12, and 14, respectively.

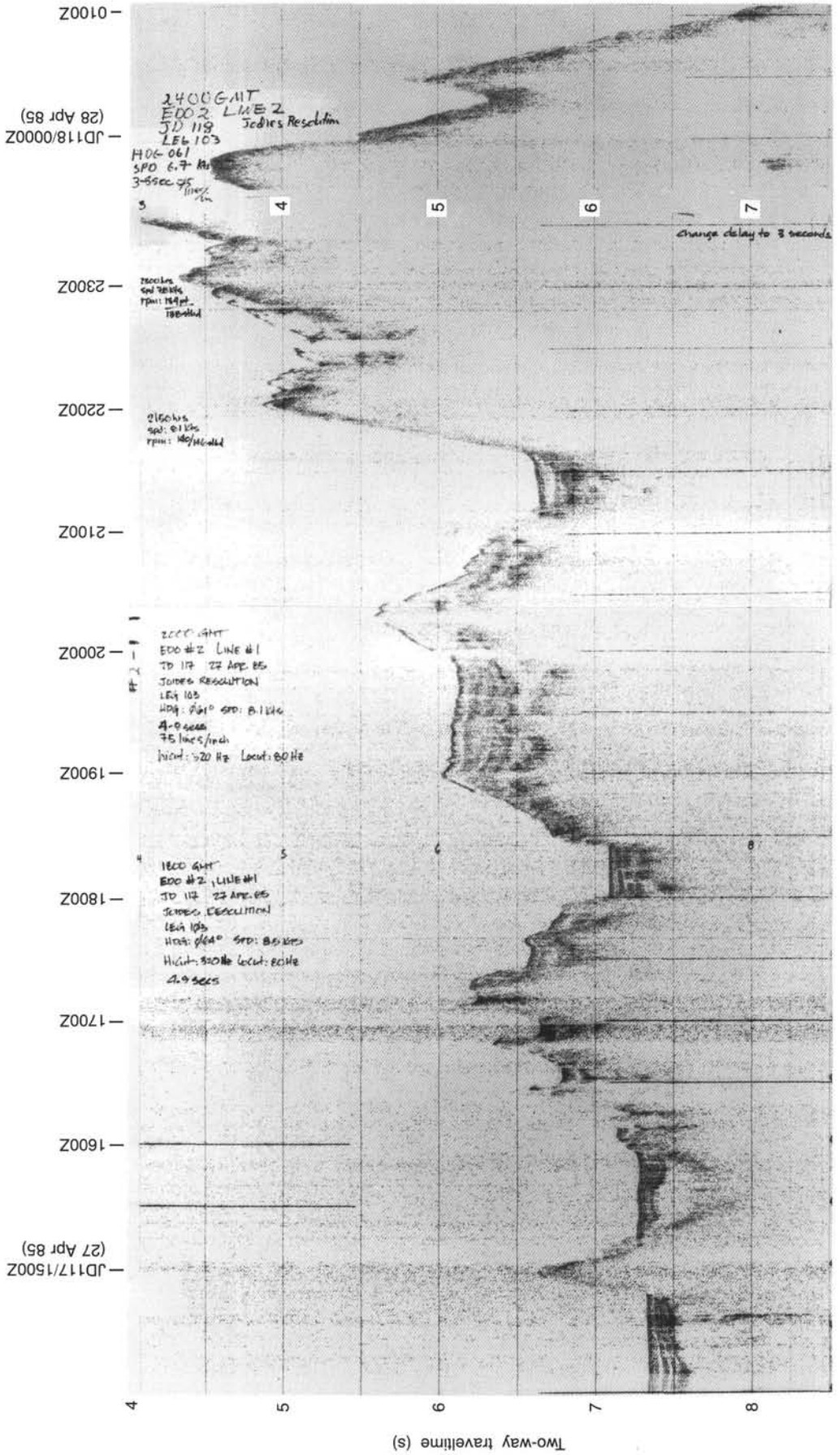


Figure 6. Unprocessed analog seismic data collected on line 1, en route to Site 637 and recorded on the EDO 2 recorder. Trackline navigation is shown in Figure 2.

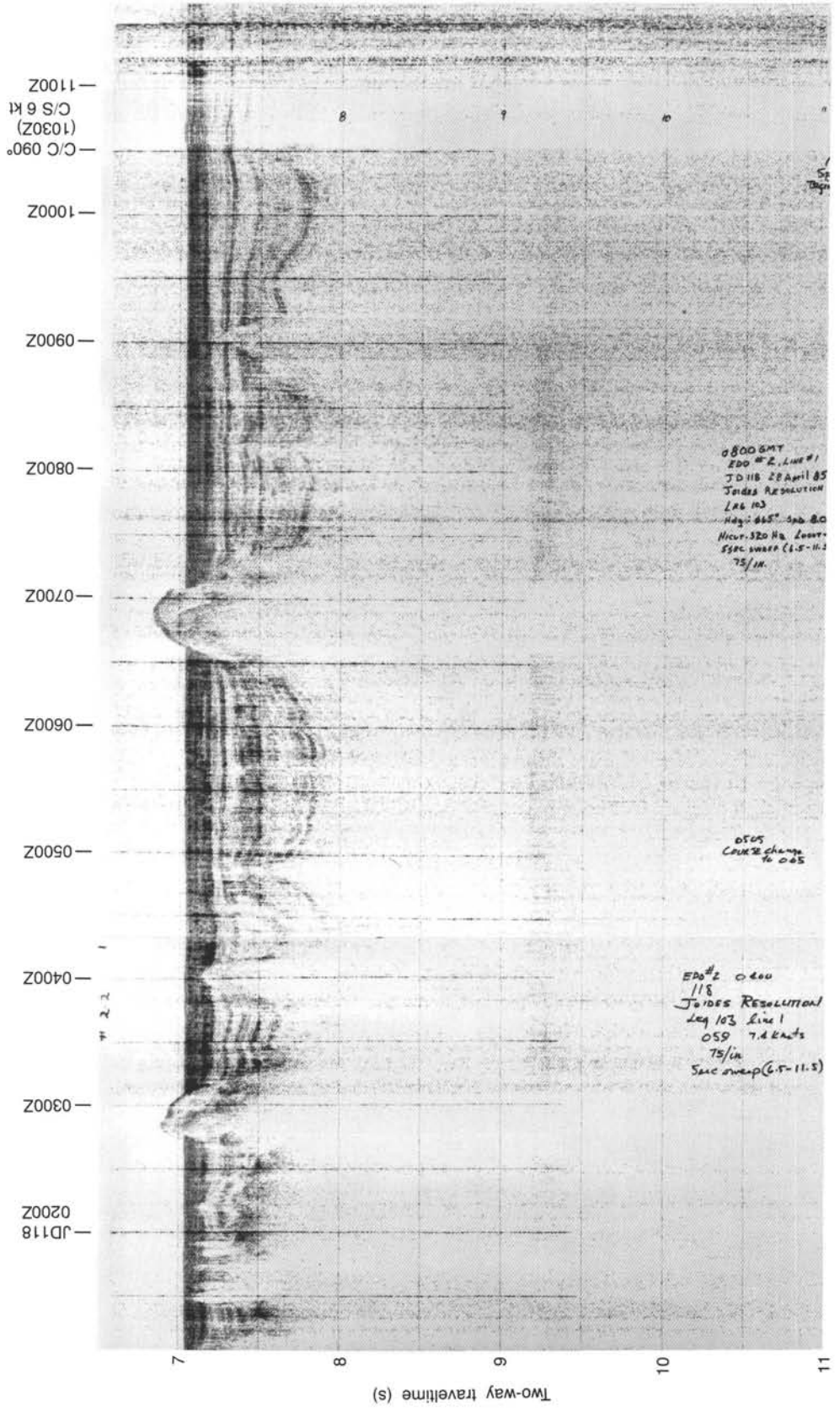


Figure 6 (continued).

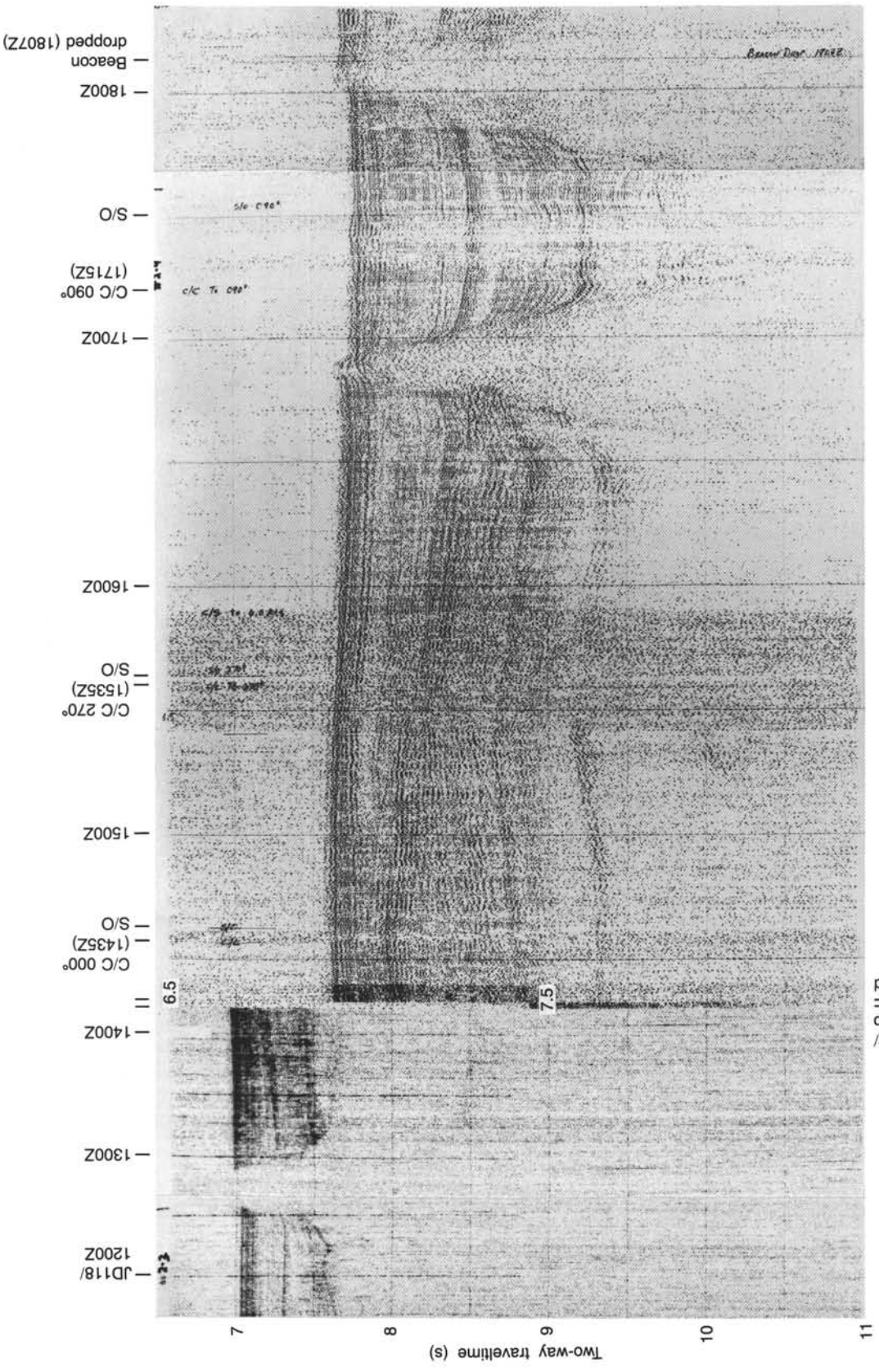
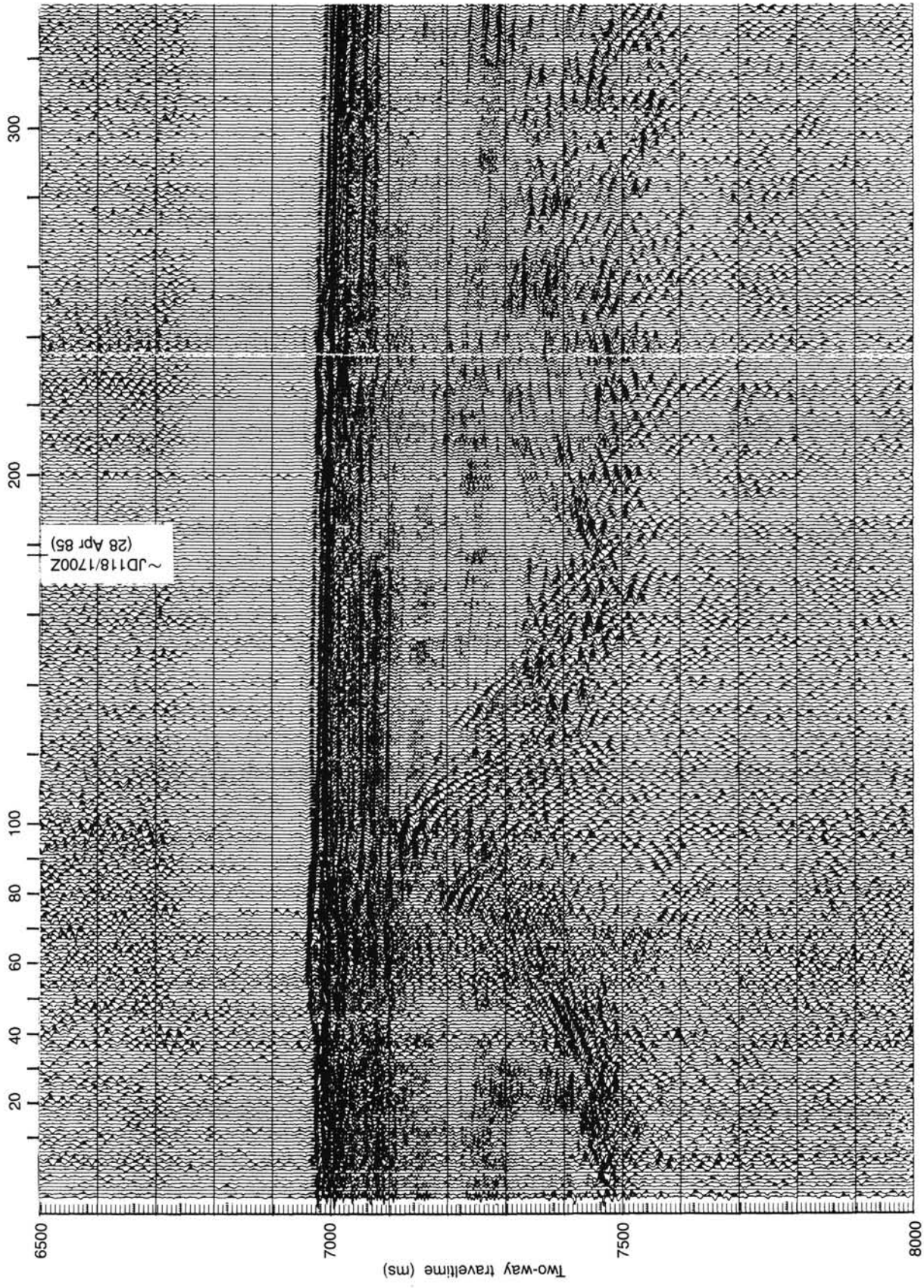


Figure 6 (continued).


~JD118/1700Z
(28 Apr 85)
20
40
60
80
100
200
300
6500
7000
7500
8000
Two-way traveltime (ms)

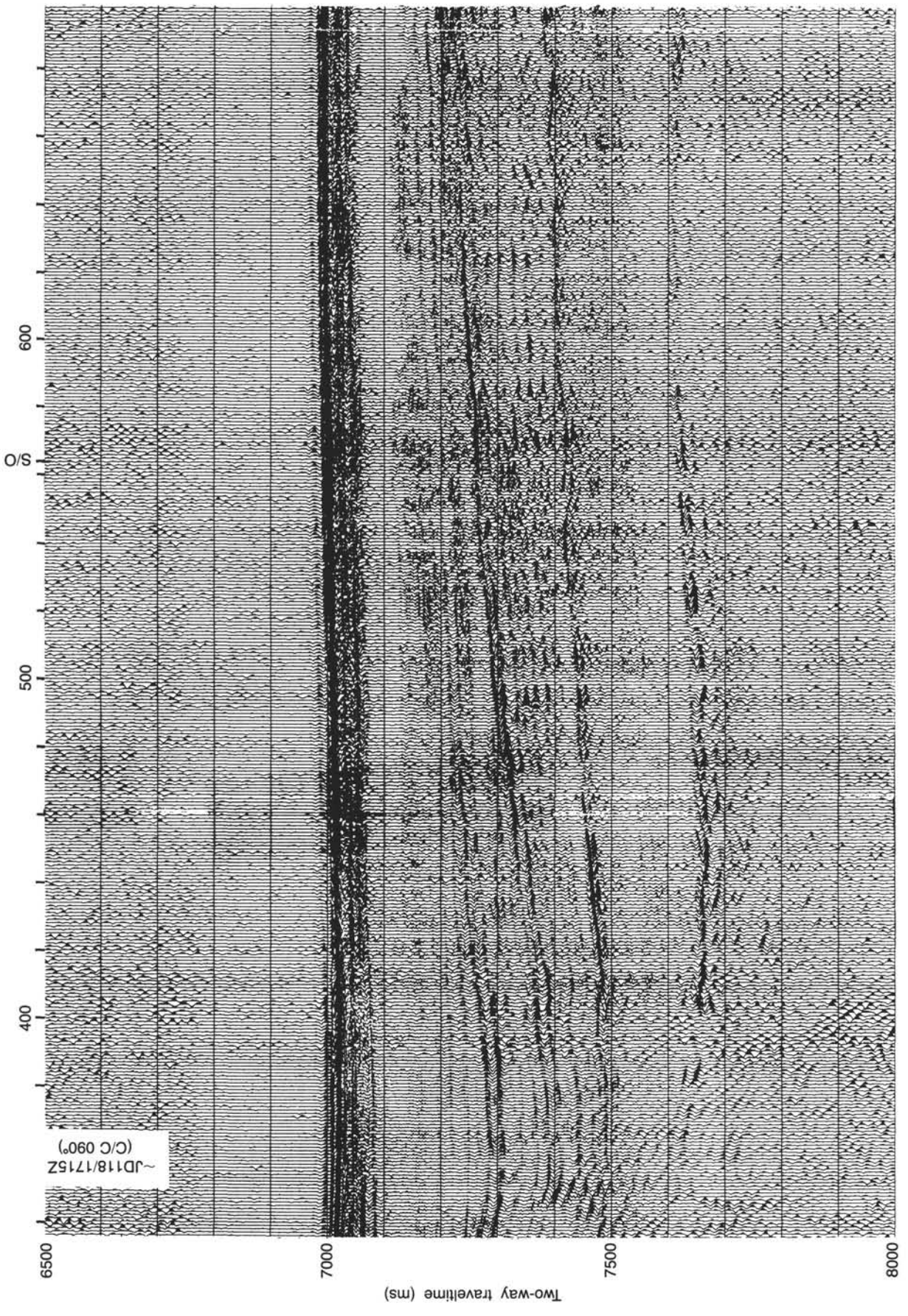


Figure 7. Processed digital seismic data collected on line 1, en route to Site 637. Profile was plotted on the Versatec plotter. Trackline navigation is shown in Figure 2.

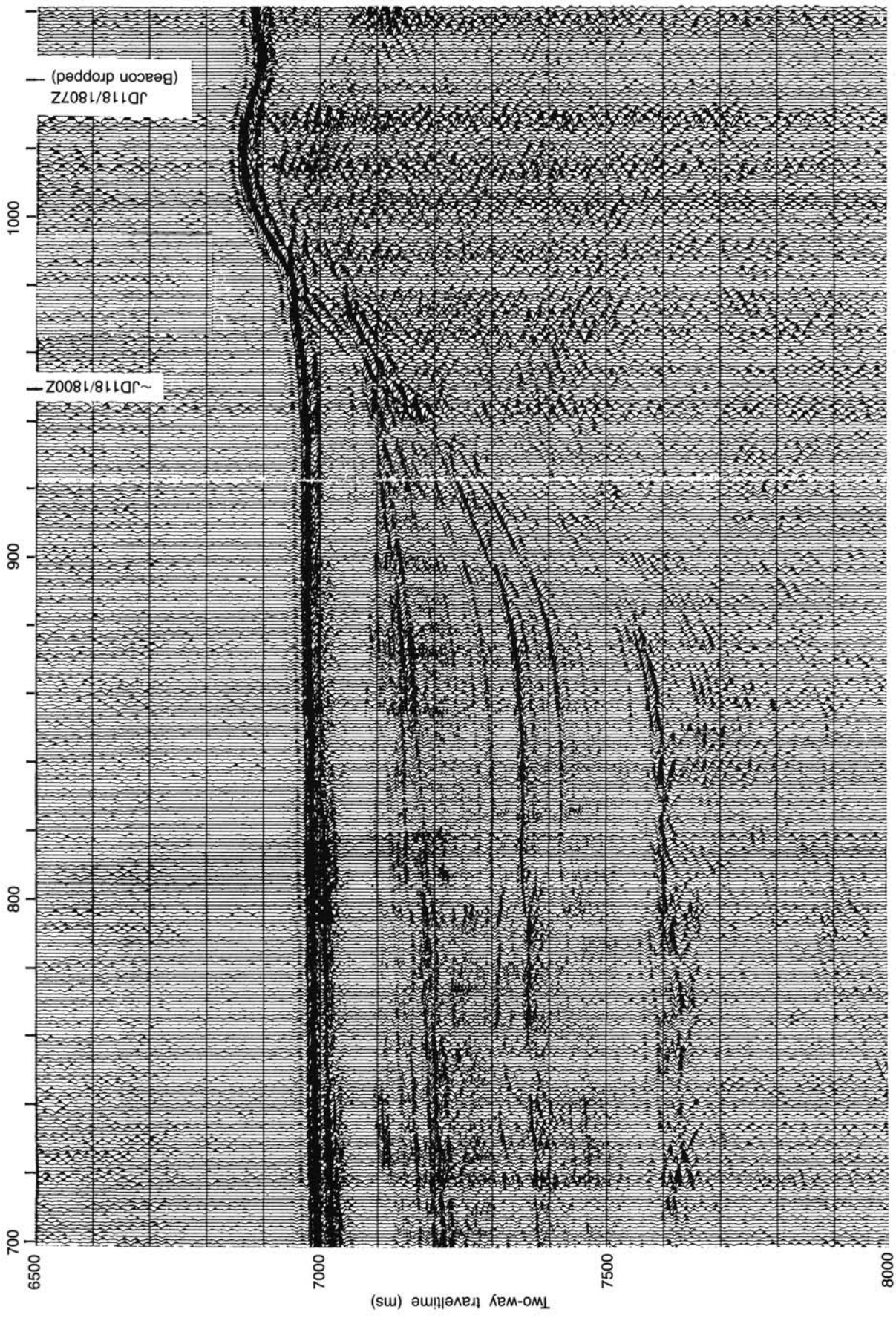


Figure 7 (continued).

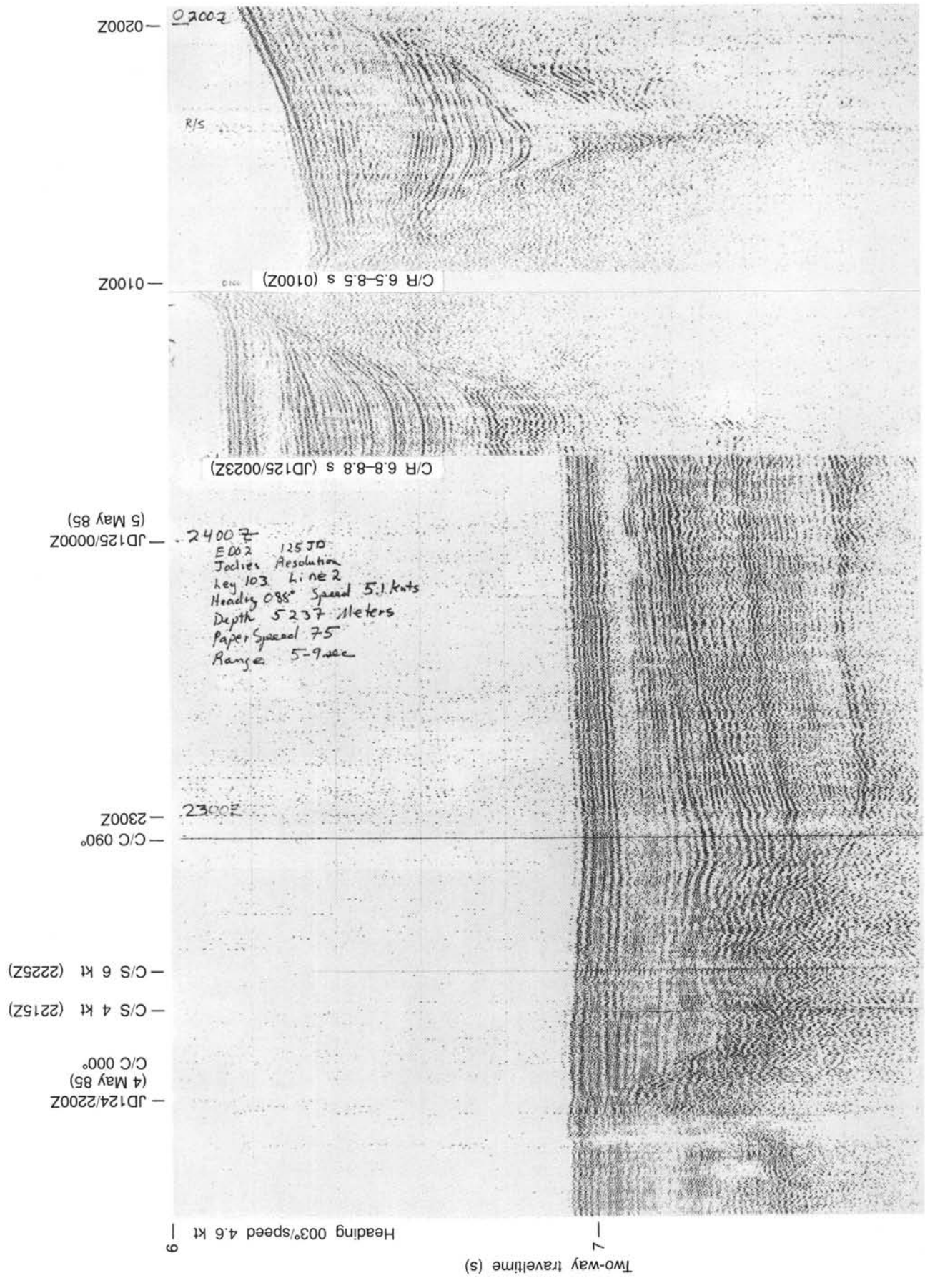


Figure 8. Unprocessed analog seismic data collected on line 2, during transit to Site 638 and recorded on the EDO 2 recorder. Trackline navigation is shown in Figure 3.

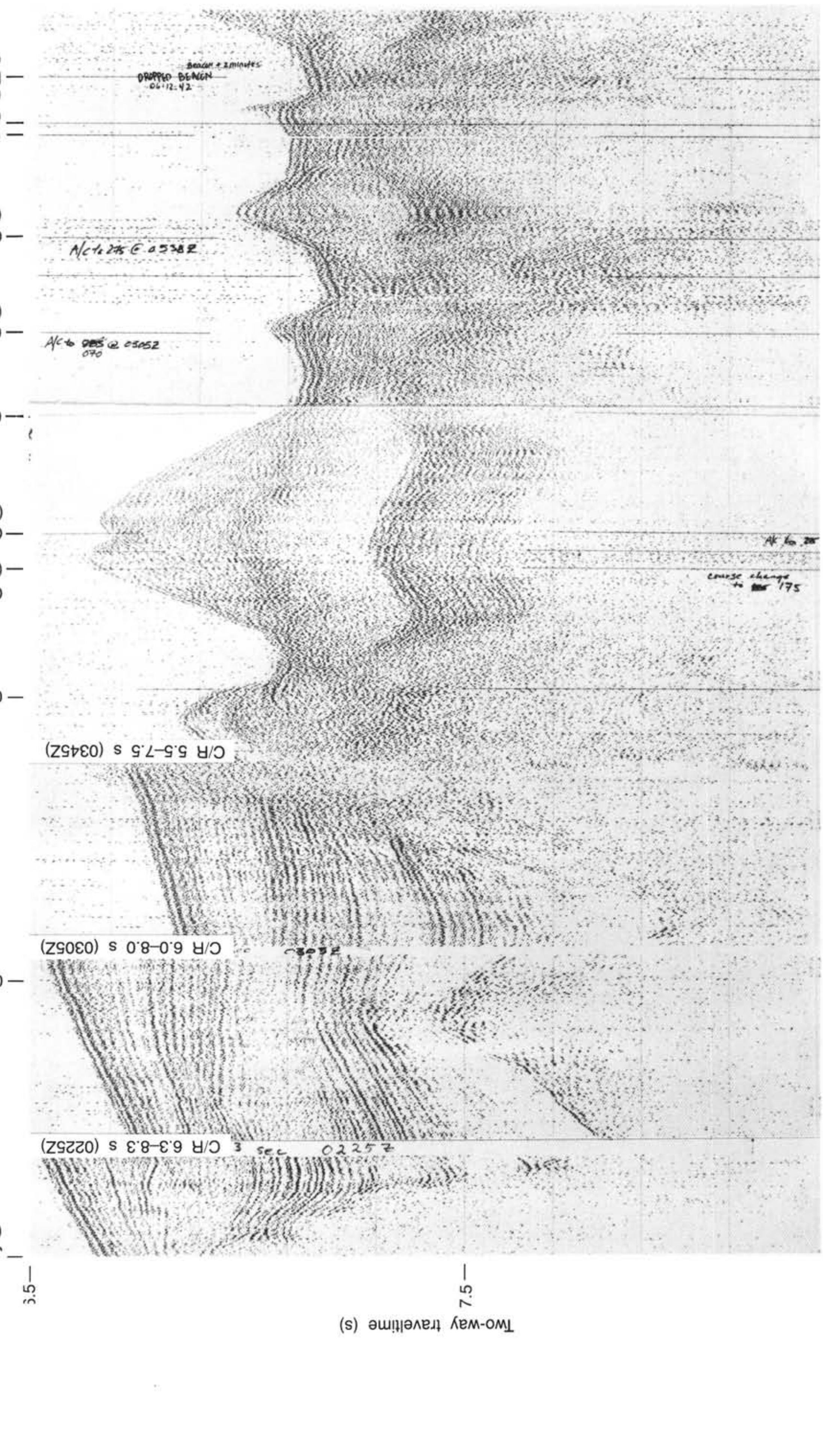


Figure 8 (continued).

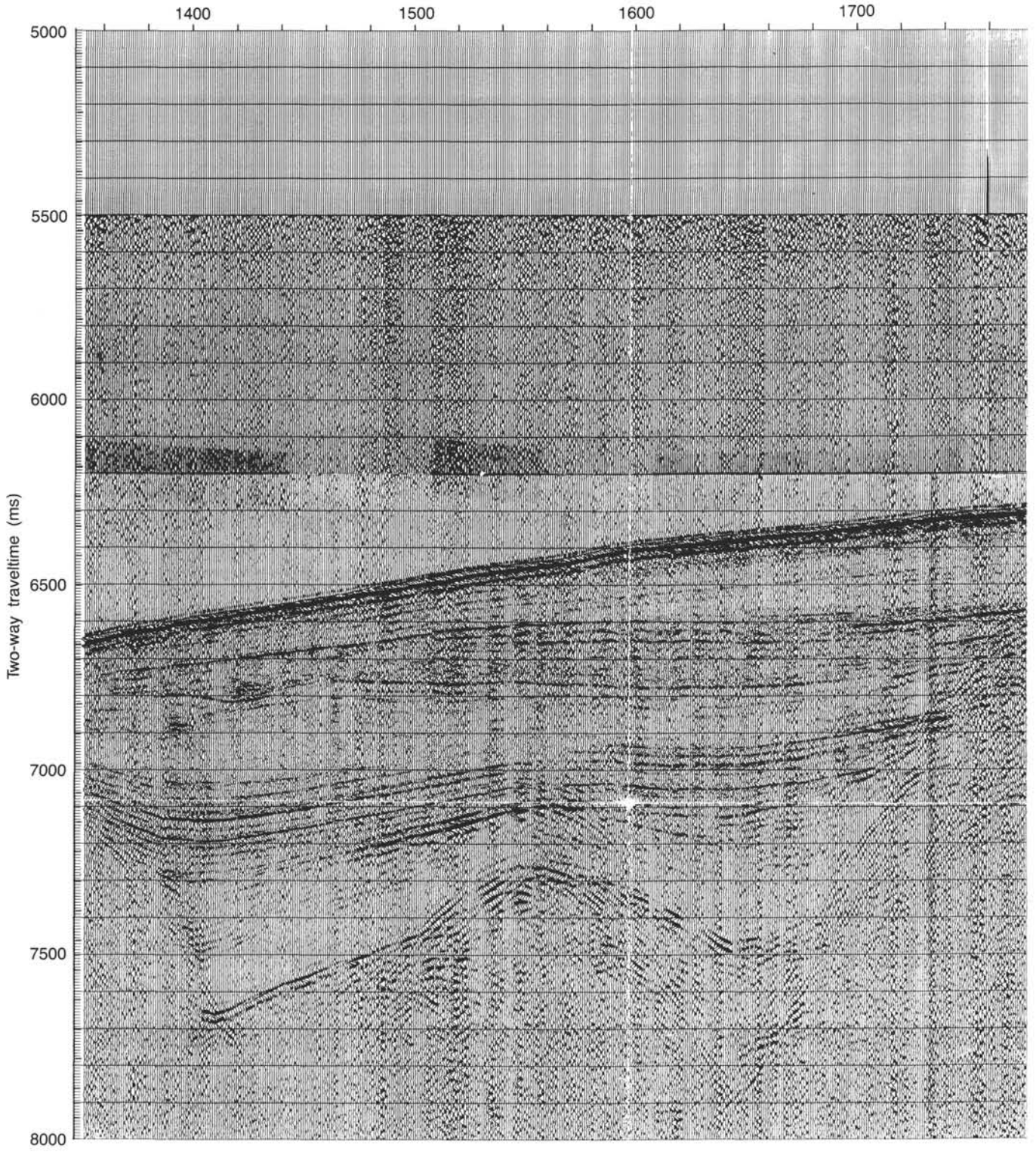


Figure 9. Processed digital seismic data collected on line 2, en route to Site 638. Profile was plotted on the Versatec plotter. Trackline navigation is shown in Figure 3.

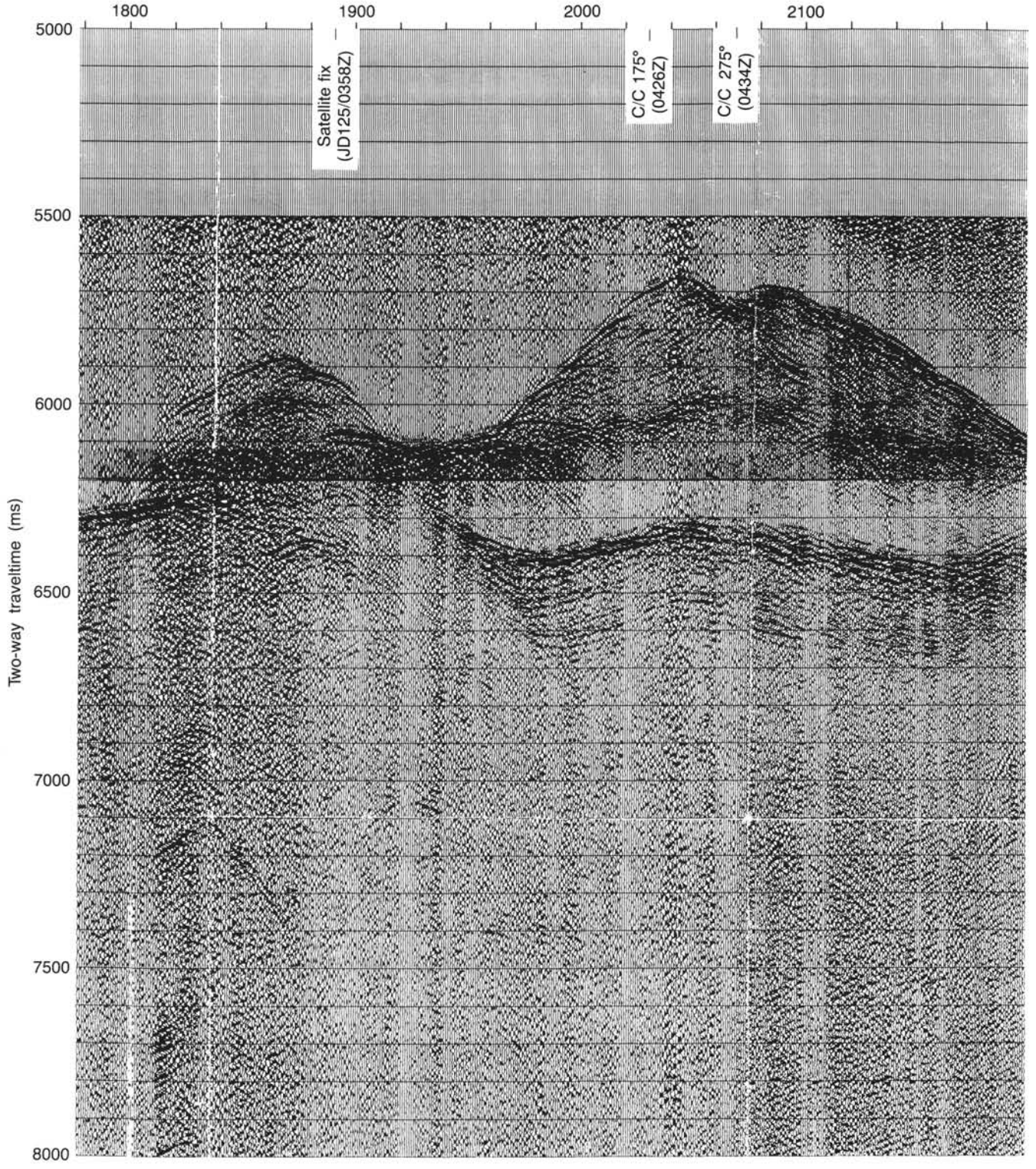


Figure 9 (continued).

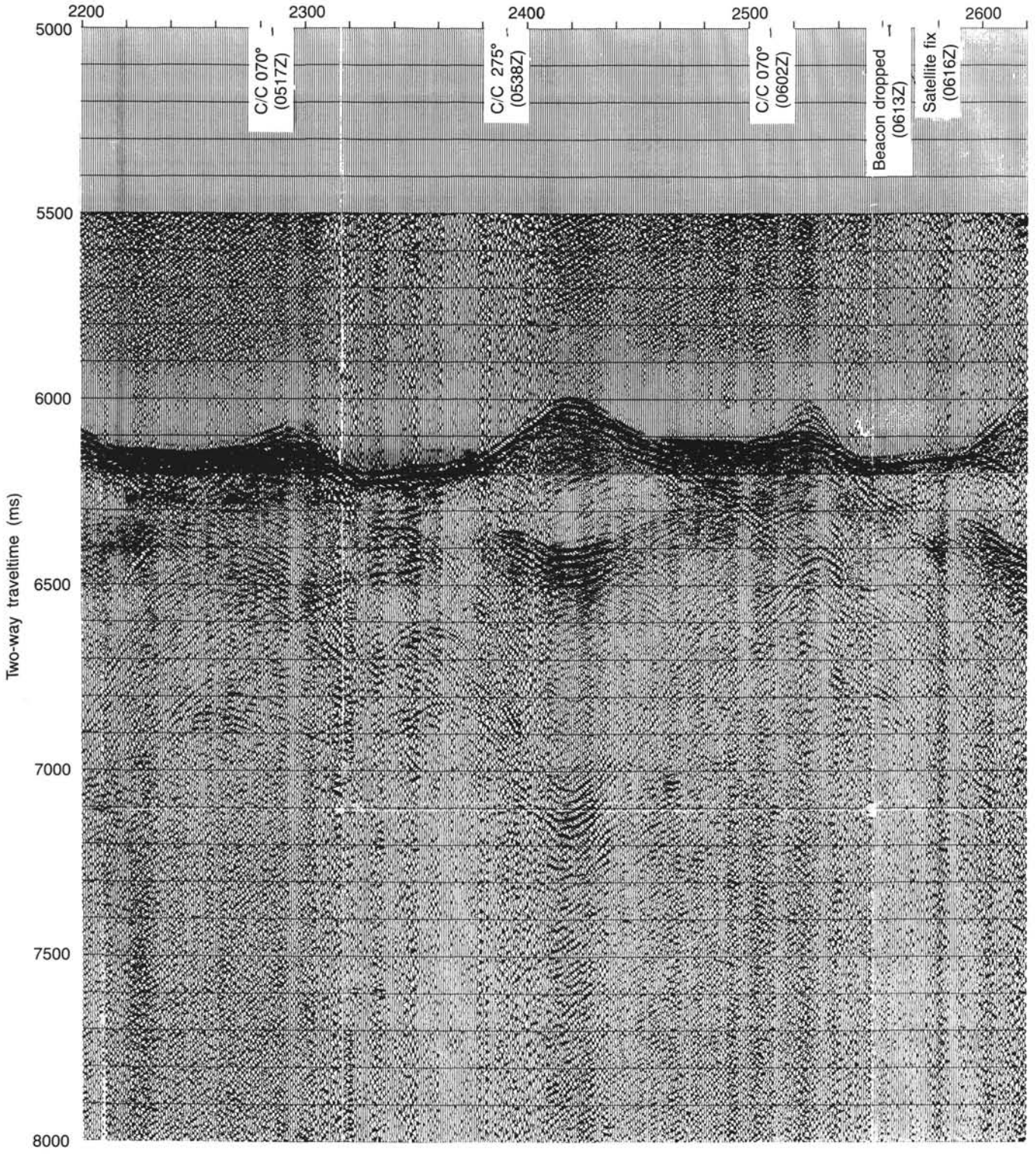


Figure 9 (continued).

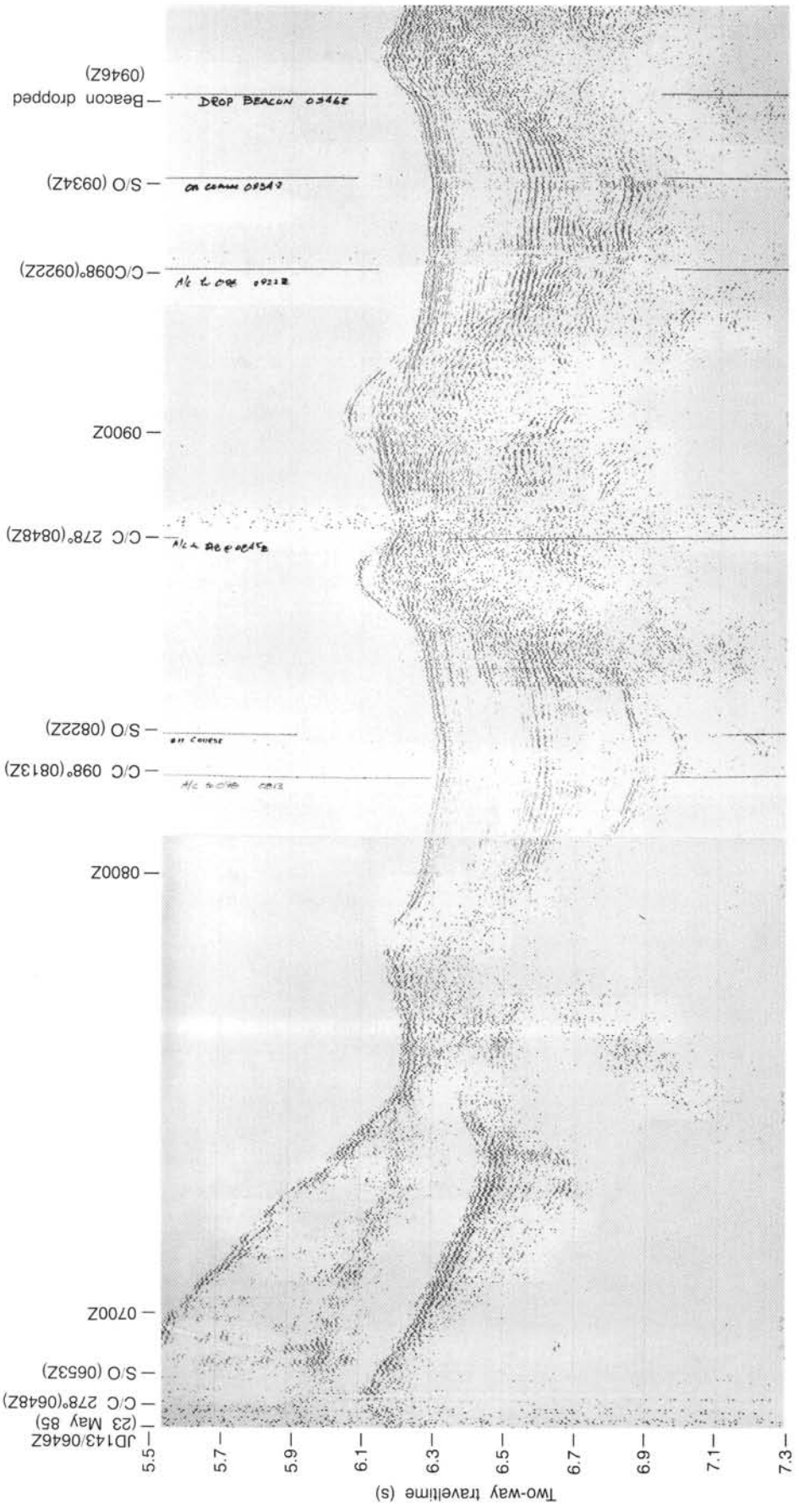


Figure 10. Unprocessed analog seismic data collected on line 3, during transit to Site 639 and recorded on the EDO 2 recorder. Trackline navigation is shown in Figure 4.

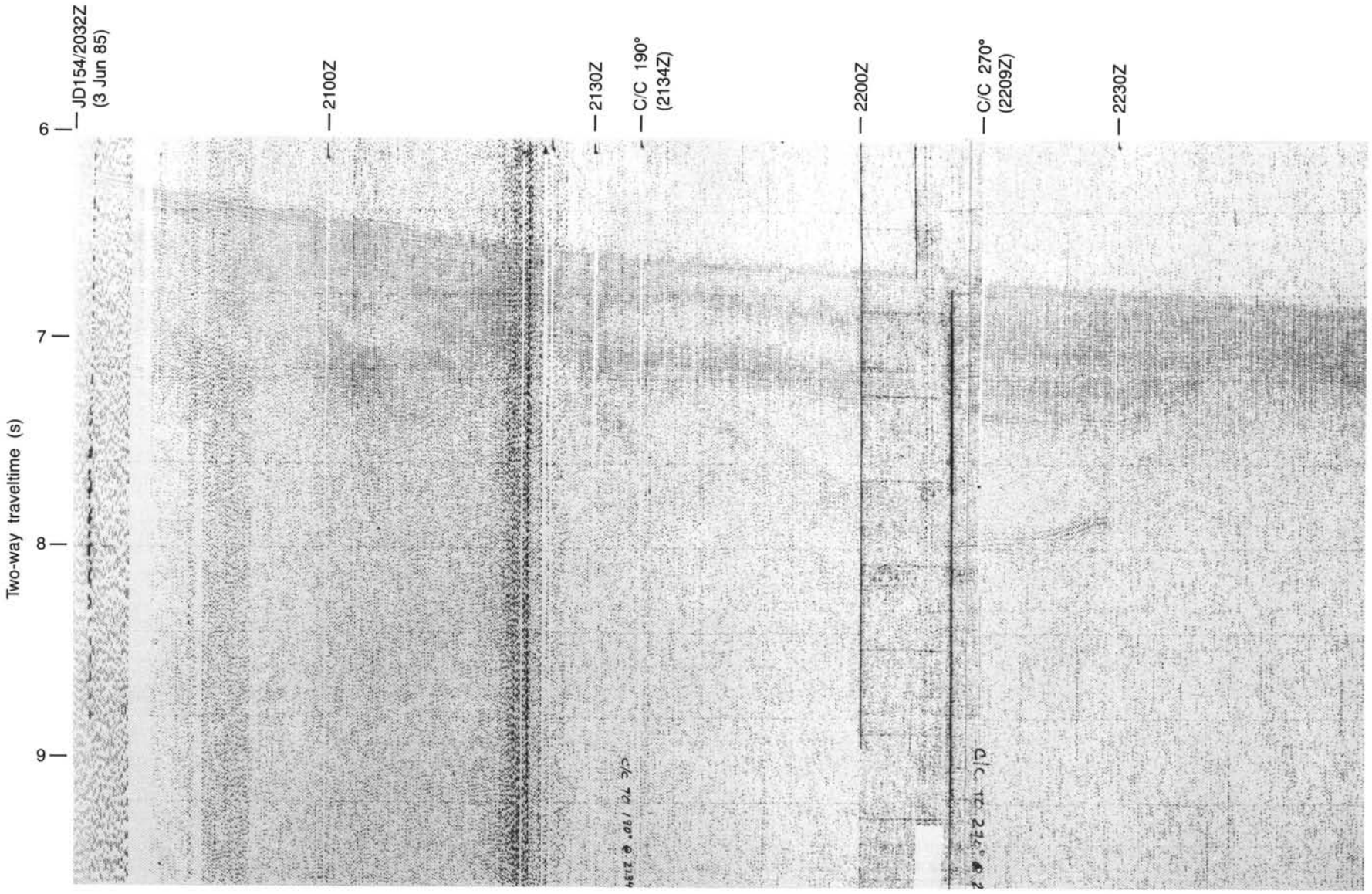


Figure 11. Unprocessed analog seismic data collected on line 4, during transit to Site 640 and recorded on the EDO 2 recorder. Trackline navigation is shown in Figure 5.

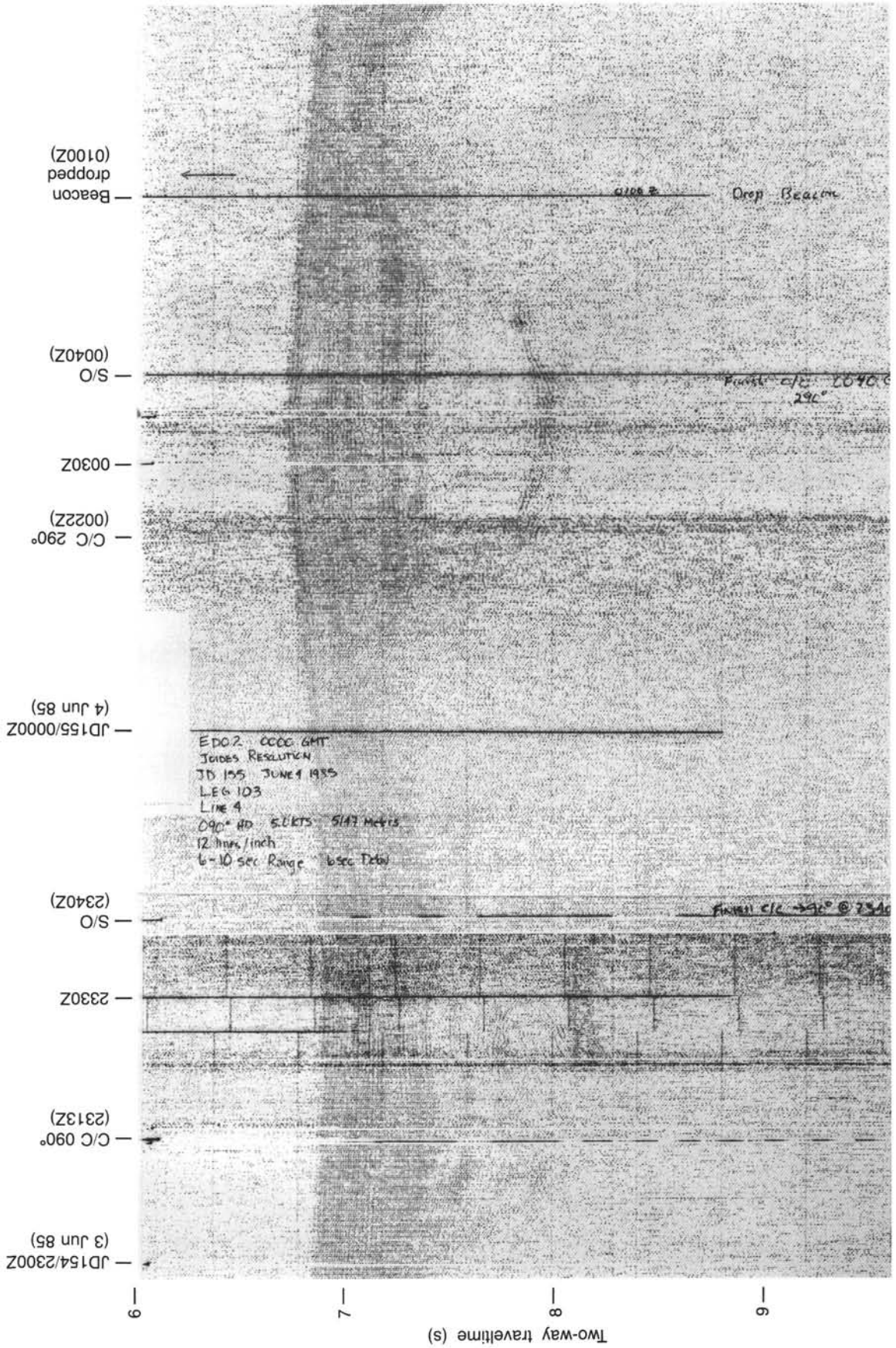


Figure 11 (continued).

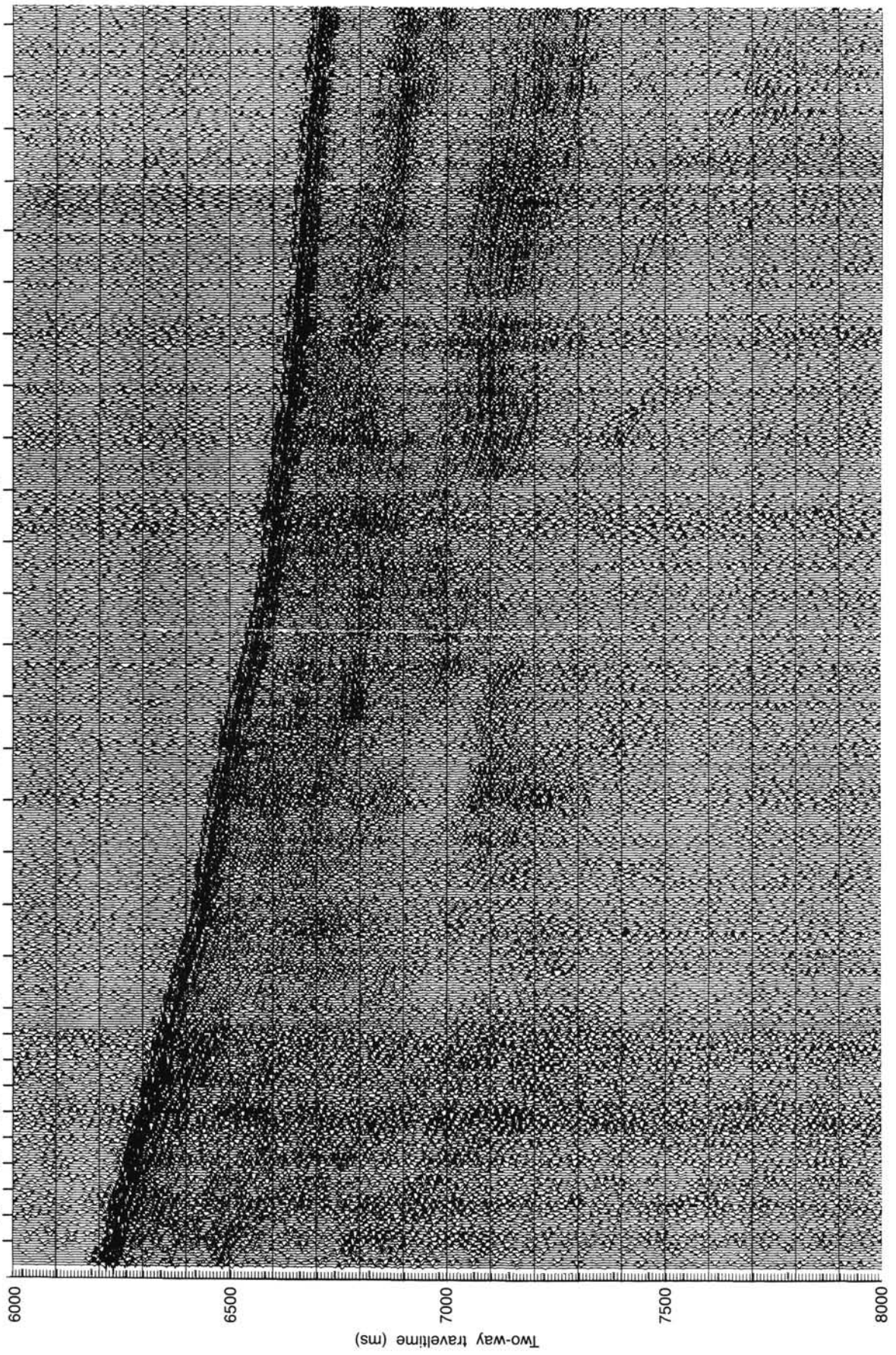


Figure 12. Processed digital seismic data collected on line 4, en route to Site 640. Profile was plotted on the Versatec plotter. Trackline navigation is shown in Figure 5.

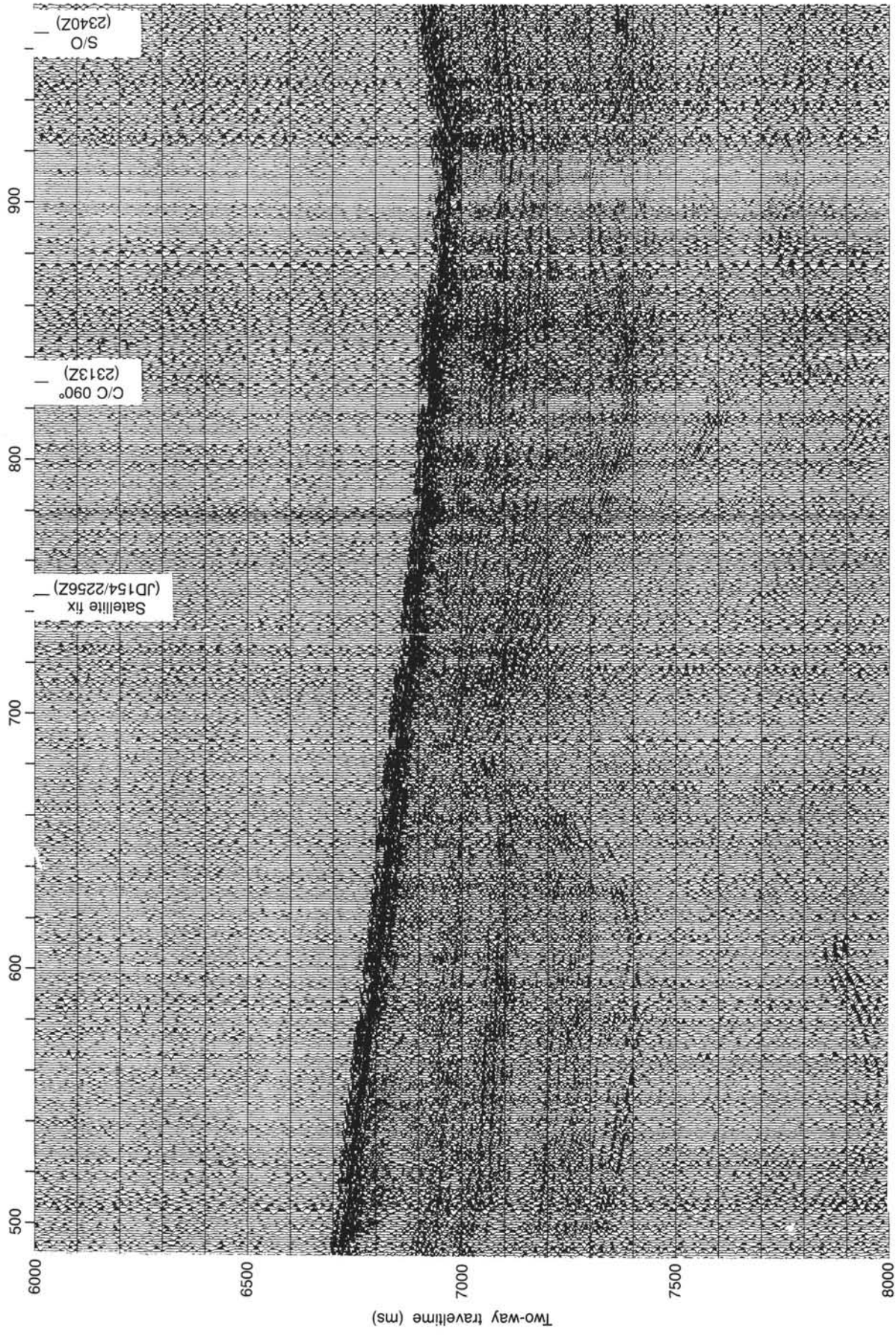


Figure 12 (continued).

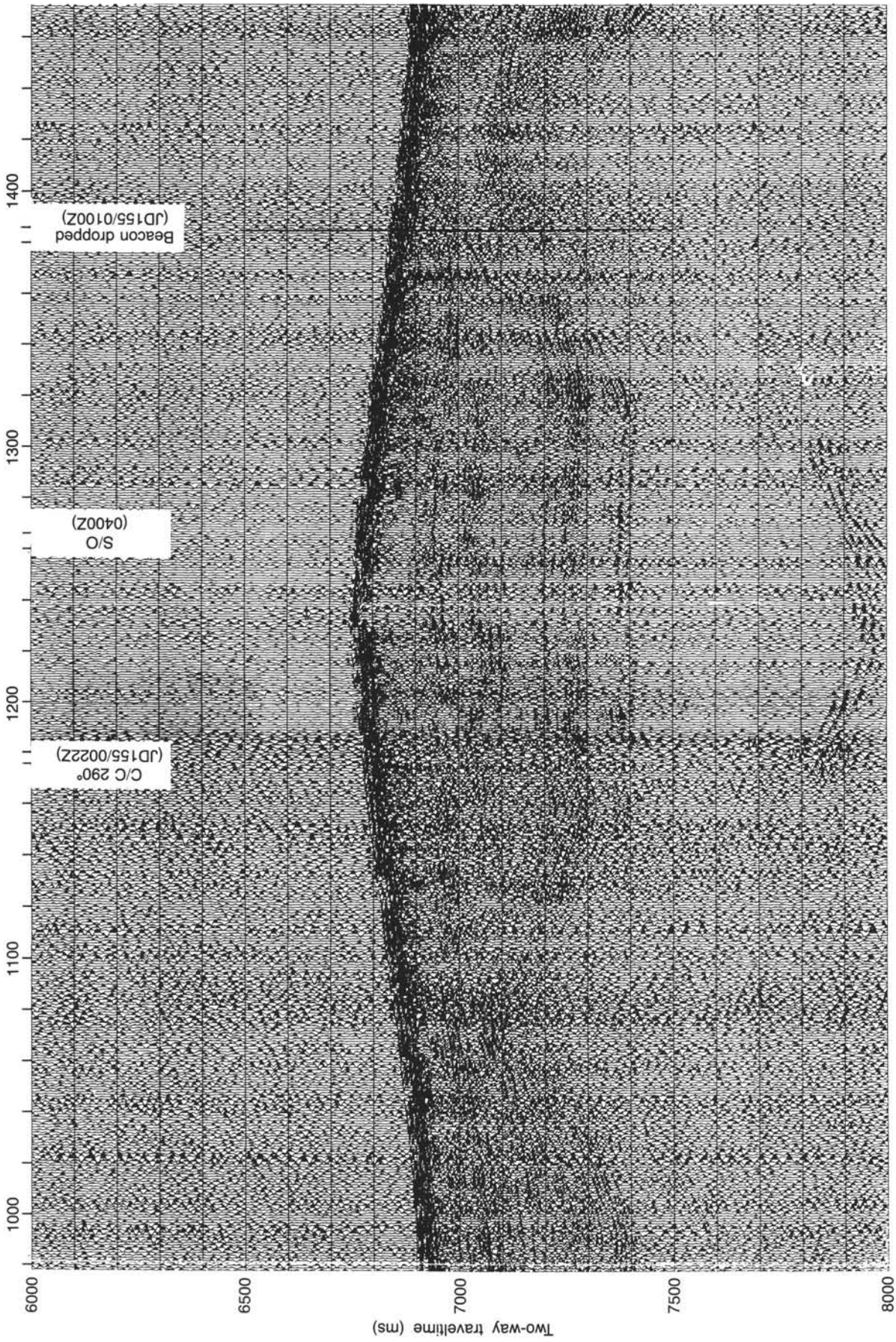


Figure 12 (continued).

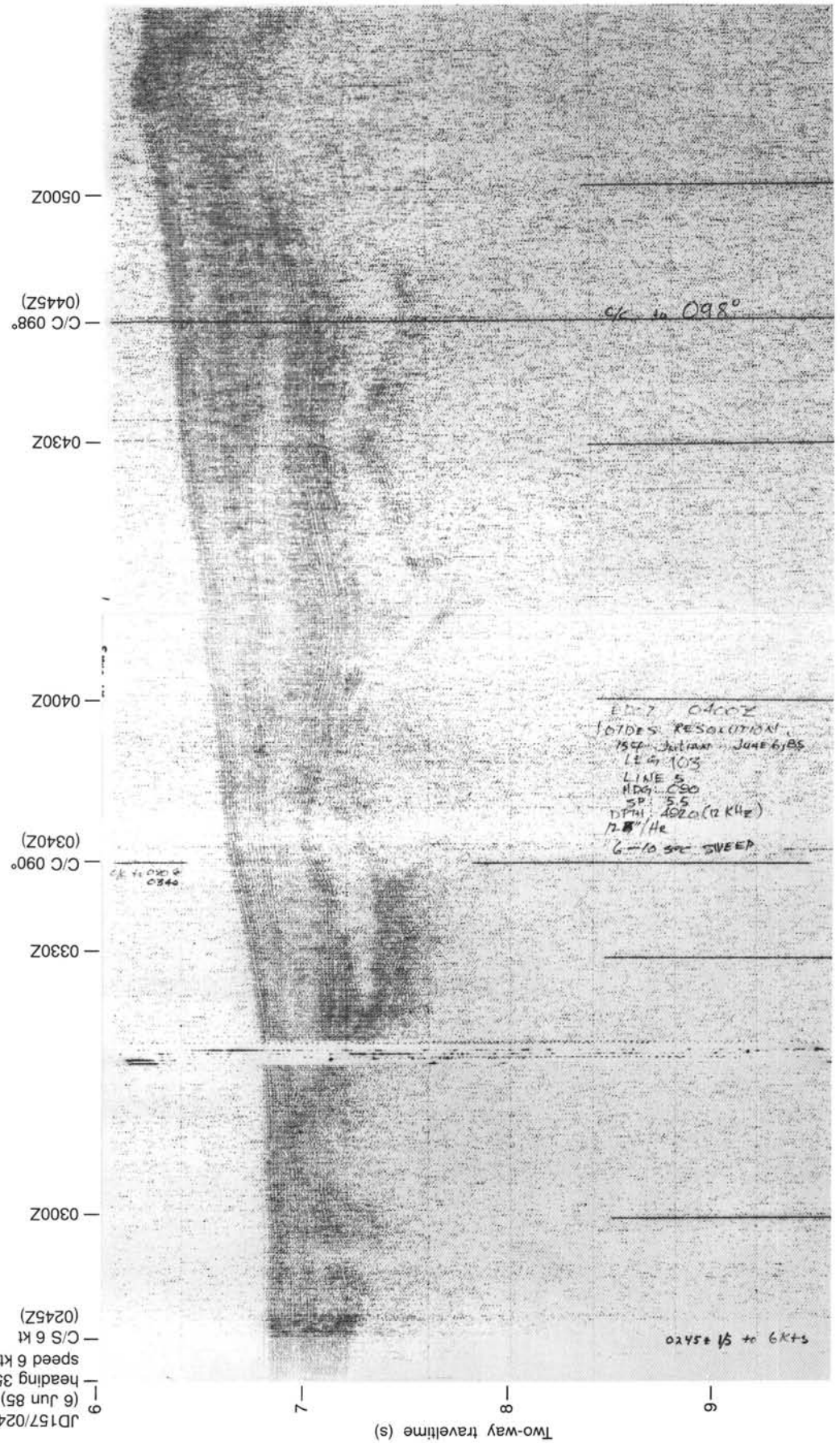


Figure 13. Unprocessed analog seismic data collected on line 5, during transit from Site 640 to Site 639 and recorded on the EDO 2 recorder. Location of profile is shown in Figure 1B.

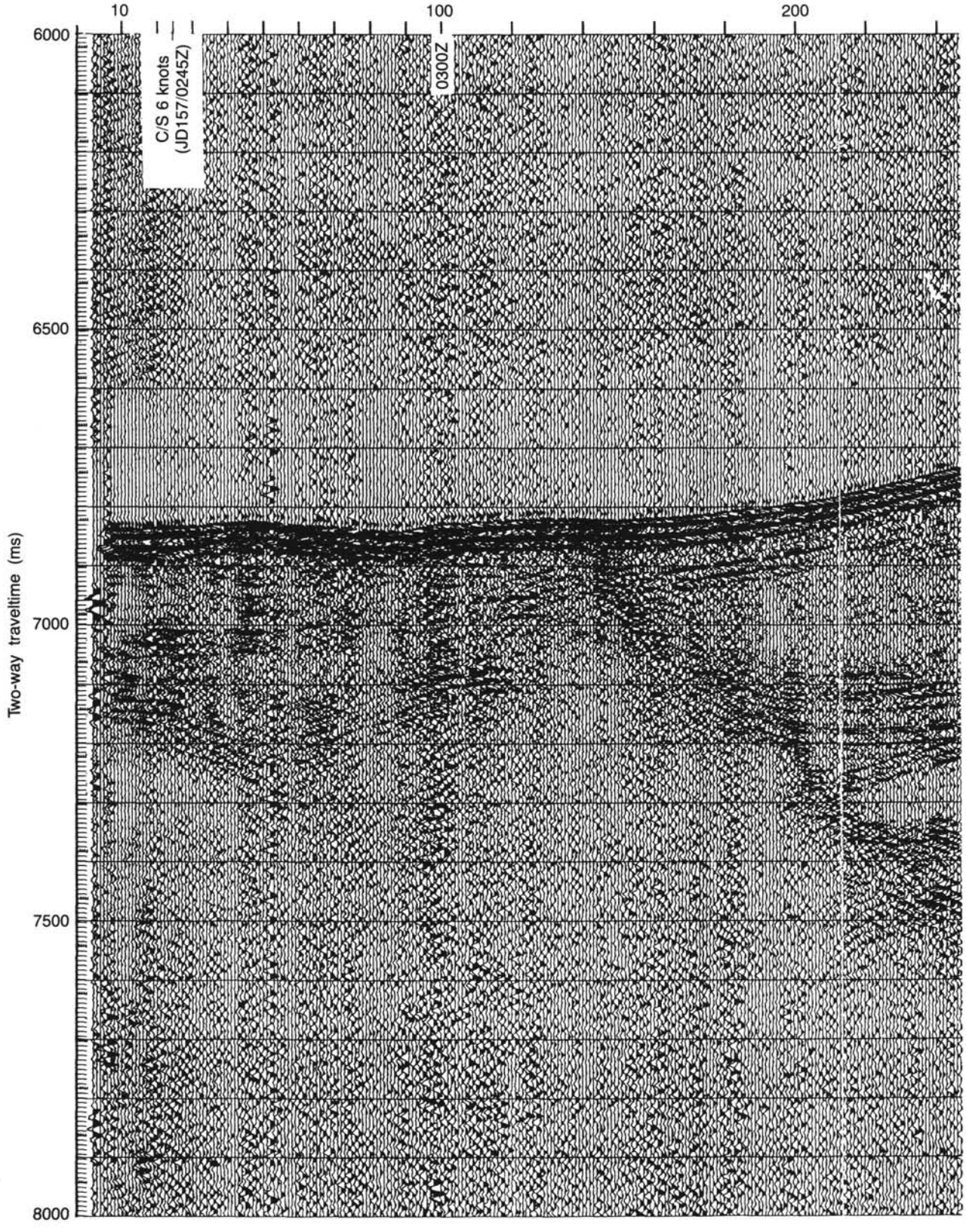


Figure 14. Processed digital seismic data collected on line 5, during transit from Site 640 to Site 639. Profile was plotted on the Versatec plotter. Location of profile is shown in Figure 1B.

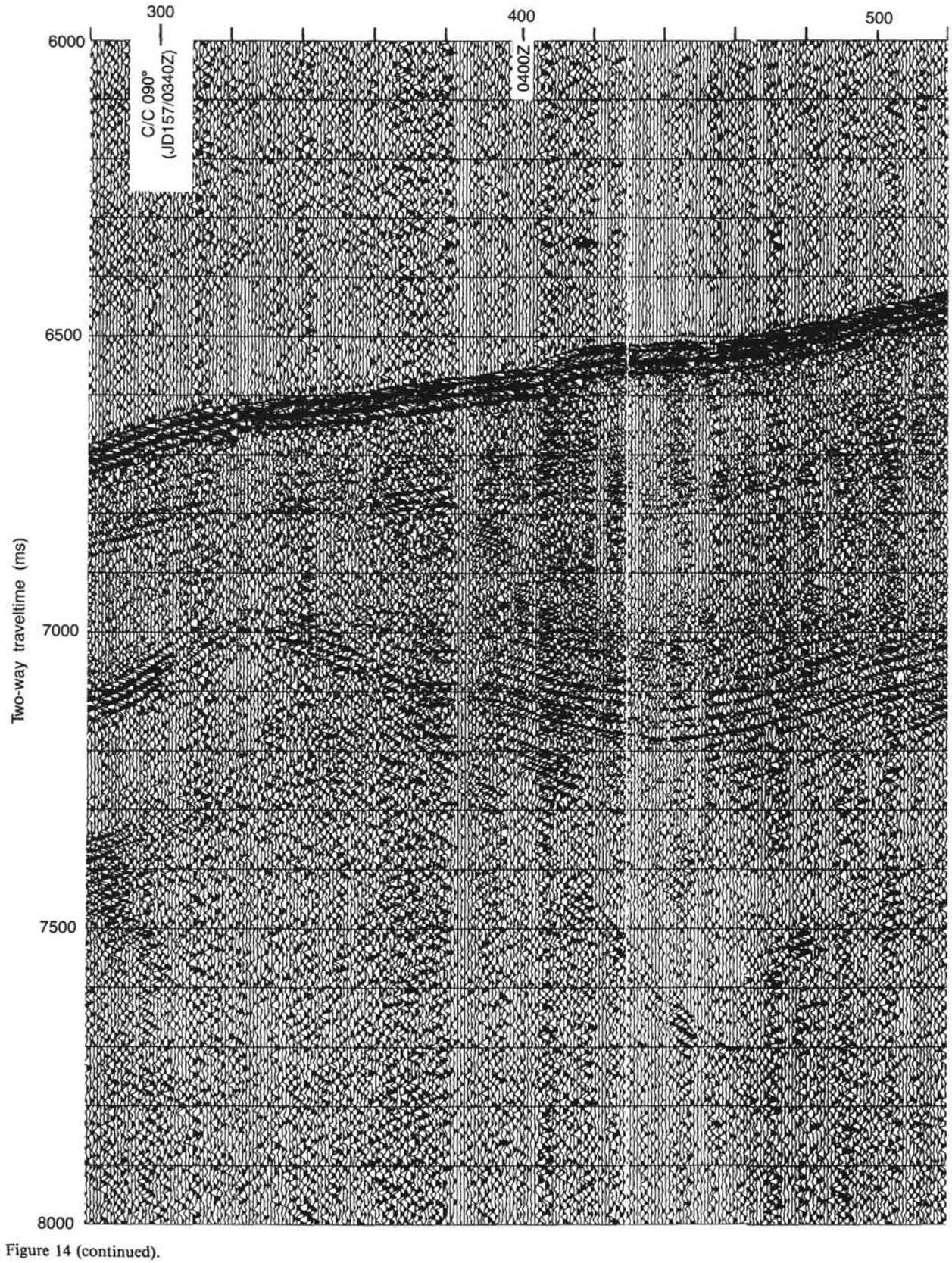


Figure 14 (continued).

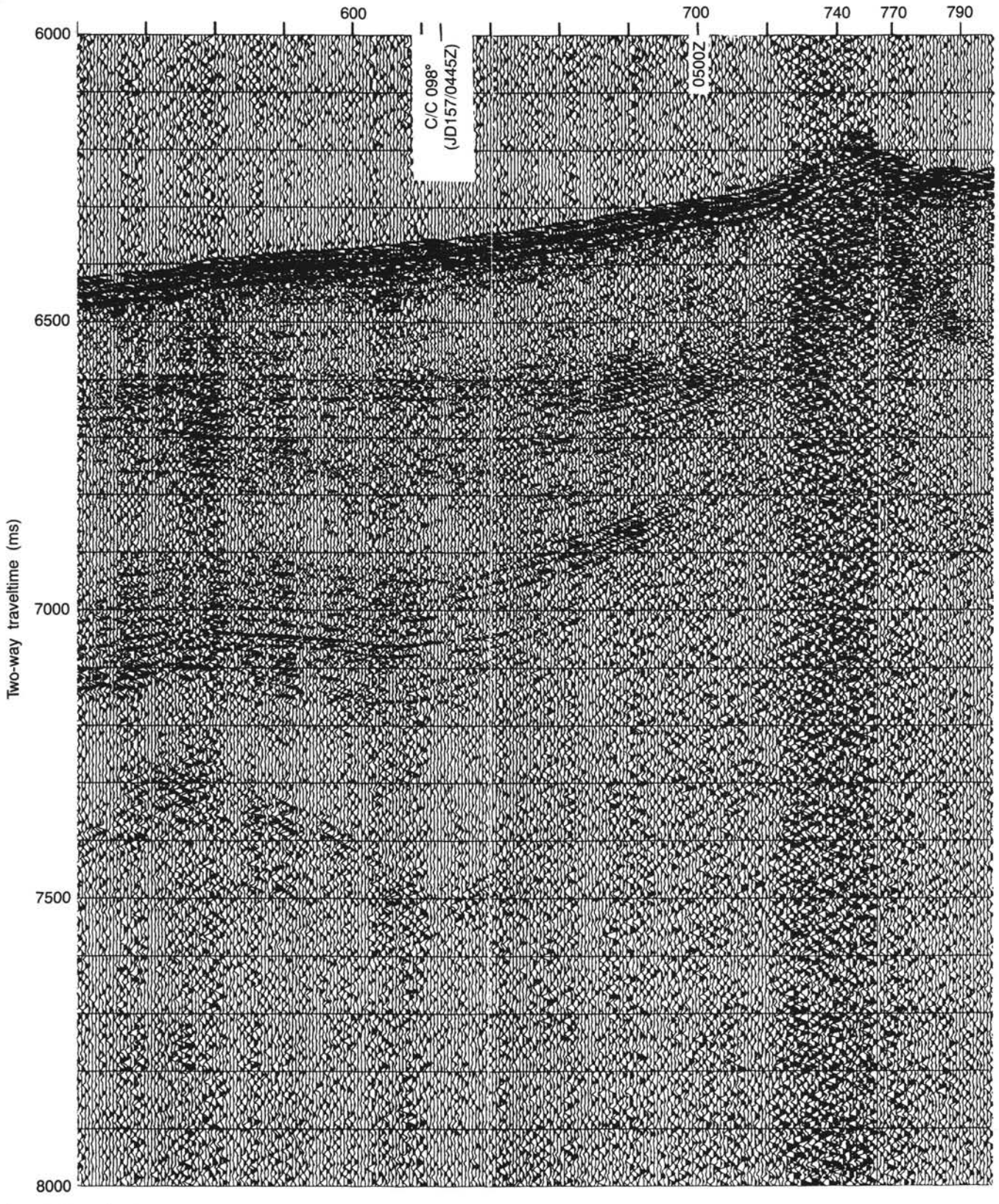


Figure 14 (continued).