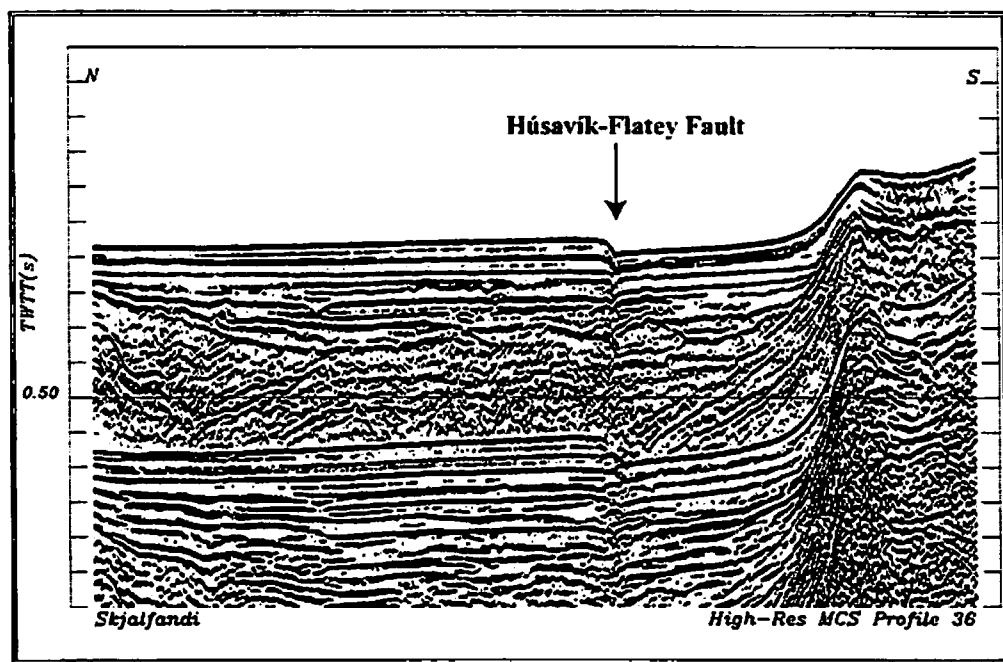


CRUISE REPORT

R/V *Bjarni Sæmundsson* Leg TFZ-B9
Reykjavík, Iceland-to-Reykjavík, Iceland
16 July 2001 - 29 July 2001

Pilot Study of the Tjörnes Fracture Zone, offshore Northern Iceland, using High-Resolution Multichannel Seismic Reflection Profiling and CHIRP Sonar



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1.0 Summary

In July, 2001, *R/V Bjarni Sæmundsson* cruise TFZ-B9 conducted an extensive, high-resolution seismic reflection survey of the Tjörnes Fracture Zone (TFZ) off Iceland's northern coast. The goal of this pilot study was to use two high-resolution seismic profiling systems (SUBSCAN Chirp/Side Scan Sonar and a portable High-Resolution Multichannel Seismic Acquisition System) to demonstrate the feasibility of mapping Holocene faulting and volcanic activity in the tectonically complex TFZ system. The very high Pleistocene-to-Recent sedimentation rates in this area provide an ideal "tape-recorder" of the tectonic evolution of the TFZ and the recent history of fault activity. Our two principle scientific objectives were:

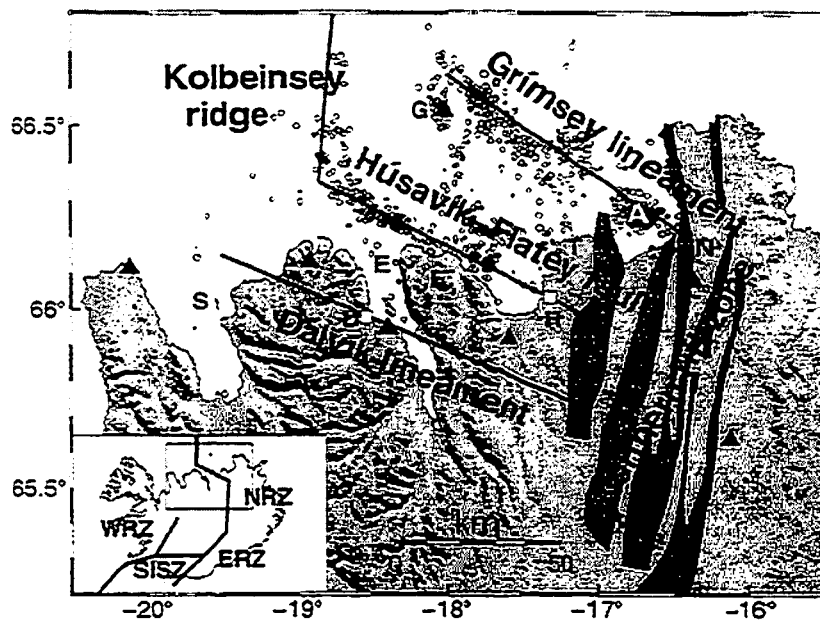
- (1) determine the current location and history of strike-slip movement along the offshore portion of the Húsavík -Flatey (HFF) fault
- (2) estimate the amount of extension across the Eyjafjarðaráll graben (the southern extension of the Kolbeinsey Ridge), Skjálfandi Bay and the Öxarfjörður basin in order to determine how strain has been accommodated in the TFZ over the past 6 Ma.

Approximately 1600 km of MCS and Chirp data were acquired during TFZ-B9. This was the first time these two systems have been used together and this nested surveying strategy proved to be very successful. Owing to favorable weather conditions throughout the leg, more extensive reflection coverage was obtained of Skjálfandi Bay and Öxarfjörður than originally planned. However, due to equipment problems only a limited amount of side scan data were acquired, mostly along the HFF east of Flatey Island. Within the glacially-eroded and sediment-filled graben on the N-Iceland shelf, the Chirp typically penetrated up to 30-40 m subbottom; HiRes MCS data were able to extend this stratigraphy to 300-500 m depth. The uppermost Holocene section is characterized by a 10-25 m thick transparent layer of silts and muds overlying a highly reflective, jökulhlaup-derived turbidite sequence 5-10 m thick of late glacial or early post-glacial age which buries an older reflective surface interpreted as glacial diamictites. Several thin, high-amplitude reflectors occurring within the transparent layer may represent tephra layers identified in nearby cores. The thickest 'transparent' Holocene section is in the Öxarfjörður basin with a progressively thinner Holocene section in the Skjálfandi and Eyjafjarðaráll basins. Holocene sedimentation rates in these graben are estimated at up to 3m/1000 yrs. The Holocene section is compressed, or in some cases absent altogether, on the basement highs separating the graben.

Numerous faults were mapped in both the MCS and Chirp data in the three N-S trending graben north of the HFF fault (Eyjafjarðaráll, Skjálfandi and Öxarfjörður). Many of these faults extend to the seafloor suggesting these graben are actively extending. The HFF was extensively mapped between Flatey Island and the town of Húsavík. The fault is marked by a prominent 10-15 m high, south facing scarp between Flatey Is. and ~17°36'W where it intersects a N-S trending basement ridge. East of this point the HFF fault appears to step to the north, where its expression is much more subdued. We were unable to find an offshore extension of the faults that have been mapped on-land into the town of Húsavík. Side scan sonar data collected along the HFF west of 17°36'W show the presence of numerous, lineated shallow depressions in the surficial sediments on the upthrown block near the fault which may be caused by focused fluid expulsion along the fault.

2.0 Background

The Tjörnes Fracture Zone (TFZ) is characterized by left-stepping, *en-echelon* NS-striking rift segments and a WNW-trending dextral (right-lateral) transform fault system connecting the Northern Iceland Rift Zone (NIRZ) with the Kolbeinsey Ridge (see figure below). The TFZ is believed to have formed ~6-7 Ma ago as a result of an eastward jump of the axis of spreading in northern Iceland to its present position (Sæmundsson, 1974; 1986). The ~150 km long (E-W) and ~70 km wide (N-S) TFZ lacks the clear topographic expression of typical oceanic fracture zones and is thus defined primarily by a region of high seismicity. Small earthquake swarms are common within the TFZ making it the most seismically active region in Iceland. Earthquake epicenters during 1983-2000 define two main seismic lineaments: the Húsavík-Flatey Fault (HFF) and the Grímsey Seismic Lineament (GSL). Two earthquakes (M6-6.5, Einarsson, 1986) near the eastern and western end of the HFF in 1872 caused severe damage in the village of Húsavík and on Flatey Island. In 1934 several buildings were damaged in a ~M6.3 earthquake on the Dalvík lineament, south of the HFF, and a M7 earthquake occurred offshore in the southwestern part of the TFZ in 1963 (Stefansson, 1966).



The Tjörnes Fracture Zone. The Húsavík-Flatey Fault and the Grímsey Seismic Lineation connect the Northern Iceland Volcanic Zone on the east with the Kolbeinsey Ridge. Earthquake epicenters are shown as circles. S, E and A are the Skagafjörður, Eyjafjarðaráll, and Óxarfjörður graben. From Rögnvaldsson *et al.*, 1998.

Accurate relative locations, focal mechanism studies, and detailed geological mapping show a distinct difference between the style of faulting along the Húsavík-Flatey Fault and the Grímsey Seismic Lineation (Rögnvaldsson *et al.*, 1998). The HFF is a well-developed right-lateral, strike-slip fault striking N60-65°W that can be traced from the western edge of the Holocene rift zone in northern Iceland for about 90 km to the [extinct?] southern end of the Kolbeinsey Ridge in the Eyjafjarðaráll Basin. The right-lateral displacement along the HFF prior to 1 Ma has been estimated as 60 km resulting in a basement age difference of 5 m.y. across the fault (Sæmundsson, 1974). In recent years, most of the earthquake activity on the HFF has taken place at two locations; near its western end where it joins the Eyjafjarðaráll Basin and some 40 km to the east where it intersects the east flank of the Grímsey platform, near Flatey Island. Focal mechanisms indicate right-lateral, strike slip motion on a plane striking N122°E-N140°E, consistent with the WNW strike of the HFF (Rögnvaldsson *et al.*, 1998). In contrast, focal mechanisms for earthquakes on the Grímsey Seismic Lineament indicate left-lateral faulting on N-S trending fault planes with a considerable dip-slip component (Rögnvaldsson *et al.*, 1998). This pattern has been interpreted as evidence of an oblique, *en-echelon* rift system, similar in some respects to the Reykjanes Peninsula, which marks the on land continuation of the Reykjanes Ridge in SW Iceland. The GSL is believed to have formed during the last 1 Ma in response to the northward propagation of the NIRZ beyond the HFF (Sæmundsson, 1986). Rögnvaldsson *et al.* (1998) proposed that continued northward propagation of the NIRZ may lead to the extinction of the HFF.

While much of the Tjörnes fault system lies offshore, comparatively little mapping of this region has been conducted. McMaster *et al.* (1977) used single channel seismic reflection, gravity and magnetics data to define the major structural provinces within the TFZ. K. Gunnarsson of Orkustofnun (Iceland's National Energy Authority) has compiled single beam bathymetric data collected in this area by the Icelandic Hydrographic Survey, and interpreted 1100 km of multichannel seismic reflection data collected in 1978 and 1985 (Gunnarsson, 1998). His compilation shows that the Tjörnes fault zone is associated with some of the thickest sediments found on Iceland's insular shelf. These Plio-Pleistocene glacial sediments were deposited in N-S striking graben, including from west to east the Eyjafjarðaráll, Skjálfandi Basin and Öxarfjörður Basins. The thickest sediments (up to 4 km) are found on the inner shelf where the N-S trending Eyjafjarðaráll and Skjálfandi graben terminate against the Húsavík-Flatey fault. Sediments between 1 and 2 km thick are present over a much wider area. Seismic reflection profiles across the southern part of Eyjafjarðaráll graben near its intersection with the HFF reveal a faulting pattern that is typically listric within the sediments; faulting is seen in many places to extend up to the seafloor, forming escarpments as much as 10 m high (Gunnarsson, 1998). The overall pattern suggests a widening of the graben system south towards the HFF, where normal faulting appears to terminate against the strike-slip fault.

The only offshore location where sediments have been sampled to any significant depth is in a 554-m deep hole drilled on Flatey Island. This core sampled shallow water marine and coastal silts and sandstones characterized by repeated glacial regression/transgression sequences, and two lava flows (Eiríksson *et al.*, 1990). Shallow gravity cores taken in the Eyjafjarðaráll Basin include fine grained sediments with relatively high

(up to 4%) total organic carbon content (Gunnarsson, 1998). The gravity cores reveal high sedimentation rates and contain sufficient fossil material to enable biostratigraphical zonation, C^{14} dating, and study of stable isotopes; they also contain discrete tephra horizons that may be linked to historical eruptions in Iceland (PANIS Group, pers. comm., 2000). The basal sediments in this area are not more than 6 Ma old and the bulk of the sediments are believed to have accumulated over the past 2 Ma (Gunnarsson, 1998).

The goal of this pilot study was to use two high resolution seismic profiling systems (SUBSCAN Chirp/Side Scan Sonar and a portable High-Resolution Multichannel Seismic Acquisition System) to demonstrate the feasibility of mapping Holocene faulting and volcanic activity in the tectonically complex Tjörnes Fracture Zone system. The very high Pleistocene-to-Recent sedimentation rates in this area provide an ideal "tape-recorder" of the tectonic evolution of the TFZ and the recent history of fault activity. Our two principle scientific objectives were:

- (1) determine the current location and history of strike-slip movement along the offshore portion of the Húsavík -Flatey (HFF) fault
- (2) estimate the amount of extension across the Eyjafjarðaráll graben (the southern extension of the Kolbeinsey Ridge), the Skjálfandi bay and Öxarfjörður in order to determine how strain has been accommodated in the TFZ over the past 6 Ma.

In addition, we planned to acquire reflection data across two *Marion Dufresne* core sites (Sites 71 and 75) located on Iceland's northern insular shelf for Jón Eiríksson (Univ. of Iceland). Site 71 (MD992271) is located at 66°30.05N, 19° 30.20W; Site 75 (MD992275) is located at 66°33.06N, 17°41.59W.

3.0 Cruise Narrative

7/16 JD197 (Monday) - The *R/V Bjarni Sæmundsson* left the dock in Reykjavík at 1015h GMT. After a Coast Guard helicopter rescue exercise, we slowed to 2 kts for test deployments of both the SUBSCAN chirp and HiRes MCS systems. The transformer on Chirp system's SeaMac winch burned out when the winch was powered up; when the HiRes system's SeaMac winch was turned on the same thing happened. Neither winch had been properly configured for 220V power. We decided to return to Reykjavík for repairs. These repairs were completed at ~1915h and we once again departed for the Tjörnes region. We slowed at ~2030h to conduct a test of the Chirp and deployment of the HiRes gun and streamer. By 2300h these tests were successfully completed and we were underway at full speed for the Tjörnes Fracture Zone.

7/17 JD198 (Tuesday) - Clear sunny day with beautiful views of the western fjords as we transit toward the Tjörnes FZ. At 2150h we slowed to begin deployment of the Chirp and HiRes systems. Streamer deployment was complete by 2253h; the GI gun was deployed at 2300h. The first shot on Line 1 (66°30.00; 19°40.92) was at 2357h.

7/18 JD199 (Wednesday) - Shooting Line 1. We experienced firing problems with the GI gun during the first part of this line; the problem was traced to the gun lines. At 0228h we slowed to 3 kts to recover and replace the gun lines. At ~0420h gun line replacement was completed and we began line 1c. Streamer and gun depth are now set at 3 m. At 1127h we completed line 1; started turn for line 2. Continued with shooting of lines 3, 4 and 5.

Lines 3 and 7 cross *Marion Dufresne* core site 75. At 1915h (about 30 minutes after crossing site 75 on line 7) the side scan was shut down due to a voltage problem. The side scan unit was recovered at the end of line 7 (~2110h). A problem was found with co-axial cable termination at the towfish; the termination was replaced and repotted. No Chirp or side scan data were collected on line 8.

7/19 JD200 (Thursday) - Line 9, the first of 15 E-W profiles across the Eyjafjarðaráll graben, began at 0152h. The SUBSCAN system was redeployed at ~1153h but failed within 30 minutes; we believe water got into the cable through the new termination shorting out the side scan unit and the topside DCU. The splicemeister, who clearly needs more training, then cut off the last 20 m of cable and reterminated and potted the connector once again. Effectively no useful Chirp or side scan data collected for lines 9-18 while repairs were being made.

7/20 JD201 (Friday) - Continued with Eyjafjarðaráll graben survey. At 1255h, before the start of line 19, we redeployed the Chirp. We were now acquiring Chirp data but no side scan. Early this morning a call was placed to Edgetech in Massachusetts requesting them to airfreight us a new side scan fish and DCU. Arrangements will be made to put this equipment on the Friday night Boston-to-Reykjavík Icelandair flight, and then to have it flown to Akureyri where we will pick it up Saturday.

7/21 JD202 (Saturday) - We completed line 24 of the Eyjafjarðaráll graben survey at 0632h and recovered the SUBSCAN fish and HiRes system. We then transited to Dalvík to disembark John Diebold and pick up the Edgetech equipment. The Edgetech gear did not make it on the morning flight and we had to wait for the afternoon plane. The gear arrived and we departed Dalvík at ~1600h. Unfortunately, only the port side scan on the new unit works and the DCU is not fully functional either. We will thus conduct most of the remaining survey with just the Chirp (no side scan). The HiRes MCS system and Chirp were redeployed and shooting of line 25A commenced at 1805h. With line 26, which began at 2041h, we completed the Eyjafjarðaráll graben survey and profiled eastward into Húsavík Bay where our objective was to map the HFF fault.

7/22 JD203 (Sunday) - The Húsavík Bay survey began with Line 27 starting at 0045h. While surveying we attempted to get the side scan unit to function with little success. Otherwise the Húsavík Bay survey went very smoothly with very nice MCS and chirp records of the HFF.

7/23 JD204 (Monday) - Continued survey of the HFF in Húsavík Bay. Completed this work ~1411h with the end of line 48. We then began a series of NE-SW trending profiles across the HFF west of Flatey Island (lines 51-58).

7/24 JD205 (Tuesday) - At the end of line 55 at about 0114h the OYO stopped working. There were two problems. First, we had trouble with the unit fully powering up - this led to a "keyboard" error (no power to keyboard) during the start-up sequence. This problem was intermittent - some times it powered up OK, other times it didn't. The other problem was with the DAS program itself hanging up during the loading process. We struggled with this problem for more than 2 1/2 hours. Finally, we tried using the "diagnostics"

menu choice and this successfully booted an old version of the DAS and apparently reset some other internal parameters. In any event, we then quit out of this and restarted the DAS from the DOS prompt and it came up OK. It was a minor miracle that this worked. Recording began again at 0359h in the middle of line 57. With the completion of line 58 at 0611h we begin the survey of the Skjálfandi bay and Öxarfjörður (lines 59-76).

7/25 JD206 (Wednesday) - Continuing survey of the Skjálfandi bay and Öxarfjörður with HiRes and SUBSCAN chirp. Completed lines 63-68 collecting MCS and chirp data.

7/26 JD207 (Thursday) - Continuing survey of the Skjálfandi bay and Öxarfjörður with HiRes and SUBSCAN chirp. Completed lines 69-73A collecting MCS and chirp data.

7/27 JD208 (Friday) - At 1055h at the end of line 75 the OYO hung up again. This time we were unable to root the HiRes DAS. Line 76 was therefore shot without MCS. At the end of this line a final attempt was made to reboot the DAS but it was not successful. We therefore recovered the GI gun and MCS streamer; both were on deck by 1500h. This terminated all MCS operations. The side scan fish was deployed during line 78 and the side scan and chirp were towed much closer to the bottom to optimize the side scan records. Only the port channel of the side scan is operable. On line 78 we attempted to image the N-S ridge located north of the HFF in Húsavík Bay. Line 79 ran from E to W along the HFF just to the north of the escarpment while line 80 ran from W to E along the HFF just south of the scarp. The main objective of both lines was imaging the fault in the side scan.

7/28 JD209 (Saturday) - Line 80 was completed at 0208h. Shortly after this a fuse blew out in the side scan DCU. The fuse was replaced and blew almost immediately. We continued to run 4 short lines (81-84) collecting Chirp data just to the south of the HFF to document the continuation of the N-S ridge south of the fault. After completing these lines we ran 5 short lines (lines 85-89) oriented NNE-SSW just west of the town of Húsavík in order to identify any offshore continuation of the faults mapped on land in this area. At ~0900h we completed line 89, concluded all operations, and began the transit to Reykjavík.

7/29 JD210 (Sunday) - At ~1320h, enroute to Reykjavík, we deployed the chirp across the *Marion Dufresne* core site MD992264 in Djúpáll, NW of Iceland and collected a beautiful profile across the site. We arrived at the dock in Reykjavík at a little after 9 PM, completing TFZ-B9.

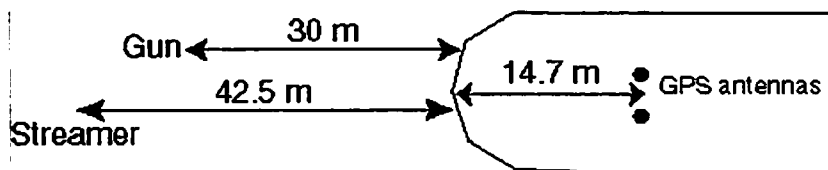
4.0 Equipment Description and Performance

4.1 HiRes MCS System The Lamont High Resolution system is a portable multichannel seismic profiling system designed to image sediment structure to >1 km depth with a vertical resolution of 2-5 m. The system consists of a 210 cu. in. Gas Injection (GI) gun by Seismic Systems Inc., a 600-m long ITI streamer with 193 hydrophones in 48 groups with a 12.5 m group interval, and an OYO DAS-1 digital acquisition system. An air-cooled Price A-35 compressor can fire the GI gun at a shot

interval of 5 s. Additional information on the Lamont HiRes system can be found at: <http://www.ldeo.columbia.edu/Ewing/Home.html>

As provided by Lamont, the HiRes system does not provide any shipboard real-time or near real-time processing capability. Thus there is no way to judge the quality of the data as it is being acquired, or to use the results to guide surveying plans. We therefore set up a Sun-based shipboard system running SIOSEIS to produce near-real-time brute stacks of each line. The system included a 3480 tape drive and a DLT drive. After each 3480 tape was completed, it was copied to DLT and the shot files read for the brute stack. Within a few minutes of the end of a line, a brute stack was completed and plotted. Copies of the shipboard processing scripts are included in Section 8.8. These brute stacks were invaluable in assessing data quality and in making a preliminary interpretation of our results (see Section 8.7 for examples of these brute stacks).

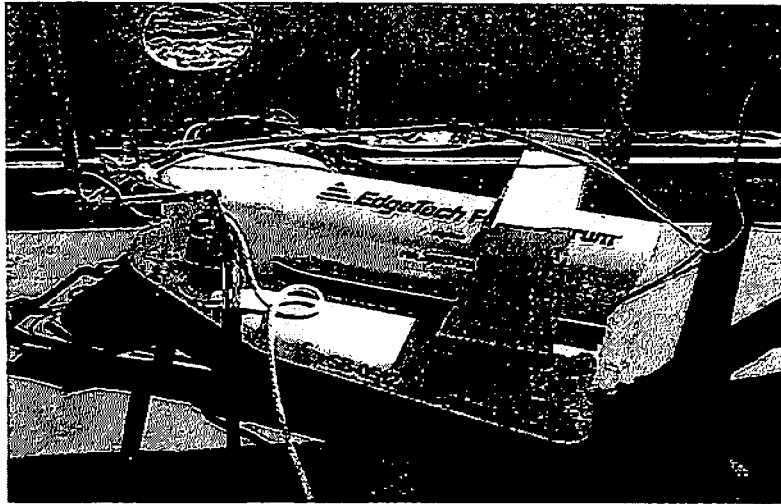
The following diagram shows the setbacks of the gun and streamer from the fantail and the GPS antenna for TFZ-B9:



Ship	R/V <i>Bjarni Sæmundsson</i>
Ship speed	5 kts
Source	210 cu. In. Seismic Systems Inc. G1 gun
	12.5 m (~5 s) shot spacing
	3 m nominal towing depth; 30 m from fantail
Receiving array	ITI streamer; 600 m streamer length
	48 groups at 12.5 m group interval (3 hydro./group)
	3 m towing nominal depth; 1 st active section 42.5 m from fantail
	Dead traces: 15-18;20;25;29-30 (after 7/24 20;25;29-30)
Recording system	OYO Digital Acquisition System
	1 ms sample rate; 2500 ms record length
	30-250 Hz filters; 6 dB/oct

4.2 SUBSCAN Chirp and Side Scan System The SUBSCAN system is a state-of-the-art seismic chirp and side scan imaging system. During the Iceland survey we used the "L-pulse", which sweeps across 1.0 to 6.0 kHz in 50 ms. This yields subbottom penetration on the order of 30-40 m with sub-meter resolution. The system used in the Tjörnes FZ survey included:

- DF1000 side scan towfish and topside unit
- X-Star subbottom sonar including a SB0512 tow fish (see picture below) with
 - i) 2 planar receiving arrays
 - ii) Woofer/tweeter transmitting pair covering the range of 0.5 -16 kHz
 - iii) 31" pressure housing containing matching transformers, 2 channel power amp, 2 channel receiving amp, matching transformers, 2 channel DGA and A/D converters and associated DSP processors, Pentium 2 computer, ADSL telemetry transceiver, 300 VDC to 48/12/5 VDC power supplies
 - iv) Pitch/Roll sensor



The SUBSCAN SB0512 towfish used on the Tjörnes FZ survey

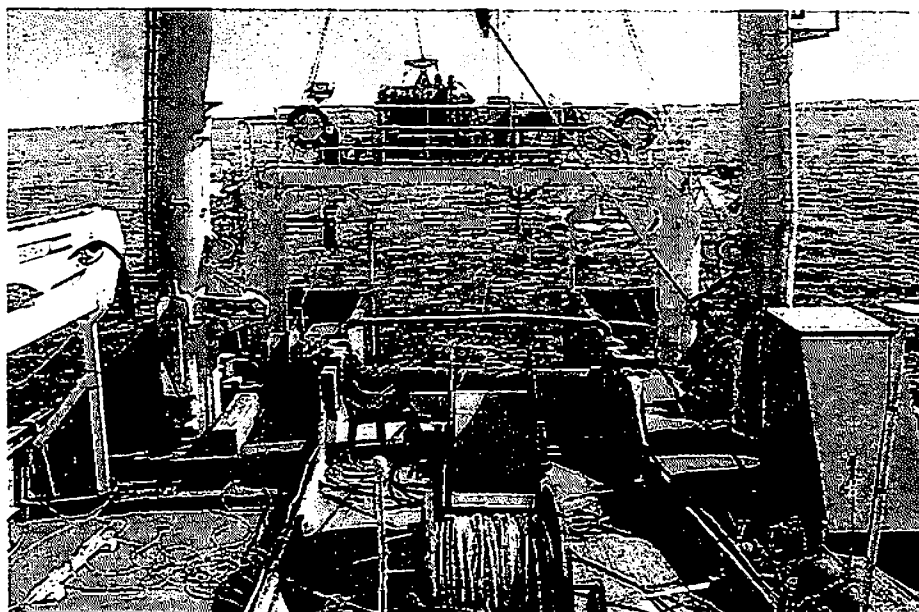
A shipboard interface unit (SIU) provides 300 VDC power to the fish and the ADSL telemetry transceiver, hardware and software diagnostics, and an Ethernet output. There is a Pentium host. A topside Pentium processor with an ethernet input from the SIU performs the following

- i) Subbottom image display during acquisition and playback
- ii) Navigation interface
- iii) SEG-Y storage of subbottom and navigation data

The system also includes a tow winch with 500 meters (now 480 m) of cable with remote controls, which allows the fish to be flown in real time. The complete system is shipped in its own 20 foot van.

4.3 Equipment Performance This was the first time the HiRes MCS and SUBSCAN Chirp systems had been used simultaneously. We encountered no operational problems running the two systems together, and this nested surveying strategy proved to be very useful for defining subseafloor structure at very high resolution both in the uppermost few tens of meters and down to several hundred meters depth. The SUBSCAN and side scan fish were towed off the starboard corner of the fantail; the GI

gun off the port corner of the fantail (see picture below). The compressor and streamer reel were located midship with the streamer towed through the center of the A-frame. With this configuration we were able to make fairly rapid 180° turns at 4.5 kts without tangling the streamer and gun lines (the SUBSCAN tows at a fairly deep angle minimizing chances for tangling with the streamer).



Overall we were also pleased with the HiRes MCS data we acquired during the TFZ survey (see example records in Section 8.7). However, we also experienced a number of problems with the system's OYO digital acquisition unit, and its associated Sun-based control software. The OYO hung up twice, and we had problems rebooting the unit. This happened once about halfway through the survey and a second time near the end of the leg (see Cruise Narrative for details). The first time we were very lucky that we were able to finally reboot the acquisition system and continue surveying. The second time we were not successful in rebooting the OYO and had to terminate MCS operations. Fortunately, we were close to the end of the leg and lost only ~6 hours of data. However, had this happened earlier in the leg it could have been disastrous. We also experienced frequent problems with handshaking between the OYO and the Sun-based HiRes control software. This required careful watching since shooting would stop when this happened, and acquisition had to be restarted or sometimes the Sun workstation had to be rebooted to resume shooting and recording. The compressor and GI gun proved to be reliable workhorses throughout the leg thanks to the careful attention of the Lamont crew of Winston, Jean and Doug. The ITI streamer had 8 'dead' traces, however, after the OYO was rebooted midway through the leg, four of these traces became 'live' again suggesting the problem may have been with the OYO not the streamer.

Given our experience on this leg, the reliability of the OYO is suspect. Before the HiRes system goes to sea again, the OYO should be repaired or replaced (if that is

possible since these units are no longer manufactured), and ideally a second, backup unit should taken to sea. The control software should also be improved to solve handshaking problems with the OYO and gun firing system, and to write a single shot file with correct shot times and positions to disk. Finally, in our view, it is essential to have some sort of real-time or near real-time processing capability on the ship in order to assess data quality and to guide the survey. This capability should be provided to users as part of the HiRes package. In the future it would clearly be very desirable to completely replace the ITI streamer, OYO and associated software with a modern digital streamer and state-of-the-art digital seismic acquisition system.

5.0 Preliminary Cruise Results

Approximately 1600 km of MCS and Chirp data were acquired during TFZ-B9. A table summarizing the line locations, start and end times, and data collected is presented in Section 8.5. A map showing the location of these profiles is presented in Section 8.3. A more detailed map of our data coverage near the Húsavík-Flatey fault (HFF) in Skjálfandi bay is shown in Section 8.4. Owing to favorable weather conditions throughout the leg, more extensive reflection coverage was obtained in the Skjálfandi bay and Öxarfjörður than originally planned. However, due to equipment problems only a limited amount of side scan data were acquired, mostly along the HFF on lines 78-80. Several representative brute stacks (produced aboard ship) of the MCS profiles are presented in Section 8.7; examples of unprocessed screen dumps of the Chirp sonar data are shown in Section 8.10.

Despite the equipment problems we experienced, all of the major operational goals of the leg were achieved. Extensive reflection data coverage was obtained with both the Chirp and HiRes MCS systems across Eyjafjarðaráll, Skjálfandi and Öxarfjörður, and along the HFF east of Flatey Island. Within the major graben in the Tjörnes region the Chirp typically penetrated up to 30-40 m subbottom. A consistent stratigraphy was observed in this uppermost section with a 10-25 m thick transparent layer overlying a highly reflective sequence 5-10 m thick which buries an older reflective surface (see plots in Section 8.10). Several thin, highly reflective bands occur within the transparent layer. Based on a correlation with cores from this region (e.g., *Marion Dufresne* core sites 71 and 75 crossed on lines 1, 5 and 7) we interpret this section as mostly Holocene in age with a glacial diamictite overlain by late glacial or early post-glacial turbidites that have in turn been buried by 10-25 m of acoustically transparent silts and muds. The reflectors within the transparent layer may in some cases be tephra layers. Tephra layers already identified at core site 75 are Hekla 3 (2980 cal. BP) at approximately 6.7 m depth and the Vedde ash (from Katla, 11040 ± 90 ^{14}C yr BP, corresponding to Ash Zone 1) at 34 m depth, (*Knudsen and Eiríksson*, in press). Other tephra layers identified on the North Iceland shelf are Hekla 1104, Hekla 4 (~4000 BP), Saksunarvatn Ash (from Grímsvötn?, 9330 ± 60 ^{14}C yr BP) and the Borrobol tephra (13.4 k ^{14}C yr BP), (*Eiríksson et al.*, 2000a,b). By tracing these tephra layers from the core sites our data will provide more accurate estimate of sedimentation rates in the graben on the N-Iceland shelf, hereto estimated at up to 3m/1000 yrs.

The HiRes MCS data were able to extend this stratigraphy to 300-500 m subbottom where the water bottom multiple typically obscured deeper arrivals (see plots in Section 8.7). The thickest 'transparent' Holocene section is in the Öxarfjörður basin with a progressively thinner Holocene section in the Skjálfandi and Eyjafjarðaráll basins (compare

lines 59E, 59W and line 17 in Section 8.7). Catastrophic floods (jökulhlaups) from glacier dammed lakes during early Holocene and more recent, smaller jökulhlaups from lakes by the Vatnajökull margin and during subglacial eruptions in the Bárðarbunga Volcano have contributed to the added sedimentary thickness in Óxarfjörður, through the drainage system of the river, Jökulsá á Fjöllum. Older, pre-Holocene sediments are in several cases steeply dipping (e.g. profiles 17 and 27), suggesting uplift and tilting associated with extension across this region. The three N-S trending basins typically have an asymmetric, half-graben structure. Numerous faults were mapped in both the MCS and Chirp data in these graben. Many of these faults extend to the seafloor suggesting they have been recently active (e.g. western wall of Eyjafjardaráll graben on line 17).

The HFF was extensively mapped between Flatey Island and the town of Húsavík (see track map in Section 8.4). The fault is marked by a prominent 10-15 m high, south facing scarp between Flatey Is. and $\sim 17^{\circ}36'W$ (profiles 36 and 38 in Section 8.7) where it intersects a prominent, N-S trending basement ridge (crossed by profile 45 just north of the HFF). Detailed Chirp profiling on lines 81-84 showed that this ridge continues south of the HFF where it is largely buried by recent sediment. This ridge thus constitutes an effective strain marker for displacement along the HFF. Unfortunately, magnetic data from this region is insufficient to determine the nature (glacial moraine or volcanic) and age of this ridge. However, a small magnetic survey is planned this Fall to rectify that. East of this ridge the HFF fault appears to step to the north, where its expression is much more subdued. We were unable to find an offshore extension of the faults that have been mapped on-land into Húsavík town. Side scan sonar data collected along the HFF west of $17^{\circ}36'W$ show the presence of numerous, lineated shallow depressions in the surficial sediments on the upthrown block near the fault (see side scan images shown in Section 8.11). These features may be evidence for focused fluid expulsion along the fault.

6.0 Acknowledgements

We wish to thank the officers and crew of the *R/V Bjarni Sæmundsson* for their outstanding efforts to make this scientific program successful. Their assistance with everything from deck operations to electronics troubleshooting was greatly appreciated. We also thank John Diebold, and his Lamont team, for insuring the successful operation of the HiRes MCS system. We especially thank Graham Kent for coming on the cruise and setting up and carrying out the shipboard processing of the HiRes MCS data, including producing brute stacks of each MCS line. Finally, we appreciate the cooperation of Edgetech who air-freighted us a replacement side scan fish and DCU on just a few hours notice, and provided frequent telephone consultation on the various problems we were experiencing with the side-scan sonar.

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7.0 References

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8.0 Supporting Documents

8.1 Scientific Complement for TFZ-B9

*Bryndís Brandsdóttir (Univ. of Iceland)

*Robert Detrick (WHOI)

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Jean Hanley (L-DEO)

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*Co-Chief Scientists



8.5 Line Summary Table for TFZ-B9

Line#	Start Date	Start Time	Latitude	Longitude	End Date	End Time	Latitude	Longitude	MCS Reels	CHIRP tape
1	17-7-01/198	2357	66°30.00	19°40.92	18-7-01/199	1127	66°30.03	17°30.50	1-21	1-3
2	18-7-01/199	1139	66°30.83	17°30.40	18-7-01/199	1208	66°32.24	17°30.10	22-23	3
3	18-7-01/199	1215	66°33.37	17°30.24	18-7-01/199	1404	66°33.21	17°52.40	24-27	3
4	18-7-01/199	1404	66°33.21	17°52.40	18-7-01/199	1452	66°36.69	17°53.59	28-29	3
5	18-7-01/199	1456	66°36.68	17°53.00	18-7-01/199	1646	66°36.66	17°30.52	29-34	3
6	18-7-01/199	1700	66°37.45	17°30.25	18-7-01/199	1752	66°37.16	17°41.15	34-36	4
7	18-7-01/199	1758	66°36.80	17°41.79	18-7-01/199	2047	66°22.95	17°41.97	37-43	4
8	18-7-01/199	2056	66°22.51	17°42.72	19-7-01/200	0158	66°27.94	18°34.90	44-56	no data
9	19-7-01/200	0152	66°27.81	18°33.22	19-7-01/200	0504	66°27.99	19°12.57	56-63	no data
10	19-7-01/200	0522	66°26.94	19°11.91	19-7-01/200	0819	66°27.02	18°35.78	64-71	no data
11	19-7-01/200	0835	66°26.03	18°35.66	19-7-01/200	1136	66°25.95	19°12.69	71-79	no data
12	19-7-01/200	1216	66°25.08	19°12.52	19-7-01/200	1513	66°25.00	18°36.53	80-87	5
13	19-7-01/200	1559	66°23.93	18°33.85	19-7-01/200	1853	66°23.93	19°08.90	88-93	no data
14	19-7-01/200	1913	66°22.98	19°07.37	19-7-01/200	2218	66°22.95	18°29.39	94-101	no data
15	19-7-01/200	2235	66°22.00	18°30.12	20-7-01/201	0127	66°22.01	19°05.35	102-109	no data
16	20-7-01/201	0223	66°20.99	19°01.55	20-7-01/201	0522	66°20.95	18°25.25	111-117	no data
17	20-7-01/201	0540	66°19.96	18°26.90	20-7-01/201	0834	66°20.02	19°00.34	117-124	no data
18	20-7-01/201	0850	66°18.98	19°00.39	20-7-01/201	1227	66°18.95	18°17.59	125-133	no data
19	20-7-01/201	1308	66°18.01	18°21.82	20-7-01/201	1605	66°17.95	18°55.88	134-141	6
20	20-7-01/201	1622	66°16.98	18°55.88	20-7-01/201	1932	66°17.01	18°17.62	142-149	6
21	20-7-01/201	1950	66°16.00	18°18.42	20-7-01/201	2224	66°15.97	18°48.58	150-156	7
22	20-7-01/201	2242	66°14.97	18°47.67	21-7-01/202	0139	66°14.95	18°12.14	157-164	7
23	21-7-01/202	0155	66°13.98	18°12.91	21-7-01/202	0412	66°13.98	18°39.97	165-170	7
24	21-7-01/202	0429	66°12.86	18°38.80	21-7-01/202	0632	66°13.00	18°15.47	171-175	7
25A	21-7-01/202	1805	66°06.90	18°23.30	21-7-01/202	1900	66°10.63	18°20.59	176-177	no data
25B	21-7-01/202	1915	66°10.99	18°21.82	21-7-01/202	2025	66°11.01	18°24.50	178-180	no data
26	21-7-01/202	2041	66°12.02	18°33.83	22-7-01/203	0044	66°11.94	17°44.79	181-191	no data
27	22-7-01/203	0045	66°11.91	17°44.47	22-7-01/203	0232	66°08.03	17°22.99	191-195	8
28	22-7-01/203	0318	66°09.00	17°27.28	22-7-01/203	0452	66°02.04	17°35.12	197-201	8
29	22-7-01/203	0525	66°01.71	17°30.08	22-7-01/203	0729	66°10.54	17°30.00	203-207	8
30	22-7-01/203	0729	66°10.65	17°30.58	22-7-01/203	0906	66°03.66	17°30.98	208-211	8
31	22-7-01/203	0937	66°06.91	17°38.03	22-7-01/203	1102	66°11.28	17°39.87	212-215	8

Line#	Start Date	Start Time	Latitude	Longitude	End Date	End Time	Latitude	Longitude	MCS Reels	CHIRP tape
32	22-7-01/203	1126	66°12.21	17°40.19	22-7-01/203	1237	66°06.86	17°46.91	216-219	8
33	22-7-01/203	1257	66°07.66	17°48.93	22-7-01/203	1400	66°11.91	17°43.31	220-222	9
34	22-7-01/203	1414	66°11.16	17°42.56	22-7-01/203	1510	66°07.10	17°47.70	223-225	9
35	22-7-01/203	1528	66°06.64	17°45.23	22-7-01/203	1629	66°10.99	17°39.98	226-228	9
36	22-7-01/203	1644	66°10.23	17°38.80	22-7-01/203	1746	66°05.77	17°43.91	229-231	9
37	22-7-01/203	1815	66°04.95	17°40.66	22-7-01/203	1927	66°10.19	17°35.06	232-235	9
38	22-7-01/203	1937	66°09.67	17°34.41	22-7-01/203	2049	66°04.05	17°39.98	235-238	10
39	22-7-01/203	2113	66°03.23	17°36.82	22-7-01/203	2233	66°09.24	17°30.66	240-243	10
40	22-7-01/203	2244	66°08.93	17°29.24	23-7-01/204	0015	66°02.00	17°36.94	243-247	10
41	23-7-01/204	0035	66°01.55	17°34.03	23-7-01/204	0149	66°07.03	17°27.73	247-250	10
42	23-7-01/204	0203	66°06.66	17°25.84	23-7-01/204	0318	66°01.23	17°32.60	251-254	10
43	23-7-01/204	0341	66°01.38	17°28.65	23-7-01/204	0440	66°05.72	17°24.04	255-257	10
44	23-7-01/204	0445	66°05.98	17°24.31	23-7-01/204	0633	66°09.38	17°44.33	257-261	10-11
45	23-7-01/204	0647	66°08.70	17°44.80	23-7-01/204	0838	66°04.10	17°24.55	261-266	11
46	23-7-01/204	0852	66°04.02	17°25.56	23-7-01/204	1040	66°07.87	17°45.64	266-270	11
47	23-7-01/204	1056	66°07.27	17°46.93	23-7-01/204	1247	66°03.17	17°26.65	271-275	11
48	23-7-01/204	1250	66°03.39	17°26.50	23-7-01/204	1414	66°10.21	17°29.66	276-279	11
49	23-7-01/204	1427	66°10.96	17°28.11	23-7-01/204	1530	66°14.91	17°20.11	280-282	11
50	23-7-01/204	1536	66°15.11	17°20.85	23-7-01/204	1808	66°15.01	17°57.33	282-288	12
51	23-7-01/204	1811	66°14.83	17°51.70	23-7-01/204	1921	66°09.97	17°57.97	288-291	12
52	23-7-01/204	1950	66°10.42	18°02.76	23-7-01/204	2045	66°14.57	17°58.65	292-294	12
53	23-7-01/204	2111	66°14.95	18°03.04	23-7-01/204	2210	66°10.64	18°08.22	295-298	12
54	23-7-01/204	2238	66°11.53	18°12.62	23-7-01/204	2337	66°15.90	18°07.77	299-301	12
55	24-7-01/205	0007	66°16.38	18°12.76	24-7-01/205	0114	66°11.10	18°19.04	302-305	12
57	24-7-01/205	0359	66°15.07	18°25.93	24-7-01/205	0430	66°12.83	18°28.83	306-307	13
58	24-7-01/205	0452	66°13.51	18°32.26	24-7-01/205	0611	66°29.13	18°25.42	308-310	13
59	24-7-01/205	0615	66°19.14	18°24.83	24-7-01/205	1509	66°19.02	16°37.99	311-331	13
60	24-7-01/205	1536	66°17.99	16°36.31	24-7-01/205	1754	66°17.94	17°04.27	333-338	14
61	24-7-01/205	1809	66°16.99	17°04.27	24-7-01/205	2039	66°16.98	16°33.20	339-345	14
62	24-7-01/205	2059	66°15.92	16°34.15	24-7-01/205	2333	66°15.99	17°04.59	346-352	14
63	24-7-01/205	2348	66°14.98	17°04.36	25-7-01/206	0234	66°14.98	16°30.99	353-359	14
64	25-7-01/206	0249	66°14.04	16°31.39	25-7-01/206	0501	66°14.00	16°57.62	360-365	15
65	25-7-01/206	0507	66°13.61	16°57.58	25-7-01/206	0559	66°12.51	16°48.27	365-367	15
66	25-7-01/206	0604	66°12.70	16°47.66	25-7-01/206	0928	66°28.82	16°52.55	367-375	15
67	25-7-01/206	1041	66°27.95	16°40.68	25-7-01/206	1637	66°27.99	17°51.59	378-392	15-16

Line#	Start Date	Start Time	Latitude	Longitude	End Date	End Time	Latitude	Longitude	MCS Reels	CHIRP tape
68	25-7-01/206	1706	66°25.98	17°50.71	25-7-01/206	2242	66°25.91	16°43.02	393-407	16
69	25-7-01/206	2310	66°24.01	16°42.66	25-7-01/207	0440	66°23.94	17°50.06	408-421	17
70	25-7-01/207	0455	66°23.99	17°50.00	25-7-01/207	1033	66°22.98	16°40.46	422-435	17
71	25-7-01/207	1048	66°21.99	16°40.57	25-7-01/207	1618	66°21.90	17°47.63	436-449	17-18
72	25-7-01/207	1634	66°20.99	17°47.43	25-7-01/207	2210	66°20.93	16°40.23	450-463	18
73A	25-7-01/207	2223	66°20.07	16°40.71	27-7-01/208	0018	66°20.45	17°03.95	464-468	18
73B	27-7-01/208	0057	66°20.12	17°10.94	27-7-01/208	0403	66°20.01	17°47.62	470-477	19
74	27-7-01/208	0433	66°17.90	17°47.15	27-7-01/208	0734	66°17.95	17°10.50	478-486	19
75	27-7-01/208	0808	66°17.00	17°10.49	27-7-01/208	1055	66°17.00	17°48.45	486-493	19
76	27-7-01/208	1112	66°16.00	17°48.94	27-7-01/208	1416	66°15.90	17°13.04	no data	19-20
77	27-7-01/208	1519	66°14.06	17°15.17	27-7-01/208	1644	66°14.03	17°27.07	no data	20
78	27-7-01/208	1644	66°14.03	17°27.07	27-7-01/208	2045	66°04.94	17°35.96	no data	20-21
79	27-7-01/208	2107	66°05.35	17°34.17	27-7-01/208	2324	66°08.24	17°48.45	no data	21
80	27-7-01/208	2238	66°08.12	17°47.95	28-7-01/209	0208			no data	21
81	28-7-01/209	0209			28-7-01/209	0253			no data	21
82	28-7-01/209	0254			28-7-01/209	0338	66°05.46	17°33.54	no data	21
83	28-7-01/209	0339	66°05.46	17°33.54	28-7-01/209	0419	66°05.71	17°37.49	no data	21
84	28-7-01/209	0422	66°05.66	17°37.60	28-7-01/209	0454	66°05.17	17°33.69	no data	21
85	28-7-01/209	0554	66°01.60	17°27.64	28-7-01/209	0645	66°05.17	17°23.82	no data	22
86	28-7-01/209	0650	66°04.89	17°23.47	28-7-01/209	0734	66°01.57	17°26.69	no data	22
87	28-7-01/209	0741	66°01.60	17°25.84	28-7-01/209	0815	66°04.00	17°23.28	no data	22
88	28-7-01/209	0821	66°05.60	17°23.03	28-7-01/209	0848	66°01.53	17°25.06	no data	22
89	28-7-01/209	0853	66°01.46	17°24.50	28-7-01/209	0920	66°03.52	17°22.37	no data	22

8.6 TFZ Hi Res MCS Recording Log

Cruise: TFZ-B9
Area: Tjornes FZ

Channels: 48
Sample rate (ms): 1 ms
Record length (s): 2.5 s

Source: GI gun
Shot Int. (m): 12.5 m

DLT Backup tapes		DLT tape	#1	3480 Tapes:	1-50
		DLT tape	#2	3480 Tapes:	51-175
		DLT tape	#3	3480 Tapes:	176-325
		DLT tape	#4	3480 Tapes:	326-493

Line#	Reel#	File#	Date	JD	Time	Latitude	Longitude	Comments
1a	1	1	17-7-01	198	2357	66°30.00	19°40.92	Beginning of Tjornes FZ Survey
1a	1	300	17-7-01	199	0023	66°29.97	19°34.82	
1a	2	301	18-7-01	199	0023	66°29.97	19°34.82	
1a	2	600	18-7-01	199	0048	66°29.89	19°30.70	
1a	3	601	18-7-01	199	0048	66°29.89	19°30.70	
1a	3	749	18-7-01	199	0057	66°29.98	19°28.34	Stop firing to retrieve airgun and replace
								firing line at about file 743
1b	4	900	18-7-01	199	0132	66°29.42	19°23.76	
1b	4	1199	18-7-01	199	0156	66°30.00	19°18.24	
1b	5	1200	18-7-01	199	0156	66°30.00	19°18.24	
1b	5	1492	18-7-01	199	0222	66°30.02	19°13.91	
1c	6	1500	18-7-01	199	0419	66°30.02	19°13.91	Shift to shooting by distance at file 1560
1c	6	1799	18-7-01	199	0445	66°29.98	18°52.88	
1c	7	1800	18-7-01	199	0445	66°29.98	18°52.88	
1c	7	2099	18-7-01	199	0511	66°29.97	18°47.64	

Line#	Reel#	File#	Date	JD	Time	Latitude	Longitude	Comments
1c	8	2100	18-7-01	199	0511	66°29.97	18°47.64	
1c	8	2399	18-7-01	199	0534	66°30.00	18°42.46	
1c	9	2400	18-7-01	199	0534	66°30.00	18°42.46	
1c	9	2699	18-7-01	199	0601	66°30.00	18°37.60	
1c	10	2700	18-7-01	199	0601	66°30.00	18°37.60	
1c	10	2999	18-7-01	199	0625	66°29.99	18°32.20	
1c	11	3000	18-7-01	199	0625	66°30.00	18°37.60	
1c	11	3299	18-7-01	199	0651	66°29.98	18°27.06	
1c	12	3300	18-7-01	199	0651	66°29.98	18°27.06	
1c	12	3599	18-7-01	199	0716	66°29.97	18°21.92	
1c	13	3600	18-7-01	199	0716	66°29.97	18°21.92	
1c	13	3899	18-7-01	199	0739	66°29.98	18°16.79	
1c	14	3900	18-7-01	199	0739	66°29.98	18°16.79	
1c	14	4199	18-7-01	199	0805	66°29.94	18°11.66	
1c	15	4200	18-7-01	199	0805	66°29.94	18°11.66	
1c	15	4499	18-7-01	199	0829	66°29.93	18°06.51	
1c	16	4500	18-7-01	199	0829	66°29.93	18°06.51	
1c	16	4799	18-7-01	199	0905	66°29.96	17°59.07	
1c	17	4800	18-7-01	199	0905	66°29.96	17°59.07	Stopped shooting between 0922-0924
1c	17	5099	18-7-01	199	0931	66°30.00	17°53.86	
1c	18	5100	18-7-01	199	0931	66°30.00	17°53.86	
1c	18	5399	18-7-01	199	0957	66°29.97	17°48.56	

Line#	Reel#	File#	Date	JD	Time	Latitude	Longitude	Comments
1c	19	5400	18-7-01	199	0957	66°29.97	17°48.56	No shots for files 5432, 5439-5440; 5645-5646
1c	19	5699	18-7-01	199	1028	66°29.99	17°42.05	
1c	20	5700	18-7-01	199	1028	66°29.99	17°42.05	No shots for files 5975-5979
1c	20	5999	18-7-01	199	1056	66°30.08	17°36.77	
1c	21	6000	18-7-01	199	1056	66°30.08	17°36.77	No shots for files 6015-6016
1c	21	6299	18-7-01	199	1127	66°30.03	17°30.50	
2	22	6300	18-7-01	199	1127	66°30.03	17°30.50	6360 - start line 2
2	22	6599	18-7-01	199	1152	66°31.94	17°30.00	
2	23	6600	18-7-01	199	1152	66°31.94	17°30.00	
2	23	6899	18-7-01	199	1212	66°33.44	17°30.82	
3	24	4	18-7-01	199	1212	66°33.44	17°30.82	Only 3 readable files on this tape
3	24	300	18-7-01	199	1243	66°33.22	17°36.84	
3	25	301	18-7-01	199	1243	66°33.22	17°36.84	
3	25	600	18-7-01	199	1315	66°33.18	17°41.77	
3	26	601	18-7-01	199	1315	66°33.18	17°41.77	
3	26	900	18-7-01	199	1339	66°33.17	17°46.74	
3	27	901	18-7-01	199	1339	66°33.17	17°46.74	
3	27	1200	18-7-01	199	1404	66°33.21	17°51.80	
4	28	1201	18-7-01	199	1404	66°33.21	17°51.80	
4	28	1500	18-7-01	199	1430	66°34.97	17°53.35	
4	29	1501	18-7-01	199	1430	66°34.97	17°53.35	
4	29	1800	18-7-01	199	1452	66°36.69	17°53.59	
5	30	1801	18-7-01	199	1456	66°36.68	17°53.00	
5	30	2100	18-7-01	199	1521	66°36.66	17°47.90	

Line#	Reel#	File#	Date	JD	Time	Latitude	Longitude	Comments
5	31	2101	18-7-01	199	1521	66°36.66	17°47.90	
5	31	2400	18-7-01	199	1545	66°36.64	17°42.79	
5	32	2401	18-7-01	199	1545	66°36.64	17°42.79	
5	32	2700	18-7-01	199	1611	66°36.66	17°37.60	
5	33	2701	18-7-01	199	1611	66°36.66	17°37.60	
5	33	3000	18-7-01	199	1636	66°36.67	17°32.46	
5/6	34	3001	18-7-01	199	1636	66°36.67	17°32.46	3129 - end of line 5
5/6	34	3300	18-7-01	199	1701	66°37.38	17°30.75	3285 - start line 6
6	35	3301	18-7-01	199	1701	66°37.38	17°30.75	
6	35	3600	18-7-01	199	1726	66°37.18	17°35.75	
6	36	3601	18-7-01	199	1726	66°37.18	17°35.75	
6	36	3900	18-7-01	199	1752	66°37.16	17°41.15	
7	37	3901	18-7-01	199	1752	66°37.16	17°41.15	3998 - start of line 7
7	37	4200	18-7-01	199	1815			
7	38	4201	18-7-01	199	1815			
7	38	4500	18-7-01	199	1842	66°33.29	17°42.00	
7	39	4501	18-7-01	199	1842	66°33.29	17°42.00	
7	39	4800	18-7-01	199	1907	66°31.24	17°41.90	
7	40	4801	18-7-01	199	1907	66°31.24	17°41.90	
7	40	5100	18-7-01	199	1933	66°29.07	17°41.89	
7	41	5101	18-7-01	199	1933	66°29.07	17°41.89	
7	41	5400	18-7-01	199	1958	66°27.02	17°42.00	
7	42	5401	18-7-01	199	1958	66°27.02	17°42.00	
7	42	5700	18-7-01	199	2023	66°24.98	17°41.97	

Line#	Reel#	File#	Date	JD	Time	Latitude	Longitude	Comments
7	43	5701	18-7-01	199	2023	66°24.98	17°41.97	
7	43	6000	18-7-01	199	2047	66°22.95	17°41.97	
8	44	6001	18-7-01	199	2047	66°22.95	17°41.97	2058Z - start of line 8
8	44	6300	18-7-01	199	2114	66°22.74	17°45.01	
8	45	6301	18-7-01	199	2114	66°22.74	17°45.01	
8	45	6600	18-7-01	199	2139	66°23.03	17°47.93	
8	46	6601	18-7-01	199	2139	66°23.03	17°47.93	
8	46	6900	18-7-01	199	2204	66°23.36	17°50.96	
8	47	6901	18-7-01	199	2204	66°23.36	17°50.96	
8	47	7200	18-7-01	199	2230	66°23.62	17°54.13	
8	48	7201	18-7-01	199	2230	66°23.62	17°54.13	
8	48	7500	18-7-01	199	2256	66°24.13	17°58.62	
8	49	7501	18-7-01	199	2256	66°24.13	17°58.62	
8	49	7800	18-7-01	199	2321	66°24.68	18°03.54	
8	50	7801	18-7-01	199	2321	66°24.68	18°03.54	
8	50	8100	18-7-01	199	2346	66°25.19	18°08.53	
8	51	8101	18-7-01	199	2346	66°25.19	18°08.53	
8	51	8400	19-7-01	200	0010	66°25.70	18°13.46	
8	52	8401	19-7-01	200	0010	66°25.70	18°13.46	
8	52	8700	19-7-01	200	0036	66°26.29	18°18.54	
8	53	8701	19-7-01	200	0036	66°26.29	18°18.54	
8	53	9000	19-7-01	200	0102	66°26.82	18°23.59	

Line#	Reel#	File#	Date	JD	Time	Latitude	Longitude	Comments
8	54	9001	19-7-01	200	0102	66°26.82	18°23.59	
8	54	9300	19-7-01	200	0126	66°27.34	18°28.52	
8	55	9301	19-7-01	200	0126	66°27.34	18°28.52	
8	55	9600	19-7-01	200	0150	66°27.81	18°33.22	
9	56	1	19-7-01	200	0152	66°27.81	18°33.22	
9	56	300	19-7-01	200	0218	66°28.00	18°38.93	
9	57	301	19-7-01	200	0218	66°28.00	18°38.93	
9	57	600	19-7-01	200	0244	66°29.99	18°44.16	
9	58	601	19-7-01	200	0244	66°29.99	18°44.16	
9	58	900	19-7-01	200	0308	66°27.97	18°49.22	
9	59	901	19-7-01	200	0308	66°27.97	18°49.22	
9	59	1200	19-7-01	200	0334	66°27.97	18°54.32	
9	60	1201	19-7-01	200	0334	66°27.97	18°54.32	
9	60	1500	19-7-01	200	0359	66°27.97	18°59.42	
9	61	1501	19-7-01	200	0359	66°27.97	18°59.42	
9	61	1800	19-7-01	200	0424	66°27.98	19°04.53	
9	62	1801	19-7-01	200	0424	66°27.98	19°04.53	
9	62	2100	19-7-01	200	0450	66°28.02	19°09.61	
9	63	2101	19-7-01	200	0450	66°28.02	19°09.61	
9	63	2400	19-7-01	200	0516	66°27.22	19°12.63	
10	64	2401	19-7-01	200	0516	66°27.22	19°12.63	
10	64	2700	19-7-01	200	0542	66°27.00	19°07.84	
10	65	2701	19-7-01	200	0542	66°27.00	19°07.84	
10	65	3000	19-7-01	200	0606	66°29.70	19°02.73	

Line#	Reel#	File#	Date	JD	Time	Latitude	Longitude	Comments
10	66	3001	19-7-01	200	0606	66°29.70	19°02.73	
10	66	3300	19-7-01	200	0632	66°26.99	18°59.51	
10	67	3301	19-7-01	200	0632	66°26.99	18°59.51	
10	67	3600	19-7-01	200	0657	66°27.00	18°52.45	
10	68	3601	19-7-01	200	0657	66°27.00	18°52.45	
10	68	3900	19-7-01	200	0722	66°27.02	18°47.40	
10	69	3901	19-7-01	200	0722	66°27.02	18°47.40	
10	69	4200	19-7-01	200	0747	66°27.02	18°42.26	
10	70	4201	19-7-01	200	0747	66°27.02	18°42.26	
10	70	4500	19-7-01	200	0812	66°27.00	18°37.18	
10	71	4501	19-7-01	200	0812	66°27.00	18°37.18	4595 - end of line 10
10	71	4800	19-7-01	200	0838	66°26.03	18°36.07	4787 - start of line 11
11	72	4801	19-7-01	200	0838	66°26.03	18°36.07	
11	72	5100	19-7-01	200	0903	66°28.99	18°41.23	
11	73	5102	19-7-01	200	0903	66°28.99	18°41.23	
11	73	5401	19-7-01	200	0928	66°25.97	18°46.34	
11	74	5402	19-7-01	200	0928	66°25.97	18°46.34	
11	74	5701	19-7-01	200	0953	66°25.99	18°51.45	
11	75	5702	19-7-01	200	0953	66°25.99	18°51.45	
11	75	6001	19-7-01	200	1018	66°26.00	18°56.53	
11	76	6002	19-7-01	200	1018	66°26.00	18°56.53	
11	76	6301	19-7-01	200	1043	66°26.03	19°01.66	

Line#	Reel#	File#	Date	JD	Time	Latitude	Longitude	Comments
11	77	6302	19-7-01	200	1043	66°26.03	19°01.66	
11	77	6601	19-7-01	200	1108	66°25.99	19°06.84	
11	78	6602	19-7-01	200	1108	66°25.99	19°06.84	
11	78	6901	19-7-01	200	1133	66°25.95	19°11.92	
11	79	6902	19-7-01	200	1133	66°25.95	19°11.92	
11	79	6907	19-7-01	200	1136	66°25.95	19°12.69	
12	80	1	19-7-01	200	1203	66°25.45	19°14.08	0154 - start of line 12
12	80	236	19-7-01	200	1228	66°24.90	19°09.75	end tape - recording problem
12	81	29	19-7-01	200	1239	66°25.00	19°07.66	
12	81	300	19-7-01	200	1303	66°25.00	19°03.07	
12	82	301	19-7-01	200	1303	66°25.00	19°03.07	
12	82	600	19-7-01	200	1328	66°25.02	18°57.99	
12	83	601	19-7-01	200	1328	66°25.02	18°57.99	
12	83	900	19-7-01	200	1353	66°25.00	18°52.77	
12	84	901	19-7-01	200	1353	66°25.00	18°52.77	
12	84	1200	19-7-01	200	1418	66°24.99	18°47.69	
12	85	1201	19-7-01	200	1418	66°24.99	18°47.69	
12	85	1500	19-7-01	200	1444	66°25.02	18°42.27	
12	86	1501	19-7-01	200	1444	66°25.02	18°42.27	
12	86	1800	19-7-01	200	1509	66°25.01	18°37.27	
12	87	1801	19-7-01	200	1509	66°25.01	18°37.27	
12	87	1880	19-7-01	200	1513	66°25.00	18°36.53	stopped shooting; no more data on tape
13	88	12	19-7-01	200	1559	66°23.93	18°33.85	
13	88	300	19-7-01	200	1623	66°23.99	18°38.69	

Line#	Reel#	File#	Date	JD	Time	Latitude	Longitude	Comments
13	89	301	19-7-01	200	1623	66°23.99	18°38.69	
13	89	600	19-7-01	200	1648	66°23.96	18°43.62	
13	90A	601	19-7-01	200	1648	66°23.96	18°43.62	
13	90A	900	19-7-01	200	1714	66°23.97	18°48.91	
13	90B	901	19-7-01	200	1714	66°23.97	18°48.91	
13	90B	1200	19-7-01	200	1740	66°24.00	18°53.99	
13	91	1201	19-7-01	200	1740	66°24.00	18°53.99	
13	91	1500	19-7-01	200	1804	66°24.00	18°59.00	
13	92	1501	19-7-01	200	1804	66°24.00	18°59.00	
13	92	1800	19-7-01	200	1831	66°24.03	19°04.26	
13	93	1801	19-7-01	200	1831	66°24.03	19°04.26	2075 - end of line 13
13	93	2100	19-7-01	200	1858	66°23.64	19°09.08	
14	94	2101	19-7-01	200	1858	66°23.64	19°09.08	2288 - start of line 14
14	94	2400	19-7-01	200	1922	66°22.99	19°05.54	
14	95	2401	19-7-01	200	1922	66°22.99	19°05.54	
14	95	2700	19-7-01	200	1948	66°23.00	19°00.51	
14	96	2701	19-7-01	200	1948	66°23.00	19°00.51	
14	96	3000	19-7-01	200	2012	66°22.99	18°55.37	
14	97	3001	19-7-01	200	2012	66°22.99	18°55.37	
14	97	3300	19-7-01	200	2037	66°23.03	18°50.15	
14	98	3301	19-7-01	200	2037	66°23.03	18°50.15	
14	98	3600	19-7-01	200	2103	66°23.00	18°44.85	

Line#	Reel#	File#	Date	JD	Time	Latitude	Longitude	Comments
14	99	3601	19-7-01	200	2103	66°23.00	18°44.85	
14	99	3900	19-7-01	200	2128	66°23.02	18°39.67	
14	100	3901	19-7-01	200	2128	66°23.02	18°39.67	
14	100	4200	19-7-01	200	2152	66°23.01	18°34.60	
14	101	4201	19-7-01	200	2152	66°23.01	18°34.60	
14	101	4500	19-7-01	200	2218	66°22.95	18°29.39	
15	102	4501	19-7-01	200	2218	66°22.95	18°29.39	4708 - start of line 15
15	102	4800	19-7-01	200	2243	66°22.00	18°31.81	
15	103	4801	19-7-01	200	2243	66°22.00	18°31.81	
15	103	5100	19-7-01	200	2309	66°22.00	18°36.95	
15	104	5101	19-7-01	200	2309	66°22.00	18°36.95	
15	104	5400	19-7-01	200	2334	66°21.98	18°42.19	
15	105	5401	19-7-01	200	2334	66°21.98	18°42.19	
15	105	5700	19-7-01	200	2358	66°21.96	18°47.08	
15	106	5701	19-7-01	200	2358	66°21.96	18°47.08	
15	106	6000	20-7-01	201	0023	66°22.03	18°52.43	
15	107	6001	20-7-01	201	0023	66°22.03	18°52.43	
15	107	6300	20-7-01	201	0048	66°22.03	18°57.52	
15	108	6301	20-7-01	201	0048	66°22.03	18°57.52	
15	108	6600	20-7-01	201	0114	66°21.98	19°02.65	
15	109	6601	20-7-01	201	0114	66°21.98	19°02.65	6745 - end of line 15
15	109	6767	20-7-01	201	0130	66°22.01	19°05.35	end reel - recording problem
16	110	1	20-7-01	201	0223	66°20.99	19°01.55	
16	110	300	20-7-01	201	0251	66°20.97	18°55.95	

Line#	Reel#	File#	Date	JD	Time	Latitude	Longitude	Comments
16	111	301	20-7-01	201	0251	66°20.97	18°55.95	
16	111	600	20-7-01	201	0314	66°21.02	18°51.25	
16	112	601	20-7-01	201	0314	66°21.02	18°51.25	
16	112	900	20-7-01	201	0338	66°20.98	18°45.95	
16	113	901	20-7-01	201	0338	66°20.98	18°45.95	
16	113	1200	20-7-01	201	0404	66°21.00	18°41.01	
16	114	1201	20-7-01	201	0404	66°21.00	18°41.01	
16	114	1500	20-7-01	201	0430	66°21.05	18°35.94	
16	115	1501	20-7-01	201	0430	66°21.05	18°35.94	
16	115	1800	20-7-01	201	0455	66°21.02	18°30.87	
16	116	1801	20-7-01	201	0455	66°21.02	18°30.87	
16	116	2100	20-7-01	201	0520	66°20.96	18°25.74	
16/17	117	2101	20-7-01	201	0520	66°20.96	18°25.74	2330 - start of line 17
16/17	117	2400	20-7-01	201	0544	66°19.98	18°26.90	
17	118	2401	20-7-01	201	0544	66°19.98	18°26.90	
17	118	2700	20-7-01	201	0609	66°19.99	18°37.10	
17	119	2701	20-7-01	201	0609	66°19.99	18°37.10	
17	119	3000	20-7-01	201	0635	66°19.95	18°42.17	
17	120	3001	20-7-01	201	0635	66°19.95	18°42.17	
17	120	3300	20-7-01	201	0700	66°19.95	18°42.17	
17	121	3301	20-7-01	201	0700	66°19.95	18°42.17	
17	121	3600	20-7-01	201	0726	66°19.98	18°47.27	

Line#	Reel#	File#	Date	JD	Time	Latitude	Longitude	Comments
17	122	3601	20-7-01	201	0726	66°19.98	18°47.27	
17	122	3900	20-7-01	201	0752	66°20.05	18°52.31	
17	123	3901	20-7-01	201	0752	66°20.05	18°52.31	
17	123	4200	20-7-01	201	0819	66°19.99	18°57.41	
17	124	4201	20-7-01	201	0819	66°19.99	18°57.41	4385 - end of line 17
17	124	4500	20-7-01	201	0845	66°19.26	19°00.97	
18	125	4501	20-7-01	201	0845	66°19.26	19°00.97	4575 - start of line 18
18	125	4800	20-7-01	201	0909	66°18.99	18°51.20	
18	126	4801	20-7-01	201	0909	66°18.99	18°51.20	
18	126	5100	20-7-01	201	0935	66°18.94	18°51.20	
18	127	5101	20-7-01	201	0935	66°18.94	18°51.20	
18	127	5302	20-7-01	201	0951	66°18.92	18°48.02	stopped shooting
18	128	5373	20-7-01	201	0959	66°18.94	18°46.21	
18	128	5672	20-7-01	201	1025	66°18.99	18°41.11	
18	129	5673	20-7-01	201	1025	66°18.99	18°41.11	
18	129	5972	20-7-01	201	1050	66°19.06	18°30.93	
18	130	5973	20-7-01	201	1050	66°19.06	18°30.93	
18	130	6272	20-7-01	201	1117	66°14.04	18°30.93	
18	131	6273	20-7-01	201	1117	66°14.04	18°30.93	
18	131	6572	20-7-01	201	1143	66°18.97	18°97.10	
18	132	6573	20-7-01	201	1143	66°18.97	18°97.10	
18	132	6872	20-7-01	201	1210	66°18.97	18°20.76	
18	133	6873	20-7-01	201	1210	66°18.97	18°20.76	7064 - end of line 18
18	133	7172	20-7-01	201	1236	66°18.19	18°17.52	

Line#	Reel#	File#	Date	JD	Time	Latitude	Longitude	Comments
19	134	7173	20-7-01	201	1236	66°18.19	18°17.52	7231 - stopped shooting
19	134	7472	20-7-01	201	1324	66°18.00	18°25.03	7285 - start of line 19
19	135	7473	20-7-01	201	1324	66°18.00	18°25.03	
19	135	7772	20-7-01	201	1354	66°18.01	18°31.16	
19	136	7773	20-7-01	201	1354	66°18.01	18°31.16	
19	136	8072	20-7-01	201	1416	66°17.99	18°35.33	
19	137	8073	20-7-01	201	1416	66°17.99	18°35.33	
19	137	8372	20-7-01	201	1440	66°17.98	18°40.18	
19	138	8373	20-7-01	201	1440	66°17.98	18°40.18	
19	138	8672	20-7-01	201	1506	66°18.00	18°45.41	
19	139	8673	20-7-01	201	1506	66°18.00	18°45.41	
19	139	8972	20-7-01	201	1531	66°18.02	18°50.43	
19	140	8973	20-7-01	201	1531	66°18.02	18°50.43	
19	140	9272	20-7-01	201	1556	66°18.00	18°55.46	
19	141	9273	20-7-01	201	1556	66°18.00	18°55.46	9360 - end of line 19
19	141	9572	20-7-01	201	1622	66°16.98	18°55.88	
20	142	9573	20-7-01	201	1622	66°16.98	18°55.88	
20	142	9872	20-7-01	201	1648	66°17.01	18°50.72	
20	143	9873	20-7-01	201	1648	66°17.01	18°50.72	
20	143	10172	20-7-01	201	1712	66°16.99	18°45.64	
20	144	10173	20-7-01	201	1712	66°16.99	18°45.64	
20	144	10472	20-7-01	201	1738	66°17.00	18°40.46	

Line#	Reel#	File#	Date	JD	Time	Latitude	Longitude	Comments
20	145	10473	20-7-01	201	1738	66°17.00	18°40.46	
20	145	10772	20-7-01	201	1802	66°17.05	18°35.59	
20	146	10773	20-7-01	201	1802	66°17.05	18°35.59	
20	146	11072	20-7-01	201	1827	66°17.00	18°30.47	
20	147	11073	20-7-01	201	1827	66°17.00	18°30.47	
20	147	11372	20-7-01	201	1854	66°16.96	18°25.17	
20	148	11373	20-7-01	201	1854	66°16.96	18°25.17	
20	148	11672	20-7-01	201	1921	66°17.01	18°19.73	
20	149	11673	20-7-01	201	1921	66°17.01	18°19.73	11828 - end of line 20
20	149	11972	20-7-01	201	1945	66°16.09	18°17.34	
21	150	11973	20-7-01	201	1945	66°16.09	18°17.34	
21	150	12272	20-7-01	201	2019	66°15.98	18°28.20	
21	151	12273	20-7-01	201	2019	66°15.98	18°28.20	
21	151	12572	20-7-01	201	2040	66°15.98	18°28.20	
21	152	12573	20-7-01	201	2040	66°15.98	18°28.20	
21	152	12872	20-7-01	201	2101	66°16.01	18°32.52	
21	153	12873	20-7-01	201	2101	66°16.01	18°32.52	
21	153	13172	20-7-01	201	2127	66°15.98	18°37.45	
21	154	13173	20-7-01	201	2127	66°15.98	18°37.45	
21	154	13472	20-7-01	201	2154	66°15.98	18°42.47	
21	155	13473	20-7-01	201	2154	66°15.98	18°42.47	
21	155	13772	20-7-01	201	2220	66°15.98	18°47.74	
21	156	13773	20-7-01	201	2220	66°15.98	18°47.74	
21	156	13830	20-7-01	201	2224	66°15.97	18°48.58	end of line 21

Line#	Reel#	File#	Date	JD	Time	Latitude	Longitude	Comments
22	157	1	20-7-01	201	2229	66°15.47	18°49.15	142 - start of line 22
22	157	300	20-7-01	201	2254	66°14.98	18°45.28	
22	158	301	20-7-01	201	2254	66°14.98	18°45.28	misfire on file 570
22	158	600	20-7-01	201	2320	66°15.03	18°45.28	
22	159	601	20-7-01	201	2320	66°15.03	18°45.28	
22	159	900	20-7-01	201	2344	66°15.00	18°35.97	
22	160	901	20-7-01	201	2344	66°15.00	18°35.97	
22	160	1200	21-7-01	202	0009	66°15.01	18°29.87	
22	161	1201	21-7-01	202	0009	66°15.01	18°29.87	
22	161	1500	21-7-01	202	0035	66°15.00	18°24.87	
22	162	1501	21-7-01	202	0035	66°15.00	18°24.87	
22	162	1800	21-7-01	202	0101	66°14.97	18°19.78	
22	163	1801	21-7-01	202	0101	66°14.97	18°19.78	
22	163	2100	21-7-01	202	0126	66°15.00	18°14.76	
22	164	2101	21-7-01	202	0126	66°15.00	18°14.76	2250 - end of line 22
22	164	2400	21-7-01	202	0152	66°14.03	18°12.10	
23	165	2401	21-7-01	202	0152	66°14.03	18°12.10	2443 - start of line 23
23	165	2700	21-7-01	202	0218	66°13.97	18°17.45	
23	166	2701	21-7-01	202	0218	66°13.97	18°17.45	
23	166	3000	21-7-01	202	0244	66°13.97	18°22.54	
23	167	3001	21-7-01	202	0244	66°13.97	18°22.54	
23	167	3300	21-7-01	202	0309	66°14.00	18°27.62	

Line#	Reel#	File#	Date	JD	Time	Latitude	Longitude	Comments
23	168	3301	21-7-01	202	0309	66°14.00	18°27.62	
23	168	3600	21-7-01	202	0333	66°14.04	18°32.69	
23	169	3601	21-7-01	202	0333	66°14.04	18°32.69	
23	169	3900	21-7-01	202	0358	66°14.02	18°37.80	
23	170	3901	21-7-01	202	0358	66°14.02	18°37.80	4047 - end of line 23
23	170	4200	21-7-01	202	0426	66°12.97	18°39.42	
24	171	4201	21-7-01	202	0426	66°12.97	18°39.42	4257 - start of line 24
24	171	4500	21-7-01	202	0452	66°12.97	18°34.50	
24	172	4501	21-7-01	202	0452	66°12.97	18°34.50	
24	172	4800	21-7-01	202	0518	66°12.97	18°29.44	
24	173	4801	21-7-01	202	0518	66°12.97	18°29.44	
24	173	5100	21-7-01	202	0544	66°12.99	18°24.41	
24	174	5101	21-7-01	202	0544	66°12.99	18°24.41	
24	174	5400	21-7-01	202	0612	66°12.95	18°19.34	
24	175	5401	21-7-01	202	0612	66°12.95	18°19.34	
24	175	5643	21-7-01	202	0632	66°13.00	18°15.47	end of line 24; port stop in Dalvik
25A	176	1	21-7-01	202	1805	66°06.90	18°23.30	275-290 - no shots
25A	176	300	21-7-01	202	1832	66°08.78	18°23.36	
25A	177	301	21-7-01	202	1832	66°08.78	18°23.36	
25A	177	600	21-7-01	202	1857	66°10.48	18°20.83	540 - stopped shooting
25A/B	178	601	21-7-01	202	1857	66°10.48	18°20.83	638 - end of line 25A
25A/B	178	900	21-7-01	202	1934	66°10.99	18°24.48	880 - start of line 25B
25B	179	901	21-7-01	202	1934	66°10.99	18°24.48	
25B	179	1200	21-7-01	202	2000	66°10.99	18°29.54	

Line#	Reel#	File#	Date	JD	Time	Latitude	Longitude	Comments
25B	180	1201	21-7-01	202	2000	66°10.99	18°29.54	
25B	180	1500	21-7-01	202	2025	66°11.01	18°24.50	
26	181	1501	21-7-01	202	2025	66°11.01	18°24.50	1694 - start of line 26
26	181	1800	21-7-01	202	2051	66°12.02	18°31.74	
26	182	1801	21-7-01	202	2051	66°12.02	18°31.74	
26	182	2100	21-7-01	202	2115	66°11.96	18°26.54	
26	183	2101	21-7-01	202	2115	66°11.96	18°26.54	
26	183	2400	21-7-01	202	2140	66°12.00	18°21.69	
26	184	2401	21-7-01	202	2140	66°12.00	18°21.69	
26	184	2700	21-7-01	202	2207	66°12.02	18°16.65	
26	185	2701	21-7-01	202	2207	66°12.02	18°16.65	
26	185	3000	21-7-01	202	2231	66°11.98	18°11.75	
26	186	3001	21-7-01	202	2231	66°11.98	18°11.75	
26	186	3300	21-7-01	202	2257	66°11.98	18°06.38	
26	187	3301	21-7-01	202	2257	66°11.98	18°06.38	
26	187	3600	21-7-01	202	2320	66°11.97	18°01.55	
26	188	3601	21-7-01	202	2320	66°11.97	18°01.55	
26	188	3900	21-7-01	202	2346	66°12.07	17°56.36	
26	189	3901	21-7-01	202	2346	66°12.07	17°56.36	
26	189	4200	22-7-01	203	0012	66°12.00	17°51.16	
26	190	4201	22-7-01	203	0012	66°12.00	17°51.16	
26	190	4500	22-7-01	203	0037	66°12.02	17°46.13	

Line#	Reel#	File#	Date	JD	Time	Latitude	Longitude	Comments
26/27	191	4501	22-7-01	203	0037	66°12.02	17°46.13	4596 - end of line 26
26/27	191	4800	22-7-01	203	0101	66°11.40	17°41.42	4616 - start of line 27
27	192	4801	22-7-01	203	0101	66°11.40	17°41.42	
27	192	5100	22-7-01	203	0126	66°10.61	17°36.81	
27	193	5101	22-7-01	203	0126	66°10.61	17°36.81	
27	193	5400	22-7-01	203	0151	66°09.80	17°32.11	
27	194	5401	22-7-01	203	0151	66°09.80	17°32.11	
27	194	5700	22-7-01	203	0215	66°09.01	17°27.47	
27	195	5701	22-7-01	203	0215	66°09.01	17°27.47	5924 - end of line 27
27	195	6000	22-7-01	203	0241	66°08.76	17°22.99	
27	196	6001	22-7-01	203	0241	66°08.76	17°22.99	Turn
27	196	6300	22-7-01	203	0308	66°09.07	17°26.86	
28	197	6301	22-7-01	203	0308	66°09.07	17°26.86	6415 - start of line 28
28	197	6600	22-7-01	203	0334	66°07.78	17°28.61	
28	198	6601	22-7-01	203	0334	66°07.78	17°28.61	
28	198	6900	22-7-01	203	0358	66°05.91	17°30.72	
28	199	6901	22-7-01	203	0358	66°05.91	17°30.72	
28	199	7200	22-7-01	203	0423	66°04.05	17°32.81	
28	200	7201	22-7-01	203	0423	66°04.05	17°32.81	
28	200	7500	22-7-01	203	0448	66°02.17	17°34.78	
28	201	7501	22-7-01	203	0448	66°02.17	17°34.78	7566 - end of line 28
28	201	7800	22-7-01	203	0453	66°01.77	17°35.14	
28	202	1	22-7-01	203	0453	66°01.77	17°35.14	Turn
28	202	300	22-7-01	203	0522	66°01.66	17°30.24	

Line#	Reel#	File#	Date	JD	Time	Latitude	Longitude	Comments
29	203	301	22-7-01	203	0522	66°01.66	17°30.24	324 - start of line 29
29	203	600	22-7-01	203	0547	66°03.46	17°27.89	
29	204	601	22-7-01	203	0547	66°03.46	17°27.89	
29	204	900	22-7-01	203	0613	66°05.30	17°25.85	
29	205	901	22-7-01	203	0613	66°05.30	17°25.85	
29	205	1200	22-7-01	203	0639	66°07.23	17°25.47	
29	206	1201	22-7-01	203	0639	66°07.23	17°25.47	
29	206	1500	22-7-01	203	0705	66°09.00	17°27.72	
29	207	1501	22-7-01	203	0705	66°09.00	17°27.72	
29	207	1800	22-7-01	203	0729	66°10.65	17°30.58	
30	208	1801	22-7-01	203	0729	66°10.65	17°30.58	Problems with DAS; start and stop
30	208	2100	22-7-01	203	0807	66°08.07	17°34.22	shooting several times
30	209	2101	22-7-01	203	0807	66°08.07	17°34.22	
30	209	2400	22-7-01	203	0832	66°06.15	17°36.22	
30	210	2401	22-7-01	203	0832	66°06.15	17°36.22	
30	210	2700	22-7-01	203	0856	66°04.32	17°38.20	
30	211	2701	22-7-01	203	0856	66°04.32	17°38.20	2811 - end of line 30
30	211	3000	22-7-01	203	0923	66°04.39	17°41.51	
31	212	3001	22-7-01	203	0923	66°04.39	17°41.51	3175 - start of line 31
31	212	3300	22-7-01	203	0949	66°06.12	17°41.74	
31	213	3301	22-7-01	203	0949	66°06.12	17°41.74	
31	213	3600	22-7-01	203	1015	66°07.97	17°39.67	

Line#	Reel#	File#	Date	JD	Time	Latitude	Longitude	Comments
31	214	3601	22-7-01	203	1015	66°07.97	17°39.67	
31	214	3900	22-7-01	203	1039	66°09.83	17°37.50	
31	215	3901	22-7-01	203	1039	66°09.83	17°37.50	4137 - end of line 31
31	215	4200	22-7-01	203	1104	66°11.67	17°36.28	
32	216	4201	22-7-01	203	1104	66°11.67	17°36.28	4462 - start of line 32
32	216	4500	22-7-01	203	1129	66°11.95	17°40.53	
32	217	4501	22-7-01	203	1129	66°11.95	17°40.53	
32	217	4800	22-7-01	203	1155	66°10.07	17°42.77	
32	218	4801	22-7-01	203	1155	66°10.07	17°42.77	
32	218	5100	22-7-01	203	1220	66°08.19	17°45.18	
32	219	5101	22-7-01	203	1220	66°08.19	17°45.18	5325 - end of line 32
32	219	5400	22-7-01	203	1243	66°06.84	17°47.50	
33	220	5401	22-7-01	203	1243	66°06.84	17°47.50	5325 - start of line 33
33	220	5700	22-7-01	203	1314	66°08.75	17°47.50	
33	221	5701	22-7-01	203	1314	66°08.75	17°47.50	
33	221	6000	22-7-01	203	1338	66°10.40	17°45.41	
33	222	6001	22-7-01	203	1338	66°10.40	17°45.41	6254 - end of line 33
33	222	6300	22-7-01	203	1404	66°11.86	17°42.62	
34	223	6301	22-7-01	203	1404	66°11.86	17°42.62	
34	223	6600	22-7-01	203	1433	66°09.76	17°44.44	
34	224	6601	22-7-01	203	1433	66°09.76	17°44.44	
34	224	6900	22-7-01	203	1456	66°08.10	17°46.50	
34	225	6901	22-7-01	203	1456	66°08.10	17°46.50	7077 - end of line 34
34	225	7200	22-7-01	203	1525	66°06.51	17°45.68	

Line#	Reel#	File#	Date	JD	Time	Latitude	Longitude	Comments
35	226	7201	22-7-01	203	1525	66°06.51	17°45.68	7267 - start of line 35
35	226	7500	22-7-01	203	1549	66°06.16	17°43.41	
35	227	7501	22-7-01	203	1549	66°06.16	17°43.41	
35	227	7800	22-7-01	203	1615	66°10.00	17°41.09	
35	228	7801	22-7-01	203	1615	66°10.00	17°41.09	7973 - end of line 35
35	228	8100	22-7-01	203	1629	66°10.99	17°39.98	
36	229	8101	22-7-01	203	1629	66°10.99	17°39.98	8134 - start of line 36
36	229	8400	22-7-01	203	1707	66°08.60	17°40.90	
36	230	8401	22-7-01	203	1707	66°08.60	17°40.90	
36	230	8700	22-7-01	203	1736	66°06.50	17°43.20	
36	231	8701	22-7-01	203	1736	66°06.50	17°43.20	8863 - end of line 36
36	231	9000	22-7-01	203	1806	66°04.58	17°41.48	
37	232	9001	22-7-01	203	1806	66°04.58	17°41.48	9167 - start of line 37
37	232	9300	22-7-01	203	1833	66°06.29	17°39.49	
37	233	9301	22-7-01	203	1833	66°06.29	17°39.49	
37	233	9600	22-7-01	203	1901	66°08.36	17°37.20	
37	234	9601	22-7-01	203	1901	66°08.36	17°37.20	
37	234	9900	22-7-01	203	1918	66°09.61	17°35.83	
37/38	235	9901	22-7-01	203	1918	66°09.61	17°35.83	10020 - end of line 37
37/38	235	10200	22-7-01	203	1944	66°09.14	17°34.87	10125 - start of line 38
38	236	10201	22-7-01	203	1944	66°09.14	17°34.87	
38	236	10500	22-7-01	203	2008	66°07.29	17°36.75	

Line#	Reel#	File#	Date	JD	Time	Latitude	Longitude	Comments
38	237	10501	22-7-01	203	2008	66°07.29	17°36.75	
38	237	10800	22-7-01	203	2034	66°05.11	17°39.10	
38	238	10801	22-7-01	203	2034	66°05.11	17°39.10	11002 - end of line 38
38	238	11100	22-7-01	203	2059	66°03.53	17°38.94	
	239	11101	22-7-01	203	2059	66°03.53	17°38.94	Turn
	239	11236	22-7-01	203	2105			
39	240	1	22-7-01	203	2112	66°03.23	17°36.82	0008 - start of line 39
39	240	300	22-7-01	203	2138	66°05.21	17°35.15	
39	241	301	22-7-01	203	2138	66°05.21	17°35.15	
39	241	600	22-7-01	203	2204	66°07.12	17°33.07	
39	242	601	22-7-01	203	2204	66°07.12	17°33.07	
39	242	900	22-7-01	203	2228	66°08.92	17°31.06	
39/40	243	901	22-7-01	203	2228	66°08.92	17°31.06	0962 - end of line 39
39/40	243	1200	22-7-01	203	2254	66°08.19	17°30.07	1093 - start of line 40
40	244	1201	22-7-01	203	2254	66°08.19	17°30.07	
40	244	1500	22-7-01	203	2319	66°06.33	17°32.19	
40	245	1501	22-7-01	203	2319	66°06.33	17°32.19	
40	245	1800	22-7-01	203	2344	66°04.42	17°34.30	
40	246	1801	22-7-01	203	2344	66°04.42	17°34.30	
40	246	2100	23-7-01	204	0010	66°02.60	17°36.34	
40/41	247	2101	23-7-01	204	0010	66°02.60	17°36.34	2169 - end of line 40
40/41	247	2402	23-7-01	204	0038	66°01.36	17°33.80	2373 - start of line 41
41	248	2403	23-7-01	204	0038	66°01.36	17°33.80	
41	248	2702	23-7-01	204	0103	66°03.65	17°31.67	

Line#	Reel#	File#	Date	JD	Time	Latitude	Longitude	Comments
41	249	2703	23-7-01	204	0103	66°03.65	17°31.67	
41	249	3002	23-7-01	204	0128	66°05.48	17°29.45	
41	250	3003	23-7-01	204	0128	66°05.48	17°29.45	3237 - end of line 41
41	250	3302	23-7-01	204	0155	66°07.05	17°26.71	
42	251	3303	23-7-01	204	0155	66°07.05	17°26.71	
42	251	3602	23-7-01	204	0222	66°05.24	17°27.74	3385 - start of line 42
42	252	3603	23-7-01	204	0222	66°05.24	17°27.74	
42	252	3902	23-7-01	204	0247	66°03.41	17°30.02	
42	253	3903	23-7-01	204	0247	66°03.41	17°30.02	
42	253	4202	23-7-01	204	0303	66°01.55	17°32.16	
42	254	4203	23-7-01	204	0303	66°01.55	17°32.16	4264 - end of line 42
42	254	4502	23-7-01	204	0339	66°01.21	17°28.92	
43	255	4503	23-7-01	204	0339	66°01.21	17°28.92	4532 - start of line 43
43	255	4802	23-7-01	204	0406	66°03.17	17°26.65	
43	256	4803	23-7-01	204	0406	66°03.17	17°26.65	
43	256	5102	23-7-01	204	0432	66°05.11	17°24.58	
43/44	257	5103	23-7-01	204	0432	66°05.11	17°24.58	5197 - end of line 43
43/44	257	5402	23-7-01	204	0502	66°06.43	17°27.67	5205 - start of line 44
44	258	5403	23-7-01	204	0502	66°06.43	17°27.67	
44	258	5702	23-7-01	204	0529	66°07.28	17°32.33	
44	259	5703	23-7-01	204	0529	66°07.28	17°32.33	
44	259	6002	23-7-01	204	0554	66°08.13	17°36.91	

Line#	Reel#	File#	Date	JD	Time	Latitude	Longitude	Comments
44	260	6003	23-7-01	204	0554	66°08.13	17°36.91	
44	260	6302	23-7-01	204	0618	66°08.92	17°41.53	
44/45	261	6303	23-7-01	204	0618	66°08.92	17°41.53	6302, 6318, 6334 -stop shooting several min
44/45	261	6602	23-7-01	204	0656	66°08.39	17°43.30	6356 - end line 44; 6505 - start shooting line 45
45	262	6603	23-7-01	204	0656	66°08.39	17°43.30	
45	262	6902	23-7-01	204	0721	66°07.52	17°38.62	
45	263	6903	23-7-01	204	0721	66°07.52	17°38.62	
45	263	7202	23-7-01	204	0746	66°06.73	17°34.03	
45	264	7203	23-7-01	204	0746	66°06.73	17°34.03	
45	264	7502	23-7-01	204	0811	66°05.88	17°29.49	
45	265	7503	23-7-01	204	0811	66°05.88	17°29.49	
45	265	7802	23-7-01	204	0837	66°05.00	17°24.78	
45/46	266	7803	23-7-01	204	0837	66°05.00	17°24.78	7863 - end of line 45
45/46	266	8102	23-7-01	204	0901	66°04.40	17°27.33	7990 - start of line 46
46	267	8103	23-7-01	204	0901	66°04.40	17°27.33	
46	267	8402	23-7-01	204	0926	66°05.27	17°31.87	
46	268	8403	23-7-01	204	0926	66°05.27	17°31.87	
46	268	8702	23-7-01	204	0950	66°06.14	17°36.64	
46	269	8703	23-7-01	204	0950	66°06.14	17°36.64	
46	269	9002	23-7-01	204	1015	66°07.00	17°41.37	
46	270	9003	23-7-01	204	1015	66°07.00	17°41.37	
46	270	9302	23-7-01	204	1040	66°07.87	17°45.64	
47	271	9303	23-7-01	204	1040	66°07.87	17°45.64	9485 - start of line 47
47	271	9602	23-7-01	204	1107	66°06.79	17°45.15	

Line#	Reel#	File#	Date	JD	Time	Latitude	Longitude	Comments
47	272	9603	23-7-01	204	1107	66°06.79	17°45.15	
47	272	9902	23-7-01	204	1131	66°05.84	17°40.76	
47	273	9903	23-7-01	204	1131	66°05.84	17°40.76	
47	273	10202	23-7-01	204	1150	66°04.98	17°35.99	
47	274	10203	23-7-01	204	1150	66°04.98	17°35.99	
47	274	10502	23-7-01	204	1220	66°04.11	17°31.51	
47	275	10503	23-7-01	204	1220	66°04.11	17°31.51	
47	275	10802	23-7-01	204	1247	66°03.17	17°26.65	10802 - end of line 47
48	276	10803	23-7-01	204	1247	66°03.17	17°26.65	
48	276	11102	23-7-01	204	1311	66°05.04	17°27.32	
48	277	11103	23-7-01	204	1311	66°05.04	17°27.32	
48	277	11402	23-7-01	204	1336	66°07.09	17°28.36	
48	278	11403	23-7-01	204	1336	66°07.09	17°28.36	
48	278	11702	23-7-01	204	1400	66°08.99	17°29.47	
48	279	11703	23-7-01	204	1400	66°08.99	17°29.47	11838 - end of line 48
48	279	11876	23-7-01	204	1414	66°10.21	17°29.66	
49	280	1	23-7-01	204	1425	66°10.96	17°28.11	0016 - start of line 49
49	280	300	23-7-01	204	1451	66°12.54	17°24.92	
49	281	301	23-7-01	204	1451	66°12.54	17°24.92	
49	281	600	23-7-01	204	1516	66°14.08	17°21.66	
49/50	282	601	23-7-01	204	1516	66°14.08	17°21.66	0764 - end of line 49
49/50	282	900	23-7-01	204	1544	66°15.03	17°22.54	0822 - start of line 50

Line#	Reel#	File#	Date	JD	Time	Latitude	Longitude	Comments
50	283	901	23-7-01	204	1544	66°15.03	17°22.54	
50	283	1200	23-7-01	204	1608	66°15.02	17°27.45	
50	284	1201	23-7-01	204	1608	66°15.02	17°27.45	
50	284	1500	23-7-01	204	1638	66°14.94	17°33.37	
50	285	1501	23-7-01	204	1638	66°14.94	17°33.37	
50	285	1800	23-7-01	204	1706	66°14.99	17°08.94	
50	286	1801	23-7-01	204	1706	66°14.99	17°08.94	
50	286	2100	23-7-01	204	1726	66°14.98	17°43.01	
50	287	2101	23-7-01	204	1726	66°14.98	17°43.01	
50	287	2400	23-7-01	204	1748	66°14.99	17°47.47	
50/51	288	2401	23-7-01	204	1748	66°14.99	17°47.47	2629 - end of line 50
50/51	288	2700	23-7-01	204	1817	66°14.43	17°52.26	2653 - start of line 51
51	289	2701	23-7-01	204	1817	66°14.43	17°52.26	
51	289	3000	23-7-01	204	1841	66°12.74	17°54.47	
51	290	3001	23-7-01	204	1841	66°12.74	17°54.47	
51	290	3300	23-7-01	204	1907	66°10.88	17°56.64	
51	291	3301	23-7-01	204	1907	66°10.88	17°56.64	3465 - end of line 51
51	291	3600	23-7-01	204	1940	66°09.97	18°02.12	
52	292	3601	23-7-01	204	1940	66°09.97	18°02.12	3812 - start of line 52
52	292	3900	23-7-01	204	1958	66°10.95	18°02.01	
52	293	3901	23-7-01	204	1958	66°10.95	18°02.01	
52	293	4200	23-7-01	204	2024	66°12.90	17°59.82	
52	294	4201	23-7-01	204	2024	66°12.90	17°59.82	
52	294	4500	23-7-01	204	2049	66°14.72	17°59.13	

Line#	Reel#	File#	Date	JD	Time	Latitude	Longitude	Comments
52/53	295	4501	23-7-01	204	2049	66°14.72	17°59.13	4771 - start of line 53
52/53	295	4800	23-7-01	204	2115	66°14.67	18°03.42	
53	296	4801	23-7-01	204	2115	66°14.67	18°03.42	
53	296	5100	23-7-01	204	2140	66°12.85	18°05.56	
53	297	5101	23-7-01	204	2140	66°12.85	18°05.56	
53	297	5400	23-7-01	204	2205	66°10.97	18°07.79	
53	298	5401	23-7-01	204	2205	66°10.97	18°07.79	5476 - end of line 53
53	298	5700	23-7-01	204	2229	66°11.05	18°11.90	
54	299	5701	23-7-01	204	2229	66°11.05	18°11.90	5802 - start of line 54
54	299	6000	23-7-01	204	2255	66°12.81	18°11.11	
54	300	6001	23-7-01	204	2255	66°12.81	18°11.11	
54	300	6300	23-7-01	204	2320	66°14.23	18°09.08	
54	301	6301	23-7-01	204	2320	66°14.23	18°09.08	6505 - end of line 54
54	301	6600	23-7-01	204	2345	66°16.23	18°09.02	
55	302	6601	23-7-01	204	2345	66°16.23	18°09.02	6850 - start of line 55
55	302	6900	24-7-01	205	0012	66°16.03	18°13.19	
55	303	6901	24-7-01	205	0012	66°16.03	18°13.19	
55	303	7200	24-7-01	205	0037	66°14.23	18°15.39	
55	304	7201	24-7-01	205	0037	66°14.23	18°15.39	
55	304	7500	24-7-01	205	0102	66°12.39	18°17.47	
55	305	7501	24-7-01	205	0102	66°12.39	18°17.47	OYO crash; rest of line 55, line 56 and part of
55	305	7684	24-7-01	205	0114	66°11.10	18°19.04	line 57 not recorded

Line#	Reel#	File#	Date	JD	Time	Latitude	Longitude	Comments
57	306	6	24-7-01	205	0359	66°15.07	18°25.93	
57	306	300	24-7-01	205	0424	66°13.29	18°28.19	
57	307	301	24-7-01	205	0424	66°13.29	18°28.19	0382 - end of line 57
57	307	600	24-7-01	205	0449	66°13.33	18°32.22	
58	308	601	24-7-01	205	0449	66°13.33	18°32.22	0634 - start line 58
58	308	900	24-7-01	205	0523	66°15.63	18°29.91	
58	309	901	24-7-01	205	0523	66°15.63	18°29.91	
58	309	1200	24-7-01	205	0548	66°15.45	18°27.96	
58	310	1201	24-7-01	205	0548	66°15.45	18°27.96	1481 - end line 58
58	310	1500	24-7-01	205	0615	66°19.68	18°24.83	
59	311	1501	24-7-01	205	0615	66°19.68	18°24.83	1515 - start of line 59
59	311	1800	24-7-01	205	0639	66°19.08	18°19.85	
59	312	1801	24-7-01	205	0639	66°19.08	18°19.85	
59	312	2100	24-7-01	205	0705	66°19.12	18°14.69	
59	313	2101	24-7-01	205	0705	66°19.12	18°14.69	
59	313	2400	24-7-01	205	0731	66°19.10	18°09.63	
59	314	2401	24-7-01	205	0731	66°19.10	18°09.63	
59	314	2700	24-7-01	205	0756	66°19.13	18°04.65	
59	315	2701	24-7-01	205	0756	66°19.13	18°04.65	
59	315	3000	24-7-01	205	0821	66°19.06	17°59.55	
59	316	3001	24-7-01	205	0821	66°19.06	17°59.55	
59	316	3300	24-7-01	205	0847	66°19.07	17°54.48	
59	317	3301	24-7-01	205	0847	66°19.07	17°54.48	
59	317	3600	24-7-01	205	0911	66°19.10	17°49.41	

Line#	Reel#	File#	Date	JD	Time	Latitude	Longitude	Comments
59	318	3601	24-7-01	205	0911	66°19.10	17°49.41	
59	318	3900	24-7-01	205	0936	66°19.10	17°44.38	
59	319	3901	24-7-01	205	0936	66°19.10	17°44.38	
59	319	4200	24-7-01	205	1002	66°19.12	17°39.14	
59	320	4201	24-7-01	205	1002	66°19.12	17°39.14	
59	320	4500	24-7-01	205	1028	66°19.13	17°33.99	
59	321	4501	24-7-01	205	1028	66°19.13	17°33.99	
59	321	4800	24-7-01	205	1053	66°19.01	17°29.00	
59	322	4801	24-7-01	205	1053	66°19.01	17°29.00	
59	322	5100	24-7-01	205	1119	66°18.95	17°24.03	
59	323	5101	24-7-01	205	1119	66°18.95	17°24.03	
59	323	5400	24-7-01	205	1145	66°19.00	17°18.68	
59	324	5401	24-7-01	205	1145	66°19.00	17°18.68	
59	324	5700	24-7-01	205	1209	66°18.99	17°13.63	
59	325	5701	24-7-01	205	1209	66°18.99	17°13.63	
59	325	6000	24-7-01	205	1233	66°18.96	17°08.48	
59	326	6001	24-7-01	205	1233	66°18.96	17°08.48	
59	326	6300	24-7-01	205	1259	66°18.93	17°03.52	
59	327	6301	24-7-01	205	1259	66°18.93	17°03.52	
59	327	6600	24-7-01	205	1328	66°18.96	16°57.94	
59	328	6601	24-7-01	205	1328	66°18.96	16°57.94	
59	328	6900	24-7-01	205	1400	66°10.99	16°51.69	

Line#	Reel#	File#	Date	JD	Time	Latitude	Longitude	Comments
59	329	6901	24-7-01	205	1400	66°10.99	16°51.69	
59	329	7200	24-7-01	205	1422	66°19.02	16°47.23	
59	330	7201	24-7-01	205	1422	66°19.02	16°47.23	
59	330	7500	24-7-01	205	1443	66°19.02	16°42.81	
59	331	7501	24-7-01	205	1443	66°19.02	16°42.81	
59	331	7800	24-7-01	205	1509	66°19.02	16°37.99	7800 - end of line 59
-	332	7801	24-7-01	205	1509	66°19.02	16°37.99	
-	332	8100	24-7-01	205	1534	66°17.99	16°36.13	
60	333	8101	24-7-01	205	1534	66°17.99	16°36.13	8135 - start of line 60
60	333	8400	24-7-01	205	1600	66°17.99	16°41.32	
60	334	8401	24-7-01	205	1600	66°17.99	16°41.32	
60	334	8700	24-7-01	205	1624	66°17.99	16°46.24	
60	335	8701	24-7-01	205	1624	66°17.99	16°46.24	
60	335	9000	24-7-01	205	1650	66°17.96	16°57.90	
60	336	9001	24-7-01	205	1650	66°17.96	16°57.90	
60	336	9300	24-7-01	205	1713	66°17.98	16°56.26	
60	337	9301	24-7-01	205	1713	66°17.98	16°56.26	
60	337	9600	24-7-01	205	1737	66°18.00	17°01.54	
60	338	9601	24-7-01	205	1737	66°18.00	17°01.54	0804 - end of line 60
60	338	9900	24-7-01	205	1802	66°17.24	17°05.08	
61	339	9901	24-7-01	205	1802	66°17.24	17°05.08	9985 - start of line 61
61	339	10200	24-7-01	205	1828	66°17.01	17°00.57	
61	340	10201	24-7-01	205	1828	66°17.01	17°00.57	
61	340	10500	24-7-01	205	1856	66°16.97	16°54.98	

Line#	Reel#	File#	Date	JD	Time	Latitude	Longitude	Comments
61	341	10501	24-7-01	205	1856	66°16.97	16°54.98	
61	341	10800	24-7-01	205	1919	66°16.99	16°50.07	
61	342	10801	24-7-01	205	1919	66°16.99	16°50.07	
61	342	11100	24-7-01	205	1942	66°17.02	16°45.19	
61	343	11101	24-7-01	205	1942	66°17.02	16°45.19	
61	343	11400	24-7-01	205	2006	66°17.02	16°40.16	
61	344	11401	24-7-01	205	2006	66°17.02	16°40.16	
61	344	11700	24-7-01	205	2032	66°17.02	16°35.03	
61	345	11701	24-7-01	205	2032	66°17.02	16°35.03	
61	345	11819	24-7-01	205	2040	66°16.98	16°33.21	11815 - end of line 61
62	346	1	24-7-01	205	2042	66°16.72	16°32.73	0209 - start of line 62
62	346	300	24-7-01	205	2108	66°15.98	16°35.87	
62	347	301	24-7-01	205	2108	66°15.98	16°35.87	
62	347	600	24-7-01	205	2132	66°16.01	16°40.91	
62	348	601	24-7-01	205	2132	66°16.01	16°40.91	
62	348	900	24-7-01	205	2158	66°15.92	16°45.88	
62	349	901	24-7-01	205	2158	66°15.92	16°45.88	
62	349	1200	24-7-01	205	2225	66°16.00	16°51.14	
62	350	1201	24-7-01	205	2225	66°16.00	16°51.14	
62	350	1500	24-7-01	205	2251	66°15.99	16°56.32	
62	351	1501	24-7-01	205	2251	66°15.99	16°56.32	
62	351	1800	24-7-01	205	2316	66°00.00	17°01.15	

Line#	Reel#	File#	Date	JD	Time	Latitude	Longitude	Comments
62	352	1801	24-7-01	205	2316	66°00.00	17°01.15	2006 - end of line 62
62	352	2100	24-7-01	205	2343	66°15.20	17°05.06	
63	353	2101	24-7-01	205	2343	66°15.20	17°05.06	2193 - start of line 63
63	353	2400	25-7-01	206	0013	66°14.99	17°59.50	
63	354	2401	25-7-01	206	0013	66°14.99	17°59.50	
63	354	2700	25-7-01	206	0032	66°15.00	16°55.40	
63	355	2701	25-7-01	206	0032	66°15.00	16°55.40	
63	355	3000	25-7-01	206	0057	66°15.03	16°50.37	
63	356	3001	25-7-01	206	0057	66°15.03	16°50.37	
63	356	3300	25-7-01	206	0122	66°15.00	16°45.34	
63	357	3301	25-7-01	206	0122	66°15.00	16°45.34	
63	357	3600	25-7-01	206	0148	66°15.01	16°40.26	
63	358	3601	25-7-01	206	0148	66°15.01	16°40.26	
63	358	3900	25-7-01	206	0214	66°14.99	16°33.12	
63	359	3901	25-7-01	206	0214	66°14.99	16°33.12	4130 - end of line 63
63	359	4200	25-7-01	206	0240	66°14.59	16°30.62	
64	360	4201	25-7-01	206	0240	66°14.59	16°30.62	4295 - start of line 64
64	360	4500	25-7-01	206	0307	66°14.01	16°34.92	
64	361	4501	25-7-01	206	0307	66°14.01	16°34.92	
64	361	4800	25-7-01	206	0333	66°14.01	16°34.92	
64	362	4801	25-7-01	206	0333	66°14.01	16°34.92	4864 - no shots for 2 min
64	362	5100	25-7-01	206	0400	66°14.01	16°45.29	
64	363	5101	25-7-01	206	0400	66°14.01	16°45.29	5204 - no shots for ~1 min
64	363	5400	25-7-01	206	0427	66°13.97	16°50.69	

Line#	Reel#	File#	Date	JD	Time	Latitude	Longitude	Comments
64	364	5401	25-7-01	206	0427	66°13.97	16°50.69	5656 - no shots for ~1 min
64	364	5700	25-7-01	206	0452	66°14.01	16°55.77	
64/65	365	5701	25-7-01	206	0452	66°14.01	16°55.77	5983 - end of line 64; start of line 65
64/65	365	6000	25-7-01	206	0517	66°13.29	16°55.66	
65	366	6001	25-7-01	206	0517	66°13.29	16°55.66	
65	366	6300	25-7-01	206	0546	66°12.46	16°50.97	end of line 65
66	367	6301	25-7-01	206	0546	66°12.46	16°50.97	-6517 - start of line 66
66	367	6600	25-7-01	206	0617	66°13.56	16°48.03	
66	368	6601	25-7-01	206	0617	66°13.56	16°48.03	
66	368	6900	25-7-01	206	0643	66°15.51	16°49.29	
66	369	6901	25-7-01	206	0643	66°15.51	16°49.29	
66	369	7200	25-7-01	206	0708	66°17.68	16°49.29	
66	370	7201	25-7-01	206	0708	66°17.68	16°49.29	
66	370	7500	25-7-01	206	0732	66°19.65	16°49.84	
66	371	7501	25-7-01	206	0732	66°19.65	16°49.84	
66	371	7800	25-7-01	206	0758	66°21.68	16°50.43	
66	372	7801	25-7-01	206	0758	66°21.68	16°50.43	
66	372	8100	25-7-01	206	0823	66°23.75	16°51.01	
66	373	8101	25-7-01	206	0823	66°23.75	16°51.01	
66	373	8400	25-7-01	206	0849	66°25.82	16°51.71	
66	374	8401	25-7-01	206	0849	66°25.82	16°51.71	
66	374	8700	25-7-01	206	0915	66°27.81	16°52.35	

Line#	Reel#	File#	Date	JD	Time	Latitude	Longitude	Comments
66	375	8701	25-7-01	206	0915	66°27.81	16°52.35	8857 - end of line 66
66	375	9000	25-7-01	206	0929	66°28.91	16°52.46	
	376	1	25-7-01	206	0930	66°28.99	16°52.22	turn
	376	300	25-7-01	206	0955	66°29.01	16°47.17	
	377	301	25-7-01	206	0955	66°29.01	16°47.17	
	377	600	25-7-01	206	1020	66°28.98	16°42.00	
67	378	601	25-7-01	206	1020	66°28.98	16°42.00	0855 - start of line 67
67	378	900	25-7-01	206	1045	66°27.96	16°41.35	
67	379	901	25-7-01	206	1045	66°27.96	16°41.35	
67	379	1200	25-7-01	206	1112	66°28.02	16°46.72	
67	380	1201	25-7-01	206	1112	66°28.02	16°46.72	
67	380	1500	25-7-01	206	1136	66°28.00	16°51.61	
67	381	1501	25-7-01	206	1136	66°28.00	16°51.61	
67	381	1800	25-7-01	206	1201	66°27.96	16°56.72	
67	382	1801	25-7-01	206	1201	66°27.96	16°56.72	
67	382	2100	25-7-01	206	1226	66°27.99	17°01.84	
67	383	2101	25-7-01	206	1226	66°27.99	17°01.84	
67	383	2400	25-7-01	206	1253	66°27.97	17°07.13	
67	384	2401	25-7-01	206	1253	66°27.97	17°07.13	
67	384	2700	25-7-01	206	1319	66°27.98	17°12.32	
67	385	2701	25-7-01	206	1319	66°27.98	17°12.32	
67	385	3000	25-7-01	206	1344	66°28.00	17°17.44	
67	386	3001	25-7-01	206	1344	66°28.00	17°17.44	
67	386	3300	25-7-01	206	1409	66°27.99	17°22.55	

Line#	Reel#	File#	Date	JD	Time	Latitude	Longitude	Comments
67	387	3301	25-7-01	206	1409	66°27.99	17°22.55	
67	387	3600	25-7-01	206	1438	66°27.98	17°28.19	
67	388	3601	25-7-01	206	1438	66°27.98	17°28.19	
67	388	3900	25-7-01	206	1503	66°28.02	17°33.15	
67	389	3901	25-7-01	206	1503	66°28.02	17°33.15	
67	389	4200	25-7-01	206	1527	66°27.98	17°37.97	
67	390	4201	25-7-01	206	1527	66°27.98	17°37.97	
67	390	4500	25-7-01	206	1552	66°27.93	17°43.05	
67	391	4501	25-7-01	206	1552	66°27.93	17°43.05	
67	391	4800	25-7-01	206	1620	66°28.02	17°48.46	
67	392	4801	25-7-01	206	1620	66°28.02	17°48.46	5018 - end of line 67
67	392	5100	25-7-01	206	1643	66°27.51	17°52.06	
68	393	5101	25-7-01	206	1643	66°27.51	17°52.06	5363 - start of line 68
68	393	5400	25-7-01	206	1709	66°26.00	17°49.93	
68	394	5401	25-7-01	206	1709	66°26.00	17°49.93	
68	394	5700	25-7-01	206	1735	66°25.94	17°44.72	
68	395	5701	25-7-01	206	1735	66°25.94	17°44.72	
68	395	6000	25-7-01	206	1759	66°25.99	17°39.91	
68	396	6001	25-7-01	206	1759	66°25.99	17°39.91	
68	396	6300	25-7-01	206	1827	66°26.01	17°34.19	
68	397	6301	25-7-01	206	1827	66°26.01	17°34.19	
68	397	6600	25-7-01	206	1852	66°25.98	17°29.31	

Line#	Reel#	File#	Date	JD	Time	Latitude	Longitude	Comments
68	398	6601	25-7-01	206	1852	66°25.98	17°29.31	
68	398	6900	25-7-01	206	1916	66°25.96	17°24.44	
68	399	6901	25-7-01	206	1916	66°25.96	17°24.44	
68	399	7200	25-7-01	206	1943	66°25.99	17°19.15	
68	400	7201	25-7-01	206	1943	66°25.99	17°19.15	
68	400	7500	25-7-01	206	2010	66°26.02	17°13.80	
68	401	7501	25-7-01	206	2010	66°26.02	17°13.80	7688 - small turn to avoid topography
68	401	7800	25-7-01	206	2036	66°26.07	17°08.48	
68	402	7801	25-7-01	206	2036	66°26.07	17°08.48	
68	402	8100	25-7-01	206	2058	66°25.98	17°03.93	
68	403	8101	25-7-01	206	2058	66°25.98	17°03.93	
68	403	8400	25-7-01	206	2135	66°26.00	16°56.60	
68	404	8401	25-7-01	206	2135	66°26.00	16°56.60	
68	404	8700	25-7-01	206	2149	66°26.01	16°53.75	
68	405	8701	25-7-01	206	2149	66°26.01	16°53.75	
68	405	9000	25-7-01	206	2215	66°26.04	16°48.56	
68	406	9001	25-7-01	206	2215	66°26.04	16°48.56	
68	406	9300	25-7-01	206	2241	66°25.99	16°43.28	
68	407	9301	25-7-01	206	2241	66°25.99	16°43.28	9340 - end of line 68
68	407	9600	25-7-01	206	2305	66°24.18	16°41.92	
69	408	9601	25-7-01	206	2305	66°24.18	16°41.92	9681 - start of line 69
69	408	9900	25-7-01	206	2330	66°23.99	16°46.89	
69	409	9901	25-7-01	206	2330	66°23.99	16°46.89	
69	409	10200	26-7-01	207	0009	66°24.01	16°54.57	

Line#	Real#	File#	Date	JD	Time	Latitude	Longitude	Comments
69	410	10201	26-7-01	207	0009	66°24.01	16°54.57	
69	410	10500	26-7-01	207	0029	66°23.99	16°58.52	
69	411	10501	26-7-01	207	0029	66°23.99	16°58.52	
69	411	10800	26-7-01	207	0052	66°23.99	17°03.06	
69	412	10801	26-7-01	207	0052	66°23.99	17°03.06	
69	412	11100	26-7-01	207	0112	66°24.02	17°07.09	
69	413	11101	26-7-01	207	0112	66°24.02	17°07.09	
69	413	11400	26-7-01	207	0137	66°24.02	17°12.10	
69	414	11401	26-7-01	207	0137	66°24.02	17°12.10	
69	414	11700	26-7-01	207	0202	66°24.04	17°17.16	
69	415	11701	26-7-01	207	0202	66°24.04	17°17.16	
69	415	12000	26-7-01	207	0227	66°24.01	17°22.30	
69	416	12001	26-7-01	207	0227	66°24.01	17°22.30	
69	416	12300	26-7-01	207	0252	66°23.99	17°27.40	
69	417	12301	26-7-01	207	0252	66°23.99	17°27.40	
69	417	12600	26-7-01	207	0317	66°24.05	17°32.65	
69	418	12601	26-7-01	207	0317	66°24.05	17°32.65	
69	418	12900	26-7-01	207	0342	66°23.99	17°37.59	
69	419	12901	26-7-01	207	0342	66°23.99	17°37.59	12914 - shooting stopped for ~1 min
69	419	13200	26-7-01	207	0410	66°23.96	17°43.17	
69	420	13201	26-7-01	207	0410	66°23.96	17°43.17	
69	420	13500	26-7-01	207	0434	66°23.94	17°48.02	

Line#	Reel#	File#	Date	JD	Time	Latitude	Longitude	Comments
69	421	13501	26-7-01	207	0434	66°23.94	17°48.02	13576 - end of line 69
69	421	13800	26-7-01	207	0440	66°23.94	17°49.32	
70	422	1	26-7-01	207	0445	66°23.59	17°49.58	0112 - start of line 70
70	422	300	26-7-01	207	0511	66°22.99	17°45.55	
70	423	301	26-7-01	207	0511	66°22.99	17°45.55	
70	423	600	26-7-01	207	0537	66°23.00	17°40.40	
70	424	601	26-7-01	207	0537	66°23.00	17°40.40	
70	424	900	26-7-01	207	0602	66°23.01	17°35.34	
70	425	901	26-7-01	207	0602	66°23.01	17°35.34	
70	425	1200	26-7-01	207	0628	66°22.96	17°30.20	
70	426	1201	26-7-01	207	0628	66°22.96	17°30.20	
70	426	1500	26-7-01	207	0654	66°23.00	17°25.11	
70	427	1501	26-7-01	207	0654	66°23.00	17°25.11	
70	427	1800	26-7-01	207	0720	66°22.98	17°20.02	
70	428	1801	26-7-01	207	0720	66°22.98	17°20.02	
70	428	2100	26-7-01	207	0745	66°22.99	17°14.95	
70	429	2101	26-7-01	207	0745	66°22.99	17°14.95	
70	429	2400	26-7-01	207	0812	66°23.02	17°09.77	
70	430	2401	26-7-01	207	0812	66°23.02	17°09.77	
70	430	2700	26-7-01	207	0837	66°22.94	17°04.67	
70	431	2701	26-7-01	207	0837	66°22.94	17°04.67	
70	431	3000	26-7-01	207	0901	66°22.93	16°59.62	
70	432	3001	26-7-01	207	0901	66°22.93	16°59.62	
70	432	3300	26-7-01	207	0926	66°23.01	16°54.45	

Line#	Reel#	File#	Date	JD	Time	Latitude	Longitude	Comments
70	433	3301	26-7-01	207	0926	66°23.01	16°54.45	
70	433	3600	26-7-01	207	0951	66°23.01	16°49.38	
70	434	3601	26-7-01	207	0951	66°23.01	16°49.38	
70	434	3900	26-7-01	207	1015	66°23.05	16°44.22	
70	435	3901	26-7-01	207	1015	66°23.05	16°44.22	4127 - end of line 70
70	435	4200	26-7-01	207	1040	66°22.50	16°39.97	
71	436	4201	26-7-01	207	1040	66°22.50	16°39.97	4304 - start of line 71
71	436	4500	26-7-01	207	1105	66°22.00	16°44.00	
71	437	4501	26-7-01	207	1105	66°22.00	16°44.00	
71	437	4800	26-7-01	207	1130	66°21.99	16°47.69	
71	438	4801	26-7-01	207	1130	66°21.99	16°47.69	
71	438	5100	26-7-01	207	1155	66°21.99	16°53.40	
71	439	5101	26-7-01	207	1155	66°21.99	16°53.40	
71	439	5400	26-7-01	207	1220	66°21.99	16°59.38	
71	440	5401	26-7-01	207	1220	66°21.99	16°59.38	
71	440	5700	26-7-01	207	1245	66°22.00	17°04.51	
71	441	5701	26-7-01	207	1245	66°22.00	17°04.51	
71	441	6000	26-7-01	207	1310	66°21.99	17°09.45	
71	442	6001	26-7-01	207	1310	66°21.99	17°09.45	
71	442	6300	26-7-01	207	1336	66°22.03	17°14.53	
71	443	6301	26-7-01	207	1336	66°22.03	17°14.53	
71	443	6600	26-7-01	207	1402	66°21.99	17°19.71	

Line#	Reel#	File#	Date	JD	Time	Latitude	Longitude	Comments
71	444	6601	26-7-01	207	1402	66°21.99	17°19.71	
71	444	6900	26-7-01	207	1427	66°21.98	17°24.67	
71	445	6901	26-7-01	207	1427	66°21.98	17°24.67	
71	445	7200	26-7-01	207	1500	66°22.01	17°31.16	
71	446	7201	26-7-01	207	1500	66°22.01	17°31.16	
71	446	7500	26-7-01	207	1518	66°22.01	17°34.93	
71	447	7501	26-7-01	207	1518	66°22.01	17°34.93	
71	447	7800	26-7-01	207	1543	66°21.99	17°40.10	
71	448	7801	26-7-01	207	1543	66°21.99	17°40.10	
71	448	8100	26-7-01	207	1608	66°21.98	17°45.44	
71	449	8101	26-7-01	207	1608	66°21.98	17°45.44	
71	449	8246	26-7-01	207	1618	66°21.90	17°47.63	8246 - end of line 71
72	450	1	26-7-01	207	1624	66°21.58	17°48.24	O112 - start of line 72
72	450	300	26-7-01	207	1650	66°21.00	17°44.09	
72	451	301	26-7-01	207	1650	66°21.00	17°44.09	
72	451	600	26-7-01	207	1718	66°21.01	17°38.62	
72	452	601	26-7-01	207	1718	66°21.01	17°38.62	
72	452	900	26-7-01	207	1740	66°21.02	17°33.85	
72	453	901	26-7-01	207	1740	66°21.02	17°33.85	
72	453	1200	26-7-01	207	1806	66°20.97	17°28.65	
72	454	1201	26-7-01	207	1806	66°20.97	17°28.65	
72	454	1500	26-7-01	207	1838	66°20.96	17°22.35	
72	455	1501	26-7-01	207	1838	66°20.96	17°22.35	
72	455	1800	26-7-01	207	1858	66°21.04	17°18.23	

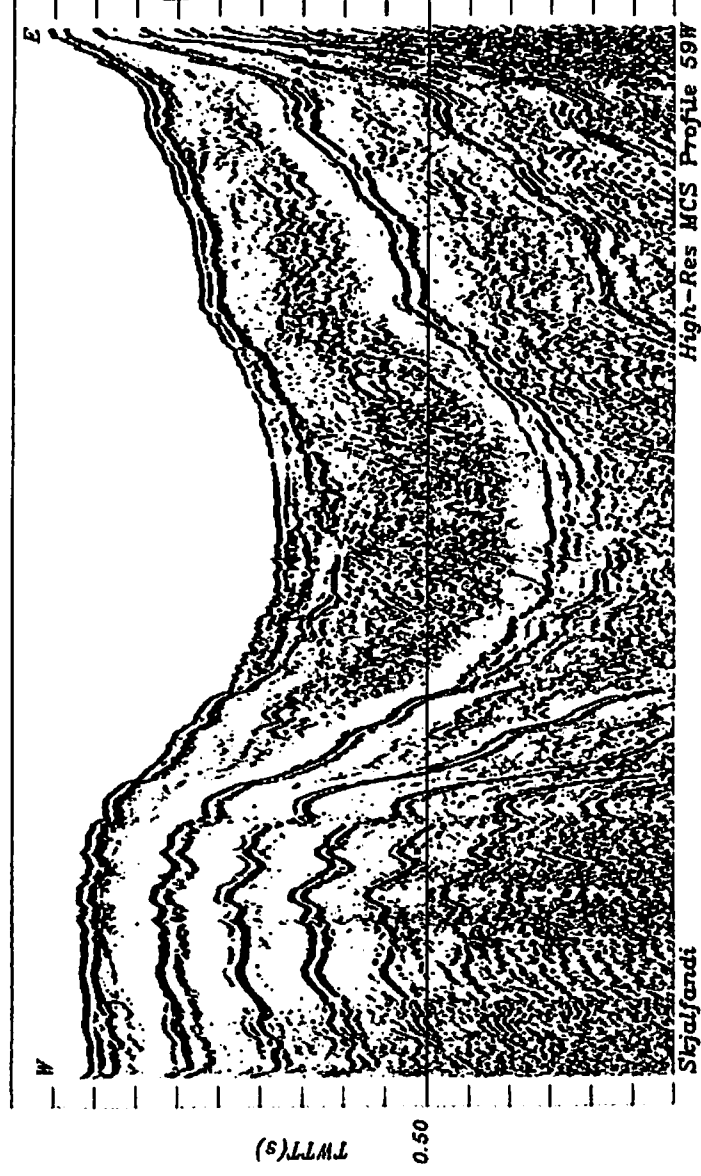
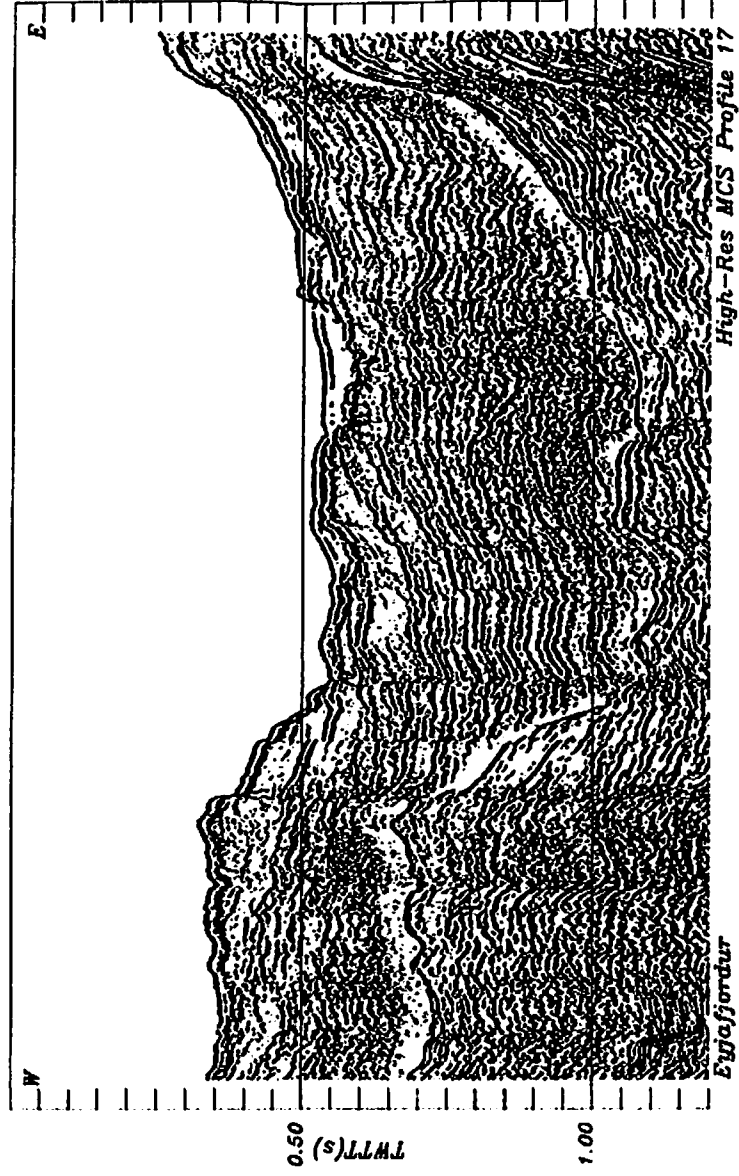
Line#	Reel#	File#	Date	JD	Time	Latitude	Longitude	Comments
72	456	1801	26-7-01	207	1858	66°21.04	17°18.23	
72	456	2100	26-7-01	207	1922	66°21.02	17°13.42	
72	457	2101	26-7-01	207	1922	66°21.02	17°13.42	
72	457	2400	26-7-01	207	1950	66°20.97	17°08.02	
72	458	2401	26-7-01	207	1950	66°20.97	17°08.02	
72	458	2700	26-7-01	207	2013	66°20.97	17°03.38	
72	459	2701	26-7-01	207	2013	66°20.97	17°03.38	
72	459	3000	26-7-01	207	2040	66°21.00	17°58.13	
72	460	3001	26-7-01	207	2040	66°21.00	17°58.13	
72	460	3300	26-7-01	207	2105	66°21.00	16°53.19	
72	461	3301	26-7-01	207	2105	66°21.00	16°53.19	
72	461	3600	26-7-01	207	2132	66°21.05	16°47.79	
72	462	3601	26-7-01	207	2132	66°21.05	16°47.79	
72	462	3900	26-7-01	207	2157	66°21.04	16°42.54	
72	463	3901	26-7-01	207	2157	66°21.04	16°42.54	
72	463	4200	26-7-01	207	2221	66°20.07	16°40.42	4072 - end of line 72
73A	464	4201	26-7-01	207	2221	66°20.07	16°40.42	4225 - start of line 73A
73A	464	4500	26-7-01	207	2248	66°20.02	16°46.08	
73A	465	4501	26-7-01	207	2248	66°20.02	16°46.08	
73A	465	4800	26-7-01	207	2312	66°19.98	16°50.79	
73A	466	4801	26-7-01	207	2312	66°19.98	16°50.79	
73A	466	5100	26-7-01	207	2348	66°20.00	16°58.14	

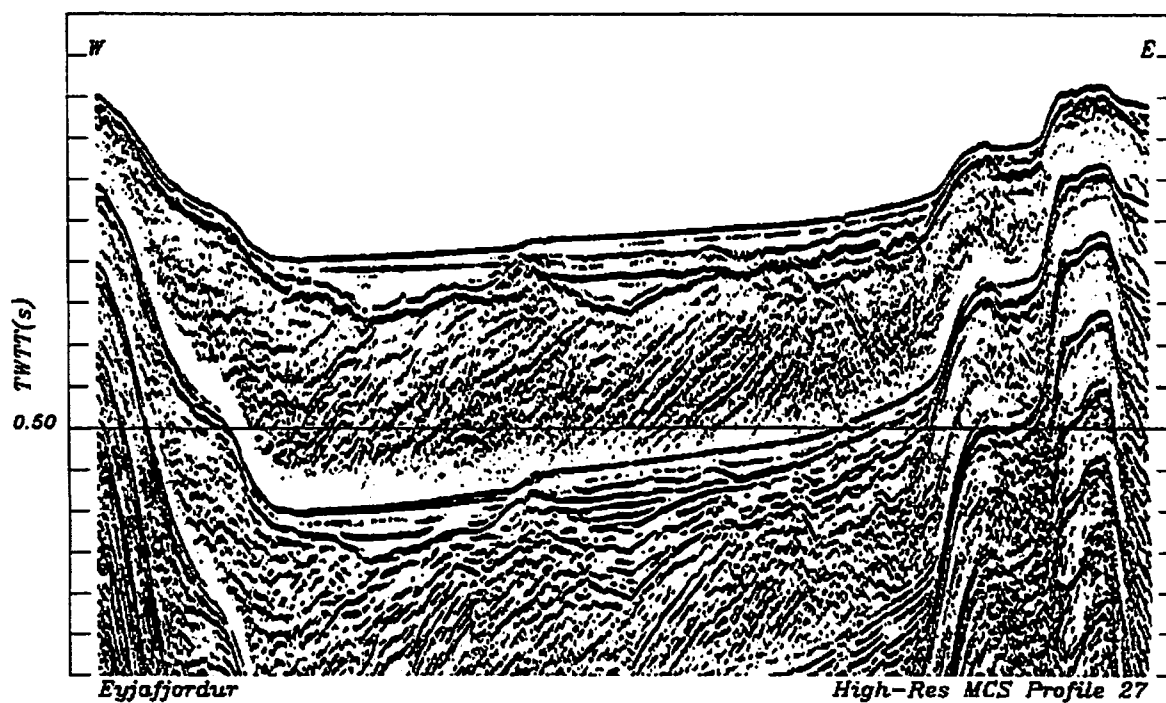
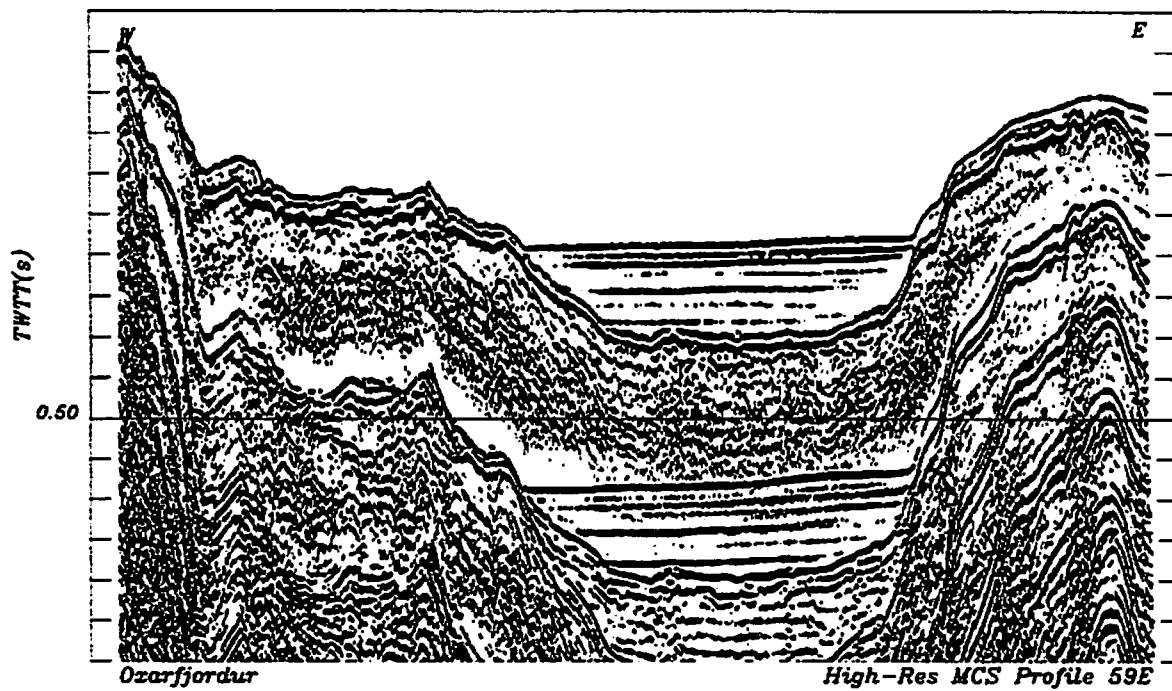
Line#	Reel#	File#	Date	JD	Time	Latitude	Longitude	Comments
73A	467	5101	26-7-01	207	2348	66°20.00	16°58.14	
73A	467	5400	27-7-01	208	0015	66°20.33	17°03.45	
73A	468	5401	27-7-01	208	0015	66°20.33	17°03.45	
73A	468	5700	27-7-01	208	0027	66°20.87	17°05.45	5574 - end of line 73A
-	469	5701	27-7-01	208	0027	66°20.87	17°05.45	Turning
-	469	5946	27-7-01	208	0051	66°20.53	17°09.39	
73B	470	1	27-7-01	208	0057	66°20.18	17°10.46	0030 - start of line 73B
73B	470	300	27-7-01	208	0122	66°20.01	17°15.56	
73B	471	301	27-7-01	208	0122	66°20.01	17°15.56	
73B	471	600	27-7-01	208	0146	66°20.02	17°20.65	
73B	472	601	27-7-01	208	0146	66°20.02	17°20.65	
73B	472	900	27-7-01	208	0211	66°20.01	17°25.73	
73B	473	901	27-7-01	208	0211	66°20.01	17°25.73	
73B	473	1200	27-7-01	208	0237	66°20.03	17°30.81	
73B	474	1201	27-7-01	208	0237	66°20.03	17°30.81	
73B	474	1500	27-7-01	208	0259	66°20.05	17°35.94	
73B	475	1501	27-7-01	208	0259	66°20.05	17°35.94	
73B	475	1800	27-7-01	208	0328	66°20.01	17°40.99	
73B	476	1801	27-7-01	208	0328	66°20.01	17°40.99	
73B	476	2100	27-7-01	208	0355	66°20.01	17°46.07	
73B	477	2101	27-7-01	208	0355	66°20.01	17°46.07	
73B	477	2400	27-7-01	208	0422	66°18.69	17°47.87	2196 - end of line 73B
74	478	2401	27-7-01	208	0422	66°18.69	17°47.87	2541 - start of line 74
74	478	2700	27-7-01	208	0446	66°17.99	17°44.44	

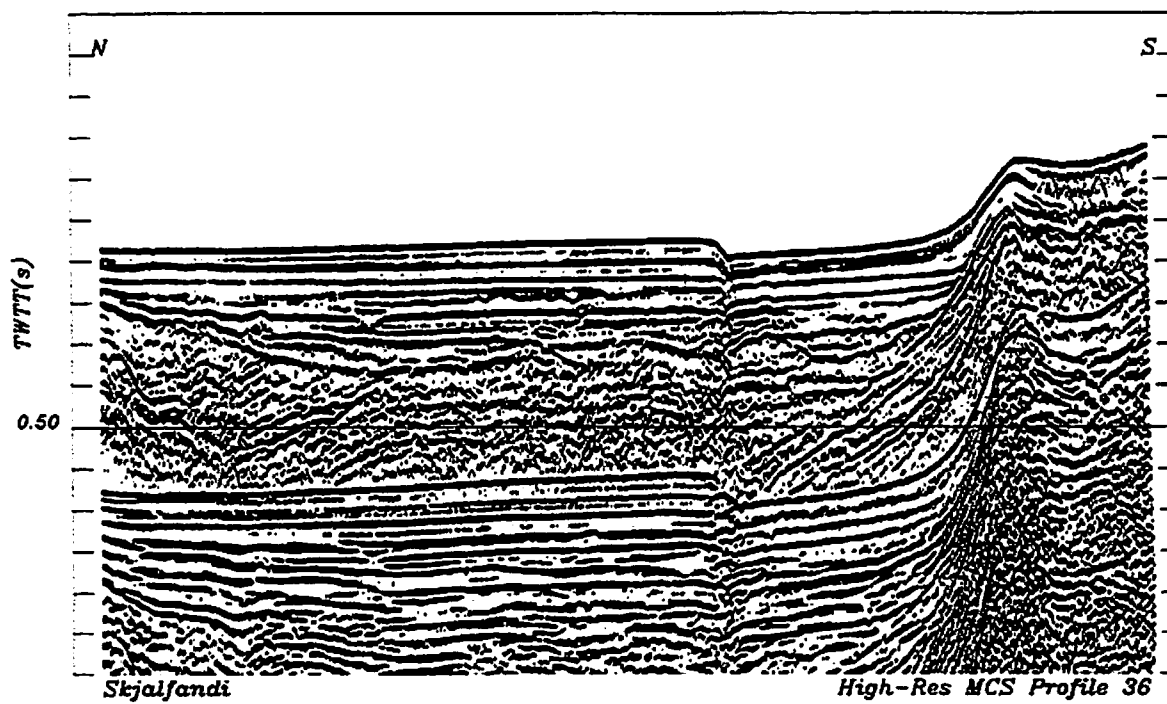
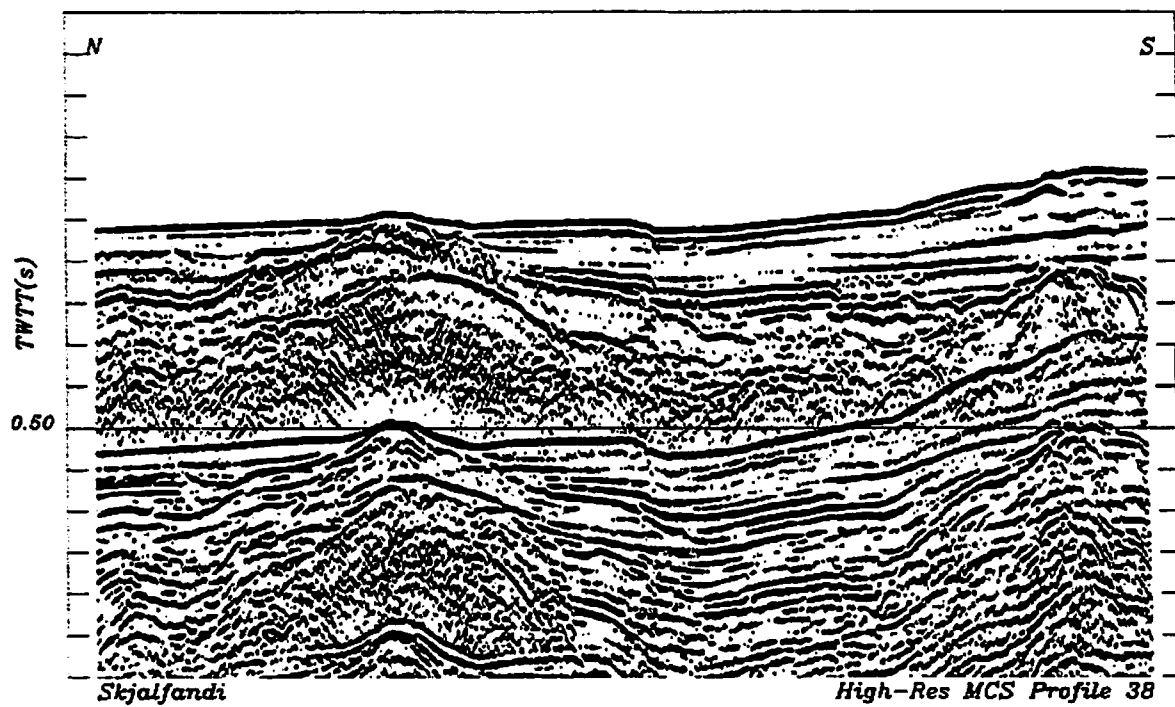
Line#	Reel#	File#	Date	JD	Time	Latitude	Longitude	Comments
74	479	2701	27-7-01	208	0446	66°17.99	17°44.44	
74	479	3000	27-7-01	208	0512	66°18.02	17°39.31	
74	480	3001	27-7-01	208	0512	66°18.02	17°39.31	
74	480	3300	27-7-01	208	0536	66°17.99	17°34.03	
74	481	3301	27-7-01	208	0536	66°17.99	17°34.03	
74	481	3600	27-7-01	208	0602	66°17.92	17°29.14	
74	482	3601	27-7-01	208	0602	66°17.92	17°29.14	
74	482	3900	27-7-01	208	0627	66°18.00	17°24.09	
74	483	3901	27-7-01	208	0627	66°18.00	17°24.09	
74	483	4200	27-7-01	208	0651	66°18.02	17°18.98	
74	484	4201	27-7-01	208	0651	66°18.02	17°18.98	
74	484	4500	27-7-01	208	0717	66°17.97	17°13.87	
74	485	4501	27-7-01	208	0717	66°17.97	17°13.87	
74	485	4800	27-7-01	208	0742	66°17.40	17°09.91	4705 - end of line 74
74	486	4801	27-7-01	208	0742	66°17.40	17°09.91	
74	486	5100	27-7-01	208	0808	66°16.97	17°14.27	4878 - start of line 75
75	487	5101	27-7-01	208	0808	66°16.97	17°14.27	
75	487	5400	27-7-01	208	0834	66°16.96	17°19.43	
75	488	5401	27-7-01	208	0834	66°16.96	17°19.43	
75	488	5700	27-7-01	208	0859	66°16.97	17°24.52	
75	489	5701	27-7-01	208	0859	66°16.97	17°24.52	
75	489	6000	27-7-01	208	0923	66°16.95	17°29.57	

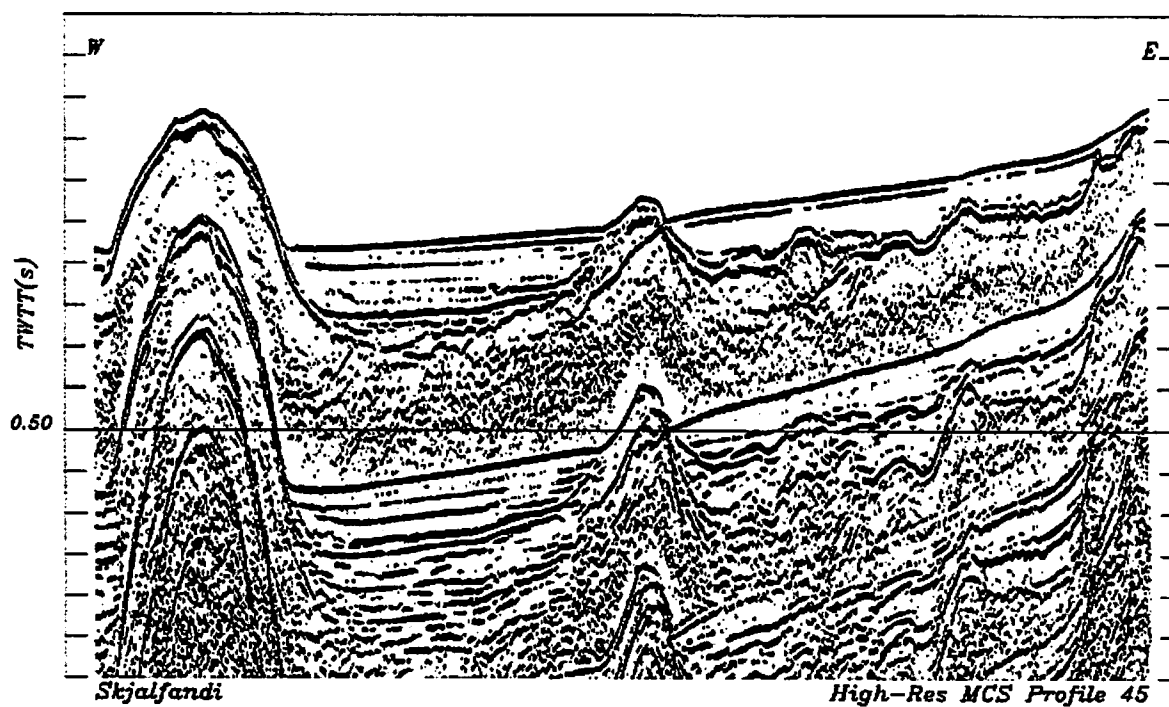
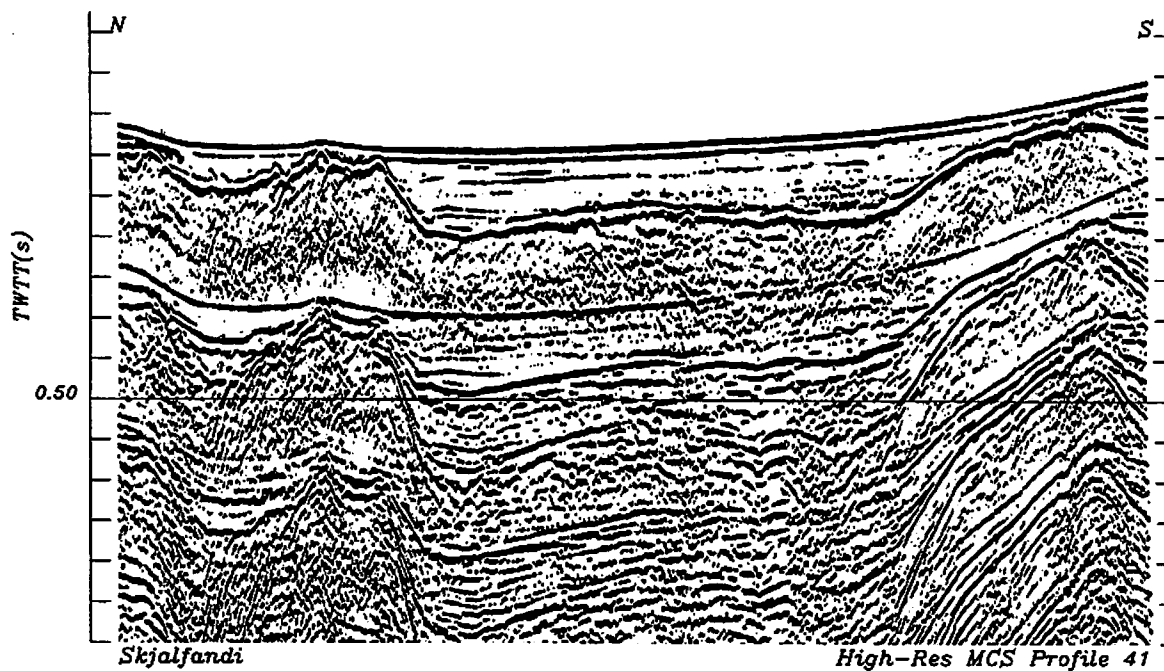
Line#	Reel#	File#	Date	JD	Time	Latitude	Longitude	Comments
75	490	6001	27-7-01	208	0923	66°16.95	17°29.57	
75	490	6300	27-7-01	208	0948	66°16.98	17°34.68	
75	491	6301	27-7-01	208	0948	66°16.98	17°34.68	
75	491	6600	27-7-01	208	1012	66°16.97	17°39.68	
75	492	6601	27-7-01	208	1012	66°16.97	17°39.68	
75	492	6900	27-7-01	208	1037	66°16.96	17°44.78	
75	493	6901	27-7-01	208	1037	66°16.96	17°44.78	
75	493	7125	27-7-01	208	1055	66°17.00	17°48.45	7125 - end of line 75

8.7 Examples of HiRes Reflection Profiles









8.8 Shipboard MCS Data Processing Scripts

c_tapeCOPY

```
#!/bin/csh -f
```

```
/usr/local/bin/sioseis << eof  
procs segdin output end
```

```
segdin  
  ffilen 99999  
  secs 2.5  
  ftr 1 ltr 48  
  fcset 1 lcset 1  
  offline yes  
  newfile yes  
  iunit 10 end  
end
```

```
output  
  ount 28  
  ontrcs 48  
  rewind 0 end  
end
```

```
end
```

```
eof
```

in.plus

3

in.minus

-1

c_bruteSTK

```
#!/bin/csh -f
```

```
if ( $#argv < 1) then
    echo "Usage: stack line-number"
    exit 1
endif
```

```
set LINENO = $1
```

```
/usr/local/bin/sioseis << eof
procs segdin prout geom diskoa weight gather diskoc nmo stack filter diskob end
```

```
segdin
    ffilen 99999
    stime 0.0 secs 2.5
    ftr 1 ltr 48
    fcset 1 lcset 1
    offline yes
    newfile yes
    iunit 10 end
end
```

```
prout
    fno 0 lno 99999 ftr 1 ltr 48 noinc 10 end
end
```

```
geom
    type 2
    fs 1 ls 99999
    gxp 1 -12.5
    ggx 12.5
    dfls 12.5
    dbrps 6.25 smear 6.25
    rpadd 1000 end
end
```

```
diskoa
    fno 1 lno 99999 noinc 100 rewind 1
    opath /export/disk0/tfz2001/realtime/shots/latest.shot end
end
```

```
weight
    twp 1 0 2 0 15 0 16 0 17 0 18 0 20 0 25 0 29 0 30 0 end
end
gather
    maxtrs 50 maxrps 60 end
end
```

```
diskoc
    fno 1 lno 99999 noinc 100 rewind 1
    opath /export/disk0/tfz2001/realtime/shots/latest.cmp end
```

end

nmo

 vtp 1500 1.00 1500 3.00 end

end

filter

 ftype 0 pass 5 120 dbdrop 24 end

end

diskob

 opath /export/disk0/tfz2001/realtime/bstack/TFZ.HighRes.\$LINENO end

end

end

eof

c_filterSTK

/usr/local/bin/sioseis << eof

procs diskin filter agc diskoa end

diskin

 ipath ../realtime/bstack/TFZ.HighRes.7 end

end

filter

 ftype 0 pass 30 100 dbdrop 24 end

end

agc

 winlen 0.1 center 0.1 end

end

diskoa

 opath ../realtime/bstack/TFZ.HighRes.F.7 end

end

end

stk_QC.pl

plot

```
dtfile = ../realtime/bstack/TFZ.HighRes.F.7;  
{dtfile = ../realtime/bstack/TFZ.HighRes.7;  
plfile = LatestSTK7.ps;  
srfile = LSTK.sortfile.7;  
device = 16;  
interact = 1;  
origin = 50, 55; reduc = 0.85;  
sort = cdp;  
cdp = t;  
tbi = 0.0; tfi = 0.8; timscale = 200;  
delt = 0.001;  
leng = 250;  
{size = 350 200;  
{rpb = 20199;  
{rpf = 28159;  
rpb = 8799;  
rpf = 12997;  
noinc = 2;  
ntrab = 1;  
ntraf = 1;  
ntrinc = 1;  
mxdef = 10;  
{pscale = 4.0E-3;  
{xscale = 1.5;  
{tsca = 1.0;  
tsbase = 0.2;  
shad = 1; clip = -1.5;  
speq = t;  
{rgmin = 0.0; rgmax = -0.6;  
xann = 8799; delann = 2;  
tmark = 0.05;  
anninc = 100; annb = 1;  
chgt = 2.5; form = 16;  
labhgt = 3.5;
```

```
tr_color = black white;  
{advplt = t;  
{ifilc = 1;  
end$
```

stk_pretty.pl

plot

```
dtfile = ../realtime/bstack/TFZ.HighRes.F.50;
{dtfile = ../realtime/bstack/TFZ.HighRes.50;
plfile = LatestSTK50.ps;
srtfile = LSTK.sortfilc.50;
device = 15;
interact = 1;
origin = 50, 45; reduc = .85;
sort = cdp;
cdp = t;
tbi = 0.0; tfi = 0.8; timscale = 200;
delt = 0.001;
leng = 250;
{size = 350 200;
rpb = 2799;
rpf = 5797;
noinc = 2;
ntrab = 1;
ntraf = 1;
ntrinc = 1;
mxdef = 4.5;
{pscale = 4.0E-3;
{xscale = 1.5;
{tsca = 1.0;
tsbase = 0.2;
shad = 1; clip = -1.5;
speq = t;
{rgmin = 0.0; rgmax = -0.6;
xann = -2799; delann = -2;
tmark = 0.05;
anninc = 100; annb = 1;
chgt = 2.5; form = 16;
labhgt = 3.5;
label = 'r' -2799 0.825 0 'ita\High-Res MCS Profile 50';
label = 'l' -5797 0.825 0 'ita\Skjalfandi';
label = 'c' -5997 0.35 90 'ita\TWTT(s)';
label = 'c' -5797 0.05 0 'ita\W';
label = 'c' -2799 0.05 0 'ita\E';
tr_color = black white;
{advplt = t;
ifile = 2;
```

end\$

hole

trtp =

-5785 0 0.132

....

....

-4289 0 0.297;

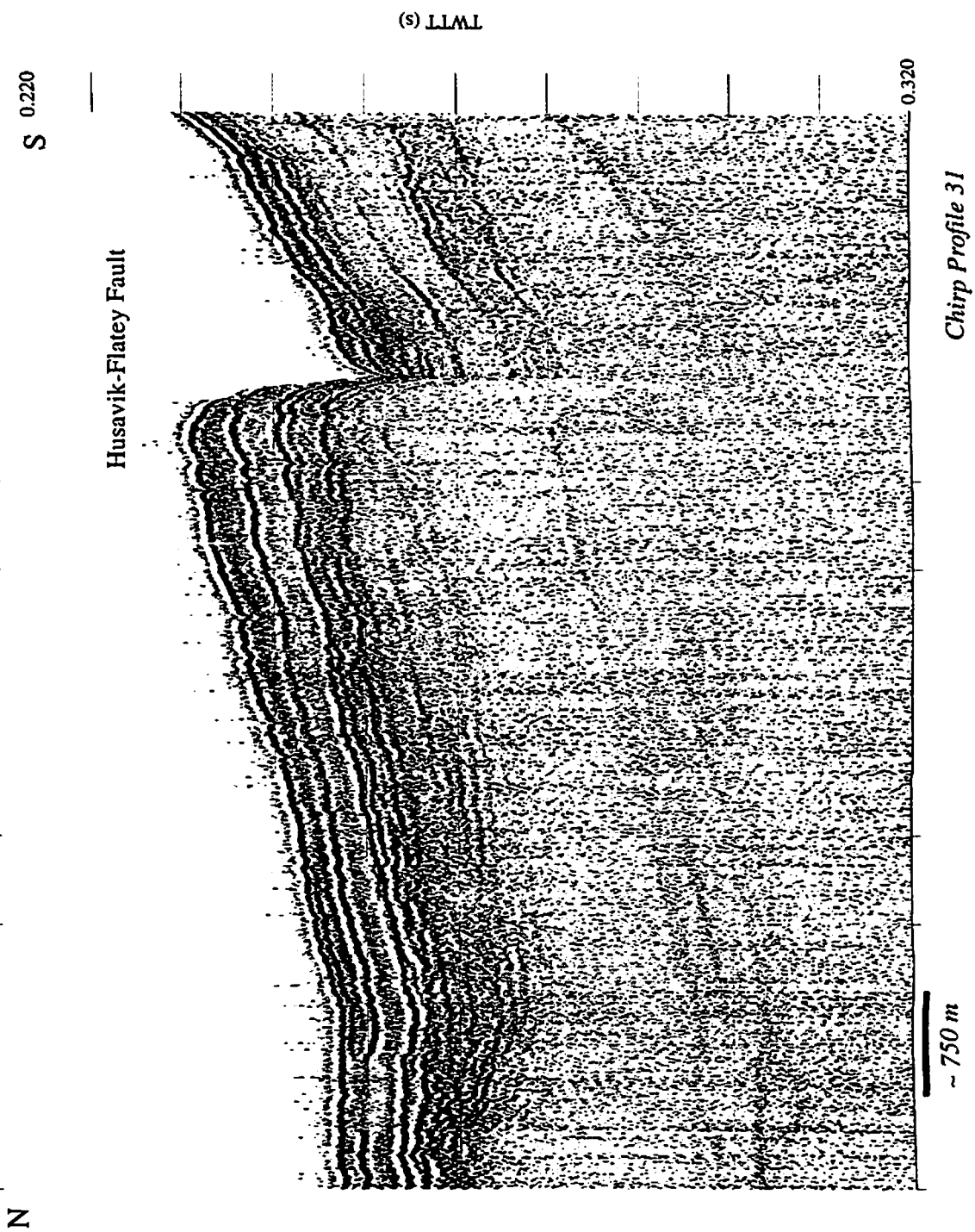
end\$

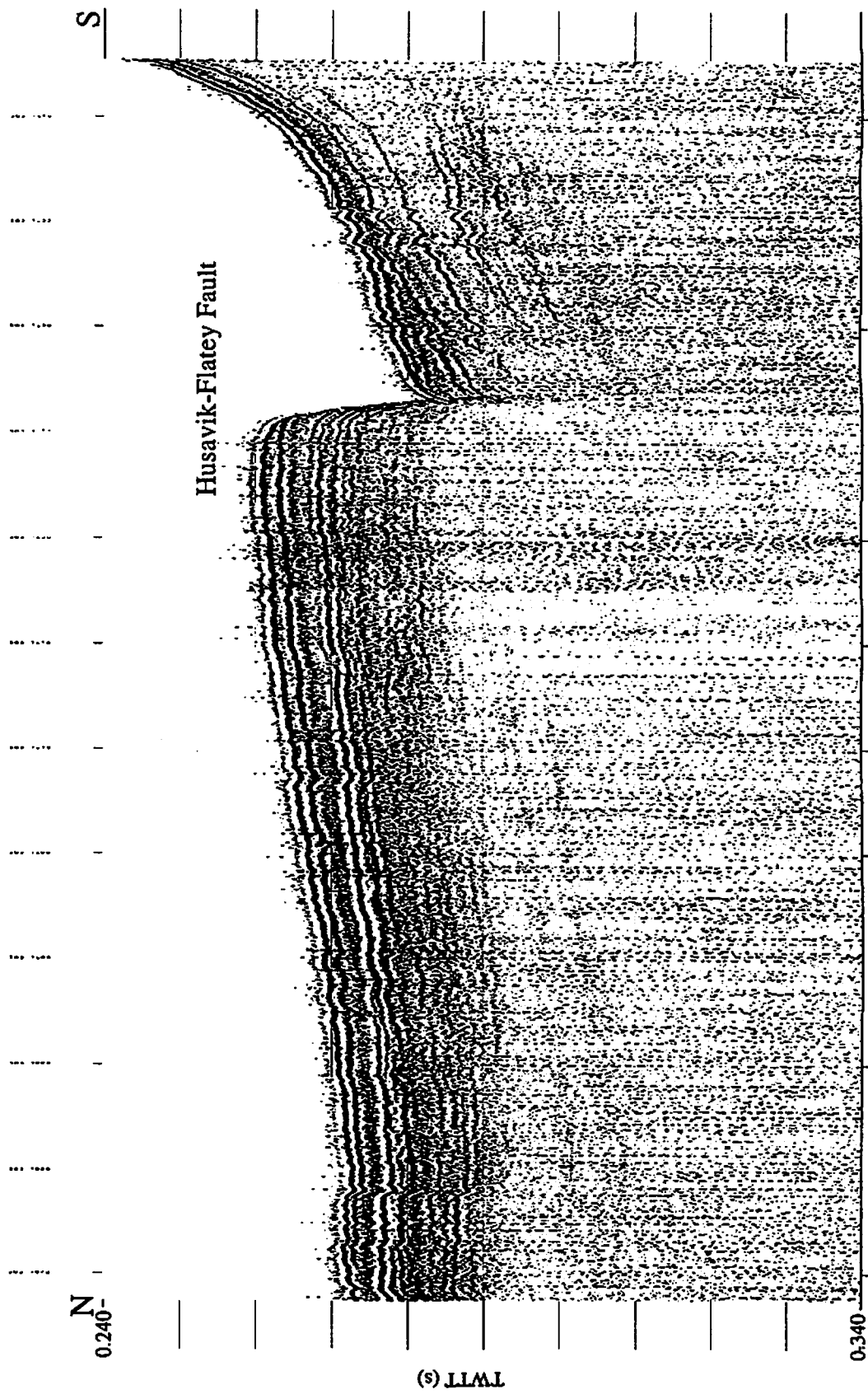
8.9 TFZ X-Star CHIRP Recording Log

Tape #	Latitude	Longitude	Time (GMT)	JD	Date	Line #
1 - start	66° 30.036'N	19° 56.870'W	2211	198	7/17/01	1
1 - stop	66° 30.020'N	19° 13.910'W	0306	199	7/18/01	1
2 - start	66° 29.600'N	19° 07.110'W	0309	199	7/18/01	1
2 - stop	66° 29.980'N	18° 25.390'W	0701	199	7/18/01	1
3 - start	66° 29.980'N	18° 25.390'W	0704	199	7/18/01	1
3 - stop	66° 36.685'N	17° 30.217'W	1647	199	7/18/01	5
4 - start	66° 36.934'N	17° 29.678'W	1650	199	7/18/01	6
4 - stop	66° 22.635'N	17° 43.810'W	2104	199	7/18/01	7
5 - start	66° 25.980'N	19° 14.480'W	1153	200	7/19/01	12
5 - stop	66° 24.960'N	19° 09.750'W	1225	200	7/19/01	12
6 - start	66° 18.060'N	18° 20.870'W	1303	201	7/20/01	19
6 - stop	66° 16.800'N	18° 17.088'W	1936	201	7/20/01	20
7 - start	66° 16.305'N	18° 17.095'W	1942	201	7/20/01	21
7 - stop	66° 12.999'N	18° 15.393'W	0633	202	7/21/01	24
8 - start	66° 08.293'N ?	17° 28.010'W ?	0327?	203	7/22/01	27
8 - stop	66° 07.270'N	17° 49.104'W	1251	203	7/22/01	32
9 - start	66° 07.574'N	17° 14.047'W	1255	203	7/22/01	33
9 - stop	66° 10.207'N	17° 34.951'W	1927	203	7/22/01	37
9 - stop	66° 10.118'N	17° 34.459'W	1931	203	7/22/01	39
10 - start	66° 07.809'N	17° 35.221'W	0544	204	7/23/01	44
10 - stop	66° 07.869'N	17° 35.534'W	0546	204	7/23/01	44
11 - stop	66° 14.910'N	17° 20.119'W	1530	204	7/23/01	49
12 - start	66° 15.126'N	17° 20.791'W	1535	204	7/23/01	50
12 - stop	66° 11.431'N	18° 18.602'W	0114	205	7/24/01	55
13 - start	66° 11.114'N	18° 19.001'W	0119	205	7/24/01	57
13 - stop	66° 19.001'N	16° 35.831'W	1519	205	7/24/01	59
14 - start	66° 18.883'N	16° 35.472'W	1521	205	7/24/01	60
14 - stop	66° 14.038'N	16° 32.879'W	0257	206	7/25/01	63
15 - start	66° 14.029'N	16° 33.550'W	0258	206	7/25/01	64
15 - stop	66° 28.031'N	17° 31.962'W	1458	206	7/25/01	67
16 - start	66° 28.027'N	17° 32.765'W	1501	206	7/25/01	67
16 - stop	66° 24.018'N	17° 31.142'W	0301	207	7/26/01	68

Tape #	Latitude	Longitude	Time (GMT)	JD	Date	Line #
17 - start	66° 24.034'N	177° 31.971'W	0314	207	7/26/01	69
17 - stop	66° 21.979'N	177° 30.049'W	1455	207	7/26/01	71
18 - start	66° 22.012'N	177° 31.217'W	1500	207	7/26/01	71
18 - stop	66° 20.676'N	177° 08.997'W	0047	208	7/27/01	73A
19 - start	66° 20.510'N	177° 09.468'W	0050	208	7/27/01	73B
19 - stop	66° 15.999'N	177° 36.732'W	1217	208	7/27/01	75
20 - start	66° 15.998'N	177° 35.437'W	1219	208	7/27/01	76
20 - stop	66° 06.140'N	177° 35.767'W	2018	208	7/27/01	78
21 - start	66° 05.370'N	177° 35.921'W	2036	208	7/27/01	78
21 - stop	66° 01.680'N	177° 27.505'W	0505	209	7/28/01	84
22 - start	66° 02.009'N	177° 27.154'W	0611	209	7/28/01	85
22 - stop	66° 03.603'N	177° 22.572'W	0920	209	7/28/01	89

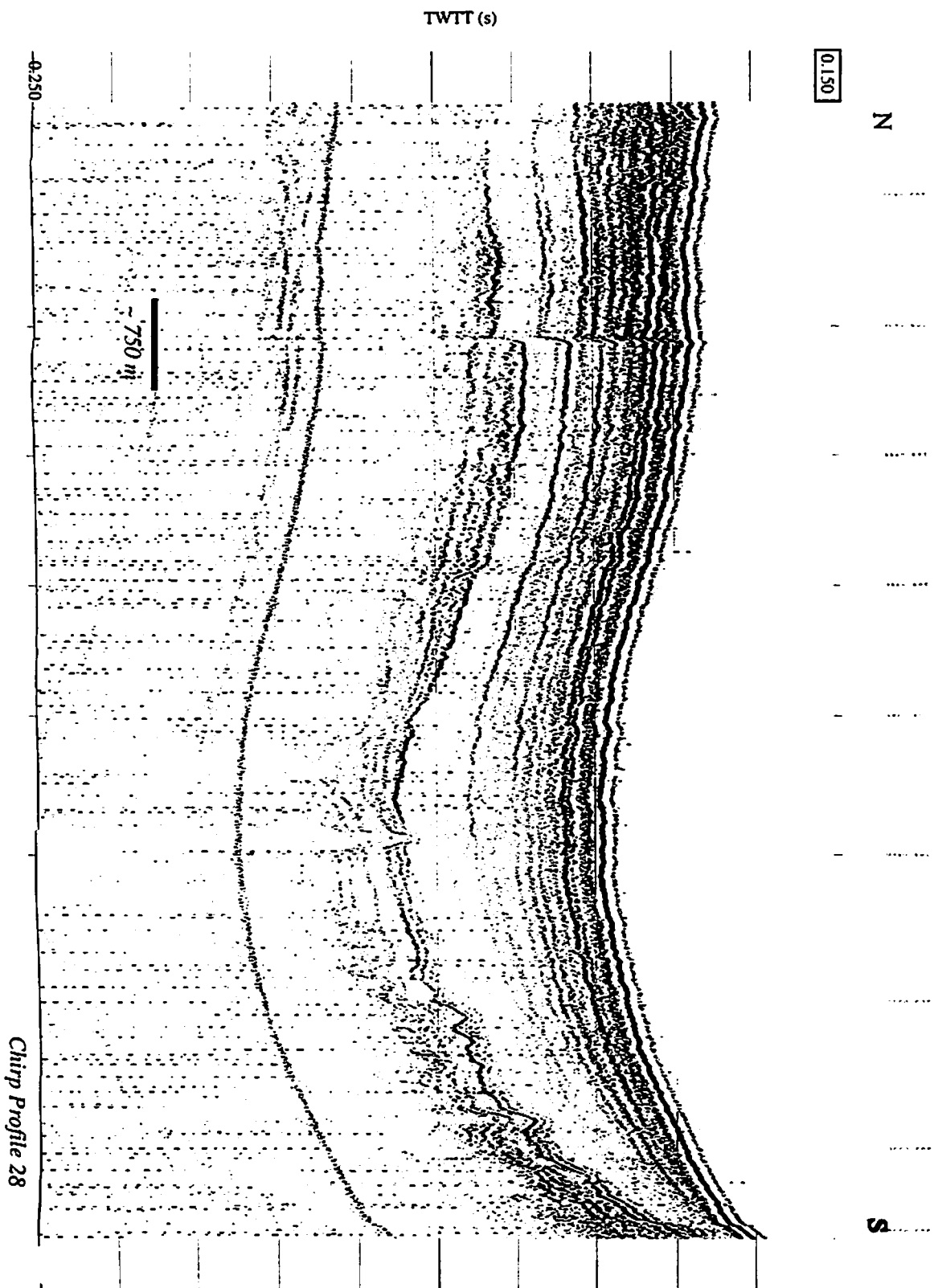
8.10 Examples of CHIRP Profiles

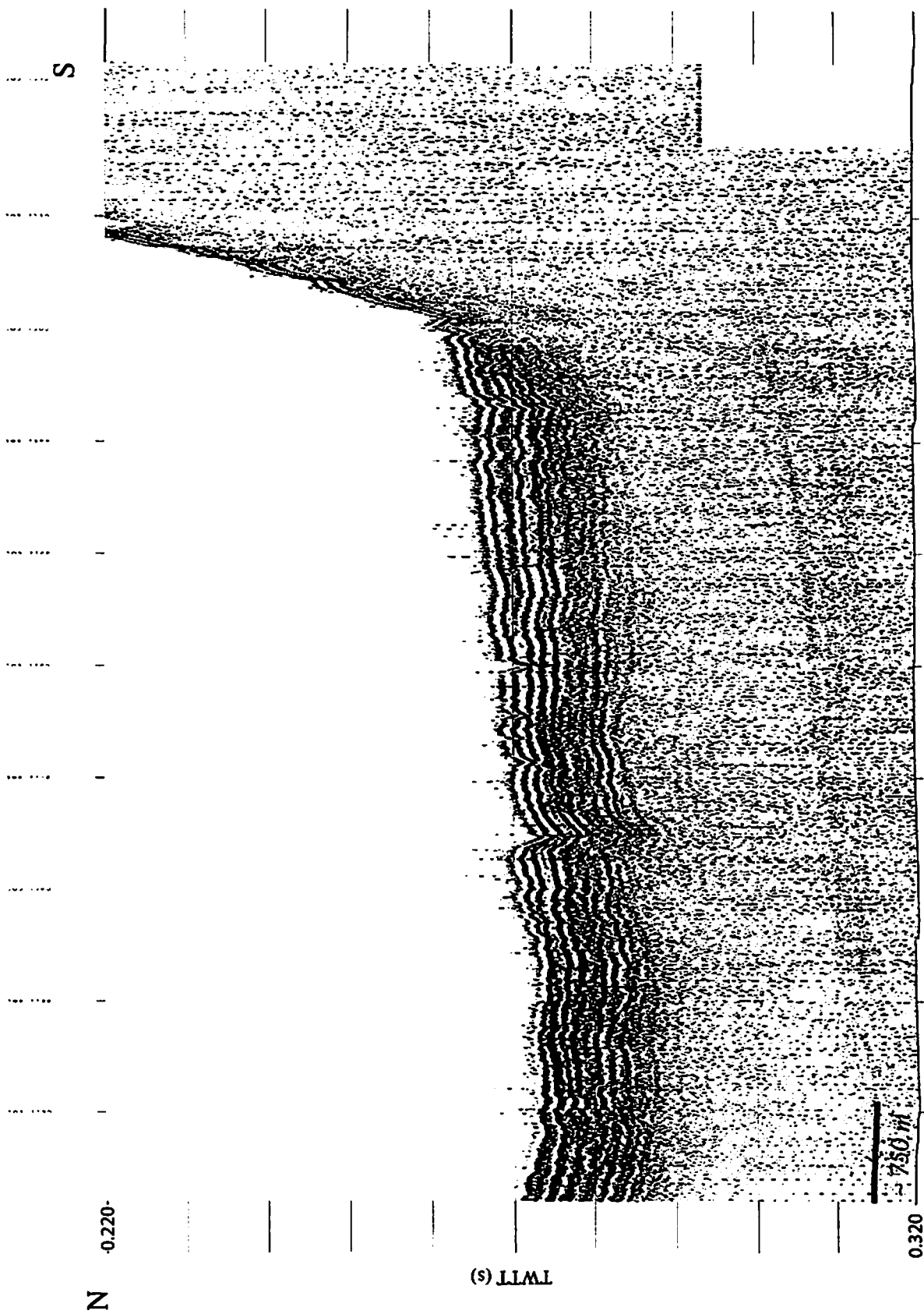




Chirp Profile 36

~ 750 m

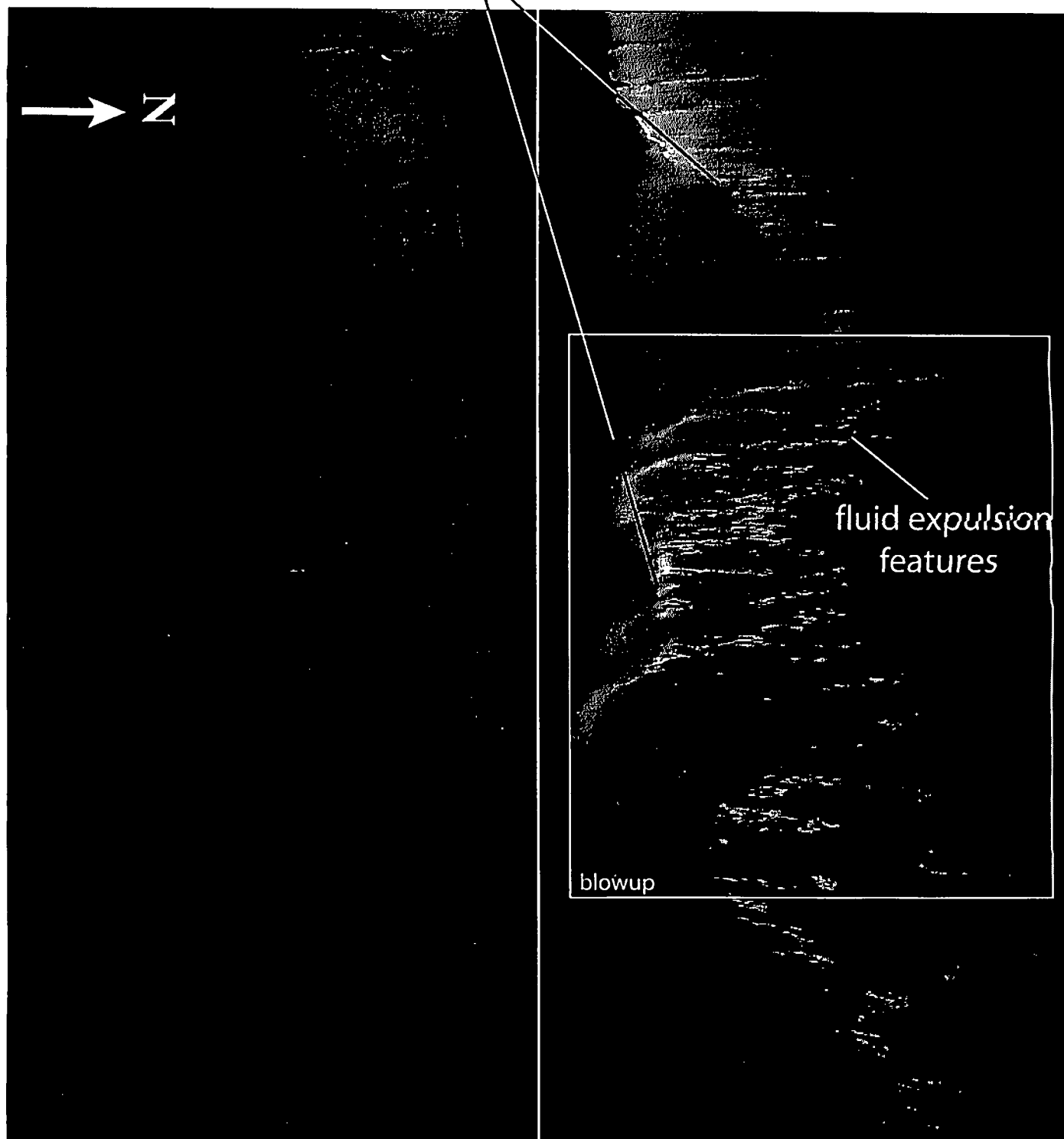




Chirp Profile 32

DF100 Dual-frequency Side-scan data

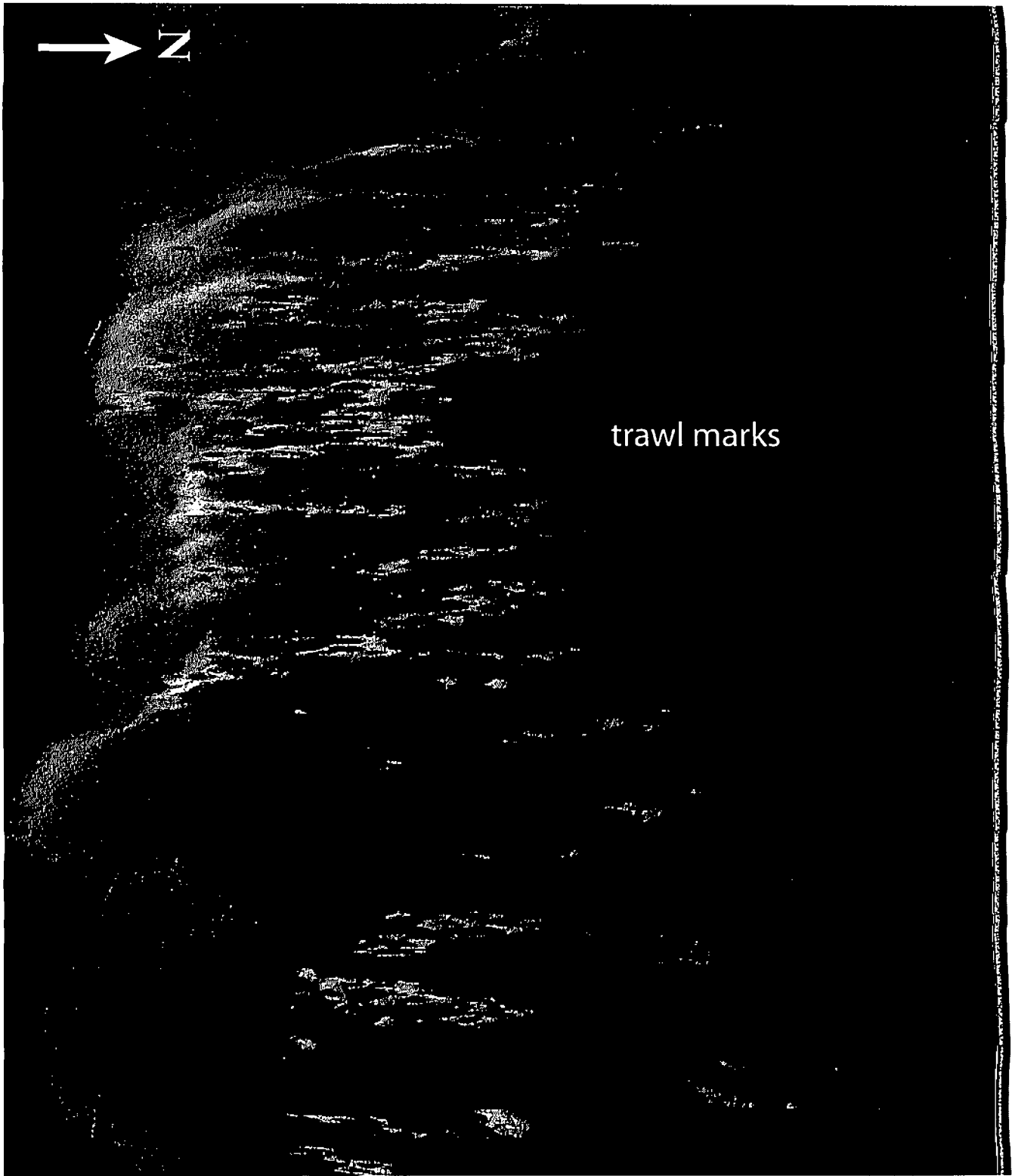
Husavik-Flatey Fault



light = high backscatter

200 m

Husavik-Flatey Fault



light = high backscatter

8.12 Data Listing for TFZ-B9

Main Lab Log (original)	Detrick (WHOI)
MCS Line Log (original)	Detrick (WHOI)
493 original 3480 MCS field tapes*	Detrick (WHOI)
4 DLT tapes with copies of MCS tapes	Detrick (WHOI)
OY, NB, GP and CB files (original)	Lamont
OY, NB, GP and CB files (copy)	Detrick (WHOI)
X-Star CHIRP Recording Log (original)	Driscoll (SIO)
22 Exabyte XSTAR Chirp tapes	Driscoll (SIO)
Ship sat nav and 3.5 kHz Simrad depth data	Brandsdóttir (Iceland)

* original tapes to be sent to SIO for copying after DLT tapes read at WHOI